MACWORLD

July 1986 $3.95
Canada $4.25
The Macintosh™ Magazine

Moving into the Future

Color Your Mac

- Update Printers to Color
- How and When to Expand Your Font Library
- Add Graphics to Your Business Presentation
- The Secrets of Spelling Checkers–Eight Programs Compared

Inside: Your Copy of *Publish!*
All about Desktop Publishing

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the world, and double your

NEW VERSION 1.1

SideKick, The Macintosh Office Manager, now supports MacPlus (128K) and Finder 5.1 for the same low price—$99.95. An upgrade is available from Borland for $19.95. The upgrade is FREE if you purchased SideKick after 12/15/85. For more information, call (408) 438-8400.

Borland products include Turbo Pascal, Turbo Prolog, Turbo Database Toolbox, Turbo Lightning, Turbo Graphix Toolbox, Turbo Tutor, Turbo GameWorks, Turbo Editor Toolbox, Word Wizard, Reflex, The Analyst, SideKick, SideKick, The Macintosh Office Manager, Traveling SideKick, and SuperKey—all of which are trademarks or registered trademarks of Borland International, Inc. or Borland/Analytica, Inc.

clear your desk, connect you to productivity for only $99.95

SideKick,® The Macintosh™ Office Manager,™ gets rid of antiques like desktop phone directories, calculators, calendars, notepads, clocks, adding machines, and similar clutter. Sweeps all that off your desk and into your Mac. You can now bring true desktop organization, information management, and telecommunications to your Mac and do all that *while you're running other programs.*

> "Take my compliments as a user. When I see SideKick, I know I want it.
>
> *Jean-Louis Gassée, VP, Product Development, Apple Computer*

SideKick is the first product for the Mac that begins to make real the promise of an electronic desktop.

Lawrence J. Magid, Chicago Sun Times "

What PhoneLink™ does for you

In true multi-tasking style, PhoneLink automatically dials for you *even while your modem is in use* on some other task, like sending or receiving a file. This one cubic-inch piece of hardware plugs into your Mac's sound port and will dial all your phone numbers for you. You can install your PhoneLink in a few seconds, and take extra pleasure in the fact that it didn't cost you anything because it came free with your new SideKick.

What SideKick does for you

- ☐ Gives you a full-screen editor and mini-word processor that lets you jot down notes, create and edit files, and/or be used in conjunction with programs like MacWrite or MacPaint.
- ☐ Provides you with a telecommunications program that sends and receives data from any on-line network or bulletin board *while using* other applications. (You need a modem for this feature.)
- ☐ Lets you tap into a full-featured financial and scientific calculator that will let you print out a paper tape of your work.
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- ☐ Tells you what you're spending in telephone charges by calculating the cost of every call to whatever area code or time zone.
- ☐ Keeps you aware of business and travel expenses.
- ☐ Gives you a credit card file that tracks entries, balances, and limits.
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Minimum System Requirements:
128K
M52

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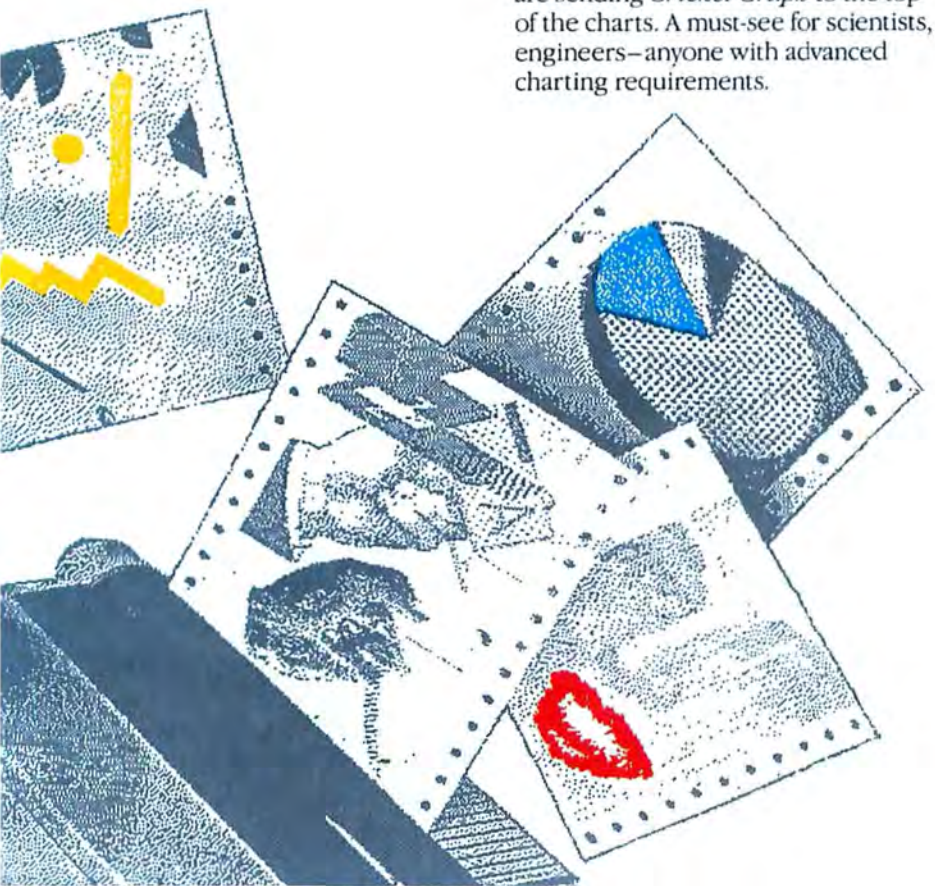
MACWORLD

July 1986 *The Macintosh™ Magazine*

On the Cover
Make your Mac's output explode with color–see pages 65, 94, and 112.



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- *Fontographer* Create logos, special characters, or entire fonts and print them on the LaserWriter.
- *Balance of Power* Not your basic shoot-'em-up, this serious game puts the fate of the world in your hands.
- *PictureBase* Picture this: a database of artwork, cataloged by category and easily accessible.
- *Bulk Mailer* Maintain a mailing list of up to 90,000 names and print labels in a variety of formats.

