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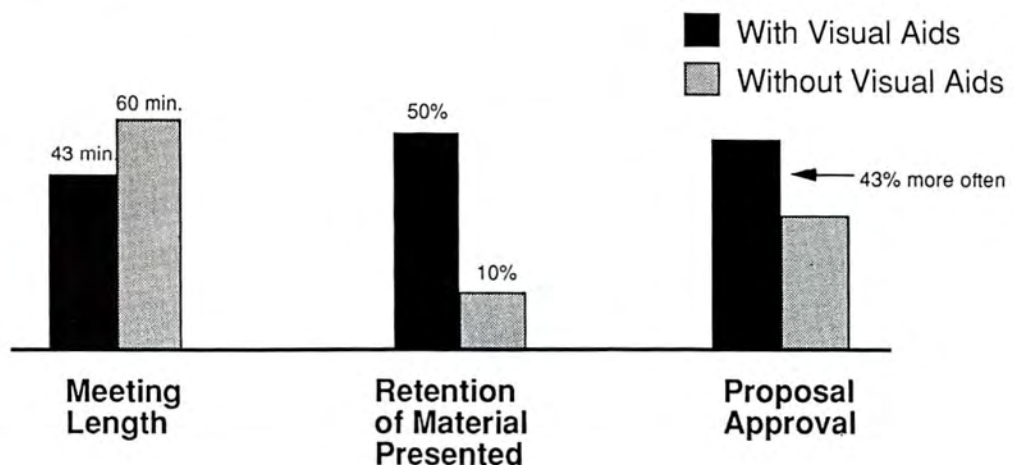
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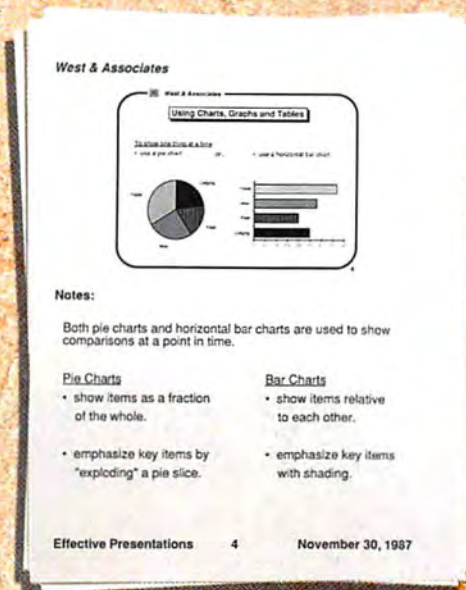
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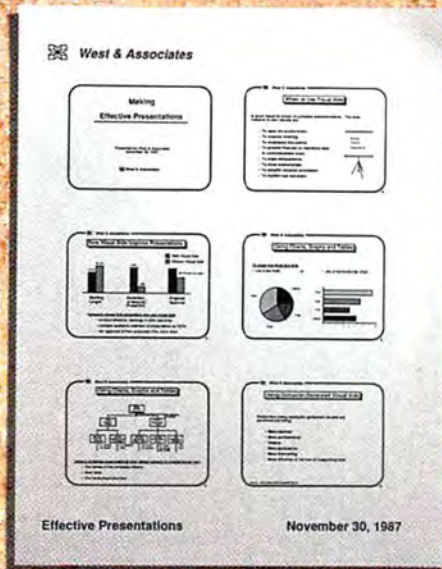


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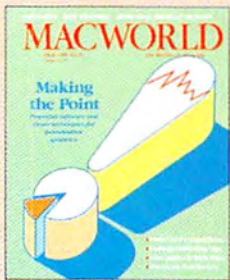
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MACWORLD

April 1988

The Macintosh® Magazine



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Plus transparent Macs, graphics-based outlining, a *HyperCard* look at history, and more.



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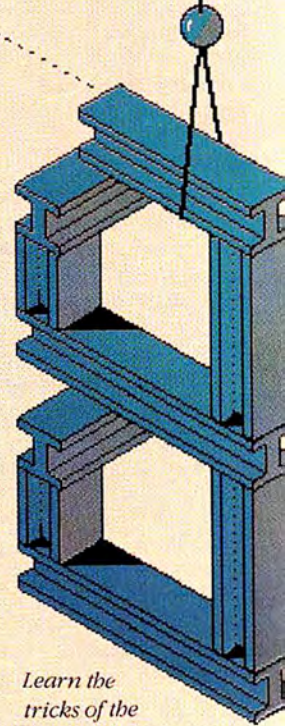
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Learn the
tricks of the
DTP trade: how to
build a font library,
manage your type col-
lection, and turn out
slick-looking type (see
page 145).

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April 1988**Volume 5, Number 4**

Macworld® (ISSN 0741-8647) is published monthly by PCW Communications, Inc., 501 Second St., San Francisco, CA 94107. Subscription rates are \$30 for 12 issues, \$60 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add \$16 per year from Canada and Mexico; add \$16 per year for surface mail or \$95 per year for airmail from all other countries. Second-class postage paid at San Francisco. POSTMASTER: Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries call 800/621-5461, in California 800/521-8455. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.

For subscriber service questions call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529.

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With the Copy II PC Deluxe Option Board, Mac and PC users can share data quickly and easily—for a lot less money than you would pay for a network or add-on Mac drives. **There's simply no easier, less expensive way to transfer data from Macs to PCs. Or vice versa.**

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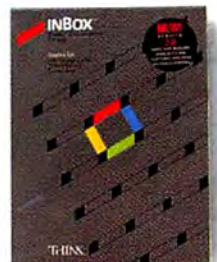
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A Display PostScript Standard?

▶ In early January, Apple's top executives visited Adobe to look at Display PostScript, a PostScript-based program that writes to a monitor instead of a printer. Adobe is pitching Display PostScript as the new imaging standard, so that future graphics programs will have the exact same look on both screen and page.

Although Adobe hit home runs with DEC and NeXT, both of which have adopted the program, they apparently struck out with Apple. A few days after the meeting, Jean-Louis Gassée, Apple vice president for product development, was asked what the chances were that Display PostScript would become a Macintosh standard. His reply was curt: "None."

Gassée explained that Apple must maintain control over its operating system—it can't relinquish an important function to another company. To meet the challenge of Display PostScript, Apple is extending the functionality of QuickDraw, the imaging program now used on the Mac.

But the door still remains open to Display PostScript. A day after Gassée's remark, Apple chief operating officer Del Yocam said Apple would improve QuickDraw but would also support Display PostScript if it became a standard. Now it's up to Adobe.

New SE Fan and Mouse

▶ Apple's newest Macintosh SEs are shipping with a much quieter fan and lighter-weight mouse. The mouse has the same basic shape as the first-issue Apple Desktop Bus mouse, but the new one is lighter and its profile is a little lower, which gives it slightly faster action. It also has a redesigned tracking system that's more resistant to dirt.

The new fan is based on a rotary design (like a room fan) and replaces the relatively noisy "squirrel-cage" fan used in the original SE. Apple dealers are offering an SE fan conversion that costs \$91 and requires replacing the video/power-supply board and the small printed circuit that plugs into the display tube. The new fan bolts to the upgraded video board.

Giant Hard Disks

▶ Huge hard disks that store up to 3 gigabytes of information—the equivalent of 3759 double-sided 800K disks—are now available for the Macintosh. They're especially useful in graphic-design settings, where a single color image can occupy 3 megabytes, and on networks where the hard disk is a file server for a number of Macintoshes.

The following companies offer such jumbo disks (they're listed with their capacities): CMS, 1.2 gigabytes; Control Data, 850MB; Jasmine, 1.4 gigabytes; FWB, 3 gigabytes; and Northern Telecom, 761MB. Both ADIC and

NuData offer 800MB optical drives.

Offering new hard disks in the midrange are: Priam, 328MB; First Class Peripherals, 300MB; Rodime, 140MB; FWB, 550MB; Micah, 300MB; Mass Micro, 100MB; Northern Telecom, 460MB; Novastar, 150MB; ADIC, 488MB; and PCPC, 144MB.

To back up this much memory, both Jasmine and PCPC have announced new tape backup systems that use 8mm videotape. Videotrax is using a regular VCR for hard disk backup.

Faster Desktop for Large Hard Disks

▶ A giant-size hard disk was supposed to answer all our storage problems, but rebuilding the huge Desktop file that results has become so time-consuming that we could be shuffling floppies and still come out ahead.

Apple's David Ramsey proposes a solution. However, he advises that you begin the following experiment with a complete backup of the hard disk and frequent backups thereafter. Your data could become unrecoverable—proceed at your own risk.

Ramsey says to speed up a hard disk update, obtain a copy of *Desktop Manager* from an *AppleShare* server and put a copy in the System Folder. Using a disk editing program like *Fedit*, erase and trash the Desktop file while some application other than the Finder is open. Holding down the Option and ⌘ keys

when you next start up the Mac prompts the Finder to use *Desktop Manager* to rebuild the Desktop file with a much more efficient B-tree structure.

Finder updates will be much faster. But remember, you achieve increased speed at your own risk.

A 68030 for the Mac II

▶ The Mac II may soon be as fast as a high-price workstation, thanks to a new series of accelerator cards based on Motorola's next-generation 68030 processor. MacProducts USA claims its 030 card will give the Mac II a 500 percent increase in speed—a 100 percent improvement over the speed of a 80386-based computer. The card, which will ship in May, doesn't require high-speed RAM chips, and you won't have to buy Apple's memory management unit (MMU) to run UNIX. The 030 card's software includes drivers that allow hard disks to operate at higher-than-normal speeds. MacProducts' cards will be available in 20 MHz, 25 MHz, and 30 MHz by the third quarter of this year.

Computer System Associates' 68030 card is now shipping primarily to hardware and software developers who will receive custom software to assist in program testing. An accelerator card planned for June will allow standard memory chips to perform at faster-than-normal speeds. The card will take advantage

(continues)

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Minimum system requirements:
Macintosh with 512K RAM, 128K ROM minimum.
One 800K disk drive.

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of the 030's internal MMU and two caches.

MacPeak's 68030 board will run at 20 MHz, have 256K of static RAM, and support the 68882 math coprocessor. Overall performance is projected to be three to four times faster than the Mac II.

University Resources

► *Wheels for the Mind* is an Apple University publication prepared for Apple Computer at Boston College and edited by Peter Olivieri. It has a circulation of 10,000. Each quarterly edition contains over 100 pages of articles and announcements about how Macintoshes are used in a wide variety of university settings. Also included are product reviews and explanations of software programs developed at universities throughout the world.

You can subscribe to *Wheels for the Mind* for \$12 per year or \$21 for two years; single copies cost \$4. Send a check or money order, made payable to Apple Computer, Inc., to *Wheels for the Mind*, Apple Computer, Inc., P.O. Box 1834, Escondido, CA 92025. Visa or MasterCard payments are accepted when accompanied by an account number and expiration date.

User Group Events

► Two big user groups have annual get-togethers and product fairs in April. The Boston Computer Society's Mac group throws its annual MegaMeeting on April 9; call 617/625-7080 for details. The New York Macintosh User Group's third annual Mac Fair takes place on April 16 at the Roosevelt Hotel in New York City; call 213/969-0533.

A Mac-VAX Strategic Alliance?

► Look for much easier and more powerful connectivity between Macintoshes and VAX computers, following the January announcement of a development agreement between Apple and DEC.

Both companies will foster development of communications protocols and products that will integrate Macintoshes and AppleTalk networks into DEC's VAX-based network, which uses the OSI international standard for communications.

This unified approach to networking will allow Macs and VAXs to share files, printers, and electronic mail; to exchange data; and to provide real-time conferencing. Macs will connect to wide-area networks now available to VAX users.

The agreement between Apple and DEC could result in new products by fall. It could also signal a new strategic alliance between Apple and DEC, as both seek to compete against the combinations of IBM and Microsoft, and AT&T and Sun Microsystems.

Your Best Stacks

► Send a disk of your best *HyperCard* stacks to: News Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. We'll pay \$25 for every entry selected for a new monthly item, "Your Best Stacks." Please tell us how you developed your stack, describe its features and who would use it, and let us know how readers can obtain more information. We'll also need to know if it's free, shareware, or a commercial product.

Word-Processor Features Galore

► *Nisus*, a powerful new word processor from Paragon Concepts, is expected to ship in June. Previously code-named InAWord, *Nisus* lets you draw on a text-based page and then wrap text around or through the artwork. If you make a mistake, *Nisus* lets you undo the last command or all previous commands.

Nisus also lets you complete a whole series of functions by pushing just two keys. More than 50 macros come with the program, and you can create your own by recording your actions; you'll even be able to edit macros until they respond just the way you want.

Nisus's many other features read like a wish list of the best capabilities from word processing and page-layout programs already on the market. *Nisus* is based on *QUED*, also distributed by Paragon Concepts of Del Mar, California (619/481-1477).

CD ROM Clip Art

► Over 1000 PostScript-based images and 48 fonts are contained on a CD ROM disk offered by the Canadian company Image Club Graphics of Calgary, Alberta. The disk, called *ArtRoom*, comes complete with a LoDown CD ROM drive that plugs into the Mac's SCSI port; the package lists for \$1999. Sold alone, the *ArtRoom* disk costs \$999. *ArtRoom* also contains some 100 color clip art images in encapsulated PostScript (EPS) format, which allows you to enlarge or reduce them without affecting image resolution or quality.

To select an image, you enter one or more keywords in

ArtRoom's Curator DA, which retrieves the appropriate images and presents them in full size or lets you flip through miniaturized images. Curator will also paste an EPS image into almost any Macintosh program, even if the program normally accepts only bit-mapped graphics. A multiuser version of *ArtRoom* is also available, compatible with *TOPS*, the popular networking product.

User Groups Growing

► The fastest-growing user groups appear to be those designed for Mac users only. The largest such organization in the country is The Boston Computer Society's Macintosh Users Group, which leapt from 5160 to 7836 members in the past year. Following BCS-Mac is BMUG, a Berkeley, California, group with a membership estimated at between four and five thousand—up about a thousand from last year.

Groups that aim to serve both Apple II and Macintosh users have not matched this explosive growth. Washington Apple Pi, in the District of Columbia, has grown only about 5 percent in the past year, with much of the interest attributed to an upsurge in Apple IIGS ownership; Apple Corps of Dallas has actually seen a slight drop in membership. Users want to focus their interests on a single machine—or even on specific topics. Many Mac groups point to business use and *HyperCard* as the two factors that are now attracting new members.

It's not surprising that group growth is tied closely

(continues)

Reflex Plus can show you more about relationships than Dr. Ruth

The relationships between different pieces of data within your database are all important ones. Because Reflex Plus is truly *relational*, it can "relate" and cross-reference your data.

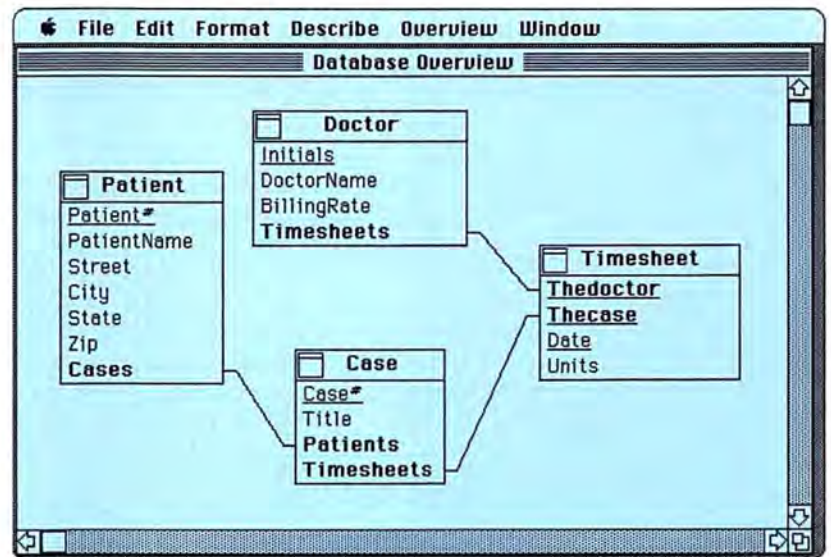
Many "database managers" are not much more than "list managers"—simple lists that can't connect and cross connect one item with another. So while they can "list," they can't really "manage."

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It's easy to customize your output with Reflex Plus. Whatever you're working on—letters, invoices, quotations or data entry screens—Reflex Plus lets you add graphics, position them wherever you want, change sizes, change fonts and produce truly professional results. Reflex Plus lets you make the most of your Macintosh.

Some of the power pluses of Reflex Plus

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- Truly relational database manager
- Auto-Save—which means you'll never lose data again



You simply draw connecting lines to relate one item to another.

- Paste Choice command that saves you enormous amounts of time
- Context-sensitive online Help
- Automatic creation of formulas to let you instantly search, sort, calculate, qualify and more
- Multiple entry forms for the same database
- Entry for more than one database in a single entry form
- Shows one record at a time or all records at once
- Calculated fields in entry forms
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- GROUPBY function
- Record sizes can be 1000, 2000, or 4000 characters
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- New rewritten documentation

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“ Borland's new relational database, Reflex Plus, is the best Macintosh database . . . It is simple to use and operate, very flexible in design, low cost (only \$279 compared to \$500 for dBase Mac), and small in size (250K versus 730K for Fourth Dimension) . . . We converted an Omnis 3 database that took two weeks to design into Reflex Plus in two days . . . We think Borland is right on target with their approach.”

David Smith, MacTutor ”

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to Apple's success. Buy a Mac and you'll find information about BCS and BMUG in the manual's introduction, along with Apple's toll-free number (800/538-9696), which you can call to locate the nearest Macintosh user group.

4th Dimension, Double Helix Upgraded

▶ A May upgrade of *4th Dimension*, version 1.1, is expected to speed data transfers, indexing, and sorting, by up to six times. The new version improves multiuser access on *AppleShare* networks, and the upgrade allows non-programmers to utilize about 90 percent of the multiuser database's capabilities without resorting to scripting.

Another upgrade, expected in the fall, will allow *4th Dimension* to access and update other database records—such as *SQL*, *Oracle*, and *dBase III Plus*—as if those files were native to *4th Dimension*.

Odesta's *Double Helix II*, another multiuser database, is an upgrade of *Double Helix* that provides a threefold speed improvement. The new version simplifies data entry by enabling you to post a single figure to separate areas of the program.

Macworld Expo Networked

▶ In case you hadn't noticed, the recent Macworld Expo in San Francisco was a showcase for AppleTalk networks of almost every shape and variety. According to Farallon's Kee Nethery, there were 13 networks, 114 visible nodes, 6000 feet of PhoneNet, 400 feet of Ethernet, 100 feet of Lanstar, 100 feet of Local-

Talk, 12 bridges, 4 StarControllers, 22 Macintosh IIs, 33 Macintosh SEs, 5 Macintosh Pluses, 7 PCs, 3 DEC VAXs, 1 Sun Workstation, 19 LaserWriters, 4 RS-232C servers, 8 Apple File Protocol file servers, 26 other file servers, and 2 mail servers.

The demonstration project was planned a week before the expo and it took five people a day and a half to construct. This was the fourth Macworld AppleTalk network. The first Macworld AppleTalk network, at the 1986 Boston expo, had only 26 nodes.

Participants on the network included: Abaton, Access Technology, Ann Arbor, Apple, BMUG, Farallon Computing, Infosphere, Kinetics, the *Macworld* press room, Microsoft, Northern Telecom, Pacer, SuperMac, Symmetry, Tangent Technologies, and TOPS.

Apple Moves Up

▶ Apple attained a new financial high when its October through December 1987 sales reached \$1.04 billion, up a whopping 52 percent over the previous year. If this pace continues, the company that began 11 years ago in a garage could reach over \$4 billion in sales by the end of its current fiscal year, September 30.

However, one Macintosh statistic is not so rosy. Info-Corp estimates that the Macintosh share in the personal computer market increased by only 2 percent (going from 12 to 14 percent) between November 1986 and November 1987.

Asked if Apple would introduce a lower-price Macintosh to increase its market share, chief operating officer Del Yocam said Apple's direction has always been to add value

to its products. "Instead of going down, I think you'll see us moving up. Our market figures show users want to become more technologically sophisticated; and they're willing to pay for that. But as we move up, we'll still have entry-level computers."

Spreadsheet Wars, a Continuing Saga

▶ The spreadsheet battle began a few months ago when Lotus announced it would bring *1-2-3* to the Macintosh. That took place a day before the press event at which Microsoft said *Excel* would compete with *1-2-3* in the MS-DOS world.

Now another big gun is entering the Mac spreadsheet market: Ashton-Tate revealed it will soon introduce *Graphsheet Mac* for around \$395. This product will feature more graphics capabilities than *Excel*.

Wingz, a new offering from Smart Software, also offers more graphics than *Excel*. It's expected to ship in May. *Wingz* combines three-dimensional color charts with database and text functions—all in addition to regular spreadsheet functions. Its cost is said to be competitive with the \$395 *Excel*, which Infonetics estimates holds about 85 percent of the market.

HyperCard as a DA

▶ You can open and browse through your stacks without opening *HyperCard* if you have *HyperDA*, a new desk accessory from Symmetry. *HyperDA* is always available in the Apple menu within your applications and requires only 512K of memory, as opposed to 1MB for *HyperCard*.

When implemented, *HyperDA* displays its own menu from which you can open or close a stack; print a card; set up a page; find a card that contains a certain word; or go to the first, previous, next, or last cards in a stack. Another feature is a window mode, which displays a stack in an expandable, scrollable window that can be moved anywhere on screen. Text and graphics can be copied to the Clipboard.

HyperDA costs \$69 and comes with a manual in the form of a stack. For further information, call Symmetry in Mesa, Arizona, at 602/844-2199.

FullWrite Pro and WordPerfectFinals

▶ Ann Arbor gave away over 10,000 demonstration samples of *FullWrite Professional*, its long-awaited word processing/page-layout program, at Macworld Expo in January. Each recipient was handed two disks that contained a fully functioning program, a help file, and a glossary. However, sample users will find "FullWrite Professional Demo" printed in large gray letters across each page of output. Ann Arbor Software announced it expects to ship a final version by the end of March.

At the same time, another long-overdue word processor, *WordPerfect*, began selling in a beta version for \$99, which includes complete documentation and limited, toll-free, technical support. Feedback from beta testers will help the WordPerfect company create a more bug-free final version. □

The Promise of HyperCard: Focal Point Delivers.

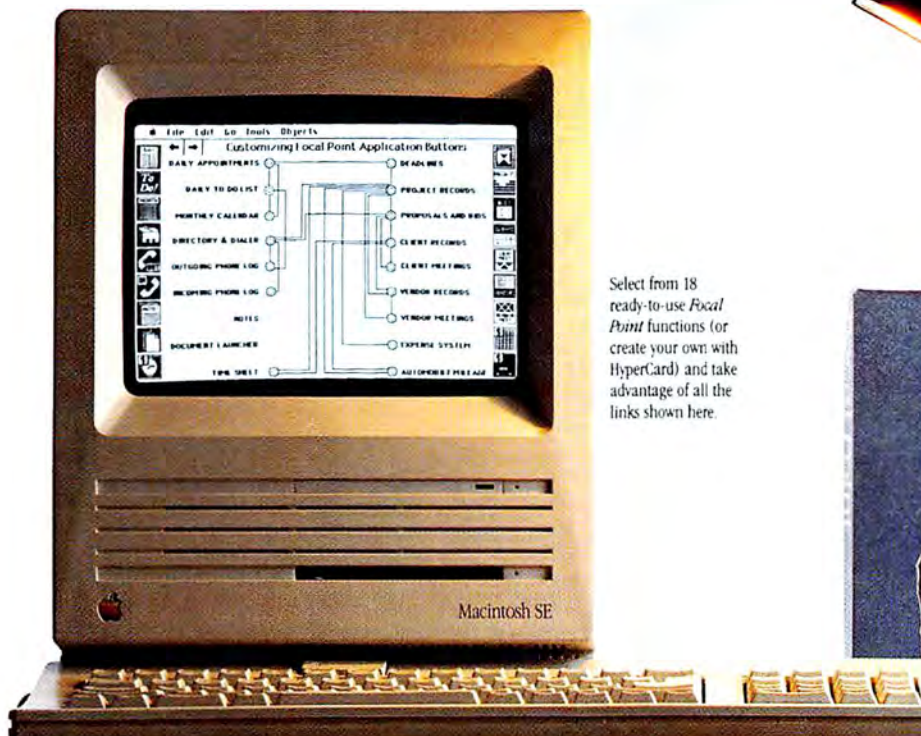
There's been a lot of talk about the promise of HyperCard.™ A lot of—well, *hype*. But not a lot of clear answers to the question "What can it do for me?" **Introducing Focal Point,™ the Ultimate Organizer.** It's got everything you need for managing your time and tasks. Whether you work for yourself or for a large company, *Focal Point* helps you keep your projects on time and on budget. It tracks what you have scheduled tomorrow and what you got done today. It records everything from expenses to exciting ideas. It makes you more efficient, more effective, more creative. And *Focal Point* is completely customizable, so it works the way you do. **Hot Links.** HyperCard *links* the *Focal Point* tools to each other. So you enter information just once. But you can organize it and use it in

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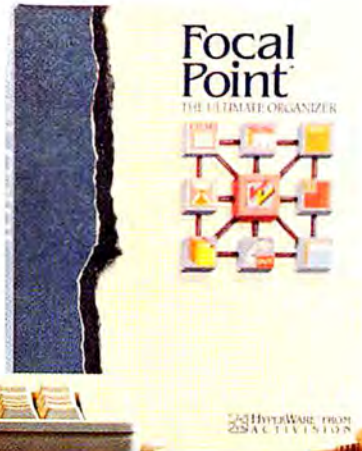
Proposal, project, and deadline functions share data with customer and vendor records. The list of links goes on and on. *Focal Point* even has a document launcher that connects you directly to your reports, letters, spreadsheets, whatever. So you can switch back and forth between *Focal Point* and other applications, instantly. **By the Guy Who Wrote the Book on HyperCard.** *Focal Point* was created by the man who wrote the book on HyperCard—Danny Goodman, author of the best-selling *Complete HyperCard Handbook*. Because Danny worked with Bill Atkinson on the development of HyperCard, he knows it inside out. So *Focal Point* really shows—and uses—the power of HyperCard. **Put the Power of HyperCard to Work for You.** Ask your retailer for *Focal Point*, the Ultimate Organizer. Or order direct: call 800-345-2888, Operator 300. \$99.95 suggested retail price. **Free Demo Disk.** (Well, almost free—there is a \$5.00 postage and handling fee.) Call the 800 # above to order. Self-running demo requires 512K but does not require HyperCard.

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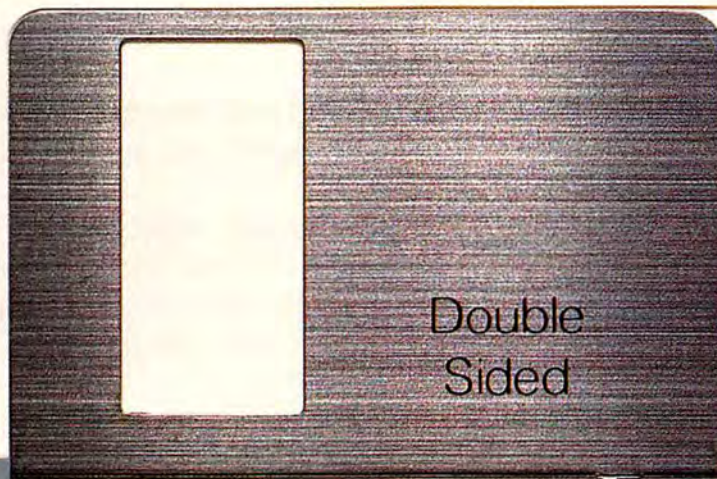
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Circle 329 on reader service card



“Can a Macintosh lover survive in an office that runs on Wang?”

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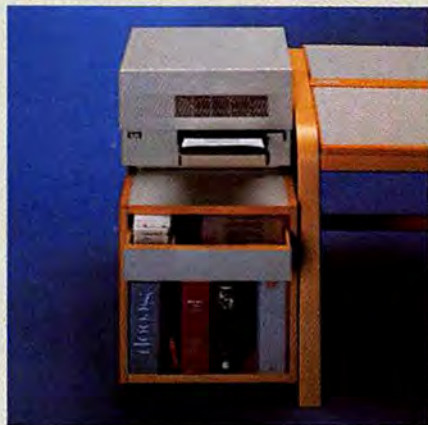
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Interchangeable surfaces offer configurations for every size Mac.

Denmark, by craftsmen using pure beechwood and durable laminates. Its new, sturdy design and quality materials support even the heaviest equipment. And MacTable is now a new color: Platinum Gray, same as the new Macintosh line.

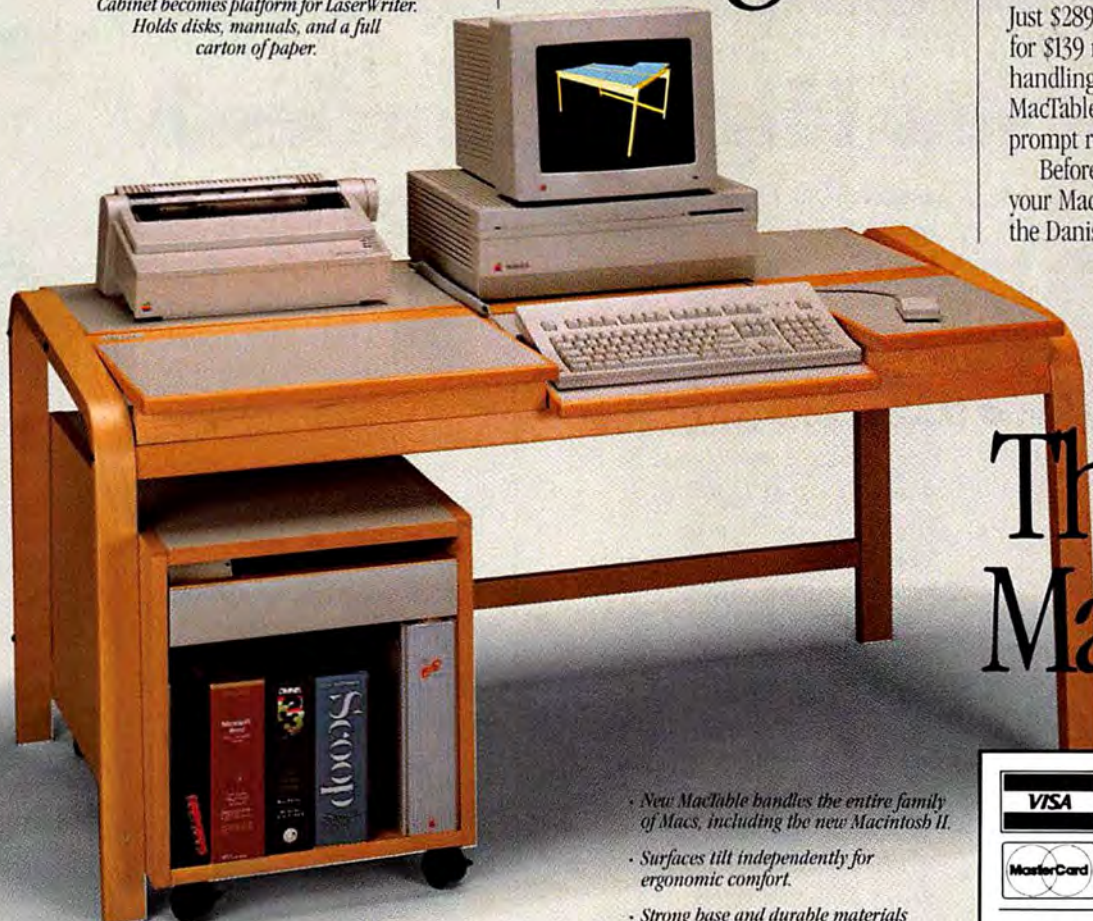
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Eyes on the Prize



Who's afraid of the low-cost Mac? Apple really has nothing to fear—except fear itself.

Have you ever wondered what it would be like to win the World Series, the Super Bowl, a few Oscars, and a Nobel prize—all in one year?

That's how Apple Computer must feel these days.

Big Red recently posted its first billion-dollar sales quarter. It signed a historic codevelopment and comarketing agreement with Digital Equipment Corporation, establishing a strategic link with the VAX-to-micro world. It's making solid inroads into the much-coveted corporate marketplace. And it has definitely become the darling of the personal computer industry.

Judging from the record attendance at the recent Macworld Expo in San Francisco—more than 40,000 people in three days—the good times are just beginning.

In a mere four years' time, the Macintosh has come to have color, speed, and desktop publishing capability, with its various spinoffs like desktop presentation and desktop video. It's got mass storage capability, connectivity, and innovative software like *HyperCard*. It's even got media personality John Sculley, Apple's CEO, appearing on newsstands everywhere.

But there's one thing Apple doesn't have: a low-cost Macintosh.

Now I'm not proposing that Apple introduce—horrors!—a "Macintosh jr." And I don't relish the thought of whatever the clone-makers might drag in from Taiwan.

Nor am I starry-eyed enough to expect Apple to bring out a 68020-based Mac with 2 megabytes of RAM for under a thousand dollars.

No, just give me a basic system for starters, thank you. I see the low-cost Mac as an equivalent to the Mac Plus—nothing fancy, but it's got to be more affordable. Given that option, I think hundreds of thousands of small-business users, low-budget organizations, and students would vote with their wallets for a Macintosh instead of an Apple II or an IBM PC clone.

Why is Apple so unwilling—or perhaps unable—to face what might be its greatest marketing challenge ever? After all, the original Macintosh mandate was to make a

computer accessible to the masses. That's still a much greater challenge for Apple than penetrating the high-end corporate market.

During a keynote session at Macworld Expo, I had the opportunity to raise this issue with Jean-Louis Gassée, Apple's senior vice president of research and development.

"Would Apple please license its ROM chip to Sony and let them make a cheap Mac?" I teased Gassée. "There's a crying need for one. What's the holdup?"

"It would be easy," Gassée admitted. "But we won't do it."

First of all, he insisted, making an affordable Mac is unrelated to actual manufacturing or labor costs.

"And besides, given the state of American currency right now," he said, "it would cost less for Apple to manufacture a Mac with cheap labor in California," than to have Sony do it.

He went on to say that Apple's reluctance to lower its profit margin or to license its system technology to second and third parties has more to do with maintaining the purity of its R&D vision than with anything as earthy as the bottom line.

"What we want is the ability to keep improving the standard without having a noose around our neck—a decrease of our margins that would prevent us from doing what Digital did. It spent 40 years doing DECnet," Gassée said, citing his favorite example of a technology company that hasn't sold its R&D birthright to outsiders.

"DEC was ridiculed when it started DECnet," he noted, "but the company kept investing and came out with something that is very successful right now."

"Another problem we don't want to take on is the business of licensing," he continued. "When you're in the licensing business, you drag all the licensees with you, and all their subtle incompatibilities and their conflicting requirements."

(continues)

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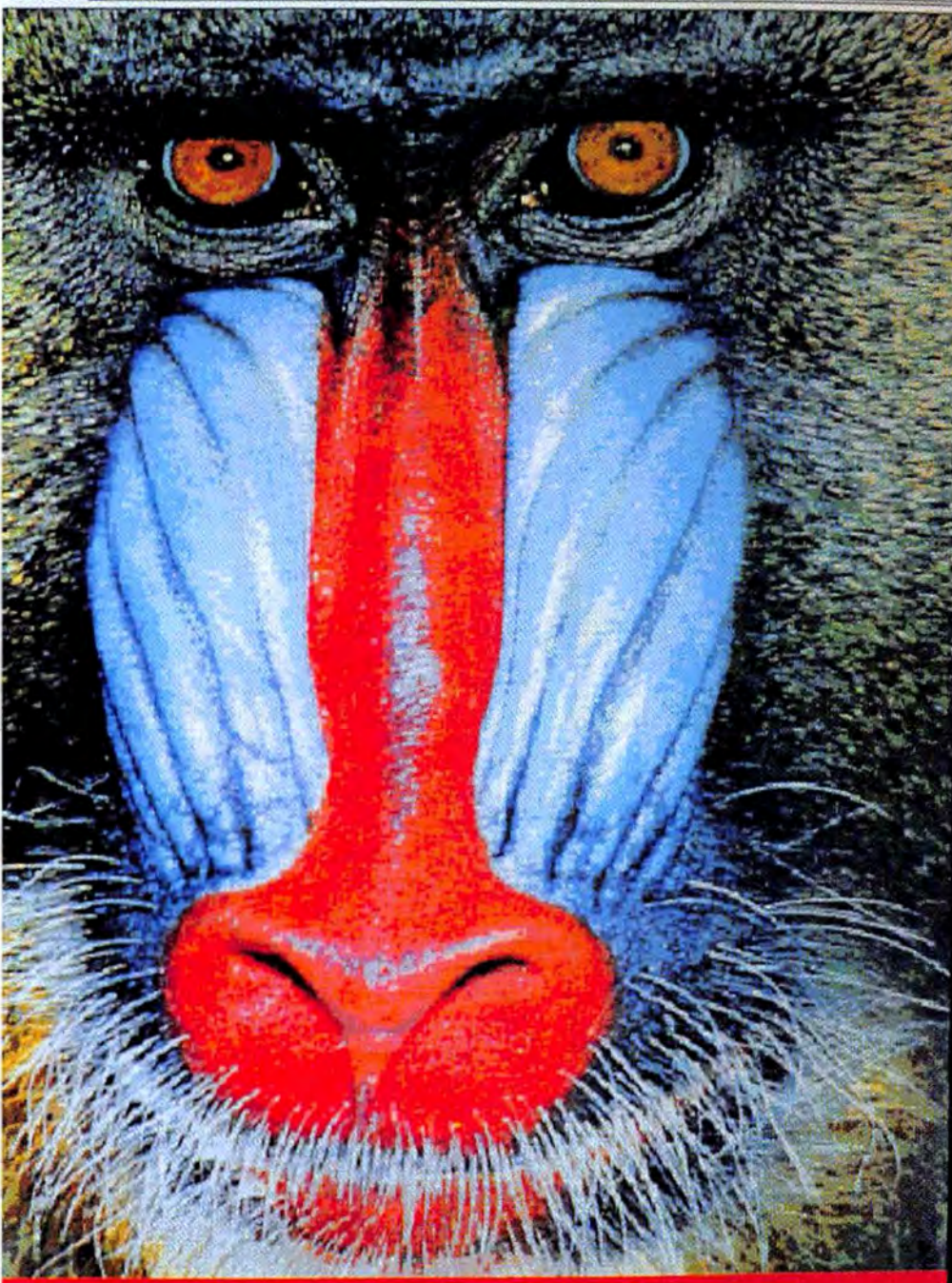
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David Bunnell

Gassée also dismissed the widespread industry allegation that, by sitting on its own proprietary technology, Apple is obstructing the creative evolution of the Macintosh in the broader marketplace.

"The marketing, thinking, and technological processes that apply to fixed media do not apply to the more flexible media that we do," he explained. "The original television technology lasted for thirty or forty years. Long-playing vinyl records were only displaced by CDs after thirty years. Personal computing is a very young technology. It needs a lot of care and feeding before it reaches maturity. And I don't believe that will happen any time soon."

To be fair to Apple, I'm not entirely unsympathetic to Gassée's position. His argument was both persuasive and poignant, although in the final analysis I feel compelled to take the opposite view.

Apple's survival as a company depends entirely on innovation, on its ability to create leading-edge products and to stay ahead of the MS-DOS market.

There is a prevailing belief among industry watchers that the IBM PC's *Windows* environment will catch up to the Mac in two years, maximum. Soon you will be able to enjoy the same functions, features, and ease of use on MS-DOS machines that you now have on the Mac.

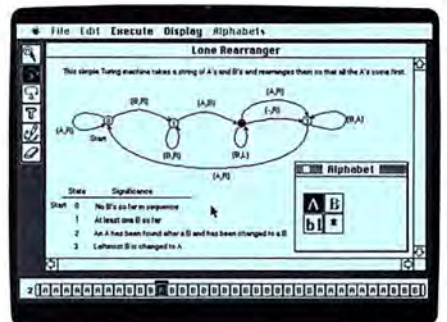
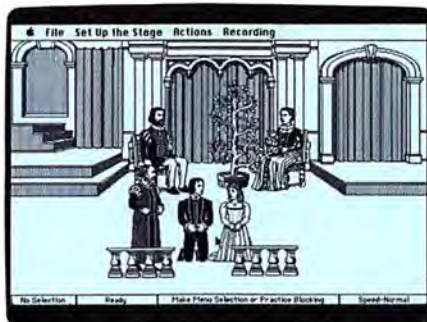
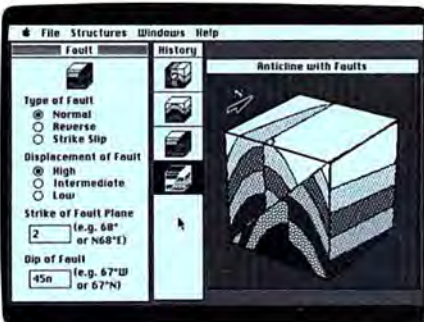
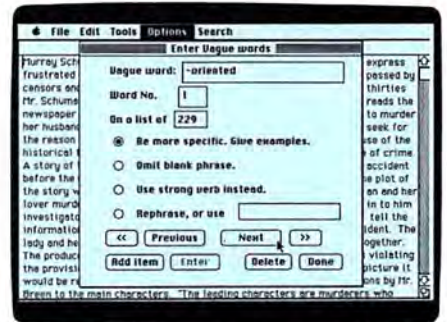
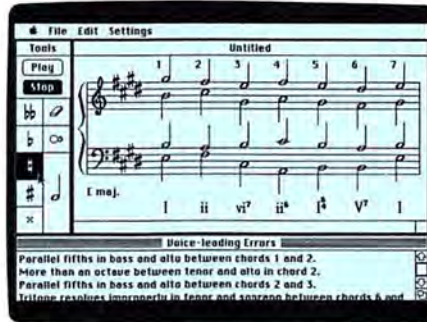
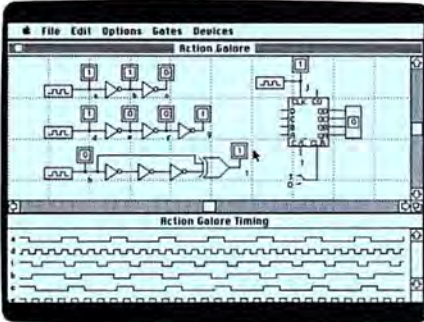
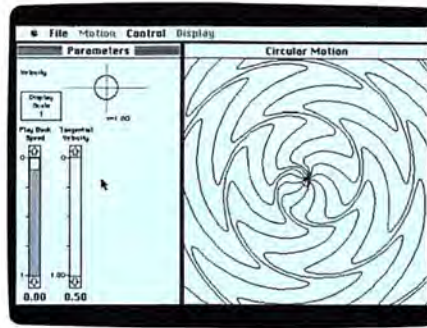
Furthermore, two years from now those 386 clones may very well be selling for about \$1000—not the nearly \$3000 you pay for a business-oriented Mac system today. If that happens, the Macintosh will be in a very precarious position unless Apple comes out with a really low-cost Mac to compete head-on with the clones.

Recently I visited T/Maker Company, a major Mac developer and the publisher of *WriteNow*. Vice president Royal Farros voiced the same concern I have, one that Apple would do well to heed.

"I'm seeing Mac fanatics—those same hard-core supporters and zealots who carried the Mac through its darkest days—sitting down and playing with *Windows 2.0* and *Windows 386*," Farros told me. "When they start looking at *Windows* and say, 'I like this almost as much as I like the Macintosh,' that should signal something to Apple."

"At that point, Apple should realize it's not offering anything that totally differentiates it from anyone else. There *are* competitive graphics solutions out there."

(continues)



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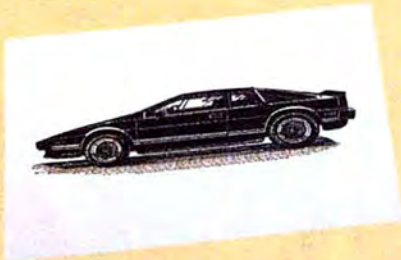
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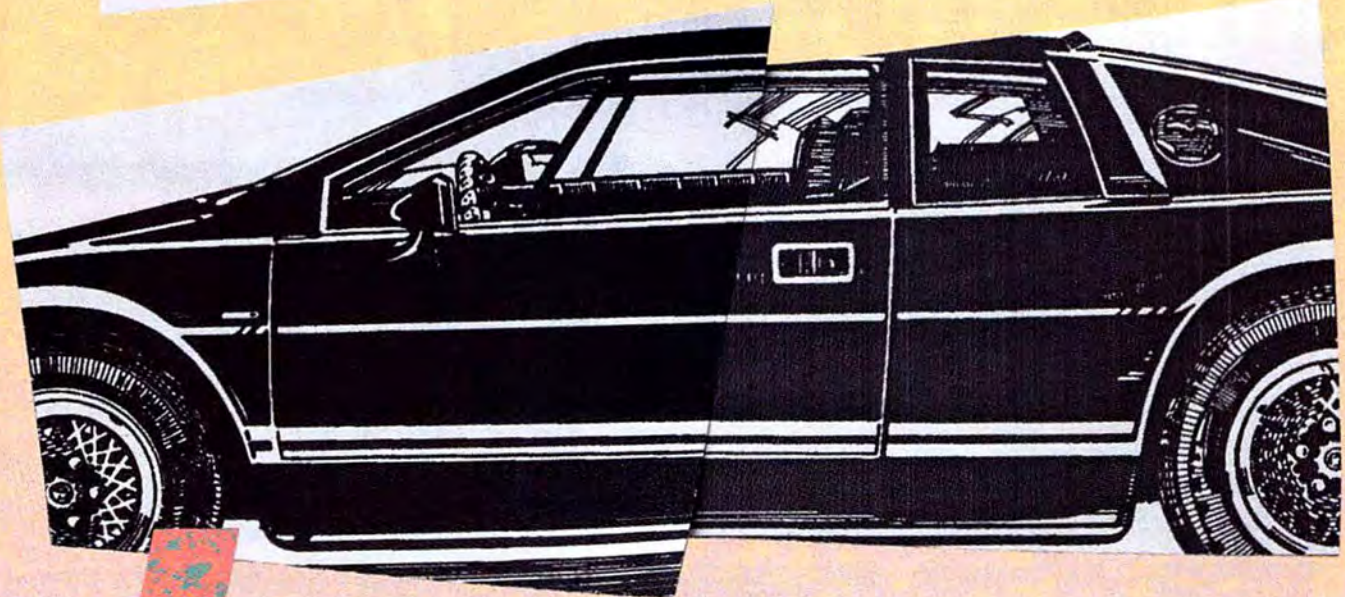
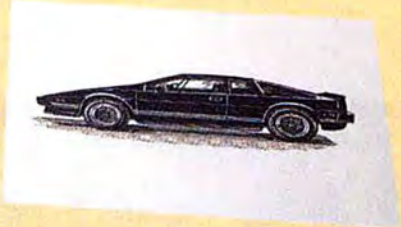
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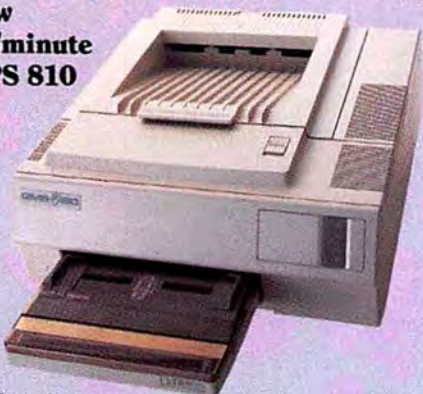
Under the hood QMS ASAP[™] (Advanced System Architecture for PostScript) is proprietary technology that helps eliminate the hardware bottlenecks that hinder other PostScript printers. As a result, QMS-PS 810 boasts processing speeds remarkably faster than other PostScript printers in its class. And faster output means greater productivity. In addition, the QMS-PS 810 laser printer's new Canon[®] SX[®] print engine covers solid areas and prints fine detail better than previous-generation engines.

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David Bunnell

Remember, the MS-DOS world is considerably bigger than the Macintosh world, even though Apple gets a lot more media attention these days because it's the company that's most fun to watch.

Between IBM, Tandy, Compaq, and the clone-makers, an estimated 2.3 million PCs will be sold in 1988, compared to about 922,000 Macintoshes (according to International Data Corporation). That's a significant difference, especially to software developers.

In the higher education market, where a discount pricing structure is maintained through Apple's university consortium program, Macintoshes easily outsell PCs. But in the general business market, PCs outsell Macs 10 to 1.

"If Apple doesn't recognize that the real volume purchasers are small-business people who can't afford \$3000 systems, then they're going to lose all of that market," Farros warned.

"If all the small-business people are buying *Windows* or the PS/2 or similar sys-

tems, those are lost sales. Apple can fall down just as fast as it rose up."

Those are the two sides of the cheaper-Mac debate: Apple's pitch for maintaining high-end R&D purity, and an appeal to pay attention to the mid-to-low end of the market.

I think the problem will sort itself out in due course. For one thing, many of the forecasts you hear about Apple's imminent doom are based on the notion that it's standing still. But Apple is very much a moving target, not a sitting duck. Even if the *Windows* environment for the PC is really ready in two years, Apple is still two years ahead.

Apple's R&D investments must be used to continue developing leading-edge products—including a new family of computers that will someday replace the Macintosh.

Not only must Apple stay technologically ahead of the pack, but the company must also continue to be extremely clever, as it was with *HyperCard*. That's an ingenious yet simple product that gives many users, people who would never learn *Turbo Pascal* or BASIC or assembly language,

the tools to program to their hearts' content. They're now able to use the computer in a way they never could before. This flexibility and ease of use still does not exist on the PC side.

As far as a low-cost Mac is concerned, I believe that there are several possible scenarios. For one thing, Apple could decide to license its ROM. If it continues to lose market share, and if its developers start jumping ship to the more lucrative MS-DOS world, Apple may change its mind.

The low-cost Mac is clearly a future challenge for Apple. I bet Jean-Louis Gassée would love a low-cost Mac, as long as it had high profit margins. I'd love that, too.

But even if Apple has to settle for a moderate-to-low profit margin, I'm convinced that the company's overall net income would jump dramatically because of increased volume sales.

Marketing 101 teaches us that mass appeal equals "the sky's the limit." And, for Apple, that would be the greatest prize of all. □

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C.J. Weigand
MACazine Oct. 1987

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A screenshot of a travel expense report software interface. The window title is "Travel Expense Report". The report includes a header with the company name "Generic Data Systems, Inc." and the report title "Travel Expense Report". Below the header is a table with columns for "Date", "Day", "To", and "From". The table contains data for a travel itinerary, including dates, days of the week, and destinations.

Prepare expense reports.

A screenshot of an accounts receivable software interface. The window title is "Accounts Receivable". The interface shows a table with columns for "Invoice Number", "Invoice Date", "Company", "Date Due", "Total Due", and "Payment 1". The table contains data for several invoices, including invoice numbers, dates, company names, due dates, and payment amounts.

Manage accounts receivable.

A screenshot of a customer information software interface. The window title is "CUSTOMER DATABASE". The interface shows a table with columns for "Name", "Address", "City", "State", and "ZIP". The table contains data for several customers, including names, addresses, cities, states, and zip codes.

Manage customer information.



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A screenshot of a payroll software interface. The window title is "Payroll". The interface shows a table with columns for "Team Member", "Base Pay", "Regular Hours", "Total Earnings", "FICA", "Federal Income Tax", and "Total Deductions". The table contains data for several team members, including names, base pay, regular hours, total earnings, FICA, federal income tax, and total deductions.

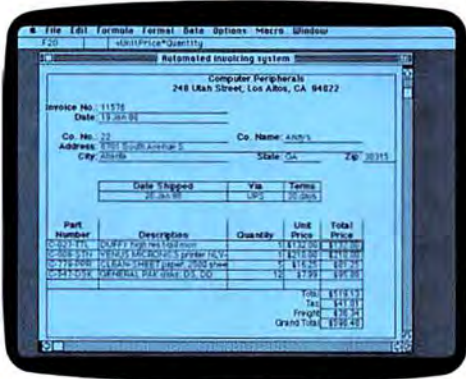
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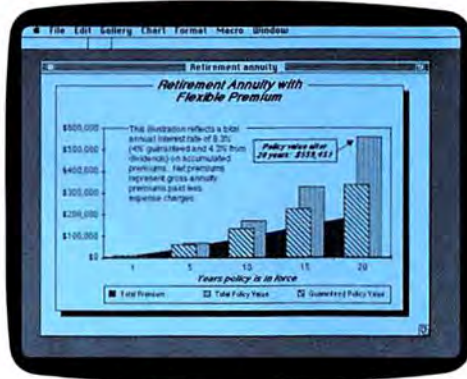
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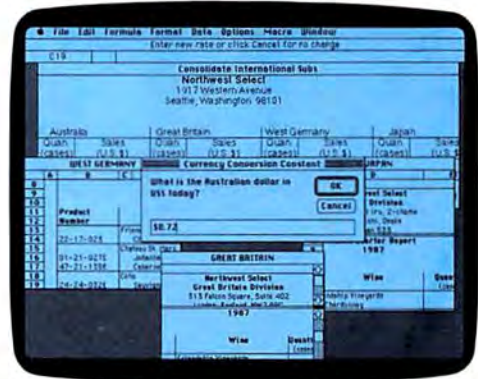
do things like this.



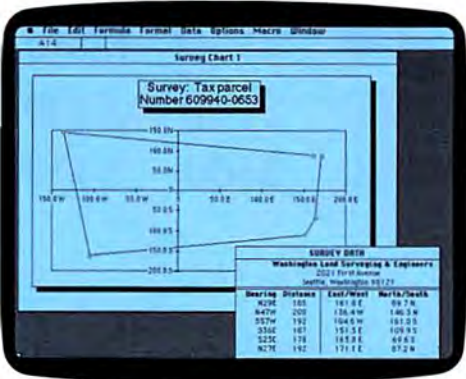
Generate invoices.



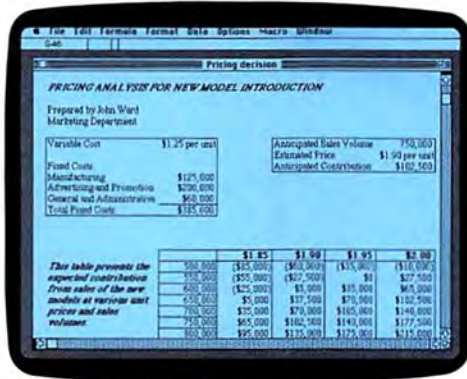
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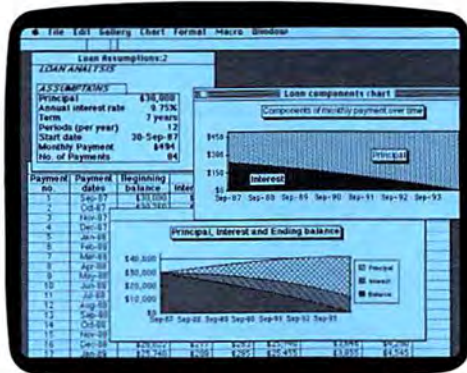
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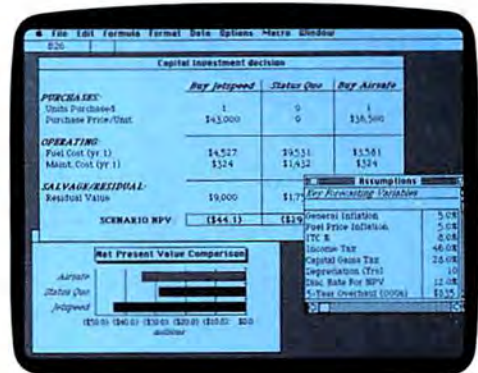
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Letters

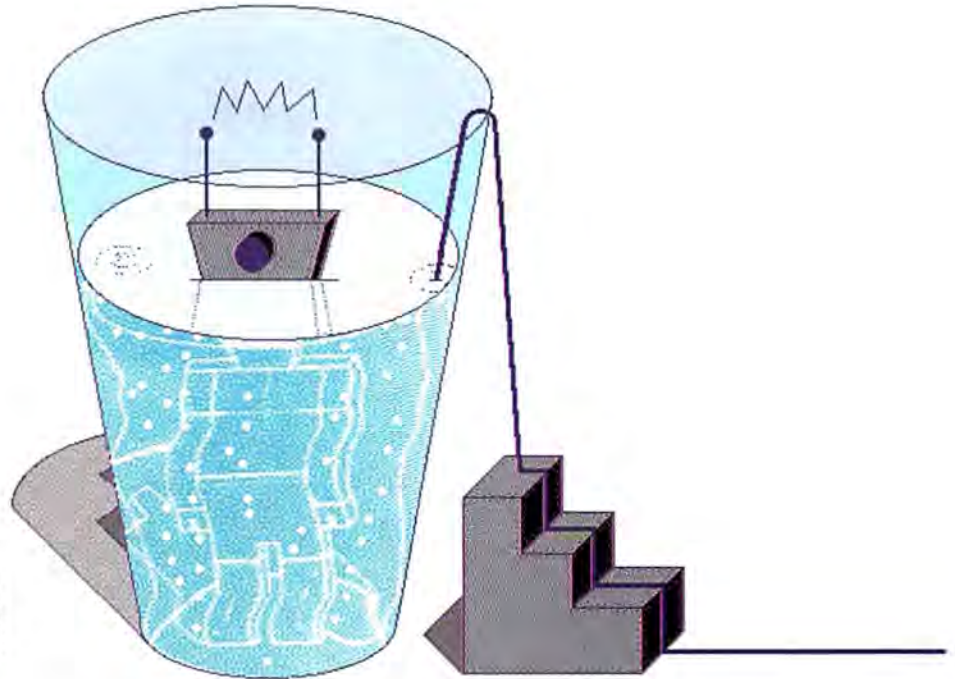
A forum for Macworld readers

Mac-Driven Robot

I want to hook up my Mac Plus to some external devices to control a toy robot—something I've already done with an Apple II. But where there are hosts of books and articles on controlling simple relays from such computers as an Apple II or a Commodore 64, I can find nothing comparable about the Mac, even though I'm sure it's possible. I'm also wondering if I can do this through *HyperCard*.

Byron Marshall
Pineville, Louisiana

Amplicon Electronics Ltd. in England (Richmond Rd., Brighton, Sussex BN2 3RL) makes a GPIB interface card for the Mac II and the Plus that may bring your robot to life.—Ed.



Corrections

Fifth Generation's Fastback ("Data Savers," February 1988) costs \$99.95, not \$179. In the comparison table, "Reconstruct lost directory" should read "Reconstruct lost disks." An updated Fastback is reviewed in this issue (see "A Second Look," Reviews).

NuData's Data Cell 220, listed in the table "Hard Disks Compared" ("The Disk Shopper's Guide to Storage," December 1987), has been discontinued and replaced by the Data Cell 290, which retails for \$6995. In addition, all NuData drives include diagnostics, partitioning, and format software.

The phone number for TechWare, maker of PsychroMouse (New Products, January 1988), is 913/782-1249.

Mail-Order Credo

In response to "What's Wrong with Mail Order?" (December 1987), I suggest mail-order firms go further than "no credit-card billing until shipment" and adopt our policy of "no billing until 30 days after shipment." Our company ships 80 percent of all orders the day they're received. We also offer a free 45-day trial, warranties, and a replacement-before-return policy for defective products.

When an industry grows to \$2 billion, abuses are inevitable. They can be minimized, though, when trust flows from the business to the customer—not the other way around.

Kenneth A. Eldred
Immac
Santa Clara, California

A Lesson Well Learned

The credibility of *Macworld*, already high in these parts, just went through the roof with the appearance of Jeff Chester's highly professional article on mail order in the

December issue. For a publication to point out sharp dealing by some of its advertisers is journalistic integrity of the highest order.

I too received a mail-order baptism of broken promises and crafty dodges, which after a year has yet to be resolved. The lesson I drew from the experience: never authorize a charge or send a check to a mail-order outfit unless you have merchandise in hand.

Sam Thornton
Fairfield, Nebraska

Guilty Verdict

As the president of a mail-order business, I was shocked when I opened my December issue of *Macworld* and saw the article on mail order. I had hoped that you would at least mention the positive side of mail

(continues)

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*MTBF (Mean Time Between Failure)



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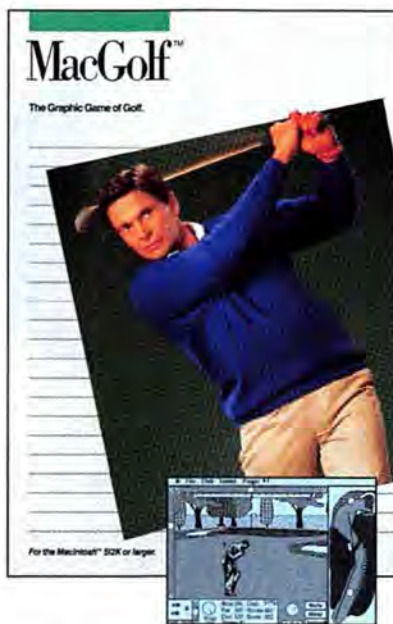


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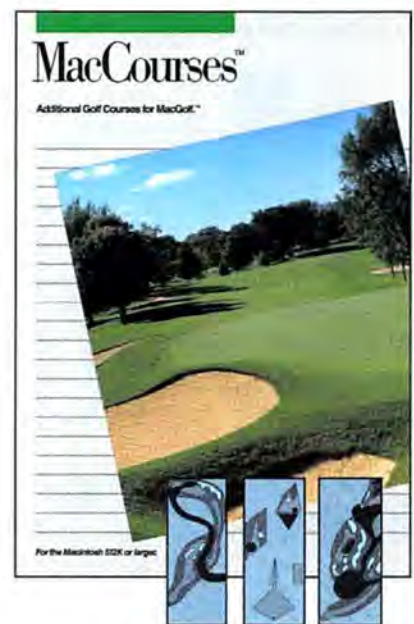


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Letters

Corrections

Negative Response

Gray-scale scanned image D as it should have looked in "Shades of Gray" (Macworld, January 1988, p. 117)—printed as a positive. The 150-line half-tone was produced on a Linotronic 300 from an 8-bit Datacopy scan.



order. While problems do exist throughout the industry, your article paints a picture of doom and gloom and offers little advice to consumers.

It's true that you have a strong obligation to your readers, but you also have a commitment to your advertisers. When mail-order firms go out of business, even the successful ones are adversely affected.

To offset the negative publicity, *Macworld* should do a follow-up article on how to buy safely through mail order.

Marc Daniels
 CDA Computer Sales

We've repeatedly stressed our belief that the majority of mail-order firms are honest, reliable, and professionally run. In February (Commentary) and March 1987 ("Navigating the Mail-Order Channel"), we mentioned a number of reputable companies and offered specific advice on how to purchase wisely through mail order. Our intent in the December feature was to look into the growing number of mail-order complaints we'd received from buyers since then.—Ed.

What's Wrong with APDA?

Your mail-order article fails to mention one well-known firm that is hopelessly inept at everything it does: the Apple Programmer's and Developer's Association. Apple has created a monopoly for APDA by making it the sole source of vital Macintosh development software while requiring members to pay an annual \$20 fee. What we get are repeated lost orders, back orders, address screwups, perpetually busy phone lines, and general incompetence.

Every catalog we get says "we've had a few problems, but we're up to snuff now." Sure. If APDA had to compete in an open market, it would have been long gone by now.

Mark S. Jennings
 Digital Kinetics
 La Honda, California

In spite of our repeated attempts to obtain a response from Apple, none was forthcoming at press time.—Ed.

Hunting License Required

In "Games for Any Budget" (*Macworld News*, September 1987), *Macworld* contributing editor Robert C. Eckhardt reported that *Duck Hunt*, by Edgar Circenis, is a free public domain program. In fact, *Duck Hunt* is a copyrighted game by Nordic Software that is given as a premium for joining the MacKey Mouse Club and is *not* in the public domain. All clubs, bulletin boards, and individuals who have included it in their public domain libraries should remove it from their lists and stop distributing it. We request that anyone who has obtained an illegal copy either destroy it or send \$14 for a year's membership to the MacKey Mouse Club, P.O. Box 4561, Lincoln, NE 68504.

Jim Wrenholt
 Nordic Software
 Lincoln, Nebraska

Our copy gave no indication that Duck Hunt was commercial software. We regret the error.—Ed.

(continues)

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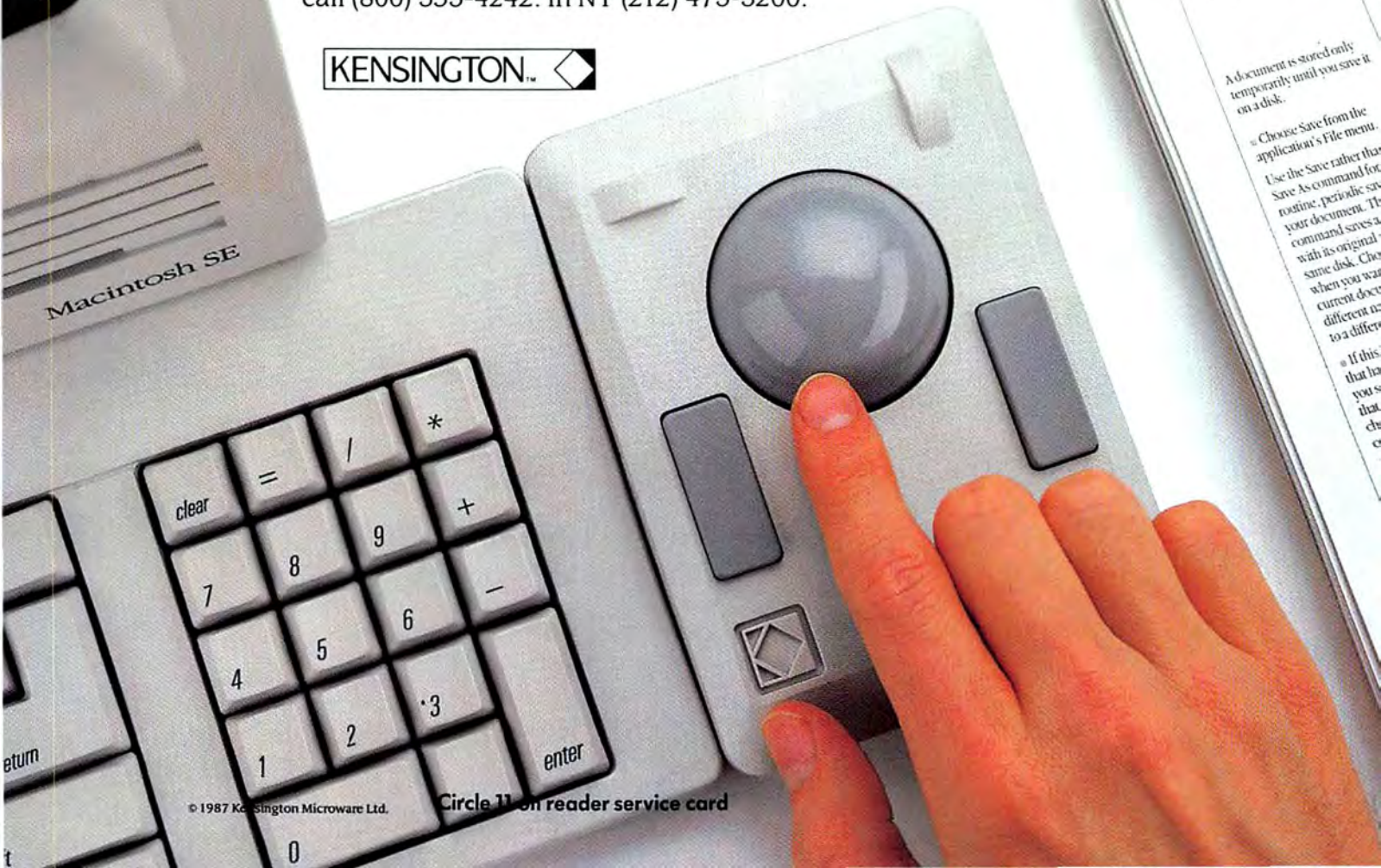
Turbo Mouse doesn't get its speed only from this ease of use. It has an automatic acceleration feature that senses the speed at which you are working and moves the cursor further when you move the mouse ball faster.

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Circle 76 on reader service card

Letters

Compatibility, Take II

Your November 1987 article on Mac II compatibility ("Just How Compatible Is Compatible?") was at least as buggy as the software it attempted to cover. For example, *MacDraft* 1.2a crashes easily when I'm working with text. Another example is *Guide*, used as the *PageMaker* 2.0a Help accessory, which requires two tries to be selected. Aldus is aware of the problem; is OWL?

At the very least, your research should have been double-checked by other users. Could such information be supplied by helpful contributors? We who use a program extensively have more collective in-depth experience than one user glancing briefly at 50 products.

John Weygandt
Claremont, California

As we stated in the article, the size and changeability of the Macintosh software market prevents us from covering every product. And for the ones we can cover, we can't hope to accurately document all bugs, since it often takes quite a while for many of them to surface. We agree that contributions from readers are a great idea, and in fact we did solicit information on compatibility problems from users.—Ed.

Beetles and Bugs

When I saw a full-page photo of beetles on page 109 in the November 1987 issue of *Macworld* ("Just How Compatible Is Compatible?"), I eagerly awaited a review of entomological software for the Mac. However, after I'd carefully read the article and found not one reference to a beetle, it finally hit me—the author was writing about bugs. Whoever supplied the specimens for the photo neglected to point out that true bugs belong to the order Hemiptera, which does not include beetles.

Gwen A. Pearson
Raleigh, North Carolina

Affordable Portable

I agree with David Bunnell's observations in the December 1987 issue ("In Search of Apple's Achilles' Heel") about the need for a low-cost Mac. When Apple drops the Mac Plus, the SE will become the entry-level Mac, scaring off many potential users with its high price tag.

Apple needs a low-end machine that's as easy to buy as Macs are easy to learn.

(continues)

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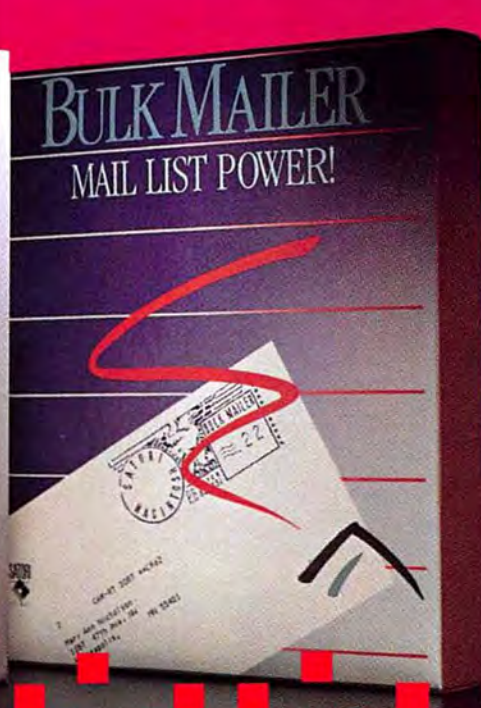
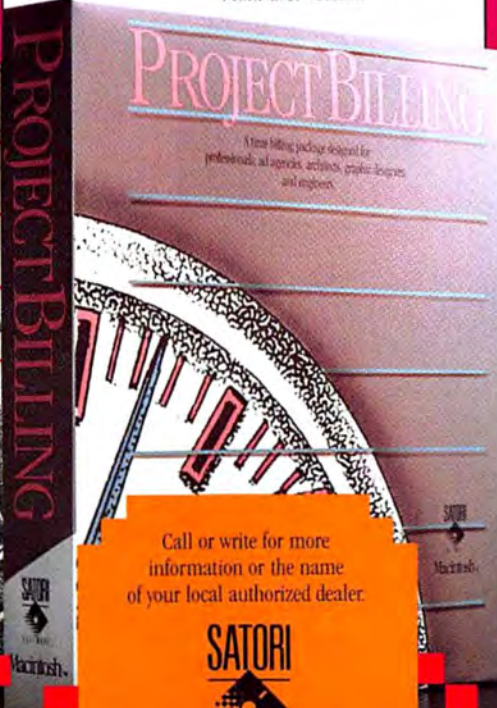
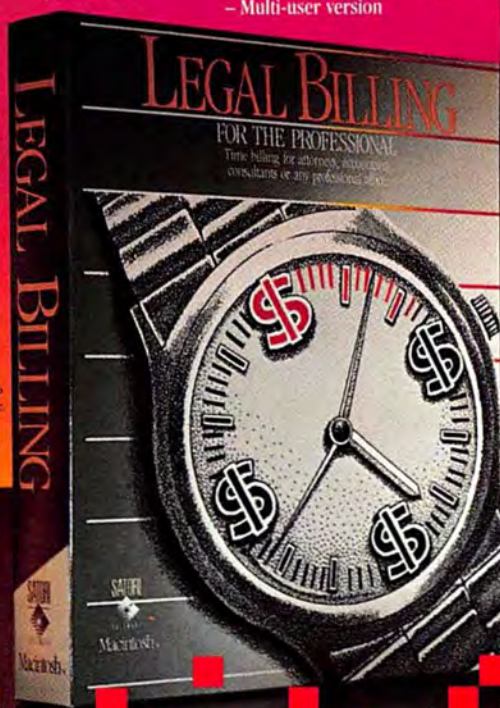
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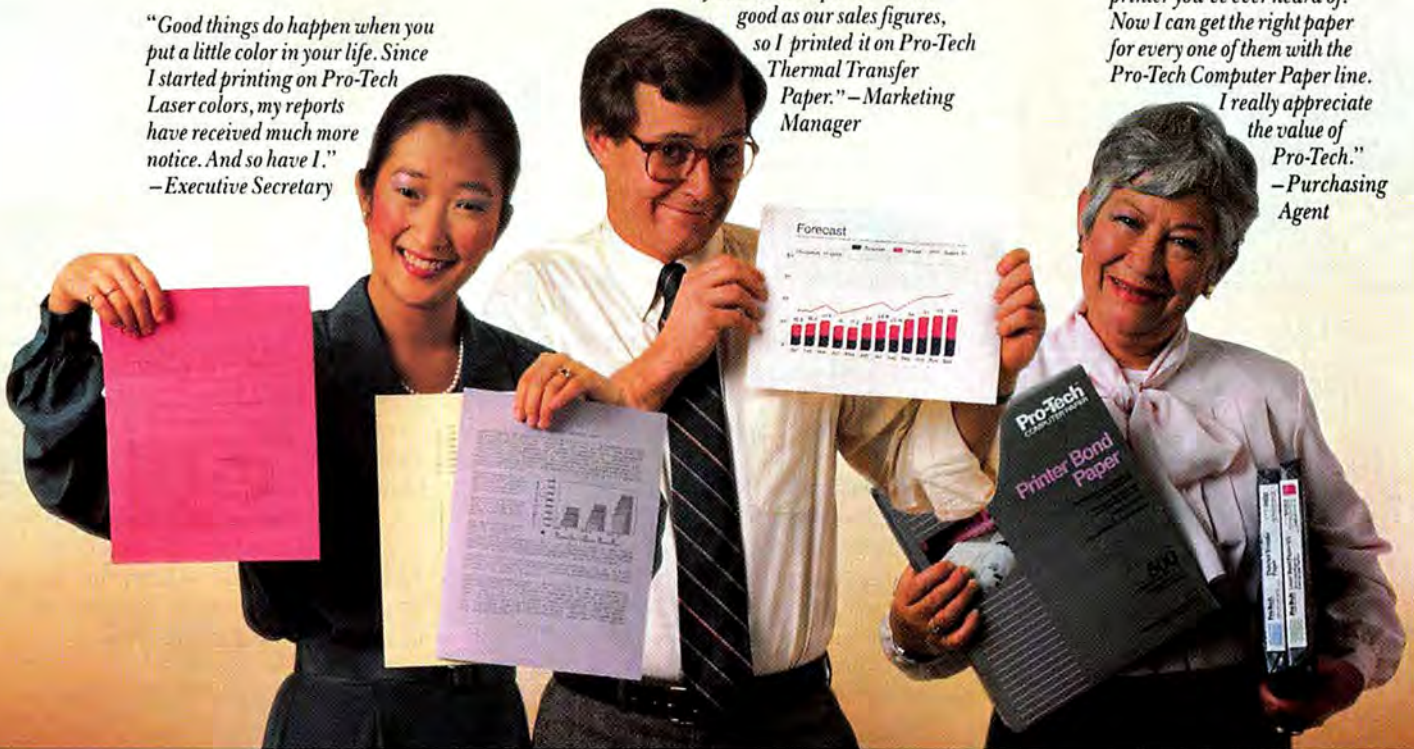
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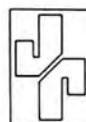
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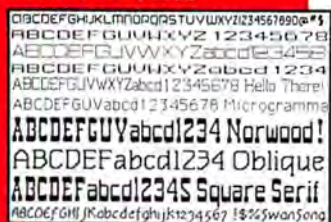
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Circle 71 on reader service card

Letters

The obvious choice is an inexpensive laptop—it would give Apple an effective tool for market penetration on a scale that it can't possibly achieve with its current line-up of pricey Macs.

Jack Hobson-Dupont
Nantucket, Massachusetts

Veto Power

"Not Recommended" was a very useful addition to "The Final Spelling Test" (October 1987). I'd like to see this feature made a part of all your comparative reviews.

Dan Wiur
Dix Hills, New York

Printer Lacks Potential

I purchased *Printworks for the Mac* after reading your claims in "Printing Potential" (*Reviews*, September 1987) that it substantially enhances ImageWriter printing capabilities and boosts spooler speed. I later discovered not only that *Printworks* cannot enhance the print quality of an ImageWriter I, but that the spooler works only with the *Printworks* printer driver, which—as an insert to the manual points out—has problems working with *Microsoft Word 3.0*. Instead of "wondering how I managed so long without its performance benefits," I wonder what the review was based on.

Robert M. Kintner
Wenatchee, Washington

True, our review did not make clear the relative advantages of the ImageWriter II over its predecessor, for which we apologize. However, we still feel that the spooling and page preview features of Printworks are useful. The problems with Word 3.0 were not due to Printworks but to Word itself, which was brand new and therefore relatively untested when this review was being written. Overall, we still stand by our evaluation of Printworks as an excellent enhancement to the ImageWriter.—Ed.

Network Trials

Although David Ushijima's article on networking ("Network Tales," January 1988) was excellent, I'd like to clarify a few misconceptions about NuData's Giga Cell. First, the Giga Cell 290 is now shipping with one 290-megabyte hard disk, rather than two 150MB disks. Second, the ROM problem exists only when Control Data's 290MB hard disk is used on the Mac Plus. Third, all NuData subsystems, including

the Giga Cell, are now shipped without internal terminating resistors.

Eric Herzog
NuData
Santa Clara, California

MiniCad Fan

As a *MiniCad* user, I disagree with the conclusions reached in "Benchmark: Mechanical CAD" (November 1987). Among other things, the review fails to point out that layering is the single most important feature in a CAD program for quickly developing a system of related documents that can be changed and checked at all levels. This should have put *MGMStation* completely out of the running. My *MiniCad* package is a good, inexpensive CAD system that turns out sketches, presentations, details, measured plans, specifications, and bid packages in half the time with twice the quality of any other system I've used.

Arthur Anderson
Philadelphia, Pennsylvania

It's impossible to devise one CAD benchmark test that covers every feature of every CAD package. And with over 300 possible CAD features to choose from, it's not easy to decide which ones to include. MiniCad's inability to support pen plotting, for example, rules it out completely for many users. While layering may be important to you, many CAD applications simply don't require it, and many CAD users who have layering available to them don't even use it.—Ed.

Fan Mail

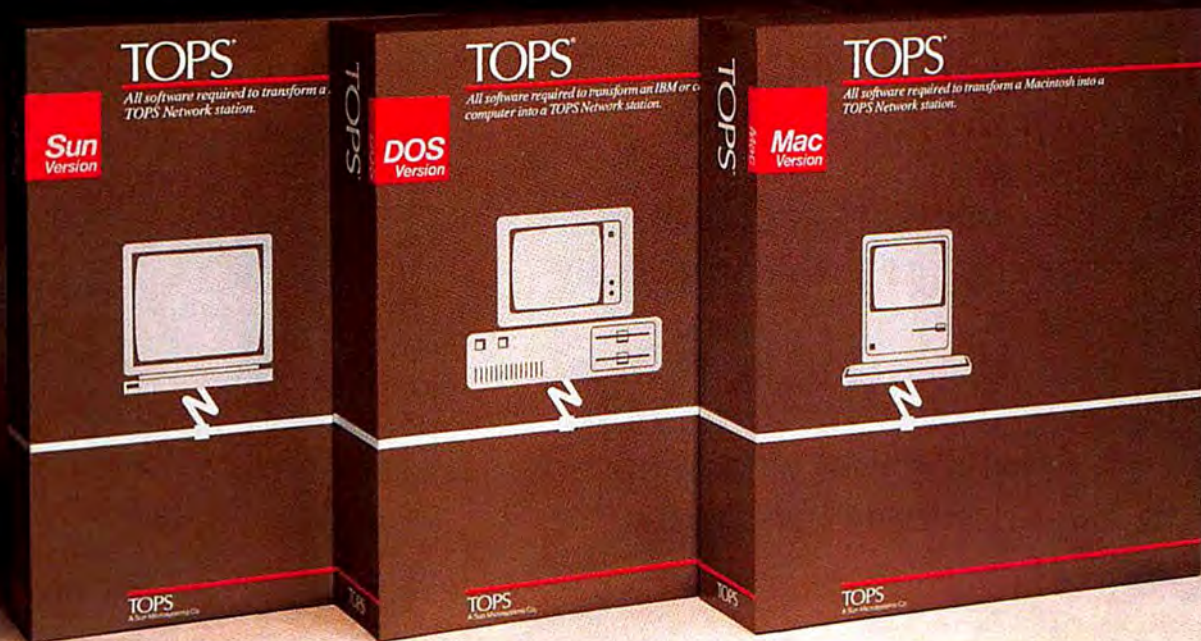
I have a subscription to *Macworld* (as it's usually pretty good), which I paid for myself. But I can't seem to get it shifted to California—it keeps going to New York. So I finally broke down and bought another one to have out here.