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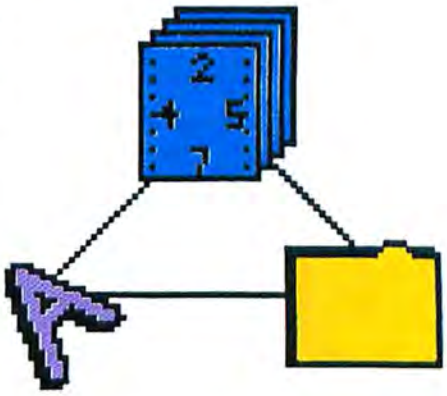

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BPA

READYSETGO™ Takes You Beyond Word Processing.

At one time you were satisfied with your word processor's output. But now you want a lot more.

Adding those Excel charts to your business plan would be nice. And your MacPaint™ creations are just begging to be included in your letters and memos.

Sure, you can put graphics in MacWrite™ or Microsoft® Word. But it isn't easy.

Neither program shows you how your page will look until you print it out.

Adding simple graphics like lines or boxes is a big chore too.

Not to mention the fact that neither MacWrite nor Word show text columns side by side.

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Introducing Page Processing.

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By processing whole pages of text and graphics at once, READYSETGO represents the next step in document generation.

Now you can import graphics, place them anywhere on a page — cropped or scaled to any desired size.

Import your MacPaint Graphics with our free Art Grabber+

Text entry is just as easy. Built into READYSETGO is a word processor more powerful than MacWrite. With complete control over fonts and line spacing in point sizes of up to 99. And, unlike those ordinary word processors, READYSETGO's time-saving print preview eliminates the guesswork of laying out pages.

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An ImageWriter Desk Design template.

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*The suggested retail price of ReadySetGo is $195. Desk Design is $69.95.

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MacUser Magazine

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It's alive!

Now available from Human Touch Computer Products, The Three to One Touch™ board brings your Macintosh® alive with stepped-up processing speed, increased power, expandability, and upgradability.

Speed. How would you like to increase the speed of your Mac? with the Three to One Touch™ board, you can. It replaces your Mac's 8 MHz 68000 processor with a 12 MHz 68000 processor. This effectively doubles the system's speed because improvements are channeled to processing rather than graphics.

How about the increased speed that comes from storing frequently used programs in ROM? The Three to One Touch™ board provides that too. It can house 512KB of preprogrammed ROM—enough to store large programs permanently in your system!

Memory. What would an *additional* 1.5 megabytes of contiguous memory in your Mac mean to you? It would give you the ability to load the operating system, Jazz or Excel and a RAM disk, and there's still space left in memory for processing a spreadsheet twice the size of what you can now do on your current Mac!

Expandability. How would you like to open the Mac's architecture so that you could attach an *array* of peripherals? The Three to One Touch™ board's unique interface brings the signals from the 68000 processor to a connector outside the case. HTCP is currently developing a SCSI port and a card cage that will permit the attachment of additional devices.

Upgradability. What about further memory expansion? The Three to One Touch™ board can be upgraded to 3.5 megabytes of RAM as soon as the 1 megabyte chips are available *or* additional memory can be accessed via the card cage.

Compatibility. The Three to One Touch™ board can be installed in your Macintosh with Apple's old or new ROM. What's more, due to its ability to revert to its original untouched operation, it can run all Mac software.

Installation. Here's the catch, right? Wrong! The Three to One Touch™ board installs in minutes and doesn't require soldering or cutting traces. So, you can't do anything during installation that you couldn't readily undo.

Bring your Mac alive with the

Three to One

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Microsoft Excel. For those who

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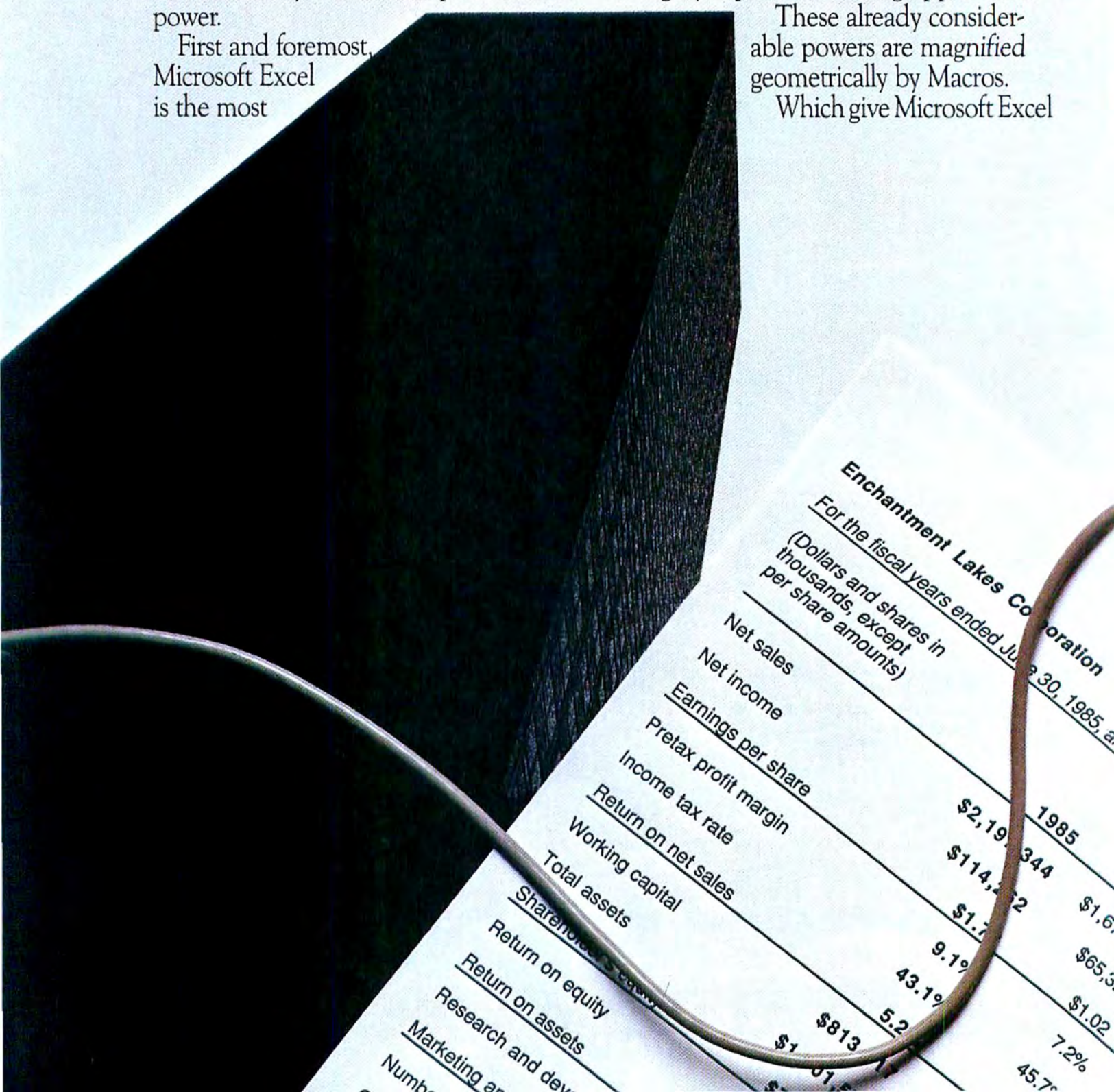
Which give Microsoft Excel



appreciate the uses of power.

the capacity to learn your most complex routines. And activate them with a single keystroke.