Steven Bobker
MacUser Publications
Palo Alto, California

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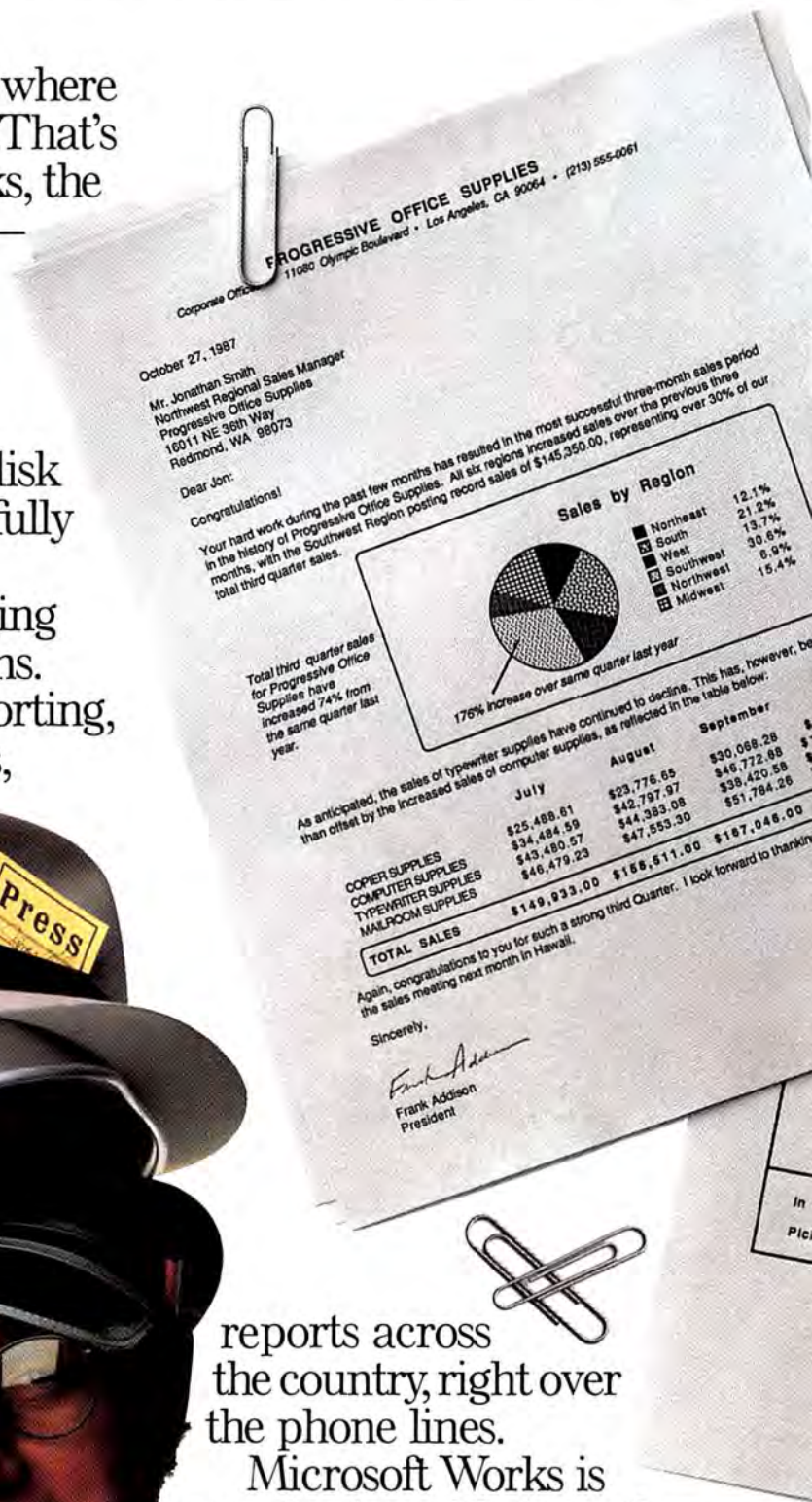
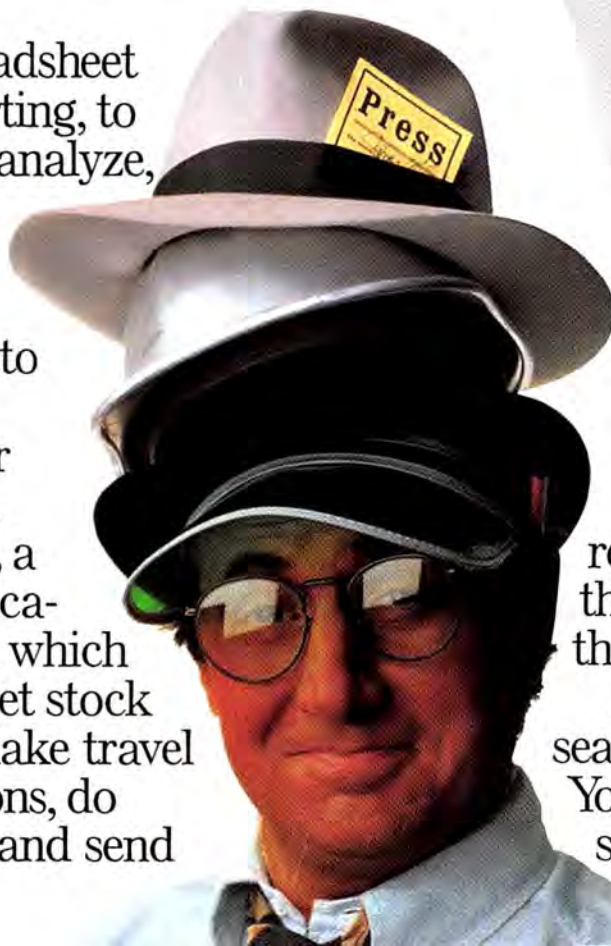
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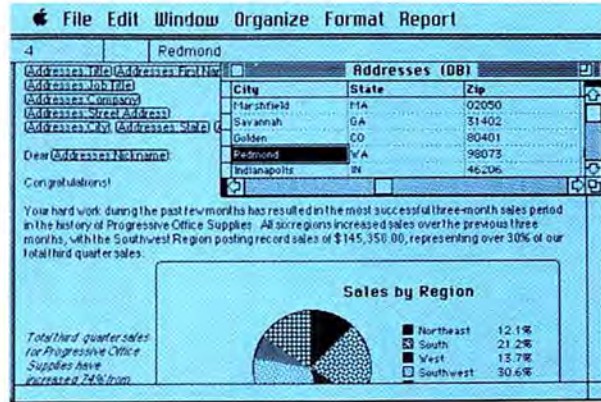
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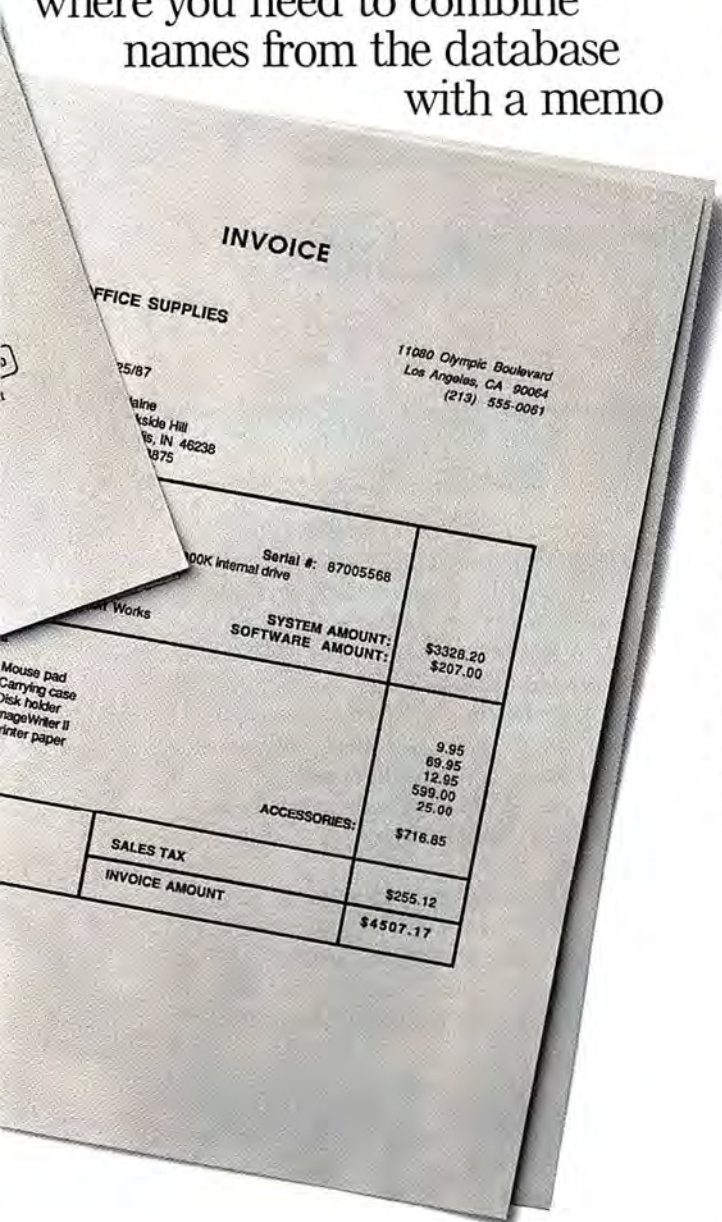
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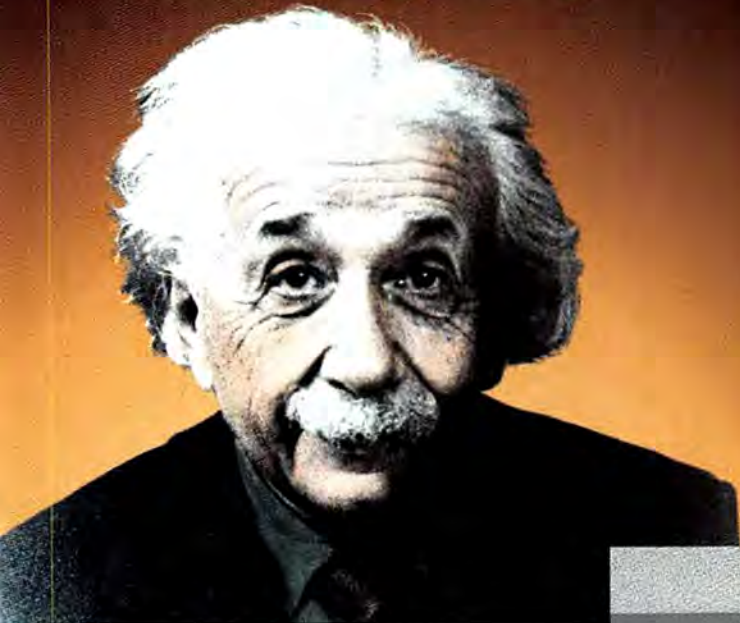
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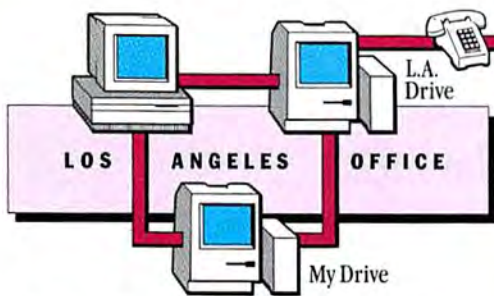
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**For this man,
time and space
meant everything.**



**For this man,
time and space
mean nothing.**



Local or remote hard disks appear on the screen as icons to be opened whenever he wishes.

SilverServer™ lets him share hard disks and modems. Anyplace. Anytime.

With all due respects to the person on the left, the person on the right has overcome a major obstacle imposed by time and space.



He can access hard disks located at the office when at home.

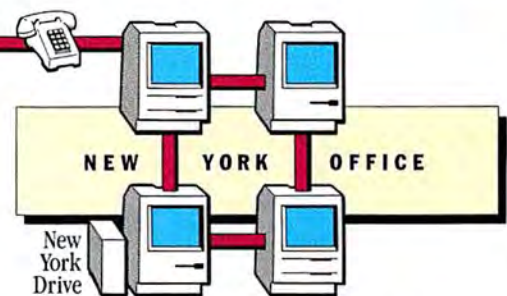
He commands the power of SilverServer, the revolutionary disk and modem server from La Cie. With SilverServer he can bring the icons of hard disks in Los Angeles, San Francisco, Chicago, Dallas or New York up on his desktop from wherever he is.

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Through SilverServer hard disks are available to him as familiar icons that can be accessed just as if the drives were physically beside him. Best of all, SilverServer doesn't require anyone sitting at the other end. So, he can get a file from the office, home or New York whenever it's convenient, without worrying about time zones or other people's schedules.

Have you ever wanted to share hard disks or modems on your AppleTalk network? Now you can. Have you ever dreamed about accessing local or remote hard disks from your home or office? Well now you can.

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What's in a Show?

New products aplenty

This winter's Macworld Expo, like last summer's, was bigger than ever. Nearly 45,000 people attended the San Francisco conference and exhibits in January. I know that many of you aren't able to attend these semiannual conferences, and many who do attend simply don't have the time to troop around to 400-plus exhibitors—so I offer this abbreviated report on the Expo, the result of my visits to each exhibitor.

There are several broad trends to report. One is the expansion of Macintosh software into more areas—the Mac is beginning to attract the kinds of vertical software that make the IBM family so attractive: real estate, medical, scientific, and the like. Another trend of note is that new technologies are coming to the Mac before they reach other personal computers. For example, Jasmine and PCPC showed 8mm videotape as a backup medium (2 gigabytes per tape), and Peripheral Land had a 10-megabyte floppy drive. MacPeak and MacProducts USA showed Motorola 68030 accelerator cards for the Mac II (albeit not working). A computer has truly come of age when it attracts the newest technologies as add-on devices. Finally, two companies offered hope for the Mac SE's future: Orchid showed the first color upgrade card for the SE (with only eight colors possible because of the SE's older ROM), and Second Wave showed an expansion chassis for the SE that makes it possible to add more options.

Peripherals Galore

Every show has its strengths; peripherals appear to have led this show. Apple announced its new family of laser printers (see "The LaserWriter Lines Up," *Macworld*, March 1988). General Computer—

first into the market with QuickDraw laser printers—announced additions to its product line, making it parallel to Apple's offering with a low-end QuickDraw printer and a high-end PostScript printer. Like Apple's products, GCC's printers are upgradable, but the high-end Apple printer has a larger capacity.

Orange Micro extended its printer interface, the Grappler, that allows low-cost lasers to emulate PostScript printers and dot matrix printers (a welcome addition for Mac owners with matrix printers from old PCs). Ergotron improved its laser printer buffer to hold 1MB to 4MB of RAM, and Olduvai showed a 68020 LaserWriter-accelerator and memory-expansion board.

There were more monitors than one could easily look at—about 20 companies offered color, gray-scale, or monochrome monitors. The latest in technology are the 24-bit color boards from SuperMac, RasterOps, and Jasmine. AT&T's offshoot TrueVision demonstrated its 32-bit board. Several companies showed NTSC input (using standard video cameras for input and image capture) and NTSC and genlock output (allowing images to be displayed on or output to video recorders). Some of the companies involved with the video developments are Computer Friends, Mass Micro Systems, Julian Systems, Comtrex, Data Translations, and Jasmine. Comtrex even had a luminance key for the Mac that lets you add text and special effects.

Hard disks—especially at the low end of 30MB to 60MB—remained competitively priced, but the trend in magnetic memory was toward medium- (100MB to 300MB) and large-capacity (500MB to 2-gigabyte) drive combinations. Several companies, including CMS Enhancements, NuData, Jasmine, Northern Telecom, and FWB, demonstrated 1-gigabyte-plus "data tower" configurations of several drives combined into a single unit. Northern Tele-

com had drives with 500MB or greater capacity. CMS, First Class Peripherals, Jasmine, Micah, and Priam all offered drives in the 300MB range—particularly suitable for small businesses networked with *AppleShare*.

Scanners ran rampant as well. The traditional vendors Datacopy, Abaton, Microtek, and Dest all demonstrated 8-bit versions of software for their scanners. A group of newer video scanners also appeared; Truvel and Pixelogic showed color video scanners (RS-170 video, not NTSC), while Barneyscan had the show's only 35mm color-slide input scanner. AST Research, New Image Technology, and Mirror Tech also showed scanners. Koala Technologies and MegaGraphics brought 8-bit, gray-scale video scanners. Sharp and Howtek exhibited their color scanner; it's actually a subset of Sharp's color copier technology, but it's the best flat-art color input device on the market. SuperMac Software demonstrated a software utility with the Sharp scanner that makes image capture practical for the first time (independent of some related application).

One unexpected crop of announcements at the Expo: ADB peripherals. These are devices that make use of the new peripheral bus, the Apple Desktop Bus, which provides better interactivity and daisy-chaining of input devices. Summagraphics and Kurta showed ADB graphics tablets, a boon for the new paint programs. Asher demo'd a new trackball (Abaton has the only other), Lightgate has a neat mouse replacement, and Gravis (huzzah from game fans), a joystick. Graphic Notes brought a prototype of the ADB musical input keypad that it will ship with its music publish-

(continues)

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Professional Desktop Presentations

Proposed Space Station



Cricket Presents...

From Cricket Software

Color your next presentation sensational with Cricket Presents.... This powerful new desktop-presentation package integrates everything you need to create color 35mm slides, overhead transparencies, speaker's notes, audience handouts, and on-line running demos — in one easy-to-use program.

Cricket puts all the tools you need at your fingertips: built-in text editing, object-oriented drawing, graphing, automatic tabling, convenient slide templates, and your choice of 64 colors on the Mac II — from a palette of 16.8 million!* You can also import data and graphics from a variety of other programs and file formats. And Cricket keeps your presentation together — even with last-minute changes. Simply create a slide and type in notes and audience handouts to go with it. Any changes in the slide appear in the other documents.

You can count on Cricket to make you look good. Print smooth transparencies with your LaserWriter or create brilliant color slides. Program includes Autographix driver w/Cricket's true outline font routines (not bit maps) and built-in terminal software.

Show off with Cricket Presents...order today!
2228 • Works w/Mac Plus, SE & II (hard disk required); includes Autographix driver; drivers for additional color output devices available from manufacturer; *retains 256 colors in graphics imported from other programs such as Pixel Paint

\$289

Inside

More
New
Products

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Check our line list for other outstanding programs from Cricket:

- Cricket Draw
- Cricket Graph
- Pict-O-Graph



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From Deneba Software

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2106 • Works w/512E, Mac Plus, SE & II; *large bit-mapped images over 300 dpi may require extra RAM

ImageStudio \$329

From Letraset



ImageStudio reads the intricate gray-scale information recorded by today's scanners and allows you to turn your Mac into one of the most versatile retouching studios available anywhere.

Its extensive collection of tools and special effects does everything from smoothing jagged edges to improving contrast in discrete areas. Use it to simply touch up flaws in a scanned picture or to accomplish more elaborate alterations, such as removing power wires from a country landscape.

Once in ImageStudio's drawing window, pictures can be cropped, rotated, and more. Assign one of 64 gray shades to each pixel! Blend or smear rough edges and attain the smooth, subtle shades of real photographs!

No one who owns a scanner can afford to be without ImageStudio—order today!

2209 • Works w/Mac Plus, SE & II; external drive required, hard disk recommended; Mac II recommended for viewing gray-scale information; reads images from most 300 dpi scanners

Personal Copiers

From Canon



Now you can take your copier anywhere, anytime. The PC-3 warms up in 18 seconds and switches to economical low power two minutes after processing your last copy. It's also virtually service-free: everything that can run out or wear out—the drum, developer unit, and toner—is in the cartridge. Small, light, and quiet, the PC-3 has a single-sheet bypass tray that uses any size paper from business card to letter size; you get clear, crisp copies on standard paper, labels, letterhead, transparencies, and more.

2188 • PC-3 Personal Copier (comes in blue)
Measures 14 3/8" W x 16 3/8" D x 5 3/8" H; weighs 25.5 lbs **\$649**

2189 • PC-L Personal Copier (comes in white)
Multi-sheet feeder; measures 16 1/2" W x 16 3/8" D x 5 3/8" H **\$919**

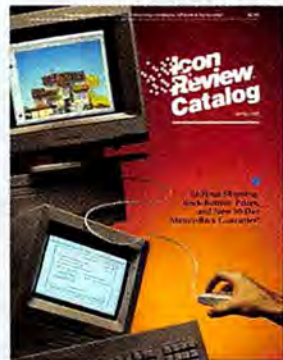
2194 • Black Cartridge
Works w/both PC-3 and PC-5L; yields approx. 1,500 copies **\$75**

- Portable – you CAN take it with you!
- Personal – make copies without waiting.
- Hassle-free – get great copies every time.

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• We accept Purchase Orders from qualified corporations, universities, and volume purchasers. Please call 800/228-8910 and ask one of our National Account Executives how you can profit from our National Accounts Program.

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SHIPPING & HANDLING: We ship all in-stock items within 24 hours of receiving your order. Our standard service is UPS Second-Day Air. Need it tomorrow? Request UPS Overnight Service. International Service also available; call for details.

A shipping and handling charge (calculated by weight) will be added to your order.

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Circle 47 on reader service card

2063	Modular Cable Kit	\$ 99
2238	NetBridge	\$ 345
2148	NetModem V1200	\$ 489
2239	NetSerial	\$ 349
2234	PhoneFlex NEW	\$ 139
PhoneNet Networking Products		
1739	• For 128 & 512K/E	\$ 49
1740	• For Plus, SE & II	\$ 49
1765	• AppleTalk Adapter	\$ 8
2006	Pocket Modem	\$ 169
2247	Red Ryder 10.3	\$ 59

HARDWARE

1142	A+ Mouse	\$ 79
2219	• A+ Mouse ADB	\$ 99
1902	AST TurboScan flatbed NEW	\$1599
2268	AST TurboScan sheetfed	\$1399
Canon Copiers		
2188	• PC-3 NEW	\$ 649
2189	• PC-5L NEW	\$ 919
2194	• PC-3/PC-5L black cartridge	\$ 75
2003	Datacopy Scanner	\$ Call
2093	• Document Feeder	\$ Call
2004	• Software/Interface	\$ Call
Dove Computer Corp.		
<i>We carry MacSnap upgrades; call to order</i>		
Kurta Graphics Tablets SPECIAL		
1900	• IS/One (12 x 12)	\$ 499
1898	• IS Penmouse (6 x 9)	\$ 199
<i>Call for prices on Kurta accessories</i>		



The optical A+ Mouse moves effortlessly across its special pad (included). Quiet & comfortable, it has no moving parts that wear out or need cleaning.

1142	• A+ Mouse	\$79
<i>Works w/128K, 512K & Mac Plus</i>		
2219	• A+ Mouse ADB	\$99
<i>Works w/SE & II</i>		

1451	MacBuffer/512K	\$ 329
1450	MacBuffer/1024K	\$ 429
1966	Mac 101 Keyboard/Beige	\$ 159
2059	Mac 101 Keyboard/Plat.	\$ 159
1207	MacVision	\$ 179
MinuteMan Power Supplies		
1867	• MinuteMan 300SS	\$ 439
2118	• MinuteMan 600SS	\$ 739
1806	Neos Mouse	\$ 49
1718	PC MacKey	\$ 119
2285	Personal Laser Printer SPECIAL	\$1699
2291	• Toner Cartridge	\$ 139
1724	quadLYNX Trackball	\$ 99
1997	ScriptEN 3MG P Script Printer	\$4295
<i>We carry all ScriptEN accessories & supplies</i>		
1871	Seikosha Printer	\$ 229
1141	• Printer Stand	\$ 17
1935	• Ribbon/Seikosha	\$ 8
1054	ThunderScan 4.0	\$ 199
1570	• Power Port Adapter	\$ 49
1888	Turbo Mouse	\$ 85
1998	Turbo Mouse ADB	\$ 85
2166	UltraScan Monitor SPECIAL	\$ 599
2167	• UltraScan Cable	\$ 49



Put your next report or presentation on the map with MacAtlas. Includes more than 60 clip-art maps of the U.S. (broken down by states, counties, major cities) and the world.

Works w/any Mac; requires Draw program

2074 • From MicroMaps

\$125

DISK DRIVES

1906	Bering 20+20 scsi Drive	\$2295
1904	• 20 meg Cartridge	\$ 99
CMS SCSI Drives		
1971	• Compact SC20	\$ 599
1970	• Compact SC40	\$ Call
1969	• MacStack SD20	\$ Call
1968	• MacStack SD43	\$ Call
1967	• Pro 40 SE Internal	\$ Call
2124	• Pro 40 II Internal	\$ Call
2085	• S-140	\$ Call
2086	• S-240	\$ Call
2087	• S-320	\$ Call
1972	• SE Internal Cabinet	\$ 149
1607	Ehman 800K Drive	\$ 189
MacBottom Drives		
1323	• HD 20 Serial/Beige	\$ 859
1653	• HD 21 SCSI/Beige	\$ 799
1843	• HD 21M/Beige	\$ 949
1841	• HD 32 SCSI/Beige	\$ 949
1844	• HD 32 M/Beige	\$1099
1842	• HD 45 SCSI/Beige	\$1199
1845	• HD 45M/Beige	\$1349
2269	• IHD-144 for Mac II NEW	\$2249
1846	• Modem Upgrade/Beige	\$ 189
<i>All drives available in platinum; call to order</i>		
2185	MicroMac 800K Drive	\$ 184
NuData SCSI Drives		
2154	• Data Cell 40/40T	\$1999
2155	• Data Cell 90	\$1899
2156	• Data File 40T	\$ 999



Now you can load hundreds of fonts, DAs, and function-key utilities at once — just pack 'em in Suitcase. Comes with screen saver Pyro. A great value!

Works w/512K, 512E, Mac Plus, SE & II

2218 • From Software Supply

\$36

ACCESSORIES

2079	AnthroCart	\$ 249
2160	• Document Holder	\$ 39
2082	• Printer Basket	\$ 53
2081	• Slide-out Shelf	\$ 89
Avery Labels		
2261	• Diskette Labels NEW	\$ 4
2262	• Laser Labels NEW	\$ 6
Backup Cassettes		
<i>We carry cartridges to fit most tap backups</i>		
Cables		
<i>We have a full line of quality cables; call to order</i>		
Carrying Cases		
1631	• For Iw I & II	\$ 69
1644	• For Mac & Mac Plus	\$ 89
Copy Holders		
1882	• Desktop (8 1/2 x 11)	\$ 12
1883	• Desktop/Wide (11 x 17)	\$ 19



Durable VeloBinder covers add polish to any presentation. The permanent binder strips unfasten to add or remove pages.

2266 • Starter kit includes punch, manual, 16 assorted strip sets & 8 assorted cover sets; punches 5 sheets at once; each strip holds 26 sheets; call for additional accessories

\$57

1884	• SpaceSaver (8 1/2 x 11)	\$ 28
1769	Data Switch/128-512K	\$ 29
1820	Data Switch/Plus, SE & II	\$ 39
Disk Holders		
1387	• disk•book-10	\$ 12
1399	• disk•book-32	\$ 22
1572	• disk•book-Plus (16)	\$ 20
1032	• Fellowes Disk Holder	\$ 16
1033	• Fellowes w/Lock	\$ 18
1597	• Mahogany Disk Holder	\$ 30
1815	• Rolltop Cabinet/45	\$ 15
1816	• Rolltop Cabinet/90	\$ 24
1781	• Traveller-4	\$ 5
1780	• Traveller-8	\$ 7
1779	• Traveller-12	\$ 9

Dust Covers

We carry quality dust covers for most Mac models and peripherals; call to order

1296	Fanny Mac/Beige SPECIAL	\$ 59
ImageWriter Printer Ribbons		
1876	• Black	\$ 4
2224	• Black 6-pack NEW	\$ 20
1643B	• 4-color	\$ 12

Ribbons available in blue, green, red, yellow

Kensington

We carry all Kensington products; call to order

Laser Cartridges

We carry new and reconditioned cartridges

1283	MacCracker	\$ 20
1527	MacInker (Iw I & II only)	\$ 42
<i>Call to order ink and rollers</i>		
1650	Mac 'N' Frost/Beige	\$ 59
2114	• Mac 'N' Frost/Platinum	\$ 64
1029	MacTilt/Beige	\$ 74
2071	• MacTilt/Platinum	\$ 74
1943	MacTilt/Mac SE	\$ 74



Compact and powerful, this 45M MacBottom drive is tops for fast, reliable under-Mac storage. Drive packs 45 megabytes plus a 1200-bps built-in modem into one space-efficient footprint! Includes print spooling, backup, and locator software.

Plugs into SCSI port; 2-year warranty; see line list for other quality MacBottom drives

1845 • From PCPC

\$1,349

2286	Micro Cleaning Kit	\$ 15
1977	Mouse Cleaner 360*	\$ 15
1143	Mouspad (7 x 9)	\$ 8
1525	Mouspad (9 x 11)	\$ 9
2266	Personal VeloBinder Kit NEW	\$ 57
<i>We carry VeloBinder accessories; call to order</i>		
2223	Power Director P25	\$ 66
1813	PowerLine One	\$ 10
1498	PowerLine Strip	\$ 39
1657	SCSI Terminator	\$ 49
2097	System Sweeper	\$ 37

DISKETTES

1344	Diskettes DS/DD-10	\$ 19
2073	Diskettes DS/DD-50	\$ 79
1144	Diskettes SS/DD-10	\$ 14
2072	Diskettes SS/DD-50	\$ 59
2226	Fuji Color Diskettes NEW	\$ 24

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Simplify tax preparation with MacInTax Federal. Incorporates IRS-approved forms and recent tax laws. Convenient on-line help shows instructions.

Works w/any Mac (2nd drive recommended); see line listing for MacInTax California

1482 • From SoftView, Inc.

\$89



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SOFTWARE

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2186	AffiniFile	\$ 59
1840	Business \$ense	\$ 309
1817	CalendarMaker	\$ 35
2106	Canvas	\$ 119
2107	• Canvas DA only	\$ 64
1911	C.A.T.	\$Call
1889	Certificate Maker	\$ 35
2168	CheckMark Payroll	\$ 199
2103	Coach 3.0	\$ 62
2108	• Coach Thesaurus	\$ 39
2104	• Coach Professional	\$ 119
2179	• Coach Prof. Network	\$ 299
2145	Comic Strip Factory	\$ 45
2227	• Comic People	\$ 24
2105	Comment	\$ 64
1485	Concertware Plus-Midi	\$ 99
1097	Concertware Plus	\$ 49
1012	Copy II Mac	\$ 25



Stay out of the Finder with **DiskTop 3.0**. This time-saving DA lets you find, delete, re-name, copy, move, launch — without quitting an application!

Works w/512E, Mac Plus, SE & II; hard disk recommended
2230 • From CE Software
\$39

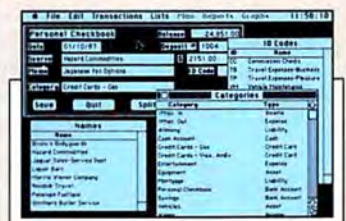
1696	Cricket Draw	\$ 175
1335	Cricket Graph	\$ 125
2228	Cricket Presents	SPECIAL \$ 289
2229	dBASE Mac	\$Call
1211	Deluxe Music Const. Set	\$ 74
1868	Dinner at 8 Bundle	\$ 49
1856	Disk Express	\$ 30
1912	DiskFit	\$ 65
2048	• Network DiskFit	\$ 279
2230	DiskTop 3.0	\$ 39
2211	Double Helix II	\$ 489
1790	• MultiUser Helix Kit	NEW \$Call
1013	Electric Checkbook	\$ 27
2200	Eureka	\$ 129
2141	Expressionist	\$ 59
1737	FactFinder	\$ 39
2217	FastBack for Mac	\$ 62
1664	FileMaker Plus	\$ 189
2049	Findswell	\$ 37
1018	Fluent Fonts	\$ 29
	Fluent Laser Fonts	EACH \$ 48
1403	FullPaint	\$ 49
2232	FuillWrite Professional	NEW \$Call
2171	GridMaker	\$ 42
1778	Hard Disk Partition	\$ 39
2233	HB Music Engraver	\$ 325
1987	Illustrator	\$Call
2209	Image Studio	\$ 329
1095	In-House Accountant	\$ 99
2152	LaserFX	SPECIAL \$ 129
1581	LightspeedC	\$ 125

1708	Lightspeed Pascal	\$ 85
2115	Lookup	\$ 32
2074	MacAtlas Professional	\$ 125
1818	MacBillboard	\$ 24
1995	MacCalc	\$ 85
1082	MacDraft 1.2	\$ 159
1918	MacGraphics	\$ 149
1482	MacInTax Federal	\$ 89
1489	• MacInTax California	\$ 49
2212	• TaxView Planner	\$ 59
1023	MacLabeler	\$ 29
1803	MacMoney 3.0	\$ 74
1668	MacMovies	\$ 79
1710	MacProof 3.0	\$ 124
2237	MacSQZ!	NEW \$Call
1105	Mac Zap	\$ 49
1986	MapMaker	\$ 179
2196	McMax	\$ 219
2149	MergeWrite	\$ 39
1397	Micro Planner Plus	\$ 299
	Microsoft	
2253	• Microsoft Write	NEW \$ 149
	We carry Excel, Word, Works; call to order	

1200 MindWrite **SPECIAL** \$ 179
1641 MORE **EACH** \$ 184
Notes... **EACH** \$ 42
Available for Excel, PageMaker 2.0, Works, Word 3.0 & Ready, Set, Go! 4

2153	Omni Backup	\$ 69
2051	101 Macros for Excel	\$ 55
1036	OverVUE 2.0	\$ 149
2241	Pict-O-Graph	\$ 139
2242	PixelPaint	\$ 329
2244	Power Op	NEW \$ 49
2068	PowerPoint	\$ 279
2243	Power Station	\$ 36
2260	Practica Musica	\$ 89
1215	Print Shop	\$ 37
1658	Pro3D	\$ 199
2213	QuickDEX	\$ 25
2246	QuickKeys	\$ 82
	Qume Laser Fonts	NEW \$Call
	Quality fonts that work w/any PostScript printer	

1798	RAM Snap	\$ 20
2173	Read-It! 300	\$ 219
2172	• Read-It! ThunderScan	\$ 129
1763	Ready, Set, Go! 4.0	\$ 359
2150	Record Holder Plus	\$ 45
2084	Reflex Plus	\$ 189
2083	ResuméWriter	\$ 28
2287	• Professional Version	NEW \$ 79
2215	Scoop	\$ 329
2069	Sentinel	\$ 195
1863	SideKick 2.0	\$ 62
1488	Silicon Press	\$ 48
1465	Smart Alarms	\$ 37
2144	• MultiUser Appt. Diary	\$ 89
1857	SmartScrap & Clipper	\$ 39



Take charge of your finances with **MacMoney 3.0**. This flexible personal accounting program lets you chart spending, figure loans, and more!
Works w/512K, Mac Plus, SE & II
1803 • From Survivor Software
\$74

2248	Space Edit	\$ 459
2249	Spelling Champion	\$ 35
1365	Spellswell	\$ 49
2050	• Legal Dictionary	\$ 59
1936	• Medical Dictionary	\$ 59
1937	Stepping Out	\$ 57
1474	Studio Session	\$ 49
2218	Suitcase	\$ 36
2151	SuperGlue	\$ 69
1811	Super LaserSpool	\$ 99
1938	• Super LaserSpl./Multi	\$ 259
1720	SuperPaint	\$ 89
1810	SuperSpool	\$ 49
2119	Tempo II	\$ 109
1804	Thunder 1.1	\$ 34
1432	TopDesk	\$ 35
1847	Trapeze	\$Call
1721	Trubo Pascal	\$ 62
	We carry all companion programs	
2181	VideoWorks II	\$ 125
2216	V.I.P.	\$ 99
2091	VLS Bulk Mailer	\$ 159
2251	WetPaint	\$ 47
1377	WillMaker	\$ 30



You'll never be at a loss for words with **Word Finder**, the electronic thesaurus Desk Accessory that puts 220,000 synonyms at your fingertips.

Works w/512K, Mac Plus, SE & II; supports most Mac software
2132 • From Microlytics, Inc.
\$37

2132	Word Finder	\$ 37
2252	Word Perfect for Mac	\$Call
1480	WordTools	\$ 49
1839	WorksPlus Spell	\$ 48

EDUCATION/GAMES

Books

2258	• Editing by Design	NEW \$ 30
2214	• HyperCard Handbook	\$ 24
2270	• Illustrator Handbook	NEW \$ 18
	• Inside Macintosh/Vols I-IV	\$19-23
1908	• MacAccess	\$ 19
1690	• Macintosh Advisor	\$ 15
1893	• Macintosh Bible	\$ 16
2175	• MS Word for the Mac	\$ 16
1910	• Personal Publishing	\$ 16
2176	• Run Your Business with Excel	\$ 16
2146	Bureaucracy	\$ 25
2052	Business Simulator	\$ 49
2284	Crystal Quest	\$ 30
1761	Dark Castle	SPECIAL \$ 28
2231	Falcon	\$ 39
	First Byte Games	EACH \$ 36
	We carry all First Byte programs; call to order	
1559	Flight Simulator	\$ 32
1685	Grand Slam Tennis	\$ 27
1475	KidsTime	\$ 29
	MacKids Games	
	We carry all MacKids programs; call to order	
1776	Mac Pro Football	\$ 32
1233	Math Blaster	\$ 32

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Works w/512K, Mac Plus & SE
1889 • From Springboard Software
\$35

2137	OnLine Companion	\$ 34
2208	Rainy Day Games	\$ 27
2142	Shadowgate	\$ 34
2138	Smart Eyes	\$ 49
2139	Smart Words/Business	\$ 49
2140	Smart Words/College	\$ 49
1869	Smash Hit Racquetball	\$ 18
2147	Sub Battle Simulator	\$ 24
1047	Typing Made Easy	\$ 32

COMMUNICATIONS

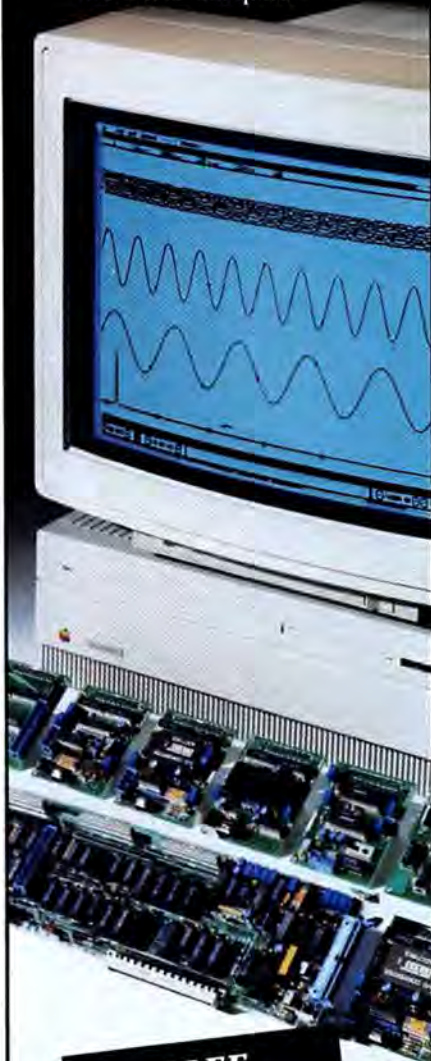
2157	Avatex 1200 Modem	\$ 129
2158	Avatex 2400 Modem	SPECIAL \$ 259
2159	Capetronic Modem	SPECIAL \$ 119
	Communications Bundles	
2255	• 1200 bps for Plus, SE, II	NEW \$ 176
2254	• 1200 bps for 128/512K	NEW \$ 176
2256	• 2400 bps for any Mac	NEW \$ 318
2123	ComServe	\$ 124
	Courier	
	We carry all Courier modems	
2088	DaynaFile single drive	NEW \$Call
2290	DaynaFile dual drive	NEW \$Call
1801	Direct 1200 Modem	SPECIAL \$ 119
2053	EMAC 2400 Modem	\$ 279
1738	Enhanced MacCharlie	\$ 859
	Hayes—we carry all Hayes products	
1437	InBox Starter Kit	\$ 239
1593	• Personal Connection	\$ 85
1973	InTalk	\$Call
1132	MacEnhancer	\$ 175
1731	MacLink Plus w/cable	\$ 159
1396	MacServe (per server)	\$ 159
2046	MicroPhone 1.1	\$ 119

Red Ryder gives you more features for less money than any other communications software. Phone home... or anywhere else with Red Ryder!

Works w/512K, 512E, Mac Plus, SE & II
2247 • From FreeSoft Co.
\$59

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The Macintosh Data Acquisition Company

Circle 124 on reader service card

Commentary/Jerry Borrell

ing software. Olduvai's ADB bridge expands the ADB world to older Macintosh peripherals, such as keyboards and tablets, so they can be used with SEs and Mac IIs.

Color Printers

Printers are peripherals, yes, but color devices demand special attention because of the rapid growth in color applications on the Mac II. Color thermal printers continue to progress on the Mac—Tektronix, Versatec, CalComp, Sharp, and Mitsubishi printers appeared in various booths. All of these are driven by QuickDraw. QMS's subsidiary Laser Connection showed its PostScript-driven thermal printer (still not ready to ship), but if the price stays over \$20,000 it will have a limited market.

Color cameras were both exciting and disappointing. Mirus demonstrated its \$5000 color camera for the Mac, but both Dunn and Matrix were notably absent. Presentation Technologies showed expanded interfaces to *Cricket Presents* and *More*.

Software

Software for the Mac has come into its own. The industry is thriving. One encouraging sign: many developers grudgingly admitted that, indeed, Apple's offshoot Claris is going to be a player in the industry. After a slow start since spinning off from Apple last May, Claris brought upgrades of *MacWrite*, *MacPaint*, *MacProject*, and *MacDraw* to the Expo. It also showed the first of its own new products, a forms-creation package.

Among the word processors, the twin contenders for most-awaited, *FullWrite Professional* and *WordPerfect*, both announced that they would be shipping "gamma" versions of their products to customers, with liberal upgrade policies for version 1.0 when it ships. I sat down with Ann Arbor Softworks' *FullWrite*, myself, and banged on it for 20 minutes. It wouldn't break, and I break lots of software. I have to admit that some of its features, such as its multicolumn capabilities, are a joy to use. T/Maker announced version 2.0 of *WriteNow*.

Graphics Programs

SuperMac's *PixelPaint* and Computer Friends' *Modern Artist* are vying for the

title of most useful paint package for the Mac II. The SuperMac folks are making all the right moves with *PixelPaint*; it keeps getting better. The battle among color draw programs amounts to Aldus's *Freehand* versus Adobe *Illustrator*. *Freehand* added some new capabilities to the fray with its announcement last November, but Adobe showed up at the Expo with *Illustrator 88*. Its new freehand drawing and bezier curve fitting tools bring the battle to a fair features match, while its color-separation features have raised the ante on *Freehand*. Cricket Software announced that it has begun shipping *Cricket Presents*, after months of delay, and a neat little program called *Pict-O-Graph* that adds symbols to represent quantities in your business charts.

Many graphics and desktop publishing products now have the ability to generate color files for color separation, an encouraging sign for those of us in the publishing industry. *Freehand*, *Quark Xpress*, *Illustrator*, and LaserWare's *LaserPaint* are among the first.

Computer-aided design had some strong entries for the show. Paracom acquired the Harvard-developed *Schema* and added surface shading. Abvent, a French company, has also added shading to its 3-D modeling. Versacad and Pegasys showed their 3-D wire-frame software packages. And IDD, the maker of *MacDraft*—the Mac's largest-selling CAD package—announced *Dreams*, a 3-D color CAD package.

What? More Software?

There are too many dramatically evolving categories of Mac software to mention all the interesting programs, but several spring to mind. Coda Software previewed *Finale*, a music program that allows direct keyboard input, real-time display of the input as a score, on-screen editing of the score, and output to PostScript laser printers. Incredible.

The MacRecorder and its accompanying software from Farallon Computing brings real-time sound digitization and editing to the Mac. This will be further developed to allow for voice mail via PhoneNet.

Yet more: the host of offerings for Prolog, Lisp, and related object-oriented programming languages. OCR (optical charac-

(continues)

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Drive:	20	40	50/80	150
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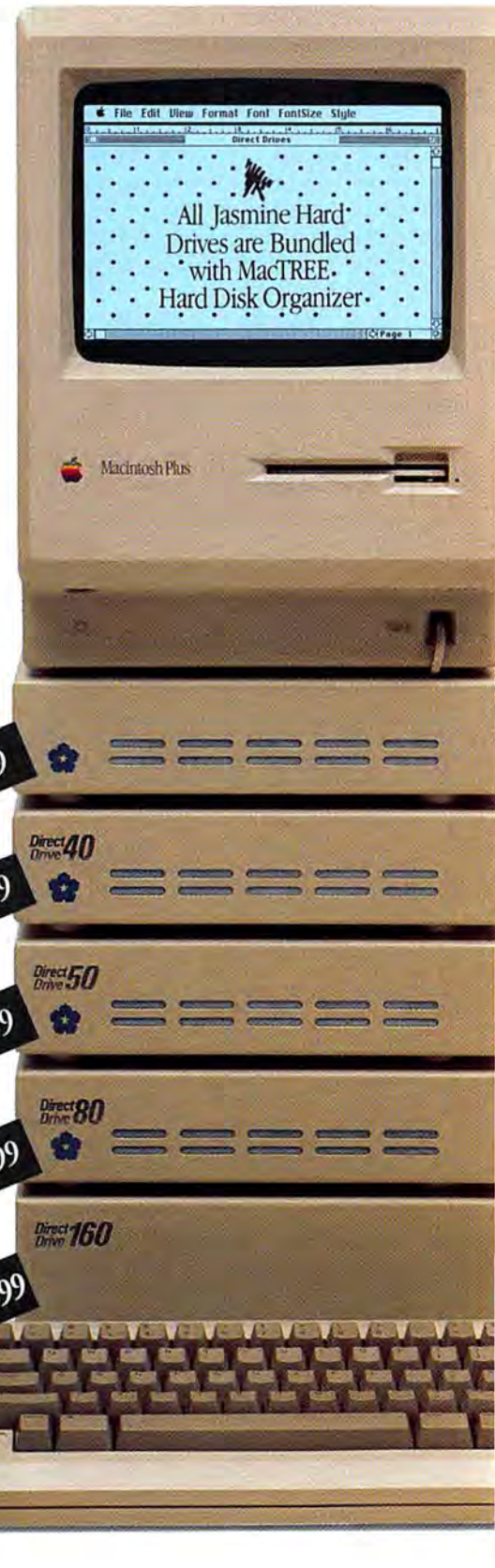
20MB \$649

40MB \$999

50MB \$1159

80MB \$1399

150MB \$2899



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Circle 457 on reader service card

ter recognition) software from Microtek, Dest, Olduvai, Innovatics, and New Image Technology.

HyperCard appeared throughout the Expo, widely used by developers to create demonstrations and tutorials. Activision offered two new *HyperCard* products to add to its original pair of offerings by Danny Goodman: *City to City*, a travel application, and *Reports*, a utility that drastically improves on *HyperCard*'s limited ability to produce reports. Symmetry's *HyperDA* allows people who don't own *HyperCard*—or who can't fit it into their system—to browse (but not modify) stacks. DataDesk International had *HyperDialer*, a *HyperCard* auto-dialing device.

A final interesting note—at the Adobe booth, Display PostScript running on IBM RT, IBM PS/2, DEC VAX, Sun Microsystems, and Mac II computers. Hmmmmm.

Communications: 1988 Is the Year

I know it sounds like hype—Desktop Everything—but a large portion of the

show was dedicated to products that share information between Macs or allow the Mac to connect to other CPUs.

One area of intense competition: providing alternatives to Apple's AppleTalk cabling. Farallon started this off some time ago with PhoneNet; now there are offerings from DuPont, Northern Telecom, Nuvotech, and TriMar USA. Northern Telecom claims 2.5-megabit capacity over its twisted-pair implementation.

The facsimile modem niche is heating up as well. Apple did not show its already-announced fax modem, but there were others from Abaton, Cypress Research, Citizens Computer Center, and Microtek. Once all of the bugs are worked out, these things could sell well—even better if they were able to send EPS or other graphics files (TIFF and the others) across phone lines in compressed formats.

File-service and resource-sharing products demonstrated significant refinements. La Cie's *SilverServer*, Infosphere's *Liaison*, and DataSpace's *TeleNode* share the same approach, enabling users to share data files and resources over a network or network devices, but they differ in their implementation.

Connectivity—Mac to IBM, Hewlett-Packard, Sun, and DEC computers—was another strong theme. Apple must be thrilled to think of the alternatives now available to its corporate users. In the Palomar booth, Tara Systems had a Mac II card with four serial ports. That's something announced last year by AST, but it hasn't shipped because it works only under A/UX.

Oh, Woe

I know in my heart that Boston will be an even bigger trade show—and this one took me three and a half days to trudge around.

For those of you who are really interested I'll send you a copy of my complete summary of the Expo. But you must send a self-addressed, 9-by-12-inch envelope with 56 cents in postage to receive the ten-page list of new products. Maybe that will help you sort out the Expo. Write to me, care of *Macworld*, at 501 Second St., San Francisco, CA 94107. □

1-800-MAC-DISK

Software

Aatrix Payroll	69.00
Beyond Dark Castle	call
Business Sense	283.00
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Cricket Graph	192.00
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Hardware

Hard Disk Drives by Everex,		
MacBottom, Magic, Relax		
and CMS:		
	Internal	External
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30meg	NA	699.00
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91meg	1295.00	1395.00
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Qume LaserPrinter		3950.00
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Memory Upgrades

128K-512K	139.00
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512K-1024K	169.00
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Sony DS Boxed	18.50
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*MacUser Editors
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It's the highest achievement to be both beautiful and

In the field of nature, the design skills of the hen and the spider have rightfully earned universal acclaim.

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And now Letraset proudly introduces its most recent achievement: Ready Set Go! 4.0™ page layout software for the Macintosh™ embodying

the perfect balance of desktop publishing beauty and productivity.

For the artist in you, RSG! 4.0 offers innovative design features that allow you to produce pages that are excitingly creative.

Including automatic run-arounds that make it easy to create extraordinary visual effects. An elegant new tool bar that keeps your tool boxes accessible to each docu-

ment you're creating. Powerful snap-to design grids that help you interactively place text and graphics and visualize designs as you go. Facing pages that allow you to view, edit and lay out a two-page spread. "Lock-and-Don't-Print" features that let you produce multiple pages for color overlays. And over 50 fill-and-pen patterns, based on Letraset's popular collection of rules and borders,



evement of great design d functional.

to create a variety of special graphics.

The practical side of you will be pleased to learn that RSG! 4.0 is also packed with a wide array of powerful time and effort saving production features.

For example, RSG! 4.0 comes equipped with full-function word processing and a built-in 100,000-word spell checker that can suggest correct spelling alternatives. Style

throughout a one-page layout or an extensive multi-page document with a single keystroke. A linker tool that allows text to flow automatically as new text or graphics are needed. And RSG! 4.0 even boasts tabloid-size page formats up to a generous 99x99 inches.

In other words, RSG! 4.0 is the first page layout software of its kind. A tool for those who recognize that

sheets that let you make formatted changes

great design is the product not only of powerful creative resources, but of a genius for efficient production.

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We deliver.

There has been a lot of talk about 24-bit color in the friendly Macintosh environment. If you're looking for more than just conversation, call us at RasterOps. We are delivering our 24-bit ColorBoard 104 worldwide.

24-bit color capability and the Macintosh II add up to the first truly usable and affordable professional design workstation. If you need to import high resolution, photo-quality, TrueColor graphics into the most popular design and layout applications, perhaps you should give us a call.

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Dealers welcome fax no. (408) 446-4168

This ad was developed using a RasterOps 24-bit ColorBoard and Monitor.

Circle 13 on reader service card

RasterOps

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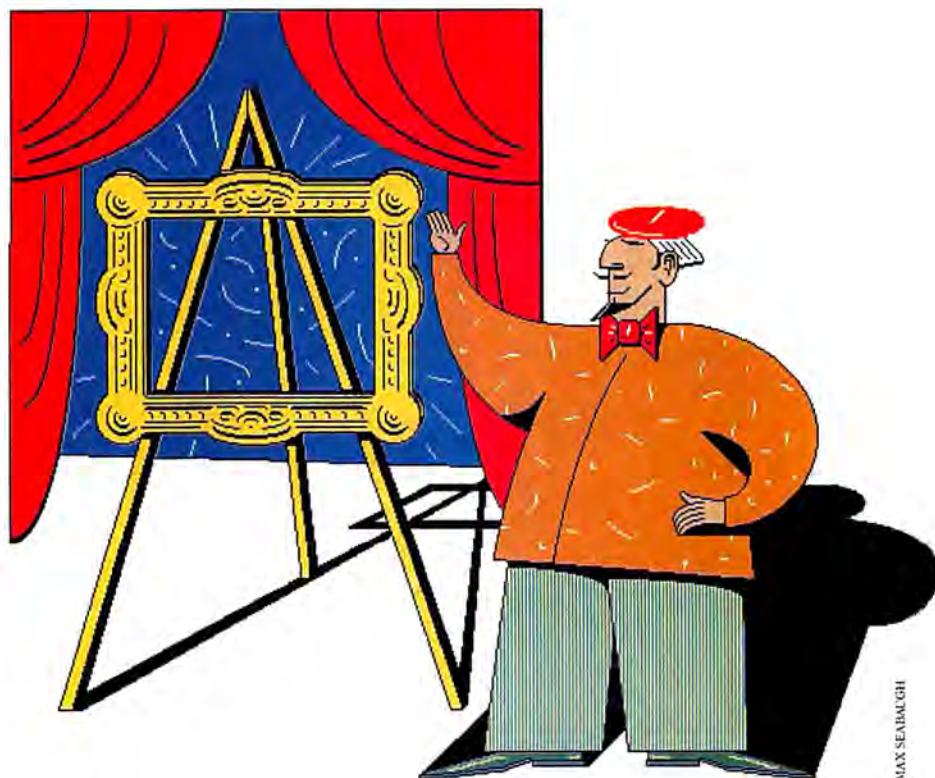


The Vapor Papers

Is announcing software before its time a crime or a service?

In the April 1987 issue of this august publication, a company called Ann Arbor Softworks ran an extraordinary two-page advertisement. It might well have been called an antiadvertisement. In large type, its message read: "The word processor you have waited years for is finally here. Don't buy it." The illustration depicted a version of the game *Whispering Down the Lane*. A business-suited woman uttered the words, "Microsoft Word 3.0?" and was warned against it by a man in tie and shirtsleeves. In the next panel, the woman gave the same admonition to a second man, who in turn repeated it to another, and so on—the ad was a veritable collage of the words "don't" and "no." The way these boomers were gossiping, you'd think that *Word* had a sexually transmitted disease. But the only concrete damnation of Microsoft's offering came in the form of faint praise: while the ad copy conceded that *Microsoft Word 3.0* is indeed an advance in the field, it added that "it's just not good enough." Why not? "Because *FullWrite Professional* is about to be shipped, and compared to *Word 3.0*, *FullWrite Professional* is a superior word processor, at a better price." The ad included a breathtaking list of features, as well as a promise: "We'll be at your store within 60 days."

If you were among the hundreds of thousands who, 60 days after this ad appeared, crowded into computer stores and software boutiques, howling like feral dogs for the right to word-wrap around irregular graphics—only to be beaten back by riot police armed with high-pressure water guns—the following revelation is no news to you. Otherwise, prepare to be shocked:



the program did not ship within the promised 60 days. In fact, it did not even ship in 100 days. As I write this column, it is almost 300 days later, and *FullWrite Professional* has yet to ship.

Thus does *FullWrite* qualify as a classic example of *vaporware*, software that has been announced but isn't yet available for sale. Vaporware is a common phenomenon.

Here are the conditions that lead to vaporware: a company has a product in the works. When completed, this product may be good enough to beat its competitors and win the favor of customers. But cus-

tomers, who live in the real world, not the vapor world, have an annoying tendency to prefer existing computers, word processors, and databases to those that do not exist. In an effort to thwart that stubborn habit, a company creates vaporware by announcing the development—if not the release—of its product; it claims that the product makes the current field look malnourished and overpriced, and that educated consumers would be wise to wait until the product ships, presumably before the next millenium. The *FullWrite* ad stands out because it brazenly admits to resorting to this ploy: Ann Arbor Software declares outright that its bird in the bush is better than the one already on the store shelves. A vaporware manifesto.

(continues)

Steven Levy is a Macworld columnist and the author of Hackers: Heroes of the Computer Revolution (Dell, 1985).

Purchase Requisition

QUANTITY	DESCRIPTION
1	MACINTOSH II
1	IBM PC AT

Impossible!
Warren!
Choose one or
the other—
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*The obvious solution
was unrealistic.*

“I would have given up anything to use a Macintosh, except my PC software.”

"You can't have your Macintosh™ and PC too!" Famous last words.

People say, "Where there's a will, there's Warren." Which means I don't settle for words like No. Impossible. Can't be done. No way.

So when I decided I wanted a Macintosh, but didn't want to give up Lotus 1-2-3® or dBASE® III, I naturally set about looking for a way to have it all.

The fastest fix was to buy both an IBM® PC and a Macintosh. "Not possible," said the DP/MIS manager. "Pick one. Any one you want, as long as it's MS-DOS® compatible!" Witty guy.

Then I searched everywhere for someone willing to loan me a PC in exchange for executive privileges. I was willing to give up anything, but I kept hearing No. Not interested.

Without another alternative in sight, I decided to surrender and settle for a PC. Then, I discovered an article on AST's newest products—

What I like best about AST's Mac86 and Mac286:

- I retain the benefits of the Mac desktop while running DOS
- I have full access to DOS programs and data through 5.25" MS-DOS floppy drives
- I can cut and paste text from both MS-DOS and Macintosh environments
- My MS-DOS files share Macintosh hard disk volumes

MS-DOS co-processors for the Macintosh II and Macintosh SE. The cavalry had arrived.

The article said AST's Mac86™ and Mac286™ allow you to actually run MS-DOS application programs on your Macintosh. Just plug the DOS

Mac86 and Mac286 meant I didn't have to compromise the Macintosh I wanted for the IBM software I needed.

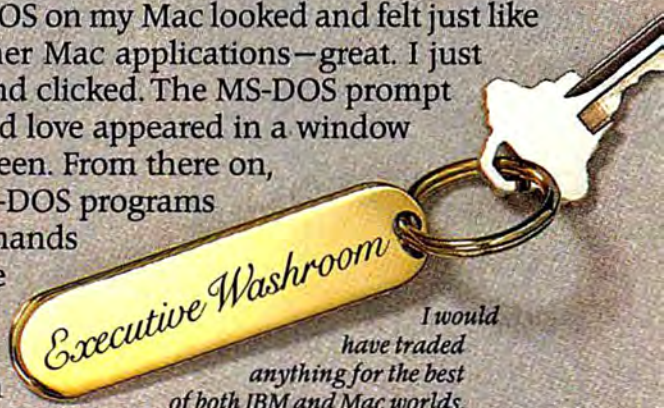
processor into your Macintosh II—Mac86 into an SE—and load your favorite MS-DOS application software onto the Mac's hard disk. I was sold.

MS-DOS on my Mac looked and felt just like all my other Mac applications—great. I just pointed and clicked. The MS-DOS prompt I know and love appeared in a window on my screen. From there on, I used MS-DOS programs and commands as if I were working on a PC.

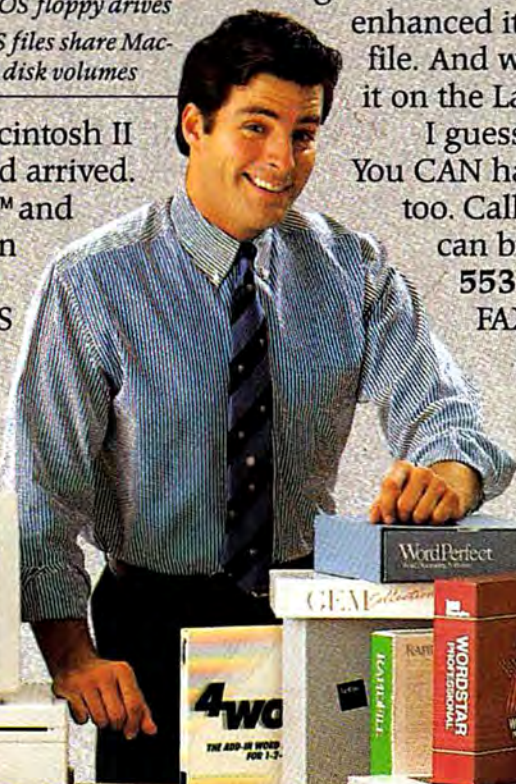
I even moved Macintosh files into MS-DOS, sometimes cutting and pasting parts from one environment to the other. And when I was finished with my PC and Macintosh files, I stored them both on the same Macintosh hard disk without any clumsy file transfer procedures to slow me down.

Back in the Macintosh environment, I still had immediate access to all of my PC files. Using Macintosh software, I reopened a PC file, enhanced it, then merged it with a Mac file. And when I was finished, I printed it on the LaserWriter®.

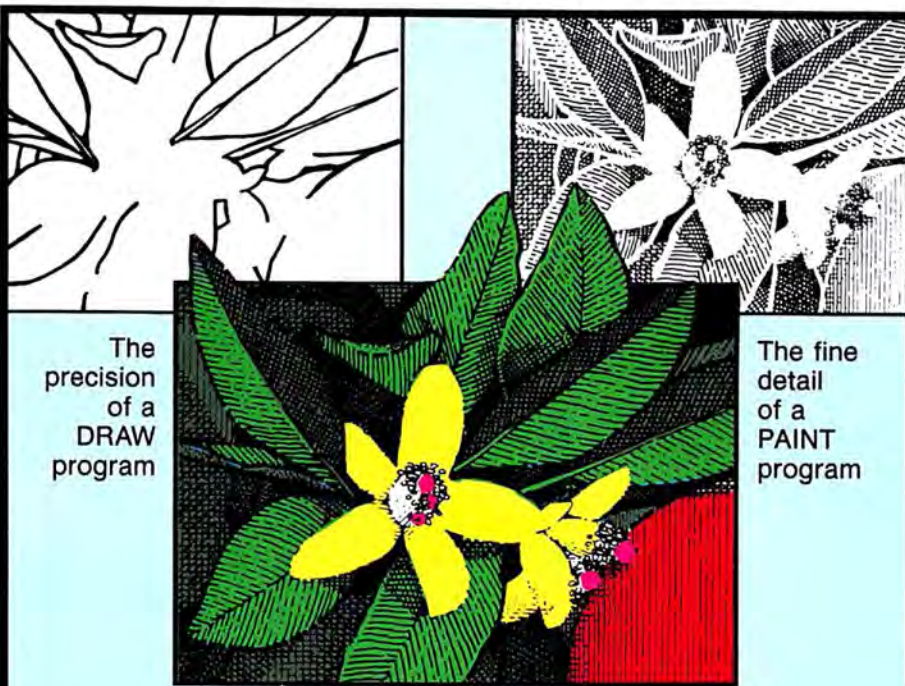
I guess the moral of this story is: You CAN have your Macintosh and PC too. Call AST today to find where you can buy Mac86 or Mac286. (714) 553-0340. BBS: (714) 660-9175. FAX: (714) 660-8063.



I would have traded anything for the best of both IBM and Mac worlds.



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The precision of a DRAW program

The fine detail of a PAINT program

Now combined in

SuperPaint

Graphics for the Macintosh will never be the same again. Before it was paint or draw. One or the other. Now, nothing less than both will do. With SuperPaint, you can edit dot by dot in the PAINT layer and you can create and manipulate objects in the DRAW layer.

Until recently, paint programs only printed at 72 dpi. Now SuperPaint's unique LaserBits™

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SuperPaint. When all you need is a masterpiece!

(compared to other paint programs) "SuperPaint is the clear winner and... MacPaint's heir apparent."

Adrian Mello, MacWorld, Jan '87

"SuperPaint is the hottest graphics package currently available."

Bob LeVitus, MACazine, Jan '87

"Is SuperPaint really super? Absolutely."

Sharon Aker, MacUser, Feb '87



Suggested Retail Price: \$149.95

System Requirements:
Macintosh 512K, Plus, XL (1 mb)

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(619) 695-6956

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Vapor Madness

At this point, I sense my loyal readers salivating in anticipation of an amusing fusillade of invective showered upon the perpetrators of this sleazy form of marketing. Well, swallow hard, dear readers, because I do not come to bury vapor. While I won't go so far as to *praise* it, my point is that as far as consumer issues go, vaporware has been wildly overrated.

That's right, overrated. So long as there is no conscious fraud—that is, as long as a company that preannounces a product actually has the software in development and is reporting the virtues it believes the program will actually deliver—vaporware doesn't hurt the educated consumer, and it sometimes helps. The fact is, once we know how to regard vaporware, we're better off with it than without it.

Yet people persist in calling vaporware one of the worst plagues since insider trading. How has this happened?

Perhaps it began with Stewart Alsop. Alsop is one of the more talented members of a field of about a hundred or so self-appointed experts who peddle high-priced computer industry newsletters to wanna-be insiders. Alsop not only popularized the word *vaporware*, but also wittily concocted a Top Ten list of the most notable no-show products, along with how long they lived in the world of fiction. Though Alsop's tongue was at least halfway in cheek, many people regarded his vapor-offenders as the computer equivalent of the FBI's most-wanted list. And the belief has firmly taken hold that companies are in some way cheating the consumer by this practice and should be flogged for it.

By the way, if you think that sounds like hyperbole, consider the plight of Phil Lipetz, the hapless president of Ann Arbor Softworks. While a cat-o'-nine-tails has yet to meet his rump, he has literally been tarred-and-feathered for his flagrant public vaporing. (Well, not exactly...the truth is that he lost a bet and posed for a picture while covered in blackstrap molasses and feathers. Tar was just too gross.)

Anatomy of a Vape

Phil Lipetz's situation offers the perfect example for my contention that the evils of vaporware are overrated. (I should say here that my argument deals with software for which competition exists, not situations where a dominant company uses near-monopoly status to crush competitors

(continues)

Three smart steps to doin' the "Mac."



1. While you print in the background, run in the foreground.

any other spooler around, SuperLaserSpool makes a great partner for any Mac 512e and up and any Apple printer, with or without MultiFinder. It gracefully handles multiple downloaded fonts and keeps pace with the latest versions of Macintosh applications. In fact, it's even optimized to correctly spool PageMaker files. Some performance!

For networks, get the 5-diskette *Multi-User SuperLaserSpool*. Or choose *SuperSpool* if you print exclusively with an ImageWriter.*

SuperLaserSpool: \$149.95
Multi-User SuperLaserSpool: \$395.00
SuperSpool: \$99.95

SuperLaserSpool, our smart print spooler, keeps you and your Mac stepping out in the foreground—where you belong—while it routes your files to your hard or floppy disk for efficient background printing. Faster than



2. Back-up.

DiskFit makes that crucial step of backing up your hard disk such a breeze you'll find yourself doing it again and again. *DiskFit* backs up your data on floppy disks, Bernoulli cartridges, DTC/Kodak cartridges, another hard disk or 3M DC 2000 tape cartridges.

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How's that for a neat turn?

DiskFit: \$99.95
Network DiskFit: \$395.00

3. Click your files closed.

Locking sensitive files is the *only* step for anyone who works with confidential or private data. Now our encryption utility, *Sentinel*, makes it so easy you'll waltz through it. For example, protection of your documents occurs right on your desktop: protected files appear with a lock symbol on the icon, or can be made invisible. And you get your choice of the Data Encryption Standard (DES), or our other fast and secure encryption algorithms, including our critically acclaimed SuperCrypt, which will protect a 100K document in an incredible 5 seconds. And our intelligent "WorkSet" feature keeps track of protected files for you. Just enter one password and you can lock or unlock all the files in the set—in one swift move.

Sentinel: \$295.00

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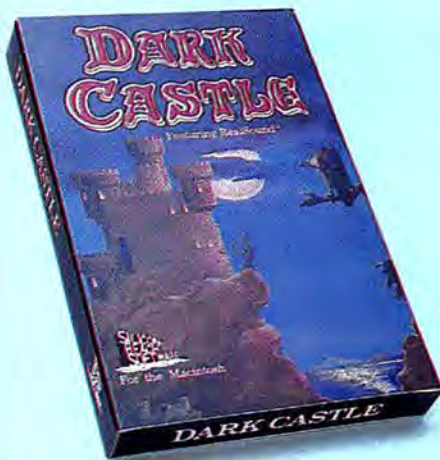
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by preannouncing products. That's anti-trust, not vaporware.) Ann Arbor Softworks is among the worst offenders in the vaporware sweepstakes in many a month—and the most roundly excoriated—yet I insist that no great harm has been done (and Mr. Lipetz, not suprisingly, agrees with me).

Let us examine the so-called sins of Ann Arbor Softworks. This is a company that found an early niche in games for the Macintosh, then moved into so-called productivity software. Its most successful product was *FullPaint*. Then, in a software developer's forum in early 1976, Lipetz suggested that all the hoopla about desktop publishing was misguided—people wanted the look of desktop publishing, all right, but they wanted to get it from their word processors. "I literally got booed down," says Lipetz, a cocky sort who figured that "if everyone is this stupid," he might as well beat them to the punch with the first word processor that fully implements the virtues of desktop publishing. He figured it would be ready in about 18 months.

By estimating so optimistically, Lipetz demonstrated a willful ignorance of history—it takes a very long time to develop a word processor for the Mac, a fact that the authors of *Microsoft Word* (all versions), *WriteNow*, and many others can attest to. Yet Lipetz insists that the product was on schedule when Ann Arbor Softworks demonstrated an early version in its booth at the January 1987 Macworld Expo and took out advertisements soon afterwards. It would be vaporware, but only for a few months, as April 30 was the projected shipping date. The purpose of the predatory advertisement in the April issue was indeed to convince customers to hold off buying *Word 3.0* (which had just started shipping at that point) and wait, just a little while, until *FullWrite* came out.

"It was a strong campaign. 'Look at us, don't look at *Word 3.0*,'" says Lipetz. "It was an ad that would catch people's attention."

If *FullWrite* did ship and did prove better, then customers would be aided by the early notice that a program with more features would soon be available. But the program did not soon materialize. Lipetz explains that as soon as he realized the buggy *Word 3.0* did not threaten to capture the entire Mac marketplace any time soon, there was no longer a need to rush out a competing product. So he decided not to release the version of *FullWrite* his company was working on, but instead to re-

(continues)

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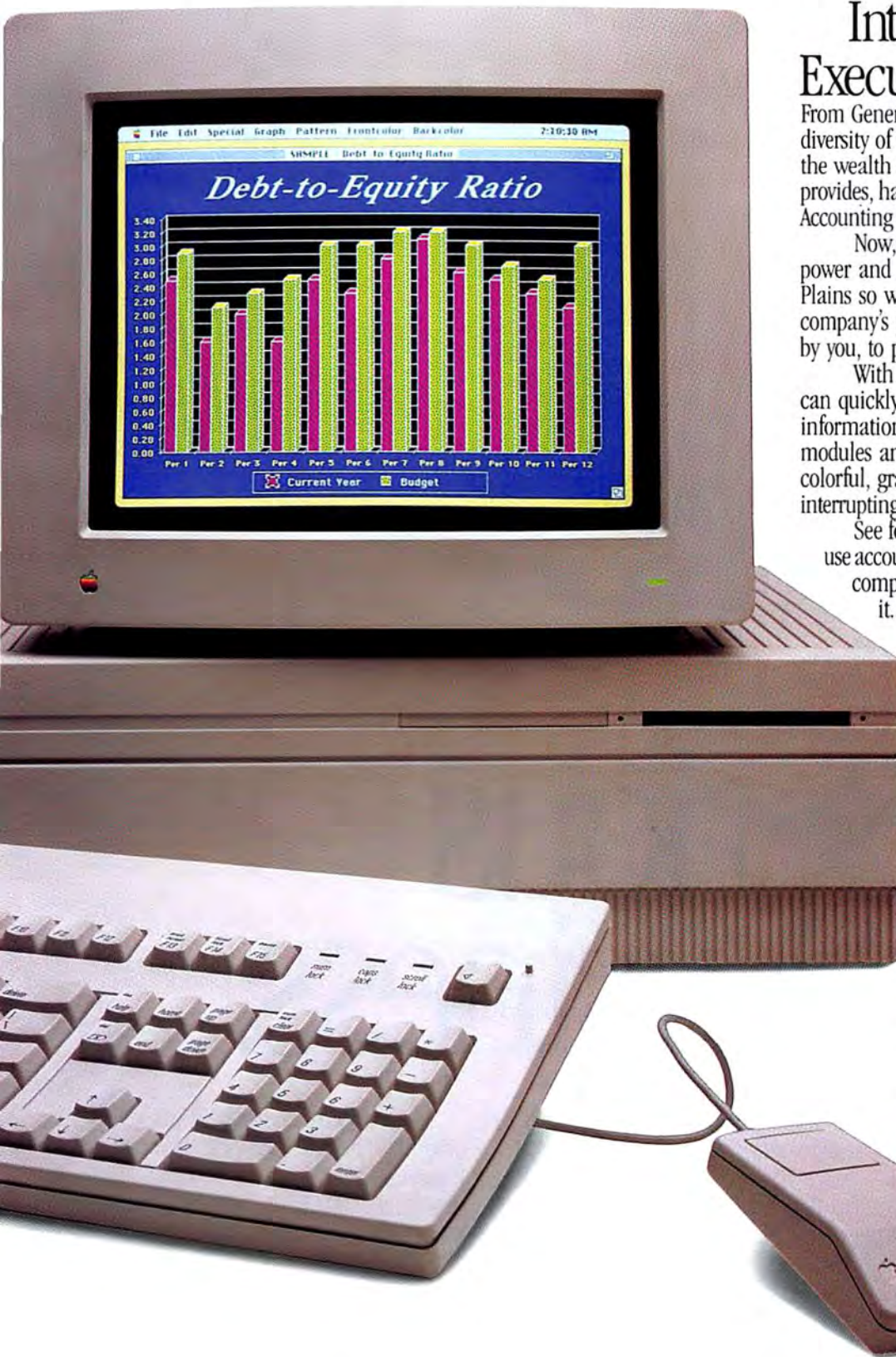


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Circle 3 on reader service card

Steven Levy

design the program to be more powerful—even though that might not be completed until August.

Doing this made that fatal advertisement look terrible. Lipetz admits that in retrospect it wasn't such a good idea, mainly because the ad made it look like Ann Arbor was attacking Microsoft when it was down. But the real problem was that Ann Arbor made a public vow it didn't keep: to ship *FullWrite* in 60 days. It told the world that Ann Arbor Softworks was a company that didn't deliver what it promised.

Exacerbating this problem was Ann Arbor's performance at the August 1987 Expo. Lipetz had fully expected to have the product done by then. "We had a warehouse full of manuals and boxes, and a version that withstood hands-on testing," he claims. But a few weeks before the show, Apple released the specs on its new version of MultiFinder, and it turned out that *FullWrite* would need a rewrite in order to run smoothly under MultiFinder. Lipetz had to decide whether to release an interim version to placate the public or to wait until his programmers solved the new problem. Again he decided on the latter course: "Our decision was to bring out the best product possible, and once you make that decision you can't do it halfway."

And again, overoptimism struck. When Ann Arbor had expected to have a version ready for shipping soon after the January show, the company had ordered oversized clocks to tick off the hours, minutes, and seconds before *FullWrite* shipped—as a kind of a joke. Lipetz thought that the joke could still be funny, so the Ann Arbor booth at the August Expo featured a brightly lit countdown of how many hours until the product would ship—starting at around seven hundred hours, which meant the program would ship sometime in October. When the *new* deadline wasn't met, people didn't take it as a joke, and Ann Arbor's credibility further eroded.

As autumn came and went and there was no *FullWrite*, people became furious. Some had already sent in money to Ann Arbor. Others had held off buying other products and now felt cheated, especially since *Word 3.01* finally provided a decent full-power word processor for the Mac. Lipetz tried his best to assuage his detractors. He instructed his employees to give honest assessments of delivery time and reprimanded those who did not. He set up a toll-free number for would-be customers

(continues)



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to get the latest status report. He held all money collected for the product in escrow and gave quick refunds to all who asked. (He says that the Federal Trade Commission reviewed Ann Arbor's practices and commended the company as a fair dealer.) He made himself available online to answer his critics directly, and only lost his cool when someone called his motives into question. He could accept being called a poor manager, a poor judge of when a product could be delivered—but not a liar.

The Value of Vapor

As of this writing, there is still no *FullWrite*. (Phil Lipetz is in very big trouble if that is still true when you read this.) And Ann Arbor Softworks has taken as much heat as any company in the history of vaporware. But where are the victims? It is true that some customers might have erred by foolishly holding off their buying decision, or by paying prematurely. But only the most naive consumers have actually been fooled. *Of course* most companies are not going to deliver on time—like it or not, that's the software biz. But that's *the com-*

pany's problem. The educated consumer, who recalls all the other products that didn't come out when they were supposed to, will give no credence to a shipping date unless the company has established a reputation for keeping its promises. Obviously, Ann Arbor Software isn't to be trusted by this standard, but neither is Microsoft, which not only was late with its own offering, but also was remiss in releasing a product before it was sufficiently tested.

And consider the well-regarded WordPerfect company, whose Macintosh version of *WordPerfect* has been running neck and neck with *FullWrite* in the overdue sweepstakes—but hasn't been as aggressively loudmouthed in preannouncing and thus has taken less heat. "Overall, people have been very good," says WordPerfect's Macintosh project leader, Roger Bell, "perhaps because we haven't taken prerelease orders." Bell figures people with Macs in offices that run other versions of the popular program have reason to wait for *WordPerfect's* eventual release on the Mac.

What I suggest for consumers is this: do not assume that any unreleased product will ship when promised. And when it is shipping, you should always do some hands-on assessment or solicit some inde-

pendent evaluation before you buy; because there is no guarantee that the product will live up to its promise.

In your long-term planning, do take advantage of the information in vaporware announcements. If the announced feature set for *FullWrite* is just what you need, or if you work in an office full of IBM machines running *WordPerfect*, then the announcement of those products for the Mac, however premature, has value for you. Take the proposed shipping dates with a grain of salt and hold on to your money—but consider the information.

When I asked Phil Lipetz what he thought the vaporous mess with *FullWrite* has done to his company's reputation, he told me, "Overall, I think it's going to turn out neutral. The bottom line is, how do we influence people's lives? If we ship a good product, people will like us."

That's the way it should be. The trials and tribulations of Ann Arbor Softworks constitute an amusing sideshow, but the main event is the software itself. If *FullWrite* really tops its competition, the gripes about its vaporware status will turn out to be just...vapor. □

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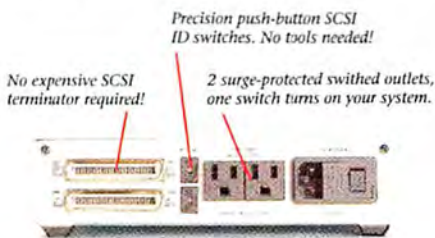
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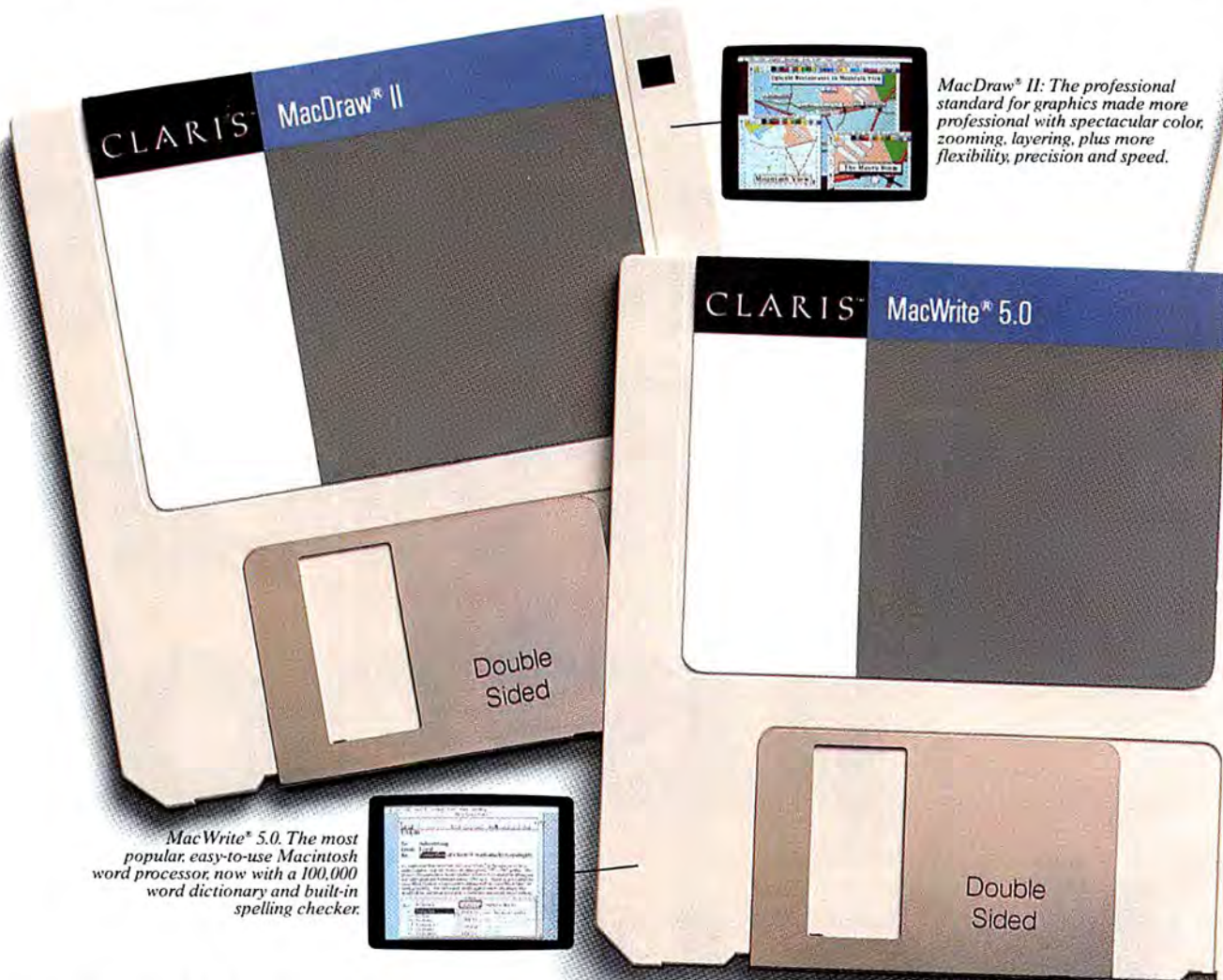
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*An interview with Bill Gates,
president of Microsoft*



Bill Gates, at 32, still ranks as a leader in an industry where he was one of the original whiz kids. He began writing his first system software, for the 8008 microprocessor, when he was in high school. In 1975, he and his high-school friend Paul Allen wrote a version of BASIC for the MITS Altair computer, launching Microsoft. Thirteen years later, the company sells more personal computer software than any other publisher in the United States, and Gates is one of the wealthiest men in the world.

One of the notable aspects of announcements of new computers is that most companies like to have Bill Gates on the podium at the showing. What is that like—especially when some of the computers have not been successful?

I'll get a call asking me to participate in one of these things. It's not like Bill Cosby, who endorses a particular product—I can't endorse any one product—I talk about our software, our standards. And yes, we're the number one company in software over the last twelve years, and that makes people want our presence at their announcement.

We have had software on all the major machines: the Altair, Commodore, IBM PC, Compaq 386, the Mac, the Mac II. Microsoft has been involved with the success of these machines because of our software. People seem to think that Microsoft became big after MS-DOS, but we were the leader when IBM came to us. Our role in the industry was bigger then than it is now; now Lotus and Ashton-Tate are similar in size to us. MicroPro and Visicorp and a few others from the early days have fallen behind.

But the MS-DOS contract was your big break.

We actually had more people working on the software than IBM did. That was the case later with the Mac, too—we actually had more people on our Mac projects than Apple did. When we see these opportunities in the industry, we get very serious. In the early days of the IBM PC there were a limited number of applications and we knew that if we threw resources at it, we could be leaders. When we saw the Mac, we said that we would do applications for it and be one of the first developers. About nine months after the first PC shipped, Steve Jobs showed us the Mac prototype and we began working on it.

How was it to work with Steve Jobs?

Our original plan was to bundle our software applications with the Macintosh, but both of us decided this would be a bad idea, so the agreement was terminated. We also thought they'd agreed not to bundle *Paint* and *Write*, so we were pleased last year when they were unbundled.

Back in the period of the Mac's development, we would go to work for two days at a time at Apple. Steve's style was great. On the first day he would tell us that the Mac was going great, and that it would sell millions. By the second day, he would look at us and say, "Do you really think we'll make it?"

The whole team would get a kick out of it when Steve and I would disagree. I was one of the few people who would stand up to him, so we had some lively exchanges.

What do you say to the opposing claims to CPU superiority: the Motorola 68020 chip in the Mac versus the Intel 80386 in the IBM?

Neither is better than the other at all things. The 386 has on-board memory management, which is important, but the 020 requires an additional memory management chip for the Mac II. The 020 has a little instruction cache, which helps it in the benchmarks. It's one of those things—show me your benchmark that shows one better than the other, and I'll show you another benchmark that shows the converse.

Both have a big range of performance within each processor family. Both the 386 and the 020 come in 16- or 20-megahertz versions, so that the range overlaps.

(continues)

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Guy Kawasaki

Ex-Macintosh software evangelist ■



"I have absolutely no training in databases, but I'm now using 4th Dimension day in and day out."

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Walter W. Stewart

4th Dimension end user

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"4th Dimension is the most powerful database I've ever recommended for a micro."



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In fact, I've become a developer myself. I wanted a point of sale application to run my business. I developed the system originally on a competitive product, but it didn't have the horsepower to solve the problems. 4th Dimension has the power to do anything I want to do.

I can offer no more sincere testimonial for the products I sell than to use them to manage my own business."

Dick Applebaum
Apple dealer and business co-owner
Computer Plus, Inc. ■

"When you sit down at a computer, there are two ways to go, IBM® or user friendly.



"In other words, what you see is what you're used to working with.

These are the reasons I like 4th Dimension: It's got the power to do everything I need in a complex vertical

market. It's got the interface to make that possible without taking on a second career. It's got layout graphics that can make your product look as good as it works.

You can sit down and use 4th Dimension without doing much to it, and you still have complete power. It has some dynamic, *dynamic* graphics. All this without programming. The others bog you down in housekeeping chores.

The custom mode enables me to use words, sentences, phrases, and icons that are familiar to my people in the real estate business. I have the ability to customize menus and menu items.

I enjoy working with 4th Dimension because of its power, interface, and the ability to create

custom programs for my clients. I can't think of anything better than 4th Dimension as a development tool, and I've looked at them all."

Ted Bobrer
Developer
Concept 2001 ■

"The thing I like best about 4th Dimension is that it works the way I expect it to work.

"The whole screen interface is so much nicer than the others.

With dBASE,™ I spend a lot of time looking at the books and then creating screens. I never get it near right the first ten times.

I really like the way the subfiles work. I use that a lot because I maintain inventory sheets and I need to pull information from other places.

I like how it does everything automatically, like buttons, radio buttons, check boxes, and scrollable windows. You really don't need training to use these features."

Diana Foster
4th Dimension user
PC Coordinator ■



**The opinion expressed is not an endorsement by the National Institutes of Health nor the Federal Government.*

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It's accurate to say that in graphics, consistent interface, and ease of use the Mac is ahead of the PC.

The 020 is a very smooth upgrade for the Mac, as is the 386 for the PC family. We've invested so much in both the Mac OS and DOS that we have a payoff with either computer. What is true is that only Intel and Motorola have substantial volume in the marketplace, and other processor families are falling by the wayside.

What about the next generation of microprocessors?

Both the 020 and the 386 have an external data cache, which speeds their performance. But for the Motorola 030 and the next-generation Intel chip, the cache is on board. Having the cache on board helps a little, but it has to be smaller so it's less sophisticated. Both companies are working hard on the next step to ensure that our investment to date in software will translate easily to the processors.

How do you distinguish between the Mac operating system and OS/2, which you're developing for the IBM PS/2?

OS/2 is designed for an Intel architecture, the 286 and 386 chips. It's substantially different from most personal computer operating systems—it's larger, it has multitasking, pipes, memory management, protection of applications from one another. It's something that, in its time, will be very important for all applications. And the graphics interface of the Presentation Manager is much cleaner.

The Mac operating system is a fine piece of work. We are looking at how to write unique applications for MultiFinder. We are trying to find out how to move data between different applications under MultiFinder—for example, moving statistics data in real time out of *Excel*. Links for data are important. Apple wants to continue evolving MultiFinder so we can put these kind of features into our applications.

Can Apple advance its system software quickly enough to compete with what you're doing with OS/2?

Apple has a lot of ability. Some of its system software is more usable than MS-DOS.

Look at *AppleShare* compared to what is available on the IBM; the cost and ease of use are so much more attractive on the Mac. You can see each other's files, create folders, and share them. In that aspect of the operating system, Apple does the best job. In other areas, it is challenged; for instance, in how to build a multitasking base—MultiFinder is only part of the way down that path. They've got smart people working on it, and both of our respective CPUs have problems with it.

It is often said that Apple system software has a one-and-a-half-year lead over OS/2. Is that accurate?

Well, let's look at the applications software in each environment. In terms of graphics applications, the Mac is way ahead of the PC. Look at the Microsoft products. *Excel* was on the Mac for two years before it was on the PC. *PowerPoint* and *Mail* are available now on the Mac, but not on the PC. Other developers have also been doing things with the Mac that are more advanced than the applications on the PC. So yes, it's accurate to say that in graphics, consistent interface, and ease of use, the Mac is ahead of the PC. Apple started in 1984 and did a great job. Microsoft and others helped it happen.

Apple does need to keep innovating. The gap will certainly narrow over the next two years in interface software.

Could PostScript be the software bridge between the CPUs from different developers? John Warnock has announced that Adobe will make the specifications of PostScript screen drivers available.

It could if Apple were to tell people just to write to PostScript, and if IBM were to do the same thing—rather than using the Presentation Manager and the SAA [Systems

(continues)



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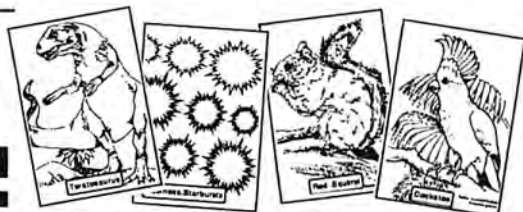
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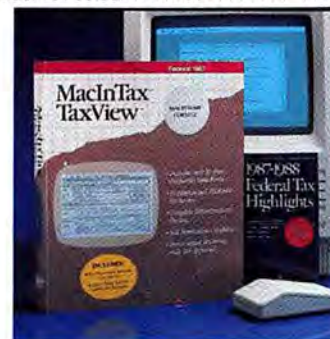
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All of us who develop successful products face the possibility of clones.

Application Architecture]. They both would have to abandon what they have implemented to date. That won't happen.

Even in UNIX, X Windows is the standard, but PostScript is valuable as a printer language. Sculley is clear that Apple's system software will always be proprietary. If Apple were to implement PostScript as a screen-driver language, then there is nothing it could do to protect itself from clones. PostScript is fine for printers, but it would need a broad variety of software developers writing applications under it to do what you suggest, and I don't see that happening.

One of the most common complaints from developers is that PostScript is too expensive. Is that true?

I have no idea. John Warnock and Chuck Geschke have made a huge contribution to the industry with PostScript, and they're also businessmen. All of us who develop successful products face the possibility of clones. As a pioneer, you differentiate your products and control them, hoping that people will prefer to buy them from you. But you have to be careful to ensure that they keep buying from the pioneer. Do you price software as buyers want, or do you decide to open the market to new competition?

Some people have cloned MS-DOS. But they haven't done a good job, and that is to our advantage. We keep our price low enough to prevent others from licensing the clones. Now Adobe faces the same thing that every successful developer that shapes the industry faces.

What do you think are the chances for success of all the announced PostScript clones?

We'll have to test them. It's a hard task, trying to clone PostScript. Warnock and Geschke are two of the great guys in graphics—when I was in school, I studied the Warnock hidden-line algorithms. It's true, someone could do a clone, but only tests will tell how good they are. Imitators will miss the proprietary way in which Adobe builds its fonts. Adobe has techniques for adjusting fonts, preserving their symmetry along raster lines when converting them for printing. It's one of the trickier things they've done and they do it well.

Other companies, such as General Computer and Apple, have gone to the typographer Bitstream for their fixed-size fonts. What does that indicate for future printing technologies?

One alternative to PostScript printing is to precalculate fonts for fixed sizes. You can get good performance with fixed formats.

(continues)



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Verbatim



A/UX is a good idea. It will be an important operating system in the education and government markets.

There are trade-offs: basically, less flexibility for faster speeds. However, the volume-printing market in the IBM world has found the LaserJet approach with fixed fonts to be adequate. Bitstream also has a scaling technique like Adobe's but I don't know how it compares.

What problems do you foresee for Apple in advancing QuickDraw for more color and interactive graphics?

QuickDraw is an internal graphics standard, and it has to evolve. QuickDraw has progressed a lot with its color model, but its imaging model, fonts, clipping, rotations, line patterns, and so on, all need work. PostScript is quite a bit richer in

these areas. As an independent software developer, we are asking Apple for these improvements.

How does the VDI/CGI standard for the IBM market compare to QuickDraw?

The CGI [computer graphics interface] is an ANSI standard. It doesn't talk about compatibility or define bits and pointers; rather, it describes parameters for ellipses, and circles—geometric primitives. Most of the principles in CGI are in *Windows*.

How do you address similar problems with graphics in the Presentation Manager?

We've put a lot into it: clipping objects or text through a polygon, placing thin lines

and having them follow angles—the way splines and curves work. It's difficult programming.

How important is MS-DOS on the Mac?

If you are in a company that wants Macs, and 10 percent of the people in the company want PCs, then you might want to buy MS-DOS cards for 10 percent of the Macs. That means it's important for Apple to have an MS-DOS card for the Mac—so they can sell 100 machines, 10 of which run MS-DOS. It would be simpler if the [Macs] could read MS-DOS 3½-inch disks. The IBM-compatible keyboards for the Mac have helped PC users, too.

Is A/UX still an important product for the Mac market?

It's a good idea. A/UX is an operating system that will be important in the education and government markets. We've been a dominant player in the UNIX market—Microsoft has sold more UNIX than anyone

(continues)

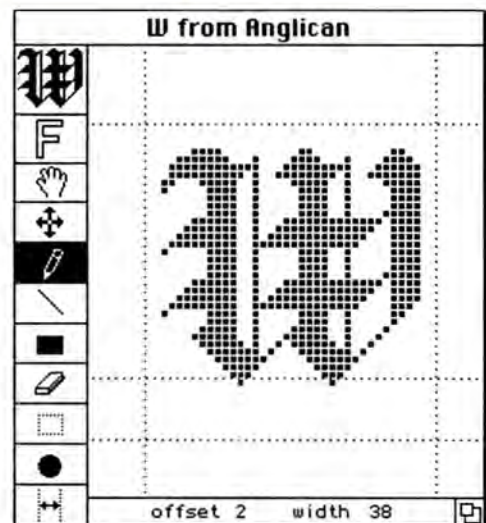
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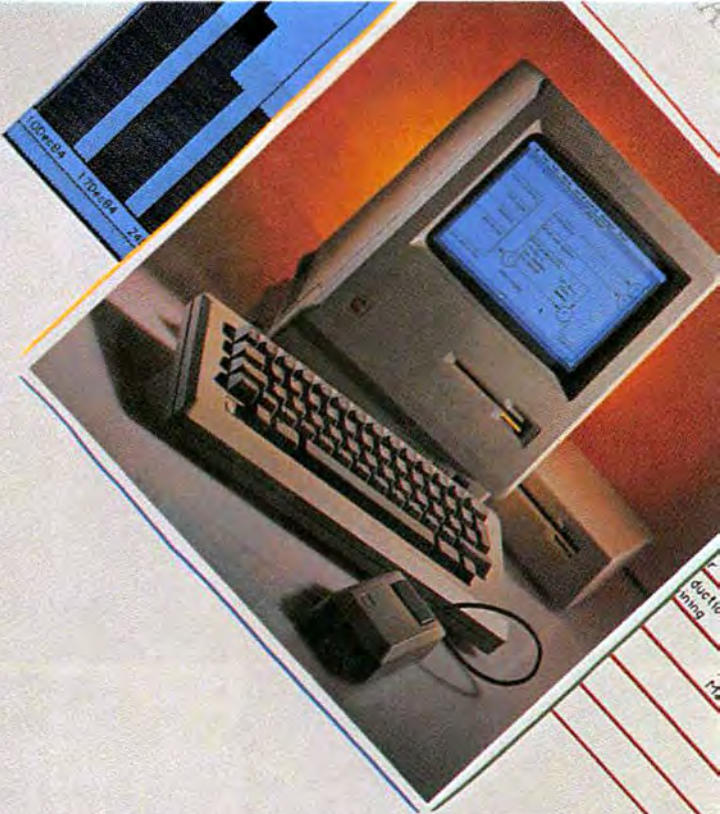
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Apple 13" Color Monitor
640 X 480 Resolution ■ ■ ■



SuperMac Trinitron 16" Color Monitor
1024 X 768 Resolution ■ ■



SuperMac Trinitron 19" Color Monitor
1024 X 768 Resolution ■ ■

All you need to know

First, know that SuperMac products make it simple for you to put together *highest performance* video for your Macintosh® II. Here's all you do.

1. Choose your monitor.

Just as you choose speakers with your ears, you choose your monitor with your eyes. You'll know your monitor when you see it.

So you'll want to look at Apple's color and monochrome monitors, which may well be all the monitor you'll ever need.

But, in case they're not, we offer a few giant alternatives.

Two of them incorporate the renowned Trinitron technology for richest colors, blackest blacks, and the flattest, least distorted image area available.

Just pick between the 19" workstation size, or the 16" executive size—which ever best suits your needs.

Our other two monitors incorporate Ikegami display technology—highly regarded by leading video professionals worldwide.

You'll appreciate the outstanding price-performance of the *SuperMac Standard 19" Monitor*.

Or, if you need a big, photoquality display but don't need color, you'll be very impressed with the *SuperMac 19" Gray Scale Monitor*.

2. Choose a video card.

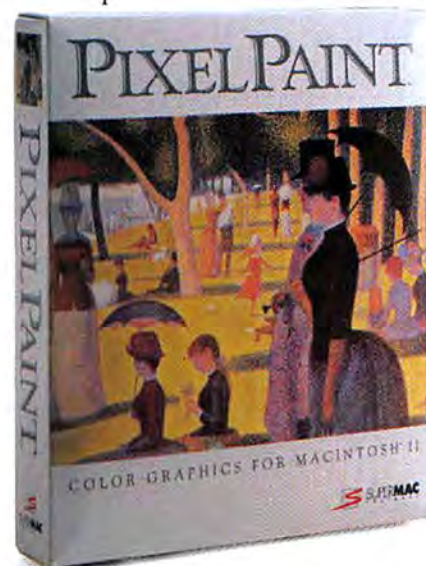
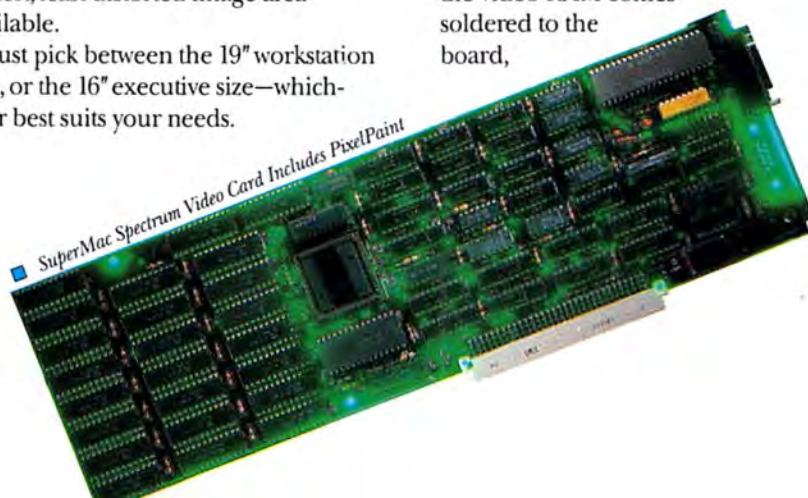
If the Apple 13" display is your choice, our *SuperMac ColorCard* has significant advantages over the Apple card. For starters, you get 8-bit video for up to 256 colors or gray shades, standard. For greatest reliability, the video RAM comes soldered to the board,

not slipped in as an upgrade.

And for a limited time, you get PixelPaint for free.

If you *ever* want a bigger display you'll want a *Spectrum card*.

The *SuperMac Spectrum* will drive *all* the monitors shown, at their full resolution. You get 8 bits of resolution standard, for 2, 4, 16, or 256 colors or gray scales simultaneously, chosen from a palette of over 16 million.



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SuperMac Standard 19" Color Monitor
1024 X 768 Resolution ■ ■



SuperMac 19" Gray Scale Monitor
1024 X 768 Resolution ■ ■

about Mac II video:

And you get PixelPaint, free.

Our *Spectrum/24*, with 24 bits per pixel, provides the most realistic richest color display available. You see the results in the image shown on the *SuperMac Trinitron 19" Color Monitor* above. You can literally display as many colors as there are pixels on the screen, so that images have a photo-realism that 256 colors just can't achieve.

Naturally, the *Spectrum/24* is compatible with all standard Mac II software, driving any of the monitors shown above. And it includes PixelPaint.

3. Get PixelPaint. (It's free with SuperMac video cards.)

PixelPaint is the acclaimed color and gray scale paint package that delivers minicomputer paint features and performance, with the ease of use and simplicity of the Macintosh interface.

Whether you're the most sophisticated graphic artist or don't know art at all, PixelPaint and the magnificent Mac II will change your mind about how you work and play.

You'd spend thousands to get this capability on high end systems. At \$495 on the Mac II, PixelPaint is a superb value, and a best seller.

PixelPaint is included, free of charge, with our video cards. That's value.

Always: Choose a vendor with great support.

SuperMac video products just plug in and run. The cards actually use digitized voice instructions to talk you through the installation.

All SuperMac video hardware products are protected with a one year warranty.

And, should the need arise, our expert support people will answer your questions over our tech support hotline. Or use our handy 24-hour BBS.

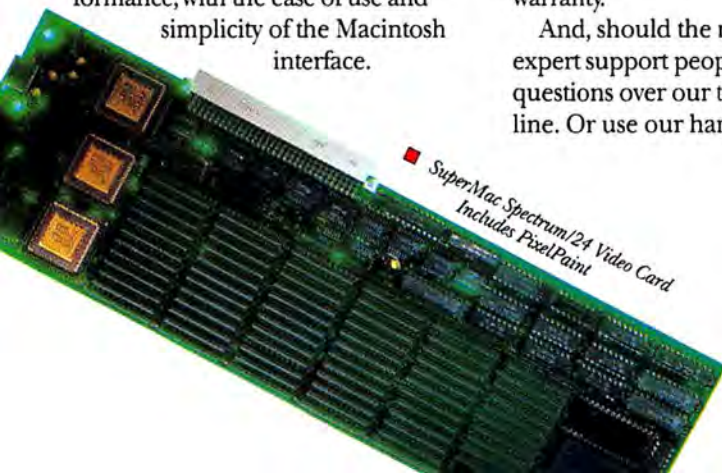


■ SuperMac ColorCard Includes PixelPaint Through April 30, 1988

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Map: Barbara Smyth, using PixelPaint. Tennis Player: Keith Ohlf, using PixelPaint. Floating Balls: Jim Batson, 24 bit ray tracing. Lamborghini: Markus Houy, using Dimensions. The Victorians: Image Studio.

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Our products have been a significant element in the Mac's success.

else. We even had a version for the Lisa that we worked on with Apple.

Sculley says Apple wants to continue to develop its own system software. I doubt if Apple will push real hard to develop Post-Script or UNIX because they provide no way to differentiate Apple from IBM.

Does the long delay between announcement and shipment hurt Apple on A/UX?

Hmmm...people who live in glass houses shouldn't throw stones. Apple does a professional job, so A/UX will probably be fine.

From the outside it often looks as if there is a love/hate relationship between Microsoft and Apple.

That's a fair statement. Actually, we love Mac applications. We work closely with Apple. We have more people doing Mac software today than ever before. Our applications have been a significant element in the Mac's success. *Excel* was believable when many people were asking if the Mac was suitable for business. We released *Works* one year earlier on the Mac than on the PC.

To a degree, we are waiting for the PC applications to catch up. We're committed to Apple—we plan to do major updates to all of our Mac applications to exploit the features of the new machines—*HyperCard*, color, and so on. I just spent time in Cupertino talking with Apple executives, briefing them on all of the updates and improvements that we plan to make on our Mac products.

It's great to have two standards. Apple may see it as problematic that some of our Mac applications are now in the other market. But we continue to be the largest vendor for Mac applications. There are some companies that were saying early on that the Mac was a bad machine, and now they want that forgotten.

And long term?

We have more resources devoted to the Mac than ever before. Maybe some people see us do PC *Excel*, and it has some features that are not in the Mac version. It makes them wonder what is coming out for our software on the Mac.

We have a nicely integrated product family on the Mac. Often we pioneer new ideas on the Mac. Our big customers use primarily Microsoft software on the Mac. The customers can't do the same thing in the PC environment because of the different user interfaces, and the networking expense.

Do you have any comments on Claris?

A lot of the competition in the software industry is bothered by Claris. Claris has a lot of good people, and it's unique in having the Apple association. My request to Sculley was not to use the Apple name on their products, and while it is certainly up to them, they have agreed. I was interested only in their not having some kind of unholy relationship.

Claris has the same sales force as Apple, but beyond that, Apple treats it just like another developer. Sure, sometimes I wish Apple hadn't [spun off the company], but overall, it's a plus for the Mac. I hope Claris becomes independent sooner rather than later.

One of the criticisms leveled at Microsoft is that the company produces committee software.

That's just not true. We have many products, and each of them has a product champion—one or two people who lead the product's development. It's true that we put products on the network so that people have a chance to provide feedback on how they work. There is lots of input from technical support, from me, from users. But a

(continues)

Circle 54 on reader service card

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QuickDEX, the free-form database Desk Accessory, continues to draw great reviews. QuickDEX works similarly to Hypercard's rolodex but QuickDEX can be used within almost any Macintosh application without expensive memory upgrades. Names, addresses, notes, simple databases are available within seconds. Auto dialer and printing utility included. *It's fast, easy, versatile, and convenient. But, don't take our word for it...*

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"The search routine is blinding fast and so easy to use. Great little program...Recommended."

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"I renamed the QuickDEX DA with a leading space so it would be at the top of my DA menu. I use it all the time."

Steve Brecher — Publisher of Suitcase and Powerstation

"We are able to find a customer out of over 8,000 entries instantly...It uses less of my machine's resources than Hypercard."

Al Whipple — President ALSoft
Publisher of Disk Express

"I really am quite impressed with it...I use it everyday!"

Fred McClaine — Manager of programming and software services San Diego Supercomputer Center

"It's a superb utility!"

C.J. Weigand — MACazine

"It's a simple-to-use, convenient program that I wouldn't be without now."

Macworld — February 1988

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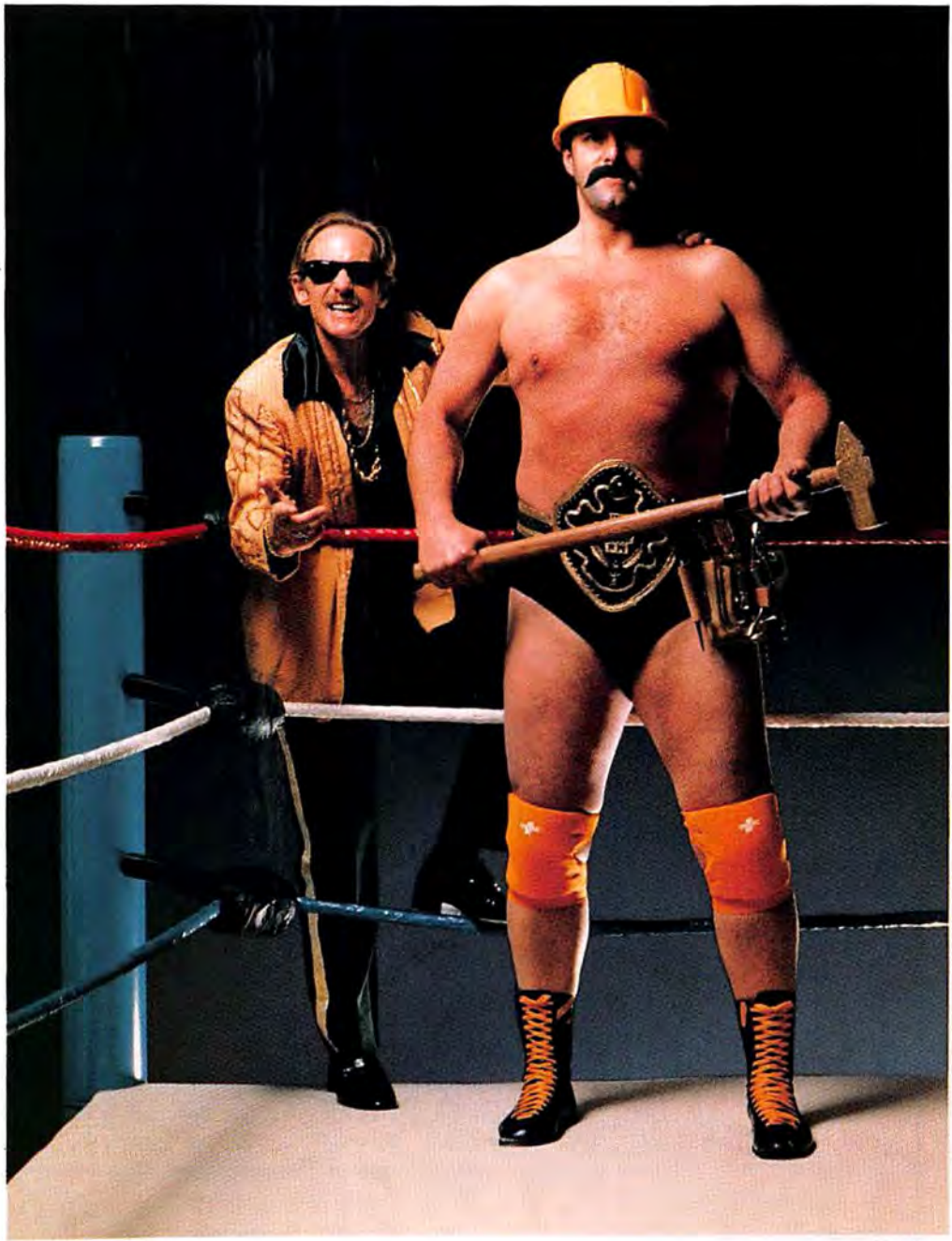
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As Well As Characters Like These.

THE BIG EVENT The Marketing Events Newsletter Of The Civic Arena Manager

Issue Number 36

Spring/Summer 1988

Event Staff Pin Big Attendance Figures On Wrestling Matches



Manager Marty "The Mink" Mintz with
"The Human SledgeHammer"

"Let me tell you one thing. Do you really think I care who I have to beat to a pulp to defend my belt? That is, if I can find anyone without a wide yeller streak down his back to take me on. My daddy always said, 'If you can't stand the heat, kick out a window.' And brother, I see a lot of broken glass!"

The rantings of a mad man? Perhaps. But "The Human Sledge-Hammer" and dozens of other wrestlers like him are just mad enough to bring wrestling fans by the thousands to civic arenas all across the country.

For many marketing managers wrestling matches have become the rock concert attractions of the '80s.

"Wrestling is a proven sports attraction," says Bernie Turk, events manager for the Los Angeles County Sports Dome.

"It seems everytime you flip through the channels on your television, you run across a wrestling match. They're on Saturday morning cartoons. You go in a toy store and you see their action dolls. People just can't seem to get enough of them."

Industry attendance figures seem to prove Turk's point.

In the first two months of the year, there were 37 wrestling matches held in the country. From a 57,000 seat arena in Denver to a 3,000 seat junior college gym in Raleigh. Total attendance for the matches has been estimated to be in excess of 500,000.

And it doesn't show any sign of slowing down.

More Facilities Benefiting From Hotel Tax

Seattle and Bismarck, North Dakota are just two cities that have passed legislation to enact an "entertainment tax." Hotel and motel rooms, along with restaurants, add a surcharge to each customer's bill to help finance improvements to public

convention, meeting and entertainment facilities.

"It's worked wonders for us," says Linda Connell, the chairperson of the Bismarck Meetings Group. "The amount of the tax, which varies depending on the item taxed, hasn't affected

us negatively in any way at all."

"We were a little leery at first of visitors complaining about the tax, but it's so little no one seems to really notice. But even though it seems small, it really adds up quickly."

How has the tax helped Bismarck?

"Very well," according to Connell. "This spring we'll be financing over 15,000 new square feet of exhibition space for our convention center. That's space that otherwise wouldn't have been available. Unless we passed a bond issue—which never seems to be a very popular idea."

For more information on how your city can benefit from similar legislation, please contact the public affairs office of *The Big Event*.

Deadline Approaching For Next Month's Articles

Remember, the deadline for all articles submitted to *The Big Event* is the 10th of each preceding month.

Send your pieces, double-spaced please, to Carol East, Events Coordinator, POB 8384, Seattle, WA 98182.

Dates To Remember

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St. Louis, Missouri

National Events Association
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For full information,
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DEST

Verbatim



We don't have a high-end database, but we'll give Microsoft File a major enhancement.

product has to represent the uniform vision of one individual. And there are generally never more than ten developers total working on a product.

I'm not saying that all of our early PC products were wonderful, or that their MS-DOS interface can't be criticized. But those products were made by two people, not by committee. We made some mistakes.

People seem to yell in the halls of Microsoft.

Yes. Apple is so quiet it scares me. If I go to work one day and I don't hear people in the halls arguing about some product,

I might get worried and ask what's happening.

People have the right to challenge what they do here. Things can be made better. People have ideas of how code can be made optimal; they show code to one another. There's lots of interchange here. That's why we're a great personal software company. I don't know about actual yelling. Perhaps "loud tone of voice" would describe it better.

How about the criticism that Microsoft is a sterile company?

What? Are you kidding? Do you know how many things we come up with here? Well, if we're sterile, then the entire industry is sterile. Or, if we are, who isn't? Lotus? Ashton-Tate? IBM?

At present Microsoft does not have products in the areas of graphics and desktop publishing. Do you plan any?

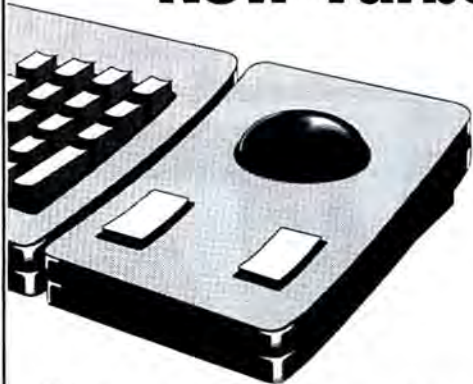
Let's look at the product line. We've recently entered electronic mail and desktop presentations with the acquisitions of *Mail* and *PowerPoint*. We don't have a high-end database, but we will give *Microsoft File* a major enhancement.

You won't see a dedicated DTP package, but you will see *Microsoft Word* and *Microsoft Write* continue to improve with on-screen columns, WYSIWYG, and more DTP features. Lots of people see an overlap with DTP and word processors, but they are separate in many ways.

If you mean a drawing package when you ask about graphics, then no, you won't see a graphics package from us. In 1988 you will see major things from us, including enhancements to *File*, *Mail*, *PowerPoint*, *Excel*, *Word*, and *Works*. That's our real focus.

(continues)

New Turbo Trackball from Asher!



The Turbo Trackball is a versatile, reliable, easy to use and very accurate device for sophisticated desktop publishing, graphics, CAD/CAM, and many other applications. (For example, this entire ad, including the illustration was desktop published using the Asher Turbo Trackball).

Only the Asher Trackball gives you precise fingertip control in a space saving, low profile, ergonomic package designed with a patented hi-tech encoder used in sophisticated aerospace instrumentation; like aircraft, missiles, torpedos, gyros and space shuttles.

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MTTR**	10 days	?	?
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*MTBF-Mean time between failure **MTTR-Mean time to repair

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Programs & Peripherals

Picks of the Month



Tempo II by Affinity Microsystems



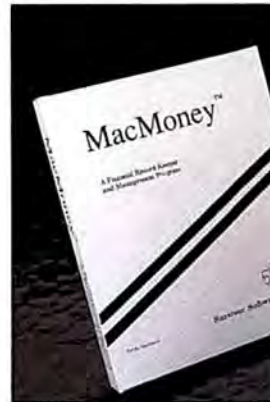
Tempo II can take a series of keystrokes or mouse clicks and turn them into a one key code. Whether your macro just selects a font or performs hundreds of steps through multiple programs, *Tempo II* replays it all with a single keystroke. And as your needs grow, *Tempo II* meets them. Transfer directly between applications, auto-paste text and graphics, repeat your commands 100's of times, wait until midnight then run — great for automating data transfers!

Tempo II 89.

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MacMoney 3.0 69.

Fanny Mac by Beck-Tech

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Fanny Mac (Available in Beige or Platinum) 65.

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Languages

Apple Computer MacPascal	99.	Microsoft	
Borland Turbo Pascal	65.	Microsoft Basic Interpreter 3.0	62.
Turbo Pascal Numerical Methods	65.	Microsoft Basic Compiler 1.0	119.
Turbo Pascal Tutor	46.	Microsoft Fortran Compiler 2.2	169.
Consular		THINK Technologies Lightspeed C	109.
Macintosh 68000 Development System	59.	Lightspeed Pascal	65.
Mainstay		CAPP's for Lightspeed C	49.
V.I.P. (Visual Interactive Programming)	85.	CAPP's for Lightspeed Pascal	49.

Communications Software

Apple Computer MacTerminal	99.	Think Technologies, Inc.	
Compuserve Compuserve Starter Kit	24.	InBox-Starter Kit V2.0	
DataViz MacLink Plus with Cable	145.	(3 Personal Connections)	209.
Freesoft Red Ryder V9.4	64.	InBox-Mac Connection	79.
Software Ventures		InBox-PC Connection	
Microphone 1.1 (Includes Glue)	119.	(Req. AppleTalk Card)	125.

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MacKids Educational Programs by Nordic Software

MacKids is a complete series of twelve quality educational software products for the Mac specifically designed to teach and entertain kids. Whether your children are preschoolers or young adults, there's a *MacKids* package that will give them the learning edge.

Preschool Disk 1 (3-7), Preschool Disk 2 (3-7), CoinWorks (4-12), ClockWorks (4-10), Early Elementary 1 (6-9), Lemonade Stand (6-16), FlashWorks (6-adult), Naval Battle (6-adult), Word Search (6-adult), Alphabetizer (7-adult), EarthWorks (10-adult), or BodyWorks (10-adult).



Each Program 29.

AffiniFile by Affinity Microsystems



AffiniFile is a desk accessory filing program which stores text and graphics as a combination note pad/scrapbook organized by topics and subtopics in color graphics or black and white. Each file you create can include hundreds of topics and subtopics and every file card shows its topic, subtopic and related topics. And, *AffiniFile* can also be used as a Help File for a specific application — so you're able to create your own customized help screens for your favorite applications.

AffiniFile 46.

MacProof 3.0 by Automated Language Processing Systems

MacProof is a grammar, style and spelling checker DA that's like having your own personal copy editor. *MacProof* will work with most word processing software and checks your document for problems in four areas: style, usage, structure, and mechanics. Trouble spots in writing such as punctuation, capitalization and double words are checked as is spelling with *MacProof's* 80,000 word dictionary. Avoid mistakes and learn to be a better writer with *MacProof* the most advanced electronic proofreader available!



MacProof (MacPlus, SE, MacII) 115.

Micro Planner Plus by Micro Planning International



Micro Planner Plus is the most powerful yet easy-to-use project and resource management software available on any Micro. *Micro Planner Plus* handles progressing, target seeking, resource leveling, multiple projects and "what if" analysis. Choose to have customized PERT, GANTT and other management reports drawn for you with the option of embellishment in MacDraw.

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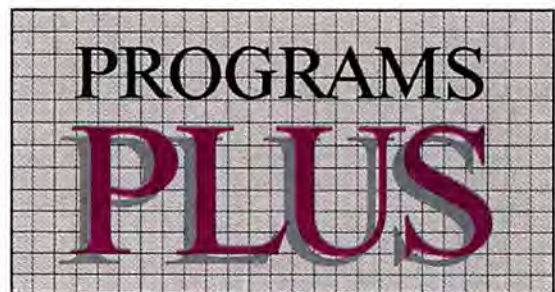
ThunderScan 4.0 with Power Port by Thunderware

Ever since *ThunderScan* started zipping back and forth inside the ImageWriter, it's been famous for eye-popping graphics. Now, the most popular Macintosh scanner is better than ever with true halftone capabilities, special effects, and more. *ThunderScan* images can now be saved in a variety of formats providing complete compatibility with PageMaker 2.0 and other desktop publishing programs. Grace the pages of your publications with honest-to-goodness halftones from *ThunderScan* and its software palette that lets you alter any image to your art's desire!



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Game Software

Accolade Hard Ball	23.	Stationfall, The Lurking Horror, Trinity, or Zork I (each)	24.
Activision Hacker II, Shanghai or Romantic Encounters	24.	Beyond Zork	32.
Star League Baseball or Tass Times in Tonetown	21.	Hitchhiker's Guide to The Galaxy	18.
Portal	30.	Zork Trilogy	44.
Artworx Bridge 5.0	22.	Microsoft Flight Simulator 1.02	32.
Avalon Hill Mac Pro Football	29.	Miles Computing Inc.	29.
Broderbund Ancient Art of War	27.	Downhill Racer or Quintette	24.
Bullseye Software		Harrier Strike Mission II	27.
Fokker TriPlane Flight Simulator	33.	or The Fool's Errand	27.
Ferrari Grand Prix	33.	Fool's Errand Hint Booklet	7.
Electronic Arts Ogre	20.	Mindscape Balance of Power or Crossword Magic	30.
Reach for the Stars	32.	Deja Vu: A Nightmare Comes True	30.
Starfleet I	37.	King Of Chicago or Shadowgate	30.
Venture's Business Simulator	47.	Defender of the Crown, Siboot or The Uninvited	30.
ChessMaster 2000, Patton vs Rommel or Scrabble	28.	Practical Computer Applications	
Archon, One-On-One, Pinball Construction Set, Seven Cities of Gold, Software Golden Oldies or SkyFox (each)	15.	MacGolf 2.0 or MacRacquetball	36.
EPYX Winter Games		MacCourses	34.
or Sub Battle Simulator	24.	Psion Psion Chess (3D & Multi-Lingual)	31.
Hayden Software Sargon III		Sierra On-Line Space Quest	30.
Infinity Software, LTD.		King's Quest I, II, or III (each)	30.
Grand Slam Tennis I	29.	Leisure Suit Larry	24.
World Cup Soccer	27.	Silicon Beach Software	
Go	22.	Enchanted Scepters	21.
Infocom		Dark Castle or Apache Strike	27.
Ballyhoo, Border Zone, Bureaucracy, Hollywood Hyjinx, Leather Goddesses of Phobos, Moon Mist, Nord & Bert, Plundered Hearts, Sherlock,		World Builder	41.
		Simon & Schuster	
		Star Trek (The Kobayashi Adventure)	24.
		Sir-Tech Mac Wizardry	35.
		Sphere, Inc. GATO, Orbiter, or Falcon	26.
		XOR Software NFL Challenge	65.

Laser Printers & Digitizers

AST Research		New Image Technology Magic Digitizer	
TurboLaser P/S	2995.	(Mac 128/512k or MacPlus Version)	249.
TurboScan	1329.	Summagraphics MacTablet 12x12 size	379.
Impulse		ThunderWare	
Impulse (MacNifty) Audio Digitizer V2.0 w/Soundwave	149.	ThunderScan V4.0 with Power Port (Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)	Special 199.
Koala Technologies Corp.		Mac II Power Accessory	42.
MacVision (Digitizer)	169.		

Accessories

Abaton		Disk Drive Cleaning Kit	20.
ProPoint (ADB TurboMouse for Mac SE & Mac II)	119.	Tilt/Swivel	22.
Bech-Tech		Universal Copy Stand	23.
Fanny Mac (Beige or Platinum)	Special 65.	Apple Security Kit	34.
Cambridge Automation		Polarizing Filter	33.
Numeric Turbo	99.	Printer Muffler 80	38.
Central Products		Printer Muffler 132	51.
MacOpener (All In One Mac Tool)	16.	Control Center	63.
Curtis Manufacturing		System Saver Mac (Beige or Platinum) A/B Box (MacPlus Only)	64.
Diamond-Surge Suppressor-SP-1	29.	Turbo Mouse (Reg. or ADB)	82.
Emerald-Surge Suppressor-SP-2	36.	Lightgate Felix (Second Generation Pointing Device)	99.
Ruby-Surge Suppressor-SPF-2	55.	Mouse Systems A+ Mouse (MacPlus)	69.
Sapphire-Surge Suppressor-SPF-1	47.	A+ ADB Mouse (Mac SE/ Mac II)	89.
DataDesk		Moustrak MousePad 7" x 9" Size	8.
MAC-101 Keyboard/Beige (128k/512k & MacPlus)	139.	MousePad 9" x 11" Size	9.
MAC-101 ADB Keyboard/Platinum (Mac SE & Mac II)	139.	Moustrak L/F (Low Friction)	9.
Ergotron		NuVotek	
MacTilt or MacTilt SE (Platinum Color)	69.	EasyNet (Specify Dnt 8 or DB-9)	27.
Mouse Cleaner 360°	15.	Orange Micro	
I/O Design		Grappler C/Mac/GS (Parallel Interface for the Mac)	65.
Mac Luggage Available in Navy or Platinum Gray		Grappler L/Q (Parallel Interface for 24 Pin & Laser Printers)	99.
Macinware Plus Carrying Case	64.	Ribbons Unlimited	
Macinware SE Carrying Case	74.	Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
Imageware II Carrying Case	44.	ImageWriter Ribbon-Black	4.50
Kalmar Designs		ImageWriter Ribbon-Color	5.
Teakwood Roll-Top Disk Cases:		ImageWriter Rainbow Pack (6 Colors)	25.
Micro Cabinet (holds 45 disks)	14.	ImageWriter II-Four Color Ribbon	11.
Double Micro Cabinet (holds 90 disks)	20.	Silicon Comforts MacChimney	
Triple Micro Cabinet (holds 135 disks)	28.	(Very Effective Cardboard Laminate Convection Cooling Device)	16.
Kensington External Disk Drive Cover		SoftStyle MacEnhancer	165.
Extra Long ADB Keyboard Cable	8.	The Madson Line	
Macintosh II Stand	20.	Professional Series Carry Cases In Black Ballistic Nylon	
Macintosh II Monitor Cable Extension	33.	Mac(Plus) Carry Case	79.
Mouse Pocket (Reg. or ADB)	8.	Mac SE Carry Case	99.
Mouseway (Mousepad)	8.	ImageWriter I (II) Carry Case	75.
ImageWriter or ImageWriter II Cover	9.		
Macintosh Plus/SE Dust Cover	9.		
Mouse Cleaning Kit w/Pocket	17.		

Blank Media

Single Sided 3 1/2" Diskettes		Double Sided 3 1/2" Diskettes	
BASF 3 1/2" SS/DD Disks (box of 5)	8.	BASF 3 1/2" DS/DD Disks (box of 5)	9.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Bulk (Sony) 3 1/2" DS/DD (10)	16.
Sony 3 1/2" SS/DD Disks (box of 10)	13.	Centech 3 1/2" DS/DD Color Disks (10)	19.
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Maxell 3 1/2" SS/DD Disks (box of 10)	13.	Maxell 3 1/2" DS/DD Disks (box of 10)	20.
Verbatim 3 1/2" SS/DD Disks (box of 10)	13.	Verbatim 3 1/2" DS/DD Disks (box of 10)	20.
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Modems

Epic Technology		Migent	
Epic 2400 I (Internal for the Mac SE)	299.	Migent Pocket Modem (ext. 300/1200 Baud)	169.
Epic 2400 II (Internal for the Mac II)	299.	Prometheus	
Epic 2400 Plus External	155.	Promodem 1200 (Hayes Compatible)	239.
Hayes Microcomputing		Promodem 2400 (Hayes Compatible)	309.
Smartmodem 1200	299.	Mac Pack w/Procom M and Cable (Specify Mac or MacPlus)	49.
Smartmodem 1200 Mac w/Smartcom II & Cable (MacPlus)	359.	U.S. Robotics	
Smartmodem 2400	449.	Courier 1200 (Hayes Compatible)	199.
Transet 1000-128K	269.	Courier 2400 (Hayes Compatible)	349.
Transet 1000-512K	429.	Courier 2400E (Hayes Compatible)	379.
Transet 1000 Mac Accessory Kit	29.	Courier HST 9600 (Hayes Compatible)	689.

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Activision Focal Point	59.	Chang Laboratories	
Business Class	32.	C.A.T. Contacts*Activities*Time	229.
Acius 4th Dimension	559.	Microsoft Microsoft File 1.05	110.
Apple Computer HyperCard	44.	Nantucket Software	
Ashlon Tate dBASE Mac 1.0	295.	McMax (dBase III Compatible)	179.
Blythe Software		Nashoba Systems FileMaker Plus	149.
Omnis 3 Plus: Express	279.	North Edge Software Timeslips III	119.
Omnis 3 Plus Multi-User		Odesta Double Helix II	329.
(MacServe, Tops Network, Corvus, Appleshare or Hypernet 2-5 users)	489.	Multi-User Helix	429.
Borland Reflex Plus	179.	ProVUE Development OverVUE 2.1	149.
		Software Discoveries RecordHolderPlus	45.

Business Software

Apple Computer MacProject	159.	Mainstay Think 'n Time	69.
Bravo Technologies MacCalc	79.	Microworld Planning Software	
Cricket Software Cricket Graph	119.	Microworld Planner Plus	Special 279.
Cricket Presents...	289.	Microsoft	
Pict-O-Graph	105.	Microsoft Works 1.1	179.
Deneba Software Comment	59.	Microsoft Multiplan 1.11	110.
Xtra 2.0	109.	Microsoft Chart 1.02	72.
Layered		Microsoft Excel 1.04	224.
Notes For Excel, Jazz, PageMaker, Microsoft Works or Word 3.0 (each)	41.	Microsoft PowerPoint	Call
Legisolo/Nolo Press WillMaker 2.0	30.	North Edge Software Timeslips III	119.
Lotus Jazz 1A	189.	Satori Software Bulk Mailer 3.0	79.
Lundeen & Associates		Bulk Mailer Plus	195.
WorksPlus Commands	62.	Legal Billing	369.
MacroPac International		Legal Billing II	539.
101 Macros For Excel	45.	Project Billing	409.
		Turner Hall Publishing MacSQZ!	59.

Word & Outline Processors

Apple Computer MacWrite	99.	Microsoft Write	109.
Living Videotext		MindWork Software MindWrite 1.1	159.
More 1.1C (Color Version)	175.	Symmetry Acta V2.0	36.
Microsoft Microsoft Word 3.01	239.	T/Maker Company WriteNow	98.

Spelling & Grammar Checkers

Aegis Development		Coach Merriam Webster's Thesaurus 2.0	36.
Doug Clapp's Word Tools	42.	Lundeen & Associates	
A.L.P. Systems MacProof 3.0		WordsPlus Spell 1.1	46.
(Requires MacPlus)	Special 115.	Microlytics, Inc.	
Batteries Included		Word Finder (Synonym Finder)	39.
Thunder! 1.23	31.	Sensible Software Sensible Grammar	57.
Deneba Software Spelling Coach 3.0		Working Software, Inc.	
(Webster's/Medical/Legal/Hyphenation)	59.	Spellswell 2.0	42.
Spelling Coach 3.0 Professional		Spellswell Medical or Legal Dictionary	57.
(Adds Definitions & Thesaurus)	109.	Lookup (Makes Spelling Suggestions)	29.

Desktop Publishing

Addison-Wesley TEXTures	279.	ImageStudio	279.
Aldus Corporation PageMaker 3.0	475.	Postcraft International, Inc.	
Allan Bonadio Associates		Laser FX	479.
Expressionist 1.11	49.	Quark, Inc. QuarkXPress	479.
Ann Arbor FullWrite Professional	169.	Solutions, International Super Glue	52.
Boston Publishing Systems		Target Software Scoop	299.
The MacPublisher III	119.	Word Perfect Corporation	
Letraset Ready, Set, Go! 4.0	279.	Word Perfect for the Macintosh	189.

Accounting Packages

Chang Labs		Insight Multi-User	
Free Inventory or Professional Billing with Purchase of 3-Pak!		A, R, A, P, or Inventory	529.
New Enhanced Version III Modules!		MECA Managing Your Money	145.
Rags to Riches 3-Pak 3.1 (GL/AR/AP)	289.	Migent In House Accountant	99.
Professional 3-Pak		Monogram Business Sense	279.
(GL/Professional Billing/Payables)	359.	Dollars & Sense 4.0	81.
Retail Business 3-Pak		Peachtree	
(GL/AP/Inventory Control)	359.	Back To Basics 3-Pak (GL/AR/AP)	139.
Inventory Control 2.6 or		Softview MacInTax Federal 1987	65.
Professional Billing 2.6	239.	California or New York	
Rags to Riches GL, AR, or AP	120.	Supplement (1987)	39.
Layered Insight One Write	189.	TaxView Planner (1987-1991)	45.
Insight Expert G/L, A/R, or A/P	349.	Survivor Software MacMoney 3.0	
		(Enhanced Version)	Special 69.

Statistics & Math Packages

BrainPower		Borland Eureka! The Solver	129.
StatView 512 Plus	175.	Systat Systat 3.1 (Specify Mac 512K, MacPlus, or Mac II)	459.
Math View Professional	145.		

Graphics Software

ABA Software Draw It Again Sam...	89.	MacAtlas Professional	129.
Adobe Systems Adobe Illustrator		Miles Computing	
(MacPlus, SE & Mac II)	379.	Mac The Ripper, Orchestra of Fonts,	
Aldus Freehand	379.	People-Places-Things, or	
Altsys Corp. FONtastic Plus	47.	Taking Care of Business (each)	27.
Fontographer 2.2	239.	Mindscape ComicWorks	47.
Ann Arbor Softworks Full Paint	49.	GraphicWorks 1.1	87.
Apple Computer MacPaint	99.	Olduvai Software	
Broderbund Print Shop	37.	Post-ART (3-Disk Set)	35.
VideoWorks II	118.	Silicon Beach Software	
Casadyware Fluent Fonts 2.0 (2-Disk Set)	27.	Digital Darkroom	114.
Fluent Laser Fonts Vol. 1-15 (ea)	46.	SuperPaint	79.
Computer Friends Modem Artist	129.	Silicon Press	41.
Deneba Software Canvas 1.0		Solutions International	
(Includes Desk Accessory)	109.	The Curator (Catalog Your Art)	79.
Canvas DA	59.	Springboard Certificate Maker	24.
Dubl-Click Software		SuperMac Software Pixel Paint	259.
World Class Fonts! (Both Volumes)	36.	Symmetry PictureBase 1.2	59.
WetPaint (Both Volumes)	36.	T/Maker	
Enzan-Hoshigumi USA		Click Art Letters I, Letters II, Personal	
MacCalligraphy 2.0	109.	Graphics, Publications, Effects,	
Japanese Clip Art Scroll 1		Business Image, or Holidays (each)	28.
"Heaven" or Scroll 2 "Earth"	57.	Christian Images	35.
Japanese Clip Art "Borders" Scroll	69.	Click Art EPS Illustrations	Call
Foundation Publishing		Click Art Laser Fonts: Plymouth,	
Comic Strip Factory	45.	Bombay, or Seville (each)	45.
Comic People	26.	Unison World Chest Top Publishing	34.
Micro: Maps MacAtlas Paint Version	32.	Zedcor DeskPaint 1.0	39.

CAD Products

Apple Computer MacDraw	159.	Professional 3D	199.
Challenger Software		Innovative Data Design	
Mac 3D (Enhanced Version 2.0)	119.	MacDraft 1.2A	149.
Cricket Software Cricket Draw	169.	Silicon Beach Software Super 3D	159.
Enabling Technologies Easy 3D	79.	Super 3D Enhanced (Mac II)	249.

Educational/Creative Software

Baron's Baron's SAT	35.	CrystalPaint	32.
Bogas Productions Studio Session	52.	Concertware+ 4.0 or American Discovery	39.
Broderbund Jam Session	30.	Concertware+ MIDI 4.0	79.
Geometry, Calculus or Physics	62.	Hayden MusicWorks	29.
Compu-Teach Once Upon A Time	24.	Score Improvement System for the SAT	58.
Stepping Stones Level I or Level II	24.	Learning Company Reader Rabbit	34.
Davidson & Associates Speed Reader II	39.	Mindscape Perfect Score SAT	
Math Blaster or Word Attack!	27.	w/The Perfect College	46.
Electronic Arts		Nordic Software	
Deluxe Music Construction Set V2.0	61.	MacKids Educational	
1st Byte/Electronic Arts		Programs (each)	Special 29.
Kid Talk, Speller Bee,		Rubicon Publishing	
First Shapes, or Math Talk	32.	Dinner at Eight-Silver Palate Bundle	51.
Mathtalk Fractions, First Letters &	32.	Simon & Schuster Typing Tutor IV	35.
Words, or Smoothtalker	32.	Speed Reading Tutor IV	32.
Great Wave Software TimeMasters	22.	Springboard Early Games for	
KidsTime or NumberMaze	26.	Young Children or Easy as ABC	28.

Disk Drives/Hard Disks/Upgrades

AST Research		SCSI Interface/Port	85.
Mac86 Co-Processor (Mac SE)	419.	MacSnap Toolkit (trax driver, opener & grounding set)	15.
Mac286 Co-Processor (Mac II)	1049.	MacMemory, Inc.	
Central Point		Turbo SE (16 Mhz 68000	
Central Point 800K External Drive	185.	Accelerator for the Mac SE)	399.
CMS		Motorola 68881	
20MB External Subsystem		(Math Coprocessor for Turbo SE)	349.
(MacPlus/SE/II)	569.	MaxPlus Mega (2MB Upgrade	
40MR External Subsystem	919.	with 1MB Chips for MacPlus)	345.
(MacPlus/SE/II)		Personal Computer Peripherals	
60MB External Subsystem	789.	Beige or Platinum Color, Optional	
(MacPlus/SE/II)	739.	Built-In Modems Available.	
60MB Tape Backup (MacPlus/SE/II)	175.	MacBottom HD-21	749.
Cutting Edge Cutting Edge 800k Drive		MacBottom HD-32	
Dove Computer Corporation		(32MB SCSI Hard Disk)	879.
MacSnap 524 (512K to 1MB)	139.	MacBottom HD-45	
or 524E (512E to 1MB)		(45MB SCSI Hard Disk)	1139.
MacSnap 524S		MacBottom 20 (20+MB Serial Hard	
(512E to 1MB w/SCSI)	359.	Disk for Mac 512k & MacPlus!	839.
MacSnap 548 (512K to 2MB)		Rodime Rodime 20 Plus	
or 548E (512E to 2MB)	449.	(External 20MB SCSI)	629.
MacSnap 548S		Rodime 201 Plus	
(512E to 2MB w/SCSI)	249.	(Internal 20MB for MacPlus)	629.
MacSnap Plus 2 (MacPlus to 2MB		Rodime 45 Plus	
Non Expandable)	449.	(External 45MB SCSI)	939.
MacSnap 2S or 2H (1MB to 2.5MB		Rodime 450RX (Internal 45MB	
for MacPlus/SE)	879.	for Mac SE & Mac II)	829.

Verbatim



Microsoft receives more than 40 percent of its revenues from outside the United States.

What about games, especially for the Mac II?

There's color on other machines already, but it makes sense to do something for the Mac II. We have the largest-selling game on the Mac now—*Flight Simulator*. It was done by an independent developer for us. We want to bring that product up to date with the capabilities of the Mac, but it's not mainstream business for us.

In what direction will you take your E-mail package, *Microsoft Mail*?

We will do things to improve the interface, and to improve integration with other applications. You'd like to be able to be in

your word processor and send messages directly from there. Some office automation is sensible stuff, so we're looking at how businesses can use the capability. And we understand this since everyone at Microsoft uses an E-mail system already.

Nick Holt, the developer of *Mail*, has joined us as a full-time consultant, so he will continue to work on this project.

How important are foreign markets to Microsoft?

Microsoft receives more than 40 percent of its revenues from outside the United States. We have a higher share of the market outside of the U.S. than we do inside. *Multiplan* on the PC is not well known in the U.S., but it is a best-seller in France, Japan, and Germany. We do a good job overseas.

I spend a lot of time going to foreign markets.

The key for our software for the Mac in foreign markets is how well Apple sells Macs. It has done well in France, West Germany, also in Canada, Australia, and Scandinavia. It's been good in the UK and Italy. They're trying in Japan.

We have over 150 people here at headquarters who work on localizing software. We usually get out a foreign version of our products about 60 days after they ship in the United States.

Do your foreign markets have any special characteristics?

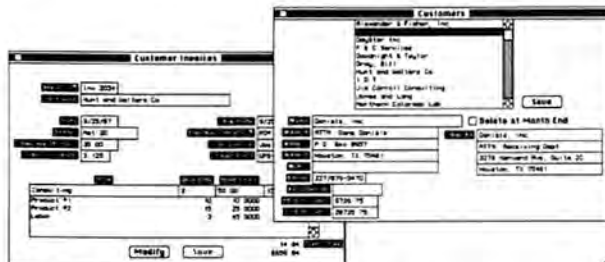
Japan is a special case. Charting packages there have 3-D chart types that we don't even think about in the U.S. They work a lot with gridlines, that's part of the reason we put gridlines in *Excel*. We have five line types. Few markets are that specialized. By and large, the European market is similar to the United States. They want office automation, networking, and so on. Earlier that

(continues)

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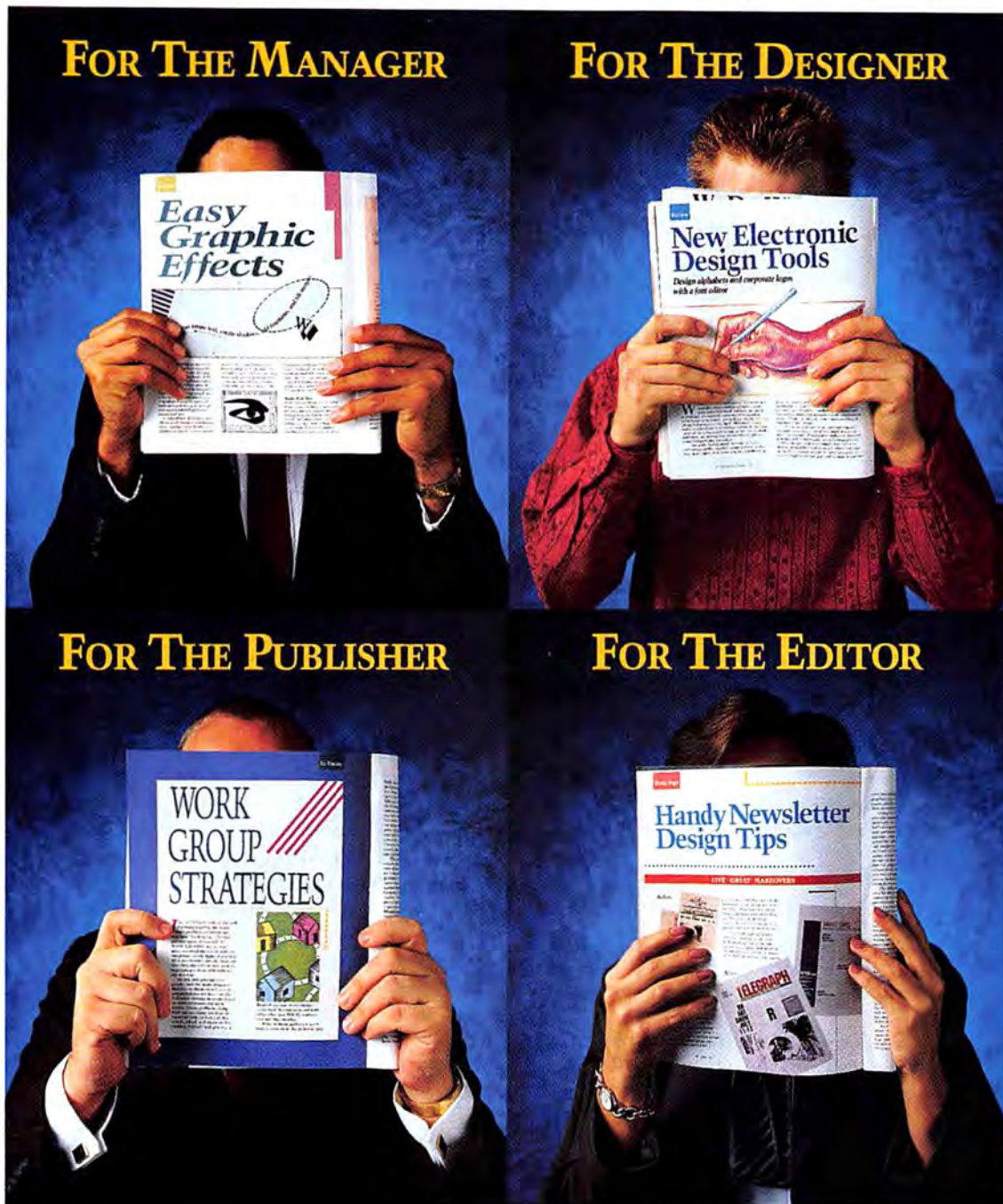
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Verbatim



We have an internal set of testing procedures... With Word 3.0 we just didn't follow our own guidelines.

wasn't true—they were a year or two behind us in computing. Now they've caught up. They're using 386 computers as well.

What is your outlook for CD ROM?

As a storage technology, it's very inexpensive—540MB capacity for less than the cost of a floppy drive. The cost can go as low as \$3 per disk, and I can have a three-day turnaround in pressing a master disk.

The key to CD ROM is in new applications. The idea of multimedia will shape CD ROM. Sound and video can be used to enrich the software so that it creates a new graphics environment that we can study and use to push computers to a new level. In applications we'll also take this approach—shaping applications in multimedia environments.

Like any field, CD ROM needs standards, building tools, and new applications.

What is Microsoft announcing for CD ROM on the Mac?

We're not ready to announce any products, but we're committed to this technology.

What happened with Microsoft Word version 3.0?

We have an internal set of testing procedures—how long after the code freezes can we ship it, how long do we check the code, and a lot more. We just didn't follow our own guidelines.

After the product shipped we found out quickly that people were having problems with the software, and we put together a large group of people in product support to work with them. Within two weeks we were working on a new version that would correct the problems and be offered as a free update to our customers. We're really concerned with what our consumers feel about our products. Version 3.01 shipped on July 12; 3.0 had shipped on

February 15. We believe that 3.01 corrected the problems of 3.0, and judging by the continued strength of the product, we believe we were successful.

Now we are working on the next version, because a lot of people want us to add editable columns and repagination. All that, and more, is being added. We get a lot of feedback from our large user base and we try to act on the feedback to improve the product.

It sounds like the famous story of the problems with the shipment of Multiplan.

Well, we shipped a bad disk. Then we sent out a free upgrade to make up for the bad disk. The problem was in formulas; a bug that could make the system crash. Actually it was even worse—doing a reference could corrupt data—but very few people ever experienced that. We were so scared that we did a free upgrade within 30 days.

In our industry, lots of people do free upgrades. It's one of the few industries where that happens, perhaps because the cost of goods is relatively low. But it is also critical to the industry. It's worth giving out an upgrade if you make a mistake because the customer will return the cost with additional business if they feel the developer is good.

Aren't you a leading proponent of laptop computers?

The laptop market is different from the transportable market. The Tandy Model 100 had a good start, but it didn't do what I expected. I had a vision of the computer as small and inexpensive, but the Tandy only had a subset of the functionality needed. It has sold in the hundreds of thousands, but not the millions, and Tandy continues to evolve it.

(continues)

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Desktop functionality on a laptop is a challenge, and the sooner Apple has a laptop Mac, the better.

Today people have the perception that they can carry a desktop computer around. How to put desktop functionality into a laptop is a challenge, and the sooner Apple has a laptop Mac, the better.

There's a Compaq already that has 640-by-400-pixel resolution and is portable today. They are very nice—and have the power of a supermini. The trade-offs come in whether the computer has a battery—portable versus transportable. The transportable needs an AC port whereas a portable uses a battery but can support a large screen.

What's your personal life like?

I do work shorter hours these days than I used to. I spend an hour each evening reading my E-mail from home. I travel about one-third of the time. I still work until midnight, but I come in around 9, so I still work a lot. I take vacations, play tennis, sail, take trips to our new offices in different countries.

What is it like being one of the world's most eligible bachelors?

Under the age of 60 anyway. It doesn't hold much importance to me. Some aspects of it are funny, some aren't so funny.

I've been told to avoid asking you about money, that you don't like to talk about it, but I must ask one question. You're one of the richest men in the world. Does that

responsibility give you any particular philosophy?

Well, Paul Allen and I built a science building at the high school where we went. I do a number of things with my time; I'm on the national board of the United Way, for example. But mostly I work. I am in my thirties; I'll spend a greater part of my time thinking about this issue when I'm in my fifties and sixties.

You need to remember that I own a piece of the company. My biggest responsibility now is to make this company great over the long term. The wealth that I have is shares of Microsoft—not a pile of money somewhere.

What are your plans for the future of Microsoft?

Our strategy is to do tools for the desktop and the home. Part of our overall goal is to help hardware reach its potential. We're probably ten years away from reaching that goal. □

Interviewed by Jerry Borrell

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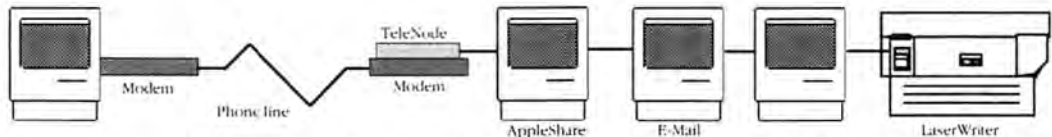
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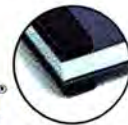
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Macworld News

by Gil Davis

Airwave AppleTalk

With a couple of modems and AppleTalk, you can connect two Macs that are miles apart. But Paul Flaherty of Stanford University's packet radio project has a better idea: microwave.

Flaherty, who is now a research associate in the Computer Systems laboratory at Stanford, is a licensed ham radio operator who has been active in packet radio for several years. For his Ph.D. project, he's using dish antennae mounted on a broadcast tower to link Stanford's mainframe computer to remote Macintoshes.

Mac users will transfer files and mail using software such as TOPS's *TOPS*, or Think Technologies' *InBox*, as well as AppleTalk. A typical link would utilize two Kinetics FastPath boxes to operate AppleTalk at its top speed in full duplex and would broadcast in an underutilized portion of the spectrum, around 10 GHz, which is reserved for hobbyists by the FCC.

The goal of the packet radio project, funded by Stanford's electrical engineering department, is to extend Stanford's Ethernet and AppleTalk networks beyond the campus, giving researchers who work at home the ability to transfer files to and from university



Paul Flaherty is connecting off-campus instructors and students to Stanford University's mainframe computer using an AppleTalk network based on radio waves instead of wiring.

computers quickly. Of course, creative students have already come up with recreational ideas for the microwave links, such as intercampus *Maze Wars*.

Flaherty believes cheap microwave links will make it possible to string Macs together nationwide in a much more complete way. He estimates that for each end of the link, it will cost around \$1000 to install a 2-foot dish with a 10-mile reach.—Bernard Aboba

Wiring Your Mac for Sound

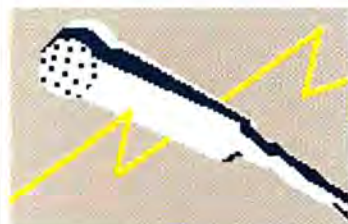


Farallon Computing of Berkeley, California, is now shipping *MacRecorder*; a \$199 hardware/software package intended to be the standard sound input device for the Macintosh. Initially it will be the principal method of putting sound into *HyperCard* stacks, and it will require no programming knowledge at all—it will be as simple as installing a button. Among the

most important of its several unique capabilities are recording stereo sound for the Mac II and compressing and decompressing sound files at up to an 8-to-1 ratio.

One of the biggest drawbacks of Macintosh sound files has been that they take up as much as 44K of memory per second. Sampled at 22 kHz per second, a stereo recording for a Mac II could only play about 18 seconds from a 800K floppy disk. Recorded in mono at 5 kHz and compressed, the same disk could hold up to 4½ minutes of sound. The amount of sound that can be recorded at one time by *MacRecorder* is limited by the amount of RAM available.

Working with any Mac (except a 128K—it's not worth the bother), *MacRecorder* plugs into the modem or printer port. The hardware module includes a built-in microphone and input/output jacks for an external microphone and other audio devices.



The package comes with three floppy disks and includes a Sound Edit application, a HyperSound stack, and demos.

(continues)



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The HyperSound stack looks and works like an audiocassette recorder—with one additional button, labeled “Copy Sound to Stack.” To put a sound button in a *HyperCard* stack, you merely choose a stack, name the sound button, and position it.

MacRecorder can save files in practically all sound formats used by other Macintosh applications, including *HyperCard*, *VideoWorks*, *Studio Session*, and *Jam Session*. *Beep Init* and MIDI-based programs can also use *MacRecorder*'s sound files.

Farallon Computing plans to use *MacRecorder* to add audio capabilities to local area networks. Soon, the Mac may be used as a Dictaphone, for leaving voice mail in E-mail networks, or for talking to all other Macs on the network simultaneously. For more information, call Farallon at 415/849-2331.—*Scott Beamer*

Big Spreadsheet for Small Wallets

BiPlane is a \$40 shareware spreadsheet program that, at first glance, appears to be not all that different from Microsoft's *Multiplan*. But while it has a similar user interface and a comparable collection of functions, *BiPlane* is a DA as well as an application, making it very useful when copying data from other programs.

BiPlane author Alan Porter maintains that *Excel* is the best spreadsheet program on the market. But he wanted a DA that was compatible with all the other spreadsheets.

BiPlane can read Microsoft SYLK files generated by *Excel*, *Multiplan*, and some other programs, so you can use it as a “portable” spreadsheet while



Alan Porter's shareware spreadsheet program reads Excel files, and it's always available in the Apple menu.

running other applications. It is comparable to *Multiplan* in performance, and runs at about one-half to one-third the speed of *Excel*. *BiPlane* lacks *Excel*'s macro capability and full function set but lets you specify typeface, style, and size for every cell, individually.

Porter will even add functions to tailor the program to your particular application, so that you can design spreadsheets quickly.

BiPlane is available through most shareware distribution channels, as well as directly from the author. Registration benefits include faster technical support and the latest version of the program.—*Raines Cohen*

Another Low-Cost Laser Printer

A second relatively low-cost laser printer from QMS now competes with General Computer's Personal Laser Printer (PLP). The QMS offering, called MacKiss, features a Canon SX engine, a next-generation engine found in a growing number of laser printers. The PLP uses a Ricoh engine. Both the

Canon and the Ricoh produce richer blacks than the Canon CX engine used in Apple's LaserWriter. At \$2885, the QMS package is somewhat more expensive (the PLP lists for \$2599). But MacKiss includes the Kiss Plus printer engine (\$1995), MacKiss software and 60 fonts, ranging in size from 6 to 24 points (\$495); and a Personality 10 card (\$395). The last item provides 512K of memory; offers serial and parallel ports; and emulates Epson FX-80, Qume Sprint, and Diablo 630 printers.

These printer emulations and multiple ports may attract



The QMS MacKiss laser printer understands QuickDraw.

buyers who want a laser printer that serves a variety of computers. Although MacKiss isn't AppleTalk compatible, many computers can share it by using a manual or automatic switching system.

Both the QMS and PLP machines convert QuickDraw output into signals they understand, since neither printer accepts PostScript files. They print fonts at 300 dots per inch (dpi).

Another major difference between the MacKiss and the PLP is in graphics handling. The PLP can print a full page of bit-mapped graphics, while MacKiss's memory limits it to about a quarter page of 300-dpi graphics with text. However, two other Personality cards, the 20 and 30, give 1 and 2.5 megabytes of memory to the MacKiss printer at a cost of \$695 and \$1495, respectively. For further information, call QMS's marketing company, Laser Connection, in Mobile, Alabama, at 800/523-2696.

Mac Helps Design a Winner

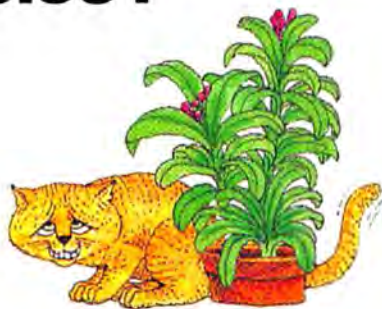


On November 6, 1987, the General Motors Sunraycer crossed the finish line in Adelaide, Australia—winning a 1950-mile transcontinental race against 23 other cars, beating the second-place car by more than 600 miles. The Sunraycer, a revolutionary solar-powered racing car that was designed in part on the Mac, is the product of a team effort. Several divisions of General Motors provided such components as the battery and the high-efficiency electric motor, Hughes Aircraft designed and built the array of solar panels, and a small engineering company called AeroVironment designed the car's unique shell.

The Mac entered the picture from the moment AeroVironment's engineers began to design the car body. The Mac then

(continues)

Has that statistics package you thought was a tiger turned out to be something else?



Most Mac statistical packages call themselves 'professional,' 'comprehensive,' or 'complete.' But feed them some *real* problems, and you'll discover how toothless they really are. ■ They can't do multivariate procedures ■ Or analyze financial time series ■ Or fit nonlinear models ■ Or compute large, multi-way cross tabs

That's why, if you're serious about statistics, sooner or later you'll end up with SYSTAT. No other Mac package has SYSTAT's range of statistics and high resolution data graphics.

Mac Features: Pull-down menus, Clipboard, Desk Accessories and mouse control of spreadsheet data editor Replay commands Macintosh II™ and 68020/68881 versions available

Graphics: More than 50 business and scientific types with PostScript™ support for Apple LaserWriter™ (300 dpi) *Two dimensional:* Error Bars Scatterplots Line and Vector Graphs Vector, Dot, Bubble and Quantile Plots Bar Graphs (single, multiple, stacked, range) Box Plots (single and grouped) Stem-and-Leaf Diagrams Linear, Quadratic Regression LOWESS Smoothing Confidence Intervals (any alpha value) Smooth Mathematical Functions Rectangular or Polar Coordinates ANOVA Interaction Plots Histograms (regular, cumulative) Fuzzygrams Gaussian Histogram Smoothing Scatterplot Matrices (Casement Plots)

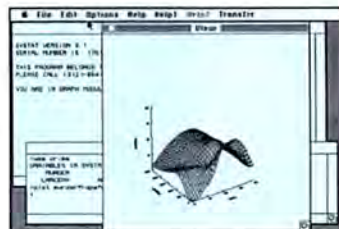
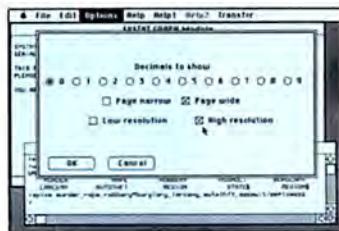
Three dimensional: Data Plots Smooth Function Plots Vector Plots Linear, Quadratic Surface Smoothing Locally Weighted Least Squares

Statistics: Basic statistics, frequencies, t-tests, post-hoc tests Multi-way crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance) Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances Linear, polynomial multiple, step-wise, weighted regression with extended diagnostics Multivariate general linear model includes multi-way ANOVA, ANOCOVA, MANOVA, repeated measures, canonical correlation Principal components, rotations, scores Multidimensional scaling Multiple and canonical discriminant analysis, Bayesian classification Cluster analysis (hierarchical, single, average, complete median, centroid linkage, k-means, cases, variables) Time series (smoothing, seasonal and nonseasonal ARIMA, ACF, PACF, CCF, transformations, Fourier analysis) Nonlinear estimation (non-linear regression, maximum likelihood estimation, and more)

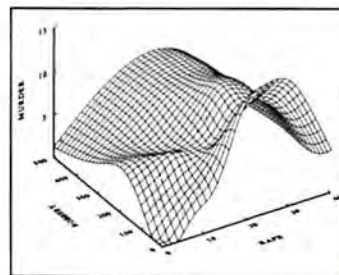
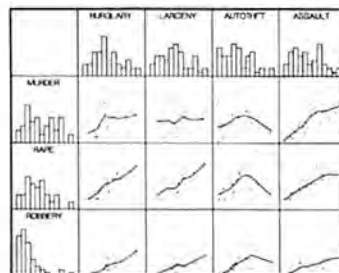
Data Management: Full screen spreadsheet data editor Missing data, arrays, character variables Process hierarchical, rectangular or triangular files or files with variable length records Character, numeric, and nested sorts Merge and append large files Unlimited numeric and character transformations Subgroup processing with SELECT and BY Value labels and RECODE statements Unlimited cases

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Mac screens



LaserWriter™ graphics



SYSTAT™



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tagged along during the race to collect data, and the engineers now use a Macintosh to store and analyze the information gathered during the race. According to AeroVironment's Sunraycer project manager, the project progressed from a clean sheet of paper to a fully functional car in only 4½ months—in that period, one week was allotted to develop the optimum shape for the car's body.

carrying the Sunraycer's crew as well as three Mac SEs to monitor the car's performance and calculate how to use the car's battery and solar cells most efficiently. A transmitter in the Sunraycer sent radio signals to a receiver in the motor home, which fed the information to a Mac running a custom program that displayed a bird's-eye view of the car, with bars representing the voltage and current



A Mac helped design the shape of this General Motors Sunraycer, which won a solar-powered race across Australia.

Such a tight schedule left little room for mistakes, and the Mac helped keep the body-design phase progressing smoothly.

AeroVironment's engineers integrated the Sunraycer's solar panel in a novel way—instead of a panel of solar cells attached to a car body, the solar panel is the Sunraycer's body. Rows of solar-collection cells coat almost the entire surface of the vehicle. During the design phase, a Mac was used as a terminal to a VAX running *VS-Arrow*, a program that calculates airflow around a three-dimensional object. A BASIC program was written to display a 3-D image of the proposed shell on the Mac, and other programs were written to help optimize the car's shape to reduce drag and absorb as much sunlight as possible.

During the 5½-day race, a motor home followed the car,

coming from the car's strings of solar cells. The telemetry-link program would have allowed the Sunraycer team to spot performance problems immediately—had there been any. With the exception of three flat tires, the Sunraycer performed flawlessly.—*Erfert Nielson*

Faster LaserWriters



Although acclaim for Apple's LaserWriter has been nearly universal, so have complaints about its slowness—especially on networks and in desktop publishing environments. Fortunately, network managers can now speed things up with add-in boards like those recently

announced by Mass Micro Systems and Olduvai Corporation.

Olduvai's \$1995 LaserAccelerator card uses a 68020 processor and a 68881 math coprocessor to print text at twice the LaserWriter's normal speed. Complex graphics and *Page-Maker* documents will output at up to four times normal speed. Olduvai expects to offer a font-server interface soon that will use a normal SCSI hard disk drive for storage of outline and bit-mapped fonts and for spooling.

Mass Micro's Mass Fonts memory-expansion board speeds up complicated document processing by keeping numerous fonts in the LaserWriter's memory. It allows the LaserWriter to upload as many as 27 fonts at a time, instead of the normal 3. Included is 1 megabyte of RAM, which frees up to 850K of memory for faster graphics processing, and two ROM chips. Mass Fonts is priced at \$599; with two families of the Adobe font libraries, it's \$749.

For further information, contact Olduvai Corporation in South Miami, Florida, at 305/665-4665, and Mass Micro Systems in Santa Clara, California, at 800/253-8900 (408/988-1200 in California).—*Scott Beamer*

Real Estate in the 4th Dimension



For the first time in his ten years of real estate management, George Riccardelli can easily get up-to-the-minute information about what's going on inside his Century 21 real estate office in Stoneham, Massachusetts.

He oversees 25 sales associates who are constantly creating and checking on sales leads, so it's very easy for infor-



George Riccardelli uses a 4th Dimension application to make order out of chaos.

mation to fall through the cracks or for a potential client to receive numerous unrelated calls from different salespersons working for the same real estate office.

That's why Riccardelli turned to *Track* by Softworks—one of the first applications created following the multiuser database's July introduction.

Track helps Riccardelli quickly find out exactly who's handling a particular property, which is important when he's fielding client calls.

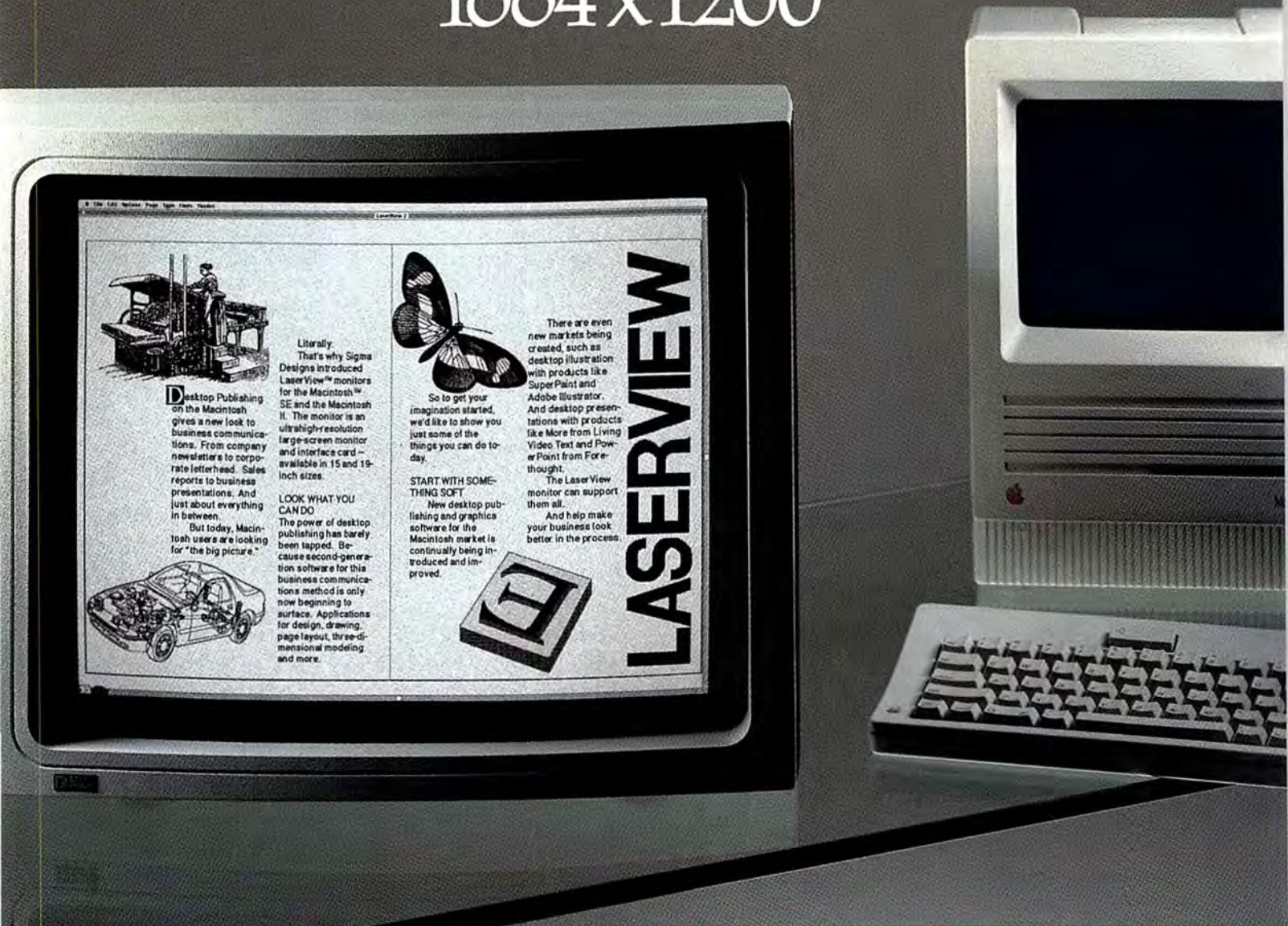
He also uses *Track* to print statistical reports that include such details as when calls were made concerning a particular listing and the number of closings and sales leads being handled by each associate.