Yet for all its ability, Microsoft Excel is simple to learn, simple to use. No complex commands to memorize. No classes to take. The only thing complicated about Microsoft Excel is the problems it can solve.

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In the right hands, a potent weapon, indeed, in the cause of commerce.

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Microsoft Excel

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Don't be overwhelmed

The good news is that virtually all of you who follow these things know that Microsoft® Word is by far the most capable word processor you can run on a Macintosh.™

The too bad news is that some of you think that means you're not qualified for Word.

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In fact, if you've ever needed to combine information from old files in a new one, or if you've ever had to shut down one file just to look at another—then you're ripe for Word.

Leave the windows open.

For people who've gotten used to the tedium of closing one job before they could open the next, Word's windows are a real eye-opener.

Because this feature—an exclusive, we must add—lets you display four different Word documents on screen at one time. And leap rapidly from one to another, cutting and pasting among them.

A real time saver, even if you're only composing a memo. If, say, you needed to combine material from your three previous memos into a fourth new one.

The training wheels aren't welded on.

Some things *are* best done with mouse and menus. But once you've worked with a Macintosh for a while, you'll want the option to run commands from the keyboard as well. A faster way to order up everything from opening and closing files and starting a new file, to printing and saving, to changing font styles or page formats. It's an option only Word gives you.

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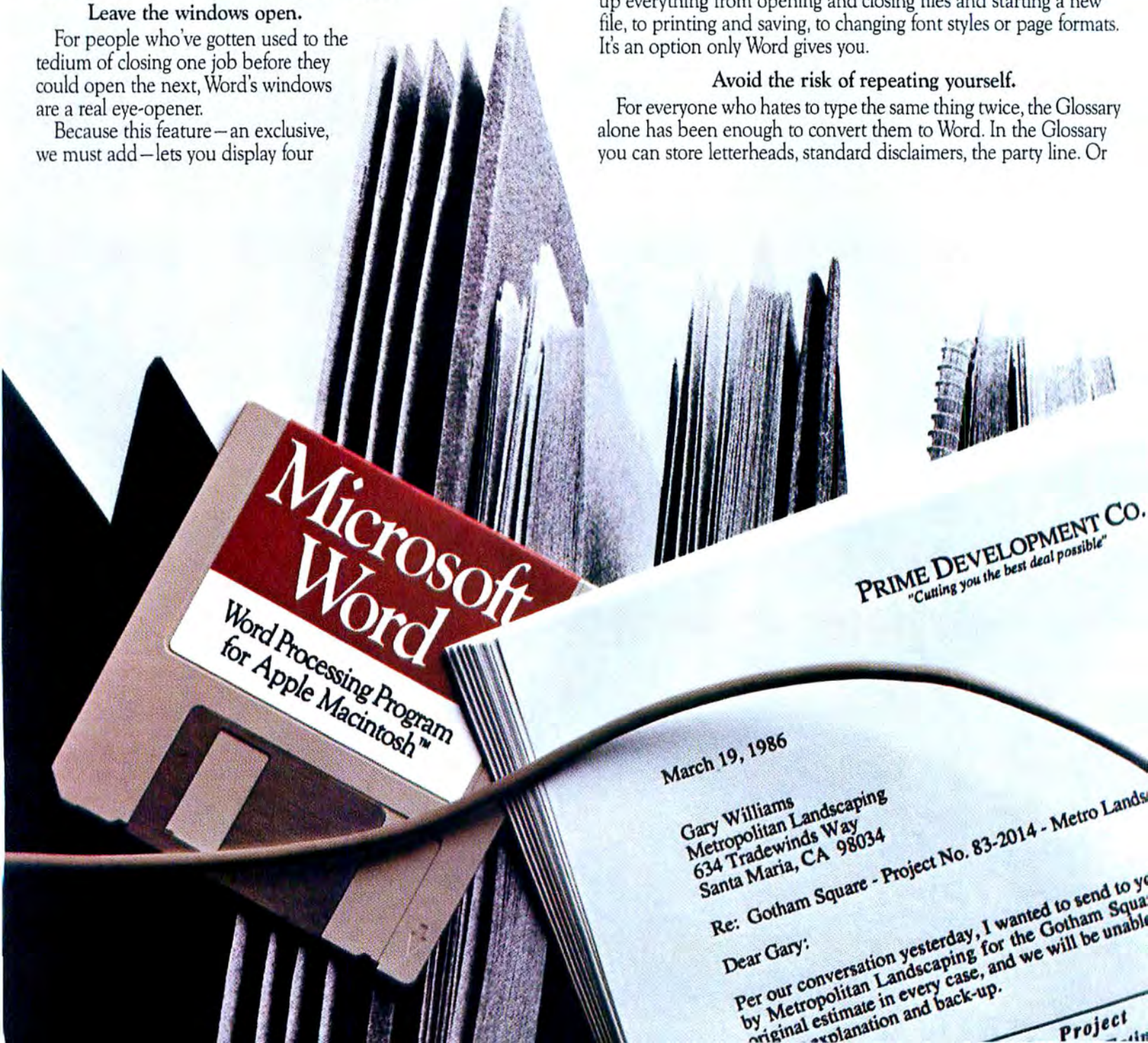

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mumbo jumbo. All can be instantly retrieved with a keystroke.

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So before you process another paragraph, test scribe the program from Microsoft. And never be at a loss for Word.