Track also prints mailing labels, stores important dates, and contains a built-in auto-dialer. Additional features include an appointment scheduler and calendar, mortgage calculator, expense log, terminal program, and electronic index cards.

Other Softworks' 4th Dimension products for the real estate market include *Lead*,

(continues)

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Desktop Publishing on the Macintosh gives a new look to business communications. From company newsletters to corporate letterhead, sales reports to business presentations. And just about everything in between.

But today, Macintosh users are looking for "the big picture."

LITERALLY. That's why Sigma Designs introduced LaserView™ monitors for the Macintosh SE and the Macintosh II. The monitor is an ultrahigh-resolution large-screen monitor and interface card - available in 15 and 19-inch sizes.

LOOK WHAT YOU CAN DO

The power of desktop publishing has barely been tapped. Because second-generation software for this business communications method is only now beginning to surface. Applications for design, drawing, page layout, three-dimensional modeling and more.

There are even new markets being created, such as desktop illustration with products like SuperPaint and Adobe Illustrator. And desktop presentations with products like More from Living Video Text and PowerPoint from Forthought.

The LaserView monitor can support them all.

And help make your business look better in the process.

START WITH SOMETHING SOFT.

New desktop publishing and graphics software for the Macintosh market is continually being introduced and improved.

LASERVIEW

S I G M A D E S I G N S

When they say a picture is worth a thousand words, they're describing LaserView,™ ultrahigh-resolution large-screen monitors from Sigma Designs.

Available for the Macintosh™ SE and Macintosh II in 15-inch and 19-inch sizes, LaserView provides a 1664x1200 on-screen pixel display (equal to 11 Macintosh SE screens). And because

LaserView is a noninterlaced monitor, text and graphics are displayed virtually flicker-free. Even facing pages.

You can opt to view finished documents in the high-resolution 1664-1200 pixel mode. Or compose your pages in the standard, 832x600 resolution mode without repeated scrolling, resizing, or zooming. You can choose from three cursor sizes and two system font sizes for legibility.

For more information on LaserView, call Sigma Designs today at (415) 770-0100. Or visit an authorized Sigma Designs dealer.

Because for computer-aided engineering, advanced desktop publishing and anything in between, LaserView offers you a totally new point of view.



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which helps increase listings and sales; *For Sale*, which maintains property listings and owner/rental data; and *List*, a management system for properties.

Suggested list price for *Track* is \$395; *Lead* is \$595 and *For Sale* is \$695. For further information, call Softworks in Huntington, Connecticut, at 203/926-1116.

Visual Outlining

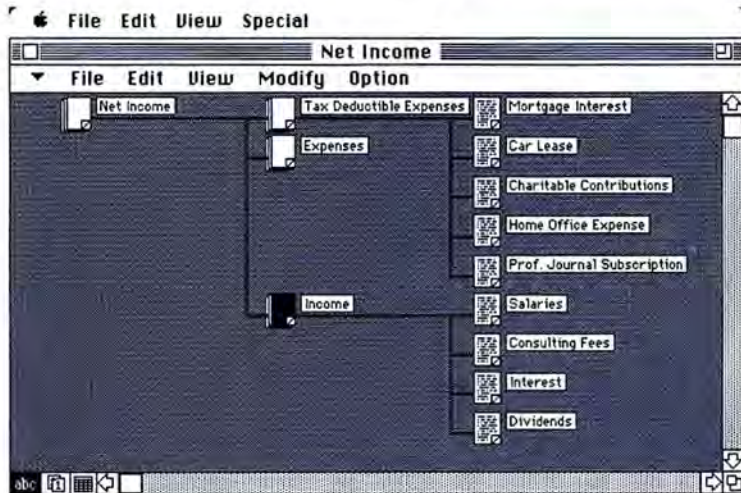
 Outlining was spectacular when it was first introduced on the Mac. It almost seemed like magic: outlines could expand and contract with just the click of a mouse. Then outlining broadened to include presentation software, as ambitious executives tried to outdo each other with spectacular overheads and flashy reports. These developments resulted in a whole new field—desktop presentations.

So what could be newsworthy about an outliner that offers no presentation graphics? Look at Mainstay's *Think 'n Time* and you'll see that it has a whole new outlining graphics interface. Instead of lists of words,

you'll see document icons whose logical relationships are represented by lines. Double-click on a stack of documents and new documents instantly appear to the side and under parent documents. It's great fun, especially for someone who's more comfortable with graphics than text.

While *Think 'n Time* is a graphically oriented organizer, it also has lots of words. Each box displays a little *text tag*. Click on that tag and the whole screen opens into a text box in which you can enter up to 32,000 characters, about 15 to 20 pages. This feature is perfect for keeping running notes or preparing portions of a larger report. Text can be modified, imported, exported to the Clipboard and to *More*, printed, cut, pasted, or given any font style or size available in the System file.

Think 'n Time also offers integrated date and time management for tracking time-sensitive topics, and it performs numeric calculations for automatically generating such documents as expense reports. And the \$99.95 program is a DA, so it's available within an application to let you jot down those "aha" thoughts as you have them. For further information, call Mainstay in Agoura Hills, California, at 818/991-6540.




Think 'n Time is a graphics-oriented outlining program that reveals hidden text with just a double-click of the mouse.



Ron Wartow takes fun seriously. Enthralled with Macintosh-based games, he has decided to leave his Washington, D. C., law practice to develop entertainment software for the Mac.

The Ultimate Game Buff

 Lawyer, doctor, geneticist, teacher, and monk. What do they have in common? They are all avid game players who showed up at the second annual Washington, D.C., Apple Pi (WAP) games extravaganza last August. Master of ceremonies was Ron Wartow, chairman emeritus of WAP GameSIG. For Wartow, gaming is a good escape from his everyday work as a lawyer and government contracts expert.


Wartow bought an Atari in 1978 to play games. He went on to buy an Apple IIe and then a Mac Plus—yes, that's right—to play games. With over 100 megabytes of shareware and public domain games on his hard disk, Wartow can talk firsthand about almost every game that's ever appeared on the Mac.

Wartow, acknowledging that the Mac is a terrific gaming machine, feels most game developers haven't yet taken full advantage of its potential. In fact, he says, even games available on the IBM PC outnumber those available on the Mac.

So Wartow plans to go into the software games business

full-time. It's a decision that has some of his co-workers envious. Just imagine working at your favorite hobby and getting paid for it.—Brita Meng

New Ground Broken in Hard Disks

 Jasmine Technologies, not content with developing hard disks, is about to jump into the software market with *FastCopy*, which will back up one hard disk to another, at a rate of 25 megabytes per minute, by making an exact replica of the source drive on the backup drive.

FastCopy came to life as a utility for Jasmine's 80MB direct drive, but the company soon discovered that the software worked with most SCSI drives, including Quantum's (which are used as original equipment in many Jasmine drives and in some Apple offerings). *FastCopy*'s packaging clearly states which drives are supported. Only one of the two drives involved in the backup

(continues)

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P2E♦65	64Mb	\$849
P2E♦100	102Mb	\$1449

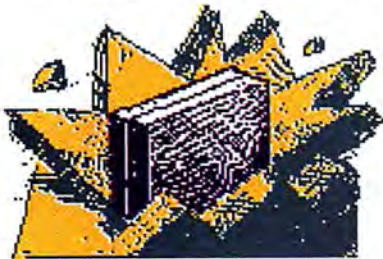
Circle 206 on reader service card

requires a built-in hardware element, called "SCSI copy command."

Jasmine is also introducing *Diagnostic Package*, which runs diagnostic tests on Jasmine hard disks and presents the results as a numeric code. Users can then be told over the phone the exact nature of their problem and whether it's based in hardware or software. Jasmine hopes this strategy will save many users the inconvenience of sending their hard disks to the factory for servicing.

Jasmine's *Diagnostic Package* also runs the sort of tests "techies" love: seeks, reads, writes, and sector verifications. And it includes utilities specifically designed for hard disk users who have no interest in learning what makes their hard disks tick.

This program also cures one of the most common problems associated with restoring a balky hard disk to normal service: rebuilding the desktop file. By holding down the \mathbb{H} and Option keys while the hard disk is booting, the user instructs the Macintosh to make a new directory file for all the files on the disk. One of the inconvenient consequences of this procedure is that the Get



Info times and dates are converted to the current ones. Jasmine's *Diagnostic Package* software includes a utility that remembers the original information and installs it in the new desktop file.


For more information, call Jasmine Technologies in San Francisco, at 415/621-4339.

—Scott Beamer



Tom Mullaney of ARCO built a network that spans 50 stories.

Corporate Networking

 Just as pioneering individuals started bringing their own Macs in to the office, so too have such pioneers been largely responsible for starting some of the successful Mac networks in their corporations. The Mac networks in ARCO's corporate towers in downtown Los Angeles are just such an example.

ARCO's first Mac networks started as a small effort within the Controller's and Marketing/Distribution departments. Under a corporate mandate to maintain mainframe connectivity, the networks started with seven Macs, one LaserWriter, and a Tri-Data Netway 1000, which was used for communications with ARCO's IBM/VVM mainframe.

The networks have grown to include two to three hundred Macs spreading from the Conference Planning group in the sub-basement to the Control-

ler's office on the 4th floor, and on to Personal Computing Services and Marketing/Distribution on the 20th floor. To top it all off, two vice presidents on the 49th floor are also a part of the networks.

The networks now include Avatar's MacMainFrame as well as several Netway 1000s, Hayes InterBridges, and a Farallon StarController. The StarController has proved especially valuable by eliminating the need to balance the network load every time a new user is added.

The networks' original goals of supporting multiple users for the LaserWriter and communicating with the mainframe have been supplemented by electronic mail and file sharing (via *TOPS*). ARCO found AppleTalk an inexpensive network to install, even just for sharing LaserWriters. With the addition of other benefits such as E-mail, Marketing/Distribution has realized a cost savings. The current network structure (distrib-

uted file sharing using *TOPS* and one centralized mail server) has not required a full-time network administrator—just a part-time administrator and knowledgeable users.

—David R. Kosiur

See-Through Mac



Hard & Soft of Fort Lauderdale, Florida, developed clear plastic cases to show off the company's Silver Server Internal Hard Disks at trade shows. But many trade show attendees seemed more interested in the see-through boxes than the drives they were showcasing.

As a result, the company now also markets handmade, VisiMac clear plastic cases for all Macintosh computers—\$279

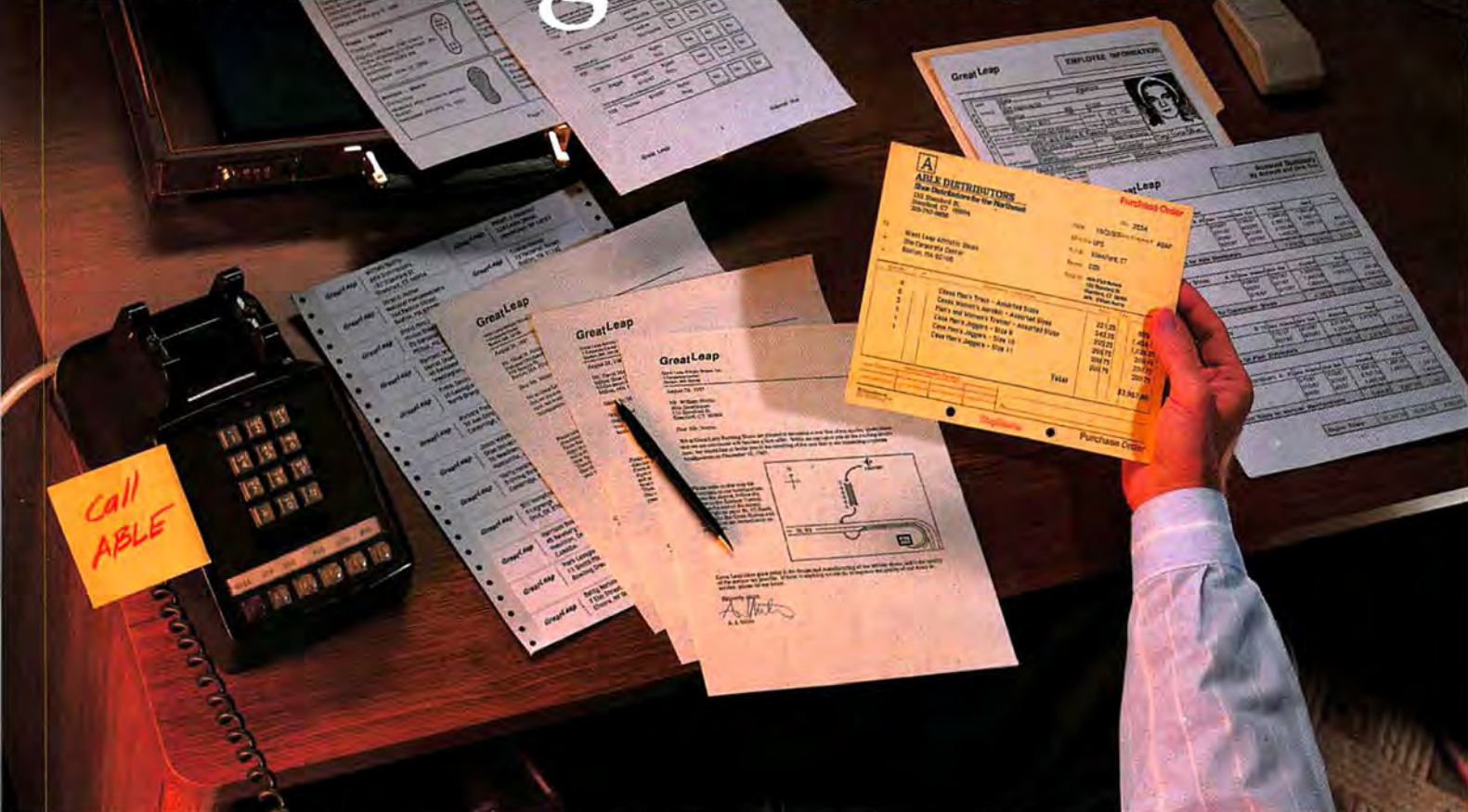


This Mac works fine for displays—it's not for everyday use.

each. A transparent case retains all the functionality of a normal Mac shell, but lacks one feature necessary for regular use: FCC approval. Regular Mac shells are lined with opaque shielding required by the government to prevent Macs from interfering with television and radio signals; VisiMac cases can't be shielded in this way. Clearly, plastic won't soon replace "platinum" for typical Mac cases. For further information, call Hard & Soft at 305/772-0430.

—George Beekman

Keep your business running true to form



FileMaker Plus. The data base and forms manager from Nashoba Systems.

The winner of top awards from both MacUser and Macworld is now the top-selling data base manager for the Macintosh.* And for good reasons.

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And FileMaker Plus is on friendly terms with the entire Macintosh family, including the Macintosh 512K, Macintosh Plus, Macintosh SE as well as the Macintosh II, the ImageWriter® II and LaserWriter® Plus, and the latest system software, such as MultiFinder™ and AppleShare.™

Nashoba Systems is just as committed to FileMaker Plus today as we were when we first developed it. We'll continue to do all the things that have made it such a success: listen to our customers, provide outstanding free technical support, upgrade our product with the most advanced technology in an easily accessible form, and assure your satisfaction

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HYPERCARD

HyperTime

 Say you wanted to know what was going on the day Sputnik, the first artificial satellite, was launched—October 4, 1957. If you had the *Timetable of History* among your *HyperCard* stacks, you'd find that the first episode of "Leave It to Beaver" was broadcast on that day.

Like a Wellsian Time Machine, Xiphias's *Timetable* allows you to move backward and forward in time and to conduct information "quests." While it may strike the browser merely as a treasure trove for trivial pursuers, the stackware houses a surprising amount of information in abbreviated form.

Created by Peter Black, the 36-year-old president of Xiphias, a purveyor of digital fonts, the five-disk *Timetable of Science and Innovation* is the first of seven *HyperCard Timetables*. Future editions will cover thought, religion, government, arts, sports, and consumer activities.

Originally conceived as a CD ROM application, *Timetable* was retooled as a *HyperCard* stack when Tim Oren, one of the creators of KnowledgeSet's Grolier's *Electronic Encyclo-*

pedia, a hypertext reference, provided Black's associate Bill Fancher with the HyperTalk code to write the stackware.

The idea is to show information in context so that a researcher can discover, for instance, events that occurred in the arts and sciences during 1872. *Timetable* puts history on horizontal hold, allowing the user to read across the spectrum of events.

Timetable has a definite editorial slant. Cryptanalysis and electronic news gathering receive heavy emphasis because they are evidently areas of special interest to Black. Emphasizing "imagineers" like Leonardo da Vinci, who dreamed inventions before they were feasible, Black traces the origin of television, for instance, back to a concept of Aristotle's.

Many terms and ideas are meant to coax the curious into further research. A reference to the "black chamber," a windowless room next to the king's court where cryptanalysis was carried out, will be explained in the as-yet-unpublished government stacks.

With at least five disks per subject area, Black expects *Timetable* to ultimately return to its CD ROM origins. He sees the *Timetable of Science and Innovation* stack as the "first shot in our personal battle to



Steven Peart designed the shape of the ImageWriter II. No telling what new designs you'll be seeing from this artist.

enter CD ROM publishing," meant to whet everyone's appetite for the entire project. Future publishing ventures in the *HyperCard* realm for Black's seven-year-old company may include a history of aviation and a *HyperCard* version of the McGuffey Eclectic Readers. For more information, call Xiphias in Marina del Rey, California, at 213/821-0074.—Richard Rawles

Shape of Things to Come

 Glance at the ImageWriter II and you'll understand why Steven Peart has won international awards for its design—along with awards for the styling, direction, packaging concepts, and finished external designs of numerous other Apple, Sony, Kodak, Polaroid, and Louis Vuitton products.

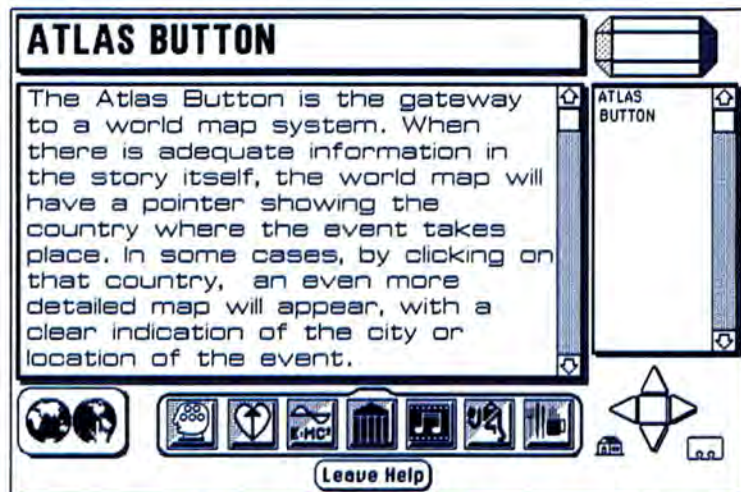
Apple was an early client of Peart's when he worked at Frogdesign in Campbell, California, near Cupertino. "Steven Jobs was unique," says Peart, "in that he always considered design essential to Apple's corporate image. He saw it as an

investment. It's paid off. Apple is going to be a case study. In 20 years, it will stand out as a pinnacle of design."

Besides Peart, Frogdesign attracted the likes of Brad Bissel, Tony Guido, and Sigmar Willnauer. Bissel was largely responsible for the look of Apple's keyboards and connectors; Guido worked with Peart on the Macintosh monitor and peripherals; Willnauer's most recent Apple designs include the Mac SE and Mac II.

Although Frogdesign provided an exciting environment that stimulated new ideas, all four designers have since left to establish their own firms. Guido and Willnauer call their San Francisco-based company That, while Peart formed Vent Design Associates of Campbell, and was recently joined by Bissel.

With Apple having merged its product development and advanced technology departments, design has now become more a part of the whole team and is being integrated into the entire development process. According to Jim Stewart, manager of Apple's industrial design department, Apple will certainly continue to benefit from all the ideas generated by these exceptional designers. —Suzanne Stefanac



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Activision ... NCP
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Focal Point (organizer, req. Hypercard) ... 62.
Aegis Development ... NCP
Doug Clapp's Word Tools ... 42.
Affinity Microsystems ... NCP
Affinifile (DA filer) ... 49.
Tempo 1.2 (power user's macro utility) ... 52.
Tempo II (updated, auto installation) ... 89.
Allan Bonadio Associates ... NCP
Expressionist 1.1 (equation processor) ... 49.
ALSoft ... NCP
DiskExpress (maximize disk performance) ... 26.
Font/DA Juggler Plus (w/sound utility) ... 32.



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Ann Arbor ... NCP
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Ashton-Tate ... NCP
dBASE Mac 1.0 (relational, req. MacPlus) ... 295.
Batteries Included ... NCP
Thunder! 1.1 (spelling checker) ... 31.
Berkeley System Design ... NCP
Stepping Out (requires 512k) ... 54.
Blyth ... NCP
Omnis 3 Plus/Express (database) ... call
Omnis 3 Plus/Express (2-5 users) ... call
Omnis 3 Plus/Express (6-10 users) ... call
Bogas Productions ... NCP
Studio Session (music creation) ... 52.
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Borland International ... NCP
Turbo Pascal Tutor ... 49.
Numerical Methods Toolbox ... 65.
Sidekick 2.0 (includes MacPlan) ... 65.
Turbo Pascal (HFS compatible) ... 65.
Eureka: The Solver ... 129.



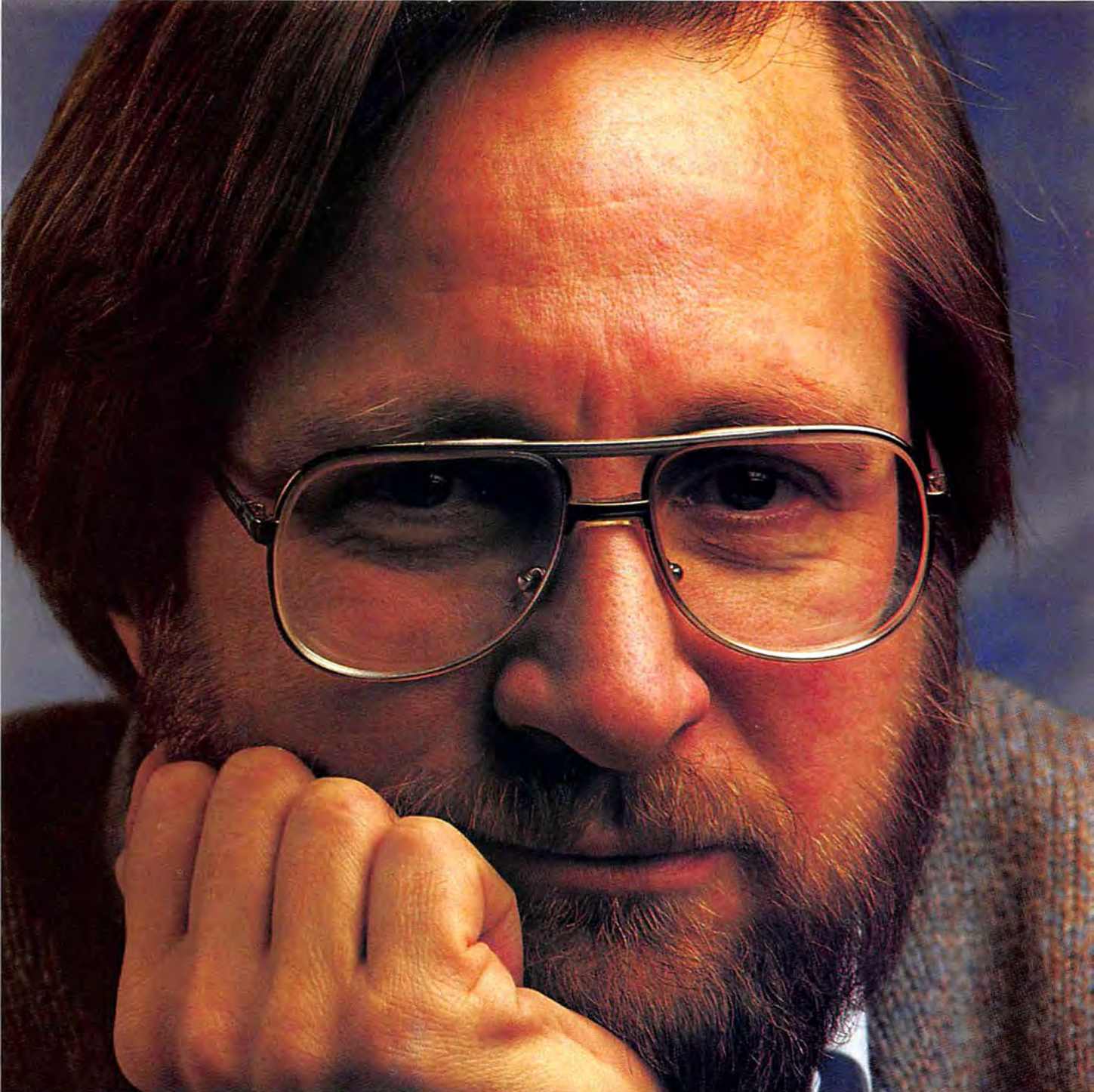
Deneba Software ... NCP
Comment—The handiest thing since Post-It Notes. Attaches electronic notes to any document. Timed Notes set off an alarm. ... \$59.

Reflex Plus (info management tool) ... 165.
BrainPower ... NCP
StatView (statistics package) ... 32.
Graphidex (DA graphics organizer) ... 65.
DesignScope (electronic circuit design) ... 128.
MathView Professional (num. analysis) ... 149.
StatView 512+ (req. external drive, 512k) ... 177.
Bravo Technologies ... NCP
MacCalc (easy to use spreadsheet) ... 79.
Broderbund ... CP
Jam Session (create your own tunes) ... 30.
Print Shop (create cards and memos) ... 36.
Geometry (over 350 problems!) ... 60.
Physics (over 300 problems!) ... 60.
CAMDE ... NCP
Nutricalc Plus (full-featured program) ... 175.
CasadyWare ... NCP
Fluent Fonts (two-disk set) ... 27.
Fluent Laser Fonts (Vols. 1-18) ... each 46.
CE Software ... NCP
Calendar Maker (create custom calendars) ... 32.
Disktop 3.0 (powerful DA Finder) ... 32.
QuickKeys (reduce mouse movements) ... 64.
Challenger Software ... NCP
Mac3D (3D graphics, CAD features) ... 126.
Chang Labs ... NCP
Rags to Riches Led., Pay., or Rec. ... each 120.
Rags to Riches Three Pak ... 289.
C.A.T. (contacts, activities, time) ... 239.
Inventory Control or Professional Billing ... 239.
Professional Three-Pak ... 389.
Retail Business 3 Pak ... 389.
Cortland ... CP
TopDesk 2.3 (7 new desk accessories) ... 32.
Cricket Software ... NCP
Pict-O-Graph (color on the Mac II) ... 105.
Cricket Graph (multiple windows) ... 119.
Cricket Draw (advanced draw capabilities) ... 169.
DataViz ... NCP
MacLink Plus (transfer Mac/IBM data) ... 149.
Davidson ... CP
Math Blaster! (grades 1-6) ... 27.
Deneba Software ... NCP
Merriam-Webster's Thesaurus ... 36.
Comment (electronic Post-It notes) ... 59.
Canvas 1.0 (includes desk accessory) ... 109.
Dove Computer ... NCP
RAMSnap (RAM Disk/Disk Cache) ... 21.

Dow Jones ... CP
Market Manager Plus ... \$159.
Dubl-Click Software ... NCP
Calculator Construction Set ... 36.
World-Class Fonts! (both volumes) ... 36.
WetPaint Clip Art (both volumes) ... 36.
Electronic Arts ... CP
Disk Tools Plus (8 DAs plus tools) ... 37.
Deluxe Music Construction Set 2.0 ... 61.
Enabling Technologies ... NCP
Easy3D (create solid 3D objects) ... 79.
Pro 3D (3D shaded modeling) ... 199.
Enzan-Hoshigumi USA ... NCP
Japanese Clip Art Scroll 1 "Heaven" ... 59.
Japanese Clip Art Scroll 2 "Earth" ... 59.
Japanese Clip Art "Borders" Scroll ... 69.
MacCalligraphy (create unique designs) ... 115.
Fifth Generation Systems ... NCP
FastBack Mac (powerful backup utility) ... 59.
1st Byte ... CP
Mad Libs (w/synthesized speech) ... 14.
First Shapes (all about sizes & shapes) ... 32.
Kid Talk ("talking notebook") ... 32.
Math Talk (math learning tool) ... 32.
Math Talk Fractions (great homework helper) ... 32.
Smooth Talker (speech synthesis) ... 32.
Speller Bee (spelling learning tool) ... 32.
Forethought ... NCP
Factfinder 1.1 (information organizer) ... 35.
FileMaker 1.0 (custom design reports) ... 49.
Foundation Publishing ... NCP
Comic People (create your own characters) ... 25.
Comic Strip Factory (create cartoons) ... 45.
FWB Software ... NCP
Hard Disk Partition ... 36.
Hard Disk Util (program backup) ... 54.
Great Wave Software ... NCP
TimeMasters (learn about time, ages 4+) ... 22.
KidsTime (educational, ages 3-8) ... 26.
American Discovery (U.S. facts & fun) ... 39.
Crystal Paint (graphic symmetries) ... 42.
ConcertWare+ (music composition) ... 39.
ConcertWare+ MIDI ... 79.
Greene, Inc. ... NCP
QuickDEX (address book) ... 32.
Hayden Software ... CP
MusicWorks (songs for your Mac) ... 29.
Score Improvement for the SAT ... 58.



Foundation Publishing ... NCP
The Comic Strip Factory—Everything you need to bring your comic talents out: movable characters, backgrounds, balloon processor, more! \$45.
Comic People (7 "Office Days" characters) ... 25.



“I’m a complainer by nature.”

“Dear MacConnection,

“I ordered four items from you on Tuesday December 8th at about 4:30 PM. You told me immediately that one item would be back-ordered and would take two weeks. That was fine. But the other three items arrived *at 10 AM the next morning!* I find this little short of incredible, especially since

the address I gave you was not a complete delivery address!

“Even the out-of-stock item arrived a week earlier than I expected. I’m a complainer by nature, and I’m trying desperately to find something to complain about. Many thanks for your excellent service!”

Mark A. Brown, Assistant Professor
Department of Philosophy
Syracuse University

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For just \$3.



Target Software ... NCP

Scoop—Create professional graphics with this WYSIWYG desktop publishing package. Totally self-contained with Paint, Draw and spelling checker \$295.

Legal Billing II (full trust accounting)	549.
Project Billing (architects to engineers)	439.
Silicon Beach Software ... NCP	
Silicon Press (printer utility, 512k)	41.
SuperPaint (advanced graphics program)	79.
Simon & Schuster ... NCP	
Typing Tutor IV (typing instruction)	35.
SoftStyle ... NCP	
Epstart (Epson printer driver)	27.
Laserstart (Hewlett-Packard Laserjet)	58.
Printworks for the Mac (Dot Matrix)	43.
Printworks for the Mac (Daisywheel)	56.
Printworks for the Mac (Laser printers)	85.
SoftView ... NCP	
MacInUse (time-use manager)	42.
MacInTax (the complete tax program!)	69.
Software Discoveries ... NCP	
Merge Write (MacWrite mail merge)	35.
Record Holder Plus (data manager)	45.
Software Supply ... NCP	
Suitcase (font and DA utility)	38.
PowerStation (alternative to Finder)	38.
Software Ventures ... NCP	
Microphone 1.1 (includes Glue™)	119.
Solutions, Inc. ... NCP	
SmartScrap & The Clipper	35.
SuperGlue (total graphic integration)	55.
The Curator (access your artwork)	79.
Springboard ... CP	
Art a la Mac Volume 1 or 2 (NCP)	23.
Early Games (counting, shapes, ages 2-6)	28.
Easy as ABC (alphabet, ages 3-6)	28.
Certificate Maker (over 200 certificates!)	34.
Certificate Library Vol. 1	18.
SuperMac Software ... NCP	
SuperSpool 3.4 (very fast, top-rated)	42.
SuperLaserSpool	82.
Multi-User SuperLaserSpool	199.
DiskIt (backup & restore utility)	54.
Network DiskIt (automatic back up)	205.
Sentinel (encryption)	155.
Pixel Paint (color Paint program)	259.
Survivor Software ... NCP	
MacMoney (updated version)	62.
Symmetry ... NCP	
Acta 2.0 (outline/writing desk accessory)	36.
HyperDA (access Hypercard stacks)	42.
PictureBase 1.2 (clip art manager, 512k)	58.

Target ... NCP

Scoop (composition & page layout) \$295.

Think Educational ... CP

MacEdge II (math & reading) 28.
Mind Over Mac (memory & strategy games) 28.

THINK Technologies ... NCP

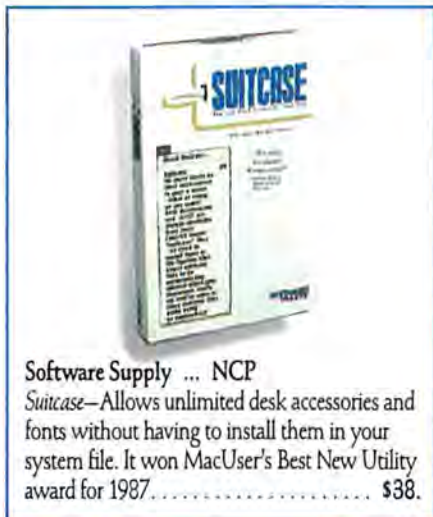
HFS Navigator (search for buried files) 34.
Laserspeed (LaserWriter utility) 55.
Lightspeed Pascal 65.
Lightspeed C (top-rated C Compiler) 95.
CAPP's for Lightspeed C 49.
CAPP's for Lightspeed Pascal 49.
InBox Starter Kit (CP) 199.
InBox Personal Connection (Mac & PC) call

T/Maker ... NCP

ClickArt Personal Graphics, Effects, Publications, Letters Vol. 1 or 2.
Holidays, Business Images each 28.
Christian Images 35.
Bombay, Plymouth, or Seville Laser font 45.
Write Now (word processor) 98.

TML Systems ... NCP

TML Source Code Library 55.
TML Database Toolkit 59.
TML Pascal (compiler, req. 512k) 59.



Software Supply ... NCP

Suitcase—Allows unlimited desk accessories and fonts without having to install them in your system file. It won MacUser's Best New Utility award for 1987. \$38.

TOPS ... CP

TOPS (file-server/LAN software) 119.
NET PRINT (formerly TOPS PRINT) 119.
TOPS for the PC 119.
TOPS Flashcard (network add-in card) 169.

True BASIC ... NCP

PROGRAMMING LIBRARIES
True BASIC (fast, flexible, & portable) 59.
Runtime (create stand-alone applications) 59.
Advanced String or 3D Graphics 35.
CHIPendale 35.

EDUCATIONAL SOFTWARE

Algebra I or II, Pre-Calculus, Trigonometry, Discrete Math, Probability, Calculus, Arithmetic & MacFunction each 35.
TrueSTAT (statistics) 58.

Unicorn ... CP

Animal Kingdom (ages 6-12) 27.
Decimal Dungeon (math, ages 9 and up) 27.
Fraction Action (arcade style math game) 27.
Mac Robots (pre-school program) 27.
Math Wizard (math games, ages 5-10) 27.
Read-A-Rama (reading, ages 5-8) 32.

William & Macias ... NCP

myDiskLabeler (design & print labels) \$24.
myDiskLabeler w/Color (req. ImageWriter II) 31.
myDiskLabeler w/LaserWriter option 34.
216 Smart Labels (for ImageWriter) 15.

Working Software ... NCP

Lookup (90,000 word dictionary) 29.
Findswell (locate documents fast) 29.
Spellswell (spelling checker) 42.
Spellswell Legal or Medical Dictionary 56.

GAMES

Accolade ... CP

Hardball (baseball simulation) 23.

Activision ... CP

Tass Times in Tonetown 21.
Shanghai (Mah Jongg strategy) 24.
Portal (sci-fi novel) 30.

Addison-Wesley ... CP

Puppy Love (you and your dog will love it!) 19.

Ann Arbor ... CP

Grid Wars (3D arcade) special
Normally \$22. Free w/purchase of FullPaint.

Avalon Hill ... CP

MacPro Football (req. 1 Meg) 28.
MacPro Football 85 Team or Season 16.

Baudville ... CP

Guitar Wizard (learning tool for guitar) 22.
Ted Bear's Rainy Day Games 22.

Blue Chip ... CP

Millionaire or Baron 35.

Broderbund Software ... CP

Lode Runner (over 150 levels) 24.
Ultima III (fantasy adventure) 24.
Ancient Art of War (military strategy) 27.
Toy Shop (create working models) 30.

Bullseye ... CP

Ferrari Grand Prix (Formula One racing) 32.
Fokker TriPlane Flight Simulator 32.

Electronic Arts ... CP

Skyfox, Pinball Construction Set,
Dr J vs Larry Bird, Archon each 15.
Ogre (tank simulation) 20.
Patton vs Rommel or Scrabble 27.
Chessmaster 2000 29.

Epyx ... CP

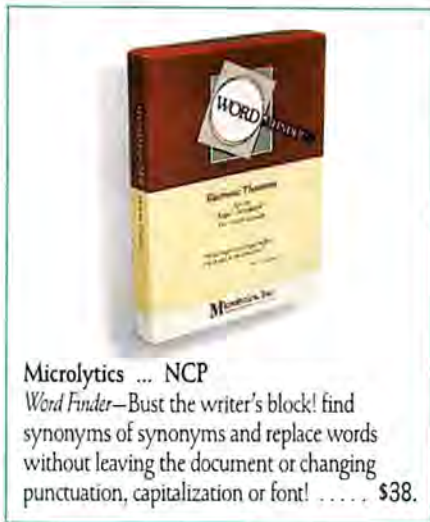
Sub Battle Simulator (NCP) 24.



Symmetry ... NCP

HyperDA—Install it as a DA under the Apple menu and you can browse a HyperCard stack, copy to the clipboard, or search a stack all without opening HyperCard \$42.

Get it tomorrow.

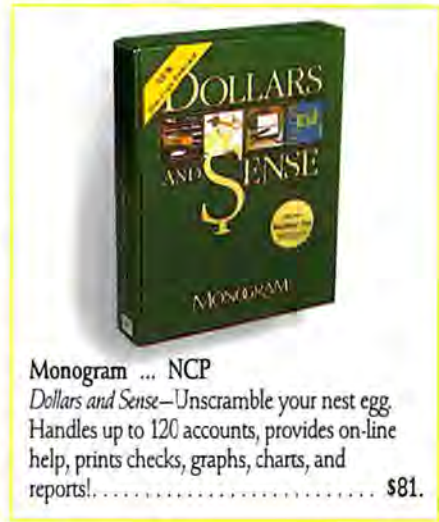


Microlytics ... NCP
Word Finder—Bust the writer's block! find synonyms of synonyms and replace words without leaving the document or changing punctuation, capitalization or font! \$38.

Ideaform ... NCP
 MacLabeler or DiskQuick 27.
 201 QuickLabels 18.
 HyperBook Maker (print stacks into book) 42.
Imagine ... NCP
 Smart Alarms (DA reminder system) 35.
 Multi-user Appointment Diary 89.
Infosphere ... CP
 LaserServe (network software) 62.
 ComServe (NCP, modem sharer) 124.
 MacServe (network software) 162.
Innovative Data Design ... NCP
 MacDraft 1.2A (requires 512k) 155.
Kent Marsh Ltd.
 The NightWatch (hard disk security) call
 MacSafe (advanced security program) call
LaserWare ... CP
 LaserWorks (requires 512k, LaserWriter) 189.
 LaserPaint (requires Mac Plus) 314.
Layered ... CP
 Notes for...Excel or Microsoft Works 41.
 Notes for...PageMaker or Ready,Set,Go!3 41.
 Notes for...Microsoft Word 41.
Legisoft/Nolo Press ... NCP
 WillMaker 2.0 (prepare your own will) 30.
Letraset ... NCP
 Image Studio (image processing software) 279.
 Ready,Set,Go! 4.0 (page layout) 279.
Linguist's Software ... NCP
 Tech (1000 different symbols) 59.
FOREIGN LANGUAGE FONTS
 SuperFrench/German/Spanish 39.
 MacGreek New or Old Testament 79.
 MacHebrew or MacKana/Basic Kanji 59.

MacSemitic/Coptic/Devanagari, MacKorean,
 MacThai, SuperGreek, MacHieroglyphics,
 MacCyrillic, MacAkkadian each \$59.
 MacHebrew Scriptures 79.
 MacGreek/Hebrew/Phonetics 89.
 LaserFrench/German/Spanish 79.
 LaserGreek or LaserHebrew 79.
 Laser Transliterater 79.
 LaserTech 79.
 MacChinese (with supplements) 109.
 LaserCyrillic 115.
Living Videotext ... NCP
 More 1,1C (outlines, windows, & tree charts) 175.
Lundeen & Associates ... NCP
 WorksPlus Spell 1.1 47.
 WorksPlus Command 61.
MacroMind ... NCP
 VideoWorks II (animation tool) 119.
MacroPac International ... NCP
 101 Macros for Excel 44.
Magnum ... CP
 McPic Vol. 1 or Vol. 2 29.
 The Slide Show Magician 1.3 35.
Micro Analyst ... NCP
 Mac Zap (recover crashed hard disks) 39.
Micro Education (MECA) ... CP
 Managing Your Money 129.
Microlytics ... NCP
 Word Finder (synonym finder) 38.
Microsoft ... NCP
 Basic Interpreter 3.0 62.
 Chart 1.02 (42 chart styles, CP) 72.
 Multiplan 1.1 or File 1.05 110.
 Microsoft Write 1.0 (w/spell checker) 105.
 Basic Compiler 1.0 119.
 Fortran 2.2 (compiler) 169.
 Works 1.1 (integrated tool) 185.
 Microsoft Mail (up to four users) 195.
 Excel 1.04 (power spreadsheet) 224.
 Word 3.01 (powerful word processor) 239.
 PowerPoint (presentations) 249.
Migent ... NCP
 In House Accountant (small business) 119.
Miles Computing ... NCP
 Mac the Ripper Vol. 3 (req. Paint program) 27.
 Orchestra of Fonts Vol. 4 (30 different fonts) . . . 27.
 Peoples, Places & Things Vol. 5 27.
Mindscape ... NCP
 The Perfect Score: SAT (CP) 46.
 ComicWorks (create your own comics) 47.
 GraphicWorks 1.1 (newsletters & posters) 87.
Monogram ... NCP
 Forecast (tax planning) 40.
 Dollars & Sense (home, small business) 81.
 Business Sense (full-featured) 282.
Nantucket ... NCP
 McMax (dBASE III compatible) 179.

Nashoba Systems ... NCP
 FileMaker Plus (feature-packed database) \$149.
North Edge Software ... NCP
 Timeslips III (time & expense tracking) 119.
Odesta ... NCP
 Double Helix II (relational, custom menus) 349.
Olduvai Software ... NCP
 DA-Switcher (unlimited desk accessories) 25.
 Post ART (clip art, 3 disk set) 35.
 Icon-It! (create custom icon bars) 40.
 FontShare (share PostScript™ fonts) 159.
 Read-It! TS (OCR software for Thunderscan) 79.
 Read-It! (300 dpi OCR software) 199.
OWL International ... NCP
 Guide (hypertext, free-form info) 75.
 Guide Envelope System 99.



Monogram ... NCP
Dollars and Sense—Unscramble your nest egg. Handles up to 120 accounts, provides on-line help, prints checks, graphs, charts, and reports! \$81.

Palantir ... NCP
 MathFlash or WordPlay 26.
 MacType (typing instruction, NCP) 31.
 inTalk (communication to emulation, NCP) 119.
Passport Designs ... CP
 Mastertracks Pro 259.
PBI Software ... NCP
 HFS Locator (DA organizer for HFS) 26.
Personal Computer Peripherals ... NCP
 HFS Backup 28.
ProVUE Development ... NCP
 OverVUE 2.1 (power-packed database) 149.
Rubicon Publishing ... CP
 Dinner At Eight-Encore Edition Bundle 51.
Satori ... NCP
 BulkMailer 3.0 (mailing lists) 80.
 BulkMailer Plus (up to 90,000 names) 195.
 Legal Billing (attorneys to accountants) 369.

1-800/Mac&Lisa 810C

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* Defective software replaced immediately. Defective hardware replaced or repaired at our discretion.

We offer toll-free sup

Winter Games (Olympic events)	\$24.
Greene, Inc. ... NCP	
Crystal Quest (color arcade on Mac II)	24.
Hayden Software ... CP	
Perplexx (scrabble-type game)	24.
Sargon III (9 levels of chess)	29.
Infinity Software ... CP	
Go (4000-year-old strategy game)	21.
Grand Slam (tennis, req. 512k)	27.
Infocom ... CP	
Leather Goddesses, Nord & Bert,	
Bureaucracy, Hollywood Hyjinx,	
Lurking Horror, Plundered Hearts,	
Borderzone, Stationfall	each 24.
Beyond Zork	30.
Classic Mystery Library: Moonmist,	
Suspect, & Witness	36.



Bullseye Software ... CP
Ferrari Grand Prix—Puts you in the driver's seat of a Formula One race car! Includes practice and additional courses, or design your own! . . . \$32.

Science Fiction Classics: Hitchhiker's,	
Planetfall, & A Mind Forever Voyaging	36.
Zork Trilogy	42.
Invisiclues Hint Booklets (please specify)	6.
MacroMind ... NCP	
Mazewars+ (play via modem or network)	31.
Microsoft ... CP	
Flight Simulator (the Mac takes flight)	32.
Micro Sports ... CP	
MSFL Pro League Football	32.
Miles Computing ... CP	
Down Hill Racer (3D ski simulation)	24.
Harrier Strike Mission II	27.
Fool's Errand (solve the puzzles)	27.
Fool's Errand Hint Booklet	7.
Mindscape ... CP	
Crossword Magic	30.

Balance of Power (world politics)	\$30.
King of Chicago (req. minimum 512E)	30.
Shadowgate (castle adventure)	30.
Uninvited or Deja Vu	30.
Trust & Betrayal: The Legacy of Siboot	30.
Defender of the Crown (req. 800k drive)	30.
Olduvai Software ... NCP	
Maze Survival (action game)	21.
PBI Software ... CP	
Strategic Conquest (multi-user)	35.
Primera Software ... CP	
Smash Hit Racquetball (top-rated!)	15.
Smash Hit Racquetball II	22.
Psion ... CP	
Psion Chess (3D and multi-lingual)	31.
Sierra On-Line ... CP	
Leisure Suit Larry (swinging single life)	24.
King's Quest I, II or III	30.
Space Quest (save the universe!)	30.
Silicon Beach Software ... NCP	
Airborne! (CP digitized sounds)	20.
Enchanted Scepters (CP, over 200 scenes)	21.
Dark Castle (top-rated arcade action)	27.
Apache Strike (3D helicopter action)	27.
World Builder (program creator)	41.
Simon & Schuster ... CP	
Star Trek—The Kobayashi Adventure	24.
Sir-Tech ... CP	
Mac Wizardry (high-rated fantasy)	35.
SPHERE, Inc. ... NCP	
Tellstar II (No. & So. hemispheres)	15.
GATO (submarine simulator)	26.
Orbiter (space shuttle simulation)	26.
Falcon (F-16 flight simulation)	26.
XOR ... NCP	
NFL Challenge (w/illustrated handbook)	64.

Emerald (6 outlets; 6 ft cord)	\$36.
Sapphire (3 outlets; EMI/RFI filtered)	47.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord)	59.
Dove Computer ... 90 days	
Toolkit (clamp, torx driver & wrist strap)	15.
SCSI Interface/Port	85.
MacSnap 524 (512k to 1 Meg)	175.
MacSnap 524S (512E to 1 Meg w/SCSI)	219.
MacSnap 548 (512k to 2 Meg)	399.
MacSnap 548S (512E to 2 Meg w/SCSI)	449.
MacSnap 2S (1 Meg to 2.5 Meg)	489.
MacSnap 4S (1 Meg to 4 Meg)	969.
MacSnap 8S (for Mac II, to 8 Meg)	1939.
MacSnap Plus 2 (MacPlus to 2 Meg)	289.
MacSnap Plus 4H (MacPlus to 4 Meg)	969.
Ergotron ... 1 year	
Mouse Cleaner 360°	15.
MacTilt or MacTilt SE	68.
MacTilt (for large monitor)	85.
Farallon Computing ... 1 year	
PhoneNET-AppleTalk 120	9.
PhoneNET PLUS (DB-9 or DIN-8)	44.
PhoneNET StarController™ w/StarCommand™ software	1395.
PhoneNET StarController™ Wiring Kit: Punch Down Block	69.
PhoneNET CheckNET™ (multi-user)	69.
MacRecorder™ Sound System	149.
TrafficWatch (monitor network)	159.
Hayes ... 2 years	
Smartcom II (communications software)	88.
Smartmodem 1200	299.
Smartmodem 2400	449.
MacPlus 1200 or 2400 Package	call

HARDWARE

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

NOTE: Some hardware items are available in either platinum or beige color. Please specify.

Apricorn ... 1 year	
ApriCord Mac (for Mac 512k or Mac Plus)	75.
AST Research ... 6 months	
Mac 286 (MS-DOS on your Mac II)	1095.
AST TurboScan (300 dpi scanner)	1369.
AST TurboLaser P/S	2995.
Curtis Manufacturing ... lifetime	
SURGE SUPPRESSORS	
Safestrip (6 outlets)	21.
Diamond (6 outlets)	32.



Primera Software ... NCP
Smash Hit Racquetball—Two-player version of the game MacUser gave 5 Mice! Play via modem, AppleTalk, or direct connect. Four ability levels, instant replay, and more \$22.

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*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion.

port for every product.

Kensington ... 1 year	
Appletalk Cable Clips or Connectors . . . each	\$1.
External Drive Cover	8.
Mouseway (mouse pad)	8.
Mouse Pocket (for your idle mouse)	8.
Mac Plus/Mac SE Cover	9.
ImageWriter II Dust Cover	9.
Printer Stand	17.
Mouse Cleaning Kit w/Mouse Pocket	17.
Disk Drive Cleaning Kit	20.
Tilt/Swivel	22.
Universal Copy Stand	22.
Polarizing Filter (for MacPlus or SE)	33.
Surge Suppressor	34.
Apple Security Kit	34.
Printer Muffler (80 column)	38.
Printer Muffler (132 column)	51.
Printer Muffler Stand (80 or 132 column)	25.
Control Center	62.
A-B Box (for the Mac Plus)	64.
System Saver Mac	64.
Turbo Mouse (for the MacPlus & SE)	82.
Koala Technologies ... 90 days	
MacVision (digitizer, includes MoreVision)	169.
Kraft Systems ... 1 year	
3-Button QuickStick	39.
Migent ... 1 year	
Pocket Modem (ext. 300/1200 baud)	168.
Mirror Technologies ... 1 year	
Magnum 800 External Drive (platinum)	199.
MagNet 30x (w/cable & print spoolers)	call
MagNet 40x (w/cable & print spoolers)	call
Magnum Tape 40 Backup	call
MSC Technologies ... lifetime	
A+ Mouse (optical mouse)	69.
A+ Mouse ADB (for Mac SE & II)	87.
Orange Micro ... 1 year	
Grappler (universal parallel interface)	69.
Passport Designs ... 90 days	
Passport MIDI Interface	95.
Personal Computer Peripherals ... 2 years	
WSI (connects Apple HD 20 to SCSI)	295.
MacBottom HD 21 Meg (SCSI)	749.
MacBottom HD 32 Meg (SCSI)	899.
MacBottom HD 45 Meg (SCSI)	1159.
Optional built-in 1200 baud modems available for the above MacBottom units	call
MacBottom IHD-144 Meg (for Mac II; 1 yr.)	2195.

Practical Peripherals ... 5 years	
1200 Baud External Modem	\$109.
2400 Baud External Modem	189.
SoftStyle ... 90 days	
MacEnhancer (for plotters to printers)	159.
Summagraphics ... 90 days	
MacTablet 12" x 12"	379.
Systems Control ... 2 years	
MacGard (surge protection)	55.
Thunderware ... 90 days	
ThunderScan 4.0 with PowerPort	199.
Mac II Power Accessory	42.
Western Automation	
DASCH RAMdisk 2000K	399.

DISKS

Double-sided diskettes.	
Sony 3 1/2" DS/DD Disks (box of 10)	18.
Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Verbatim 3 1/2" DS/DD Disks (box of 10)	19.
MAXELL 3 1/2" DS/DD Disks (box of 10)	20.
3M 3 1/2" DS/DD Disks (box of 10)	20.



Olduvai Software ... NCP
Read-It—The first OCR (Optical Character Recognition) software for any 300 dpi scanner. "Learns" new typefaces, allowing unlimited number of fonts and sizes. **\$199.**

INFORMATION SERVICES

CompuServe	
CompuServe Information Service	24.
Grolier's Online Encyclopedia	32.
Dow Jones	
Dow Jones News/Retrieval Membership Kit	24.

ACCESSORIES

Clean Image Ribbon Co.	
Clean Image Ribbon Kit	12.
Computer Coverup	
External 800k Drive Cover	4.
ImageWriter II Cover	8.
Mac Plus or Mac SE Cover Set	10.
I/O Design	
Available in navy blue.	
ImageWare II (ImageWriter II carry case)	49.
Macinware Plus (Mac Plus carry case)	69.
Macinware SE (Mac SE carry case)	76.
Kalmar Designs	
Teakwood Roll-top Case (holds 45 disks)	14.
Teakwood Roll-top Case (holds 90 disks)	20.



Practical Peripherals ... 5 years
External 2400 Baud Modem—Delivers 300, 1200, and 2400 Hayes compatible operation. Internal speaker and status lights tell which bit is going where **\$189.**

Teakwood Roll-top Case (holds 135 disks)	27.
Magnum	
Mouse Mover (let your mouse ride!)	14.
Moustrak	
Moustrak Pad (standard 7" x 9")	8.
Moustrak Pad (large 9" x 11")	9.
Ribbons	
ImageWriter Ribbons	4.
Available colors: black, blue, brown, green, orange, purple, red, yellow and silver.	
Rainbow Pack (6 single color ribbons)	20.
Multi 4-Color Ribbon (req. ImageWriter II)	9.
Sensible Softworks	
Quality "MacAttire" nylon dust covers	7-17.
High Trek ImageWriter II carry case	49.
High Trek Mac SE & ext. kybd. carry case	69.
Smith & Bellows	
Mahogany case (holds 90 disks)	28.

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Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders phoned into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now \$3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery. **Hawaii, Alaska and Outside Continental US:** Call 603/446-7711 for information.



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All screens shown are unretouched photographs of running displays. The desktop publishing example was created with Quark XPress™. The CAD document was created with Versacad™. MegaScreen, MegaTalk and WYSIWYW (What You See Is What You Want) are Trademarks of MegaGraphics, Inc. Apple and AppleTalk are Registered Trademarks and Macintosh is a Trademark of Apple Computer, Inc. Versacad is a Registered Trademark of Versacad Corp. Quark and XPress are Trademarks of Quark Incorporated. MegaGraphics is an Authorized Apple Value Added Reseller. ©1988, MegaGraphics, Inc.

Quieting the SE

 With every one of the estimated 100,000 Macintosh SEs sold during the SE's first year of production comes an unwelcome bonus: noise. Quieting the SE's fan has been the subject of many bulletin-board discussions. Suggestions have ranged from slowing the SE down by installing a resistor in series with one of the fan's two power wires, to masking the noise with musical accompaniment.

Another solution comes from ComputerWare of Palo Alto, California. The SEaBreeze replacement fan kit is very different from Apple's squirrel-cage mechanism, which relies on turbulence to mix up the internal air and to throw some of the hot air out the back so that cooler air can be drawn in through the SE's side vents.

In contrast, ComputerWare's replacement fan emphasizes extraction of hot air, which draws in cool air to cool the SE's interior components. ComputerWare's fan may have a long life, since a ball bearing supports the fan shaft rather than a less reliable sleeve bearing.

To help you make the switch, ComputerWare provides a two-page instruction sheet that begins with the warning that opening your Mac will void the 90-day and AppleCare warranties, and that Apple dealers aren't supposed to repair or re-

place boards that have been tampered with.

And there will be some tampering. You'll be opening the Mac, removing Apple's fan by unscrewing four bolts, and unsoldering it from the rear of the analog circuit board. Then you mount and secure the SEaBreeze fan to the power supply/video board using sticky foam and a tie strap. One wire is soldered to the circuit board while the other is grounded.

List price of the SEaBreeze fan kit is \$49. For further information, call ComputerWare in Palo Alto, California, at 800/235-1155 or at 800/323-1133 in California.

Mac Music Publishing

 We read a lot about the pros and cons of individual products, but what happens when the latest hardware and software are assembled into a system and tested in a highly critical environment like music publishing? Electronic Publishing Center (EPC) of New York City had a chance to find out when it used the Macintosh to compose and print a four-book series called *Music Textbooks—Teacher's Edition* for Macmillan Publishing Company (1987).

To produce *Music Textbooks*, EPC relied on *Microsoft Word*



Irving Berman, president of the Electronic Publishing Center, found the right products for printing musical texts.

to handle type and a Dayna FT100 to convert IBM files to the Mac format. Musical notation was created with Electronic Arts' *Deluxe Music Construction Set* and Adobe's Sonata music font. Music abstracts were produced with the help of *SuperPaint*, *MacDraw*, and *MacDraft*.

Line art was digitized with a Canon scanner using New Image Technology's *MacScan* and was touched up with Silicon Beach's *SuperPaint*. EPC created various percentage screens for tints, as well as drop-out type. Rules and borders were produced using the PostScript editor in Knowledge Engineering's *JustText*. *PageMaker* composite pages were proofed on a LaserWriter. Film negatives were printed on a Linotronic 300 typesetter.

One of the more surprising problems showed up when incongruities appeared between the outputs of the LaserWriter and the Linotronic. A close examination found that the LaserWriter's 9-point Times Roman actually measures 8 points. If you want 9-point Times Roman, you have to use 10-point. This and similar problems prompted EPC to develop special calibration routines to make sure point sizes remained consistent.

Another surprise came when screens and halftones changed

densities from page to page. These variances weren't eliminated until EPC standardized the density setting on the Linotronic 300, the speed of the processor, and the temperature and concentration of the typesetter's chemicals. Who would have thought that desktop publishing could be so complicated?

—Janet McCandless

Technology and Issues Conference '88

 Third-party hardware and software developers are urged to register for *Macworld's* second annual Technology and Issues Conference, which focuses on the future of the Macintosh. Session topics will include graphics, sound, color, QuickDraw, multiuser operating systems, and hardware technology. To register for the June 1-3 conference, write to:

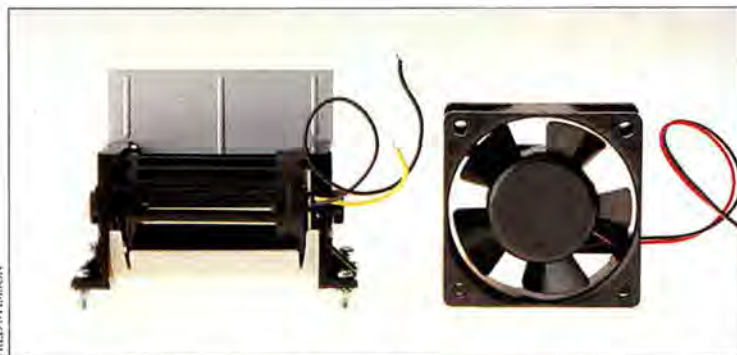
Technology and Issues Conference

Jerry Borrell, Editor

Macworld

501 Second St.

San Francisco, CA 94107 □



If you have a noisy Mac SE, blame the squirrel-cage fan on the left and consider the replacement fan on the right.

Get to the Point

*Win audiences by mastering the tools
and techniques of presentation graphics*

by Brita Meng

Ask most users what a computer does and they are likely to say word processing, working with spreadsheets, or some kind of number crunching. Like other personal computers, the Macintosh can crunch numbers and edit text, but the Mac goes further—it excels at presenting information as well as processing it.

The Mac's strength as a graphics machine extends beyond its well-known desktop publishing capabilities to the world of presentation graphics. You can prepare an impressive business presentation using the Mac without spending a lot of time or money. As in desktop publishing, Macintosh presentations can join information prepared with a variety of programs, such as word processors, spreadsheets, and graphics applications. But instead of printing a document on paper, you output a presentation on transparencies or 35mm slides.

Proper use of visual aids like charts, diagrams, and text slides is the key to an effective presentation. A presenter uses visuals to highlight key information, to channel thinking, to make comparisons, to show relationships, and to simplify complex processes. Well-designed charts, diagrams, tables, graphs, and text can improve the effectiveness of any presentation (see "Why Presentations?"). The question is how to create those visuals on the Mac—and how to decide which type of visual best supports the idea you want to communicate.



To make and give a presentation that commands your audience's attention, you need to follow an orderly process, using the proper tools and techniques at each step.

Create a Script

Start by deciding what you want to tell your audience, then create a script that covers the main points. It's best to use a program with outlining capabilities, such as *MindWrite* or *More*, so you can rearrange the order of the points. As you create the script, prioritize points. Avoid skipping around; the script should progress logically from beginning to end.

When you're satisfied with the basic script, you need to look for graphic opportunities. Sketch ideas for graphics next to the points listed in the script. Don't worry about drawing a polished graphic at this stage—a rough sketch is fine.

There are a few ways to sketch graphics. You can use a desk accessory—such as *MockChart* or *Canvas DA*—along with an outliner or word processor. This is an effective way for Mac owners who have 1 megabyte or less of RAM to create sketches that can be pasted into an open script. If you have more memory you can combine complete applications, like *Cricket Graph* and *More*, in MultiFinder.

Some programs, such as *PowerPoint* and *Cricket Presents*, are specifically designed to manage presentations. *PowerPoint* lets you create storyboards, which usually contain rough sketches of the visuals, sometimes with written explanations, and notes about the verbal points that should be made when each visual is shown. Storyboards help you track all slide elements—an important consideration if you plan to use graphics created with other programs. It's a good idea to note the file name and originating application for any imported graphic.

Don't illustrate every sentence or concept; simply highlight the main points. The purpose of a graphic is to reinforce the presentation. It should assist communication, not take the place of the presenter.

Describe each graphic included in the script in terms of what you want to convey to the audience. For example, don't just write "Sales chart needed here," write "Chart to show last year's record-breaking sales figures needed here."

Good slides focus on one idea at a time. Depict the essence of an idea and fill in the details with spoken remarks. Includ-

ing three or four ideas in a single graphic is distracting: as you present one idea, the audience may focus on another.

Text: Presentation Mainstay

It may sound funny, but the most popular type of visual aid used in any presentation is text. Text slides constitute roughly 75 percent of all visuals used. A text slide that lists the main topics of your presentation in big, bold type, with subtopics underneath in smaller type, can be an effective way to convey the scope of your talk.

- The key rule for text is readability. Type should be no smaller than 18 points. One way to check the readability of text is to print it in the font size you plan to use, and view it from a distance.

- The typeface you choose also affects readability. There is no clear agreement on which typefaces are best. Some designers believe sans serif faces, such as Helvetica or Geneva, are more effective for headlines.

- Use one typeface consistently throughout your presentation.

- Don't use more than three font sizes per slide. Reserve bigger sizes for emphasis.

- Limit text to seven words per line and seven lines per slide.

- Avoid jargon and verbosity. Use the shortest word that will do.

- Use bullets to highlight individual points within a text slide. *PowerPoint* and *More* both provide a selection of large font sizes and bullets.

Tables Show Relationships

When lines of text by themselves don't place things in context, consider using a table. Tables show relationships between categories of ideas. For example, you can divide one slide into two columns to illustrate similarities or differences between two categories.

- Don't make columns too narrow or too long.

- Make sure there's space around each word or idea.

- Since tables are by nature more complex than simple text, be especially careful to avoid using too many words on a single line and too many lines of type in the table.

- Project tables for only a short time. The moment the table appears, the audi-

ence's attention immediately switches from you—and whatever you're saying—to the table. Organize tabular information in a simple, easy-to-read format so audience members can easily digest the information. The more quickly they grasp the gist of the table, the sooner their attention will return to you.

Of course, you can use a table to summarize a mass of data for comparison. But tables of data are much less dramatic than graphics of data. As a result, number tables should be used only when simpler visuals such as charts, graphs, or diagrams can't get your point across.

Graphs: The Meaning of Numbers

While tables simply present facts and figures, a chart or graph can clarify and emphasize the key relationships between those facts and figures. You can produce graphs with a number of programs. *Microsoft Excel*, *Jazz*, and *Microsoft Works* produce charts from built-in spreadsheets, and *Cricket Graph* and *Microsoft Chart* are dedicated chart-making programs. All these programs automatically generate a graph from numerical data stored in the program.

You create a graph by typing numbers into the program's data table or by copying numbers from another program into the table via the Clipboard. If you want to transfer large data sets between applications, you can usually save the file in text-only or SYmbolic LinK (SYLK) format and reopen it in the chart-making program. If you want to chart data stored on a mainframe or minicomputer, you can download the information with a program like *MacTerminal* and then transfer it into the chart-making program.

Graphs are easily abused. Don't use graphs to dress up a presentation with pretty pictures. Don't use graphs that are imprecise or that distort data. Such graphs are not only misleading, they waste an audience's time.

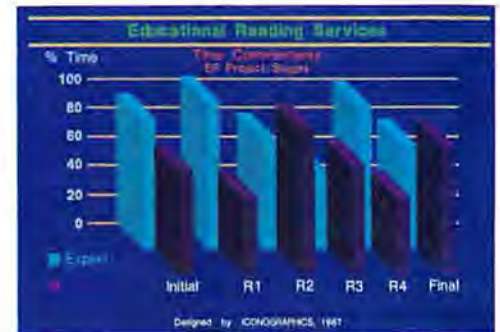
There are several different types of graphs, each of which represents data in a particular way. Be careful to pick the right kind of graph for your data and the point you want to make (see "The Chart of Charts"). Most chart-making programs can create column, bar, pie, line, area, and scatter charts.

Some programs create specialized graphs for scientific and financial applications. *Cricket Graph* provides double-y-



Text Slide

Most presentation visuals are text slides. Make sure that text is readable. Use large type sizes and try not to convey too much information at once.



Columns with Depth

Color and depth spruce up a plain graphic. This MacDraw chart was prepared for color slides with Management Graphics from 20/20 Data Systems.

axis graphs, polar graphs, and quality-control graphs. To graph stock market data, you might use *Market Pro*, which generates a standard bar chart showing the high, low, and closing prices for a stock. *Market Pro* has tools for analyzing a stock's performance, in addition to tools for drawing trend lines. *Jazz* also provides a stock-market graphing capability. Other programs create statistical graphs (see Figure 1).

Diagrams Show Structure

Diagrams include flowcharts, Program Evaluation and Review Technique (PERT) charts, and decision trees. The purpose of

a diagram is to help the audience understand a complex structure at a glance. For example, a corporate-organization chart lets viewers see employee names and titles in their positions within departments as well as in the overall company hierarchy.

Diagrams are easy to create if you just remember that they must conform to some

a model, you run the simulation and graph the results.

Project-management diagrams, such as PERT and Critical Path Method (CPM) charts, are useful for creating business plans and reporting on a project's progress and resource allocations. *MacProject II* and *Micro Planner Plus* use PERT charts to show how projects are progressing; they also use bar charts and histograms to depict the allocation and status of tasks and resources.

Enhancements

The advantage of using chart-making software is that you can generate acceptable presentation materials quickly and without much artistic skill. However, if you have the time and talent, you might want to add some pizzazz to your charts and diagrams. Enhancing a graph can be as simple as drawing a box around it or as elaborate as redrawing it to turn plain numbers into thematic illustrations.

Painting and drawing programs are well-suited to improving graphics. You might even use one of these programs simply to overcome limitations of your chart-

Many graphics programs, including *Illustrator*, *Cricket Draw*, *Dimensions*, and *SuperPaint*, can be used to embellish simple images or to create appealing images on their own.

By choosing the appropriate symbol and chart type, you can create a graphic that not only compares numbers but reinforces a theme. Be careful not to go too far; a thematic chart can be distracting if it stretches the idea or draws too much attention away from the numbers and relationships you're trying to show. One interesting program, *Pict-O-Graph* from Cricket Software, substitutes picture symbols for quantities represented in charts. For example, instead of using plain bars to show the amount of crude oil purchased by the United States over a six-year period, you could characterize each bar as a stack of oil barrels (see Figure 2).

If you want to add some excitement to your presentation, consider an animation program like *VideoWorks II*. When you add motion to static visuals, they hold your audience's interest longer. To show how your sales staff outperformed projections, you might use a line graph in which the

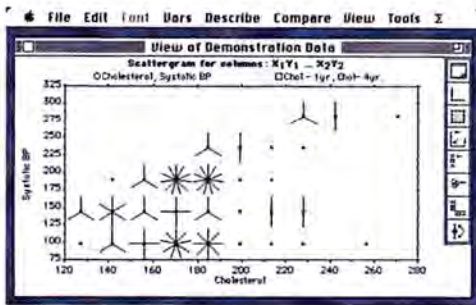


Figure 1
StatView 512+ can create a scatter graph that shows a concentration of data points on a single set of coordinates by drawing "sunflowers" with each petal representing a single data point.

kind of logic. For example, the logic behind an organizational chart is the chain of command, while a flowchart follows a chain of events. You wouldn't draw an organizational chart with the company head at the bottom.

More automatically generates tree charts from outlines. (An organizational chart is an example of a tree chart.) *More* offers four tree-chart types, as well as different box shapes, fill patterns, and joining line-shapes and sizes.

Flowcharts can be created with *MacDraw*, *Cricket Presents*, *Design*, *Anatool*, or *MacFlow*. Even *PowerPoint* provides rudimentary drawing tools for creating simple flowcharts and diagrams. *MacDraw* is a good general-purpose tool, and *Cricket Presents'* drawing capabilities are similar to *MacDraw's*. *MacFlow* is suited to small diagrams and quick charts. *Design* is appropriate for complex diagrams because it links all objects, including text and graphics, and checks multipage diagrams for consistency. *Anatool*, a structured systems-analysis program, records and cross-checks data definitions in its Data Dictionary.

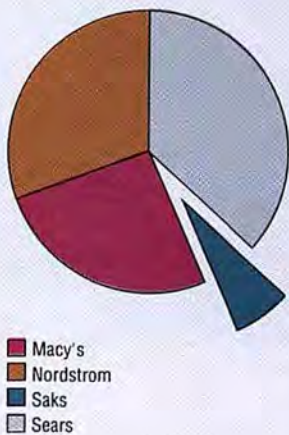
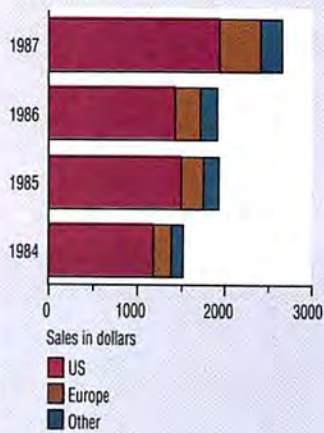
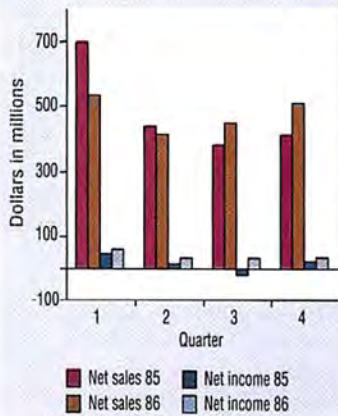
STELLA for Business allows you to model and simulate problems from engineering to economics. After you construct



Bob Fischer, of BBN Advanced Computers, uses *PowerPoint*, *MacDraw*, and *PageMaker* to prepare transparencies for computer training classes.

ing software. For example, if your chart program can't drag a slice out of a pie to emphasize that segment, you can import the pie chart into a paint program and use the lasso tool to select a wedge and drag it from the pie's center. Using *MacDraw*, you can group all the elements in a bar graph and rotate the entire graph on the page.

The Chart of Charts



Column chart: Compares the progress of one variable over a period of time. Use a column chart, for example, to compare sales figures over several years. You can compare variations of several items by plotting the values of each on the same chart either by stacking the resulting columns on top of each other or by placing them side by side. *ColorChart, Cricket Graph, Excel, Interleaf Publisher, Jazz, Microsoft Chart, Microsoft Works, MindSight, MockChart, StatView 512+, Trapeze*

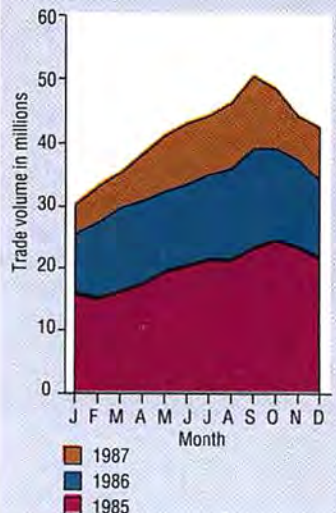
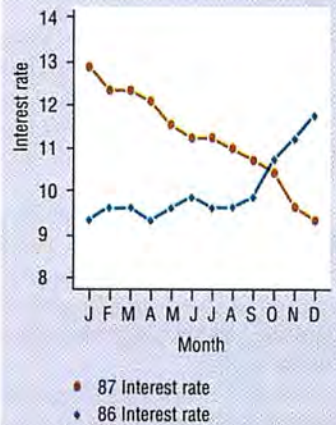
Bar chart: Bar charts are column charts set horizontally. Bar charts often compare several items to a single variable. It's a good way to show, say, the increase in sales in different locales around the world. You can elaborate bar charts by stacking them or using multiple bars. *ColorChart, Cricket Graph, Excel, Interleaf Publisher, Jazz, Microsoft Chart, StatView 512+, Trapeze*

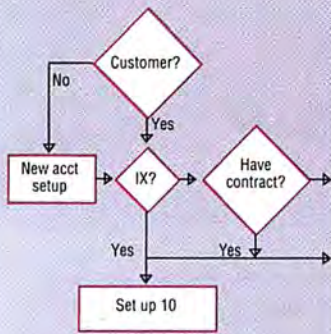
Pie chart: Compares the relative parts that make up a whole. The circular pie represents the whole, and the size of each wedge shows that component's share. Some software packages, such as *Cricket Graph* and *Microsoft Chart*, allow you to drag out a slice for emphasis. Use a pie chart, for example, to show the share of the business that several department stores in one region command. *ColorChart, Cricket Graph, Excel, Interleaf Publisher, Jazz, Microsoft Chart, Microsoft Works, MindSight, MockChart, StatView 512+, Trapeze*

PERT chart: PERT stands for Program Evaluation Review Technique, a widely used method of managing projects. A PERT chart graphically represents the tasks, milestones, and different dependencies involved in completing a project. PERT charts are often confused with Gantt charts, which use bars to represent the relative durations of individual tasks over the course of a project. *MacProject, Micro Planner Plus*

Line chart: Ideal for depicting trends over time, or even the distribution of one variable over another. The fluctuation of the line indicates variations in the trend, while the distance of the line from the horizontal axis at any given point indicates a quantity. By plotting multiple lines on the same graph you can compare several trends at once. For instance, to compare the variation in interest rates from one year against another you could put two lines on the same chart. *ColorChart, Cricket Graph, Excel, Interleaf Publisher, Jazz, Microsoft Chart, Microsoft Works, MindSight, MockChart, StatView 512+, Trapeze*

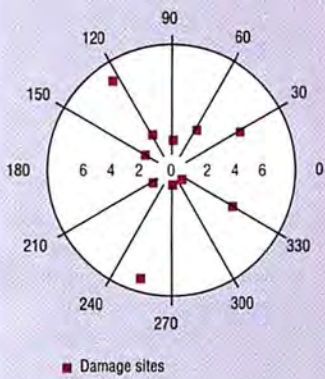
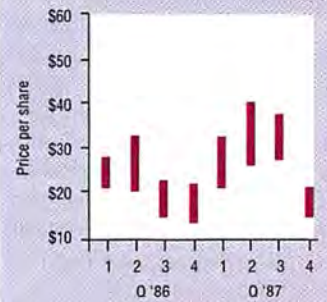
Area graph: A variation of a line chart that emphasizes quantity or volume. Adding multiple sets of data to the graph enables you to compare different sets of data over time or among categories. Each set of data creates a band, with subsequent bands stacking on top of each other. *Cricket Graph, Interleaf Publisher, Jazz, Microsoft Chart*





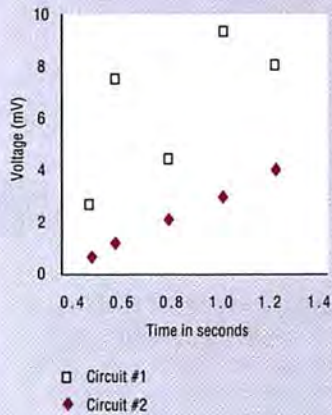
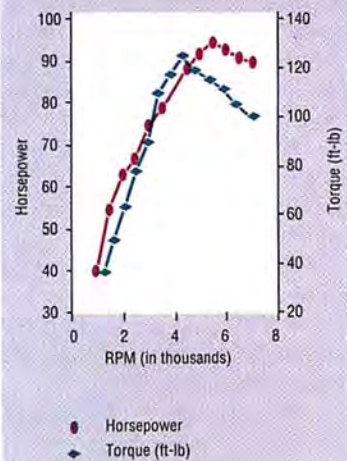
Flow chart: A diagram that shows the relationships and steps involved in the development of a process. Flow charts frequently make use of specialized symbols to represent specific kinds of processes and components. For example, flow charts can show how computer programs work or the steps involved in refining oil. *Anatool, Design, FlowMaster, MacDraw², MacFlow, SuperPaint²*

High/low chart: A specialized chart for stock brokers and anyone who reports on the progress of the stock market. High/low charts compare the high and low selling points of any given stock. Line charts are commonly used for plotting trends, and column and bar charts are also frequently used in applications that analyze the stock market. *ColorChart, Jazz, MockChart*



Polar chart: Polar charts plot data points as described by their distance from the center of a circle (radius) and their relative angle in degrees from a reference point. Examples include showing occurrences of damage at various distances from an earthquake's epicenter or sites of artifact findings from the center of an archeological excavation. *Cricket Graph*

Double-y graph: Compares combined trends in two sets of experimental data measured in different units. Double-y graphs are useful when you want to compare two trends that share one variable but not a second. For example, you could use a double-y graph to compare an engine's torque output and horsepower output over the same range of engine speeds. *Cricket Graph*



Scatter graph: Typically used as an analytical tool to show the relationship of one variable to other variables. Overlaying data sets on one plot shows an audience all results at a glance. A scatter graph could be used, for example, to measure voltage over two circuits. *Cricket Graph, Excel, Interleaf Publisher, Jazz, Microsoft Chart, StatView 512+, Trapeze*

Many specialized programs feature graphing and charting capabilities for specific applications. For example, *MacSpin, MacSS, and Systat* create sophisticated statistical graphs. *Market Pro* generates charts showing the high, low, and closing prices of stocks, as well as sales volume. For more information about specialized programs, contact your dealer.



Tree chart: A diagram that illustrates hierarchical relationships. The most common example is a corporate organizational chart, but tree charts are also used to show matches in a sports championship or genealogical histories. *Design¹, MacDraw¹, More, SuperPaint¹*

¹You can draw tree charts manually with these applications; however, *More* generates them automatically.

²Flow charting is possible with these applications, but requires more work because of limited flow chart drawing features like connectors.

line progresses across the chart, eventually bursting out of the confines of the graph.

Color

Color is an important component of a presentation. When an audience sees four blue lines of type, followed by one in red, the red type gets the attention. With *More*, you can color outline elements like headlines and document windows, or highlight individual words or phrases for emphasis. *Cricket Presents* also offers full color support, allowing you to set color for individual words in text visuals.

In addition, a number of useful coloring programs are now available on the Mac II. *PixelPaint* from SuperMac Software of Mountain View, California, lets you colorize existing black-and-white charts from *Excel* or *PowerPoint*. *ColorLab* from Language Systems Corporation of Herndon, Virginia, lets you color presentation visuals in the 256 colors available on the Mac II.

It's easy to get carried away when you have so many colors at your disposal. Be careful not to drown your audience in a paint bucket.

- Use no more than four colors on any slide.
- Dark colors, like blue, tend to fade into the background. Yellow and other bright colors jump forward.
- Avoid color combinations that contrast badly—for example, low-contrast combinations like yellow on white, and high-contrast combinations like violet on yellow. This is especially true with type. It's a common mistake to put black type on a blue or violet background.
- Restrict mixing text colors. Use color in text for occasional emphasis only. For example, in a line of black type you might set off a key word in red.

Assemble the Presentation

When you make a presentation, you tell a story. And, while your choice of slides is important, so is their organization. Some programs, such as *More*, *PowerPoint*, and *Cricket Presents*, provide features that help you organize, lay out, and even give presentations. Presentation-layout software works like page-layout software, allowing you to see the composition of a presentation as you would a printed document.

Some outliners, such as *ThinkTank 512* and *Acta*, provide rudimentary organization capabilities by letting you insert

graphics and text under outline headings. *More* takes outlining farther into the realm of presentations by letting you create bullet charts and tree charts and then present them as an on-screen slide show. Tree charts, text, and even graphics imported from other graphics programs can be placed into windows in the outline.

PowerPoint and *Cricket Presents* are specialized presentation programs that allow you to create a shared background for all slides. If you have a standard design (border, company logo) you want on each slide, using a shared background is a good way to ensure visual consistency. *Cricket Presents* also lets you design multiple slide backgrounds.

Both *PowerPoint* and *Cricket Presents* let you set the order of your slides. *PowerPoint* has two ways to view all the visuals in a presentation: the Slide Sorter and the Title Sorter (see Figure 3).

Both *PowerPoint* and *Cricket Presents* can create handouts that contain reduced copies of slides or can produce note pages with reductions of slides and any comments or notes you care to include. These pages can be used as a script, as projectionist's directions, or as printed summaries of the presentation.

More, *PowerPoint*, and *Cricket Presents* let you run through a presentation on screen after formatting it, an excellent way to check for problems. It's also a good way to rehearse. (Note that a final version of *Cricket Presents* was still unavailable at press time.)