Microsoft® Word

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Fly where no man has

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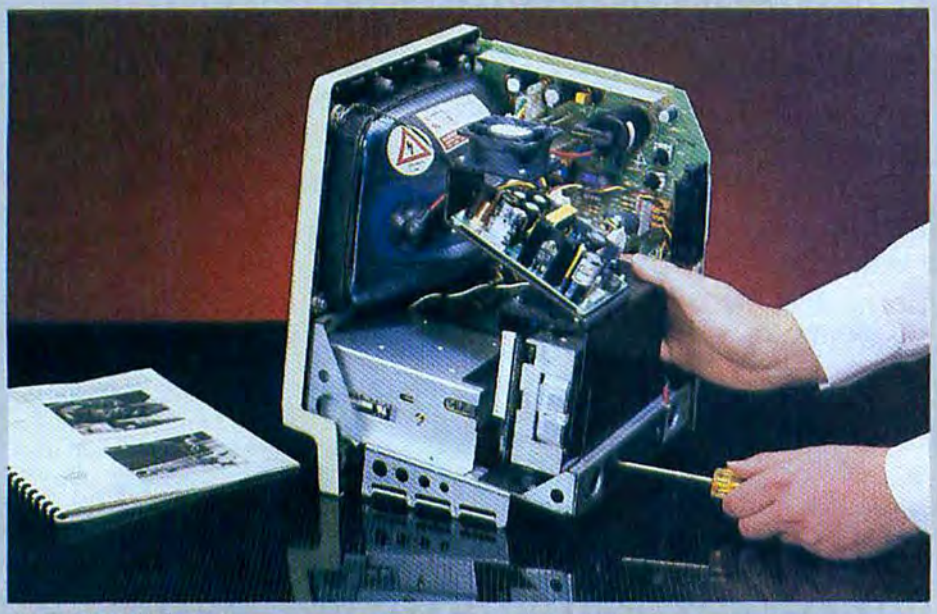

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HFS Compatible	**Yes**	Yes	Yes	Yes	**Yes**	Yes	Yes
Mac Plus Compatible	**Yes**	Soon	Yes	Yes	**Yes**	Yes	Yes
Data Transfer Rate, Mb	**5.0**	5.0	5.0	0.5	**5.0**	5.0	5.0
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Circle 439 on reader service card

David Bunnell

On the Fault Line

Amid tremors and aftershocks, consumer discontent is rising on the software Richter scale

A vast gap lies between the reality of what software does and how it's promoted.

"Unnecessarily unfriendly."

"Toll-free numbers are not always available–some are advertised but not in service."

"I very much dislike getting screen menus with commands that respond 'not available in this version' or 'to be added in a future update.'"

"My biggest problem with software is that when I don't use the package for a while, I have to spend a lot of time learning it again."

"Customer support phone numbers are available for most software I use. Unfortunately, the companies do not provide enough staff. It is extremely difficult to get in touch with anyone. I end up having to solve my own problems."

These are just some of the comments we received from readers who responded to our recent PC World Communications "Software Education Questionnaire." The purpose of the survey was to find out how people decide which new software to buy and how they learn to use it.

Perhaps the most shocking revelation was how deeply dissatisfied most people are with the level of support software publishers provide.

The intensity of their complaints would register at least 5.2 on the Richter scale.

What's the source of all these tremors on the personal computer fault line–and whose fault is it, anyway?

My contention is that the software industry puts a lot of obstacles in the way–especially for beginners. As software grows in complexity, many people become so discouraged that they never grasp the full capability of the programs they have.

In some ways the standard interface of the Macintosh gives it an advantage over the IBM PC, but there are as many problems associated with mastering Mac software as there are with PC software.

The problems relate to some of the issues our survey identifies–poor documentation, lack of telephone help lines, lack of knowledgeable support staff on existing help lines, lack of money-back warranties, and lack of adequate demo software so a customer can try a program out before buying it.

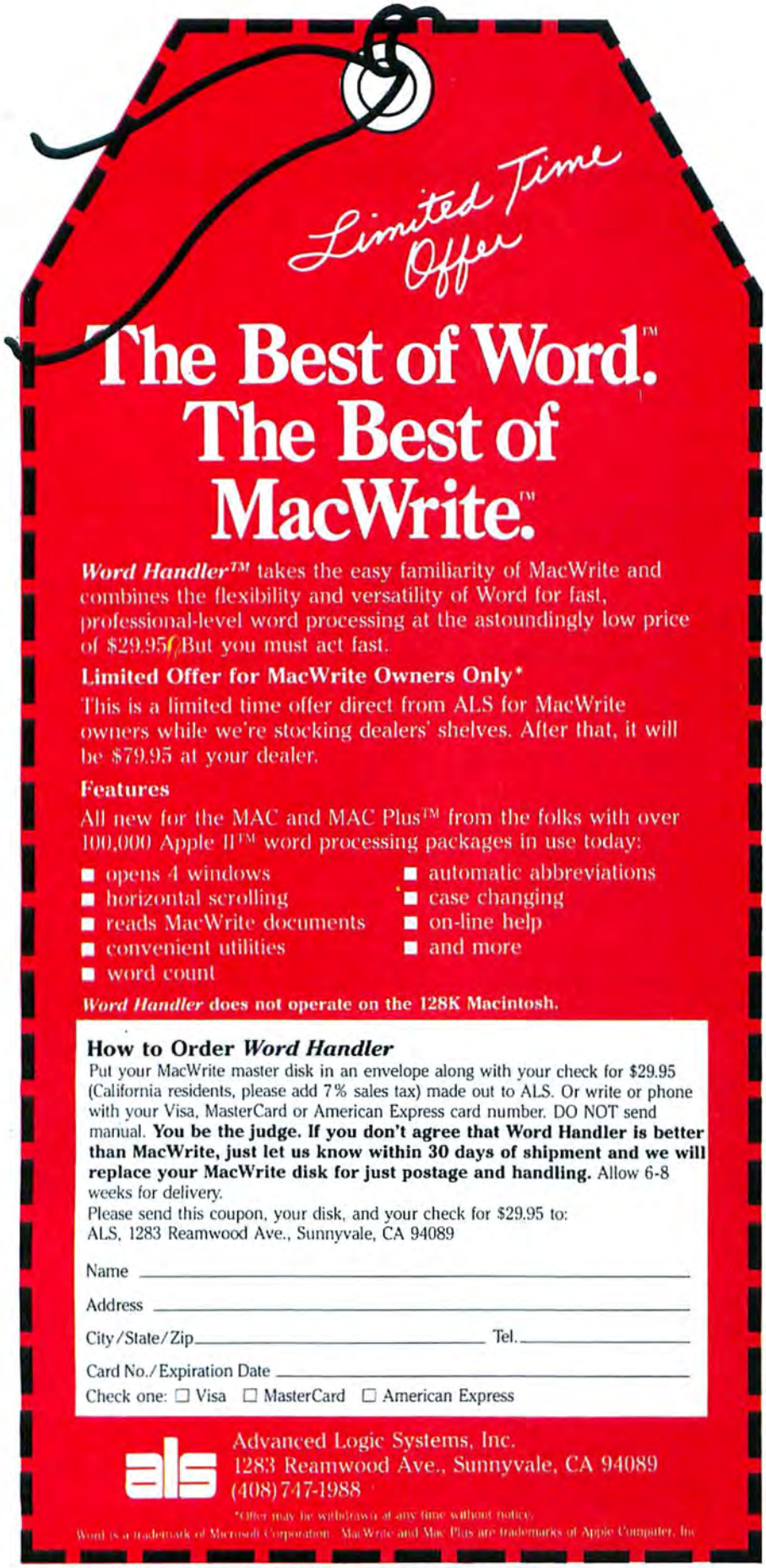
A vast gap lies between the reality of what software does and how it's advertised and promoted. And software publishers seem unwilling to list their products' requirements on the package.

For example, a recent column of mine in *PC World* magazine (April 1986) chronicled the misadventures of my writer-friend James, who had tried unsuccessfully to run the *Volkswriter 3* word processing program on his Tandy 1000. After the issue hit the newsstands, I received a call from Lifetree Software's public relations director.

She pointed out that *Volkswriter 3* should not be used with the 256K version of the Model 1000. The reason she gave is that some of the Model 1000's RAM is dedicated to the computer's video display, so there isn't enough working memory for *Volkswriter* to run successfully on that machine.

She also noted that *Volkswriter* worked without a hitch on other 256K personal computers.

(continues on page 16)



Circle 525 on reader service card

David Bunnell

(continued from page 15)

I believe that's true, because I received a number of letters from readers who use *Volkswriter* with no apparent difficulty.

However, I couldn't resist commenting to the Lifetree representative, "It doesn't say anywhere on your package not to use this program with the Model 1000 from Radio Shack."

"It's up to Radio Shack to tell you that," she replied.

That seems a little strange, because Lifetree actively markets its *Volkswriter 3* package through Radio Shack stores. Where does the real responsibility for informing the user lie?

My impression is that even if a program took up 255K of memory, software publishers would be tempted to say it worked on 256K machines. The only thing they'd neglect to tell you is that you'd have only 1K to work with.

Who's kidding who!

I strongly urge hardware companies to consider supporting the current legislation in California (Assemblywoman Gloria Molina's Assembly Bill 1507), which seeks to hold software publishers, manufacturers, and dealers accountable to consumers for their advertising materials and promises.

The way it stands now, manufacturers can claim anything they want without being held accountable.

This is a disgrace. In the long run, it's damaging to the software industry. And that's not the only group that will be hurt. If anyone should be outraged by this, it should be the hardware manufacturers, who will sell less hardware as customers have more and more trouble running ornery software.

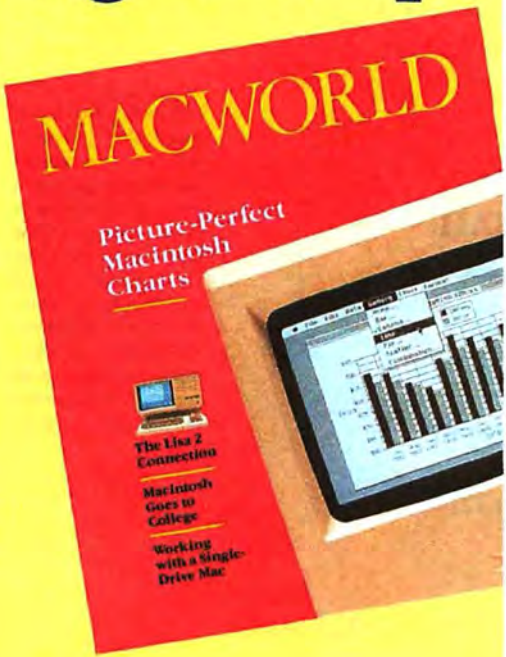
For example, beginners might try out a word processor and find it very complicated to learn. They'll think the program is confusing and discover that it doesn't do what was claimed. They'll end up thinking that computer software is difficult and slow and that it has a host of frustrating problems associated with it.

What happens then? These customers assume that the computer itself must be somehow to blame.

Thus, the hardware is found guilty by association.

(continues on page 18)

Sign me up!



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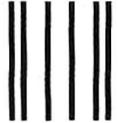