Choosing Media

After you've designed the graphics and organized them, you need to produce the presentation materials. From flip charts to color slides, your choice of presentation output depends as much on the type of presentation you want to make as on the time and money you want to spend.

Each medium conveys a different message, especially in terms of formality and authority. For small audiences, flip charts are most effective because they have an informal appearance that invites interruptions. You can modify flip charts on the fly; just grab a felt-tip marker and respond to your audience.

Overhead transparencies are more authoritative than flip charts, but they're still informal enough that most audiences feel comfortable asking questions. You can modify transparencies by writing on them with a grease pencil or special marking



Figure 2

Thematic charts represent data with graphic symbols. This basketball chart was created with Management Graphics and drawn in MacDraw.

pen. Transparencies work well for audiences of small to moderate size. The easiest way to create transparencies is by printing them directly on a laser printer. 3M sells specialized transparency films for laser printers (Type 154) and dot matrix printers (Type 186).

The most formal and authoritative format is 35mm slides. No one can deny the impact of well-designed, color slides. But they are less personal and discourage interaction, partly because of their formal appearance. Another drawback is that the audience is in the dark—literally; you can't see their reactions any more than they can see yours. Slide presentations are most appropriate for medium- and large-size audiences.

You might also consider making a presentation on the Mac. Depending on the size of the group, you can show your presentation on the Mac's own screen, on a large video screen, or on a video projection system. The quality of the image is limited by screen resolution, but the Mac's the best medium for demonstrating software, showing animated presentations, or giving *HyperCard* presentations.

Why Presentations?

Are presentation graphics really worth the extra time and bother they take to prepare, or do they only serve to gussy up information that's quite acceptable without embellishment? The answer is they're worth it if you want to get your point across.

The most effective way to communicate information and ideas to an audience is by making a presentation that takes advantage of charts, graphs, and other visual aids. Over 8 million sales presentations and 10 million classroom presentations are made every day.

A 1986 study by the University of Minnesota showed that use of graphics increased a pre-

sender's persuasiveness by 43 percent. Speakers using visual aids were perceived as being better prepared, more professional, clearer, more interesting, and more concise when compared with speakers who didn't use visuals. The same study concluded that color visuals were more persuasive than simple black-and-white graphics. Color images enhanced audience comprehension and retention of presented information.

Using a Mac to create a presentation gives you more complete control over the visual images than if you sent them out to a graphics professional or service. It can also save you

time and money. However, it may still be best to use a professional artist when you want to create images that move beyond the limits of automatically generated charts and begin to require design talent and experience.

If you already use a Mac to manage a database or to track numbers with a spreadsheet, it's easy to begin experimenting with presentation graphics. Simply prepare a standard-format report in the usual way, and try augmenting key aspects with a chart or two. You may find that the report more easily captures the recipient's attention and more quickly conveys the key points.

Making Slides

You can produce 35mm slides in three ways: by making slides from photographs of the Mac's screen, by sending files to a slide-processing service, or by using an in-house film recorder. Photographing the Mac screen and having slides made is not recommended. It's hard to get good photos and the quality is usually inadequate for formal presentation settings.

You can send a floppy disk or paper copy of your presentation to a slide-processing service, which will produce 35mm slides and send them back to you. The service does all the work, and in some cases even provides presentation design advice. Slide services are the best way to produce slides if you make presentations infrequently. In general, turnaround takes four to five days, with costs ranging from \$15 to \$50 per slide (not including mail or delivery charges). Two of these slide services are Genigraphics in Liverpool, New York, and Autographix in Waltham, Massachusetts.

If you make presentations very often, slide service charges can add up—to the point that you might consider purchasing a film recorder. Film recorders are specialized computer peripherals that create slides of screen images, instead of paper printouts. Several companies now offer film recorders for the Macintosh, including Dunn Instruments, Matrix Instruments,

Mirus, and Presentation Technologies. Due to the technology they use, film recorders are expensive. Prices begin around \$5000 and rise quickly to well over \$10,000.

The media you choose, the types of charts you use, and how carefully you design them are all important to the success of your presentations. But whichever presentation route you decide to take, the most important factor is to put yourself in your audiences' seats. Is the presentation clear? Are the visuals readable and easily interpreted? Do the main points of the presentation follow a sensible order? Ask yourself these questions, and remember all the presentations you've sat through—talks in which you've wished the speaker would stop wasting your time and just get to the point. □

See *Where to Buy* for contact information.

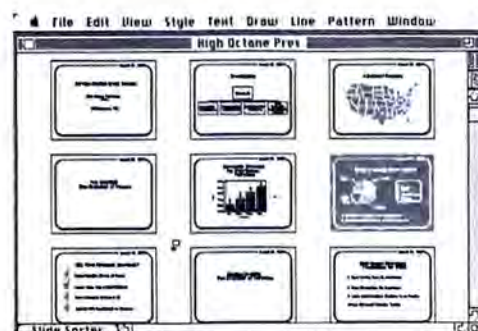


Figure 3

In PowerPoint you can reorder and sort visuals in two views: the Slide Sorter and the Title Sorter. You can rearrange your presentation by selecting and dragging one or more slides or titles to a new position or by cutting and pasting from within the two views.

Fit to Print

by Erfert Nielson

These days everybody's a desktop publisher. With LaserWriter time for rent at the corner copy shop, anyone with a Mac and a manuscript can turn out the ubiquitous "near-typeset-quality" publication. If you want your desktop-published document to stand out from the crowd, you need to know the ins and outs of Macintosh fonts. A low-budget publication won't look low-budget if you know a few tricks, including how to choose the right fonts for the job, access special characters, and fix character-spacing problems. As you move into more advanced Mac typesetting, you'll also need to know how to troubleshoot printing problems and manage your growing font collection.

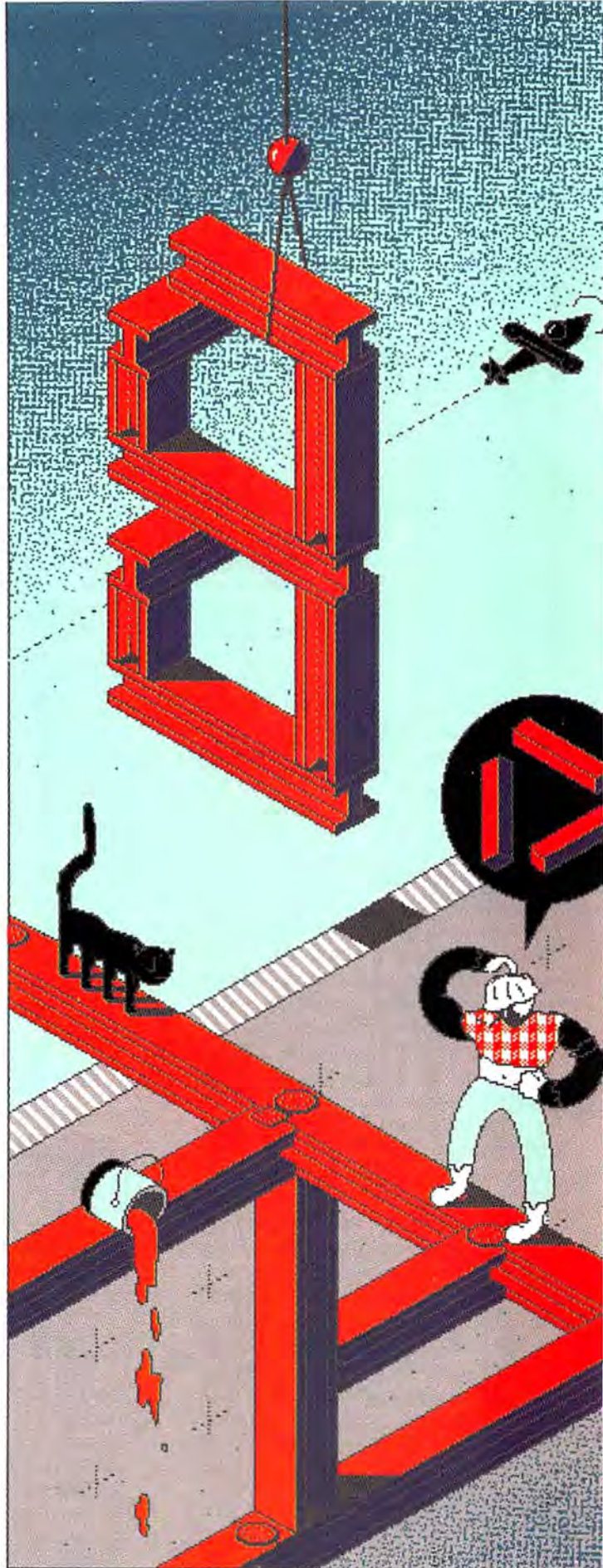
Font Basics

Let's begin by defining a font. Glossing such a basic term might seem unnecessary, but the word *font* means something different in Mac circles than in the typesetting world. In typesetting terms, a font is the physical incarnation of a *typeface*—a set of characters distinguished by a unique design (for example, Helvetica). In the early days of typesetting, every size of a given typeface had to be designed as a separate font. With the advent of digital typesetting, different sizes could be generated by scaling a single master, so the terms *typeface* and *font* became somewhat interchangeable.

In Mac parlance, a font is a set of characters of a certain typeface, in a certain style (roman or italic, for example), weight (thin, bold, and so on), or width (condensed or extended). Therefore, Times Roman and Times Italic are distinct fonts, but 12-point and 10-point Times Roman are different sizes of the same font.

The LaserWriter Plus contains 35 built-in fonts. Although 35 fonts sounds like a healthy selection, remember that fonts are defined by style attributes such as bold or italic. The LaserWriter Plus actually offers style variations on only 10 font *families*. Of these, 4—Courier, Symbol, Zapf Chancery, and Zapf Dingbats—aren't suitable for long passages of text, or *body copy*. That leaves a total of 6 font families—4 serif and 2 sans serif. (*Serifs*, the small strokes capping the ends of a

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Font fine points and typesetting tips for professional-looking publications

character's main strokes, help the eye distinguish characters that would otherwise become a thicket of uniformly weighted lines.) Since sans serif fonts are generally frowned on for body copy, we're left with 4 families of text fonts: Times, New Century Schoolbook, Palatino, and Bookman.

Choosing a Font Library

Needless to say, a selection of 4 font families doesn't give you much to work with. Luckily, more than 150 *downloadable* families are available. These fonts can be temporarily stored in the printer's memory and printed in the same fashion as built-in fonts. Downloadable fonts consist of two components: *screen fonts*, which are installed in a Font menu and displayed on the screen as you type, and *printer fonts*, the PostScript character descriptions that are sent to the LaserWriter or another PostScript-compatible device. (For a detailed description of the font-downloading process, see "Font Facts," *Macworld*, February 1987.)

For around \$40 to \$180 apiece, you can add fonts to your collection, building up a font library to suit your publishing style. While Adobe Systems, creator of the LaserWriters' built-in fonts, is considered by most to be the premier font developer, several other companies produce good-quality PostScript fonts—many of them at bargain prices. The "Font Sampler" gives you a taste of the kinds of fonts available from various companies, as well as an indication of their quality. To see an example of how fonts differ from one manufacturer to another, look at Figure 1, which compares two similar fonts executed by different companies.

Criteria for selecting a font library vary from one publisher to another, but in general you'll probably want a basic set of serif and sans serif fonts that look good together, since sans serif fonts are often used as headlines, chapter headings, and so on, in publications consisting primarily of serif type. You may also want to purchase an occasional special-purpose font, but be careful—although a decorative or novelty font can be an attention grabber, if used only once or twice such a font can be an expensive impulse buy.

Common Problems

Once you start using downloadable fonts, you may run into a number of problems. A few are attributable to stray gremlins in the LaserWriter, but most can be easily solved. A survey of several font manufacturers and desktop publishing experts turned up the following collection of common font questions.

I'm sure I installed the printer font in my hard disk's System Folder, but when I try to print my document, a dialog box tells me the font isn't available and the LaserWriter prints a bitmapped approximation. What's wrong?

This is probably the most frequent query on manufacturers' hot lines. The answer is usually straightforward.

The Mac is finicky about the placement of printer fonts; if a printer font is placed in its own folder within the System Folder, it can't be read. Another possible explanation is the presence of more than one System Folder on a hard disk. The printer font may be sitting in plain view in a System Folder, but it may not be the System that boots the hard disk. When you copy applications to a hard disk, make sure you don't accidentally copy a System along with them. A final possibility is that someone (you perhaps) may have succumbed to the urge to rename a printer font; doing so makes the font unrecognizable to printer software.

I indicated italic (or bold) on the screen. Why is the printed output in roman?

The answer is simple. The printer font, not the screen font, determines what prints. Even if you don't have an italic screen font installed, when you select Italic from a word processor's style menu, the screen version of the font slants to the right in a process known as *obliquing*, and you see italic on the screen. But for the printed text to be italicized, an italic printer font must be available. This requirement isn't obvious with a font like Times, since the Times Italic font is built into the LaserWriter's memory. But if you purchase a downloadable font, you may notice printer font files labeled Bold, Italic, Oblique, and so on; be sure to install these if you intend to use a variety of styles.

When I print in bold or italic in certain applications, I get too much space between letters and words. This is particularly a problem with headlines. Can this be fixed?

According to an Adobe representative, screen fonts contain information about character spacing. When you select italic but have no italic screen font,

Adobe Systems:

Goudy Old Style
Avant Garde Gothic
Bodoni
Lubalin Graph

Park Avenue

The quick downloadable font
The quick downloadable...
The quick downloadable font
The quick downloadable...

The quick downloadable font

Linotype Company:

Glypha
Optima
Helvetica Light
Melior

The quick downloadable font
The quick downloadable font
The quick downloadable font
The quick downloadable font

Century Software:

Dickens
Chescheir
Murchison
Los Angeles
Albany

The quick downloadable font
The quick downloadable font
The quick downloadable font
The quick downloadable font
The quick downloadable...

Image Club:

Fina Heavy
Compacto Bold
THEATER BOLD
Coble
COMIC BOOK

The quick downloadable font
The quick downloadable font
THE QUICK DOWNLOADABLE FONT
The quick downloadable font
THE QUICK DOWNLOADABLE FONT

Invincible Software:

Moonlight
Blackjack
Acropolis
Kimberly
Trisse

The quick downloadable font
The quick downloadable font
The quick downloadable...
The quick downloadable font
The quick downloadable font

Shareware Fonts:

Louisville *The quick downloadable font*
 Thin Times Bold **The quick downloadable font**
 ModernPrint Bold *The quick downloadable font*
 ARCHITECT'S *THE QUICK DOWNLOADABLE...*

CasadyWare:

Sans Serif *The quick downloadable font*
 Bodoni *The quick downloadable font*
 Ritz **The quick download...**
 Gatsby Demibold *The quick downloadable font*
 Calligraphy *The quick downloadable font*

EmDash:

Caspian *The quick downloadable font*
 Briar *The quick downloadable font*
 ArchiText *The quick downloadable font*
 UpStart **The quick downloadable font**

Software Complement:

Calculus **The quick downloadable font**
 Nouveau **The quick downloadable font**
 VERTIGO *THE QUICK DOWNLOADABLE FONT*
 Hobnob **The quick downloadable font**

Allsys Corporation:

Goudy Oldstyle *The quick downloadable font*
 Venezia *The quick downloadable font*
 Penstroke *The quick downloadable font*

T/Maker:

Seville *The quick downloadable font*
 Plymouth **The quick downloadable font**
 Bombay *The quick downloadable font*

Font Sampler

Samples of PostScript fonts from ten companies are shown here, as well as some of the many shareware PostScript fonts available from user groups or online services. As you can see, most Mac font companies—excepting Adobe and Linotype—specialize in decorative and display fonts.

the screen font is obliqued. The obliqued screen font is translated to a true italic version of the font for printing, but some applications are better than others at translating spacing information (see Figure 2). *Microsoft Word*, for example, seems to have a problem here. The same holds true for selecting bold as a style option; the screen font adds pixels to the characters, which may cause the printer to print bold characters too far apart.

Luckily, a solution exists. If you install specially created screen fonts for styles such as bold and italic, spacing problems should be eliminated. For example, if you frequently use italics in Times text, you should install the Times Italic screen font in your System, just as you would install any other screen font. Then, when you italicize a word, a true italic font appears, rather than an oblique version of a roman font. Adobe offers a set of screen fonts to match the LaserWriter's built-in fonts for \$50. You can also get these fonts from CompuServe (type **Go Adobe**).

Why are the letters in all-caps Helvetica headlines squished together when I print a MacWrite document?

Make sure you use the Helvetica screen font rather than Geneva when composing Helvetica type. Although Geneva is automatically converted to Helvetica when printed on the LaserWriter, spacing problems can crop up during this conversion (see Figure 3). The same advice applies if you're using the Times font: always compose in Times rather than New York.

I printed a document in Font X on my LaserWriter at home, but when I printed the same document on the office LaserWriter it came out in Font Y, even though the office Mac has both screen and printer versions of Font X installed. Why did this happen?

This case of mistaken identity results from a font ID number conflict. Printer fonts are identified by number; font developers must assign a number from 0 to 255 to each font they create. Since there are only 256 numbers to go around, duplicates are bound to occur.

Apple's Font/DA Mover deals with ID number conflicts by assigning a new number to a font when it's installed if that font's ID number is already taken. For

example let's say, by coincidence, that Font A and Font B (from different companies) have the same ID number—124. If you install Font A and then Font B, the Mac recognizes the conflict and assigns Font B the first unused ID number it encounters, say 135. (You are happily oblivious to these internal machinations.) But when you take your disk to work and try to print it, the office System associates font ID number 135 with an entirely different font—Font C. Therefore, your document prints in Font C, which is not what you wanted at all. To avoid this puzzling problem, it's a good idea to take a copy of your System as well as your document with you when printing on a Mac other than your own—whether at the office or a copy shop. As an alternative, you can stick to fonts from one manufacturer, since fonts from the same developer won't have conflicting ID numbers. Several books on desktop publishing provide lists of ID numbers for various companies' fonts.

Enhancing Fonts

Overall, Macintosh fonts are masterpieces of design, with an impressive array of accents, mathematical symbols, and other special characters. So why the heck don't they include fractions? And why is it so hard to type standard, "curly" quotation marks? Well, every masterpiece has a flaw or two. Fortunately, solutions exist for these annoying peccadillos, and others as well.

Fractions

Before you throw in the towel and resort to decimal notation, consider the following options for adding fractions to Mac fonts.

If you don't use too many fractions, and don't mind a little hard labor, you can create passable fractions in just about any font. Let's say you want to type "6½ years" in 12-point Times, for example. First, type 61/2 with no spaces between the letters. Then select the 1 and change it to a 9-point superscript; select the 2 and change it to 9-point type. You now have a 12-point number followed by a fraction.

A shareware font called *Helvetica Fractions* provides a more automated approach. Install the screen and printer versions of the font and select it when you

wish to add a fraction to a block of Helvetica text. You then type fractions using the number keys in conjunction with Shift and Option. Unfortunately, *Helvetica Fractions* produces only single-digit numerators and denominators, and the fractions look good only with Helvetica or a similar sans serif font.

A more flexible alternative is Century Software's *Caps & Fractions* font disk, which provides one set of fractions for Times and another for Helvetica (or similar serif and sans serif fonts, respectively). *Caps & Fractions* defines the top row of letter keys as numerators and the second row as denominators, allowing you to type custom fractions such as 1½/4.

Figure 4 shows examples of fractions created by each of the techniques just discussed. If none of these suits your fancy, you can create your own fractions by combining slashes and numbers from existing fonts in Altsys's *Fontographer* font-creation program.

Quotes

When asked to choose the most glaring flaw in the Mac's keyboard layout, many writers mention the difficulty of typing standard quotation marks (" "). The default quotation mark (" ") isn't suitable if you're aspiring toward typeset quality (especially with serif fonts).

Bodoni was designed in the 18th century.

Bodoni was designed in the 18th century.

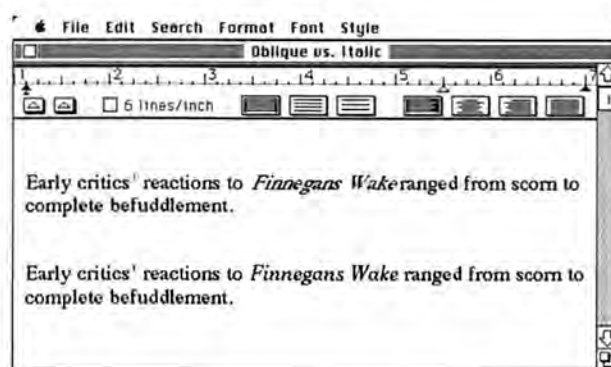


Figure 2

The top sample shows the oblique Times screen font produced by slanting roman text to the right. The bottom sample shows the true italic screen font, available from Adobe. The oblique font spacing information can adversely affect printed text.

The normal technique for producing curly quotes requires that you press Option-[for open quotes and Shift-Option-[for close quotes.

Similarly, you must press Shift-Option-] to produce the more elegant version of another common character, the apostrophe.

As with fractions, several options are available. If you don't want to purchase additional software, you can use your word processor's search-and-replace

Figure 1

Both of these samples are PostScript versions of Bodoni, a typeface originally created by the eighteenth-century Italian printer Giambattista Bodoni. In addition to the obvious difference in size, if you look closely at this LaserWriter printout, you'll notice that Adobe's version (top) has thinner serifs than CasadyWare's, giving it a crisper look. While Adobe's font looks cleaner, it's also considerably more expensive.

PostScript Alternatives

Mac owners have always associated high-resolution printing with Adobe's PostScript, the page-description language built into the LaserWriter. But a number of so-called PostScript clones are just around the corner, promising to provide some competition for Adobe. Just what is a PostScript clone?

PostScript was developed by John Warnock and Chuck Geschke, who founded Adobe. Like Pascal or C, PostScript is a programming language; its principal function is to describe pages consisting of text and graphics. While the language itself is in the public domain, the *interpreter*, a program that translates the PostScript code into a form the printer can understand and execute, is proprietary. Adobe's PostScript interpreter resides in a processor in the LaserWriter. So far, the only way for a printer manufacturer to include PostScript in a printer has been to license it from Adobe. But a number of developers have been striving to clone Adobe's interpreter and give printer manufacturers an alternative.

While more than a dozen companies have been working on one aspect or another of creating PostScript clones, at press time no finished products were available. Dan Jones of Western Digital, a controller manufacturer working on custom chips to accelerate PostScript processing, estimates that duplicating Adobe's interpreter of the rich PostScript language is "easily a 20-man-year project."

At last fall's Seybold conference in Santa Clara, California, the printer manufacturer Printware demonstrated a prototype of its PostScript clone, PrintScript, running on the company's 720 IQ laser printer. Several companies, including Printware, have opted to use fonts from Bitstream, an established producer of digital fonts. Like PostScript fonts, Bitstream's fonts are stored as outlines, scaled by printer software to a

specified size, and printed as bitmaps (see "The Proof's in the Printing").

Producing smooth characters at 300 dots per inch isn't easy, however. Adobe has the advantage of years of experience fine-tuning fonts. It remains to be seen whether companies such as Bitstream and Compugraphic can meet—or beat—PostScript's inventors at their own game.

DAN ESCOBAR



I will start worrying about the clones when I see one," says PostScript coinventor John Warnock. A number of companies have announced their intentions to create competitors to Adobe's PostScript interpreter; but so far none have succeeded.

Adobe's Helvetica:

Font Alternatives

Printware's Swiss:

Font Alternatives

Adobe's New Century Schoolbook:

Font Alternatives

Printware's Century:

Font Alternatives

The Proof's in the Printing

Prerelease samples of Bitstream fonts printed on a Printware 720 IQ laser printer running the PrintScript PostScript alternative. Strictly speaking, this comparison isn't fair because the 720 IQ has a higher resolution than the LaserWriter that printed the Adobe fonts. Still, the results are promising.

function to change the straight quotes to curly quotes. If you prefer a more automated approach, two shareware utilities, *Smart Quotes* and *Laser Quotes*, add curly quotes as you type.

Punctuation and Special Characters

Those who make the transition from typewriter (remember those?) to word processor sometimes apply conventions that are undesirable in desktop-published documents. For example, many typists-cum-word processors leave two spaces after a period, a technique that makes monospaced typewritten text easier to read but is unnecessary with Macintosh fonts. Another outmoded typing habit is the use of two hyphens to represent a dash—few things shout “unprofessional!” more loudly. Shift-Option-hyphen (-) produces a dash sometimes called an *em dash* because it’s approximately as wide as an uppercase letter *M*, the widest character in most fonts. Option-hyphen creates an *en dash*, which is half the length of an em dash and slightly longer than a hyphen. Almost everyone is familiar with hyphens and dashes, but many desktop publishers are unaware that the en dash, rather than the hyphen, should be used in sets of inclusive numbers (pages 5–17; 1977–83).

When the word *ligatures* is mentioned, most people think of letter combinations such as the *æ* in *medieval*. A far more common, though less visible, pair of ligatures can be found in many fonts and can be used routinely to make text more appealing. Though you may never have noticed it, typesetters commonly join the pairs *fi* and *fl* (as shown here) for more aesthetic and easy-to-read type. Changing the letter pairs *fi* and *fl* to ligatures requires some keyboard acrobatics on the Mac (see Figure 5).

Wouldn’t it be nice if there were an easy way to add all the aforementioned enhancements automatically to a document? Not only does one exist, but it costs only \$10. *Macify*, a shareware program by Eric Celeste, replaces an entire document’s straight quotes with curly quotes, double hyphens with dashes, *fi* and *fl* combinations with the appropriate ligatures, and double spaces with single ones. Not bad for ten bucks.

Managing a Font Collection

Once you’ve accumulated a few dozen downloadable fonts, you’re faced with the task of managing them efficiently. Font management involves installing printer and screen fonts without eating up too much disk space, keeping track of the location of uninstalled fonts so you can install them when necessary, and making sure the LaserWriter has enough memory to

process the fonts you download. The following tips assume that you have a hard disk; downloading a collection of fonts via floppies is possible, but difficult.

Printer- and Screen-Font Placement

As mentioned earlier, printer fonts must be sitting in plain view in the System Folder to be recognized. With four styles per family, things can get pretty crowded. If your font collection is too large for random organization, take heart. A shareware utility called *SetPaths* can trace the location of files and folders, allowing you to group printer fonts in folders within the System Folder.

Now that you have the printer fonts neatly arranged, what about screen fonts? As I mentioned before, not having screen fonts installed can lead to imprecise spacing in printer output from certain pro-

Figure 3

When you print Geneva text (with the Font Substitution option checked), the LaserWriter prints Helvetica, as shown in the top sample. Note the differences in letter size and spacing compared to the bottom sample, which was printed from the Helvetica screen font.

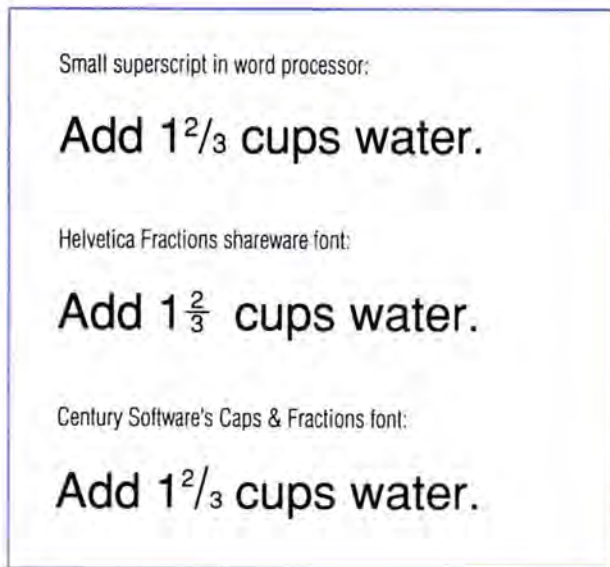
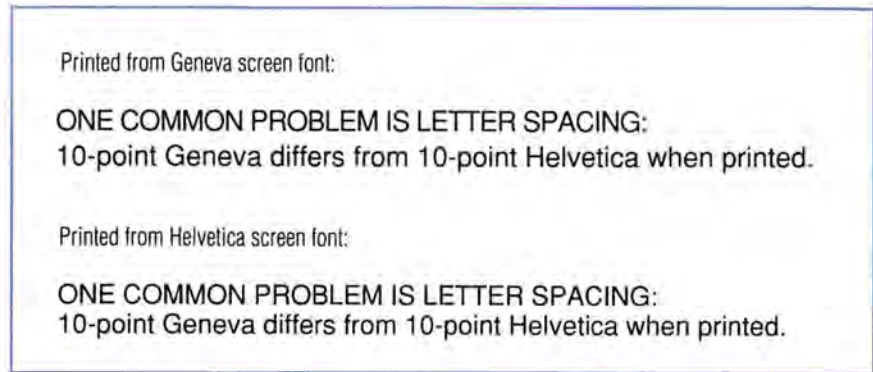


Figure 4

With a little work, you can create creditable fractions in any word processor. Alternatively, special fonts and utilities can automate the fraction-construction process.

Avoiding Font Menu Overload

Font/desk accessory extenders like *Suitcase* make it easy to load up on all those screen fonts you used to put aside to make room in the System file for the essentials. But *Suitcase* also makes it easy to turn your font menu into an overcrowded nightmare in which it's nearly impossible to find the font you need. Fortunately, there are a few simple techniques you can employ to create order out of chaos.

For example, there's no reason to list non-roman (italic, bold, and bold-italic) fonts in the font menu, since you should always invoke these fonts by means of the style menu or keyboard commands anyway. You can reduce the length and complexity of the font menu by making unnecessary font names disappear, leaving only the roman font for each family. To accomplish this, you'll use Apple's *ResEdit* to prefix each font name with a period. Before you attempt to follow the instructions for doing so, however, take heed: *ResEdit* is a powerful utility, powerful enough to destroy the file you are working on should you make a mistake. Thus, always use *ResEdit* on a backup copy, never on an original.

Here's how to make your non-roman screen fonts invisible:

1. Copy all the sizes of all your non-roman screen fonts into a file, which we'll call Fonts (if you have a superabundance of fonts, use several files). Place the Fonts file on a floppy disk, and, if there's room, copy *ResEdit* onto the same disk.

2. Launch *ResEdit*. In the *ResEdit* main screen, there will be a window listing files and folders for each currently active

disk. Locate the Fonts file and open it. You should now see a window labeled "Fonts file" containing two resource types, FONT and FOND.

3. Double-click on the FOND resource to open the "FONDS from Fonts file" window. It will contain a list of all the fonts in the file.

4. Click once on the first name in the list to select it and press **⌘-I**. In the resulting Info window, insert a period in front of the name in the Name box (a percent sign has the same effect). Be careful not to change the name in any other way. Close the window.

5. Repeat this procedure until all the names on the list are prefixed with a period.

6. Close the FOND window and double-click on the FONT resource while holding down the Option key to open the "FONTs from Fonts file" window. The window should display font names on some lines and font ID numbers on others.

7. Repeat the process described in step 4 for the lines containing font names, inserting a period in front of every font name in each font's Info window. Ignore the lines that list only ID numbers.

8. Now review both FONT and FOND lists to make sure all the font names prefixed in one window are prefixed in the other, and that the font names are otherwise unchanged. Everything must match exactly.

9. Close the Font file window and save your changes.

10. Before performing this last step, be sure that you have backups of all the files (System file and/or font files) in which your renamed fonts will be installed. Now use the Font/DA Mover to remove the visible non-roman screen fonts, then

install the invisible versions in their place.

When you next pull down a font menu, only roman fonts should appear. Be aware that a few applications, such as *Page-Maker*, handle fonts in a non-standard way and list every font, despite all efforts to the contrary.

You can also use this technique to add prefixes to the names of your screen fonts so that they fall into natural groupings in the Font menu. Use *ResEdit* as before, but this time place something other than a period in front of the font names you want to group together: for example, a bullet (Option-8) in front of the decorative fonts sends them to the bottom of the menu and an exclamation point in front of the text fonts puts them at the top. (See "Quick Tips," November 1987, for a list showing the order in which prefixes are sorted.) If you do change screen font names in this way, keep in mind that only documents created after the change will recognize the new font names.

One other useful technique for organizing a font menu is to divide up fonts into separate Font/DA Mover files according to their function. Set *Suitcase* so that it loads just the text-font file, for example, at start-up. Then install the other font files, using the *Suitcase* desk accessory, only when you actually need them. Take care, however, to install font files only from the Finder (and when all your applications are closed, if you are using MultiFinder). Also be sure to store all the fonts of a single family (all sizes and all styles, visible and invisible) in one Font/DA Mover file or in the System file. —Robert C. Eckhardt

grams. Power publishers may have to install 24 screen fonts (six sizes for each of four styles) for every font family they want to use. At that rate, it takes only eight families to reach the System file maximum of 200 fonts.

Shuttling fonts in and out of the System file with the Font/DA Mover isn't the solution; this practice is not only tedious, it can eventually degrade your System, impairing performance. In addition, gargantuan Systems are a problem to back up and restore.

Three software solutions can help you avoid this problem: ALSoft's *Font/DA Juggler*; Software Supply's *Suitcase*, and Olduvai's *DA Switcher*. By enabling the Mac to access screen fonts that aren't in the System file, these utilities get around the 200-font limitation. They also enable you to organize your font collection in different *suitcases*—the icons representing collections of fonts. (For tips on how to manage the multitudinous collection of screen fonts that utilities like *Suitcase* make possible, see "Avoiding Font Menu Overload.")

LaserWriter Memory Lapses

If you're tired of using only two or three downloadable fonts at a time because of the LaserWriter's memory limitations (only about 180K is available for downloadable fonts), you might consider expanding the printer's memory. Mass Micro Systems' MassFonts, a \$600 1MB LaserWriter memory expansion card, lets you download up to 27 fonts at once, according to a company representative.

A hardware printer buffer such as DataSpace's LaserServer can also increase your font-downloading capabilities by storing fonts that would otherwise go directly to the LaserWriter's RAM.

A nifty desk accessory called *LaserStatus*, which comes with CE Software's *DiskTop*, can also help you download fonts more efficiently. While it can't add memory to the LaserWriter, *LaserStatus* shows you how much LaserWriter memory is free, allowing you to calculate whether there's room to squeeze in another font. The utility saves you trips to the Desktop by enabling you to download fonts from within an application. And *LaserStatus* saves trips to the LaserWriter (if it's not within reach) since the DA lets you reset the printer and flush downloaded fonts from its memory without having to manually switch off the LaserWriter.

On from Here

To cover every aspect of Macintosh fonts would require an entire book. Fortunately, books on desktop publishing abound. Excellent overviews of desktop publishing terminology and techniques can be found in *Desktop Publishing Skills*, by James Felici and Ted Nace (Addison-Wesley, 1987), and in the *Illustrated Handbook of Desktop Publishing and Typesetting*, by Michael Kleper (TPR division of TAB Books, 1987). If you'd like to compare fonts from different manufacturers, MacTography's *Laser Sampler II* shows the entire

character set for each of the PostScript fonts offered by eleven companies.

Perhaps some of these tips will help you on your way to becoming a more proficient publisher. But choosing, enhancing, and efficiently managing fonts are all jobs that require research as well as hands-on experience. If you want your documents to look like they were produced by a professional, the wide selection of Macintosh fonts and font accessories will help. But it's up to you to gain the expertise that will make your publication a cut above the rest. □

See *Where to Buy* for contact information.

For a final flourish, convert the pairs fi and fl to ligatures.

Figure 5

Select the letter pair fi and press Shift-Option-5 to produce the fi ligature; Shift-Option-6 changes fl to fl. Use a word processor's search-and-replace function to add ligatures to an entire document.

Postcraft's Laser FX:

Perspective

Inline

Outline Shade

Century Software's Shadow Effects:

Zip

After

Grayscale

Figure 6

If your publication needs a little spice, consider adding some PostScript special effects to titles or headings. Several companies, including Postcraft, Century Software, London Pride, and Strider Software, offer special-effects fonts or utilities.

**SPECIAL
EVENT**

Macworld's second annual meeting

Technology and Issues Conference

of hardware and software developers

June 1-3, 1988

Sessions will include:

Graphics

The User Interface

QuickDraw

**MultiFinder
and Multitasking**

Desktop Publishing

Video

Animation

HyperCard

Networking

Scanners

Color Printing

Developers who attended last year's Technology and Issues Conference demanded another chance to get together and thrash out the important issues facing the Macintosh development community. So Macworld is pleased to announce the second annual Technology and Issues Conference in San Francisco, June 1 through 3, 1988.

This gathering brings together third-party Mac hardware and software developers for intense discussions of technical issues. Leading Macintosh developers will speak on their areas of expertise in sessions that include plenty of time for give and take. The Technology and Issues sessions and informal discussions will provide a unique opportunity to influence standards, shape technological developments, and hear from Apple representatives.

To make sure that the sessions remain small enough for productive discussion, space is limited. Please register early to avoid disappointment. For registrations received before April 6, the fee will be \$495. After April 6, the registration fee will be \$595.

Yes, I'm interested in attending the Macworld Technology and Issues Conference in San Francisco. Please send registration details.

Name _____ Title _____

Company _____

Address _____

_____ Zip _____

Send to: Technology and Issues Conference, *Macworld* Editorial, 501 Second St., San Francisco, CA 94107



Apple and third parties offer optical drives for the Mac that open the door for publishers

The Dawn of Laser Storage

by Brita Meng

More than ninety years ago, H. G. Wells foretold time travel, yet to this day the time machine stands as an example of a vision unfulfilled. The same has been said of optical storage. Read-only and read-write laser disks have been in the works for years. But until recently, few products were available. With hardware in short supply, retrieval software and published disks are even harder to find. Those disks that are available are for the most part dedicated to specialized applications and often can be read by only one manufacturer's drive.

Apple's introduction of the Macintosh CD ROM (compact disk read-only memory) drive at last provides a standard for CD ROM storage on the Mac. While it won't be accepted overnight, the Apple drive will at least stimulate developers to publish information on CD ROMs and establish a body of published work that other manufacturers' drives can read.

Optical storage drives, both read-only and write-once, read-many (WORM), will certainly not replace traditional magnetic storage. You can't write to a CD ROM, nor can you erase the contents of a WORM drive. And both CD ROM and WORM have less throughput—the time it takes a drive to locate data on a disk, read it, and send it to your Mac—than do hard disks. (To be fair though, optical disks are faster than floppies.)

The two types of optical disks available now, CD ROMs and WORMs are different enough from each other that you need a specific drive, or player, for each type of

disk (see "Writing with Lasers"). Apple's drive reads only CD ROMs.

What's a CD ROM?

A CD ROM is a prerecorded, nonerasable disk. You can neither write nor erase data on a CD ROM.

CD ROM technology derives from audio CD technology; the two types of disks look the same. In fact, CD ROMs are manufactured with the same equipment used to *press* audio CDs. This makes CD ROMs a relatively inexpensive way to distribute information, compared with floppy disks.

CD ROMs hold at least 550 megabytes of digital data—about the capacity of 700 double-sided Mac floppies. That's enough room to fit 150,000 text pages or 15,000 images or several large *HyperCard* stacks or one hour of digital sound. You can mix graphics, sound, and animation on a CD ROM because the data is all encoded digitally.

With CD ROM, multimedia Mac applications like *VideoWorks II* finally have the storage they've needed. CD ROMs can hold complete copies of online databases, so you can avoid telecommunication and connecting charges that accompany online access. Publishers also provide electronic copies of reference books on CD ROM.

Taking Advantage of CD ROM

If you want to use a CD ROM, you need a CD ROM player. CD ROM drives use the same basic components as audio CD players. Lasers in the drive read disk data (see "The Laser Stylus"). Unlike its audio brethren, the CD ROM connects to the Mac (Mac Plus, SE, and II) via the SCSI port. And CD ROM drives sell for much more than CD audio drives. Apple's CD ROM



drive retails for about \$1200; you can find audio CD players for less than \$200. As the number of available drives increases, expect the prices of CD ROM players to drop, a key factor in establishing a larger installed base.

At press time, three CD ROM players were capable of working with the Mac. Others will be available as soon as other CD ROM manufacturers add SCSI interfaces and/or Mac drivers.

Apple's CD ROM drive is a stand-alone, front-loading player. It features two SCSI connectors, so you can daisy-chain the drive with other SCSI devices; it's also *AppleShare* compatible, so it can be accessed over an AppleTalk network.

Before you can play a CD ROM disk, you must put it into a plastic *caddy*, then you insert it into the drive just like a floppy. The caddy protects the disk from scratches, which can lead to lost data. You receive one caddy with the Apple CD ROM accessory kit that accompanies the drive.

Only Apple's player requires a caddy. Arc Laser Optical Technology's (ALOT) front-loading CD ROM drive provides a tray for the CD ROM disk, much like the mechanism used with CD audio players. You can get Laser Magnetic Storage International's CM 110 top-loading drive through some Mac CD ROM vendors.

No matter which drive you buy, rest assured you won't have to buy a different player for each CD ROM. CD ROMs have a

standard *physical format*. They are all the same size, and they all carry data arranged in the same spiral pattern.

Musical Offerings

Because CD ROMs are so closely related to audio CDs, some CD ROM drives, like Apple's, let you play audio disks. Apple's desk accessory that mimics a handheld remote controller lets you select songs, fast forward, rewind, adjust the volume, and program song selections.

The ability to play CD audio disks is really independent of the data reading capabilities of the drive, however. While you can listen to the audio disks on Apple's player, the Mac does not play the sounds on an audio CD through its speaker—the higher sampling rates used on CD audio disks produce data faster than the Mac can handle it. Apple's drive provides a jack

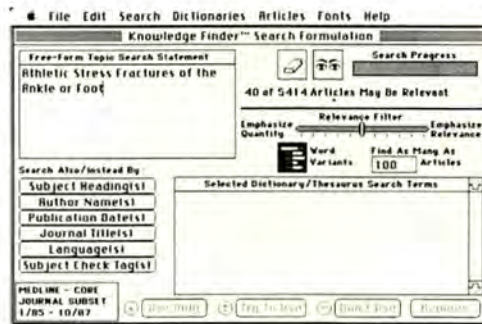
Optotech's Laser DataBank WORM drive lets you store up to 400MB of data on a removable cartridge.

for a pair of headphones or an external amplifier and speakers. Sound files that the Mac can play are therefore of lower fidelity than those stored on audio CDs.

And because CD ROMs require more stringent error-correction capabilities, you can't play CD ROMs on an audio CD player.

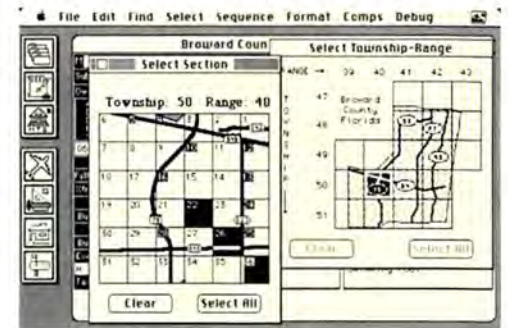
CD ROM Software

A CD ROM requires a *file format* or *logical format* to specify the organization and location of files on the disk. The logical format also defines things like the size of a file, the directory structure for all files on the disk, and the number of disks an application includes. Along with the actual data and error correction code, the logical format is pressed into the CD ROM during manufacturing.



Knowledge Finder

This program allows the user to create a sentence-style search statement and requires no command language. In addition, any number of terms may be added to the search formulation, using the dictionaries or thesaurus.



Real Estate Database

LaserScan's Broward County Real Estate Analysis CD ROM holds information on the 500,000 properties in the Broward County, Florida assessor's tax roll. A real estate professional can search the database using several criteria, including property type, characteristics, and geography. Here, the user has specified a search for property listings in only one Broward County township.

The Laser Stylus

How can a CD ROM hold that much data? The answer is simple. Optical drives use very small lasers to read and write the data on disks. The lasers sit on the read-write head of the drive.

On an optical disk, data looks like a set of micron-sized *pits* or holes (see Figure 1). When the laser shines onto the disk, the pits reflect light differently from the nonpitted disk surface, made up of *lands*. Light that strikes a pit is diffracted so the lens on the read-write head sees very little reflected light. If the laser hits a land, much more light is reflected back to the lens.

To determine the beginnings

and endings (and thereby the lengths) of pits and lands, the CD ROM drive uses *channel codes*. When there's a transition in reflectivity—a pit becomes a land, or vice versa—the circuits in the optical drive sense a 1. The length of the pit or land indicates the number of 0s.

The channel codes are then converted into *channel bits*, which also include error-correction data and address information. Channel bits are turned into a binary signal that's sent to the Mac via the SCSI port.

In a high-capacity hard drive, the read-write head must hover very close to the magnetic media to read or write to it. Be-

cause they use lasers, the read-write heads of an optical drive don't need to be as close to the disk. The greater *flying height*, or distance between head and media, means optical disks are not vulnerable to surface wear and head crashes—two serious problems associated with high-density hard drives.

Optical media can be sandwiched between plastic or glass, protecting them from dust, fingerprints, or other nasties. Surface dirt and scratches are ignored by the laser that reads the data. The shelf life of an optical disk ranges from five to ten years, compared to a magnetic disk's two- to three-year shelf life.

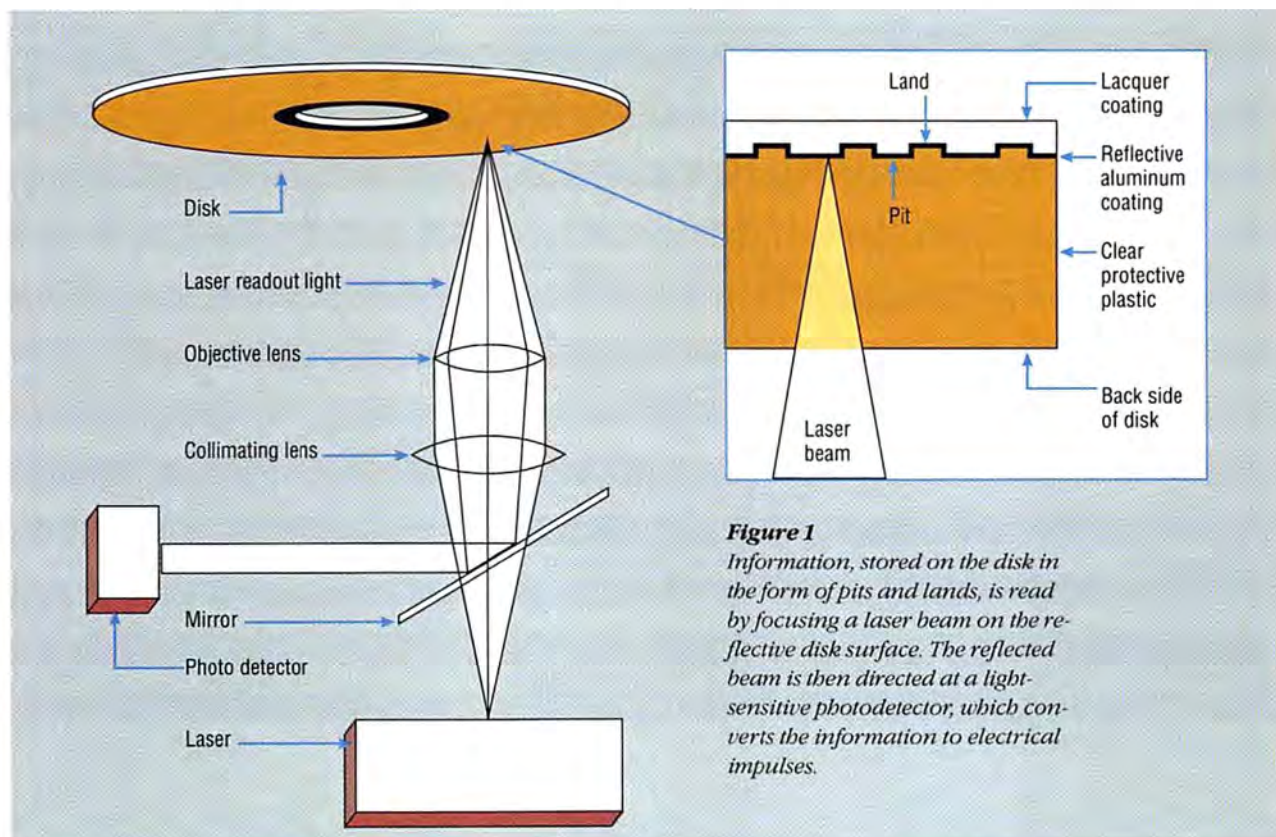


Figure 1
Information, stored on the disk in the form of pits and lands, is read by focusing a laser beam on the reflective disk surface. The reflected beam is then directed at a light-sensitive photodetector, which converts the information to electrical impulses.

Mac CD ROM Disks

Company/CD ROM Title	Description	Text	Graphics	Sound	Availability
Aries Systems					
Medline Knowledge Finder	Abridged database of citations for medical literature from National Library of Medicine	•			2nd Q 1988
Arc Laser Optical Technology					
n/a	Public domain, shareware software, and HyperCard stacks				now
Bowker Electronic Publishing					
Books in Print Plus	Database of publication and ordering information for 770,000 in-print and forthcoming titles	•			2nd Q 1988
Books in Print Plus with Book Reviews Plus	Books in Print database plus 25,000 unabridged reviews from Publishers Weekly, Library Journal, School Library Journal, Choice, and Booklist	•			2nd Q 1988
Facts On File					
The Visual Dictionary	Cross-referenced, illustrated, multilingual dictionary with audio for language teachers; available in French/Spanish/English	•	•	•	4th Q 1988
Grolier Electronic Publishing					
Electronic Encyclopedia	Academic American Encyclopedia	•			2nd Q 1988
Highlighted Data					
Merriam-Webster's Ninth New Collegiate Dictionary	Cross-referenced dictionary includes illustrations and digitized pronunciations of words		•	•	2nd Q 1988
Electronic Map Cabinet	Maps of U.S.; custom maps possible for features including streets, lakes, and local reservoirs; tools for annotating maps; PICT- and MacPaint-compatible maps		•		2nd Q 1988
LaserScan Systems					
Broward County Real Estate Analysis	Contains all real estate recording information for properties in Broward County, Florida		•		now
MacroMind					
TBA	Disk of color presentation tools, animations, and storyboards	•	•	•	3rd/4th Q 1988
Micro Dynamics					
TBA	Color, high-end clip art/images disk		•		TBA
Multi-Ad Services					
Kwikee Inhouse Graphic Services	Manufacturer, private-label, and theme-vectorized clip art; includes page-layout software		•		now
Optical Media International					
Universe of Sounds, Volumes 1-3	Digitized sound samples and sound effects for digital samplers			•	now

Company/CD ROM Title	Description	Text	Graphics	Sound	Availability
SilverPlatter					
Medline on SilverPlatter	Complete Medline database from National Library of Medicine	●			2nd Q 1988
Cancer-CD	References, abstracts, and commentaries for literature about cancer and related subjects	●			2nd Q 1988
Chem-Bank	Collection of databanks containing information on potentially hazardous chemicals	●			2nd Q 1988
PsycLit	Journal citations with abstracts in psychology and behavioral sciences	●			2nd Q 1988
OSH-ROM	Database of occupational health and safety information	●			2nd Q 1988
Sociofile	Index to and abstracts of sociology journals	●			2nd Q 1988
ERIC	Bibliographic database sponsored by U.S. Department of Education	●			2nd Q 1988
LISA	Abstracts of literature on librarianship, information science, and related disciplines	●			2nd Q 1988
Agricola/Cain	Database of citations relating to all aspects of agriculture	●			2nd Q 1988
A-V Online	Complete database of audiovisual materials from National Information Center for Educational Media	●			2nd Q 1988
Compu-Info	Database of 12,000 computer product listings; contains information on mainframes, minicomputers, microcomputers, operating systems, communications, display terminals, and peripherals	●			2nd Q 1988
Software-CD	Over 10,000 listings of software packages for business, professional, and technical computer users	●			2nd Q 1988
Corporate & Industry Research Reports	Cumulative index with abstracts to over 70,000 corporate and industry reports written by securities and investment banking firms	●			2nd Q 1988
Virginia Polytechnic Institute and State University					
n/a	Demonstration/research disk containing library's holdings in Machine-Readable Cataloging (MARC) format	●			2nd Q 1988

The Hierarchical File System (HFS) is Apple's first logical format for CD ROM. CD ROM disks appear on the desktop as volumes—just like hard disks—organized with folders and files. Using HFS as a logical format makes it easier for current Mac developers to utilize CD ROM.

Apple has plans to support a second logical file format, High Sierra, as soon as possible. Most publishers feel the sooner, the better. High Sierra is a de facto standard for the IBM PC.

Since CD ROMs available for the IBM PC number almost 200, Mac High Sierra

support is vital. Currently, there is one way to retrieve information on a Mac from a text-only CD ROM for the IBM PC: a utility from Highlighted Data translates between Mac and High Sierra file structures.

Search and Retrieve

To navigate through CD ROM data, you use software called the *search and retrieval engine*. Retrieval software finds specific information and presents it to you. You access the search and retrieval engine through a user interface consisting of menus, commands, or dialog boxes (see "Knowledge Finder").

Most retrieval software is specifically tailored to CD ROM now, but you'll find a familiar program being used soon. Once Apple releases a version of *HyperCard* that works with read-only media (like CD ROM), expect to see new CD ROM disks taking advantage of its browsing power. *HyperCard* handles not only text, but graphics and sound as well (see "HyperCard Retrieval"). Many Mac CD ROM developers are working on proprietary engines, however.



The three drives available for the Macintosh all connect to the SCSI port: (from left) the Laser Magnetic Storage International CM 131, the ALOT (formerly LoDown) CD ROM, and the Apple CD ROM drive.

One interesting disk will be a CD ROM version of the *HyperCard*-based *Whole Earth Catalog* now in development. Initially distributed on floppy disk, the CD ROM version of the catalog will include sound, images, and graphics, all controlled by *HyperCard*. Because the entire catalog is expected to exceed 100MB, it's destined for CD ROM. No release date has been set yet for the CD ROM version.

What Can I Get?

Several CD ROMs are available now—or will be soon after you read this. They target a variety of Mac users with specific information needs.

One CD ROM that will get writers' attention is Microsoft's *Bookshelf*, a CD ROM available on the IBM PC. *Bookshelf* is a collection of reference works, including *The World Almanac and Book of Facts*, *American Heritage Dictionary*, *The Chicago Manual of Style*, *Roget's Thesaurus*, and *Bartlett's Familiar Quotations*. At the time this article went to press, Microsoft was planning to include with its Mac version of *Bookshelf* features such as sound and graphics, which are not offered on the PC version.

Medical researchers, doctors, and nurses can access the U.S. National Library of Medicine's Medline database with Aries Systems' *Medline Knowledge Finder*. *Medline Knowledge Finder* takes 225 titles

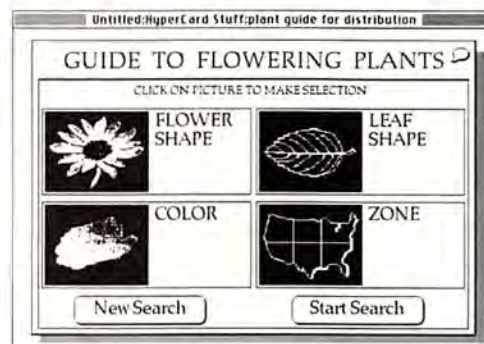
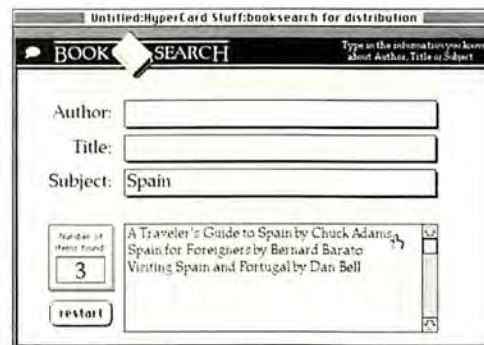
from Medline and puts all their bibliographic information on CD ROM. Up to five years of indexed citations—as many as 240,000—can fit on one disk.

Newspapers and advertising agencies can subscribe to Multi-Ad Services' *Kwickee Inhouse Graphic Services* for monthly assortments of outline clip art on

CD ROM. Each CD ROM contains more than 75 indexed pieces of theme art, plus an assortment of company logos and manufacturer-approved product art.

Highlighted Data is publishing two CD ROM disks for the Mac. The *Merriam-Webster's Ninth New Collegiate Dictionary* includes all the definitions, graphics, special fonts, and phonetic symbols in that dictionary. Word cross-references are linked on the CD ROM, which also provides pronunciations using the Mac's sound capability.

The Map Cabinet allows you to develop maps on the Mac. You can zoom from a U.S. state overview to very detailed maps by selecting features like county boundaries, city streets, even local reservoirs. Included with *The Map Cabinet* are graphics tools for enhancing or annotating your tai-



HyperCard Retrieval

These two prototype stacks were developed at Apple as examples of how HyperCard could be used to search a CD ROM database. The top stack demonstrates a method for searching a library's holdings, while the bottom stack provides access to a plant database.



Remote Control

The CD Remote controller is an Apple desk accessory that lets users manually control the CD ROM player. The CD Remote DA, like the hand-held remote controllers for audio CD players, provides for program selection as well as fast-forward and reverse scanning.

Writing with Lasers

A WORM, or write-once, read-many disk, is another type of optical disk. Its capacity ranges from 400MB to several gigabytes (1000MB), depending on the physical size of the disk.

Unlike a CD ROM, you can write information to a WORM, but with one limitation—as soon as you record data on the WORM, that data can never be erased from the disk. You can access the information on the WORM as much as you want (just like a CD ROM). Hence “write-once, read many.”

Recording to a WORM disk changes part of the disk physically. A high-intensity laser heats the surface of the disk so that tiny blisters or pits are formed. Those deformations are then read by a lower-intensity laser.

In contrast to a CD ROM, which contains published data, a WORM allows you to *archive* any document you've either created with your Mac or scanned into your Mac. Since you can't erase anything on a WORM disk, you'll have a historical record of financial statements, documentation, CAD drawings, or newsletters. Some

software developers even maintain every version of their working code on WORM disks.

Unlike CD ROM disks, WORM disks don't conform to a single physical standard—and it's unlikely they ever will. Disks come in several sizes, ranging from 5¼ inches to 19 inches. The 5¼-inch WORMs are generally the most popular. And, unlike CD ROMs, WORMs are enclosed in hard plastic cartridges, similar to the Mac's floppy disk.

Individual WORM drives record and read information to disks differently. As a result, two 5¼-inch WORM disks are not interchangeable between drives from different vendors.

Several vendors offer WORM drives for the Mac. Micro Dynamics' Multiuser Archival and Retrieval System (MARS) uses WORM drives to store scanned and computer-generated documents in a network environment. The optical drive actually acts as an AppleTalk (or EtherTalk) file server. You can choose from WORM drives of various capacities and sizes, depending on your needs.

The Laser DataBank from

Optotech provides 400MB of storage per 5¼-inch WORM disk. The drive attaches to the Mac's SCSI port. Proprietary software allows you to exchange WORM data between the Mac SE and II, Digital Equipment's MicroVAX II, Sun's Sun-3 computer, and IBM PCs.

A 400- or 800MB WORM drive is also available from Arc Laser Optical Technology (ALOT). You can buy that drive by itself, or as part of ALOT's CD ROM development system. US Design offers WORM drives as an option in its VIP 3000 storage subsystem for the Mac. Another WORM drive is on the horizon from ADIC.

If 800MB isn't enough, you can daisy-chain WORM drives for more storage. Another option is a WORM jukebox, which is exactly what the name implies—a changer inserts optical disks, rather than records, into a player. Optotech's Optofile jukebox can automatically manage 66 optical disks and four drives. (If you're counting, that's 26.4 gigabytes of storage with 400MB WORMs.)

lored map. Maps can be saved in both PICT and *MacPaint* formats for export to other programs.

LaserScan Systems offers the *Broward County Real Estate Analysis* for real estate appraisers. That CD ROM contains information for property—residential, commercial, and open acreage—in all of Broward County, Florida. If you like sounds and have a MIDI-compatible synthesizer, Optical Media International's *Universe of Sounds* CD ROMs (a three-volume set, so far) contain almost every sound effect and sample you could hope for. R. R. Bowker's *Books in Print Plus with Book Reviews Plus* in-

cludes information on every title in print, along with reviews of those books from five journals.

If it appears from the first group of disks that CD ROM has a multitude of applications, it's true. You'll soon see reference works for writers, animation clip art for presenters, and foreign language dictionaries with sound for teachers, all available on CD ROM. □

See *Where to Buy* for contact information.



Page-Makeup Roundup

On picking a publishing package

by Steve Cummings

When you set out in search of a Macintosh desktop publishing package, prepare yourself for a seemingly endless cascade of software features. Much of this deluge is attributable to the daunting complexity of the task these products tackle.

Desktop publishing programs must integrate more major functions—text editing, typography, graphics, file exchange, printer control, and of course, page layout—than products in any other software category. And each function needs its own set of features.

Another factor that adds force to the features gusher is the intense competition for a share of the growing PC publishing market. At latest count, a half-dozen





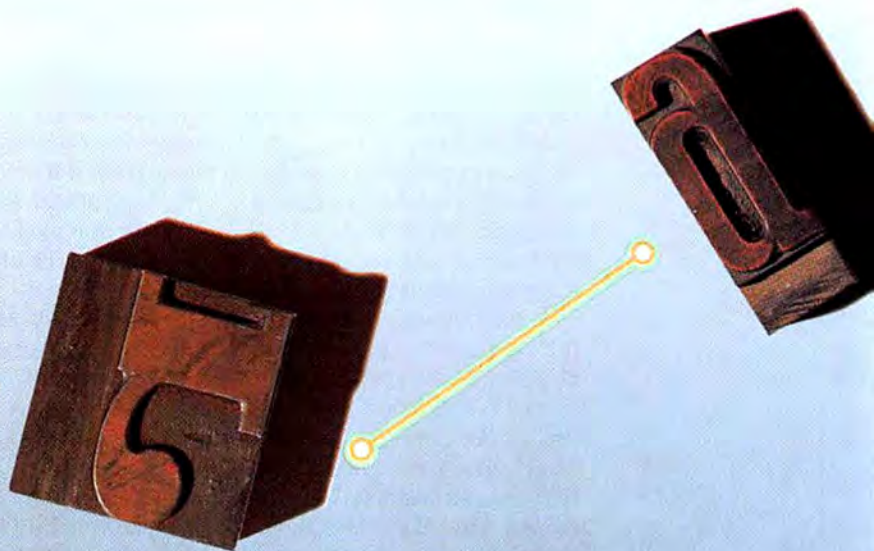
software products qualify as full-blown, general-purpose desktop publishing programs—Aldus's *PageMaker 3*, Letraset's *ReadySetGo 4*, Quark's *XPress*, Orange Micro's *Ragtime*, Target Software's *Scoop*, and Boston Publishing Systems' *MacPublisher III*—each hurrying to tack on new talents in the struggle to distinguish itself.

The resulting flood of options might overwhelm even the most steady mind. Which capabilities are really the most essential? Brace yourself, and we'll try to tame the tide of desktop publishing features.

The Basics: Layout

Page layout is the heart and soul of the desktop publishing idea. All the Mac products included in this comparison use the page as the basic metaphor for fundamental layout tasks. Before you can start positioning text or graphics, you must define the size of your page and divide it into a grid of columns and horizontal lines. Guided by the grid, you then affix text or graphic elements to the page. Typically, a text or bit-mapped graphic element goes into a special reserved area on the page—variously called a box, frame, or block—while an object-type graphic doesn't require a holding area. Boxed or not, each item of text or graphics retains an independent existence as far as its size and placement on the page are concerned.

Fortunately, all the current Mac products provide comparably effective tools for the basic layout tasks of creating, moving, and resizing design elements. Still, a few amenities distinguish some of the programs. For example, when you're experimenting with alternate



layouts, you'll appreciate the way *Scoop*, *PageMaker 3*, and *MacPublisher III* allow you to move elements to an easily accessible temporary holding area. The other programs make you go through an involved process just to bring things in for a look. And although all the programs let you create boxes of any size manually, only *Scoop* and *Ragtime* let you set up an automatic format with mixed-column widths (two columns, say, at the top and four at bottom).

All these programs enable you to create timesaving *master pages* for each document. Master pages contain specifications for margins, headers, and layout boxes and make it easy to insert repeating elements, such as logos. In all the programs you can specify different master-page layouts for left and right pages. But only *MacPublisher III* and *Scoop* can define multiple master pages within a document. The other programs let you import multiple formats from additional files, but this approach isn't as convenient.

Import/Export Files

Although all desktop publishing (DTP) programs include facilities for text and graphics editing, these facilities usually serve primarily as vehicles for assembling a set of elements prepared using other software. With that mission to fulfill, flexible importation skills are a must.

Steve Cummings has desktop-published four software manuals and has written extensively on desktop publishing topics.

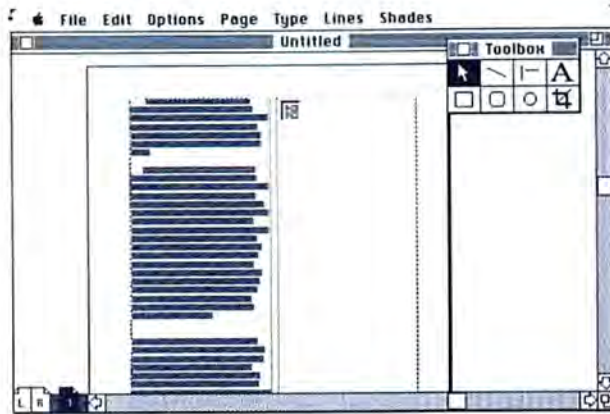


Figure 1

In PageMaker you "load" a special cursor with text from a disk file, then click on the column where you want to place the text. If the text overflows the column, you can reload the cursor to continue placing text in another column, as shown here, or you can have the program flow the extra text to the next available column automatically.

Mac desktop publishing products generally do a creditable job of reading text files in ASCII (text only), *MacWrite*, and *Microsoft Word* formats. *MacPublisher III*, disappointingly, strips out all font and tab information and limits you to importing 32K of text at a time. *MacPublisher III* is also the only program that won't let you insert new text from a disk file into a block of text you've already laid out—a serious flaw.

All the programs import *MacPaint* and *MacDraw* (PICT) graphics, and all accept and display encapsulated PostScript (EPS) files. Direct support for high-resolution bit maps, however, is less common—a surprising deficiency in the age of the laser printer. Although you can always paste in 300-dots-per-inch (dpi) graphics created in programs such as *SuperPaint* via the Clipboard, none of the desktop publishing packages reads such files directly. Only *Scoop* and *PageMaker 3* accept *Abaton Scan 300* 300-dpi bit-mapped graphics, and only *XPress 1.1*, *PageMaker 3*, and *ReadySetGo 4* read TIFF files.

File exchange is a two-way street. There will be times, for instance, when you'll want to take elements out of your DTP software and put them in your word processor to make major revisions. *ReadySetGo 4*, *PageMaker 3*, *XPress 1.1*, and *MacPublisher III* allow exportation of plain text files. But only *PageMaker 3* can preserve formatting when exporting to *Word* and *MacWrite*. And while you can save graphic elements to the Clipboard, only *MacPublisher III* has its own facilities for saving document pages in *MacPaint* format.

Text Handling

Before the allure of the latest fancy effects distracts you, remember that you'll probably spend most of your time on basic text-related layout and editing chores. For most applications, you should insist above all else that the program you buy has a solid core of text-handling features.

In the first place, laying out text can be a complicated affair. At a minimum, every program provides a manual method for placing text on one page at a time. In most programs, you must first explicitly create the screen boxes that will hold the text and then either import a word processor file or type in text from scratch.

You can flow text through two or more boxes anywhere in the document, but you have to link the boxes one by one with a special command.

PageMaker is the exception. In Aldus's program, the manual text-layout method starts when you call up a specific file. You then click on an empty area of the screen at the spot where you want the text to begin. The program generates the necessary text box automatically, sizing it horizontally to fit the page grid you've previously created, and vertically to match the length of the text. With *PageMaker*'s manual method, if your text overflows the bottom of the page, the program waits till you click on another empty column or on a new page, and then creates a new box automatically linked to the previous one (see Figure 1).

Whichever program you use, the manual approach to text layout provides the flexibility you need for columnar, newspaper-style formats, and it makes intuitive sense if you're used to laying out projects with scissors and glue. Manual layout can be cumbersome, however, for long documents (like books) that use the same format on most pages. For such projects, you'll want a feature that flows text automatically over consecutive pages, creating new pages as necessary according to your master-page layout. At this writing, only *PageMaker 3* and *XPress* qualify.

The Mac's standard Cut, Copy, and Paste commands lend basic text-editing capabilities to all these DTP programs. *XPress* lets you select anything from a word to an entire text block for cutting or copying simply by clicking the mouse a different number of times for each operation. *Ragtime*, *XPress*, and *ReadySetGo 4* offer search-and-replace as well, a feature many find indispensable.

Of course, the primary reason for using a desktop publishing program is to improve your text's appearance, and the more typographic control you have the better. All the programs let you change fonts, font sizes, and styles, but you'll find some critical differences in this area. *MacPublisher III*, for example, won't let you change fonts or sizes within a text box and doesn't display styles while you're editing the text. These are grievous limitations. In addition to the stan-



dard Mac text styles (bold, italic, underline, and so on), *Scoop* gives you superscript, subscript, strikeout, inverse, and boxed options as well. *Ragtime* lets you search and replace according to font and style throughout a document, saving you lots of time if you want to change an element's format.

The range of font sizes supported varies. If you're planning to print gigantic banners, for instance, note that only *XPress* can handle sizes up to 500 points. Automatic and manual justification, kerning, leading, and other spacing controls are built into all these packages, although some permit greater precision than others. *ReadySetGo 4* and *MacPublisher III* allow spacing adjustments no finer than 1 point ($\frac{1}{2}$ inch), the size of a pixel on the Mac's screen. *Scoop* and *XPress* support smaller increments, even though the tiny changes can't be displayed on the screen.

In most documents, the paragraph serves as a fundamental stylistic unit. If you're writing a technical manual, for example, you'll probably use a few paragraph styles over and over—one for the body of your text, another for the bold and indented material in the step-by-step instructions, and so on. With all the pro-

grams except *MacPublisher III*, you can automatically format different types of paragraphs in the same text block with different font, style, and spacing attributes.

At a minimum, you should have a way to copy formats from one paragraph to another, as you can in *XPress* and, to a degree, in *Ragtime*. Better still is an arrangement that lets you store a selection of paragraph formats with descriptive names and then call upon them as necessary from a menu. This facility is offered by *PageMaker 3*, *Scoop*, and *ReadySetGo 4* (see Figure 2). The latter program even allows you to access formats from the keyboard, reducing the time you'll spend hunting through menus.

Assuming the fundamentals have been covered, there's certainly a place for special text effects. A function that fills the space up to the next tab stop with a character of your choice is great for making easy-to-read tables; *ReadySetGo 4*, *XPress*, and *PageMaker 3* all have this feature. *Scoop* and *MacPublisher III* let you rotate text or print it in gray shades, and *Scoop* permits slanted margins.

Of the programs in our survey, only *MacPublisher III* and *PageMaker 3* lack the ability to catch and

Interleaf: DTP Gets Serious

Make no mistake about it: *Interleaf* is not for the dabbler in desktop publishing. *Interleaf* document processing software for the Mac is aimed squarely at corporations with multiple workstations. If you're outfitting a department or if you're a professional writer who lays out and produces your own books or manuals, *Interleaf* has a lot to offer.

The folks at Interleaf acknowledge that their \$2495 price tag is high for people who think only of *MacWrite* when they think of word processing. In the corporate publishing market, however, that price—even including the required Mac II with 5 megabytes of memory—is remarkably low compared even to *Interleaf* software running on other workstations.

Among personal computer desktop publishing packages, *Interleaf* is unique in its level

of software integration and its ability to handle the details of long documents. Integration is generally modelless. The package includes word processing with stylesheets and spelling checking, paint capabilities, chart generation, the ability to read scanned (bi-level) images, and output to PostScript laser printers or typesetters.

Long document handling is more complete than in *Microsoft Word* or any of the Mac programs reviewed in this article. For example, figure and table numbering is automatic across files—the software maintains proper numbering even when a new figure is inserted in the text and updates embedded references to the figure or table simultaneously. Pagination is continuously updated. The program treats files stored in its Book icon as a single object, making global changes easier. On the other hand, because

Interleaf works in some ways more like a word processor than a layout program, there are things it can't do. For example you can't specify that a graphic will run across the bottom of a two-page spread with text flowing in the top half, since the program would read this as text, graphic, text, graphic.

Interleaf is intended for a networked environment where files created on other computers—from writers using SEs and various Mac word processors, for example—can feed into two or three Mac IIs doing formatting and layout chores. The one drawback for Mac users is that *Interleaf* makes little or no use of the Mac interface; the program emulates the graphic screens of its Sun- and Apollo-version cousins. This interface is clumsier, in ruler and tab setting for example, than Mac people may be used to.

Layout Wrap-up

	PageMaker 3 ¹	Quark XPress 1.1	ReadySetGo 4.0	Scoop 1.01	MacPublisher III	Ragtime 1.1
Price	\$595	\$495	\$495	\$495	\$100	\$395
Required Memory	1MB	512K	512K	512K	512K	512K
Program Operation						
Files						
number of documents open	1	7	unlimited	unlimited	1	unlimited
maximum number of pages	128	unlimited	unlimited	unlimited	1024	350
stores graphics/text elements as separate files					•	
Screen display						
facing pages	•	•	•	•	•	
number of fixed magnification levels	4	4	4	6	10	2
fits in window	•	•	•	•		
thumbnails				•		
supports color	•	•	2	•	•	
supports large screens	•	•	•	•	•	•
Page Layout						
Rulers: user-selected units	•	•	•	•	•	•
Place and size boxes numerically	•	•	•	•	•	
Master pages						
left/right pages	•	•	•	•	•	
multiple masters		from file		•	•	from file
preset font and style	•			•		•
Protected templates	•			•		•
Maximum page size (in inches)	17 × 22	48 × 48	99 × 99	17 × 22	21 × 28	139 × 139
Automatic page numbering	•	•	•	•	•	•
Automatic page numbering for "continued from"/ "continued on"		•	•		•	3
Text						
Text editing						
search and replace		•	•			•
search by font attributes (size, style)		•			•	
insert file into existing text	•	•	•	•		•
boilerplate text			•			
Paragraph formatting						
copy format directly		•				
stylesheets	•		•	•		
keyboard select			•			
include text style/font	•		•			
import/export with text file	•					
Layout						
automatic pages	•	•				
automatic runaround	•	•	•	•		
fill irregular objects with text				•		
rotate text				•	•	
Effects						
superscripts/subscripts	•	•		•		•
stretch text		•	•	•	•	•
gray-scale text		•		•	•	
reverse (white on black)	•	•		•		
color	•	•		•	•	

	PageMaker 3 ¹	Quark XPress 1.1	ReadySetGo 4.0	Scoop 1.01	MacPublisher III	Ragtime 1.1
TypeSetting						
range of font sizes (points)	4 to 127	2 to 500	1 to 255	4 to 127	2 to 127	1 to 127
fractional font sizes		•		•		
line leading	•	•	•	•	•	•
paragraph leading	•	•	•	•		
word spacing	•		•	•		
automatic/manual kerning	both	both	both	both	both	
variable letterspacing	•	•	•	•		
raggedness control				•		
hanging indents	•	•	•	•		•
fractional baseline shifts			•	•		
change case of selected text	•			•		
automatic leading to fill vertically				•	•	
kerning increment	¼ em	.005 em	1 pt.	1 pt.	1 pt.	1 pt.
leading increment	.5 pt.	.001 pt.	1 pt.	1 pt.	1 pt.	1 pt.
Miscellaneous text features						
word count		•				
hyphenation	•	•	•	•	•	
dictionary	•	•		•	•	
algorithm		•	•	•	•	
autohyphenate	•	•	•			
user dictionary	•	•	•			
discretionary hyphens	•	•	•	•	•	
cancel hyphenation on selected word	•		•	•		
spelling checker		•	•	•		
main dictionary size		80,000	>100,000	140,000		
user dictionary		•	•			
batch checking		•	•			
interactive checking				•		
Graphics						
Number of automatic borders		editable	1	1	3	1
Fill patterns	•		•	•	•	gray scale
Border patterns			•	•	•	
Custom borders		•				
Automatic drop shadow				•	•	•
Rotate graphics				•	•	
Display PostScript screen image	•	•	•	•	•	
Paint-type						
create/edit 72 dpi				•		
create/edit 300 dpi				•		
Draw-type						
draw vertical/horizontal lines	•	•	•	•	•	•
draw diagonal lines	•	•	•	•	•	•
draw boxes/ovals	•	•	•	•	•	
polygons				•		
curves				•		
freehand				•		

(continues)

	PageMaker 3 ¹	Quark XPress 1.1	ReadySetGo 4.0	Scoop 1.01	MacPublisher III	Ragtime 1.1
File Importation/Exportation						
Text						
ASCII	imp./exp.	imp./exp.	imp./exp.	imp. only	imp./exp.	imp./exp.
MacWrite	imp./exp.	imp. only	imp. only	imp. only	imp. only	imp. only
Microsoft Word	imp./exp.	imp. only	imp. only	imp. only	imp. only	imp. vers. 1 only
WriteNow	imp./exp.	imp. only	imp. only			
Microsoft Works		imp. only				
Graphics						
MacPaint	imp. only	imp. only	imp. only	imp. only	imp./exp.	imp. only
PICT	imp. only	imp. only	imp. only	imp. only	imp. only	imp. only
TIFF	imp. only	imp. only	imp. only			
EPS	imp./exp.	imp. only	imp. only	imp. only	imp./exp.	
Printing						
Automatic imposition				•		
Reverse order	•	•		•		•
Facing pages on one page				•		
Tiling (automatic/manual)	auto/manual	auto/manual	auto/manual	auto/manual	automatic only	automatic only
Registration marks	•	•	•	•	•	
Thumbnails	•	•		•		
Color-ribbon printing	•	•		•	•	
Spot color separations	•	•		•	•	
Inverse (negatives)		•		•		
Mirror image		•		•		
Print as PostScript file	•		•		•	
Enter PostScript commands within document		•		•		

¹Beta version; final specifications may differ.

²Imported graphics only.

³For "continued on" only.

correct spelling errors. An effective spelling checker should be able to review a complete story, even if it's broken up over a number of linked boxes. Most can, but *Scoop's* checker operates only as you type—no help at all with imported files.

Accurate hyphenation is an absolute must for giving printed text a typeset appearance. Because no algorithm or dictionary will handle every situation correctly, you should look for the ability to insert hyphens manually, to override the hyphenation of specific words, and to shut hyphenation off altogether in a given box or paragraph. If you can create a dictionary to tell the program how to hyphenate particular words automatically, so much the better. *ReadySetGo 4* is particularly flexible in this area: you can instruct the program not to hyphenate capitalized words or the last word in a paragraph, and you can set a maximum number of consecutive lines that end with a hyphenated word.

Graphics

Mac desktop publishing packages may be good at importing graphics from other applications, but most of them offer only the most rudimentary tools for editing images or creating new graphics from scratch. As a rule, you can draw straight lines, rectangles, and circles, and you can fill in or outline two-dimensional shapes with various shades and patterns. In *MacPublisher III* you can place multiple borders around each shape, and *XPress* lets you design your own border patterns. *XPress* also provides a simple way to place shadows behind boxes.

Scoop is the only program to offer substantial graphics-editing features. Its integrated paint and draw abilities make the program a near-equivalent of stand-alone applications in both of these major graphics categories. You can even create and edit 300-dpi bit maps (see Figure 3). *Scoop* and *PageMaker 3* both let you change the shading of bit-mapped images.

Whatever means you use to get the graphics into your documents, all the products we've discussed give

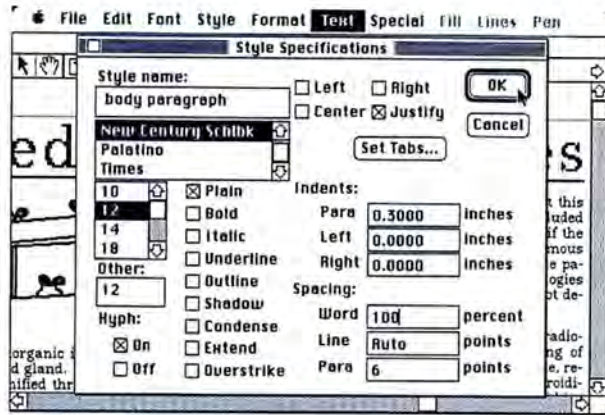


Figure 2
ReadySetGo 4's stylesheet dialog box allows you to define nearly all typographic characteristics and apply them to a paragraph with a single click or keystroke.

you a full complement of commands for moving, resizing, and cropping the pictures. Only *MacPublisher III* and *Scoop*, however, let you rotate images (see Figure 4).

Printing

You'll need a generous set of printer control options to ensure that your document looks as good on paper as it does on the screen. For instance, the ability to enlarge or reduce output is a major plus, since it allows you to adjust to last-minute changes in paper format without missing a beat. In addition, you can increase a document's resolution by enlarging it and then having a commercial printing service reduce it back to the original size.

So that you can avoid having to restack your pages, *Scoop* and *PageMaker* each have a command that makes pages come out of the printer in either reverse or normal order. *Scoop* also lets you print two pages on the same piece of paper. With this option, you can choose whether or not to have the program print consecutive pages together or automatically arrange pages according to a printer's imposition (an 8-page pamphlet, for example, might have pages 1 and 8, 2 and 7, 3 and 6, and 4 and 5 printed together). *MacPublisher III*, *PageMaker*, *XPress*, and *Scoop* all explicitly support color output, either directly on the ImageWriter II with a color ribbon, or by creating spot-color separations in black and white.

One "printing" feature—the ability to save a document onto a disk as a PostScript file—can be absolutely essential, although it's frequently overlooked when comparing desktop publishing packages (you'll find this feature in *PageMaker 3*, *ReadySetGo 4*, and *MacPublisher III*). Of course, all these products can print directly from the Mac to a LaserWriter or an ultrahigh-resolution PostScript typesetting device. But if you don't own a PostScript printer, or if you're using a typesetting service or copy shop Linotronic, you'll find that a plain-text PostScript file makes a more reliable medium of exchange than your program's proprietary file



format. A PostScript file is easier to send via modem, and a typesetter or copy shop will have no trouble downloading it to the printer, even if they don't own the program you used—or for that matter, a Mac.

Accomplished PostScript programmers will appreciate being able to send raw PostScript code directly to the printer. *XPress* lets you embed the code within a standard text block, while *MacPublisher III* places PostScript items in their own boxes on the page but lets you edit the code in a separate window.

What to Make of It All

One thing this journey through Mac desktop publishing features reveals is that the six programs we've examined have more capabilities in common than they have differences. But though all the current products sing much the same song, each has an identifiable voice.