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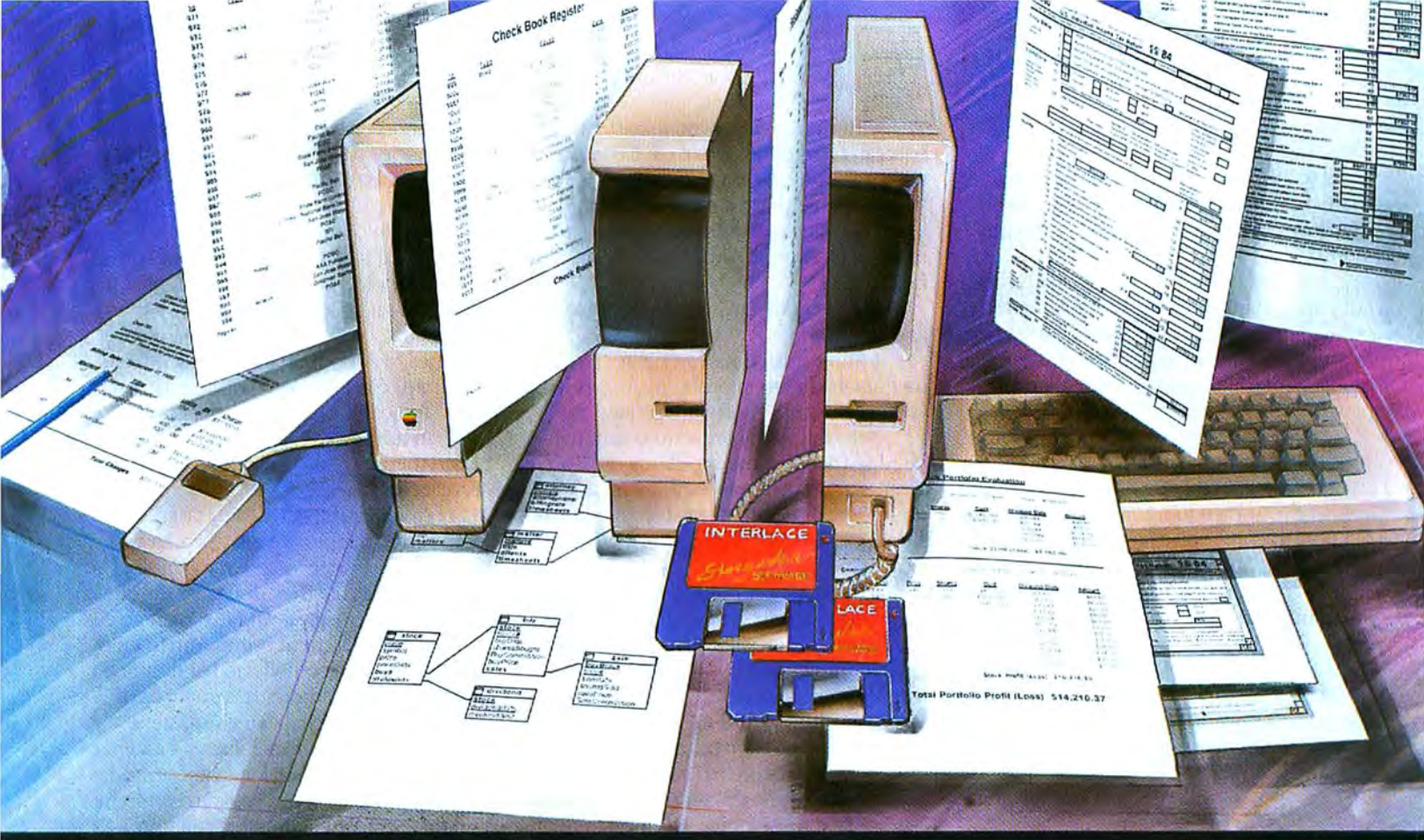

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Circle 420 on reader service card

(continued from page 16)

I would venture to say that this state of affairs is the single biggest reason for the slowdown in the growth of the computer industry last year.

Actually, hardware manufacturers are not immune from blame. For that matter, even computer magazines are guilty when we publish articles with jargon you can't understand unless you're a so-called power user.

Hardware companies expect that you will somehow know how to change DIP switches on circuit boards and that you can connect your own jumper wires and figure out how to configure systems that weren't meant to be put together in the first place.

This cavalier attitude is at the root of the number one problem facing the personal computer business today. The potential widespread use of personal computers hasn't been realized because they're too complicated; people have too many bad experiences, and the time commitment for learning programs is too long.

Often, even after you take the time, you can't make full use of your computer without someone to give you advice and hold your hand. It's almost impossible to learn everything you need to know just by reading the documentation or calling the help line.

People come away feeling intimidated and helpless.

I think this is an even bigger issue for manufacturers than problems like pricing or distribution or software piracy.

Software and hardware companies need to focus on the problems of new customers and even seasoned users.

Manufacturers must stop making assumptions about their customers' levels of experience.

Part of the problem is that many companies avoid their customers. For example, they don't want to talk to ordinary customers at computer shows like Comdex. In fact, they seem upset to see them there. Manufacturers would rather talk to distributors and to each other. They still expect computer stores to carry the burden of educating the user. Yet they must know by now that the average salesperson in a computer store doesn't understand all the nuances of using a software package on different systems.

Another factor, of course, is that the expense of supporting software is immense, and publishers have long avoided facing this. Often, they don't even factor that cost into their business plans.

If you talk to Mitch Kapor of Lotus, Dave Winer of Living Videotext, or Bill Gates of Microsoft, they'll tell you they have huge banks of people who answer phones to support customers—and that they still can't keep up with the calls.

Typically, callers are kept on hold for half an hour before reaching a help line. Even then they don't necessarily receive satisfactory answers.

In my opinion, the heart of the problem is that the people who produce the software are so involved in technology for its own sake that they don't see the chasm between themselves and the average customer. Many of them even seem to enjoy keeping things complicated and difficult because it gives them the mystique of being unapproachable tech-masters.

Our survey—which I see as a kind of seismograph monitoring users' attitudes—clearly shows that the pressure is mounting on the personal computer fault line.

We're due for a Big One soon. □

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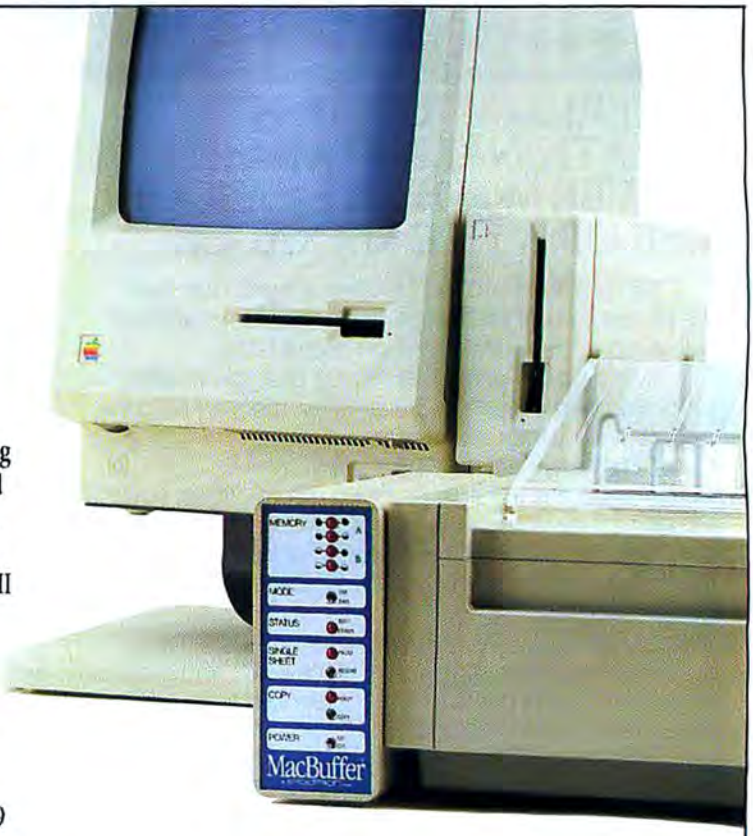

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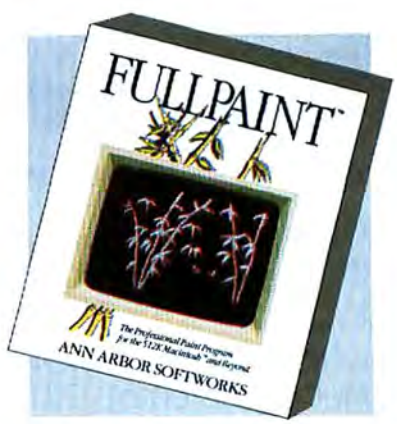

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Circle 143 on reader service card

Steven Levy

Room for Improvement

How MacTerminal's shortcomings helped make communications software a wide-open race

The fellow who first taught me how to hook up computers to the phone lines is normally a man of supernal calm. The exceptions to this rule were the times he encountered a combination of computer, modem, and communications software that refused to perform as a well-oiled machine. At those times of dead phone lines, locked keyboards, and streams of on-screen gibberish, his face reddened and inflated with rage. When he encountered files that, like terrified parachutists hanging back at the hatch, refused to take the electronic leap from computer to computer, he howled in primal discomfort.

So naturally, I was thrilled to tell him how the Macintosh would solve all his telecommunications problems. It was early 1984, and I had just been given a peek at what looked like the raciest terminal program in computer history. The program's cocreator, Apple "software evangelist" Mike Boich, had put it through some paces, and I had seen how menu commands and dialog boxes cut through the layers of incomprehensibility that previous machine-software combinations had presented.

"And what is the name of this magic program?" my telecommunications guru asked me.

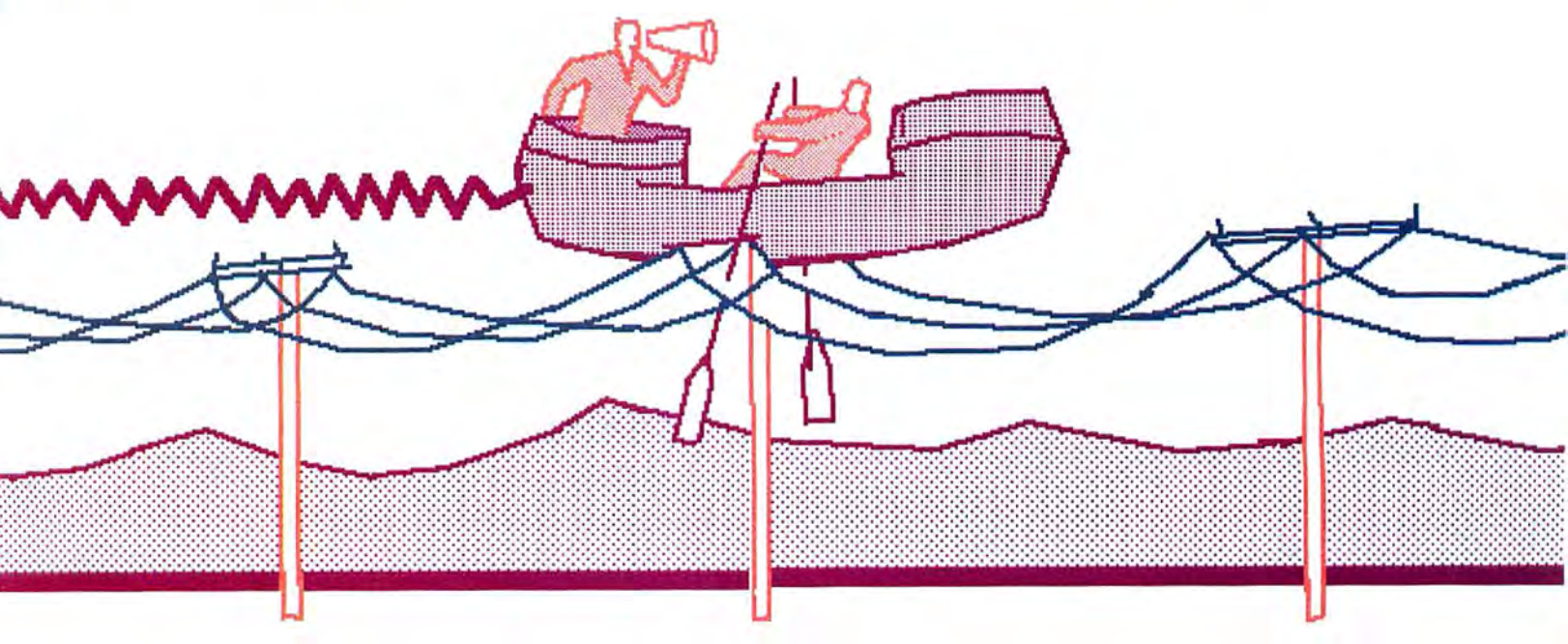
"It is *MacTerminal,*" I said.

"And when will it ship?"

"Real soon now."

Hah. Fact is, Apple Computer did not ship *MacTerminal* until several months after the Macintosh was available. And when it did ship, many words could have been used to describe it, but none of the words was panacea. It did provide a zipless style of file transfer that pleased my on-line mentor. And it had some luxury features not found in previous communications programs—like a clever way of capturing text and saving it via the Note Pad. But it lacked some features that users had taken for granted: most notably, there were no built-in log-on procedures for people to automatically dial the phone and begin a telecommunicating session on their favorite information utility. And some things about it were just plain weird, like the fact that it often would spin the disk drives—in effect, temporarily freezing all action—according to its own inscrutable whims. Disk accesses from outer space!

(continues on page 26)



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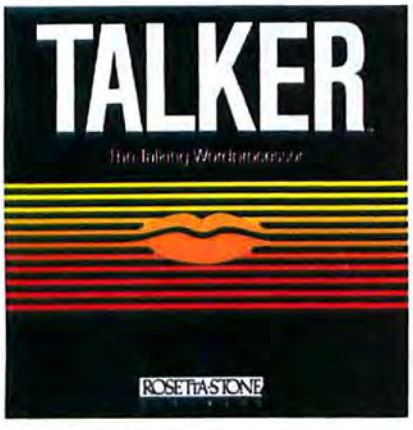

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(continued from page 23)

Too little and late, *MacTerminal* was sort of a mess. But sometimes a mess can be beneficial in the long run. After all, the shortcomings almost write an invitation for someone to step in and fix things. If *MacTerminal* had been all things to all people, few would have risked marketing a competitor. Instead, Apple's unintentional gaffe made the communications software market for the Macintosh, compared to the market for other applications, particularly vibrant, competitive, and certainly varied.