PageMaker, for example, has always covered the bases well, and with version 3's feature additions—notably stylesheets and automatic page creation—it continues to be a strong contender. Other pluses are good scanner support and relatively easy file transfer across the PC-Mac gulf. Deficiencies that may or may not bother you include the lack of a spelling checker—Aldus assumes that most of your text will be coming from a word processor—and the inability to resize text and graphics boxes numerically instead of just by eye with the mouse. Remember that where other pro-

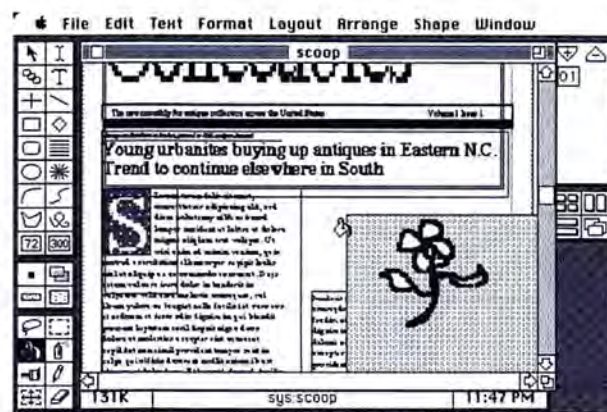


Figure 3
The graphic being edited in this *Scoop* screen is a 300-dpi bit map, generated within *Scoop*. When you open a high-resolution bit map for editing, the program automatically magnifies it for "LaserBit" accuracy.

What You Can't Do

Most of us complacently regard the Mac as the preeminent personal publishing machine and assume that Mac publishing software is the easiest and the most powerful. Truth be told, though, all Mac programs lack some important capabilities that can be found in MS-DOS programs like *Ventura Publisher*, and some of us chafe at the Mac's limitations when faced with the demands of real-life layout work. (Most of these complaints don't apply to the pricey *Interleaf*—see "Interleaf: DTP Gets Serious.")

High on my list of gripes is the incomplete paragraph-formatting controls that Mac programs still make us put up with. Some people might call the features I want special effects, but to me they're everyday layout necessities. Currently, for example, none of the standard programs can automatically place a line beside, below, or around a paragraph to set off a headline or a column of text. Of course, you can draw lines in, but why can't you drop them in on the fly at a predefined width and distance from the text? Likewise, none of the Mac programs yet create automatic drop caps. And none can automatically place bullets or numbers with the proper spacing.

Another missing paragraph-formatting feature is the ability to link paragraphs in different columns so that they float together when text in either column is edited. This is useful, for example, if you want to put comments or subheads in the margin next to the main text.

Stylesheets are an absolute must for heavy-duty layout work. Although they're gradually beginning to appear for the Mac, they need to cover more territory. They should allow you to specify every typographic element, including special effects, and they should be available from the keyboard.

Why don't any Mac DTP programs generate headers and footers? Sure, they let you manually draw them in, but why not have a feature that creates them for you and is smart enough to pick up section titles from the page and place them in the header or footer?

The current field of programs is especially weak when it comes to creating book-length manuscripts. For instance, none of these products will organize multiple files into larger complete works. Ideally a desktop publishing program should number chapters or section headings for you, keep track of them as a unit when you need

to copy documents to another disk, and let you automatically print out separate chapter files together.

None of today's Mac DTP programs generate tables of contents or indexes for you (actually, *MacPublisher III* has a crude table of contents feature, but it only identifies text file titles, not section headings). I've heard some people say that automatic contents tables and indexes are second rate, but they're a vast time-saver compared to starting from scratch.

Mac software's lack of automatic end noting is a bother, but the lack of automatic footnoting really hurts. If you carefully lay out a footnote on a particular page and then edit text anywhere earlier in the document, the footnoted text may wind up on a completely different page from the footnote, and you may have to recast the entire document.

I won't deny that Macintosh desktop publishing programs are improving quickly, but it's easy to bump into some frustrating limitations. Rather than clamoring for more esoteric special effects, let's make sure the publishers cover the features that will make our everyday layout work a pleasure.

grams ask you to define the necessary boxes before you can place text on the page, *PageMaker* creates the necessary box for each specific file that you add to your document. Be sure to try both approaches before you make a purchase.

Of the products that use the make-the-box-first method for placing text, *XPress* and *ReadySetGo 4* are most alike. Both are complete, basic page-layout packages; both are stronger in text-editing features than *PageMaker*; and neither can claim the special graphics prowess of *Scoop*.

Features that might tip the balance toward a particular package, depending on your needs, include *XPress*'s more precise control over text spacing and its support for larger fonts and spot color, and *ReadySetGo 4*'s provision of the all-important stylesheets.



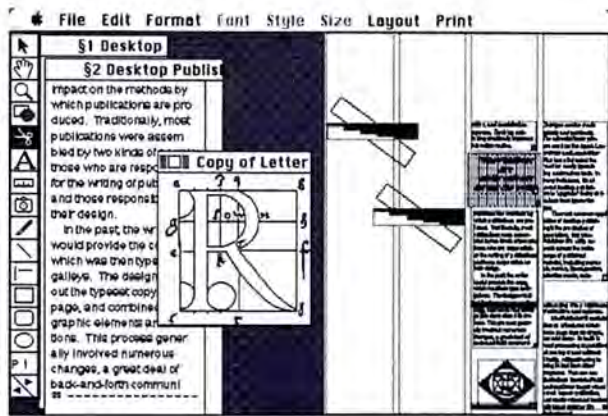


Figure 4

The graphics on the left margin of this MacPublisher page will be rotated on printout. Note that MacPublisher III elements are opened on the desktop and then snipped into position with the scissors cursor shown. Even after they've been placed, these elements remain in separate files.

With its extensive paint and draw features and reasonably strong text abilities, *Scoop* is the only program of the bunch that can be taken seriously as an all-in-one production facility. But despite its versatile list of talents, important features such as a file-oriented spelling checker are still lacking—you probably won't want to dump your current word processor and graphics package just yet. Still, don't overlook *Scoop* if you'd prefer to do as much work as possible within a single program.

MacPublisher III's strengths lie in its graphics effects and color capabilities, and its new ultralow price tag. In fact, because the program implements some key text features so miserably, you should consider it only if your work is heavily oriented toward graphics, or if your budget just won't stretch to take in a more complete program. Until *MacPublisher III's* text-handling features improve, you'll be frustrated if you try to use the program for anything other than headlines, captions, or other short textual elements.

If *MacPublisher III* is for the graphic artist, *Ragtime* is the desktop publishing package for the businessperson. In the current version, it's a solidly built

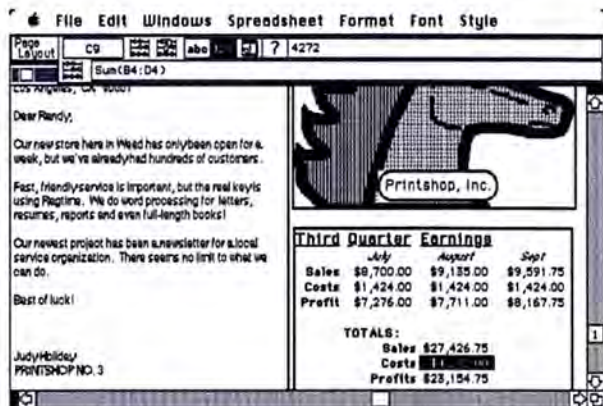


Figure 5

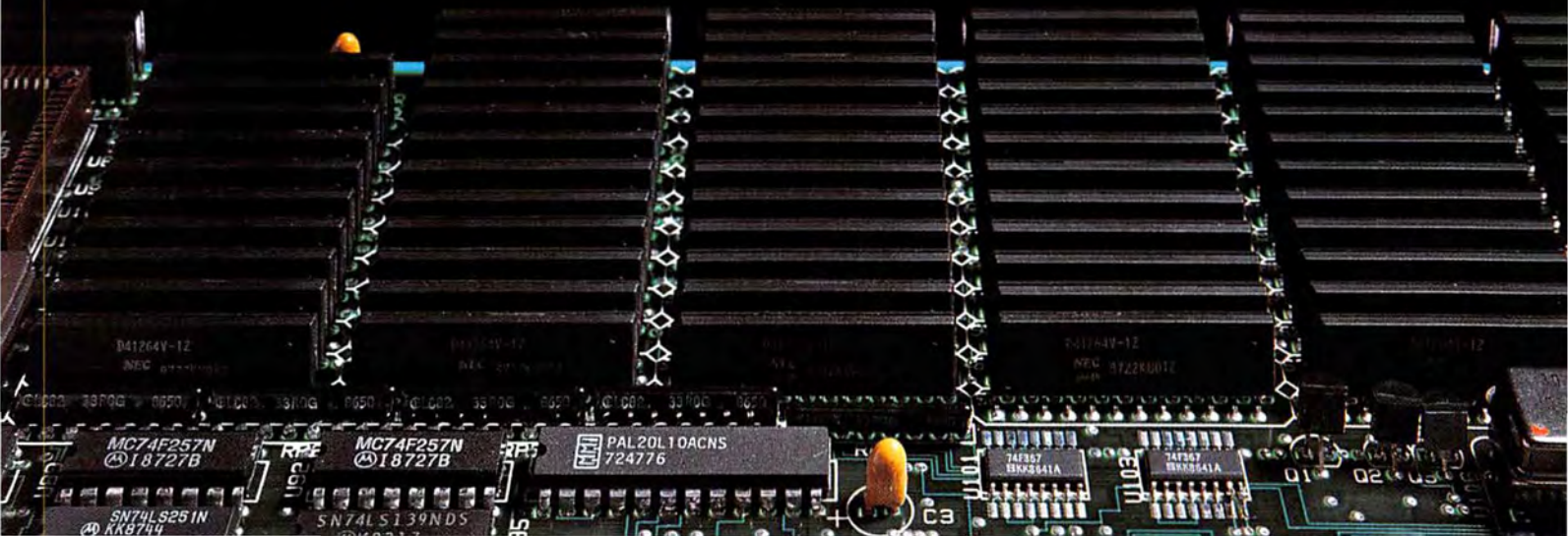
A Ragtime document can integrate text, graphics, and active spreadsheet cells, as shown here.

page-layout package with few frills but one unique feature: a built-in spreadsheet. Spreadsheet cells can be placed anywhere on the page, right along with text and graphics elements, making the package perfect for self-calculating forms and reports (see Figure 5). Although you can import all graphics files from other programs, *Ragtime*, oddly, lacks the ability to generate charts and graphs from its own spreadsheet data. Additions promised for version 2 should make the program fully competitive with the other desktop publishing products in all the standard feature categories—page layout, text, and graphics—but you still won't be able to create spreadsheet charts.

One note: this article has looked only at WYSIWYG publishing programs. When you're looking into Mac DTP, you should be aware that there are at least three code-based packages that may suit you better than the programs I've been talking about here. *T_eX*-tures from Addison-Wesley and *MacT_eX* from FTL Systems are both based on the popular T_eX typesetting language. Knowledge Engineering's *JustText* is a cross between Mergenthaler's Cora language and the Atex language. All these packages offer higher-quality, typesetting-standard Mac programs (with such functions as automatic ligature and kerning control throughout body text, and excellent math typesetting) and powerful document-assembly features. The price, however, is ease of use. In general, these programs are for people who don't mind learning obscure codes and who produce relatively long, standard-format documents. These packages are not for graphic designers.

Whatever type of publishing program you decide you need, you should demand a good deal more than an impressive features list. The program should be fast and bug-free. What's more, the features should be well implemented, so that you can concentrate on using them for productive work rather than on learning how to use them in the first place. The best way to determine whether a program will work for you is to get a good demonstration. Still, a feature-by-feature comparison is a good place to start when you're setting out to choose the desktop publishing package that's right for you. □

See *Where to Buy* for contact information.



Color Graphics in Bloom

*Exciting new graphics developments
bring video and a new level of realism
to the Macintosh*

by David Ushijima

The window that lured buyers away from a text wasteland to a graphics-oriented desktop in black and white has taken on new dimensions. Recently announced products for the Mac II let you display stunning color images as well as record, capture, and display color video. But before you can exploit the capabilities of the new graphics products, there are a host of confusing issues to resolve. A look at the recent developments in graphics hardware will show you what's available and alert you to the key considerations. You should carefully test shipping versions of a product, find out whether the manufacturer will offer updates, and confirm availability dates before you buy.

First More Dots, Now More Colors

Besides a larger screen and increased resolution, the greatest improvement in a graphics system is the ability to display more colors. The first wave of color cards for the Mac II from Apple, SuperMac, and PCPC could all display 256 colors simultaneously (see "Looking through the Mac II Kaleidoscope," *Macworld*, December 1987). While a 256-color palette sounds like overkill for a word processor or a spreadsheet, it's actually a severe limitation for professional painting and drawing programs as well as three-dimensional design and rendering packages. In order to reproduce a scanned color photograph accurately or shade a three-dimensional object, most professional graphics workstations display more than 1,000,000 colors at once.

Cards from RasterOps, SuperMac, and Jasmine now give the Mac II color capabilities close to those found on graphics workstations. Whereas cards like Apple's Macintosh II Video Card store 8 bits of color information for each pixel, the newer cards store 24 bits.

With a 24-bit card, each pixel on the screen can be one of 16.7 million colors. Because most Mac II color cards display about 780,000 pixels, you can display about 780,000 colors at once.

Jasmine, a company known for its hard disks, has introduced the Rembrandt II, a card that has the same resolution as Apple's Mac II Video Card (640 by 480 pixels) but displays 24 bits of color information per pixel. The Rembrandt II was designed by RasterOps, a company started by two Ramtek engineering execs well versed in graphics systems design. RasterOps's own ColorBoard 1/104 combines increased resolution and color capabilities, displaying 1024 by 768 pixels with 24 bits of color information per pixel. Jasmine offers the same card under the name Rembrandt III.

The RasterOps-designed cards consist of two circuit boards, a base card that plugs into the NuBus, and a smaller card that mounts on top of the base card. The base card, which contains a graphics processor and the video synchronization circuitry, is the same for both RasterOps boards. The smaller, piggybacked card contains the video memory tailored for a particular frame buffer (see "A Tangled Web").

SuperMac's Spectrum/24, like RasterOps's ColorCard 1/104, displays 1024 by 768 pixels with 24 bits of color per pixel. Unlike the RasterOps and Jasmine boards, the Spectrum/24 squeezes all its circuitry onto a single card.

24-Bit Color Cards

Video Card	Resolution	Bits/Pixel	Price	Monitors	Prices	Genlock
Rembrandt II	640 × 480	8, 24	\$1995	15" (NEC), 19" (Hitachi)	\$1995, \$2795	optional (\$599)
Rembrandt III	1024 × 768	24	\$2795	15" (NEC), 19" (Hitachi)	\$1995, \$2795	
ColorBoard 1/104	1024 × 768	24	\$2795	15" (NEC), 19" (Hitachi)	\$1995, \$2795	
Spectrum/24	1024 × 768	1, 2, 4, 8, 24	under \$3000*	16" (Sony), 19" (Ikegami), 19" (Sony)	\$2495, \$2995, \$3695	
NuVista	640 × 480	8	\$5995, \$4250 (2MB)			standard
	1024 × 768	8				
	1024 × 1024	32				
	2048 × 1024	16				
	2048 × 2048	8				

* Includes PixelPaint.

The Price of 24-Bit Color

While the newest graphics hardware provides more colors, exploiting those colors with existing Mac software is a thorny issue. Currently most manufacturers, including Apple, concede that Color QuickDraw, the set of Toolbox routines that applications use to draw images, can use only up to 8 bits of color information per pixel, even with the newer 24-bit color cards. In order to provide full 24-bit color and maintain compatibility with existing Mac software, RasterOps, Jasmine, and SuperMac modify Color QuickDraw. In effect, a modified Color QuickDraw creates separate red, green, and blue overlays for each screen. In fact when you display images with the RasterOps, Jasmine, and SuperMac cards, you see the Mac drawing the red, then the green, and finally the blue layer on the screen. As a result, 24-bit images often take about three times longer than 8-bit images to display.

Short of speeding up the Mac II itself, faster 24-bit performance will be hard to achieve. Although dedicated graphics coprocessors like the Texas Instruments 34010 and the Intel 82786 excel at drawing simple lines, circles, and polygons, and moving geometric objects around in a frame buffer, they were not designed with QuickDraw's operations in mind. Even so, designs like RasterOps's use the 34010 to speed up some of the simpler operations like line drawing and moving blocks of bits. However, because QuickDraw uses elements such as irregularly shaped regions that are unique to the Mac, graphics accelerators are large-

ly ineffectual. Until a dedicated QuickDraw graphics controller chip appears, graphics acceleration will be somewhat limited.

At press time, few manufacturers had tested applications with the 24-bit cards. SuperMac's *PixelPaint*, Letraset's *ImageStudio*, Aldus's *PageMaker*, *Quark XPress*, and MacroMind's *VideoWorks II* were said to be working with the 24-bit boards, but I did not test those applications for this article. Manufacturers claim that their Color QuickDraw patches work with any existing color applications that correctly use the pixel-map data structures that Color QuickDraw defines (rather than the older bitmaps).

According to manufacturers, when and if Apple releases a version of the Mac II ROM that corrects the 24-bit color problem, a software update could easily disable the Color QuickDraw patches, and the boards would then conform to Apple's revised system. Until Apple releases such a fix, you'll have to rely on the manufacturer to support the product.

The Fourth Plane

As if 24-bit frame buffers weren't enough, Micro Systems Consultants, a company started by former image-processing systems designers from Comtal, is offering the MSC Color Display Card. MSC's card displays 1280 by 1024 pixels with 32 bits of color information per pixel. The MSC board operates with Color QuickDraw in its 1280 by 1024 by 8-bit mode. Applications must write custom software for the board in order to operate with all 32 bits of color information.

MSC's frame buffer contains a whopping 5 megabytes of memory and can be addressed either as four separate planes of 8 bits each (chunky-planar) or as

A Tangled Web

Storing more bits per pixel both helps and hinders the color display. (For a more basic explanation of graphics displays, see "Chasing Rainbows," *Macworld*, July 1987.)

At the heart of the RasterOps and SuperMac cards is the frame buffer, where the data for each pixel resides. Both manufacturers employ color frame buffers that store 24 bits per pixel to specify the pixel's color. With 24 bits of color information, each pixel can be one of more than 16 million (2^{24}) colors. Because of the number of colors available, 24-bit frame buffers are often called *true color displays*. So far, so good.

In a direct color system the 24-bit color number would directly drive the digital-to-analog convertors, which in turn would produce three analog signals that control the red, green, and blue guns of the color monitor (see "Variations on a Buffer"). If this were the way the SuperMac and RasterOps cards worked, everything would be fine. But of course, nothing is ever simple.

It turns out that Color QuickDraw currently does not work with direct color devices. Manufacturers get around the problem by adding a mechanism called the color lookup table (CLUT) to the frame buffer. The 24-bit number from the frame

buffer points to an entry in the CLUT. Because a single CLUT for a 24-bit card would contain more than 16 million entries and require more than 16MB of RAM, manufacturers divide the 24-bit number into three 8-bit numbers, which point to three separate CLUTs, one each for the red, green, and blue color components. A CLUT, in turn, contains the actual color number that, in its analog form, drives the red, green, and blue guns of the monitor.

CLUT-type graphics cards work fine with existing applications as long as the card contains 8 bits per pixel. Normally, when an application draws in color, the Color Manager identifies the type of color card to which it is drawing. If the color card contains a CLUT, then it builds a lookup table in memory for the colors contained on the card (called the *concrete colors*). Whenever an application draws, the Color Manager uses this table to find the concrete color that comes closest to the absolute color specified by the application.

The problem is that Color QuickDraw expects to see only 8 bits of color information in a CLUT-type frame buffer. The Color Manager does not build the necessary color translation table to convert an absolute color to a 24-bit concrete color, because such a table would occupy an inordinate amount of RAM. To get around this prob-

lem, and the Mac's current inability to address more than 1MB per NuBus slot, both RasterOps and SuperMac introduce yet another twist: they divide the frame buffer into three separate planes, one for each primary color, and then modify Color QuickDraw to work with the resulting organization, called *chunky-planar*.

A chunky-planar organization divides an image into three layers, with the red, green, and blue components stored in different planes, or areas of video memory. In comparison, all the 8-bit color cards on the market use an organization termed *chunky*, where the color information for each pixel is stored sequentially in a single-layer frame buffer. Because the current version of Color QuickDraw works only with the chunky organization used in the 8-bit color cards, both RasterOps and SuperMac add further modifications to support the chunky-planar frame buffers. In effect, their modified Color QuickDraws intercept the normal Color QuickDraw calls and substitute three calls for the red, green, and blue planes, making three passes rather than one in order to draw the image on the screen.

Video Cards

Video	Input	Frame Capture	Frame Buffer	Video Output
QuickCapture	NTSC composite (4 channels)	1/30 second, full frame	640 × 480 × 8-bit gray scale	n/a
ColorSpace II	NTSC composite, RGB	1 second (640 × 480 × 8)	1024 × 768 × 8-bit color* 1600 × 1200 black-and-white	NTSC composite, RGB, PAL (optional)
NuVista	RGB	1/30 second (756 × 486 NTSC) 738 × 576 (PAL)	1024 × 1024 × 32-bit color 2048 × 1024 × 16-bit color 2048 × 2048 × 8-bit color 640 × 480 × 8-bit color 1024 × 768 × 8-bit color	RGB
MegaShot	NTSC composite	1/30 second (512 × 512 × 8)	512 × 512 × 8-bit gray scale	
Rembrandt II	n/a	n/a	640 × 480 × 24-bit color	RGB, NTSC composite (with genlock option)
TV Producer	NTSC composite	n/a	requires Mac II Video Card	NTSC composite
NTSC Converter	n/a	n/a	requires Spectrum or Mac II Video Card	NTSC composite
Mac II-TV-Video Interface	n/a	n/a	requires Mac II Video Card	RGB, NTSC composite (with genlock option)

*ColorSpace IIXL, 1024 × 768 × 16-bit color.

one continuous block of RAM (chunky). Whereas the SuperMac and RasterOps boards use three planes for red, green, and blue, the MSC board provides an additional plane for overlaying an additional 8-bit plane or up to eight single-color images (see "Variations on a Buffer"). In publishing applications where four-color separations are required, each plane can be assigned to the yellow, cyan, magenta, or black (or key) layer of a color separation. The display then lets you preview an image as it would be printed.

The MSC board is primarily aimed at those applications that process or edit the image in the frame buffer (image-processing applications). The board allows external hardware to access the digital signals into and out of the frame buffer and includes a coprocessor interface for an external graphics coprocessor board. With external hardware, the MSC board could also capture frames from an external red-green-blue (RGB) video camera.

As this article went to press, True Vision, a spin-off of AT&T, announced the NuVista card for the Mac II. NuVista, the Mac version of the Vista card for the IBM PC, combines color frame-grabbing capabilities with an immense 32-bit-per-pixel frame buffer. The board captures 756-by-486-pixel NTSC as well as 736-by-576-pixel PAL frames in 1/30 second. TrueVision claims that in its 8-bit-per-pixel mode NuVista works with stan-

dard Mac applications. In addition to its 1024-by-768-pixel or 640-by-480-pixel 8-bit modes, the frame buffer can be reconfigured for 1024-by-1024-pixel-by-32-bit, 2048-by-1024-pixel-by-16-bit, or 2048-by-2048-pixel-by-8-bit operation for custom applications that use TrueVisions' STAGE Software Toolkit. TrueVision's engineers have been working on making the board fully compatible with QuickDraw; however, at press time QuickDraw compatibility was not demonstrable.

Snapshots of the Real World

The products covered so far display Mac-generated images on the screen, but things get much more interesting when you display images from the outside world. You can do that with a scanner, a video camera, or a videotape recorder. Since scanners are digital devices, connecting them to the Mac is fairly straightforward. Video input devices, on the other hand, are totally unlike the Mac's display, and connecting them is more problematic (see "Deciphering Macintosh Video"). New products from Data Translation, Mass Micro, Computer Friends, and MegaGraphics let you connect video sources to the Mac II and capture individual frames or mix the video signal with Mac-generated graphics. The Mass Micro and Computer Friends products, as well as ones from Open Mac and Comtrex, let you record or display Mac screens on an external video device like a VCR.

Data Translation, a manufacturer with years of experience in building image-processing products for DEC VAXs and IBM PCs, now offers the QuickCapture

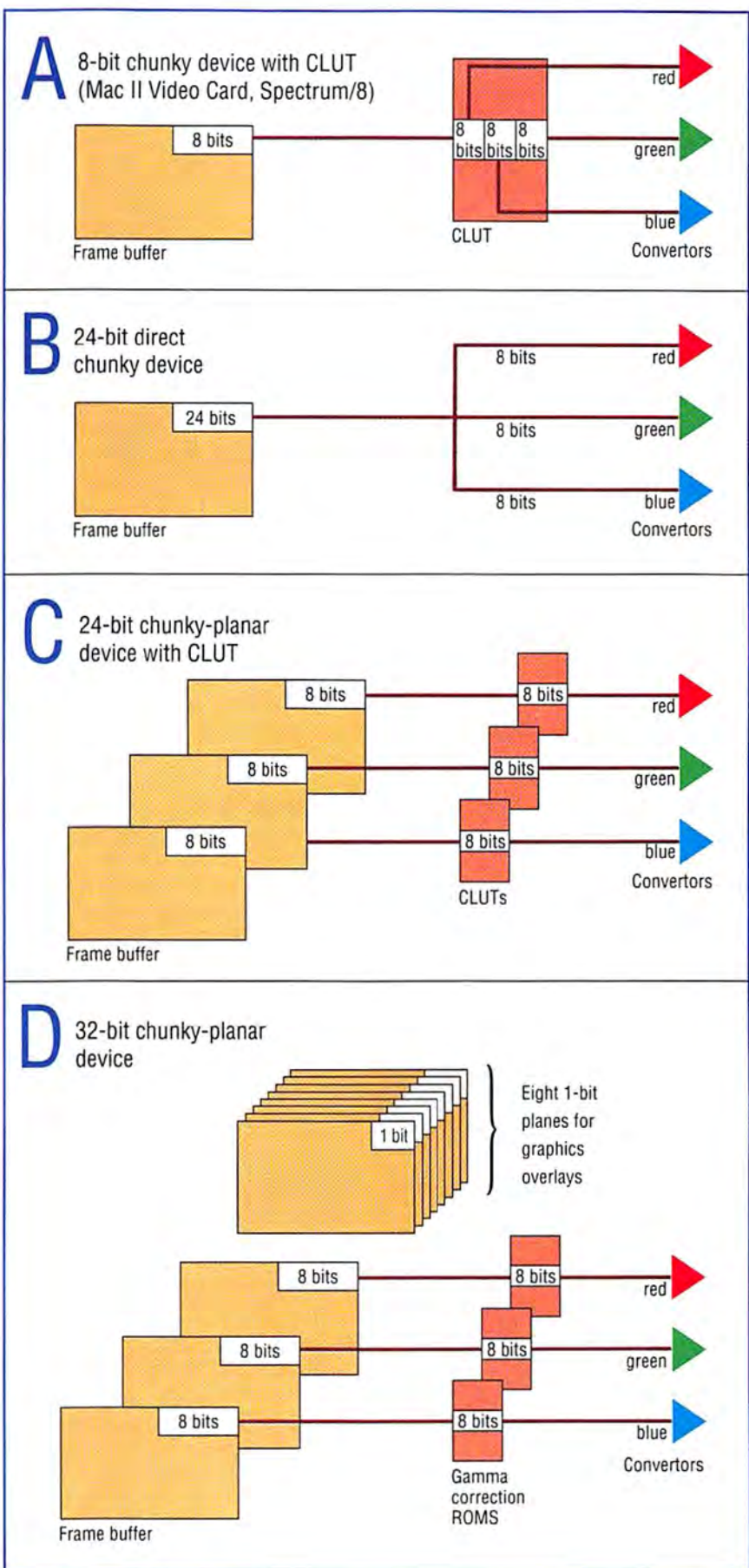
Genlock	Price
n/a	\$995
NTSC/PAL	\$1200
NTSC/PAL	\$5945, \$4250 (2MB)
n/a	TBA
NTSC (optional)	\$1995, \$599 (genlock)
NTSC, RGB (optional), PAL (optional)	\$599, \$799 (with RGB), \$999 (professional)
NTSC (optional)	\$599
NTSC (optional)	\$595, \$1495 (genlock)

frame grabber board for the Mac II. A frame grabber, as its name implies, captures and stores a single video frame (in $\frac{1}{30}$ second). QuickCapture can choose from one of four video sources (cameras or VCRs) that follow the RS-170 and National Television System Committee (NTSC) standards used in the United States, or the Consultative Committee for International Radio (CCIR) and Phase Alternating Line (PAL) standards used in Western Europe. The on-board frame buffer can capture an image with a resolution of 640 by 480 pixels and 256 gray levels. Once the QuickCapture board has captured the image, you can display it on a Mac II video display or save it to disk for importing into other applications using *MacPaint*, tagged-image file format (TIFF), PICT, PostScript, or encapsulated PostScript (EPS) formats.

Software that comes with the board enables you to edit, enhance, and filter an image as well as perform arithmetic operations on the picture using basic Boolean functions. Images saved with the QuickCapture board can also be edited with Letraset's *ImageStudio* and Silicon Beach Software's *Digital Darkroom*. Al-

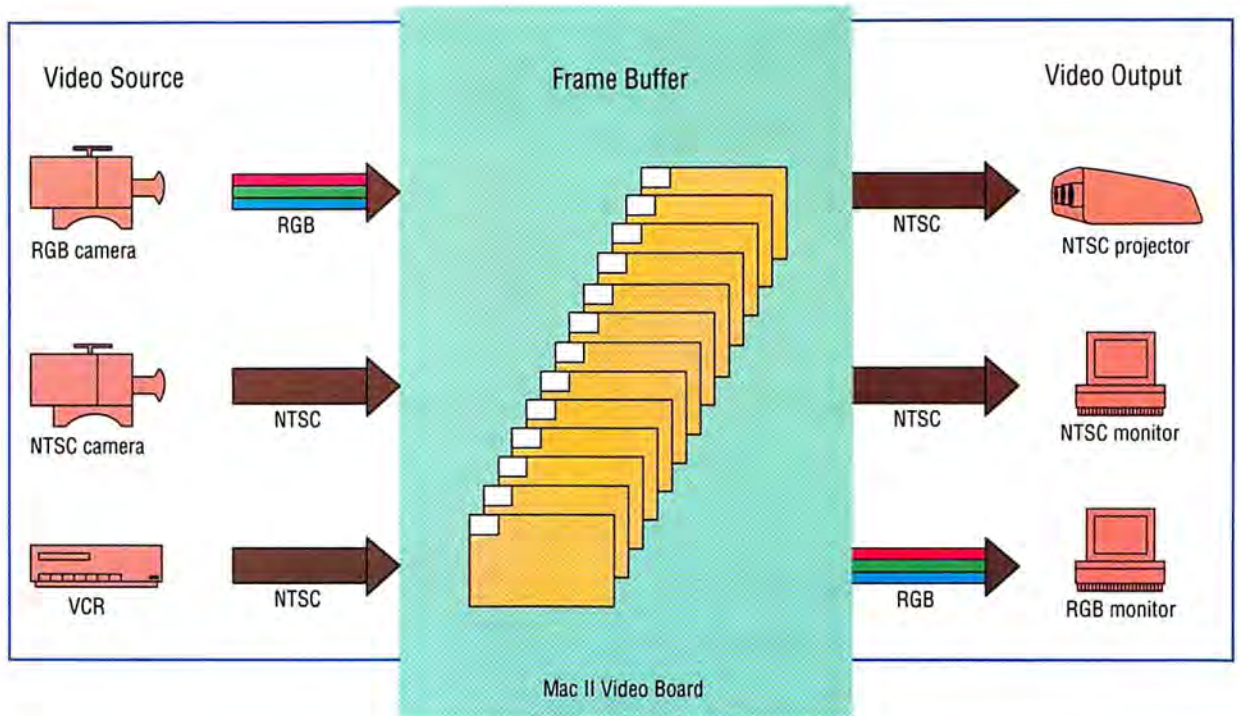
Variations on a Buffer

The most commonly used device on the Mac II is (A) the 8-bit chunky device with a color lookup table (CLUT). Because direct devices (B) currently do not work with Color QuickDraw, 24-bit color cards employ the chunky-planar scheme (C). Cards with 32 bits provide an extra plane (D) for overlaid graphics or an additional color. In each case, digital-to-analog converters send the red, green, and blue information on to the CRT gun.



From Camera to Image

The Mac II video board you choose determines what types of input and display devices you can use. Video cameras come in either NTSC or RGB models, while video recorders output only NTSC signals. NTSC video projectors and monitors are less expensive than their RGB counterparts but display a lower-quality image.



though captured images contain gray-scale information, you can replace any shade of gray with any of 256 colors, each of those chosen from more than 16 million.

Mixing Video with the Mac

Whereas QuickCapture grabs a gray-scale video image, Mass Micro's ColorSpace II card for the Mac II lets you capture a color video image from an RS-170A NTSC video camera or any camera that provides separate red, green, and blue video signals. You can capture NTSC images at a resolution of 640 by 480 pixels with up to 8 bits of color information. Unlike QuickCapture, however, the ColorSpace II card scans much more slowly, requiring 1 second to capture a full color frame. (At press time, the color slow scan feature was not implemented.) Once an image has been captured in the onboard frame buffer, its colors can be modified and the image can be copied to other Mac applications.

In addition to capturing color images, the ColorSpace boards let you mix Mac-generated graphics with a live video signal. By making specific colors in the image transparent, a process called *video keying*, you can overlay Mac graphics on a background of full-motion video.

The live video with the overlaid graphics can be recorded on a video recorder or displayed on an external NTSC projector or a high-resolution analog RGB monitor like the 19-inch Sony 1950 that's sold with the SuperMac and PCPC graphics cards. The contents of the on-board frame buffer can be displayed at a resolu-

tion of up to 1024 by 768 pixels in 256 colors, or 1600 by 1200 pixels in black and white. Mass Micro also offers a version of the ColorSpace card for the Mac SE and plans to offer a 16-bit color version for the Mac II called the ColorSpace IIXL.

Computer Friends' TV Producer, like the ColorSpace II, lets you mix an NTSC color video signal with Mac II-generated graphics. However, rather than supplying its own onboard frame buffer, the TV Producer attaches to the Apple Mac II Video Card via a separate clip-on cable. The mixed video and Mac signal can then be recorded on a video recorder or displayed on an external RS-170A NTSC monitor. If you order the RGB option, you can also display the output on an external, analog, multisync RGB monitor. (For an evaluation of multisync RGB monitors see "Looking through the Mac II Kaleidoscope," *Macworld*, December 1987.) The genlock option lets you synchronize the NTSC output with external video equipment.

Displaying Live Video

Several video display options exist if you don't need the mixing or frame-grabbing capabilities of the ColorSpace or TV Producer cards. Open Mac and Comtrex each offer an NTSC convertor for the Mac II that enables you to record Mac II images on a VCR or display images on an external RS-170A NTSC monitor. Both companies offer a genlock option so you can mix the NTSC output from the Mac on external video equipment.

Another option is available for owners of the Spectrum/8 and Rembrandt-II graphics cards. Jasmine's genlock option, which requires an additional NuBus slot, lets you record and display the 24-bit color images on an external NTSC device as well as use the

Deciphering Macintosh Video

Although the Mac's screen bears some resemblance to an NTSC video monitor, the two are only distantly related. A video display differs from the Mac's screen in three ways. First, the video screen is *interlaced*: all the even-numbered lines are displayed in one pass, followed by all the odd-numbered lines. Second, a video image is refreshed 30 times a second, which is less than half the refresh rate of the Mac's screen. Third, an NTSC color video signal differs from the three analog RGB signals that go from the Mac II's color graphics card to the monitor.

In order to properly connect the Mac with a video device, you need to overcome all three hurdles. The first and second are solved by synchronizing the Mac with the video device, whether it be an input device like a camera or an output device like a video recorder. Once synchronized, the signal from a video camera, for example, controls the rate at which an

image is stored in the frame buffer. A feature called *genlock* allows the Mac to synchronize its display rates to an external video source, like the studio synchronization signal used in video production. Outputting to a video device like a VCR is possible once the Mac can generate a standard NTSC video signal.

The standards you'll see when you look for video equipment are RS-170A and NTSC. RS-170A, a standard defined by the Electronic Industry Association, defines how the signal between a video source like a camera and an output device like a monitor should behave (the Mac can be a video source when you're recording Mac screens on a VCR, or it can be a video output device when you're displaying or capturing frames). The second standard you'll see is NTSC, which defines how the color information is encoded into the video signal. Because the number of lines (525) and the refresh rate

(60 Hz) of television in the United States differs from the standards used in Japan and Western Europe (625 lines, 50 Hz), two other standards, Phase Alternating Line (PAL) and SECAM, are common overseas.

Most of the video products mentioned in the article convert between an RS-170A NTSC video signal and the RGB color representation used in the Mac's frame buffer. The NTSC standard describes a color image in terms of hue, saturation, and luminance, compared to the red, green, and blue color information in an RGB signal. Most RGB monitors display a sharper picture than an NTSC monitor because the NTSC signal is optimized for use with a fairly low-resolution television screen. For example, the standard Mac desktop is largely illegible when displayed on an NTSC monitor because of the flicker and the limited resolution.

output for studio mixing. SuperMac's genlock option involves outfitting The Spectrum/8 with a new crystal and ROM. As this article went to press, Jasmine had not yet demonstrated a working model of the genlock option. If you need to record 24-bit images from the Mac, you should check with the manufacturer to see if any special software or modifications to the frame buffer card are required.

The Changing Image

What impact 24-bit color and video products have on the Macintosh depends on how extensively applications developers integrate into their programs capabilities that were previously considered specialized. At the moment, only a few applications employ the full capabilities of the hardware. However, as advanced graphics products become available and more affordable, a wider range of software can take advantage of

the hardware. Silicon Beach's *Digital Darkroom* and Letraset's *ImageStudio* are two examples of software with a broad appeal that could take advantage of frame grabbers like the ColorSpace II or QuickCapture. By the same token, 24-bit color cards could stimulate developers to incorporate three-dimensional realism in their software. Likewise, multimedia applications like hypertext databases and simulation software can utilize live video to attract a much wider range of people. Even though the graphics landscape will take shape slowly, and the compatibility issues will be thorny, the products available now will keep the Mac in the forefront of personal computing. □

See *Where to Buy* for contact information.

Reviews

HyperCard: What's Practical?

HyperCard 1.01

Data-management software. **Pros:** Good for interactive, visual applications; easily customized; easily links disparate information; speedy searches; provides hook to other programming languages. **Cons:** Not good for structured applications; weak report-formatting; cards cannot be resized; lacks programming utilities. **Company:** Apple Computer. **List price:** \$49.95; bundled with new Macs. **Requires:** Mac Plus. **Copy protection:** None.



HyperCard arrived on the scene with a lot of, well, hype. Apple thought so highly of it that it's now included with every new Macintosh. There's no doubt that this graphics program cum database cum software development tool is exceptional—the difficulty is defining exactly what it's exceptional at.

HyperCard combines MacPaint-like capabilities with database-like text-only fields. The underlying metaphor of HyperCard is a *stack*, or database, of cards. You paint and type the contents of each card, and then link them by creating buttons or by using HyperCard's programming language, HyperTalk. To give a stack some uniformity, you can create a *background*—a design that appears on every card in the stack. Individual cards can be modified further.

Each button, field, card, and background—each *object* in the stack—can have its *script*, or program. So with some programming you could, for instance, display a hidden field, perform a calculation, or display a totally different card—just by moving the cursor over a specific area. Using buttons to navigate among cards in a stack, you can jump between wildly disparate information, but only if someone has done the scripting to make the associations.

Not Your Average Database

The informal, button-controlled interactive links between cards in different stacks point out a major difference between HyperCard and more traditional record-oriented database programs. In traditional databases—even relational ones—links occur because the program associates data in one record with matching data in another. For example, you enter a company name into an invoice; the database program matches that name to a record in a different file and automatically enters the company's address. HyperCard can do that too, but the link does not have to be formalized (created through an indexed field when the database is first designed, for example) nor must it have any logic behind it other than your desire for easy access to some piece of information.

Also unlike traditional databases, HyperCard puts linking under the explicit control of the stack developer. Thus the developer can create a navigational link (moving from card to card) or a programmatic link (reading data from another card). If the developer wants to forge a link between dinosaurs and birds, then so be it. Moreover, anyone who uses the stack can customize it further by creating more buttons or by adding new scripts. (Customizing stacks, however, can quickly result in a complex nesting of procedures.)

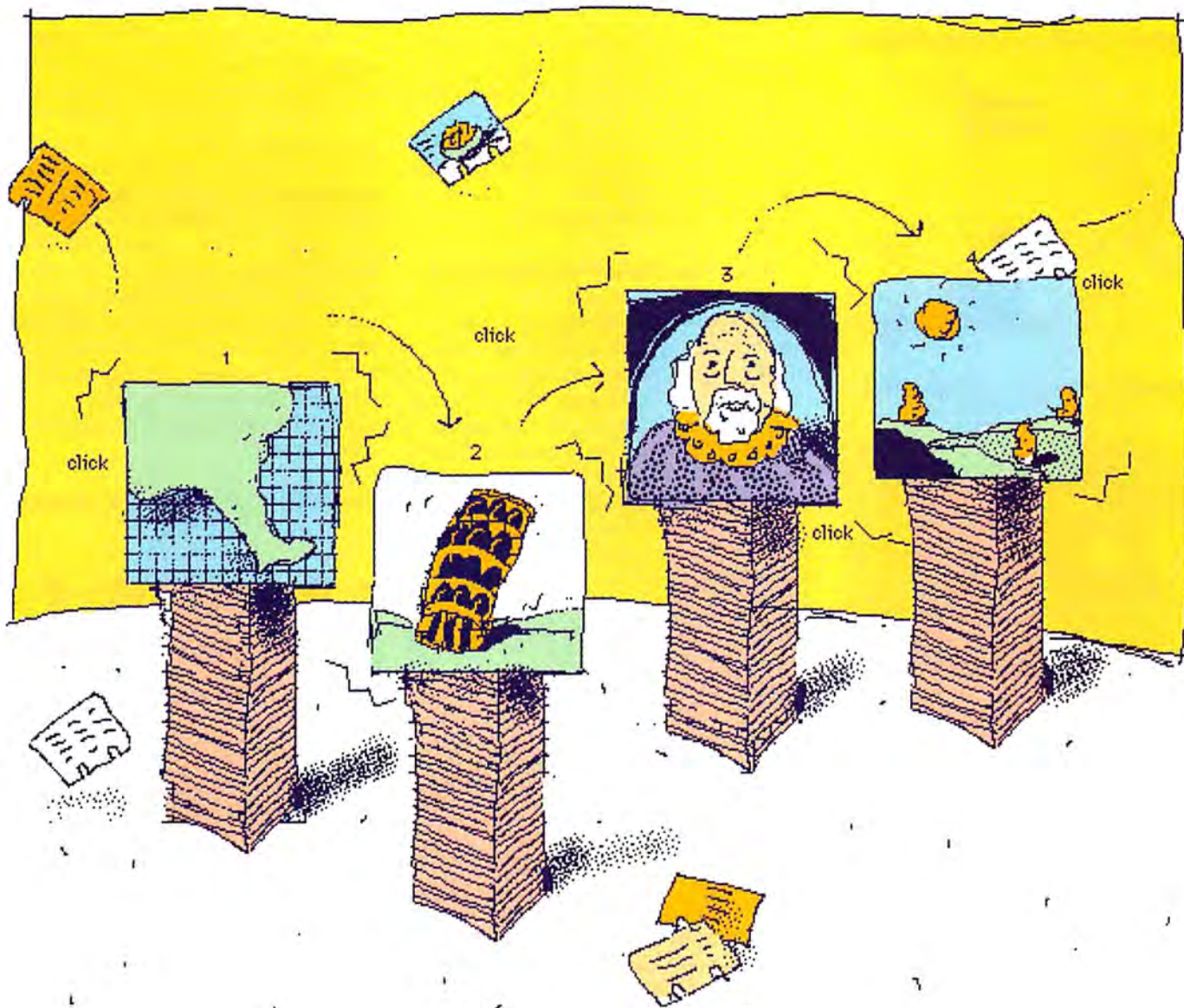
Because of its paint capabilities, HyperCard is also highly visual. The Hyper-

Card application *Business Class* from Activision has a virtually wordless user interface. Another stack that's making the rounds of user groups, *Inigo Gets Out*, is a children's story that jumps from illustration to illustration depending where on the screen you click the mouse (see "Inigo's Adventure").

HyperCard's interactivity and visual capabilities make it an excellent choice for tutorial and training applications, where a slide show of sequential cards full of text would quickly bore readers. HyperCard allows users to jump from item to item, skipping things that don't interest them and examining things that do. It's like giving viewers all the slides and having them make their own show.

Because HyperCard is so visually oriented, it's tempting to use too many graphics in your stacks. If you do, your stacks will grow too large too fast and will run too slowly. Therefore, you must plan a stack application at least as thoughtfully as you would an application written in a programming language.

The way HyperCard manages data is as important as its interactivity. HyperCard's search algorithm is a closely guarded secret; it can supposedly search millions of records in a flash. In a 100-card test of the program's text-searching and sorting capabilities, it located a unique string embedded in a field so quickly that I couldn't start the stopwatch before the search was over. HyperCard sorted the same 100-card stack alphabetically, on the basis of one field, in less than 3½ seconds. These times were for the database equivalent of an unindexed field (you don't index fields in HyperCard as you would in a database). In anticipation of future search capabilities, user groups are already distributing HyperCard drivers for CD ROMs.



On the Other Hand

Applications in which the user imposes a personal order on seemingly unrelated information are good candidates for *HyperCard* stacks. However, don't consider applications that depend on animation, menu bars, big-screen support, gray-scale support, formatted reporting, or any database where structured data must be maintained (such as in accounting).

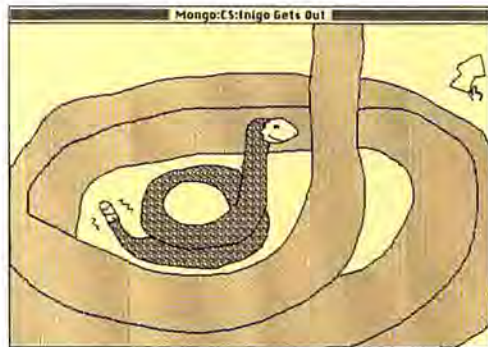
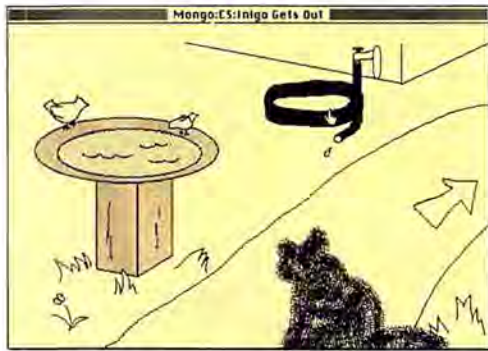
Animation in *HyperCard* is crude at best. The program does not allow you to define, move, and animate separate objects, although clever scripting might enable you to simulate some simple animation. *HyperCard* does provide a hook for

programming in other languages besides HyperTalk, which is another possibility for animating graphics. The simplest way to show movement is to flip between cards—but on a Mac Plus, card transitions are too slow for convincing animation, and even on a Mac II they produce an effect more like a rapid succession of slides.

More technical solutions for providing animation—such as using HyperTalk to activate the lasso tool to take a graphic from one card and place it on another—are still slower than card-flipping. Using an opaque button to hide and show an area of the screen works well, but no graphics can appear atop the button unless you're very sophisticated with a resource editor and can create new icons and tile them together to form a larger graphic.

Difficulties with animation extend to the Mac's menu bar. *HyperCard* has its own menu bar, which you may or may not display; but unlike *4th Dimension*—a database designed for creating applications—HyperTalk cannot create application-specific menu bars. To emulate a menu bar with *HyperCard* requires complex swapping of cards and resources.

Even if you do emulate a menu bar at the top of a card, the effect is slightly unnerving, especially on large-screen monitors. *HyperCard* puts the card in the center of a screen, away from the top of the screen where menu bars usually appear. *HyperCard* makes no use of large-screen monitors—cards cannot be resized, nor can you



Inigo's Adventure

HyperCard's interactive capabilities are showcased in the children's stackware story, *Inigo Gets Out*. Here, you choose what Inigo does next by clicking on the birdbath, the garden hose, the arrow, or Inigo. For instance, clicking on the garden hose takes Inigo close to a rattlesnake. You can then click on the snake or the arrow, again choosing your own path through the story.

display more than one at a time. (One point in the program's defense: a card is dependably the same size on every Macintosh.) *HyperCard* also does not support color or gray scales.

HyperCard has limited reporting capabilities, even when you use HyperTalk. For example, unless you write a highly complex script, you can sort on only one field at a time. Also, HyperTalk does not offer formatting commands for fields; it cannot, for example, send field data to *x, y* locations, as when printing a mailing label. Traditional databases are report- and output-oriented. *HyperCard* is screen oriented. HyperTalk simply wasn't designed to efficiently build the complex custom reports that other data-management programs can build.

Also unlike traditional output-oriented databases, *HyperCard* organizes all data behind the scenes. The user cannot tell

HyperCard how or when to save or store data—*HyperCard* just does it. Although this can be convenient for the user, it also takes away much control. You can't force *HyperCard* to track data; you can't set up an audit trail for an accounting application. For this reason, *HyperCard* is not well suited to setting up structured applications.

Issues for Would-Be Developers

Although HyperTalk code is easy to write and eminently intelligible to the lay programmer, it still lacks utilities to help with programming and debugging. For instance, to print out the logic of a script, you must do numerous screen dumps as you follow all the links. User groups are already starting to distribute a utility that prints out a script and all its branches, and helps in other ways as well. But even though these utilities may help you clean up your own code, tracing someone else's un-commented code is still a nightmare, especially when there are lots of links between unrelated stacks.

HyperCard automatically assigns an ID number nonsequentially to every object. For example, card 5743 may immediately follow card 2381. For easily traceable code, you must name every object that you refer to. Even then, you must be careful to use a well-thought-out naming scheme. Otherwise you'll be hunting for those ID numbers like a needle in a...er...haystack.

Art is integral to every *HyperCard* application, but bringing art from one stack to another or merging two stacks is a mechanistic process of copying back and forth (or copying via the Scrapbook). You can automate the process by writing a script to copy a list of named cards from one stack to another. Even so, speed is still an issue; there is no easy way to merge stacks.

HyperCard is a fairly big program, and it produces big stacks (128 cards in one application took up 628K on disk). Developers must watch stack size—floppies hold 800K, and it's a nuisance to split stacks once they've grown beyond floppy size.

The Hyperfuture

One developer who has worked intensively with *HyperCard* told me, "You can do anything with it that you can with a programming language." While not strictly true, the statement is close to the truth. Programming languages are generally optimized for particular applications; *HyperCard* is optimized for applications that let the user decide what's next and perform informal, unstructured, personal data management.

Because *HyperCard*'s programming language is interpreted (slower than compiled) and because of its limited nonscrolling card size, you would not want to program a spreadsheet in it, even though you could. In addition, *HyperCard* has poor report-formatting capabilities and does not allow the user to impose a formal structure on a stack. For these reasons, many traditional database applications, such as accounting, are not well suited to *HyperCard*. *HyperCard* can never replace structured, report-oriented databases, but it certainly is an exceptional program for those who need an interactive, visual approach to information management.

—Jeff Walden

See *Where to Buy* for contact information.

A Patchwork of Windows

MultiFinder 1.0

Multitasking system software. **Pros:** Inexpensive, allows multiple applications to be loaded simultaneously. **Cons:** Some compatibility problems; works best with a large screen and lots of memory. **Company:** Apple Computer. **List price:** \$49. **Requirements:** Mac Plus, SE, or II; 1MB of RAM.



So here I am, sitting at a Mac II with a 19-inch display and lots of memory, and I'm running the following tasks: *Excel*, *More*, *MacTerminal*, *TML Pascal*, *Comic Strip Factory*, *HyperCard*, *Go* (the game), *ReadySetGo 3*, *Microsoft Word*, and the Finder. The screen is a crazy quilt of windows, icons, documents, and folders, and I'm loving every minute of it.

Welcome to MultiFinder, Apple's first attempt at a multitasking environment on the Macintosh. It's bundled with all new Macs, but what if you bought your Mac prior to the bundling? Should you buy MultiFinder?

What It Is

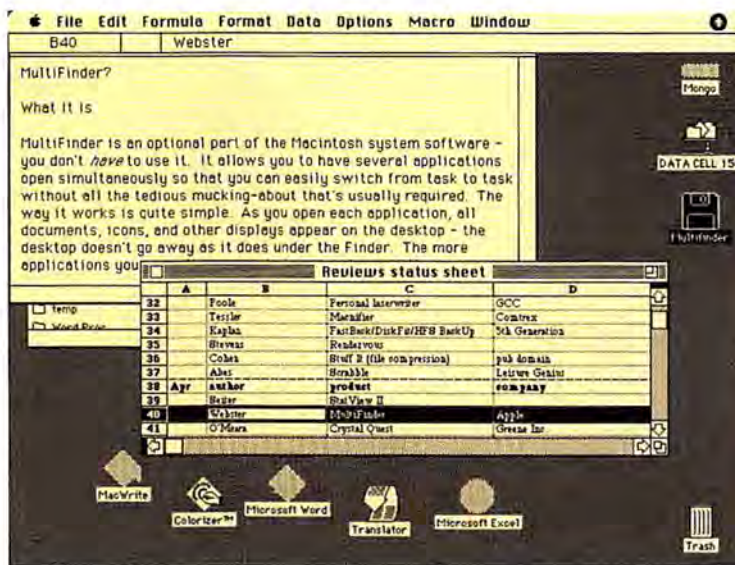
MultiFinder is an optional part of the Macintosh system software—you don't have to use it. It allows you to have several applications open simultaneously so that you can easily switch from task to task without all the tedious mucking about that's usually

required. The way it works is quite simple. As you open each application, all documents, icons, and other displays appear on the desktop—the desktop doesn't go away as it does under the Finder. The more applications you open, the more windows you have on the screen.

To switch from one application to another, you click on any window or icon associated with the application you want to run. The menu bar then changes to reflect that choice. You can thus quickly move from one application to another.

Of course, this doesn't help if the application's document is buried under several other windows, or if there aren't any documents or tools to click on. But even then, you can switch applications using the Apple menu. The desk accessories are followed by a list of the currently executing applications. You select one from the list and it becomes the active application. (Alternatively, you can scroll through the open applications by clicking on the icons in the upper-right corner of the menu bar.)

At least two benefits are immediately apparent. First, since the Clipboard remains active, you'll find it delightfully easy to cut and paste data between applications. Second, the Finder is always active, so you can quickly move, delete, and rename files. For example, while writing this article, I changed over to the Finder, created a new folder, then came back into *Microsoft Word* and saved my document in the new folder—all by simply clicking on already opened windows.



Easy Switching

Because MultiFinder enables you to have several applications open at once, you can easily switch from task to task. For instance, you can jump from a letter you are writing in Word to a spreadsheet you are creating in Excel simply by clicking on the document window. If you open too many windows, however, you run the risk of burying your work.

Another time-saving feature (if you have a laser printer) is MultiFinder's background printing capability. It allows you to spool documents to the printer so that you don't have to wait endless minutes to regain control of your Mac. Unfortunately, background printing does not work with ImageWriters.

What It Isn't

MultiFinder is not a true multitasking system. In a true multitasking system, each task (program or application) thinks it controls the entire machine. In reality, however, the operating system gives a certain amount of processing time to each task in a

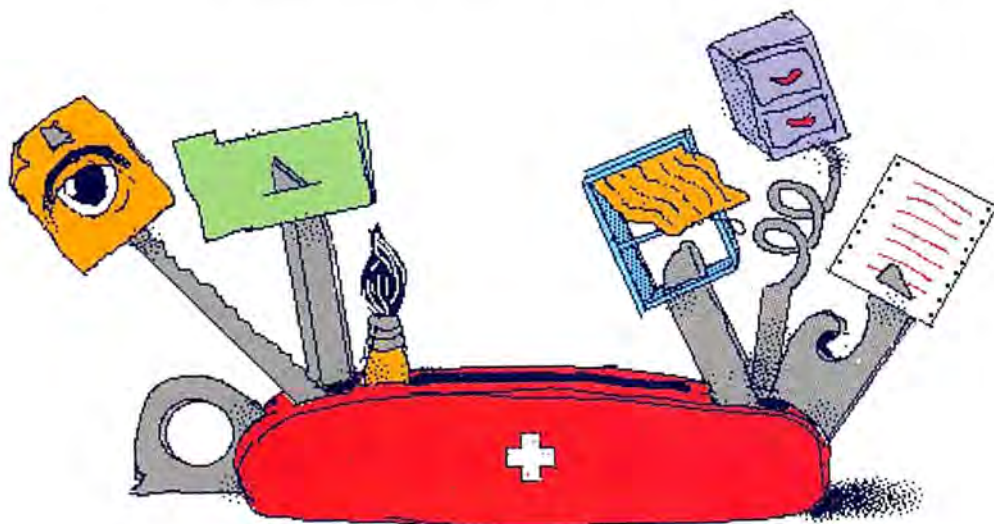
round-robin fashion, so that no single task constantly hogs the processor. Several tasks share the processor, but the user has the illusion that they are all running at the same time.

MultiFinder, however, shares time through an event queue. This means that when you create an event (for instance, by clicking the mouse or selecting a menu item), the program you are working in controls the entire machine. As long as the program is fed a series of events, it remains active; the other programs are forced to wait.

This really isn't a tremendous problem, since most applications spend a lot of time waiting for the user to do something—press a key, click the mouse button, or select a menu item. While the application is idle, background tasks can steal processor time. For instance, under MultiFinder you could conceivably work on an *Excel* spreadsheet while uploading or downloading a file via your modem. The problem, however, is that applications must be designed to take advantage of background processing, and even then they will be limited in the type of work they can do. To date, few programs work at all in the background, but look for more to do so.

Drawbacks

Since the benefits of MultiFinder—such as quick switching among several open applications, background printing, and some multitasking—have been well publicized, let's look at some of the drawbacks.



Reviews

The most obvious problem is that many programs behave erratically under MultiFinder. Some quickly terminate (*Microsoft Excel* frequently needs to be reloaded during a work session), while others hang at certain spots. My experience, though, is that most applications that run on a Mac II run under MultiFinder. However, it's a good idea for you to check each of the applications you plan to use (ask your dealer for help).

Memory requirements may cause problems for some users. You can run MultiFinder with just 1 megabyte of memory, but you may find it more tantalizing than helpful. Typically, you can't get more than two or maybe three major applications loaded using 1MB, and sometimes not even that many. Having 2MB makes operation feasible; 4MB or 5MB makes it wonderful.

The small screen of the Mac Plus and SE is another drawback. Once you have more than two applications open, windows start heavily overlapping. This can make it hard to do some of the side-by-side work (such as cutting and pasting) to which MultiFinder lends itself so well. It also may mean digging through the windows to get to the Trash Can.

Another problem you might run into—more likely on a system with a large screen—involves having too many windows open at once. I found that the Macintosh operating system only allowed me to open 12 windows. Beyond that, you can't launch any more applications or open any more file folders.

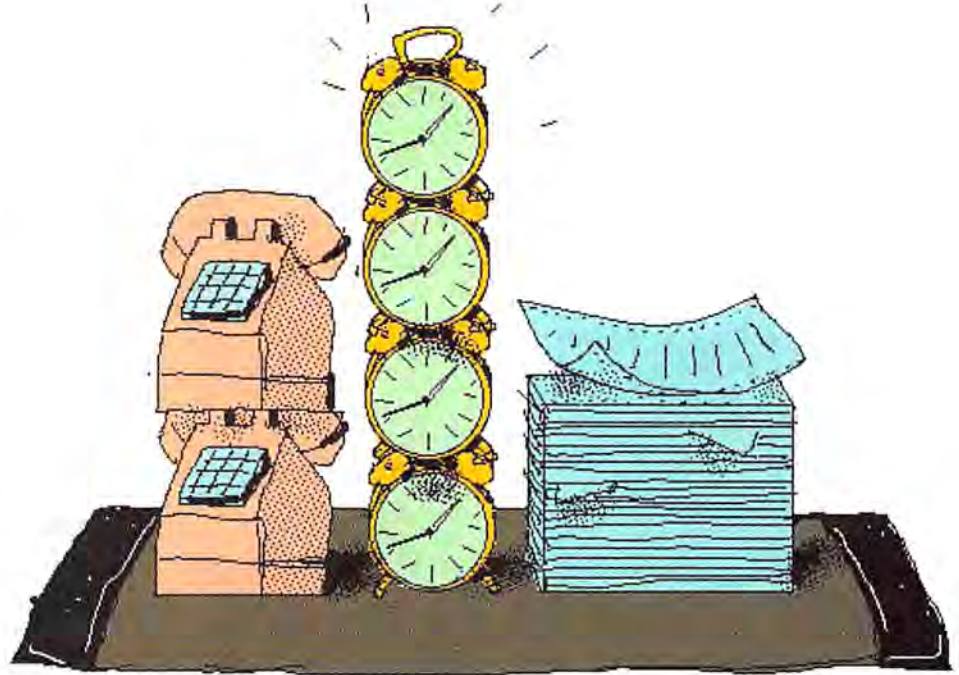
Recommendations

You certainly don't need MultiFinder; your Mac will work just fine without it. However, if you do any desktop publishing, or if you just like to work on several things at once, MultiFinder can be a real blessing. And the price (\$49) is right, especially compared to the \$1500 price tag projected for upgrading to OS/2 on IBM compatibles.

If you're serious about using MultiFinder, then get at least 2MB of memory (preferably 4MB or 5MB) and a large-screen display. No, you don't have to, but you'll be pleasantly surprised at just how powerful your system is with that combination of software and hardware.

—Bruce Webster

See *Where to Buy* for contact information.



Focus Your Time

Focal Point 1.0

Time- and project-management stackware.

Pros: Eliminates the need to retype information shared among stacks; imports existing address files. **Cons:** Uses a lot of memory; lacks invoicing capability; weak reporting capabilities.

Company: Activision. **List price:** \$99.95.

Requires: 1MB. **Copy protection:** None.



Focal Point is a collection of 18 related time-, telephone-, project-, and schedule-management stacks that can be used to keep track of jobs, appointments, proposals, clients, vendors, expenses, deadlines. Although the program was designed primarily for service professionals, at least half of its stacks can be used by practically any businessperson. In particular, the time- and telephone-management stacks are a pleasure to use, but for serious project management your needs might be better served by a more specialized program.

The Daily Activity stacks (Daily Appointments, To Do, and Monthly) offer some interesting features for managing time. For example, in the To Do stack you can prioritize your list of tasks and have *Focal Point* sort them. This is especially helpful if you have a long list and circumstances force a change in priority. Another nice feature is the Carry Over button, which moves all unfinished items over to the following day.

The Expenses stack contains a worksheet for 17 business expenses including meals, lodging, and car rental. You can add up to three more categories. Daily expenses are summarized in a weekly format. In addition, there is a separate Entertainment Expense worksheet that includes details required by the IRS. When you use the Expenses worksheet, however, one thing about *HyperCard* becomes painfully obvious—*Excel* it is not. Calculations are slow, slow, slow.

The three stacks that make up the Phone Calls segment—Directory & Dialer, Incoming Phone Log, and Outgoing Phone Log—offer a good example of how *Focal Point* can save you a lot of typing time. Whenever you make a call to someone in your Directory & Dialer, *Focal Point* automatically creates an Outgoing Phone Log card and fills in the name of the person you called, the phone number, and the date and time you called. In addition, an Import/Export feature enables you to transfer names and addresses from the standard *HyperCard* Address stack to the Directory & Dialer. Although it may not be as visually appealing as the *HyperCard* Address stack, the Directory & Dialer is certainly more functional.

Like the Directory & Dialer, much of *Focal Point* lacks visual appeal—but this is actually a credit to the program. The painting tools in *HyperCard* make it tempting to create a paper equivalent for everything. In most cases, *Focal Point* emphasizes function over form, and the program is better for it. Artistry was saved for the but-

tons, which are well done and instantly identifiable.

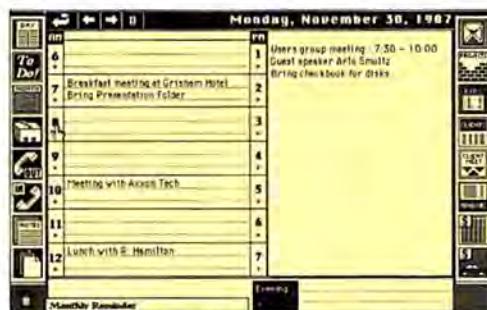
Project Management

Focal Point's project-management features center around the Proposals and Project stacks, which are extensively linked with other stacks. For instance, one helpful feature enables you to select items from your client and vendor records (contained in another *Focal Point* stack) to fill in the blanks on new cards. So, if you are preparing a proposal, you can click on the Pop-up button and choose the appropriate client from a list. The client's name and number are then automatically entered on the new card.

Later, when your proposal becomes a project, *Focal Point* can post the information from the proposal to the project cards. The Project stack has cards for job specifications, estimated labor and materials costs, invoices, payments, and client follow-up. But even though these features may sound advanced, the stack is designed only for managing very small, simple projects. The reporting capabilities are weak, there is no ledger for summarizing expenses, and there is no invoice suitable to print out for the client.

While it won't do everything you may need on a daily basis, *Focal Point* contains useful stacks, neatly integrated, that can form the core of a *HyperCard* environment. Since there are infinite approaches to time and telephone management, however, these types of stacks will probably proliferate in the public domain/shareware market—some of them may fulfill your needs for far less money than *Focal Point's* \$99 asking price.—*Terry Hostetler*

See *Where to Buy* for contact information.



Center of Attention

The Appointment Book is *Focal Point's* central stack. Buttons that lead to the time and telephone management stacks are on the left edge; project-management buttons are on the right.

A Trio of Equation Editors

MacEqn 2.03

Mathematical expression editor DA.

Pros: Clear, well-formed print output; site licenses available. **Cons:** Difficult user interface and text editing; few preformatted templates.

Company: Software for Recognition Technologies. **List price:** Version 2.1 \$44.95. **Requires:** 512K. **Copy protection:** None.

Expressionist 1.1

Mathematical expression editor (both DA and application versions).

Pros: Matrix and tensor templates; diagonal fractions; tree nodes; equation data files in application mode.

Cons: Cluttered tool palette; poor print quality for large symbols. **Company:** Allan Bonadio Associates. **List price:** Version 1.11 \$79.95.

Requires: 512K. **Copy protection:** None.

MathType 1.08

Mathematical expression editor (both DA and application versions).

Pros: Clean output; "smart" editor reduces both entry time and font attribute errors; scrolling "symbol drawers"; large symbol and template libraries.

Cons: No support for equation files. **List price:** Version 1.5 \$149. **Company:** Design Science.

Requires: 512K. **Copy protection:** None.



Most word processors can't deal very well with mathematical equations, nor should they. Besides requiring a large library of special symbols, high-quality mathematical text calls for delicate control over symbol position. The task of positioning mathematical symbols accurately is best left to special-purpose programs designed to be used with standard word processors.

MacEqn, *Expressionist*, and *MathType* are programs that let you assemble complex (or simple) expressions for insertion (as PICT graphics) into standard text files. All three programs represent a great improvement over the equation construction found in programs such as *MacDraw* or *MacPaint*. The three math expression editors are similar to one another in several ways, varying mostly in ease of use and control over printing details; their convenience and power match their respective prices.

Common Denominators

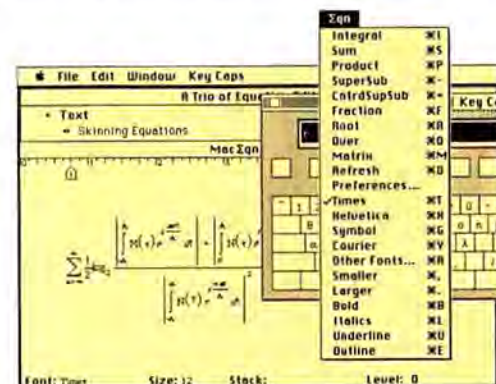
Each of these programs "understands" mathematical notation, in the sense that each one recognizes certain standard groups of symbols, such as integrals or summations. When you select a template for a complex expression, its form appears at the insertion cursor with a set of placeholders. You then fill the placeholders with expressions (by simply typing in formulas or by selecting special symbols from templates) to complete the specific equation you want to create. Finally, you copy or paste the completed equation into your word processor or page-layout program for full document preparation and final printing. All three programs allow equation graphics to be pasted back into the creating editor for further editing.

Each program knows how to nest forms within forms—you can have integrals as matrix elements, for example. All have facilities for adjusting the details of individual characters and groups, including a large assortment of diacritical marks (dots, bars, "hats," tildes, and such). All three programs provide adequate documentation, with step-by-step tutorials and printing tips, and specify format settings for ImageWriter and LaserWriter printing.

Differentiating Equation Editors

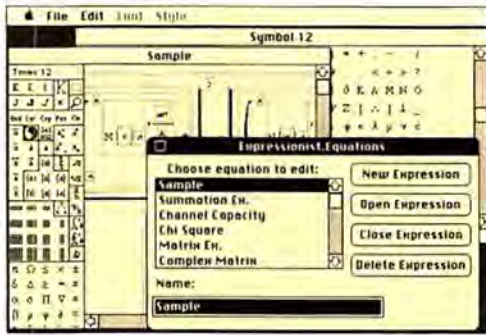
The editors differ in ease of use, support for particular types of notation, and output quality. Each has a particular appeal for a certain type of user.

MacEqn is the least expensive editor (costing only a few dollars a copy under a university site-license program), but it's also the least forgiving. Its palettes of symbols and commands allow you to develop



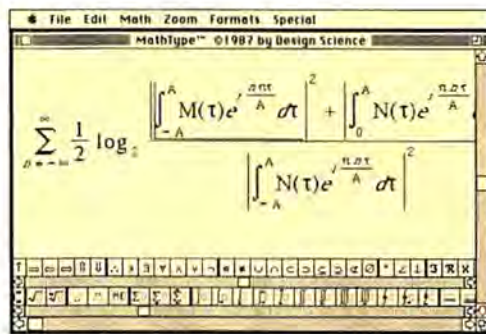
Not Expensive, but Not Easy

MacEqn's spartan interface provides a single scrolling menu supplemented by additional keyboard commands. Nonstandard editing conventions make *MacEqn* the most difficult of these programs to master.



The Palette of the Expressionists

The editing tool palette in Expressionist offers Guide and Magnify modes to "explode" nested components of an equation for detailed editing. The program also lets you save expressions in equation files.



Just the Type for Math

The MathType window features large, scrollable "drawers" full of special symbols for you to select. Typeface size, font and character attributes, and intraelement spacing are selected automatically.

nearly any expression you like, but extensive use of keyboard commands means that it takes longer to master than the other editors (see "Not Expensive, but Not Easy"). Some tasks (such as adding elements to the middle of an already-formed expression) are difficult. Students and others who only occasionally need math expression capabilities should find *MacEqn* a bargain, but it's not a first choice for an engineering department.

Printed *MacEqn* equations are well-formed, although expressions are slightly tall, with more intercharacter white space than is customary in typeset equations. A handy Traditional Form command converts unitalicized work (easier to read on the Mac screen) to the italicized form typically found in textbooks and journals.

Expressionist uses palette choices almost exclusively for expression development, resulting in a large, complex palette but few keyboard commands. The palette contains some forms not found in the

other editors, specifically forms for tensor notation, "floor and ceiling" brackets, and tree nodes for drawing hierarchical diagrams (see "The Palette of the Expressionists"). If you know what you want, you can usually find it somewhere on this program's symbol palette. *Expressionist* lets you select strings of symbols for easy manipulation of expression structure, and it is the only editor that can save equation structure intact in named files for later modification. This makes it attractive for day-to-day work in a single branch of science or engineering that requires frequent use of similar equations.

Expressionist's printed output is satisfactory at normal font sizes (up to 14 points), but gets progressively stranger thereafter. Although still acceptable, *Expressionist's* special symbols are better described as draft quality at 18 points and larger.

MathType is the most capable editor for producing a wide variety of mathematical documents. Besides offering a great variety of symbols in scrollable "drawers" (including such things as double vertical bars, labeled arrows, and horizontal braces), *MathType* allows easy positioning of symbols for construction of forms that it lacks (tensors, for example).

MathType printed output is the most compact and well proportioned. Although a patient user can tinker with *MacEqn* and *Expressionist* output and override the default spacings, in *MathType* the defaults are already highly optimized for better interelement spacing. If you are responsible for producing many types of reports for distribution within a university or company, *MathType* is probably your best bet (see "Just the Type for Math").

The Final Equation

Technical professionals comfortable with complex mathematical notation will find any of these programs to be a notable improvement over the makeshift methods often employed. It's typically faster and easier to get an equation right in a math editor than to suffer endless proofreading of notation that was set from handwriting. Perhaps the next few years will see the welcome disappearance of math monographs and conference reports filled with researchers' fiber-pen scribbles.—*Jim Salmons and Charles Seiter*

See *Where to Buy* for contact information.

RAM Cram

One Plus One

Internally mounted 1MB memory board.

Pros: Uses Apple-supplied SIMMs; ups memory to 2MB total; good installation guide; includes internal, silent fan. **Cons:** You must pry system board into place; add-on board is physically large, may preclude adding non-SuperMac options. **Company:** SuperMac Technology. **List price:** \$399. **Requires:** Macintosh Plus.

MacSnap Plus 2

Internally mounted 1MB memory upgrade.

Pros: Uses Apple-supplied SIMMs; ups memory to 2MB total; includes RAM disk software. **Cons:** Takes up all four SIMM sockets; system board must be pried into place; boards in SIMM sockets stand up from system board, may preclude adding non-Dove options; one board arrived warped (but it worked); unnecessarily complex instructions. **Company:** Dove Computer Corporation. **List price:** \$449. **Requires:** Macintosh Plus.

RamPlus 2

Internally mounted 1MB memory upgrade.

Pros: Uses Apple-supplied SIMMs; ups memory to 2MB total; leaves two SIMM sockets free for later expansion. **Cons:** System board must be pried into place; board in SIMM socket stands up very high from system board, may preclude adding other options. **Company:** Open Mac Enterprises. **List price:** \$349. **Requires:** Macintosh Plus.

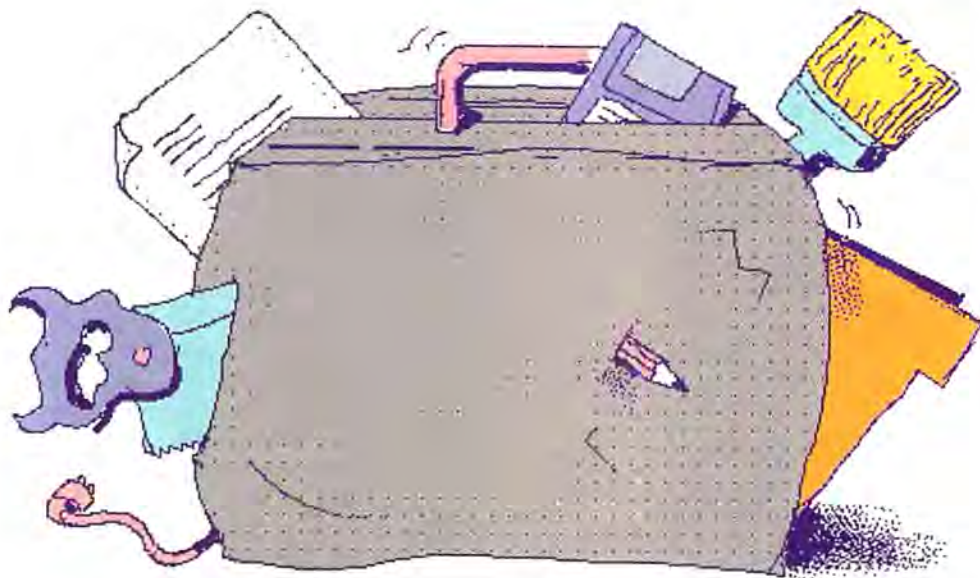


This review looks at three non-Apple, non-SIMM methods of adding memory to a Macintosh Plus. To install any of these memory boards you must disassemble your computer and handle sensitive, static-prone memory devices. (Don't forget to pull the plug before you begin.)

WARNING: Unless you have sufficient technical training or knowledge to work inside the Mac, don't do it. High-voltage components may cause physical harm to you as well as to the machine. In addition, you void the Apple warranty the minute you open the machine. If you're not up to dealing with the installation, a dealer can do it for you (expect to pay \$25 to \$75 for this service).

One Plus One Makes 2MB

SuperMac's One Plus One is a fairly large add-on board that contains conventional RAM chips and four SIMM holders in



which you put the Macintosh Plus's original memory.

Installation is reasonably simple, and the instructions are quite good. After disassembling your Macintosh and removing the system board, you remove the four SIMM packages and insert them into the One Plus One—an easy, straightforward process. Mounting the One Plus One board on the system board is a little tougher, since you have to reach under the One Plus One and insert two flexible cables into the SIMM connectors on the system board. Since the cables are short, you really can't see what you're doing under the board, and there's not much room for maneuvering. Fortunately, it's pretty hard to misalign the cables, and impossible to get them twisted. It is possible, however, to put the cables in the wrong sockets. If this happens, you'll see the sad Mac icon when you turn the computer back on—the Mac won't recognize the memory upgrade.

You must also use a small wire clip to connect a resistor and a pin on an integrated circuit on the system board. If you don't have small, dexterous fingers, you'll probably have a hard time tying the clips down. Don't let that stop you from doing so, however—the memory upgrade won't work if the clip falls off. I tied the clip down in three places instead of the suggested two, and I routed it a bit differently for a more secure connection.

Levco also supplies a MacBreeze fan that mounts on the floppy disk casing and attaches to the power supply board. This is

the most delicate operation involved in the upgrade because you work in close proximity to the picture tube, where thousands of volts of stored energy reside. The rules are: (1) work with only one hand whenever possible (keep the other behind your back, if necessary); (2) work slowly and carefully; (3) do not use any tool or device made of metal; and (4) don't bump or touch the picture tube or the wires running to it. The MacBreeze fan sits right next to the tube, and the wires to the power supply will run right under it. For safety, I suggest that you use an external fan and ignore the MacBreeze. The MacBreeze also presents problems if you transport your computer very often. The fan attaches using velcro and a single plastic tie-down strap. Since this installation is not very secure, one good bump could dislodge the fan or its power wires, resulting in who knows what kind of havoc.

Upgrades in a MacSnap

The second memory board, Dove's MacSnap Plus 2, consists of four small boards that plug directly into the SIMM sockets on the system board of the Plus. Each board contains 256K of memory plus a socket for one of the SIMMs you remove from the system board.

Installation is almost as simple as replacing SIMMs. But Dove takes three manuals to describe the steps, so you're likely to get confused. You get the standard MacSnap manual, which Dove includes with all of its memory boards, as well as the Plus 2 Supplement, which replaces portions of the MacSnap manual. Finally, you get an Installation Supplement, which tells you how to troubleshoot. If Dove would create a dif-

ferent manual for each of its memory upgrades, the amount of customer support it has to provide first-time installers would probably be reduced.

MacSnap Plus 2 is the only one of the memory upgrades I tested that came with software. It includes RamSnap, a RAM disk and microfloppy disk cache utility that allow you to set aside portions of your computer's memory for emulating a disk or for temporarily storing often-used information. RamSnap is easy to use, adequately documented, and helps create a faster, more responsive machine.

Yet Another Variation

Open Mac Enterprises' RamPlus 2 is yet another variation—it consists of a single board that plugs into the first SIMM socket on the system board. The four Apple-supplied SIMMs plug into the sockets on the RamPlus. That leaves three empty SIMM sockets on the system board. RamPlus 2 gives you a 1MB SIMM to put in one of the sockets. You may add 1MB SIMMs to the remaining two sockets.

Again, installation is very simple. Like the One Plus One, the RamPlus 2 requires that you install a short clip between a resistor and a capacitor on the system board. While this is easy to do, make sure that you tie the clip down carefully and that it has no room to move once installed. Unlike the other boards, the RamPlus also requires that you remove a resistor from the system board. This may seem a little frightening, but it is no more difficult than using a pair of wire cutters to snip the resistor in two spots. While it constitutes a modification to the system board, it is an Apple-endorsed one. If done carefully, there is no reason the change should invalidate your warranty—Apple dealers make the same change to the system board when installing 1MB SIMMs.

The RamPlus 2's installation instructions come as an eight-page sheaf of mimeographed papers, but they adequately cover the steps needed to install the new memory correctly.

HyperCard Will Love You

So, which of the options should you go with? All of them worked flawlessly the first time; each was automatically recognized by the Finder. None took me longer than about 30 minutes to install. (If this is your first time modifying a Macintosh, allow an hour and you'll probably finish early.)

The One Plus One has, by far, the best manual for the first-time installer. Unless you have extra-large hands, you shouldn't have any problems installing the board. And, if you're careful about tying the clips down and you use an external fan, the board should prove secure when you transport the computer.

The MacSnap Plus 2 suffers from poorer installation instructions, but doesn't require any additional connections or clip-ons; it's almost as easy to install this upgrade as to replace the SIMMs. The RamPlus 2 has decent installation instructions, but requires that you cut a resistor on the system board. Neither of these upgrades comes with a fan, but you should acquire one anyway, since the boards cause extra heat buildup. Of these two I'd go with the RamPlus 2, since it leaves two empty slots for adding two 1MB SIMMs at a later date. Both the MacSnap Plus 2 and the RamPlus 2 are reasonably priced and easy to install.

All three memory boards, however, may preclude the use of other add-ons such as an accelerator or big-screen board. The One Plus One covers about half the system board, while the other two stick up 1 to 2 inches above the SIMM sockets. Be sure to ask your dealer about compatibility with other options you're considering.

Opening the Macintosh and adding a new component is an intimidating task for first-timers. If you're careful, however, any of the boards reviewed will save you money over having a dealer install replacement SIMMs.—*Thom Hogan*


See *Where to Buy* for contact information.

Analyze Doesn't Excel

Analyze 2.1d

Spreadsheet with graphics and macros.

Pros: Fast and easy graphics; pop-up menus simplify basic tasks. **Cons:** No Help menu; eccentric PC-format features. **Company:** Micro-Systems Software. **List price:** \$149. **Requires:** 512K. **Copy protection:** None.

 *Analyze*, to put it bluntly, is very nearly a Lotus 1-2-3 clone for the Mac. Since 1-2-3 is the most popular spreadsheet in history, this may be good news for some PC refugees, but it



carries both positive and negative implications. *Analyze* has the graphing and macro facilities that *MacCalc* (the leading low-cost Mac spreadsheet) lacks, and initially *Analyze* would appear to compete even with *Excel*. Since it's about the same price as *MacCalc*—one-third the price of *Excel*—it looks like an unbeatable bargain. On close examination, however, *Analyze* has annoying omissions and problems in addition to some perfectly delightful features.

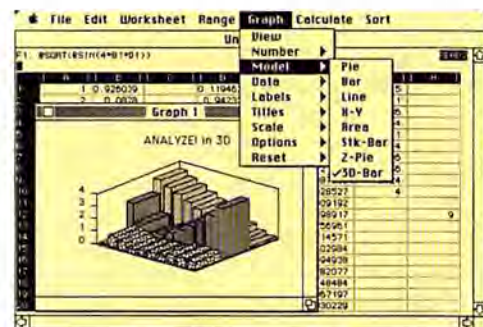
Fun with Numbers

Analyze is a 256-column-by-8192-row spreadsheet that supports a decent array of functions in formulas. It offers a keyboard mode so complete that you can disconnect the mouse when using it; you call up the key-driven menu with the backslash key (\), as in Lotus 1-2-3. In fact, the conventions in *Analyze* follow 1-2-3 so closely that you could consult Lotus's manual for tips on using *Analyze*'s Range menu. Most menu items have attached pop-up menus, so that all the program's functions can be explored on screen—to a limited extent this compensates for the lack of a Help menu.

The charting facilities in *Analyze* are not only simple to use, they produce good business-quality results, including some 3-D effects (see "Graph Fix"). You can attach up to four charts to a spreadsheet, and trying out different styles of data presentation is fast and easy. Since *Analyze* also offers a macro language with a unique auto-execute option (you can set one macro per spreadsheet to execute upon opening), on a features-list basis, it appears to be the best value on the Mac spreadsheet market.

Analyzing the Downside

But it only appears to be so. Implementing many of the features results in little slips and oddities that detract from *Analyze*'s potential value. The macro language, for example, is nearly identical to 1-2-3's, meaning that great power is available but only through the use of a cryptic and crabbed command system—in the PC world people are forced to consult books, seminars, and videotapes to master its details. The program can open only one spreadsheet at a time, which appears in one font and one size (cells can take bold, italic, or underline format, though). *Analyze* has a respectable set of functions for constructing complex formulas, but the tiny editing area makes them a chore to use. The manual, particularly the index, contains dozens of errors. For example, ⌘-10 is given as the View Graph command, although you can't actually issue this on a normal Mac keyboard (where's the 10 key?). The correct key combination for View Graph turns out to be ⌘-0. This unusual error suggests that the program was originally planned for PCs with ten func-



Graph Fix

Charting is a strong point in Analyze, with a nice variety of styles chosen from convenient pop-up menus. Four graphs can be defined for each spreadsheet.

tion keys. Reliance on nonmenu commands for such important functions as Go To and Recalc is another interface unpleasantness.

Worse yet, this program is on the wrong side of the minimal-recalculation revolution that's speeding up spreadsheets everywhere. *Analyze* is as slow as the first version of *Jazz* on large computations loaded with functions; compared to *MacCalc* on a standard recalc test, it crawled. And as a last straw, although 1-2-3 format is the main *Analyze* file-export choice under Save As, the resulting saved files won't actually open in *Excel* or in 1-2-3 on a PC.

Not Ready for Prime Time

Analyze, in its current form, is not the low-cost version of *Excel* many people would like. A larger-font editing area, a macro-recording facility, and a rewrite of the manual are some of the improvements needed to make it competitive. As it stands now, I recommend the program for people who work mostly with text but must produce an occasional small spreadsheet and want some nifty graphics. The large installed base and business-community acceptance of *Excel*, however, mean that *Analyze* will need more polish before it applies for a job downtown.

—Charles Seiter

See *Where to Buy* for contact information.

Text Effects

Laser FX 1.1

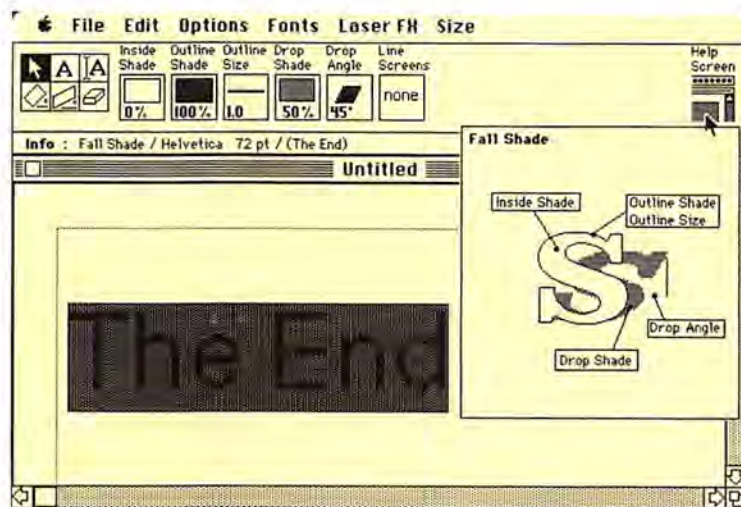
Special-effects utility for text. **Pros:** Excellent user interface; wide variety of customizable effects. **Cons:** Works on only one line at a time; difficult to position text precisely when pasting into other programs. **Company:** Postcraft International. **List price:** \$195. **Requires:** 512KE. **Copy protection:** None.

LP Text 2.2

Special-effects utility for text. **Pros:** Ability to fine-tune effects. **Cons:** Limited number of basic effects; user interface gives no visual indication of effect; difficult to position text when pasting into other applications. **Company:** London Pride. **List price:** \$99. **Requires:** 512K. **Copy protection:** None.

FX! Do your desktop publications elicit yawns instead of gasps of awe? Is Times looking tired, Helvetica ho-hum? Is even Avant Garde looking conventional? If so, you may be a candidate for *Laser FX* or *LP Text*. Although PostScript graphics programs such as *Cricket Draw* and *Illustrator* enable you to customize text, the two programs reviewed here focus on text effects, automating the task of adding special effects to PostScript fonts.

Laser FX from Postcraft International offers 30 basic effects that enliven fonts for use in headlines, chapter titles, ads, logos, and the like (see "Deluxe Effects"). The program's repertoire includes patterns,



Effecting Effects
Although *Laser FX* doesn't offer what-you-see-is-what-you-get, an Info bar and a Help window provide information on the effect you've chosen.

outlines, a neonlike effect, screens, fountains (transitions from one shade to another), and a variety of shadows. And you can modify aspects of each effect—change the angle or offset of a shadow, alter a fill pattern, or change a fountain's direction, for example. The program also lets you rotate or skew text to create even more striking effects.

Sticky Pasting Problems

Laser FX operates on the Laser-Writer's built-in fonts and on downloadable fonts as well. Unfortunately, you can't download a font from within the program; you must do so before opening *Laser FX*. Enhanced text can be printed directly from *Laser FX* or saved as PostScript, encapsulated PostScript, or in *Microsoft Word* 3.0 format for pasting into other programs. I pasted a headline into *PageMaker* 2.0 with no problems. Well, there was one slight problem—since the *Laser FX* text appears as a gray box when pasted in, it's difficult to position it correctly on the first try. You'll probably have to print a few proofs before you get a line of text positioned just right.

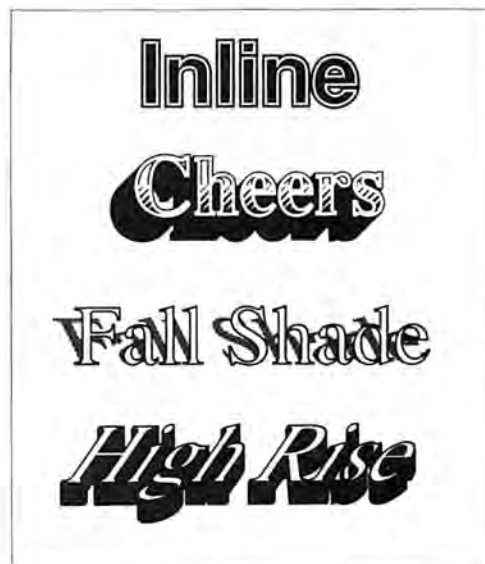
Pasting a text-effect headline into *Word* 3.0 was a snap—once I figured out how to do it. The otherwise excellent manual is so muddied on the steps involved in transferring text to *Word* that I was forced to call Postcraft. Once the procedure had been explained in detail, it worked fine. Perhaps an addendum to the manual is in order.

Impeccable Interface

The *Laser FX* screen is refreshingly simple for a program that produces so many effects (see "Effecting Effects"). You

select the effect you want from a scrolling list and type the text you'll apply the effect to. Then select the appropriate font, style, and size, and adjust the effect's attributes—outline width, shadow offset, and so on—if you wish. An Info bar displays the chosen effect, font, style (bold or italic), size, and the text you typed. Alas, the effect isn't represented on the screen; only the text itself is displayed, in the chosen size, font, and style. If you can't remember exactly what an effect looks like, a handy Help window displays a pictorial sample.

Once you've set an effect's attributes, you can print a proof from *Laser FX* before



Deluxe Effects

Here are a few of the many effects you can produce with *Laser FX*. The program lets you fine-tune attributes of each effect.

Reviews

saving the file and pasting it into another program. Printing can take several minutes, but that's true of any PostScript graphics application.

In addition to the difficulty of positioning pasted text, I came across another annoying flaw in *Laser FX*. You can type only one line of text at a time; the program doesn't support carriage returns. This shouldn't bother most people, since decorative type is meant for short, eye-catching headlines rather than for long passages of text. But if you do want to use an effect on a two-line heading or chapter title, *Laser FX* forces you to combine separate lines in a page-layout program.

All in all, however, my experiences with *Laser FX* were positive. I found it easy to use, and I was impressed at the variety of effects it could produce—without my having to touch a single line of PostScript code. The program provides a novel way to augment your font library without purchasing additional fonts.

Fonts by Number

London Pride's *LP Text* takes a different approach to adding special effects to text. While the *Laser FX* screen represents shadow offset, outline width, and so on, with icons, *LP Text* presents a database-like form to be filled out (see "Font Data"). The *LP Text* screen is, in fact, a database file created with Blyth Software's *Omni 3*; a custom version of *Omni 3* comes with the effects program. You fill in the blanks in a number of fields to specify font, font size, shadow offset and angle, and other attributes.

Font Data

With *LP Text*, you fill in a form to produce PostScript special effects. You must print proofs to see what an effect looks like.

Text to be Output	
Dark Shadows	
Text String ==>	TL
Font	5: (28x28) Pt. Times-Bold
Length	: 18 Pt.
Initial Gray	: 100% <input checked="" type="checkbox"/> Screen Size : 65.000
Final Gray	: 0% <input type="checkbox"/> Screen Angle : 45°
Overlay Gray	: 0% <input type="checkbox"/>
Vertical Shift	: 0.500 Pt. Vertical Offset : 5.125"
Horizontal Shift	: 0.200 Pt. Horizontal Offset: 3.875"

Grays Outlined EPSF Line Screen

Next
Prev
Find
Display
Insert
Edit
Delete
Output

LP Text differs from *Laser FX* not only in its interface but in the effects it offers as well. While *Laser FX* offers variations on 30 basic effects, *LP Text* has only 2: shadows and text set on convex or concave arcs. Within these 2 effects, *LP Text* offers more flexibility than *Laser FX*'s numerous but canned effects. For example, *LP Text* lets you set both the vertical and horizontal point size of text, in effect producing condensed or extended characters; offers character kerning; and lets you fine-tune attributes such as a shadow's angle or length. Finally, *LP Text* provides a curved text effect that *Laser FX* doesn't offer at all.

Like *Laser FX*, *LP Text* lets you add effects to downloaded fonts and save text in PostScript format for pasting into other programs; I pasted a sample into *Page-Maker 2.0* without a hitch. The drawbacks I found in *Laser FX* apply to *LP Text* as well: you must download additional fonts in advance, and it is difficult to position pasted text precisely.

In summary, *LP Text* has a limited number of effects, but provides more control over some of their attributes. *Laser FX* offers a larger number of basic effects and a more appealing interface.

Text effects are so much fun to create that you might be tempted to put them in all your publications. But as the *Laser FX* manual prudently advises, "Don't overdo it—what appears spectacular in moderation can seem gaudy or pretentious when used in excess." Enjoy (in moderation)!—*Erfert Nielson*

See *Where to Buy* for contact information.



Stats You Can Graph

StatView II

Integrated statistics and presentation-graphics system. **Pros:** Flexible graphics package; fast, optimized number crunching.

Cons: No 3-D graphics option. **Company:** Abacus Concepts. **List price:** \$495. **Requires:** System 4.1 and either Mac II or Mac Plus/SE with 68881 processor. **Copy protection:** None.



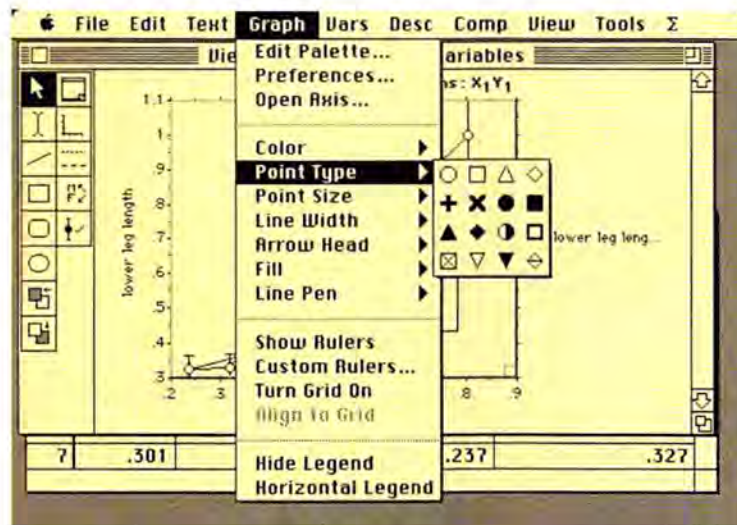
When *StatView 512+* was introduced by BrainPower, users found it to be the easiest serious statistics program available (see *Reviews in Macworld*, December 1986). Now the program's creator, Abacus Concepts, has extensively rewritten the data input and output capabilities, renamed the program *StatView II*, and decided to publish it alone. The only change in *StatView II*'s statistical machinery is 68881 math coprocessor support. Like its predecessor, *StatView II* will appeal to anyone who uses statistics professionally, and especially to those who need powerful data-import and presentation-graphics capabilities.

Parse the Inputs, Please

Most of the real-world data that statisticians analyze is collected in spreadsheets or special-purpose databases associated with various statistics programs. One way to let a statistics program use this data is to write a conversion program for each

Point by Point

StatView II features additional pop-up submenus for specifying small details of graphic views.



spreadsheet or database—a cumbersome job. StatView II, however, uses a facility called an *intelligent parser*, which operates inside the program and differentiates between data labels such as height or weight and the actual data. Although StatView II assumes it will be reading a tab-delimited file, it will adjust if it encounters spaces, commas, or other delimiters. Thus, virtually any file saved as text can be read directly into StatView II without modification or tinkering with formats.

StatView II is designed to run on the Mac II, the SE, and the Mac Plus outfitted with 68020/68881 accelerator boards. StatView II also supports most 68000/68881 combinations, but you should contact Abacus directly to make sure your combination is compatible. StatView II running on a Mac II far outraces StatView 512+ on a Mac Plus (see “StatViews Compared”). In fact, the speed of StatView II compares favorably with that of a minicomputer—so you can eliminate the time-consuming task of entering data on a Mac then uploading it to a minicomputer for processing.

A Well-Crafted Plot

StatView II now offers Text and Graph choices on the menu bar (see “Point by

StatViews Compared	StatView 512+	StatView II
Perform simple regression on 2000 data pairs	30 sec.	1 sec.
Perform factor analysis on 20 variables	640 sec.	11 sec.
Plot 5000 points	65 sec.	10 sec.

Point”), allowing detailed control over placement of legends, text blocks, and sections of tables into figures, as well as modification of data-point representation, color, line width, and chart scaling. A StatView II graph is composed of four overlaid panels: Background, Statistics, Drawing, and Legend. Background simply gives you a choice of color, and the Statistics panel is the plot that StatView generates from data. The Drawing panel is a novel feature because it allows you to place arrows, boxes, lines, and simple drawn components over the graph. The Legend panel, which lets you customize text information in the graphing window, is particularly helpful—often the simple column headings in a data table do not provide enough information for those who need to interpret the graph.

Tables can be included as insets in a graphing window, and you can design pages with multiple graphs. These flexible graphics capabilities make StatView II useful in consulting, scientific, and business contexts. The only graphing feature that the program lacks is rotatable 3-D graphics. Yet if this were added, StatView II would grow to over a megabyte in size.

Adding It Up

StatView II contains the original statistical analysis engine of StatView 512+, updated for 68881 processing, and new data-import and presentation-graphics facilities that rival stand-alone programs such as Cricket Draw. While programs like Systat offer a wider range of statistical functions, StatView II's color graphics may make it the first choice for analysts who present their results to nonstatisticians.—Charles Seiter

See *Where to Buy* for contact information.

Find It with Eureka

Eureka: The Solver 1.02

Equation-solving system. **Pros:** Easy to use; packed with features; ideal for interactive problem-solving; includes advanced calculator DA. **Cons:** Slow on non-68881 systems. **Company:** Borland International. **List price:** \$195. **Requires:** 512K (128K ROMs only). **Copy protection:** None.



Eureka lets you use sets of equations to define any science, engineering, or financial problem and then allows you to direct the program to solve these equations automatically. You can use Eureka to figure out payments on a car loan, to calculate heat dissipation in a power supply (an SE with its fan disconnected is an interesting case), or compute the optimum curvature of a hang-glider wing. It's currently the only product of its kind on the Mac, and anyone whose computations involve more than simple arithmetic should take it seriously as an alternative to programming in a traditional language or tinkering with math on a programmable calculator.

Seek and Ye Shall Find

At the heart of Eureka is a unique proprietary algorithm that attempts to satisfy all the conditions a user builds into a set of equations (see “Looking for Answers”). These equations are expressed in ordinary notation, and allow other user-defined functions besides the SIN, EXP, LOG, and PMT normally found in spreadsheets and programming languages. A Eureka equation file can contain standard equations ($x + y + 3z = 5$), inequalities ($x + y < 1$), suggested starting points for a solution search ($x := 0.5$), equations using Eureka's function set ($F = \sin(x) + \cos(x)$), and special directives ($\$max F$). The MacWrite-like editor in Eureka lets you type in your equation file or import it as a text file from elsewhere—in most cases, elsewhere is likely to be a piece of Turbo Pascal program.

To familiarize you with equation files and their rules, Eureka includes a well-worked-out set of examples that amounts

to a tutorial. These cover applications from the strictly routine to those using complex numbers, numerical integration and differentiation, and optimization. Often an example or worked-problem file that resembles the problem at hand can be modified to do the job (this is particularly true of the finance examples).

When you are satisfied with your equation file, you choose Solve from the Solutions menu and *Eureka* goes to work, reporting a solution file in a separate window. If you're just finding the roots of a polynomial or computing loan payments, *Eureka* gives you a nearly instantaneous answer. If you are looking for the minimum or maximum of a complicated function, you will wait a bit. On a non-68881 SE, *Eureka* takes several minutes for computation-intensive tasks like curve-fitting, min-max calculation, and function plotting; a

math coprocessor improves performance on these chores by a factor of 20 to 40 (68881 and non-68881 versions are supplied on the distribution disk), and I strongly recommend using one. After viewing the solution you can save it, graph the result, or change equations and settings to review simpler or more complex variations on the same mathematical theme.

In advanced use, you can specify the level of substitution the algorithm uses to solve the problem, the time allowed for calculation (you can inspect intermediate results), the desired numerical accuracy of the result, and the penalty-function weights that dictate the relative importance of conditions. Brief instructions, and a few examples, for interfacing *Eureka* to *Turbo Pascal* are also provided.

Words and Pictures

As a calculation facility, *Eureka* lets beginners solve problems that would provide serious programming challenges in BASIC or Pascal. But what makes *Eureka* really useful in practical terms is a combination of graphing and reporting facilities. The Log menu lets you record as a separate report file all the variations of your work in a session. Since *Eureka*'s interactive nature encourages you to do considerable modification of equation files in the course of solving a real-world problem, it's useful to record everything for review. Publication-quality plots of equations, drawn with a few command choices (scaling, grid) from the Graph menu dialog box, can also be included in log files. When all the calculations are finished, the report file can be edited in *MacWrite* (or any word processor that reads *MacWrite* files) to produce a finished summary of the problem and its calculated solution. This sort of automated documentation of numerical work is exactly what's lacking in calculator or programming solutions of similar problems, and it fills a real need for working engineers and financial consultants.

Borland provides two additional nice touches to go with *Eureka*: a DA called Calculator Plus that sports scientific and financial functions and a scrollable tape; and a respectable ring-bound, slip-cased 300-page manual.

Adding It Up

Eureka requires only a bare-bones mathematical definition of a problem to find a solution, bypassing both programming and calculator gymnastics. Beginners

can use *Eureka* to solve a large variety of computational problems in just a few minutes, and the ease of problem-solving encourages experimentation. Finally, *Eureka*'s graphing and reporting features make it the method of choice for solving problems in a professional setting.

—Charles Seiter

See *Where to Buy* for contact information.

Working within the Rules

Instant-Expert 1.5

Expert systems development tool. **Pros:** Effective, simple expert-system shell; easy debugging with Why? option; superior customer support. **Cons:** Plain, text-based application, slow for large rule bases. **List price:** Version 2.0 \$49.95. **Requires:** 512KE. **Copy protection:** None.

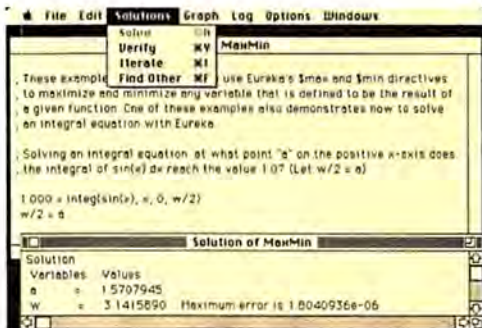


Even after several years of enthusiastic articles about how artificial intelligence and so-called expert systems were expected to revolutionize daily life, not many commercial products have yet emerged. But if you want an answer to questions like "What is an expert system?" and "How do you build one?" take a look at *Instant-Expert* from Human Intellect Systems. As a development tool, it's small enough to be comprehensible but large enough to support modest programs like office procedures training or customer support inquiry handling.

Human Intellect Systems now offers a complete expert-systems development program for the price of a typical book on the subject. *Instant-Expert* lets you develop rule-based systems (up to 250 rules) that can simulate many business decision-making processes. At *Instant-Expert*'s level of simplicity—it's text-based, with only one type of rule-entry form—you can actually see how an expert system operates and evaluate its potential and limitations.

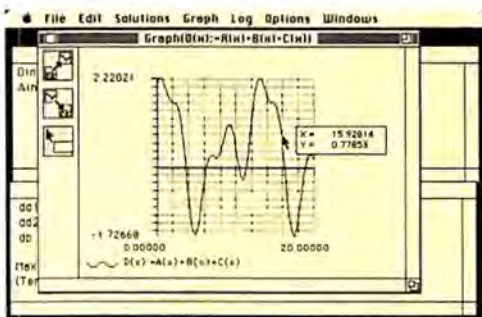
Following the Rules

An *Instant-Expert* application is just a set of IF-THEN rules. For example, to formulate an expert system called Duck De-



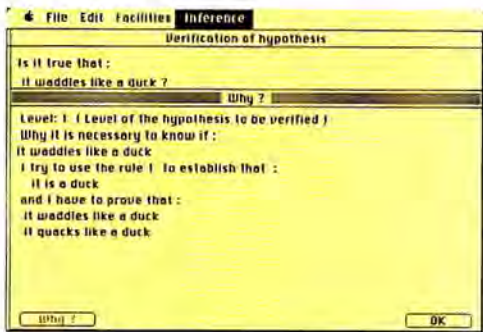
Looking for Answers

These *Eureka* windows list the definition and solution of an integral-equation problem. The Solutions menu lets you check for alternative solutions or iterate steps in a multipart problem.



A Picture Worth a Thousand x,y Pairs

Graphing is a *Eureka* strong point. Clicking the cursor at any point in a plot displays the coordinates of the point—a quick way to check local maxima and minima of functions.



Listening to Reason

A nice touch in *Instant-Expert* is the *Why?* option. Invoked during a chain of deduction, it tells what rule the system is using to process the last piece of evidence it received.

vider, you would create a set of rules called a *knowledge base*. You would enter Rule 001, "IF it waddles like a duck AND it quacks like a duck THEN it is a duck."

You can test your knowledge base by having the program ask you for a hypothesis. After you enter the hypothesis "it is a duck," the program asks you the relevant questions about waddling and quacking. Your answers are entered as the facts for the program's fact base. If your answers check out, the program tells you that the object of your inquiry is indeed a duck. If they don't, it pleads inability to determine a result.

That's it. That's an expert system. Huge medical diagnostic programs such as MYCIN and Digital Equipment's computer facility planner are essentially no more than larger collections of IF-THEN rules combined with an inference engine, which is just a program similar to *Instant-Expert*. The relative scarcity of worthwhile, daily-life expert systems doesn't reflect any conceptual or programming difficulty; it arises from problems in formulating sets of rules that are both small enough to be manageable and large enough to handle reality. Currently, business applications such as filtering sets of job applications and determining loan qualifications have been worked out successfully; *Instant-Expert* can easily work well with both these tasks.

Expert Ease

Aside from facilities for editing, modifying, and printing both the rules base and the facts base, *Instant-Expert* has several nice features typically found only in expert systems programs costing several hundred

dollars more. The Inference menu, which is used to draw conclusions from the input facts, has Deduce and Expertise options—Deduce for rapid conclusions from entered facts, and Expertise for a dialog-based, interactive investigation. It supports both forward chaining (starting with descriptive facts to identify a duck) and backward chaining (verifying the conclusion "duck" by checking the list of facts). In some cases, *Instant-Expert* uses a mixed strategy involving both forward and backward chaining.

The *Why?* button (see "Listening to Reason") in EXPERTISE lists the rule or rules that the inference engine uses in response to the facts you enter. This is useful in explaining program logic to beginners; for developers working with hundreds of rules, however, it's an essential debugging aid when the program goes awry. The manual and example knowledge bases constitute a painless introduction to this area, far simpler to follow than the most basic books of standard programming-language examples.

At this price, you don't get everything. *Instant-Expert* can't handle, at least directly, arithmetic operators, or conditions in an IF statement, or negative facts. That is, rules like "IF LoanAmount > \$1,000,000 THEN NOT possible" and "IF does NOT waddle THEN it's NOT a duck" aren't allowed. And like most basic expert systems, *Instant-Expert* can respond only to input that matches rules exactly ("It is two feet long" and "It's two feet long" are totally different statements). For graphics (useful for outlining program logic and creating livelier input/output screens) you must turn to *Instant-Expert's* more expensive big

brother, *Instant-Expert Plus*. Moreover, the response time of Deduce increases noticeably with complex rules and large rule sets. It takes 12 to 15 seconds to get an answer on an SE with a 100-rule base, but this figure is heavily dependent on the rules and their content.

These points don't detract from the main value of *Instant-Expert*, however. It's an effective tutorial in expert systems that can also serve as a platform for development of modest practical applications, with the potential for expansion.—Charles Seiter

See *Where to Buy* for contact information.

A Colorful Quest

Crystal Quest 1.0

Arcade-type game. **Pros:** Fast, challenging action; works in color on the Mac II; easy to learn; clever graphics and sound. **Cons:** Frustrating at higher levels; clever sounds may annoy some people. **Company:** Greene Inc. **List price:** \$39.95. **Requires** 512K. **Copy protection:** Not copyable.



Like some of the best video-arcade games of the early eighties—*Defender* and *Robotron* come to mind—*Crystal Quest* requires trancelike concentration. You learn to play in minutes because the game is so intuitive. Then you go nuts for hours trying to stop playing. No strategy, and above all no thinking; just go for points and try to stay alive. It's not an intellectual game.



A Very Nasty Game

Your ship (center) is under attack from various nasties, including a Dimple (blob at right) and a laser-shooting Menace.

Crystal Quest is a fully revised version of the popular shareware game *Crystal-Raidr*. Several new features have been added, including a two-player mode, support for color, a much-enhanced sound file, and a demo mode. (A bug in the demo mode that initially caused system errors on about one out of ten Mac IIs has reportedly been fixed, so buyers of early copies should call Greene Inc. to get a free replacement.)

One problem with *CrystalRaidr* was that playing it was like maneuvering a pat of butter on a hot griddle. Extreme mouse oversteer gave all movement an uncontrollable, bouncy quality. Mouse control is much better in *Crystal Quest*, although some players who have never played the earlier game complain that motion is slippery and hard to manage.

Constant Attacks

The game is simple. You move your ship (a round rosette sort of thing) with the mouse, and you shoot by clicking the mouse button. You must shoot constantly, because right from the start your enemies—Dumplings, Menaces, Trimpets, Tentawarbles, Banes—are all over you, firing various bullets and missiles. (And merely touching an enemy or a mine will finish you off, as well.) During each *wave*, or stage, you attempt to collect all the crystals on screen (by running over them) and finally escape through the gateway, which opens only when you've collected all the crystals. The game progresses through 40 waves of increasingly outrageous difficulty—after 40, if you get that far, it doesn't get any harder. At random intervals a large Bonus Crystal skitters across the screen; go after it, because it's worth many extra points. If you get through a wave fast enough, a time bonus is added to your score.

In the higher waves, the screen is almost impossibly crowded. There are ever-increasing numbers of mines, and some of the more advanced enemies are dauntingly tenacious. Large blobs—the Dumplings—have to be shot several times to finish them off, and Menaces fire laser beams across your path. Gather as many "smart bombs" as you can—you're sure to need them soon. You press the spacebar and the smart bomb explodes, clearing the screen of nasties. After about wave 25, you'll find yourself hitting the spacebar frequently.

Crystal Quest is especially fun to play on a color Mac II because the vivid color-cycle graphics rival those of the finest arcade games. It's also much easier to play in color, since so much RAM is used for color screen refresh that the nasties are slower. Also, color cues help you to sort out who's who. Still, the game works fine on a Mac 512K or Plus.

Some of the sounds are droll, and some are gross. Kids will love them. The sound that accompanies the player's entrance into the gateway at the end of each wave, however, is a digitized pseudo-female-orgasmic gasp that several women I played it for found offensive. Men are apt to chortle embarrassingly and make suggestive remarks. It's a bit like finding a Brigitte Nielsen inflatable doll in a toy store.

Crystal Quest is the first Macintosh game I've found that truly compares in features and quality with a real arcade game. And the price is right. —*Felicity O'Meara*

See *Where to Buy* for contact information.

Gravity at Play

Orbital Mech 1.11

Space flight simulator. **Pros:** *Challenging, educational, fascinating.* **Cons:** *Manual may be difficult for those without science background.*

List price: \$34.95. **Requires:** 1MB. **Copy protection:** None.



Unlike simulators that try to replicate hardware, Studio Zero's *Orbital Mech* is a real-time space-flight simulator that concentrates on orbital space flight itself. The screen represents a reduced-scale *basic gravity system* complete with twinkling stars, and the spacecraft and its environment have been simplified to maximize the experience of flying in orbit. You maneuver the spacecraft through two sequentially closer views in the extremely tricky business of docking with an orbiting space station. To dock is to win. Failing to dock sets in motion gravitational forces that bounce you off the space station and warp your orbit. Push buttons control rotation of the spacecraft with forward, reverse, up, and down thrust. The sensibly arranged keyboard controls will be easier than the mouse for some players to use. Among other options, you can mea-

sure time and fuel consumption (consequently limiting both) or turn those indicators off.

Taming the Universe

You have control over conditions in *Orbital Mech's* simulated universe, which basically conforms to scientific principles. The simulation's running speed (orbit speed, spin-out-of-control speed, and the like) can be regulated to your advantage, and other conditions can be enhanced. The Controlled Rotation feature stops spacecraft rotation the instant you cut thruster power, a sensible but unrealistic alternative to Free Rotation, which is more like the conditions actually faced by astronauts. In space, only *counter-rotation* (a precisely measured, evenly matched thrust in exactly the opposite direction of the spin) can stop rotation. Various combinations of other menu options can create fascinating orbital motions. And to assist the operator in quickly visualizing orbital movement, the Trail option produces a sky-writer-like trail that stays on the screen until you clear it.

Newton and You

Although the program's documentation is delightfully literate and humorous enough to elicit a genuine enthusiasm for the subject, a lengthier, more basic explanation of orbital mechanics would be helpful. Nevertheless, *Orbital Mech* gives those of us lacking an intuitive grasp of the physics of gravity the opportunity for hands-on experience that can bring theory to life. The difficulty of docking a spacecraft with a space station is entirely ex-



Celestial Simulation

The spacecraft's control panel has been abstracted into a simple grid that appears in the lower right portion of the screen. Shown here, the spacecraft maneuvers closer to the space station for a docking exercise.

plained by orbital mechanics—but even failure to dock in this engrossing simulation is infinitely more rewarding than simply failing to understand equations. Playing *Orbital Mech* affords pleasant discovery of something as basic as an apple dropping from a tree. —Keith McCandless

See *Where to Buy* for contact information.

Frustrating Fun

Falcon: F-16 Fighter Simulation 1.00

Flight simulator. **Pros:** Realistic; many variables and options. **Cons:** Complicated; frustrating at times. **List price:** \$49.95. **Requires:** 1MB of RAM (512K version available on request).

Copy protection: None.



You'll have to be a fighter pilot at heart to enjoy *Falcon*—a realistic but highly complex flight simulation game from Spectrum Holobyte. With *Falcon* you match wits with MiG-piloting Russians, conduct bombing runs, and fly low to avoid surface-to-air missiles. But unless you have the patience to really learn the game, you'll be lost in a morass of displays and crashes. *Falcon* is very much like real flight school: you must practice and you must study.

Hook your Mac to a stereo if possible and let the thundering music put you in the mood for a mission. A duty roster lists active pilots, their current ranks, and the merits they have earned. You can select one of these or type in a new name of your own. Unless you have fighter pilot experience, start as a lieutenant—you can't crash or get shot down. At the other extreme, "full bird" colonels face deadly MiG pilots who execute sophisticated maneuvers. Even the program's author has a hard time defeating these pilots.

Weapons include everything from Sidewinder missiles to Durandal anti-runway bombs. At the lieutenant level you are fully armed, but at other ranks you must pick and choose weapons according to your mission. Beware—you can't always get the items you want. *Falcon* randomly generates the availability of weapons.

Falcon offers a choice of 12 missions, each with its own difficulty rating. Merits and medals are awarded accordingly;



points are also given for shooting down enemy aircraft, successful bombing runs, and landing safely.

Landing can be a special headache. Don't depend too much on the deviation scales and other readouts at first. Just try to align the plane with the runway and come in at a low 10-to-15-degree angle.

Reading *Falcon*'s comprehensive manual carefully helps you sort out the mass of displays in the cockpit. The program also lets you practice specific maneuvers so you'll be better prepared for a real battle. You can even replay and study encounters with the enemy. Still, it takes a few days to feel comfortable at the lieutenant level, and even after a solid month of flying you probably won't have mastered the game.

Falcon is not for everybody—you won't just take off and excel. But if you stick with it, there's a world of battles out there. And if you're good enough, you might earn the Medal of Honor and be inducted into the Sierra Hotel, which lists the top ten pilots of all time. A fitting memorial to a helluva flyer. —Robert Buderl

See *Where to Buy* for contact information.

The Mac Goes BackPac-ing

BackPac 40

Externally mounted 40MB hard disk for Macintosh Plus. **Pros:** Quiet; retains Mac's portability; easy to install; doesn't steal power from computer or add heat internally; comes with lots of useful public domain and shareware software. **Cons:** Only for Mac Plus; won't work with ThunderScan Power Port; soft plastic screws can be marred easily; slightly higher price than Jasmine's standard 40MB hard disk. **Company:** Jasmine Technologies. **List price:** \$1299. **Requires:** Mac Plus.



Macintosh Plus owners no longer need envy the portability of an SE fitted with an internal 20MB hard disk—thanks to the introduction of Jasmine's BackPac 40, an externally mounted 40MB hard disk that adds only 1½ inches (and less than 3 pounds) to the back of the computer. Its style, color, and fittings all carefully match the Plus. Moreover, I was able to fit the whole system into my carrying case and did not need to abandon my System Saver Mac fan.

Reviews

The hard disk is no slouch, either. Jasmine claims an average track seek time of 29 milliseconds, which puts the BackPac 40 right up there with the fastest hard disks. Some informal timings showed it to be much faster than the Apple 20MB hard disks I tried. Remember, however, that the speed of any hard disk attached to a Macintosh depends on how you've arranged information on the disk—if you don't optimize files for speed, even the fastest drives will be turtle-like during data retrieval. Nonetheless, I found the BackPac to be 20 to 40 percent faster than my MacBottom 20MB at various tasks using exactly the same file arrangement on both hard disks. Even better, the BackPac 40 is quiet—you'll barely hear it running (you won't hear it at all if a fan or a printer is idling nearby).

Getting Attached

Jasmine's advertisements are accurate in claiming that the BackPac is simple to install. The manual lists the 11 steps in two pages, and Jasmine supplies the Torx wrench you'll need to remove screws from the Mac. (The screws on the BackPac 40 are big enough that they can be removed with a coin.) The company even provides a place inside the BackPac 40 to put the wrench, screws, and battery cover. That way you'll have them handy should you decide to remove the drive.

It's hard not to get the drive aligned and mounted correctly, although the SCSI port connector should be handled gently since it hangs out of the BackPac's case by a rigid flat cable that could be damaged by excessive pressure. There was one slight inconvenience: I had to temporarily remove my System Saver Mac fan (which sits on top of the Mac) to mount the drive.

The two mounting screws are soft plastic, so they tend to get marred during tightening, but they do remain functional. The BackPac's SCSI port provides a new SCSI connector to which other peripherals can connect (there's no need for an additional daisy-chain cable, as with some drives). Other connectors on the back of the Macintosh end up "buried," but are still accessible by normal cables. The one exception I found to this was ThunderScan's Power Port; you'll have to provide power to the ThunderScan scanner via an improvised method. Also, the BackPac's lower edge has labels for the Mac ports, since you can't see the original icons.

You can reset the SCSI address of the BackPac 40. I had trouble assigning it to address 6 (the next to highest priority) while my MacBottom was at 5, but everything worked fine with the MacBottom at address 4 and the BackPac at 5. The utility software provided with the BackPac made it easy to see what devices the Macintosh was recognizing and at which addresses they were installed. You can also use these utilities to mount a drive that is powered up after the Macintosh.

The BackPac 40 User's Guide is well-written, informative, and complete. It even includes a reprint of an article on how to recover lost files and damaged disks.

A Software Sampler

The BackPac 40 comes preformatted with the System and Finder files already loaded. That means that the first time you turn the power on, you'll boot directly from the hard disk. Besides the System files and the BackPac utilities (also provided on a 3½-inch disk), you get a little over 10MB of public domain and shareware software.

Included in the software loaded onto the drive are significant programs like *ResEdit* and *Switcher*; as well as some very

useful shareware products like *miniWriter*, *MockPackage*, *Red Ryder*, and *PackIt III*. Remember to send in the suggested user fee to the author if you start using a shareware product.

Was There Any Doubt?

The BackPac 40 is a fine product. The hard disk is quiet, fast, and mounts conveniently to preserve the Mac's portability. Installation and removal are both easy. The inclusion of public domain software and the preformatting of the hard disk (so it's instantly bootable) are nice extras. And, the one-year warranty is more than you get with some hard disks.

More important, though, is that the BackPac 40 looks like it's supposed to be there; it doesn't add an extra box and cable to disconnect and carry each time you move the computer, nor does it create any additional heat problems as do drives that sit under the computer. Now it's the SE owners with their slow, space-starved 20MB drives and loud internal fans who should be envious.—*Thom Hogan*

See *Where to Buy* for contact information.




Since Jasmine's BackPac 40 adds a mere 1½ inches to the depth of a Mac Plus, the computer's portability is not compromised. In addition, the drive is quiet, reliable, and easy to install.

The Mac II Opens Up

Rodime 1000 RX, Rodime 1400 RX

Large-capacity hard disks. **Pros:** Fast; transparent. **Cons:** Poor tech support; pedestrian software; expensive. **List price:** 1000 RX \$2195, 1400 RX \$2995. **Requires:** Mac II.

 Most Mac II users I know frequently have the tops off their computers to install more RAM, enhanced video cards, and larger capacity hard disks. While a Mac II with 1 megabyte of RAM seems shortsighted, the thought of one with only a 20MB hard disk is laughable. Few people are satisfied with just 40MB, and increasing numbers are outgrowing their 80MB hard disks.

Rodime is one of the first companies coming to the rescue, with a pair of internal hard disks for the Mac II. The 1000 RX and 1400 RX, with 100MB and 140MB of capacity, respectively, come close to meeting my ideal for a hard disk: I don't have to turn it on, I don't see it, hear it, or even think about it much, yet I finally have enough room—for now.

Putting one of these drives into a Mac II is a snap. Anyone who can get the top off a Mac II can install the drive correctly the first time. The only tool required is a #2 Phillips screwdriver. It's still a good idea, however, to read the manual's short but clear installation instructions. Don't be scared off by the manual's warning that the drive should be installed only by an authorized Rodime representative—this caution is included merely to protect Rodime from liability.

Because these drives are mounted internally, the external SCSI port is available for attaching another device. You could daisy-chain an external hard disk and another piece of hardware, but by installing the hard disk internally, you eliminate the inconveniences of daisy-chaining, such as fussing with terminators and keeping track of addresses.

However, you will want to attach at least one extra hardware device to your Mac II—a backup unit. As you start filling up one of the Rodime drives, floppy disk backup becomes unreasonable. Backing up a full 140MB drive with floppies, reformatting it, and reloading it could take 12

A Second Look



Last month, *Macworld* reviewed three backup programs—*Fastback* (Fifth Generation Systems), *DiskFit* (SuperMac Software), and *HFS Backup* (Personal Computer Peripherals). Due to numerous bugs in *Fastback*, we found that program unacceptable. Fifth Generation has released a new version, 1.02, which corrects the serious problems found in the original. Here are our updated findings.

Fastback 1.02 is faster than *DiskFit* and *HFS Backup*, and no longer rejects disks so readily. If the program does find an unacceptable disk, it requests another. The proprietary error-correction feature works beautifully, and data is much less likely to be lost as a result, even when the program is used with the verification option turned off. Obtaining similar reliability with *DiskFit* 1.4 requires using the verification option, which slows the program.

Fastback now restores most of the links between documents and their applications and restores most windows, files, folders, and applications to position. To restore the links, you must drag a Sys-

tem Folder and an application to the destination disk prior to the restore. But unless you choose a very small application and trash the System Folder after dragging it to the destination disk, you may end up with a too-full disk—and *Fastback* may not be able to complete the restore. (Editor's note: the version of *Fastback* sent to Linda Kaplan was dated two days earlier than the version sent to registered users. The latest version does not require that an application be dragged to the destination disk, although the System Folder must still be transferred. *Macworld* did not retest the latest version.)

Fastback still adds extra disks to sets during incremental backups. Also, the program can't be interrupted and resumed during a backup or a restore, the Catalog disk cannot be copied, and disks used for backup cannot be reused without being reformatted. But despite these drawbacks, *Fastback*'s pros in speed and error correction now outweigh its cons. I recommend *FastBack* as highly as I do *DiskFit*.—Linda Joan Kaplan

See *Where to Buy* for contact information.

matting it, and reloading it could take 12 hours or more. With the SCSI port still free, you could easily attach a tape backup unit.

The backup software, *FileGuard*, offers three modes—Entire Volume, Selected Files, and Incremental. Incremental, which backs up all files added or modified since the last backup, is the only really workable choice for backing up the large-capacity Rodime drives. You can also back up to streamer tapes or other hard disks.

Although I performed some standard speed tests on these drives, I do not place too much importance on them. In actual use, you will encounter variables such as different versions of the operating system, different organization of the HFS system, different software, and fragmented disks. These far overshadow any differences that the standard tests show in raw speed. Also, I have never found a single drive that could win all the tests.

Larger hard disks do not necessarily access information more slowly than smaller ones. Often they are faster. The Rodime 1000 RX and 1400 RX are the same speed, and both are slightly faster than Rodime's 45MB model, the 450 RX. These are among the very fastest hard disks available for the Mac, with an average seek time of 28 milliseconds.

The manual is very short, but adequate. It does not, however, mention Rodime's technical support staff nor does it list any telephone numbers. Neither of the two Rodime mailing addresses on the back cover is for the technical support facility that I was given access to for this article.

These two large, fast drives are easy to install, and very transparent. You don't have to think about them often. They just work and work and work.—Scott Beamer

See *Where to Buy* for contact information.

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New Products

*Information on the Mac's latest software,
hardware, and accessories*

Edited by Eileen Drapiza

This section covers Macintosh products formally announced but not yet evaluated by *Macworld*. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

AnyText and AnyGraph PC-to-Mac data translators for text and bitmapped graphics. Requires MS-DOS 3.0 or later version. Each includes 5¼-inch IBM format disk and 3½-inch Mac format disk, plus documentation. \$95 each. Compatible Systems, 303/444-9532.

Capture, MacSchedule, Macintosh Introductory Programming, and Think 'n Time *Capture* is a screen-snapshot utility that works on pull-down menus and dialogs, and preserves color in Mac II snapshots. *MacSchedule* automates creation of Gantt-type schedule charts. The *Macintosh Introductory Programming* book, based on VIP, includes a disk with examples. *Think 'n Time* organizes personal information into a visual tree of icon-based sheets and piles. *Capture* \$59.95, *MacSchedule* \$195.00, *Macintosh Introductory Programming* \$49.95, *Think 'n Time* \$99.95. Mainstay, 818/991-6540.

Crimeaid and Fireaid Crime-analysis and firehouse-management systems. 512KE min. memory; require 800K external drive; 20MB hard disk recommended. \$1800 each. Crimeaid, Inc., 209/523-8966.

DesignWorks Commercial version of *LogicWorks*. Includes such features as preset drawing sizes, automatic generation of borders and reference grids, arbitrary text or picture placement, and 15 to 200 percent

zoom capability. Compatible with Douglas CAD/CAM PCB layout and auto-routing. 1MB min. memory. \$685. Capilano Computing Systems Ltd., 604/669-6343.

Foresight Combines elements of word and quiz games. Program includes such subjects as geography, languages, history. 512K min. memory. The Learning Curve, 800/873-2300, 713/520-8545 in Texas.

GlobalArt Oriental Images More than 50 clip-art images in *MacPaint* format. \$79. Cathay Europa Designs, 800/533-5504, 207/967-5358 in Maine.

Graphic Astrology, The Gamma Edition Features tropical, heliocentric, and sidereal zodiacs; secondary, Naibod, and solar arc progressions; lunar and solar returns. 1MB min. memory. \$199.50. Time Cycles Research, 203/444-6641.

HyperCard for Design Professionals Checklists for predesign, planning, and working-drawing production. Project-management task modules also available. 1MB min. memory; requires *HyperCard*. \$120 per stack. Guidelines, 800/634-7779, 415/254-9393 in California.

Kanji PageMaker *Kanji PageMaker* integrates both Japanese and English text and graphics; accommodates Japanese paper sizes, units of measure, and Kanji translations of menus and screen messages. Has built-in import filters for *EG Word*. 1MB min. memory; requires KanjiTalk 2.0, 800K external drive or hard disk, and a PostScript laser printer. Price to be announced. Aldus, 206/628-2352.

KiwiEnvelopes Public domain desk accessory lets you print an envelope without leaving current application. Free. Kiwi Software, 805/685-4031; also available on CompuServe.

MacAtlas PostScript Version Clip-art collection of world maps in *Adobe Illustrator* format. 1MB min. memory; requires *Adobe Illustrator*. \$199. MicroMaps, 800/334-4291, 609/397-1611.

MacNet An online network service providing a hot-line from users to vendors, an electronic-mail forum for subscribers, and a link to the stock market. Enrollment fee and software \$49.95 (includes two hours connect time); thereafter \$8 per peak hour, \$4 off-peak. 512KE min. memory; requires a modem. Connect, Inc., 408/973-0110.

MenuFonts2 Customizes the pull-down Font menu by displaying font names in their own font and specified size. Enables scrolling through Font menu from the keyboard. Installs automatically in applications that have Font menus. \$49.95. Beyond, Inc., 602/888-8667.

Millionaire, the Stock Market Simulation Introduces users to the stock market and provides entertainment. Includes all current Fortune 1000 corporations, corporate data, and updated news headlines. 128K min. memory. \$59.95. Britannica Software, 415/546-1866.

MiniDraw Desk accessory drawing program. \$39.95. Software for Recognition Technologies, 716/359-3024.

Prototyper Software development tool for prototyping Mac user interfaces; no coding required. 512K min. memory. \$125. SmethersBarnes, 800/237-3611, 503/245-7270 in Oregon.

(continues)

New Products

Publish or Perish Bibliographic database lets you search notes by keyword, author, or title. 512K min. memory; not compatible with Mac II. \$39.95. Park Row Software, 619/581-6778.

ReadySetGo Design Workshop Modular, eight-hour training course that emphasizes type and design principles, and fundamental and advanced capabilities of *ReadySet-Go*. Contains an administrator's guide, tips for tailoring modules, instructor's notes, material reference set, overhead transparencies, and six student notebooks. \$795. Letraset USA, 800/631-1603, 201/845-6100 in New Jersey.

Science and Engineering Tools Interpret, analyze, and graph scientific and engineering data by implementing simple procedure calls with *Lightspeed Pascal* or *Turbo Pascal*. 512K min. memory. \$74.95. Quinn-Curtis, 617/444-7721.

Solitaire Royale Collection of eight solitaire games and three children's games. 512K min. memory. \$34.95. Spectrum Holobyte, 415/522-3584.

TangentSpool Kit Turns any IBM PC or compatible into a network print manager and serves up to eight PostScript print devices on the AppleTalk network. Includes PC MacBridge ATB/II and AppleTalk connector. Requires IBM PC with hard disk as host. \$600. Tangent Technologies, 404/662-0366.

HARDWARE

Anchor Modems Hayes-compatible Anchor 2400E modem supports full AT command set and S registers. Features include auto-dial, autoredial, autoanswer, and automatic speed detection (2400/1200/300 bps). The Signalman Lightning 24 is Hayes compatible. Features autodialing, diagnostics, and support of synchronous and asynchronous communications. Anchor 2400E starts at \$239, Signalman Lightning 24 \$499. Anchor Automation, 818/998-6100.

The Big Picture CX, ColorPlus II, and The Big Picture IQ The Big Picture CX is a 17-inch color Mac II monitor. 1024-by-808-pixel display format with 1 or 8 bits per pixel; 72-Hz refresh rate. ColorPlus II color card, for monitors such as the NEC Multisync Plus, features 832-by-624-pixel display at 1, 4, or

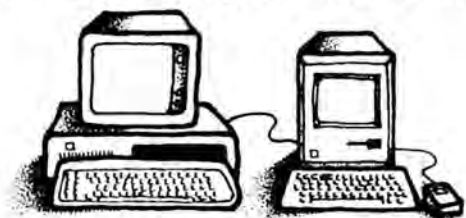
8 bits per pixel; 67-Hz refresh rate. The Big Picture IQ 17-inch gray-scale monitor simulates 300-dpi output by assigning 1 of 256 levels of gray per pixel. The Big Picture IQ offers 1024-by-808-pixel resolution and 82-dpi vertical density. The Big Picture CX \$4495, ColorPlus II \$995, The Big Picture IQ \$2895. E-Machines, 503/692-6656.

CalComp Plotter Model 1023 Eight-pen plotter produces drawing sizes A to D on cut-sheet paper and film. RS-232C interface. Optional 1MB or 2MB memory-expansion cartridge. \$4895. CalComp, 714/821-2142.

Felix Input/pointing device that maps one-to-one with screen. 6-by-6-inch footprint; 300-point-per-inch resolution. Plugs into the mouse port. \$149. Lightgate, 415/653-8500.

ForeRunner, Pegasus, and QuickCapture ForeRunner and Pegasus are analog and digital I/O boards and software for data acquisition on the Mac II. Pegasus offers 750-kHz throughput. QuickCapture is a frame-grabber board and software package that

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Circle 84 on reader service card

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enables users to capture 640-by-480 images, with 256 gray levels, from a video camera or VCR with a Mac II. ForeRunner \$795 to \$895, Pegasus \$1495 to \$3495, QuickCapture \$995. Data Translation, 617/481-3700.

Hurdler II Converts NuBus to Intel/Zilog- and Motorola-compatible bus signals, provides 16 sources of vectored interrupts, three 16-bit timers, and an 8-bit parallel port with four handshake lines and a large wire-wrap area. A declaration ROM may be replaced with up to 8K of RAM. \$279. Creative Solutions, 301/984-0262.

MacSnap 020 SE 68020 accelerator board. Available options include a 68881 math coprocessor and 4MB additional RAM. \$899. Dove Computer, 919/763-7918.

PC MacBridge ATB/II and PC MacBridge ATB/MCA Adapter cards for connecting IBM microcomputers to an AppleTalk network and allowing full use of all AppleTalk devices. PC MacBridge ATB/II \$250, PC MacBridge ATB/MCA \$300. Tangent Technologies, 404/662-0366.

ProScan Series 800 Scanner model 840i provides 400-dpi resolution with 256 gray-scale levels, plus built-in image processing capability. Scanner models 840 and 830 rely on the host computer for image processing. Model 830 features a maximum resolution of 300 by 600 dpi with 64 gray-scale levels. Model 840i \$8995, model 840 \$4800, model 830 \$2800. Datacopy Corp., 415/965-7900.

Qualstar Ministreamer Model 1260S A GCR SCSI tape system that provides 250MB of storage on a single IBM-compatible 10½-inch tape reel. \$7995. Qualstar, 818/906-9952.

ACCESSORIES

Kensington Accessories for the Mac II

Aluminum Mac II Stand lets you prop up your CPU vertically alongside your desk, leaving 2 inches of airspace above the floor for ventilation. Extra-Long ADB Keyboard Cable is more than 7 feet long, and the Mac II Monitor Cable Extension Kit contains a 6-foot power extension cord and a 6-foot video-signal extension cable. The Mac II Stand \$29.95, Extra-Long ADB Keyboard

Cable \$39.95, Mac II Monitor Cable Extension Kit \$49.95. Kensington Microware Ltd., 212/475-5200.

Macpack Microcomputer maintenance kit includes a 3½-inch disk for disk-drive head cleaning, a 4-ounce bottle of CS-85 Head Cleaning Solution, a 4-ounce bottle of Anti-Static spray, plus 25 nonresidual wipes, 50 lint-free cloths, 10 flexible cleaning wands, and a type element cleaning brush. \$34.95. PerfectData Corp., 805/581-4000.

II-tall Platform for the Mac II that allows it to be stored vertically on or beneath a desk. \$59. E-Machines, 503/692-6656. □

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.

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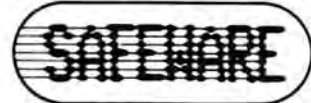
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Quick Tips

Answers to your questions

by Lon Poole

Catching up on some back issues of *Macworld*, Jeff Fischer of Carbon Canyon, California, came across a question ("Text for Mainframes") in the August 1987 *Quick Tips* that his small utility program answers. *EndLine* 2.0 breaks paragraphs of any text file into lines of 70 characters or less, and puts a Return character at the end of each line. All line breaks occur at spaces, never on the 70th character. (You can change the line length using *ResEdit*.)

EndLine is free (not shareware) and is available for the cost of shipping from most user groups that maintain a software library, including BMUG (415/549-BMUG). For the name of a user group near you, call Apple's User Group Hotline, 800/538-9696 ext. 500. (User groups, send me your disk library catalogs so I can mention you.) You can also get *EndLine* from online information services such as GENIE.

Out of Order

The November 1987 *Quick Tips* includes a table ("Orderly Arrangement," p. 280) that purports to show how the Finder alphabetizes icon names. After some experimentation, *Macworld* contributing editor Robert C. Eckhardt discovered that the Finder alphabetizes capitals, symbols, and foreign letters in a different order than does the Open dialog box—and that neither uses the ASCII-code number sequence (see "Disorder Set Right"). You can use letters, digits, and symbols as folder- and document-name prefixes to set the order in which folders and documents ap-

Lon Poole is a Macworld contributing editor. A collection of these tips can be found in his book Mac Insights (Microsoft Press, 1987).

Finder's By Name view:

! « » " ' # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 ; < = > ? @ A Á â ã ä å æ ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö Ø Ù Ú Û Ü Ý Þ ß à á â ã ä å æ ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö Ø Ù Ú Û Ü Ý Þ ß

Open dialog box:

! « » " ' # \$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 ; < = > ? @ A Á â ã ä å æ ç È É Ê Ë Ì Í Î Ï Ñ Ò Ó Ô Õ Ö Ø Ù Ú Û Ü Ý Þ ß

Disorder Set Right
This corrected version of "Orderly Arrangement" (November 1987) shows that the Finder sorts symbols and foreign letters differently than does the Open dialog box. It also puts capitals before lowercase letters, while the Open dialog treats them the same.

pear in the Open dialog box or the By Name view in the Finder.

HyperCard Sounds

I have been unable to find any details on how to add a digitized sound to a *HyperCard* stack. I have both the *SoundCap* and *SoundWave* applications, along with Impulse's sound digitizer.

David A. Watson
Montgomery, Alabama

A You need the *SoundCap Mover* stack, by Steve Milne and Ted Kaehler. It converts the digitized sound in a *SoundCap* file to an "snd" resource, which *HyperCard*'s Play command requires, and puts the resource in a stack of your choice. You also name the resource and specify a base pitch. To move sounds from one stack to another, use the *ResCopy* stack, by Steve Maller. Most user groups that maintain software libraries have *SoundCap Mover* and *ResCopy*.

To play the sound, use the name of the "snd" resource as the voice in a *HyperCard* Play command. For example, the following command plays the tune "Charge!" using the sound in a "snd" resource named "organ":

```
play "organ" "g3 c4 e gh eq gh"
```

Preserving the Lisa

At my company, there are many original Lisas with 5- and 10-megabyte hard disks. Is there a way to work with Mac files on the Lisa? We are planning to set up Mac systems throughout our department, but would like to preserve our sizable investment in their predecessor.

Eugene Hunt
Wilmington, Massachusetts

A A Lisa 2/5 or 2/10 becomes a Macintosh XL when you use *MacWorks XL* software. The Macintosh XL uses the standard Macintosh System file version 3.2 and Finder version 5.3. Mac software can take advantage of the 12-inch screen, 2 megabytes of memory, and the hard disk. You use the hard disk solely for Mac software or share it with Lisa 7/7 software. *MacWorks XL* gives you access to the AppleTalk Personal Network and the LaserWriter.

Although many Mac applications run on a Mac XL, not all do. Text and pictures appear somewhat taller on the XL screen

(continues)

too well. My phone, for example, often dials an irritable day sleeper when it bears the Macworld number. For recalcitrant phones like mine, DataDesk International (7650 Haskell Ave., Van Nuys, CA 91406, 818/780-1673) makes the \$34.95 HyperDialer, which installs between your telephone and its handset and plugs into the Mac sound port. Or you can plug an amplified speaker—like the type made for a Walkman—into the Mac.

LaserWriter Paper Flipper

Tip: The LaserWriter stacks the first page it prints on the bottom and the last page on the top. You usually have to rearrange the pile by hand. To eliminate the manual collating, remove the paper output tray and place a small box next to the printer. As paper comes out of the LaserWriter, it will automatically fall into the box upside down. When you turn the stack of paper over, the first page is first and the last page is last. (MacWrite prints the last page first, so use the standard output tray for it. Also, Word can be set up to print last page first, but documents take longer to print with this option.)

Judith R. Epstein
Highland Park, Illinois

The Occasional Legal Page

Tip: I have resisted buying a legal-size paper tray for my LaserWriter because I need legal-size pages rather infrequently. Instead, I had been selecting the Manual Feed option in the Print dialog and keeping the letter-size paper tray in the printer. But with versions 4.0 and 5.0 of the LaserWriter printer driver, my method no longer works. I get a letter-size image regardless of the Print dialog specification.

I've discovered a way to fool the printer into thinking it has a legal-size tray. Insert something into the tray slot that fully depresses the two upper roller switches on the left side of the slot (but does not press the lower one) and that simultaneously pushes up on the dangling lever that's about an inch from the left side.

Strangely enough, I found I could do the job by wedging in two Fluent Laser Font plastic boxes—one to depress the rollers and the other to push up the lever. Of course you could use your hand, but that is most uncomfortable and somewhat unreliable.

Robert G. Benson
San Diego, California

(continues)

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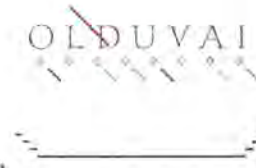
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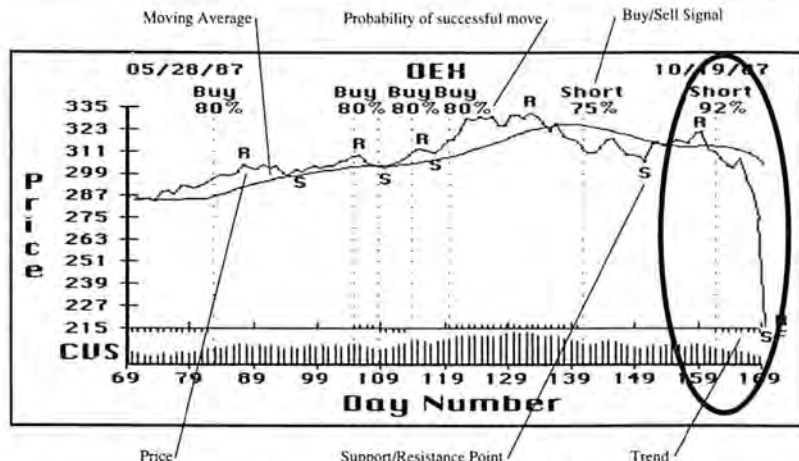


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How To/Quick Tips

Save Time and Space

Tip: If you use outside printing services to produce your desktop publishing output, you should compress your PageMaker files for minimum transmission time and disk space.

For a PageMaker publication without any encapsulated PostScript (EPS) graphics, use the Save As command when you finish the document. Save As produces a file about 40 percent smaller than the Save command does, because Save retains the previous version as well as the current version just in case you want to revert.

For a PageMaker publication with EPS graphics, the procedure is more complicated. The EPS graphics contain QuickDraw screen information that's not needed for printing on a PostScript device. The QuickDraw information can be safely stripped by following these steps:

1. Make sure your System Folder contains the *apd* file for the particular PostScript device that will ultimately print your publication.

2. Open the PageMaker publication.

3. Choose Print and verify that the printer type, page size, and so on, are set correctly for the printer that the service will use for output.

4. Press Option while clicking the Print button to bring up a special dialog box.

5. Turn off the Download Bit-Map Fonts and Download PostScript Fonts options (unless the printing service doesn't have the fonts you're using; then you'll need to use the Download PostScript Fonts option).

6. Choose Print PostScript to Disk, making sure Normal is selected, not EPS.

7. Turn off Include Aldus Prep, unless the printing service doesn't have the same version of Aldus Prep you have.

8. Tell your printing service how you prepared the file, and to simply download it to the printer after setting up the printer with Aldus Prep.

You can further compress either type of file with *PackIt III* or *StuffIt*, but the printing service must have the same application for unpacking.

Michael Scaramozzino
Providence, Rhode Island

Amen, brother. I recently reduced a one-page document from 160K to 17K using your suggestion. Transmission time went

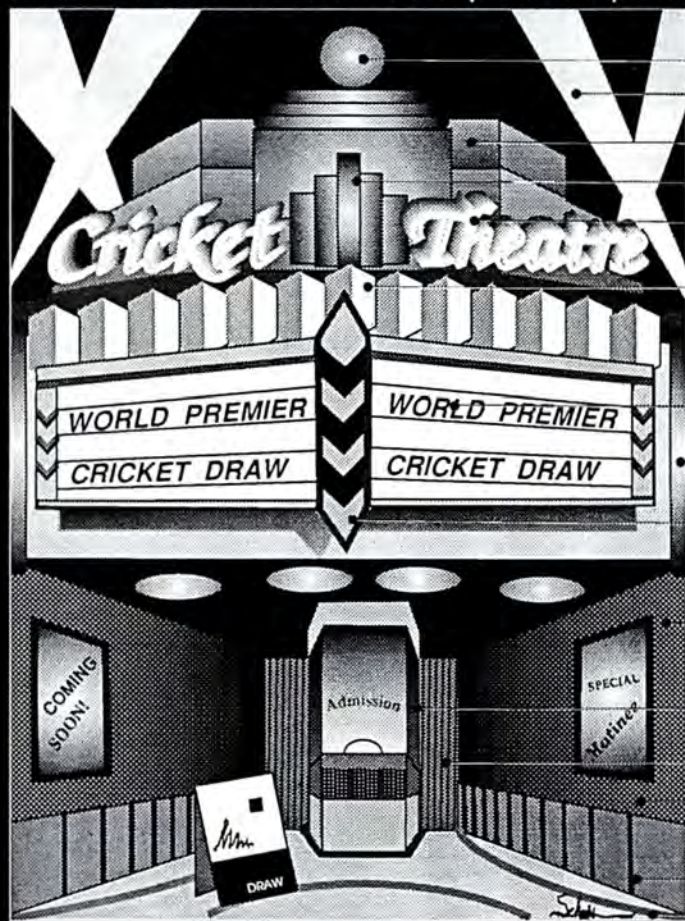
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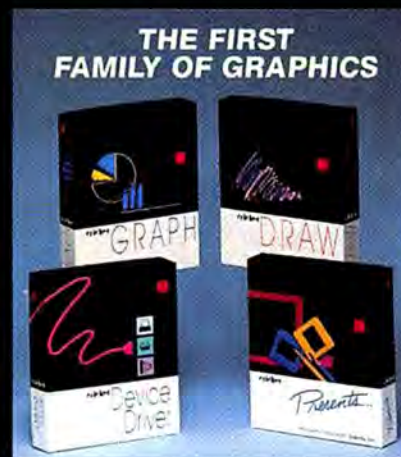
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How To/Quick Tips

down from 32 to 4 minutes. The Save As command often reduces Word 3.01 files, too.

Both PackIt III (shareware by Harry Chesley) and StuffIt (shareware by Raymond Lau) are available from most user groups.

Quick Erase

Tip: From the Finder, you can quickly erase a disk by dragging an empty disk over it. You save about a minute compared with using the Erase Disk command from the Special menu. This is especially helpful for recycling a stack of used disks.

Tim Evans
Merced, California

Word Finds Unusual Items

Tip: You can search for a graphic in a Word 3.01 document by calling up the Find or Change dialog and typing a circumflex followed by the appropriate numeric code in the Find What box. For example, type ^1 to find a graphic. This finds graphics pasted from other applications as well as empty graphics frames placed with Word's Insert Graphics command.

You can use numeric codes to find other items, too. For example, ^6 finds formula prefixes, which appear as .\ in text. To determine the appropriate code, select an instance of what you want to search for, and press ⌘-Option-Q. You'll see the numeric code in the lower-left corner of the screen.

These numeric codes supplement Word's regular search codes, such as ^t for a tab, ^p for a paragraph mark, ^n for an end-of-line mark, and ^d for a page or section mark. (For a list of the regular codes, look under Find in Word's online help.)

Larry M. Schuck
Calgary, Alberta, Canada

We pay \$25 to \$100 for tips published here. Send tips or questions to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld. □

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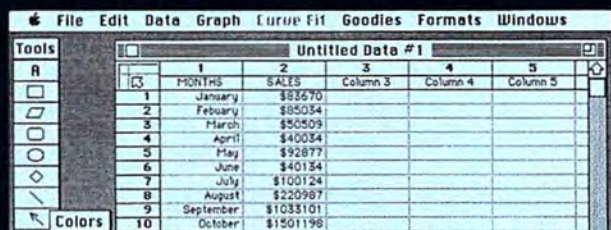
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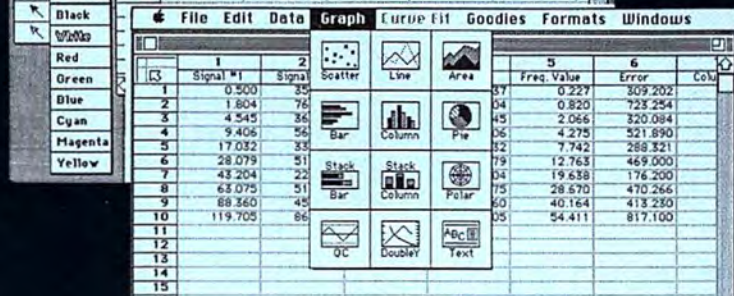
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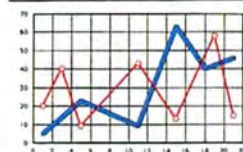
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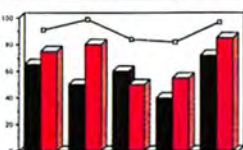
Sales Analysis



Sales are well distributed among four product categories



Comparatively, growth has stabilized in the past quarter



Sales Quotas By Territory

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Getting Started with Navigating

From clicking and dragging to keyboard control, a guide to controlling the Mac and its programs efficiently

by Jim Heid

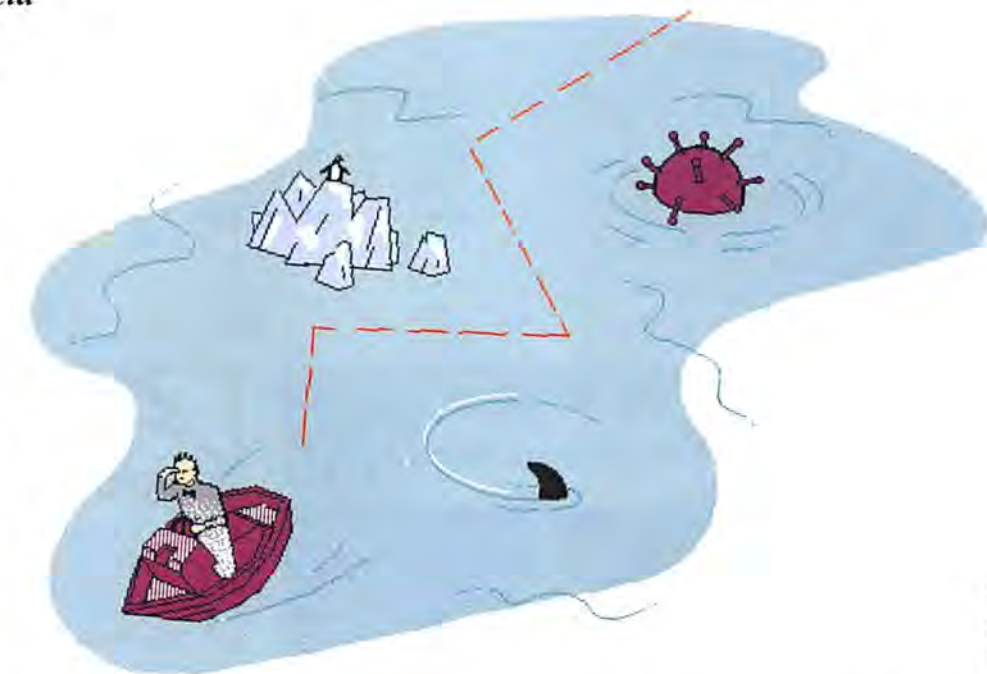
An old bicyclists' maxim says that the easiest way to make your bike 5 pounds lighter is to lose 5 pounds. There's a variation of that truism for the Macintosh: the easiest way to boost your productivity with the Mac is to learn how to control it efficiently. Hard disks and high-performance add-ons are great, but you won't get the most out of them until you master all the navigation options the Mac and its programs provide.

You might think that Mac navigation concepts could be summed up in one word: mouse. The truth is, there's more to controlling a Mac than learning to click and drag. This month, I explore the fine points of maneuvering with the Macintosh and provide some tips on getting around in the Mac's most popular programs.

The Big Three

The mouse doesn't have exclusive domain over Mac manipulation, but there's no denying the rodent's role as the primary link between you and your Mac. That's why navigational expertise is built on three basics: the click, the double-click, and the drag.

Clicking—pressing the mouse's button once—is your way of telling the Mac, "Here's where I want to work." *Here* is where the mouse's on-screen pointer is. In the Finder, pointing to an icon and clicking tells the Mac to *select* the icon—to highlight it for a subsequent action. In a word processor, clicking produces a blinking *insertion*



MICK WIGGINS

point where you've situated the I-beam pointer. In a dialog box, clicking a button performs an action, such as OK'ing or canceling your choices; clicking on a radio button or a check box selects an option. However, not all applications follow these rules; for example, the file-translation program *MacLink Plus* uses radio buttons to perform actions. ("Buttons and Bars" defines the main players in the Mac's interface.)

Double-clicking—pressing the mouse button twice in rapid succession—creates a kind of super click, a cut above a single

click in the mouse-maneuvering hierarchy. (Incidentally, you can alter double-clicking speed just as you can mouse tracking—simply click on the mouse icon in the Control Panel and you'll see the settings.) Double-clicking an icon in the Finder is the same as clicking it once, then choosing Open from the File menu. When you're editing text, whether in a word processor, a spreadsheet, or the text-entry portions of a dialog box, double-clicking while the pointer is on a word selects that word. In programs that provide *palettes*—rows of icons that control program functions—double-clicking an icon often performs an

(continues)

Jim Heid is a Macworld contributing editor who each month focuses on a different aspect of Mac fundamentals.



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Shaded area - click to scroll by the windowful.

Size box - drag to resize window.

Buttons and Bars

The leading players in the Mac's user interface—buttons, radio buttons, and check boxes—appear in dialog boxes. Scroll bars appear in windows and in file list boxes.

action that's an extended version of the icon's normal purpose. In *MacPaint*, for example, double-clicking the eraser icon clears the entire drawing window.

Dragging is the process of moving the mouse while holding down its button. You move windows by dragging their title bars. In the Finder, you move icons by dragging them. In a graphics program, dragging lets you draw with the tool that's selected in the program's palette. You can also reposition items by selecting them, then dragging. And in programs and dialog boxes that let you edit text, you can select text by dragging the pointer across it.

Natural Selection

Next to the big three, the most important Mac technique to perfect is *selecting*. A primary precept of the Macintosh says that selection is always the first step in an

action: you select something, then tell the Mac what to do with it.

To select an object such as an icon in the Finder or a graphic element in a drawing or publishing program, point at the object and click—once. Don't be what my colleague Lon Poole calls a "hapless double-clicker": someone who habitually clicks twice when once will suffice. You can also select multiple objects by enclosing them in a *selection rectangle*, often called a *marquee* because when drawn in some applications its dotted lines flow like a movie marquee (see "In the Marquee"). To draw a marquee, position the pointer at one corner of the area you want to enclose, hold down the mouse button and drag to the opposite corner; releasing the button highlights all selected objects. The technique works differently in certain applications—in some, like the Finder, you need only touch an object with the marquee, while in others, the whole object must be enclosed.

You can combine the two main text-selection moves—selecting a word by double-clicking on it and selecting a range of text by dragging the pointer across it. Just double-click to select a single word, then

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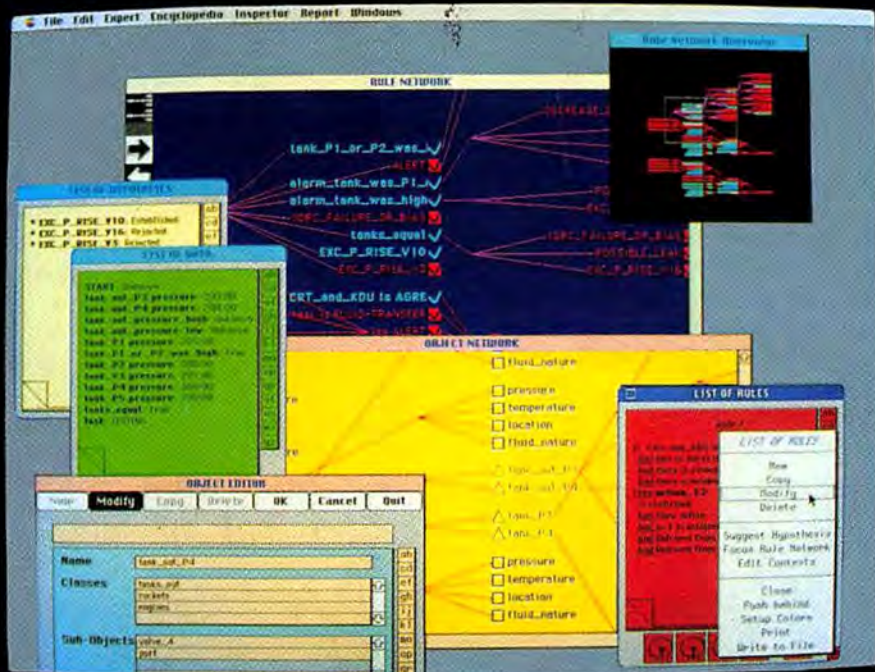
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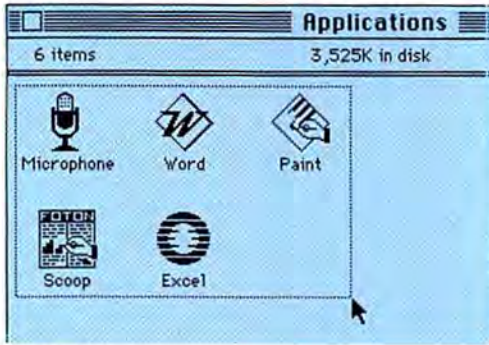
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In the Marquee

In the Finder or MultiFinder—as well as in many graphics and desktop publishing programs—you can select multiple icons by enclosing them in a marquee.

without releasing the button after the second click, drag to select additional text, one word at a time. And if you selected the text as a prelude to replacing it, don't press Backspace before typing the new text. Just start typing; the first key you press clears the selected text.

If you need to alter a lengthy passage of text—say, all 12 chapters of your first novel—dragging through it all can be a drag in itself. A better solution is to use the *Shift-click* technique. Locate the beginning of the passage you're changing and click to the left of its first character to create a blinking insertion point. Next, locate the end of the section, then hold down the Shift key and click to the right of the last character or, to include a Return character, at the beginning of the next line. (One way to move from one location to another is by *scrolling*—continuously moving through text as if you were unrolling a scroll—which will be described in more detail later.)

Shift-clicking also lets you *extend* a selection—that is, add additional items to an existing selection. Should you realize you didn't select enough text, just hold down the Shift key again and click at the appropriate place. In the Finder, you can select additional icons by Shift-clicking on each one. To select a slew of icons, you might combine the marquee and Shift-clicking techniques: select icons adjacent to each other by enclosing them in a marquee, then add ones that are scattered throughout the window by Shift-clicking on them. These same techniques also ap-

ply in most graphics and desktop publishing programs, as well as in database managers that let you create customized forms.

The Shift key takes on an additional function in drawing and publishing programs: it lets you *constrain* a drawing action. For example, pressing Shift while drawing with an oval tool produces a perfect circle; with the rectangle tool, you get a perfect square; with a line tool, you get horizontal, vertical, or diagonal lines.

Incidentally, because scrolling is such a pervasive activity, you should be aware of the three ways to do it. You can scroll in small increments (usually one line at a time) by clicking the Up or Down arrow at the end of the scroll bar; hold down the mouse button to scroll continuously. Click the shaded area above and below the *scroll box* to scroll by the windowful, again holding down the mouse button to do so continuously. To scroll large distances in a single bound, drag the scroll box itself (for instance, to reach the end of a document, drag the box to the bottom of the scroll bar). With the third approach, an outline of

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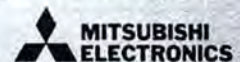
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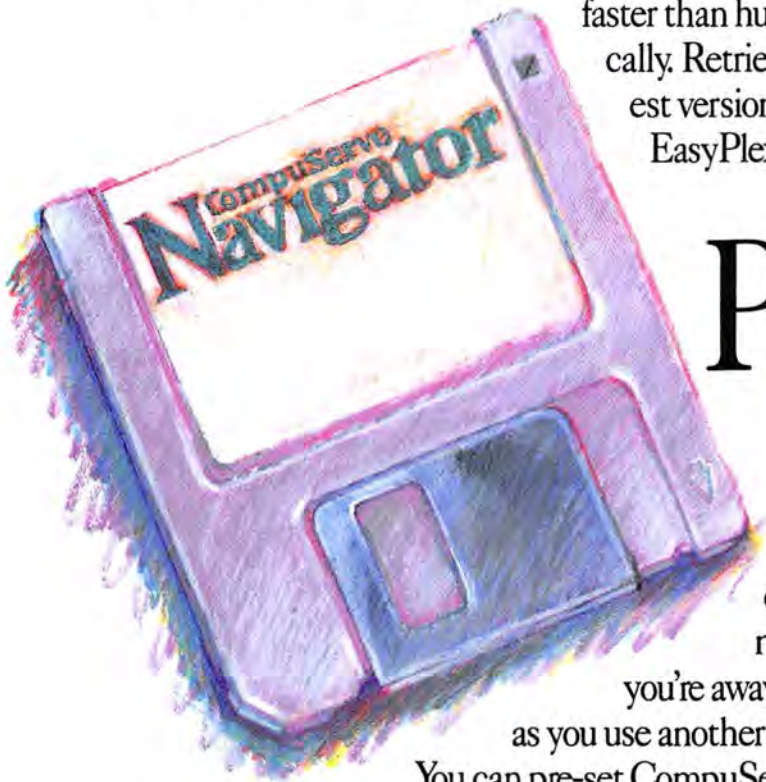
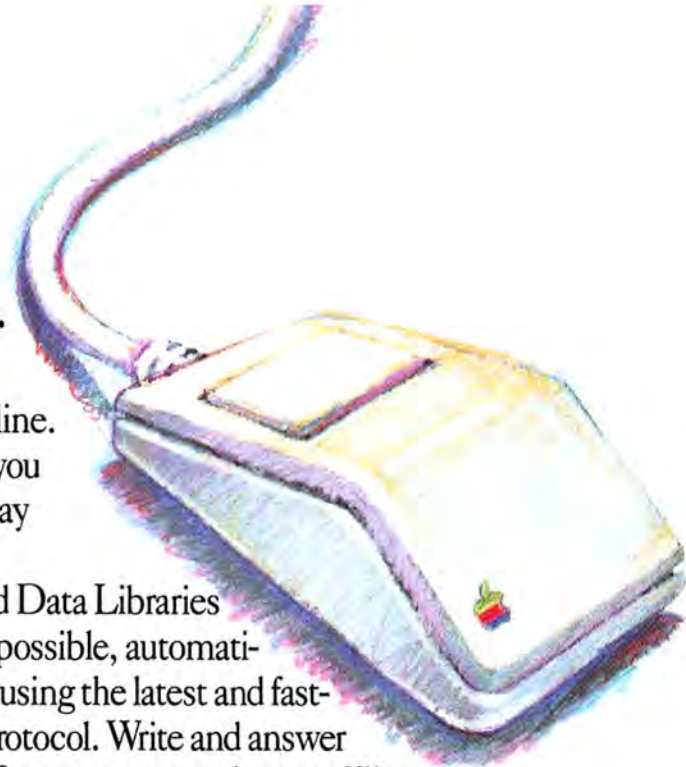
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How To/Getting Started

the scroll box follows the pointer as you drag; when the outline is where you want it, release the mouse button and the window scrolls.

But for searching through a lengthy document, scrolling can be cumbersome and time consuming. Instead, use the Go to Page command when you know the general vicinity of targeted text. When you don't, the Find command is a better option—if possible, select an unusual word or phrase that appears only in the section you're looking for and the Mac will take you there swiftly with no stops in between.

The Keys to Navigation

In the navigational realm, the Macintosh keyboard used to be considered a second-class citizen. Apple's philosophy held that keys should be used only for text entry, because keyboard commands were considered intimidating and far less intuitive than mouse movements.

That was true to an extent, but wordsmiths and data-entry artisans soon began moaning about how constant jumping between keyboard and mouse slowed them down. Fortunately, Apple listened. The Mac Plus debuted with *direction keys*, which let you move the insertion point, and from then on the Mac's keyboard maneuvering aids have steadily improved.

One keyboard control the Mac has always provided is the *⌘-key shortcut*. *⌘-key* sequences let you execute commands from the keyboard so you can bypass the mouse. These shortcuts are especially useful in text-oriented programs like word processors and database managers, since they let you issue commands without moving one hand from the keyboard. An application's designers decide which commands will have *⌘-key* shortcuts and list them alongside the corresponding menu commands. The most common are *⌘-Q* to quit the application, *⌘-O* to open a file, *⌘-S* to save a file, and *⌘-P* to print. Use *⌘-S* often to commit unsaved work to disk. Most programs with Font or Style menus offer *⌘-key* shortcuts that let you access other type styles, such as italic or bold. Most word processors also use *⌘-F* to summon the Find command. But you shouldn't assume that all applications use the same shortcuts—it's best to explore each application's menus to find out for sure. For instance, in *VideoWorks II*, *⌘-Q* starts the movie and *⌘-W* stops it.

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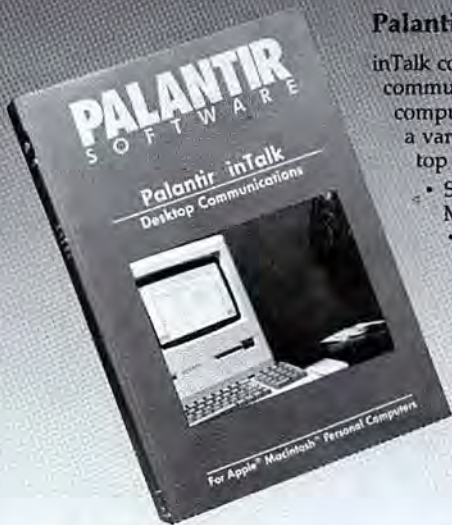
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How To/Getting Started

Commands like Open and Find always lead to dialog boxes, which have keyboard-control options of their own. In an Open dialog box you can locate a specific document or folder by typing the first character of its name. If more than one document or folder starts with the same character, type a few characters. (Unless you type them in fairly rapid succession, though, the Mac assumes each keystroke is the first character in a different name.) If your keyboard has direction keys, you can use them to scroll through the list of files. To open a document or a folder, select the folder and press Return. To close a folder and move up one level in the folder hierarchy, press the ⌘ key along with the Up arrow key. To access a different disk, press Tab instead of clicking Drive. To cancel the dialog box, press ⌘-period (.).

Speaking of dialog boxes, you can use the Tab key to move between their text-entry boxes. For example, to perform a search-and-replace in *Microsoft Word*, press ⌘-H to summon the Change dialog box, type the text you want located, press Tab to jump to the Replace With box, and type the new text. When you're finished, there's still no need to reach for the mouse. Because the Start Search button is highlighted with a heavily outlined border, pressing Return automatically chooses it.

When you use Tab to jump between text boxes, the Mac selects (and highlights) any text previously entered. That means you can type new text without having to backspace over an existing entry. Most database managers also let you move from one field to the next using Tab, and to the previous field using Shift-Tab. Spreadsheets use Tab and Shift-Tab to move one cell to the right or left, and Return and Shift-Return to move up or down one cell.

Assessing Your Options

In many programs, holding down the Option key while executing a command or using the mouse produces a different result than that of the original action. Many times, these modified effects aren't discussed in the program's manual; you're left to discover them on your own or hear about them from other sources.

In the Finder, you can close all open windows by holding down Option while clicking a window's close box (see "Finder Shortcuts"). In *MacPaint* and *FullPaint*, pressing Option while dragging a selection

(continues)

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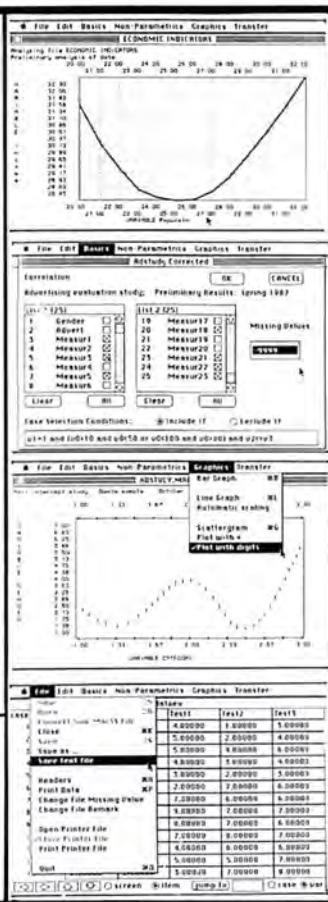


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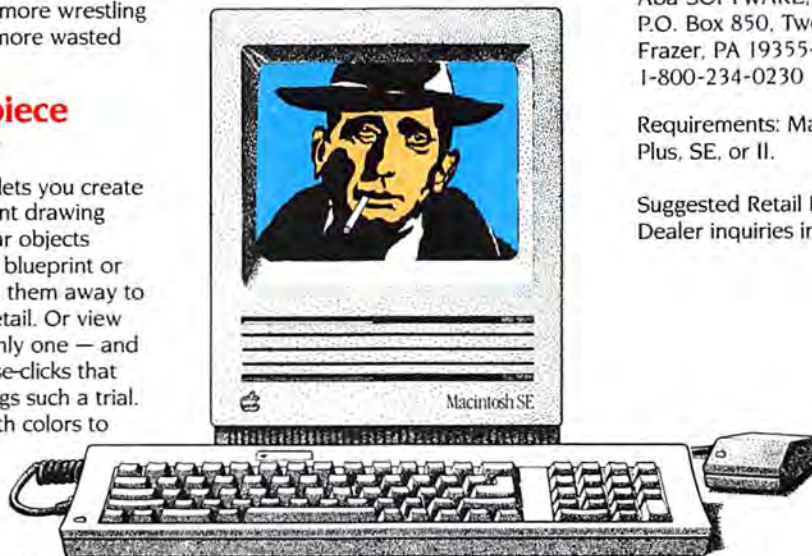
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How To/Getting Started

Finder Shortcuts

Objective

Action

To close all open windows

Press Option while clicking any window's close box

To move an inactive window without making it active

Press ⌘ while dragging the inactive window's title bar (works in all Mac applications)

To discard an application or System file and bypass the Finder's warning dialog box

Press Option while dragging the application or System file to the trash

To copy a file from one folder into another instead of moving the original

Press Option while dragging the file to the new folder

To align all icons in a window

Press Option while choosing Clean Up from the Special menu

To program a window to close automatically when you return to the Finder

Press Option while opening the window

To start MultiFinder when the Finder is running

Press Option and ⌘ while double-clicking on the MultiFinder icon in the System Folder

To determine quickly whether a file is locked

Select the file's icon, then move the pointer over its name; if the pointer turns into an I-beam, the file is not locked

To switch quickly between open applications running under MultiFinder

Click the icon to the far right of the menu bar

To get a laugh

Press Option and ⌘ while choosing About MultiFinder from the Apple menu

duplicates that selection. Adobe's *Illustrator* and Cricket Software's *Cricket Draw* use the Option key to modify the effects of numerous commands. Sometimes the Option key unlocks secret dialog boxes created by mischievous programmers. Press Option while choosing *Cricket Draw*'s About Cricket Draw command and you'll see a list of credits expressing gratitude to hard pretzels and warm muffins.

While Option seems to be the favored modifier key, some programs use Shift, ⌘, or both. In *Word*, for example, pressing Shift while choosing Open tells the program to display a list of all files, instead of just word processing documents. In MultiFinder, pressing the ⌘ key and Option while selecting a desk accessory opens the DA in the same layer as the application instead of in its own special layer, eliminating the need to switch between application and DA.

Microsoft's Nooks and Crannies

For Mac users who like navigation shortcuts, Microsoft's programs, especially *Word* and *Excel*, are what musty second-hand stores are to antique hounds. In dialog boxes, you can double-click on a radio button to select it and confirm the dialog box. Double-click on a window's title bar, and the window shrinks to half size; double-click again, and it returns to normal. (Many other Mac developers have adopted this one.) Press ⌘-period (.) to cancel a dialog box. With Mac SE and II keyboards, you can also press the Esc key. Faced with a Save Changes? dialog box, press Y, N, or C to answer yes, no, or cancel. (This works with Ashton-Tate's *dBase Mac*, too.)

Word even lets you choose menu commands and dialog-box options with the keyboard. Press the period key on the

(continues)

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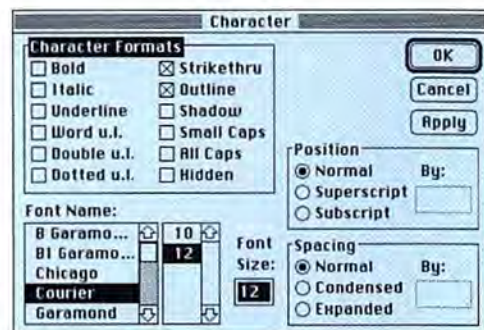
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How To/Getting Started

Mac's numeric keypad (or ⌘ -Tab on those lacking keypads), then the first letter of the menu. When the menu appears, press the first letter of the desired command (or use the direction keys to highlight the command), then choose it by pressing Return. In dialog boxes, you can "press" a button by holding down the ⌘ key while typing the button's first letter. You can even select radio buttons from the keyboard, but doing so requires such a finger-tangling combination of keystrokes that it's only worth doing if your mouse goes feet up.

Word, *Excel*, and *File* also provide a unique dialog-box feature called the *local undo*. By clicking the title above a list of radio buttons, you can undo any selections made in that list (see "Local Undo").



Local Undo

Microsoft Excel, Word, and File offer a unique dialog-box feature called local undo. Clicking the title of a series of radio buttons or check boxes tells the program to undo any changes made in that series since the dialog box was opened.

Of course, Microsoft doesn't have a monopoly on clever shortcuts. Living Vid-eotext's *More* lets you select dialog-box buttons by pressing the ⌘ key along with the button's first letter. Apple's *HyperCard* and Target Software's *Scoop* publishing program provide *power keys* that let you issue commands with a keystroke when a drawing or other non-text-entry tool is active; that is, when there's no blinking insertion point on screen. In *HyperCard*, for example, pressing A chooses Select All, H chooses Flip Horizontal, and V chooses Flip Vertical. In *Scoop*, pressing a number key instantly creates that number of columns on the current page, while pressing Tab displays the next page of your document.

(continues)

How to Buy the Right Monitor.

Let's cut through the hype and misinformation about large-screen monitors for desktop publishing. At Moniterm, we developed the first large-screen monochrome monitors. And based on 9 years of OEM experience, we've now built a family of large-screen, hi-res monitors for every application.

What size and shape monitor is best?

Page-size portrait monitors are great for word processing, but impractical for desktop publishing. To avoid constant zooming and scrolling, we recommend a 19-inch landscape monitor, like our Viking 1 for the Mac SE and Mac II. Professionals who want to view two full-size facing pages will need an even larger monitor—our new 24-inch Viking 2400—Moniterm's largest monochrome monitor.

What resolution is required?

Optimum publishing resolution for 19-inch or larger monitors is 1280x960 pixels, featured on our Viking 1 and Viking 2400 monitors. At less than 72 dpi (dots per inch), fine print becomes too hard to read. Resolutions more than 95 dpi also make characters hard to read and unfocused. And screen updates are painfully slow.

Should I get a monochrome or color monitor?

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differentiating objects on the screen. It features 256 shades of gray for near-photorealistic images. And, you'll benefit from sharper text and lower cost.

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Those are just a few of the many tough questions people are asking about large-screen monitors. We've got the answers. Write or call us for your free copy of our informative booklet, *How to Buy the Right Monitor*. It includes simple tests you can perform to check for flicker, refresh rate, screen update speed, readability, glare, ease of use, and other critical factors in large-screen monitor performance—before you buy!



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Consider a Copilot

Any pilot will tell you that navigation is easier if you have a copilot. Two products—CE Software's *QuicKeys* and Affinity Microsystems' *Tempo*—let you create your own keyboard shortcuts to automate repetitive tasks. *Tempo* installs in your System file and adds a *Tempo* desk accessory to the Apple menu. You "record" your actions by placing *Tempo* in record mode, then using the mouse or keyboard. When you've finished recording, you specify a key sequence that will repeat whatever *Tempo* recorded.

QuicKeys is a Control Panel device, or *cdev* (see January's *Getting Started*), which you activate through the Control Panel. *QuicKeys* doesn't record activities one after another as does *Tempo*. Instead, you can use its Define menu to tell *QuicKeys* to insert text, run an application, choose a command, click a button, activate a window, and much more (see *Reviews*, January 1988). Next, you specify a key sequence for the action. You can consolidate separate key definitions into *sequences* and save those definitions on disk.

I've tried to convey a sense of the navigational possibilities that Mac applications provide, but there are too many to mention in one column. Some good places to uncover the hidden treasures of your favorite applications are in *Macworld's* Insights and Tools columns and in user-group newsletters. Or you might browse through a tip anthology, such as Dale Coleman and Arthur Naiman's *The Macintosh Bible* (Goldstein & Blair, 1987 [for order information call 415/524-4000]) or *Lon Poole's Mac Insights* (Microsoft Press, 1986), by the editor of *Macworld's Quick Tips* column.

But practice is the best way to master Mac navigating. Set aside some computer time for experimentation. Try selecting text by double-clicking, dragging, and Shift-clicking. Conquer the scroll bars. Use a marquee to select groups of icons in the Finder. Press Option or \mathbb{N} while choosing menu commands or clicking palette icons. Keep exploring. You'll make better use of applications—and get more out of the Mac. □

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Insights on MultiFinder

Making sense of Apple's new System software for multitasking—from memory management to avoiding trouble

by Bruce F. Webster

With the introduction of MultiFinder, released as part of System Tools version 5.0 last October, Apple has taken another major step toward increasing the personal power and productivity of Macintosh users. But, as you might expect, there's a price: things are more complicated. Life was simple before MultiFinder; you started an application program, did what you wanted, got out, started another application, and so on. Now you can have several applications open and running simultaneously.

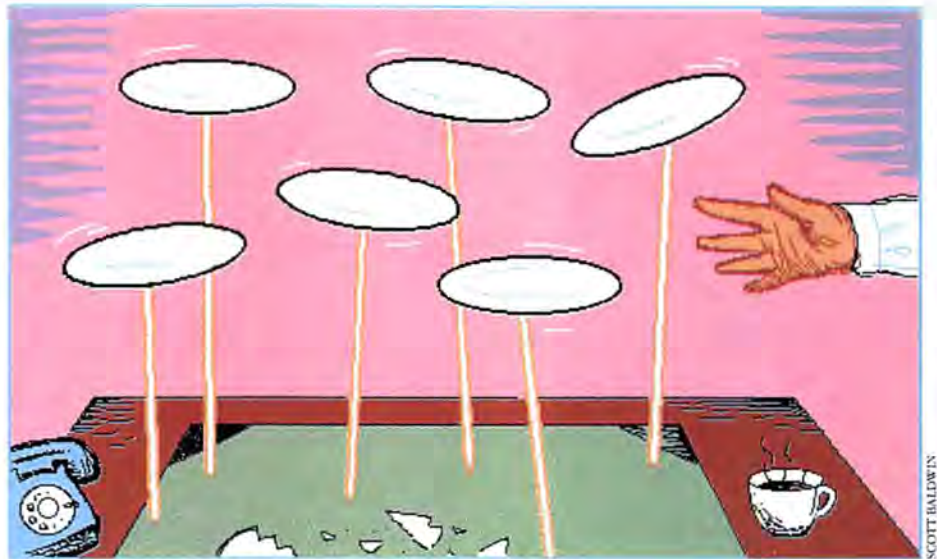
If our experience at *Macworld* and early reports from the field are any indication, however, you may not be getting all you want or need out of MultiFinder. What's more, MultiFinder can sometimes be confusing—or even dangerous. The following tips on how to work with MultiFinder ought to help you make the most of it.

Upgrading Your System

The standard line about MultiFinder is that it's going to sell a lot of memory upgrades. There's no doubt about that; you *can* run MultiFinder with just 1 megabyte of RAM, but chances are you'll quickly chafe at the limitations. The System and Finder together can easily take up half of that 1MB, especially if you have a lot of fonts and desk accessories. Add a single major application (such as *Microsoft Word*), and you're suddenly very short of memory for any additional applications.

If you really want to take advantage of MultiFinder, consider upgrading to at least 2MB of memory. That extra megabyte goes

Bruce Webster is a Macworld contributing editor who has written extensively on personal computer topics.



entirely to applications and makes it possible to have two to eight programs running simultaneously, depending upon their sizes. If you're feeling really expansive, upgrade to 4MB (or 5MB, if you're using a Mac II). That gives you space for lots of applications and a good-size disk cache.

The other upgrade you might consider is a large-screen display. Since you tend to open lots of windows under MultiFinder, the regular (512-by-384-pixel) Macintosh screen is quickly filled. The standard Apple monitors for the Mac II (640 by 480 pixels) are better, but not much. However, the 19-inch monitors (1024 by 768 pixels) work wonderfully, making it easy to have several applications open without overlapping too much on the desktop. Unfortunately, the 19-inch monitors—and their corresponding video cards—are also very expensive; rest assured that you can use MultiFinder without one.

By extension, you might think multiple screens would help manage your windows. But that strategy works only up to a point. A second screen is useful because you can keep all the desktop (folder) windows on the additional screen and reserve your original screen for application windows and the menu bar (see "Multiscreen MultiFinder"). A third or fourth screen offers no inherent MultiFinder benefit, since the menu bar stays fixed on one screen. A utility that lets you move the menu bar from screen to screen without restarting would be a great help, but so far nothing of that sort has appeared on any of the online information services I frequent.

(continues)

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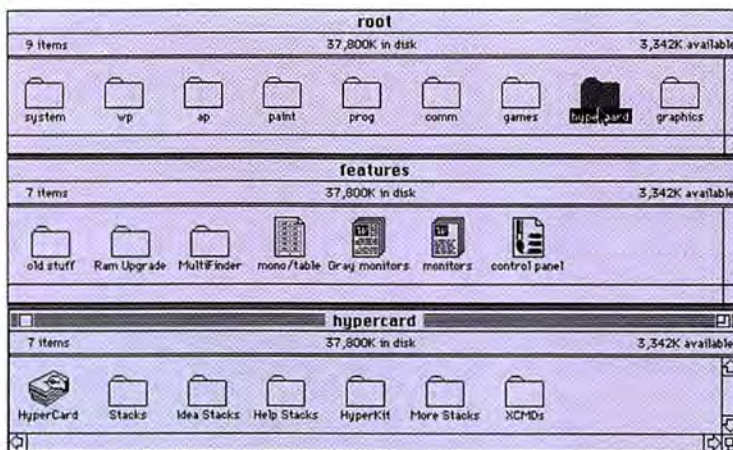
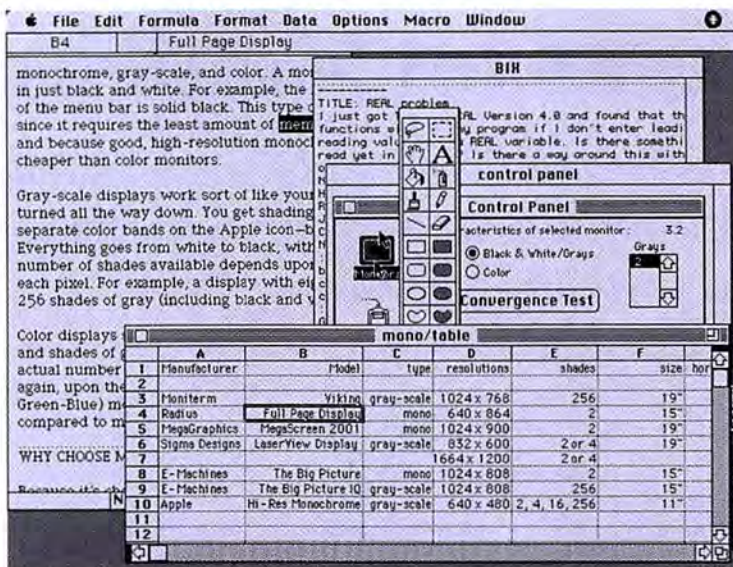
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Multiscreen

MultiFinder

Adding a second monitor to your Mac system lets you run MultiFinder more effectively by isolating desktop folders on the auxiliary screen, so you can concentrate on the applications at hand.

Sizing Up Memory

When you run an application under MultiFinder, that application asks for a specific amount of memory and must operate strictly within that amount. The application may run out of memory if it doesn't request that enough be set aside.

To find out how much memory each application has and how much free space it has left, go into the Finder and select About the Finder from the Apple menu. The box that comes up lists each application, the Finder, and the System; shows how much total memory is assigned to each application; and displays a bar graph showing how much of that memory is actually being used at the moment. You can leave this box open while you work on other applications; periodic updates let

you see if a given application is running out of memory.

Here's how to change the amount of memory that goes to an application. In the Finder, click once on an application's icon and then select Get Info from the File menu (or press ⌘-I). The two lines at the bottom of the Get Info window deal with memory allocation. The first gives the suggested memory size (in kilobytes), the second gives the actual memory size. By default, these two sizes are the same. However, you can edit the second value by clicking on its box, typing a new value, then pressing Return. If the value you enter

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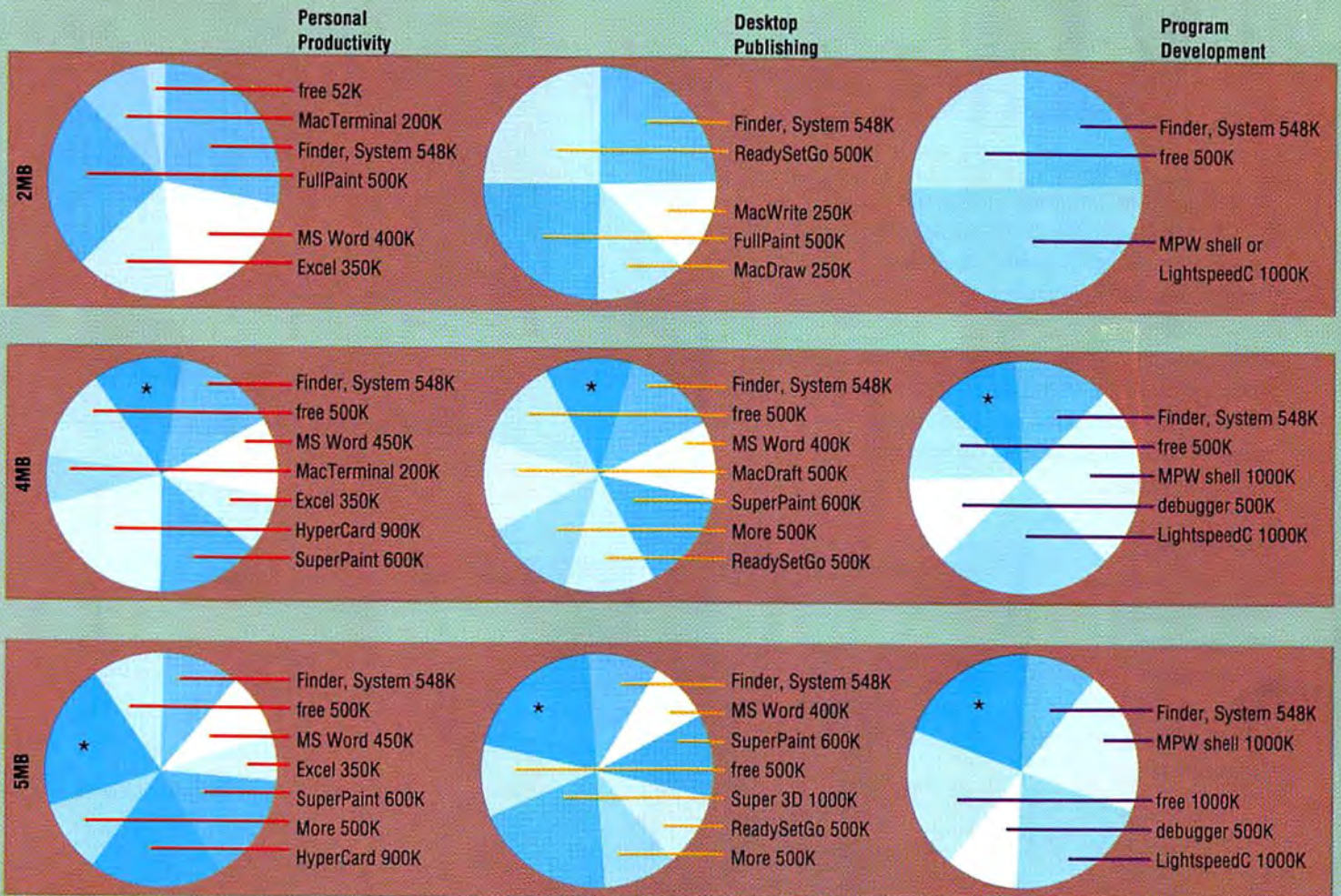
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Maximizing Memory



* These amounts designate RAM caches of 512K and 1024K for 4MB and 5MB configurations, respectively.

is less than the suggested memory size, an alert box comes up asking you to verify your choice. (Keep in mind that the manual recommends backing up an application before allocating less than the default RAM amount.) That new value then represents how much memory MultiFinder gives to the application when it is loaded. If there isn't that much memory available when you attempt to start the application, MultiFinder refuses to open it.

In general, the amount of memory MultiFinder automatically assigns to an application is really the minimum memory required. In many cases that default allot-

ment is quite acceptable; however, you run the risk of losing your work if the program suddenly exits or refuses to perform an operation due to lack of memory. Since you'll normally have just about 1500K free on a 2MB system and 3500K free on a 4MB system, you may want to assign more than the minimum to some applications. In my tests, I found that some programs—such as *Excel*, *MacDraw*, *ReadySetGo 3*, and *CricketGraph 1.1*—worked much better with 500K, considerably more than the minimum memory. If you frequently work with large documents in a given application, then you should strongly consider increasing the default memory size for that application.

Organizing Application Sets

Since MultiFinder lets you run several applications at once, new questions arise: which applications should you run at the same time, and how much memory should you set aside for each? The possible combinations are nearly endless. "Maximizing Memory" provides a few examples and leaves the rest to your imagination.

For various tasks, I propose a set of programs and memory allocations for 2MB, 4MB, or—for you Mac II owners—5MB systems. These suggested allocations as-

(continues)

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sume that the System and the Finder together consume something under 548K. Further, they assume that if you've got a 2MB system, you have disabled the RAM cache (via the Control Panel), leaving 1500K free; for a 4MB system, I've set up a 512K RAM cache, leaving 3000K free; for a 5MB system, I've set up a 1024K RAM cache, leaving 3500K free. Note that on the 4MB and 5MB configurations, I always leave 500K free. This is so you can bring up another application you find you need or, in the case of program development, so you can run the program you're developing.

These suggestions demonstrate how to divvy up your memory for best results and don't constitute endorsements of the programs I included. Substitute your favorite applications, adjust memory allocations, drop programs you don't really care about (or don't own), and so on.

Opening Application Sets

Now that you've decided what set of applications you want together in Multi-Finder, is there any way to get the Mac to load them automatically when you boot? Yes, there is, using the Set Startup command. Here's how it works.

- Make sure all the application memory sizes are set at the level you want.

- Open each of the applications that you want loaded at start-up. If there are any desk accessories that you want opened automatically as well, select them from the Apple menu.

- With all the applications still running, go into the Finder and select Set Startup from the Special menu.

- When the Set Startup dialog box opens, it will be all set for you. The Multi-Finder button will already be selected, as will the one labeled Opened Applications and DAs. Just click OK.

That's all there is to it. If you want to see how it works, select Restart from the Special menu. Your system reboots and then automatically opens all the chosen applications and desk accessories.

If you don't want those applications to load automatically, go back into the Set Startup box and click the MultiFinder Only button. Next time you restart, no applications or desk accessories will open. Selecting MultiFinder Only erases the previous start-up configuration; you'll need to go through the same steps again if you want to return to automatically starting up with an application set.

(continues)

- Suitcase
- Abacus
- Acta
- Alarm Clock
- Analog Clock
- AppFont
- Area Code
- ASLTalk
- Backdrop
- Base Tool
- BCS+Clicker
- Big Ben
- Calculator+
- Calendar
- CalendarBook
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- Chooser
- Comments
- Control Panel
- Cube
- DAFont
- DiskInfo
- DiskTools II
- DiskTop
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- Explorer
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- Find File
- Fix Pic
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- Function Keys
- Gone Fishin'
- Greg-Wc
- Guidance
- HDMount
- HDUalet
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- Idle
- JumpStart Log
- Key Caps
- KeyMouse
- Laser Envelope
- LaserStatus
- LifeSaver
- LockOUT
- Mac's Headroom
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- MacDialer
- MacTerm
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- Magnifying Glass
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- Memory Monitor
- Mini Sci Calc
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- Athens
- Auant Garde
- Auant Garde Gothic
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- Bodoni Ultra
- Bookman
- Boston
- Bubbles
- Camelot
- Cairo
- Candy
- Carta
- Cartoon
- Cavanaugh
- Centura
- Century Old Style
- Cheltenham
- Chicago
- Circus
- Cirth
- Clinton
- Cooper Black
- Coptic
- Courier
- Coventry
- Cream
- Cursive
- Dali
- Demographics
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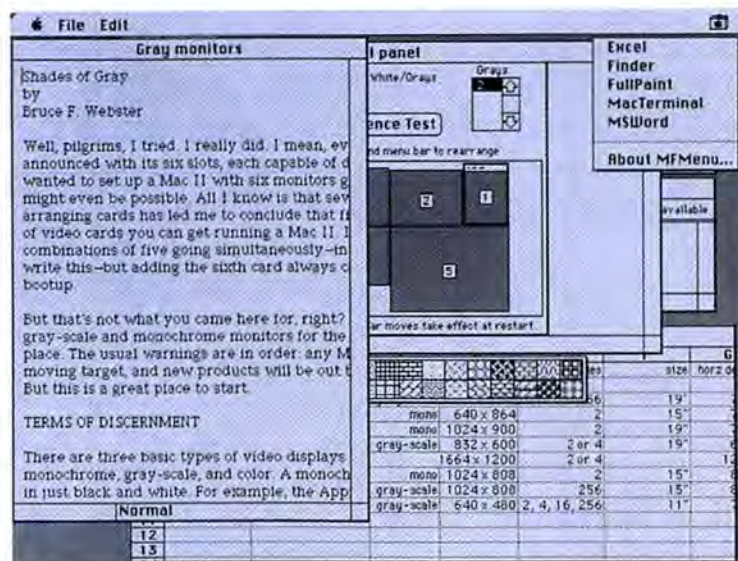
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Menu Finder

Having trouble finding the application you want in the clutter of windows on the Multi-Finder desktop? The public domain *Init* MFMenu hides a pop-up menu of open applications at the far right of the menu bar. Pointing there opens the menu, and selecting an application activates it and brings it to the foreground.

Choosing an Open Application

When you have a number of applications open, you select one to work in by clicking on any document window, tool icon, or similar item associated with that application. For example, if you have *ReadySetGo* loaded in MultiFinder, you can select that program by clicking on any *ReadySetGo* window or on the object and line tools at the left edge of the screen. The menu bar then changes to reflect the application you've chosen, and any items associated with that application come to the foreground of the display.

At times, though, there may be no windows or tool icons visible, either because they're not open or, if you have several applications open, because they're buried beneath other windows. In that case, you can select a program from the Apple menu; the open applications appear there immediately after the list of desk accessories. Select an application from the menu, as you would a desk accessory, and that program becomes active, just as if you had clicked on one of its windows.

Even here you may run into a problem, especially on the Mac Plus or Mac SE. If you have many desk accessories and a number of open applications, the list of applications probably goes beyond the bottom of the display. You can drag the cursor to the bottom of the menu to start scrolling

through the remaining menu items for the one you want, but it's a pain to do this repeatedly.

One alternative is to click on the current-application icon found near the right end of the menu bar. Each click takes you to the next application on the Apple menu list. The icon's shape indicates which application is currently active.

A better solution is to get *MFMenu*, a public domain program from IMI Software that you drop into your System Folder. An *Init* resource, *MFMenu* installs itself when you start up, creating a menu that resides invisibly on the menu bar, to the right of the current-application icon. If you point the cursor between the icon and the end of the bar and hold the mouse button down, a menu that lists all open applications pops up in the corner of the display (see "Menu Finder"). You can then select one, just as you would with the Apple menu. Unlike the Apple menu, though, this menu is so short it seldom (if ever) requires scrolling.

Warnings and Cautions

The single biggest warning about using MultiFinder is this: save work in progress before switching between applications. I lost a few hours' worth of work on this article because another application I was running crashed, and I hadn't done a Save for some time on my article text (written in *Microsoft Word*).

Another warning: avoid opening the same document with different applications at the same time. In most cases this won't

be an option, since you can only have one copy of an application running at a given time and documents tend to be specific to applications. However, there are some documents, such as ASCII (text-only) files, that numerous programs can open. Multi-Finder won't prevent this; it's up to you to exercise caution.

Finally, be aware that not all applications are completely compatible with Multi-Finder. Some crash or behave strangely. Others run fine until (and unless) you switch to another application and then switch back. Yet others appear to work, but end up going off into never-never land at some critical point (such as when you're about to save the document and get out). Since MultiFinder definitely represents the direction Apple is taking, most software houses are hurrying to fix incompatibilities, and most of the problems should be resolved by the time you read this. It won't hurt, however, to check with the publisher and then try out the software just to be sure it runs fine.

Turning MultiFinder On and Off

Sometimes you just don't want to use MultiFinder at all. The most likely reason is that you want to use an application that is not yet compatible with MultiFinder. Or maybe an application that has certain problems when you run it under MultiFinder. Or maybe you just don't want the Finder desktop appearing in the background when you're using a given application.

Whatever the reason, it's simple to turn MultiFinder on and off. In the Finder, select Set Startup from the Special menu. Click the Finder button, click OK, and then restart (by selecting Restart from the Special menu). Your Mac will reboot and come up under the regular Finder.

To turn MultiFinder back on, in the Set Startup box select MultiFinder again and then restart.

You can live without MultiFinder—at least until you've used it for a while and have come to depend upon it. It has its limitations and rough spots, but it represents a working step toward multitasking on the Macintosh. Using these tips, you can make it work for you. □

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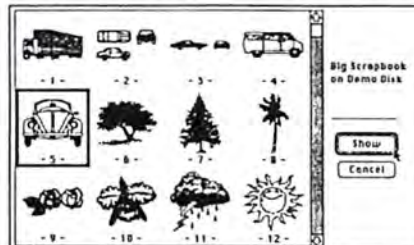
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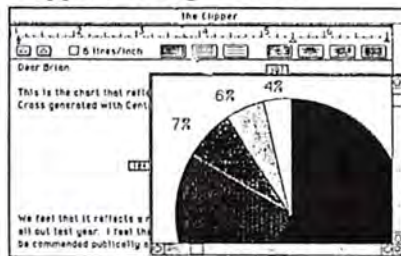
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Mac Publishing Tools

*Ten easy steps to book layout
in ReadySetGo version 4*

by Ann Cullen

You've mastered the three-column newsletter, and then some. The thrill of desktop publishing is gone. You're looking around for something new to sink your teeth into—something that will challenge both you and your sophisticated software—when someone asks you to produce a long book. Then reality sets in. You may at first feel a little intimidated by the project, as if someone just asked you to cook a sit-down dinner for 20 when your culinary expertise amounts to spotting good restaurants.

In fact, books are longer than newsletters, but they are often simpler to lay out. Most books break down into relatively solid chunks of text in the form of chapters, not into a grab bag of articles on different topics. Once you've set up a basic layout for a chapter page, all you have to do is repeat it. And, as any newsletter editor can testify, that's much easier than trying to fit numerous stories onto a few short pages.

Here's a short introduction to making up a chapter in *ReadySetGo 4*. The example created is *Cancun by Night*, an uncomplicated travel book. Except for front matter, all the book needed in the way of design was a special chapter-opener page, a simple layout for chapter text, and running headers and footers. Two pages from the finished product, as created in *ReadySetGo 4* and printed on a LaserWriter Plus, appear in "Chapter One."

You can create something similar, in ten easy steps. (I assume you know the basics of *ReadySetGo 4*, such as how to create text and picture blocks and how to use the built-in word processor.)

Ann Cullen is a former Apple editorial manager who now free-lances as a writer, editor, and desktop publishing specialist.



Step One: Choose the Grid

Most designers use a grid system to organize type and other elements on a page. In *ReadySetGo 4*, creating a page grid is virtually automatic. The Design Grids feature provides several predrawn grids, or you can design your own. (New to grids? See "Grids and Space.")

With a new *ReadySetGo 4* document open, choose Design Grids from the Special menu. A dialog box gives you a choice of several grids, from one column by one row (a single column) to eight columns by eight rows.

A 5-by-5 grid offers plenty of flexibility, so I chose that option—on an 8½-by-11-inch page—for *Cancun by Night*.

• **Tip:** By default, the Snap To command in the Special menu turns on when-

ever you choose a grid. As you draw text and picture blocks, Snap To automatically fits their borders to the grid intersections nearest the spot where you release the mouse button. This saves time; you can be pretty sloppy about placement and let Snap To keep you on the grid.

Step Two: Place the Main Text Block

With the grid in place, create the basic text page. For *Cancun by Night*, I wanted to give the page a spacious look, so I chose a wide text column and wide left and right

(continues)

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and the
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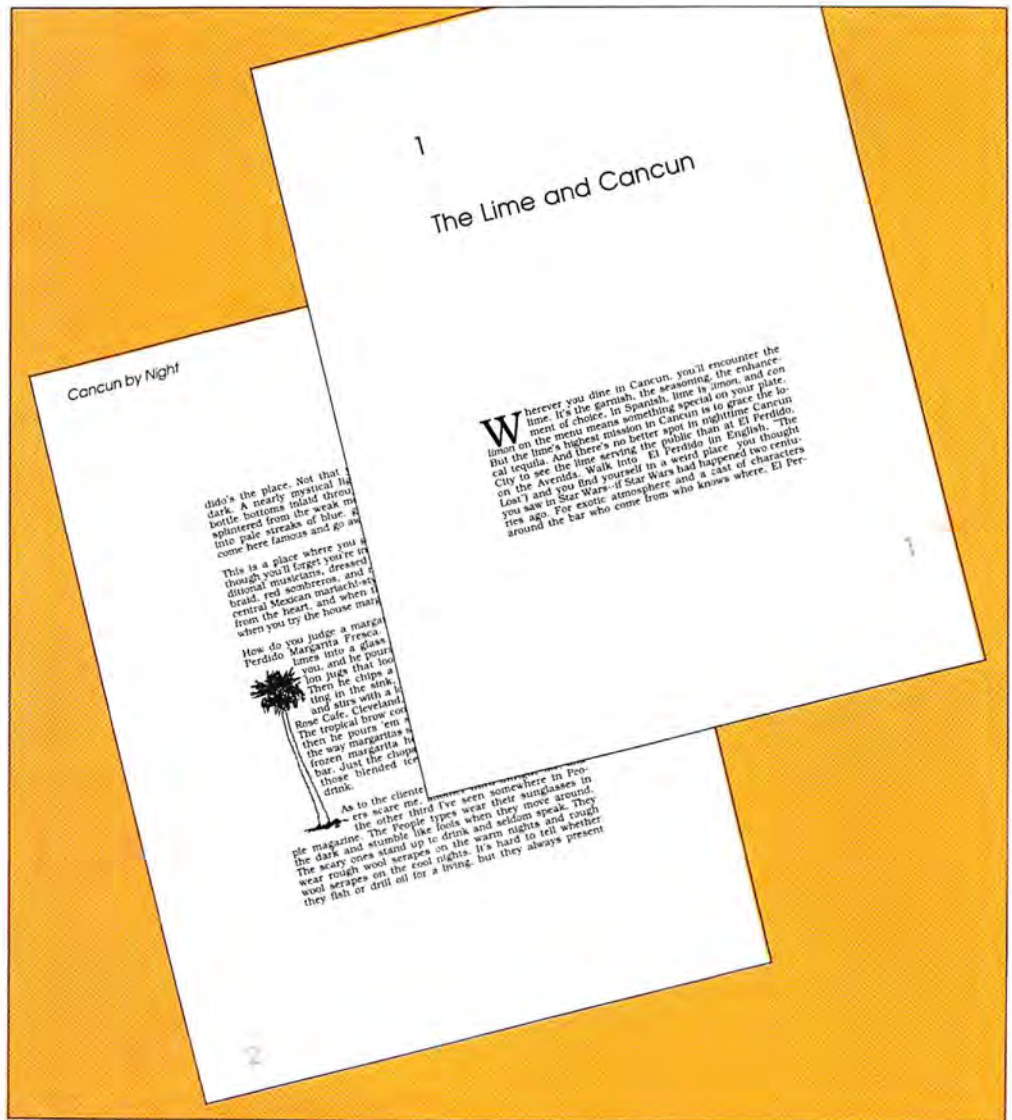
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How To/Mac Tools



Chapter One

Wide margins, lots of white space, and a big drop cap give the opening page of this book designed in ReadySetGo 4 a spacious, inviting look.

margins (see "Setting the Text Margins").

■ **Tip:** To avoid the agonies of slow scrolling when you draw large text or picture blocks, take advantage of *ReadySetGo's* interactive page views—what you change in one view changes in all views. In the Size to Fit view, which shows the whole page, drawing a large block is a breeze, and you get an overview of page elements as you go.

Step Three: Insert Duplicate Pages

The text column will be the same on all pages in the chapter, but you don't have to redraw the text block on every page. Instead, duplicate your layout using Insert

Page from the Special menu. In the Insert Page dialog box, click Insert After Current Page, click Duplicate Current Page, and type the number of pages you need.

Step Four: Set Up Repeating Elements

Use the Master Pages feature to set up elements that should appear on every page. In our example, *Cancun by Night* shows a running header at the top of the page and the page number (*folio*, in publishing jargon) in a footer at the bottom. For balance, the headers and the page numbers appear on opposite sides on left and right pages. To achieve that effect, select the left master-page icon and draw a text block about ½ inch deep in the upper-left corner of the page. Experiencing grid-

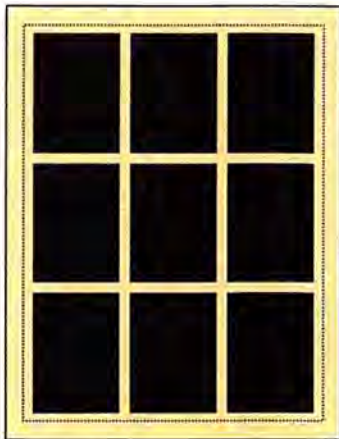
Grids and Space

Page design is all about planning: what to put on the page and where, how to create a sense of order, and how to use type and illustrations effectively. A grid system gives form to the planning process.

The grid concept isn't complicated. It's simply one way of organizing space on the page. The page grid splits a page into vertical columns and horizontal rows to guide your placement of text and illustrations (see "A 3 × 3 Grid"). Most designers use such a grid system to lay out pages. The grid keeps the content organized and gives the pages a consistent look.

If you're a *ReadySetGo* 4 user and the concept of grids is new to you, take time to study *The Grid Book*, the short, illustration-packed book that comes in the software package. There, designer Jan White explains space planning and shows how the choice of a page grid influences the choice of type and the positioning of type elements on the page. White's

book discusses (and illustrates) many rules of thumb that professional designers take entirely for granted. Almost any desktop publisher—novice or expert—can learn something from this concise, practical book.



A 3 × 3 Grid

This predrawn grid provides three columns, divided horizontally, for placing page elements.

lock? Remember Snap To. If the block won't go where you want it, toggle off Snap To so you're no longer confined to the grid.

Type the text for the header—in this case, the book title—select it, and choose the font and style. In the example, the header is set in 14-point Avant Garde italic.

In books, the running header on the left (*verso*) page usually carries the book or chapter title, and the header on the right (*recto*) page carries the name of the subsection of text within it. For example, if the verso page carried the chapter title, the recto page would carry the current section title.

To create the folio for a verso page, draw a text block in the lower-left corner, making the block about one-eighth the depth and width of the grid block. Select the text-insertion point, click once in the

text block, and then type ⌘-Option-Shift-3. Two number signs (##) appear, indicating that *ReadySetGo* will automatically insert page numbers at that spot. Select the number signs and the font characteristics; in the example, the folio is set in 24-point Avant Garde outline (see "Positioning Page Numbers").

That completes the repeating elements on the verso pages of the chapter. Now for the recto pages.

Click the right master-page icon. This time, draw the text block for the header in the upper-right corner of the grid and the block for the folio in the lower-right corner. In the header block, type the section title. In the block for the folio, again type ⌘-Option-Shift-3.

To see what you get for all this trouble, return to actual size and click the page-two icon. At the top you'll see the header, and when you scroll to the bottom, you'll see

that *ReadySetGo* really did insert the page number, 2. Return to page one for the next step.

Step Five: Create a Grand Opening

You drew up page one as an ordinary page, but it begins the chapter so it deserves special treatment. You may want to return to the Size to Fit view to work with text blocks the easy way (see "The Opening Statement").

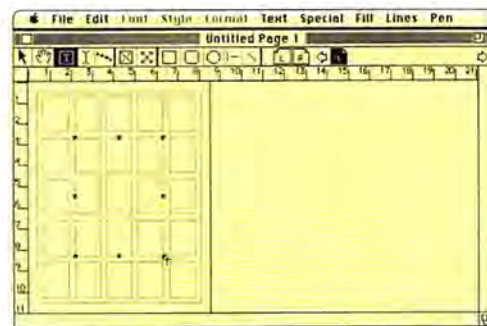
Select the main text block and shrink it to make room for the chapter title; in the example, the text block for the chapter opener is reduced to a single row of the grid. Draw another text block to hold the chapter title. Type the chapter number and title and set their font characteristics. Now you're ready to bring the opening chapter text into the small text block you left at the bottom of the page.

Step Six: Import the Opening Text

Set the text-insertion point in the lower text block, choose Get Text from the File menu, and open the document containing the chapter text. The first part of the chapter flows into the block. Now the opening page is beginning to look like something, but there's one problem—running heads don't usually go on a chapter opener.

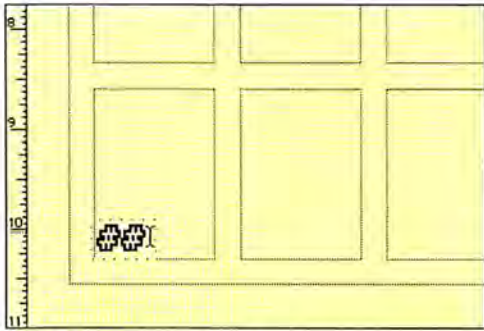
What to do with the header? Your first response is probably to attempt to select the header, so you can cut it. Nothing happens, of course. Remember, the header is on the master page, so you can't edit it anywhere but on the master page. And you can't cut the header on the master page because it would be deleted from the rest of the pages. It's time for a *ReadySetGo* mask.

(continues)



Setting the Text Margins

Here's a look at the book's regular text column in ReadySetGo 4's Size to Fit view. To set text margins, draw the main text block to cover the grid blocks you want to devote to text.



Positioning Page Numbers

After you draw a text block for the page number, pressing **⌘-Option-Shift-3** inserts two number signs that represent the page number. Then you select the font, style, and size.

Step Seven: Mask the Undesirable

To hide the running header on page one only, you create a white mask over it. On page one—not on the master page—draw a new text block that just covers the running header. Open the Fill menu and select solid White. The new block turns white and covers the header. *ReadySetGo* will respect the white mask when it prints the chapter, so page one will print without

the running header. Repeat the process if you want to mask the page one folio.

■ *Tip:* Immediately return the fill pattern to None, or the next text block you draw will hide everything beneath it.

Step Eight: Drop a Cap

To give the chapter opener a distinctive look, you can create a *drop cap*—a single letter much larger than the word it begins that's inset into the text that follows it. This fancy typographic effect is easy to produce by creating a special text block for the letter and then running the rest of the text around the letter's block.

Draw a text block about ¾ inch square at the upper-left corner of the main text block. Choose Specifications from the Edit menu. In the Text Block Specifications dialog box, choose Runaround. Cut the first letter from the first word of the chapter, and paste it into the drop-cap block. Select the letter and make it huge—in the example, it's 42-point Bookman.

■ *Tip:* You can "illuminate" a drop cap by creating a fancy opening letter in a graphics application and importing it into a picture block at the beginning of the paragraph. You can wrap the main text around either the block or the pictorial letter itself.

Text blocks allow text to wrap only to the shape of the block; with graphics you have a choice.

Step Nine: Link the Text

All that setting up may be tedious, but it's simple. The rest of the chapter goes quickly as you link the text from page one to the end of the chapter.

Where is the rest of the text, by the way? It's right there in the document; *ReadySetGo* is waiting for instructions. Do you want the text to continue in the next text block or page, or do you want it to jump to page 13? You put the text where you want it with the Linker tool, which is shaped like a lightning bolt—with good reason.

Select the Linker tool and click once in the first paragraph—not in the drop-cap block but in the block containing the main text. Click the page-two icon. Click once in the main text column of page two. The next portion of the text, hidden till now, flows into the block. Go to page three and repeat the action, and so on to the end of the chapter.

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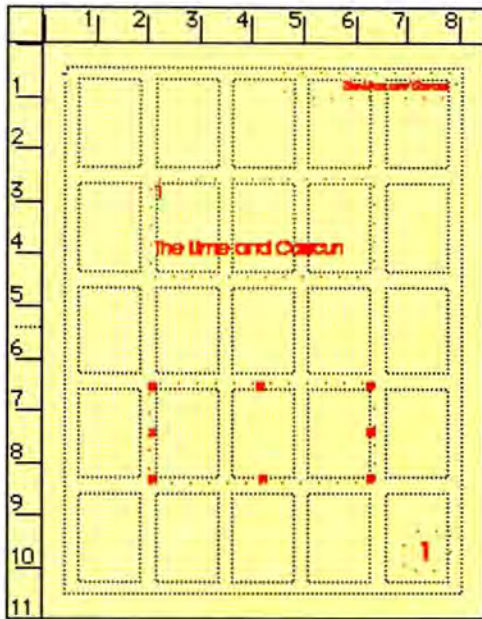


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The Opening Statement
Use the Size to Fit view to create your chapter opener. It lets you create new blocks for text and the title (shown in color).

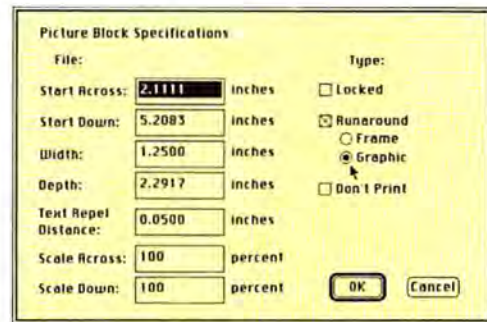
Once you've used this feature a bit, text linking for solid chapter text is ultra-fast. You'll be able to reach the last page in a few moments.

Step Ten: Wrap a Picture

For *Cancun by Night*, I wanted to add a sketch to one of the internal text pages. That called for *ReadySetGo*'s automatic runaround again.

You use the Specifications dialog box to specify how far away from the picture you want text to wrap, and you decide if you want the text to run around the picture block or the image itself. Draw a picture block where you want the picture on a text page. Import the picture and crop it any way you like. Choose Specifications from the Edit menu. In the Picture Block Specifications dialog box, click Runaround and Graphic. That tells *ReadySetGo* to ignore the square borders of the block and to wrap the text around the image (see "Wraparound Graphics").

Tip: If you have trouble seeing the text that you mean to run around a graphic, try selecting the picture block and choosing Send Behind from the Edit menu. You'll see a sort of box around the image, but the box doesn't print.



Wraparound Graphics

In the Picture Block Specifications dialog box, you specify how much space you want between the graphic or picture block and any text surrounding it. Here, the text runs a mere .05 inch from the palm tree.

And Wrap the Chapter

That's it: ten easy steps to a basic chapter layout. Maybe the process isn't quite as quick and easy as inspecting menus from the sidewalk. But it's definitely simpler than creating that dinner for 20. □

See *Where to Buy* for contact information.

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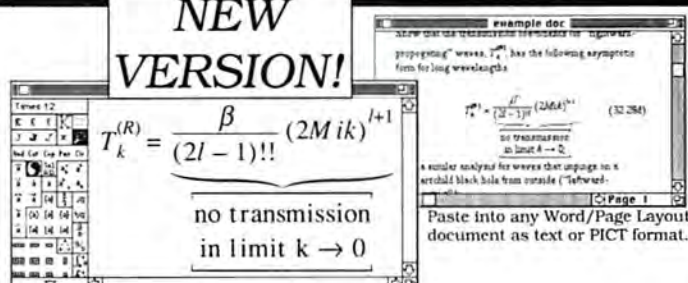
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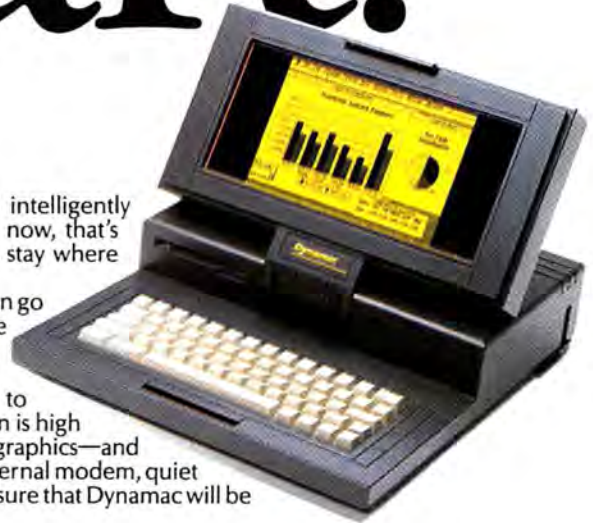
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Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Bulk Mailer and Bulk Mailer+ versions 3.18 support international addresses. They provide deeper bundle-sorting capability, and make full use of the standard Mac Style and Font menus. Both packages add new methods for merging lists, creating additional lists, and opening existing lists. Satori Software, 2815 Second Ave., #560, Seattle, WA 98121, 206/443-0765. \$30; Bulk Mailer \$149 new, Bulk Mailer+ \$350 new.

Cricket Graph version 1.2 has an improved spreadsheet-like data window that handles more data in a flexible way. It adds a Windows menu, line types and thicknesses, and new plot symbols. Also imports JWKS and WKS files, improves text handling, and includes ungrouping legends. Cricket Software, 30 Valley Stream Pkwy., Great Valley Corporate Center, Malvern, PA 19355, 215/251-9890. Free if purchased after October 21, 1987, otherwise \$20; \$195 new.

FastBack version 1.02. See "A Second Look," *Reviews*, this issue. Fifth Generation Systems, Inc., 11200 Industriplex Blvd., Baton Rouge, LA 70809, 504/291-7221. Free; \$99.95 new.

LaserPaint version 1.6 has more than 50 changes, including a redesigned interface. Additions include user-

configurable tool panels and screen arrangements, optional scroll bars, standard windows, type-in meters, Bring to Front, Send to Back, Duplicate, graying of bitmaps for tracing, server and MultiFinder support, user control of halftone dpi, display of patterned text, paper-size support for Linotronic, standard print dialogs, wide and narrow text. A Quick Start reference manual is included. LaserWare, Inc., Box 668, San Rafael, CA 94915, 415/453-9500. Free; \$495 new.

MacNix version 3.0 has multitasking, multiwindow emulation, and VT100 emulation. Includes user-configurable menus and improved file transfer. Compatible with AppleShare and MultiFinder. New documentation included. Serial or AppleTalk versions available. Eurosoft International, 14082 Loma Rio Dr., Saratoga, CA 95070, 408/741-0739. \$50; \$800 to \$8000 new, depending on host computer.

Mac240 version 2.0 adds user-installable network communication drivers, character-set handling, and file-transfer capabilities. Supports large screens and new Mac keyboards. White Pine Software, 94 Route 101A, P.O. Box 1108, Amherst, NH 03031, 603/886-9050. \$25 with return of master disk; \$199 new.

Microphone II is fully compatible with MultiFinder. It adds support for variables and counters, and includes an expression analyzer for string and arithmetic manipulations. Allows screen addressing, text editing, control of communi-

cation settings, and filtering of incoming text from within scripts. Implements modem files for PBX and nonstandard modem control. Imports/exports scripts as text files. Supports the extended keyboard. Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232. Free if purchased after December 15, 1987, otherwise \$50; \$295 new.

PosterMaker Plus version 2.5 is compatible with the Mac II. Strider Software, W8570 Beecher Lake Rd., Pembine, WI 54156, 715/324-5487. \$23 with return of original disk; \$59.95 new.

Snap version 2.0 expands the drawing area, includes automatic dimensioning, and improves output by producing PICT and PostScript files. Data Basics, Inc., P.O. Box 32, Sunset, SC 29685, 803/878-7484. \$29.95; \$695 new.

ThinkTank version 2.0 has new outlining features, such as Clone, Mark, Gather, and Sort, for manipulating outlines and document windows. Allows up to six open outline windows; adds an Undo/Redo command. Full keyboard control. Includes integrated word processor and Quick Start templates. Symantec Corp., 117 Easy St., Mountain View, CA 94043, 415/964-6300. \$49.95; \$195 new. □

Send software upgrade announcements to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

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702 **Adobe Type Library.** Adobe Systems, Inc., 1585 Charleston Rd., P.O. Box 7900, Mountain View, CA 94039-7900, 415/961-4400, 800/292-3623.
703 **Agricola/Cain.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
704 **AlKaatiB Laser Font.** Eastern Language Systems, 39 W. 300 North, Provo, UT 84601, 801/377-4558.
705 **Allotype Font Library.** Allotype Typographics, 1600 Packard Rd., #5, Ann Arbor, MI 48104, 313/663-1989.
706 **Analyze.** Micro-Systems Software, Inc., 12798 W. Forest Hill Blvd., #202, West Palm Beach, FL 33414, 305/790-0770.
707 **Anatool.** Advanced Logical Software, Inc., 9903 Santa Monica Blvd., #108, Beverly Hills, CA 90212, 213/653-5786.
708 **APL-800WD.** ADIC, 14737 N.E. 87th St., P.O. Box 2996, Redmond, WA 98073-2996, 206/881-8004, 800/336-1233.
709 **A-V Online.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- B**
- 710 **BackPac 40.** Jasmine Technologies, Inc., 555 De Haro St., San Francisco, CA 94107, 415/621-4339.
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- C**
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716 **Canvas DA.** Deneba Software, 7855 N.W. 12th St., #202, Miami, FL 33126, 305/594-6965, 800/622-6827.
717 **CD ROM-DR.** Arc Laser Optical Technology, 10 Victor Square, #600, Scotts Valley, CA 95066, 408/438-7400.
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- E**
- * **Ecological Linguistics Fonts.** Ecological Linguistics, P.O. Box 15156, Washington, DC 20003, 202/546-5862.
732 **Electronic Encyclopedia.** Grolier Electronic Publishing, Sherman Turnpike, Danbury, CT 06816, 203/797-3500.
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736 **Expressionist.** Allan Bonadio Associates, 1579 Dolores St., #24, San Francisco, CA 94110-4928, 415/282-5864.
- F**
- 737 **Faces Collection.** Invincible Software, 9534 Burwick, San Antonio, TX 78230, 512/344-4228.
* **Falcon: The F-16 Fighter Simulation.** Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501, 415/522-3584.
738 **Fastback for the Macintosh.** Fifth Generation Systems, Inc., 1322 Bell Ave., Ste. 1-A, Tustin, CA 92680, 714/259-0541, 800/225-2775.
739 **Fluent Fonts.** CasadyWare Inc., P.O. Box 223779, Carmel, CA 93922, 408/624-8716, 800/331-4321, 800/851-1986 in California.

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- 741 **Focal Point.** Activision, Inc., 2350 Bayshore Pkwy, Mountain View, CA 94043, 415/960-0410, 800/227-9759.
- 742 **Fontagenix.** Devonian International Software Co., P.O. Box 2351, Montclair, CA 91763, 714/621-0973.
- 743 **FontDA Juggler Plus.** ALSoft, Inc., P.O. Box 927, Spring, TX 77383-0927, 713/353-4090.
- 744 **Fontographer.** Altsys Corp., 720 Ave. F, #108, Plano, TX 75074, 214/424-4888.
- 745 **Fontographer Fonts.** Altsys Corp., 720 Ave. F, #108, Plano, TX 75074, 214/424-4888.
- 746 **Foreign Fonts Edition.** Devonian International Software Co., P.O. Box 2351, Montclair, CA 91763, 714/621-0973.
- 747 **FullPaint.** Ann Arbor Softworks, Inc., 2393 Teller Rd., #106, Newbury Park, CA 91320, 805/375-1467.
- H**
- 748 **HaKotev Laser Font.** Eastern Language Systems, 39 W. 300 North, Provo, UT 84601, 801/377-4558.
- 749 **HyperCard.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- I**
- 750 **Image Club LaserType.** Image Club Graphics Inc., 2915 19th St., #206, Calgary, Alberta, Canada T2E 7A2, 403/250-1969, 800/661-9410.
- 751 **ImageMaker.** Presentation Technologies, Inc., 743 N. Pastoria Ave., Sunnyvale, CA 94086, 408/749-1959, 800/345-7050, 800/749-1959 in California.
- 752 **ImageStudio.** Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9703.
- 753 **Instant-Expert.** Human Intellect Systems, 1670 S. Amphlett Blvd., #326, San Mateo, CA 94402, 415/571-5939.
- 754 **Interleaf Publisher.** Interleaf, Inc., 10 Canal Park, Cambridge, MA 02141, 617/577-9800.
- K**
- * **Kwikie Inhouse Graphic Services.** Multi-Ad Services, Inc., 1720 W. Detweiller Dr., Peoria, IL 61615, 309/692-1530, 800/447-1950, 800/322-3941 in Illinois.
- L**
- 755 **LaserFonts.** Century Software, 702 Twinbrook Pkwy, Rockville, MD 20851, 301/424-1357.
- 756 **LaserFonts Designer Series.** Century Software, 702 Twinbrook Pkwy, Rockville, MD 20851, 301/424-1357.
- 757 **Laser Fonts from Linguists' Software.** Linguists' Software, 106-R Highland St., South Hamilton, MA 01982, 617/468-3037.
- 758 **Laser FX.** Postcraft International, Inc., 27811 Avenue Hopkins, #6, Valencia, CA 91355, 818/718-1598.
- 759 **Lasergenix.** Devonian International Software Co., P.O. Box 2351, Montclair, CA 91763, 714/621-0973.
- 760 **LaserPerfect Fonts.** NeoScribe International, P.O. Box 633, East Haven, CT 06512, 203/467-9880.
- 761 **Laser Sampler II.** MacTography, 702 Twinbrook Pkwy, Rockville, MD 20851, 301/424-3942.
- 762 **LaserServer.** DataSpace Corp., 185 Riviera Dr., Unit 9, Markham, Ontario, Canada L3R 5J6, 416/474-0113, 800/387-0492.

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- 763 **LaserStatus.** CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265, 515/224-1995.
- 764 **LaserWriter II.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 765 **LISA.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- 766 **LP Text.** London Pride, Inc., 1 Birch St., Norwalk, CT 06851, 203/866-4806.
- M**
- 767 **MacDraw.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/960-1500.
- 768 **MacEqn.** Software for Recognition Technologies, 55 Academy Dr., Rochester, NY 14623, 716/359-3024.
- 769 **MacFlow.** Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301, 818/991-6540.
- Macify.** Public domain software by Eric Celeste.
- 771 **Mac-Laser Databank.** Optotech, Inc., 740 Wooten Rd., Colorado Springs, CO 80915-3518, 303/570-7500.
- 772 **MacPaint.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/960-1500.
- 773 **MacPublisher III.** Boston Publishing Systems, Inc., 1260 Boylston St., Boston, MA 02215, 617/267-4747.
- 774 **MacSnap Plus 2.** Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405, 919/763-7918, 800/622-7627.
- 775 **MacSpin.** D² Software, Inc., 5609-B Adams Ave., Austin, TX 78756, 512/454-7746.
- 776 **Mac-II-TV Video Interface.** Comtrex Ltd., P.O. Box 1450, El Toro, CA 92630, 714/855-6600.
- 777 **Mass Fonts.** Mass Micro Systems, 3250 Jay St., Santa Clara, CA 95054, 408/988-1200, 800/253-8900.
- 778 **Mass Fonts Plus.** Mass Micro Systems, 3250 Jay St., Santa Clara, CA 95054, 408/988-1200, 800/253-8900.
- 779 **MathType.** Design Science, Inc., 6475-B E. Pacific Coast Hwy., #392, Long Beach, CA 90803, 213/433-0685.
- 780 **Medline Knowledge Finder.** Aries Systems Corp., 79 Boxford St., North Andover, MA 01845, 617/689-9334.
- 781 **Medline on SilverPlatter.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- 782 **MegaShot.** MegaGraphics, Inc., 20954 Osborne St., Canoga Park, CA 91304, 818/407-0571.
- 783 **Merriam-Webster's Ninth New Collegiate Dictionary.** Highlighted Data, P.O. Box 17229, Washington, DC 20041, 703/241-1180.
- MFMenu.** Public domain software from IMI SoftWare.
- 785 **Micro Dynamics MARS.** Micro Dynamics, Ltd., 8555 16th St., #802, Silver Spring, MD 20910, 301/589-6300, 800/634-7638.
- 786 **Micro Planner Plus.** Micro Planning International, 235 Montgomery St., #840, San Francisco, CA 94104, 415/788-3324.
- 787 **Microsoft Chart.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 788 **Microsoft Excel.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 789 **Microsoft File.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 790 **Microsoft PowerPoint.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 791 **Microsoft Word.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.

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- entire fiscal year available for reports
- user definable chart of accounts
- produces full audit trail

Payables/Receivables

- uses open invoice method
- prints checks, invoices and statements
- user defined aging periods

Payroll

- automatic federal and state deductions
- accumulates QTD, YTD, W-2, 940 and 941 information

Inventory

- fully integrated with payables and receivables
- uses average weighted cost method
- handles adjustments and transfers

Jobcost

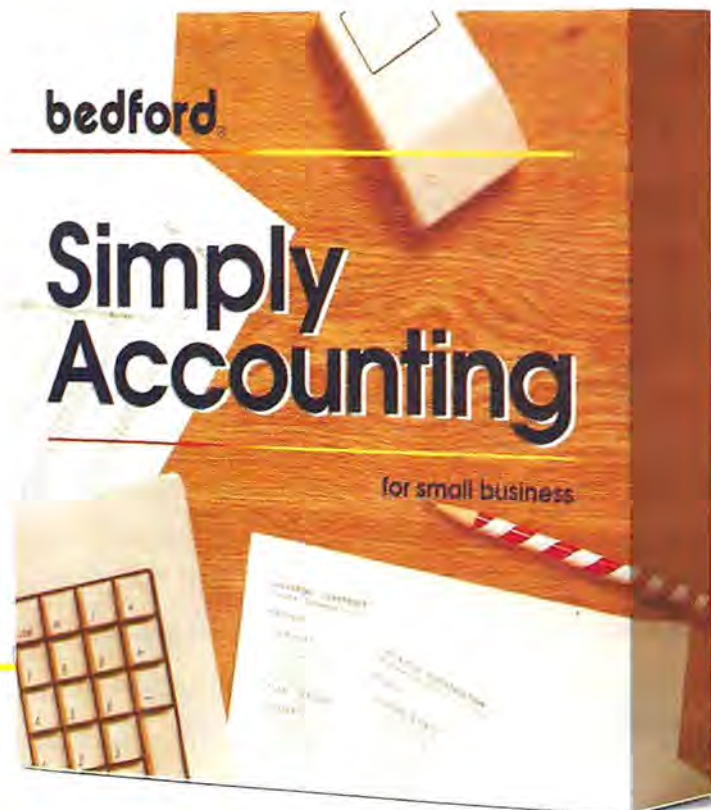
- distributes revenue or expense to projects or profit centers
- paycheck distribution includes the company's portion of FICA, SUTA and Disability Insurance

Requirements

- Apple® Macintosh™ computer with one megabyte of memory, 800K on-line storage and 128K ROM

Standard Features

- Six fully integrated functions
- Reports can be displayed, printed or exported
- Not copy protected



Where to Buy

Reader
Service

- 792 **Microsoft Works.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 793 **MindWrite.** MindWork Software, 555-C Heritage Harbor, Monterey, CA 93940-2483, 408/375-1531, 800/367-4334 (orders only).
- 794 **MockChart.** CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265, 515/224-1995.
- 795 **Modern Jazz.** Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142, 617/577-8500.
- * **More.** Living Videotext, a Division of Symantec Corp., 117 Easy St., Mountain View, CA 94043, 415/964-6300.
- 796 **MultiFinder.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- M**
- 797 **NTSC Converter.** Open Mac Enterprises, 2280 Bates Ave., Ste. J, Concord, CA 94520, 415/682-0440.
- 798 **NuVista.** Truevision, Inc., 7351 Shadeland Station, #100, Indianapolis, IN 46256, 317/841-0332, 800/858-8783.
- O**
- * **One Plus One.** SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884.
- 799 **Orbital Mech.** Studio Zero, 6212 Samuell Blvd., #153, Dallas, TX 75227, 214/381-2654.
- 800 **OSH-ROM.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- P**
- 801 **PageMaker.** Aldus Corp., 411 First Ave. S, #200, Seattle, WA 98104, 206/622-5500.
- 802 **Pict-O-Graph.** Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112.
- * **PixelPaint.** SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884.
- 803 **PIXymbols.** Page Studio Graphics, 3175 N. Price Rd., #1050, Chandler, AZ 85224, 602/839-2763.
- 804 **PosterMaker Plus.** Strider Software, W8570 Beecher Lake Rd., Pembine, WI 54156, 715/324-5487.
- 805 **Professional Laser Fonts.** EmDash, P.O. Box 8256, Northfield, IL 60093, 312/441-6699.
- 806 **PsycLit.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- Q**
- 807 **Q487 Public Domain.** Arc Laser Optical Technology, 10 Victor Square, #600, Scotts Valley, CA 95066, 408/438-7400.
- 808 **Quark XPress.** Quark Inc., 300 S. Jackson, #100, Denver, CO 80209, 303/934-2211, 800/543-7711.
- 809 **QuickCapture.** Data Translation, Inc., 100 Locke Dr., Marlboro, MA 01752, 617/481-3700.
- 810 **QuickKeys.** CE Software, Inc., P.O. Box 65580, West Des Moines, IA 50265, 515/224-1995.
- R**
- 811 **Ragtime.** Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807, 714/779-2772, 800/223-8029.
- 812 **RamPlus 2.** Open Mac Enterprises, 2280 Bates Ave., Ste. J, Concord, CA 94520, 415/682-0440.
- 813 **ReadySetGo.** Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9703.
- 814 **Rembrandt II.** Jasmine Technologies, Inc., 555 De Haro St., San Francisco, CA 94107, 415/621-4339.
- 815 **Rembrandt III.** Jasmine Technologies, Inc., 555 De Haro St., San Francisco, CA 94107, 415/621-4339.
- 816 **Rodime 1000 RX.** Rodime Inc., 901 Broken Sound Pkwy. NW, Boca Raton, FL 33431, 305/994-6200.
- 817 **Rodime 1400 RX.** Rodime Inc., 901 Broken Sound Pkwy. NW, Boca Raton, FL 33431, 305/994-6200.
- S**
- 818 **Scoop.** Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483.
- 819 **SlideWriter.** Matrix Instruments, Inc., 1 Ramland Rd., Orangeburg, NY 10962, 914/365-0190, 800/852-8533.
- Smart Quotes.** Shareware by Oak Square Publications, P.O. Box 1238, Allston, MA 02134, 617/782-5669.
- 821 **Sociofile.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- 822 **Software-CD.** SilverPlatter Information, Inc., 37 Walnut St., Wellesley Hills, MA 02181, 617/239-0306.
- * **Spectrum/24.** SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884.
- 823 **StatView 512+.** BrainPower, Inc., 24009 Ventura Blvd., #250, Calabasas, CA 91302, 818/884-6911, 800/345-0519.
- 824 **StatView II.** Abacus Concepts, Inc., 1984 Bonita Ave., Berkeley, CA 94704, 415/540-1949.
- 825 **STELLA Software for Business.** High Performance Systems, 13 Dartmouth College Hwy., Lyme, NH 03768, 603/795-4857.
- 826 **Suitcase.** Software Supply, 590 N. Mathilda Ave., Sunnyvale, CA 94086, 408/749-9311.
- T**
- * **Tempo.** Affinity Microsystems, Ltd., 1050 Walnut St., #425, Boulder, CO 80302, 303/442-4840, 800/367-6771.
- * **ThinkTank 2.0.** Living Videotext, a Division of Symantec Corp., 117 Easy St., Mountain View, CA 94043, 415/964-6300.
- 827 **TV Producer.** Computer Friends, Inc., 14250 N.W. Science Park Dr., Portland, OR 97229, 503/626-2291.
- U**
- 828 **Universe of Sounds.** Optical Media International, 485 Alberto Way, #115, Los Gatos, CA 95032, 408/395-4332.
- V**
- 829 **VIP 3000.** US Design Corp., 4311 Forbes Blvd., Lanham, MD 20706, 301/577-2880.
- * **The Visual Dictionary.** Facts On File, 460 Park Ave. South, New York, NY 10016, 212/683-2244.
- W**
- 830 **Wall Street Investor (formerly Market Pro).** Pro Plus Software, Inc., 2150 E. Brown Rd., Mesa, AZ 85203, 602/461-3296, 800/227-5728.

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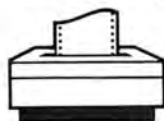
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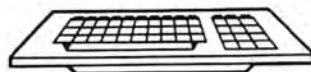
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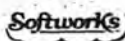
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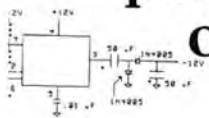


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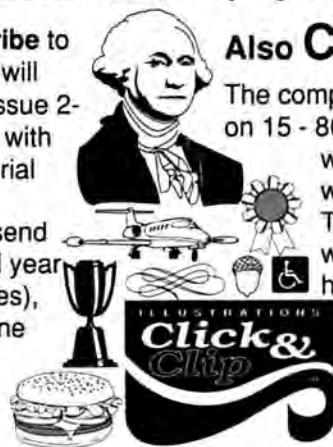
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Mignet	
Pocket Modem 1200	\$169
Modem Cables	
Macintosh 128/512	19
Macintosh Plus/SE/II	19

Memory Upgrades

Apple	
1 Megabyte Upgrade (4 256K SIMM Modules)	\$209
Mac II to 2 Megabytes	
2 Megabyte Upgrade (2 1 Meg SIMM Modules)	529
Mac SE to 2.5 Megabytes or use 2 upgrades to 4 Megabytes	
4 Megabyte Upgrade (4 1 Meg SIMM Modules)	1000
Mac II to 5 Megabytes or use 2 upgrades to 8 Megabytes	
Dove	
Mac Snap 524 (Mac 512)	\$149
Mac 512 to 1 Megabyte	
Mac Snap 524E (Mac 512E)	149
Mac 512E to 1 Megabyte	
Mac Snap 524S (Mac 512E)	229
Mac 512E to 1 Megabyte/SCSI	
Mac Snap 548E (Mac 512E)	429
Mac 512E to 2 Megabytes	
Mac Snap 548S (Mac 512E)	599
Mac 512E to 2 Megabytes/SCSI	
Mac Snap Plus 2 (Mac Plus)	299
Mac Plus to 2 megabytes	
Dove Tool Kit	\$19
CDA TOP 10 Software . . .	
1. Multifinder System 5.0	\$ 42
2. HyperCard by Apple	42

3. Microsoft Word 3.1	249
4. Microsoft Excel	249
5. Red Ryder 10.0	65
6. Super Paint	59
7. Quick Keys	75
8. Illustrator by Adobe	339
9. Cricket Draw	179
10. Cricket Graph	129

New Titles	
d-Base Mac by Ashton Take	\$339
Word Perfect	229
Fulwrite by AnnArbor	189

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20 Megabyte MacStack	\$ 579
43 Megabyte MacStack	799
60 Megabyte MacStack	899
80 Megabyte MacStack	1385
140 Megabyte MacStack	1795
60 Megabyte TapeStack	769
PCP	
MacBottom 21 Meg	749
MacBottom 32 Meg	899
MacBottom 45 Meg	1149
MacBottom 20 w/modem	899
MacBottom 32 w/modem	1049
MacBottom 45 w/modem	1299
SuperMac	
Dataframe XP30	\$ 899
Dataframe XP60	1299
Dataframe XP60+40 Tape	1849
Rodime	
20 Plus	\$ 739
45 Plus	1139

Internal Hard Drive

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Hard Disk 20 MacSE/II	\$ 809
Hard Disk 40 MacII	1295
Hard Disk 80 MacII	2190
CMS	
Pro 20 MacII (65ms)	\$499
Pro 40 MacSE/II (29ms)	849
Pro 40 MacSE (rear)	849
Pro 43 MacII (40 ms)	699
Pro 60 MacII (40 ms)	749
Pro 80 Mac II (26 ms)	1195
Pro 102 Mac II (28 ms)	1295
Pro 140 Mac II (28 ms)	1749
Pro 240 Mac II (18 ms)	3195

Scanners & Scanning Devices

AST	
TurboScan	\$1599
Microtek	
MS 300A	\$1995
MS 300C	1319
MSF 300G	2693
MSF 300C	1479
Scanner SCSI Option	235
Thunderware	
Thunderscan	199

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“What’s wrong with copying software?”

“I use a lot of programs on my personal computer, and I copy them all the time.”

“I’m a programmer. Every time you copy one of my programs, you’re taking away my income—I depend on *sold* programs for a living.”

“Oh, come on. I bought it: I have a right to copy it.”

“You *do* have a right to make a back-up, that’s true. But when you start copying programs for your friends and co-workers, that’s breaking the law.”

“What law? Any copying I do is in the privacy of my own home.”

“It doesn’t make any difference where you do it. Every time you copy a program without permission from the publisher, you’re committing a federal offense.”

“That’s all right, I won’t get caught.”

“You’re missing the point. The issue isn’t “What can I get away with?”—it’s “who am I hurting?”


Remember, lots of people worked hard to produce every program you use: designers, programmers, distributors, retailers, not to mention all the people who support users. They have a *right* to be compensated for their efforts, and their major compensation is through software sales.”

“Well, I don’t mean to hurt all those people—or anyone, really.”

“Unfortunately, that’s what copying does: it hurts people. And, ultimately, it hurts people like you, who want new and innovative software.”

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Think about it.**

The unauthorized copying of software is a crime.

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It's tough, isn't it. They both look great. But the image on the left was digitized by a scanner that costs over \$2,000. The image on the right by ThunderScan®. The scanner that replaces ImageWriter's* ribbon cartridge. Just \$249 complete.

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Use LaserWriter to create line screens and frames.

Now you can plug high-resolution halftones into your PageMaker®, Quark XPress™ or ReadySetGo!™ documents. Or use your scanned images with painting and drawing software like Illustrator™ and LaserPaint™.

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Macworld Best-Sellers

Months on chart

14
34
26
22
12
14
29
7
3
1

Last month

This month

Business Software

Rank	Last month	This month	Title	Company
1	3	1	Microsoft Works	Microsoft
2	2	2	Microsoft Word	Microsoft
3	1	3	Microsoft Excel	Microsoft
4	6	4	PageMaker	Aldus
5	5	5	SuperPaint	Silicon Beach Software
6	8	6	MacPaint	Claris
7	7	7	MacDraw	Apple Computer
8	10	8	MacMoney	Survivor Software
9	-	9	Cricket Graph	Cricket Software
10	-	10	WordFinder	Microlytics

Education Software

Rank	Last month	This month	Title	Company
1	1	1	Math Blaster	Davidson & Associates
2	4	2	KidsTime	Great Wave Software
3	5	3	Early Games	Springboard Software
4	2	4	Reader Rabbit	The Learning Company
5	3	5	Typing Tutor III	Simon & Schuster Computer Software

Entertainment Software

Rank	Last month	This month	Title	Company
1	1	1	Flight Simulator	Microsoft
2	2	2	Dark Castle	Silicon Beach Software
3	3	3	MacGolf	Practical Computer Applications
4	-	4	ShadowGate	Mindscape
5	-	5	Winter Games	Epyx

Networking/Data Communications

Rank	Last month	This month	Title	Company
1	1	1	TOPS	TOPS
2	2	2	AppleTalk	Apple Computer
3	3	3	AppleShare	Apple Computer
4	4	4	PhoneNet	Farallon Computing
5	5	5	MacServe	Infosphere

Months on chart

14
7
1
1
1

Last month

This month

Hard Disks*

Rank	Last month	This month	Title	Company
1	1	1	Apple Hard Disk 20/20SC	Apple Computer
2	2	2	Macintosh Internal 20SC Hard Disk	Apple Computer
3	-	3	Rodime 45/45 Plus	Rodime Peripheral Systems Division
4	-	4	MacStack 20	CMS Enhancements
5	-	5	Compact SC 20	CMS Enhancements

Add-in Boards

Rank	Last month	This month	Title	Company
1	3	1	Apple 2MB Memory Expansion Kit	Apple Computer
2	4	2	Apple 1MB Memory Expansion Kit	Apple Computer
3	5	3	Radius Accelerator	Radius
4	-	4	Macintosh II Video Card	Apple Computer
5	-	5	MacSnap Plus 2	Dove Computer

Product Watch

Editors' choice:
Other recent or forthcoming products of particular interest.

- Illustrator 88** Adobe Systems Post-Script drawing program
- Timbaktu** WOS Systems software that operates another Mac on a network as if by remote control
- ColorBoard 1/104** RasterOps,
- Rembrandt III** Jasmine,
- Spectrum/24** SuperMac Technology -24-bit color boards

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order suppliers. Covers sales during December 1987.

* Does not include hard disks installed at the factory.

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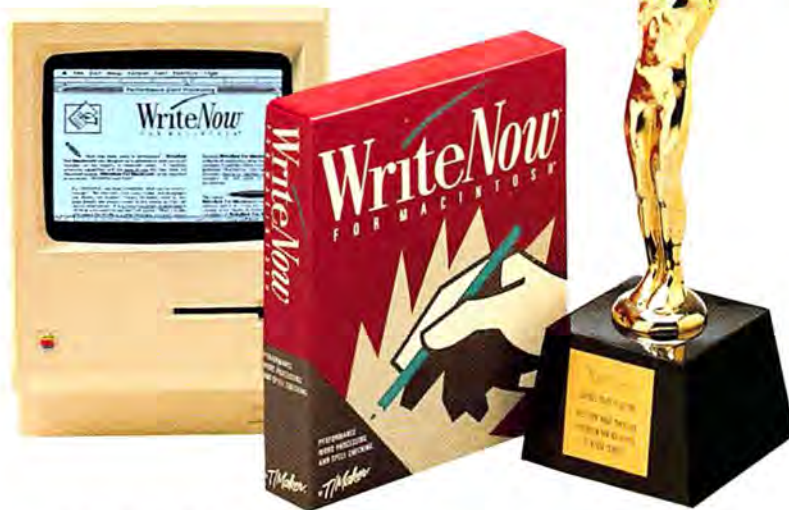
“WriteNow feels perfect.... It's hot. Highly recommended. This is THE word processor to use if you use a Mac.”
John Dvorak,
San Francisco Examiner

“Right now, WriteNow comes the closest to delivering on the promise of future word processing.”
Michael Miller,
InfoWorld

“This is the word processor that we designed and built Macintosh for.”
Steve Jobs,
NeXT Inc.

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Dan Farber,
MacWorld Magazine

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Vicky Jo Varner,
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MacUser Magazine 1986

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2



3



4



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