Most notably, while opposing philosophies of software distribution exist for all applications, the terminal applications are the only ones duking it out, not only for market share but for spiritual dominance as well. This is neatly significant, since communications programs are, by definition, linked to ideas of sharing information.

A Hot Tep

The tone was set early on by the first program that allowed Mac users to connect to modems. Called *MacTep* (terminal emulation program), it did not come close to fulfilling the computer's potential, but it did get you up and running, and since there was nothing else (remember, *MacTerminal* didn't come out until the Macintosh had been out for months), that was plenty. Its author, Boston-area programmer Dennis Brothers, had written the BASIC program just to get himself on line. But he won the gratitude of thousands, as well as a measure of fame, by putting the program into the public domain.

Many first-time computer users became accustomed to the idea of having terminal software available from their user group or an on-line service like CompuServe. So when two midwestern programmers named Buck Buchanan and Scott Watson decided to write a more ambitious program called *Red Ryder,* it seemed natural to distribute the software by those channels. Using a concept known as shareware, people are encouraged to accept free copies and even to distribute copies to their friends. But they are also put on notice: if they use the software and enjoy it, they are honor-bound to pay the modest fee of $40, which also entitles them to phone support and free upgrades thereafter.

As the Mac market matured, other packages appeared that used more traditional modes of distribution. These included *MITE, Telescape, inTouch,* and *Versaterm.* Particularly noteworthy was Hayes Microcomputer Products' *Smartcom II;* at $149 it was more costly than its competitors, but at the time of its release it was the most sophisticated terminal program available. The most recent of the heavyweight contenders is *MicroPhone,* claimed by its developer to set a new standard in Macintosh telecommunications software. Its price, $74.95, is right between *Red Ryder* and *Smartcom II,* and it's sold almost exclusively by mail order. Its author? Dennis Brothers. What goes around comes around.

Winning Hearts and Modems

Producing good communications software is pretty tricky. When it's done right, the user experiences nothing more complicated than making a phone hookup. Meanwhile, the computer is racing madly to reconcile all sorts of potentially irreconcilable parameters. As with other kinds of software, adding features increases the risk of bringing the machine down in a hopeless tangle of system calls and subroutines. It's not work for the squeamish. On the other hand, competition among telecommunications software developers is not a zero-sum game but rather one of those healthy competitions that turn out to be good for everyone. Not all Mac owners think that using a modem is worth the expense—but if the software is inviting enough, they might be enticed to take the plunge.

All players are rallying under their own banner. At Hayes the fervor comes from the synergy created by the combination of *Smartcom II* and the Hayes Smartmodem. After all, modems made the Atlanta-based Hayes Microcomputer Products an industry giant, and the Smartmodem—which works with almost all micros, particularly IBMs and compatibles—has become an industry standard. So much so that Hayes released its Mac version of *Smartcom II* with an imperious disregard for the fact that the software did not fully support the standard Apple Computer modem. Only modems 100-percent compatible with the Smartmodem could take advantage of *Smartcom II*'s numerous features, like the auto-dial log-on procedures. When I asked Hayes's VP of sales Gary Betty what went wrong there, he replied that nothing was wrong with the software—Apple was in the wrong by not fol-

(continues on page 28)

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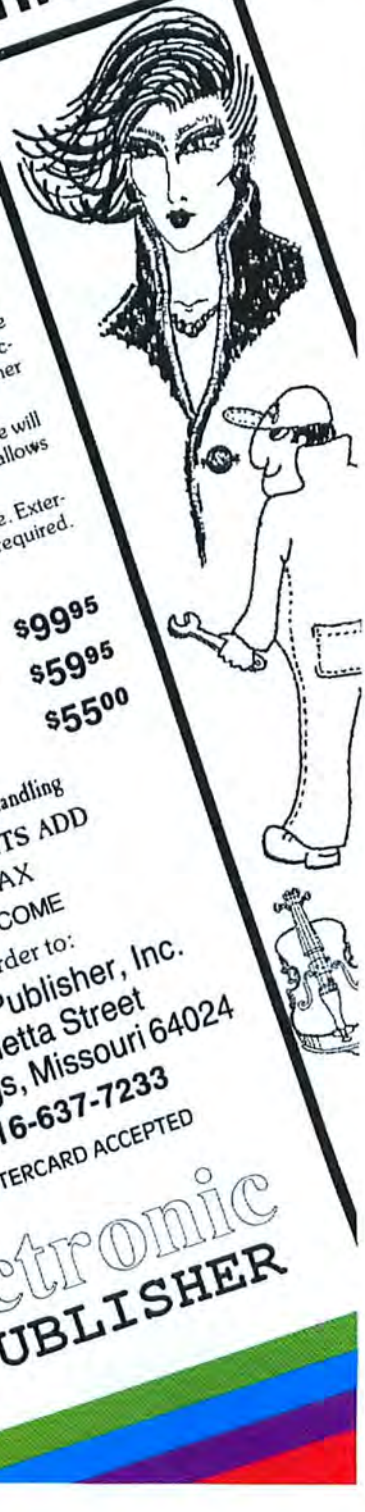

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Steven Levy

(continued from page 26)

lowing the Hayes standard. Indeed, the current version of the Apple modem is a 100-percent Smartmodem act-alike.

Hayes sells many copies of *Smartcom II* bundled with the modem (the two, along with a Mac-to-modem cable, list for $649). Some people I know respect *Smartcom II* but are impatient with its use of little animated routines that take you through the process of dialing, waiting while the phone rings, and making a connection; you can't turn off the cartoon. I think Gary Betty tipped his hand when he confided that "communications aren't as big for Macintosh users–not as big as for the IBM AT." Undoubtedly true, but would Hayes dare give the button-down AT users a picture of a frowning telephone each time the computer gets a busy signal?

Still, *Smartcom II* is a comforting communications solution, available at most of the same computer dealers who sold you your Mac. In comparison, getting hold of *Red Ryder* is a walk on the wild side. This reflects the personality of Scott Watson, who became sole author when his partner Buck Buchanan died from injuries incurred in an accident. Upon the tragedy, Watson adopted *Red Ryder* (the meaning of the name is a secret, supposedly divinable from clues hidden in the software itself) much as a widower might devote himself to his suddenly motherless child. Like a doting parent, he cannot tolerate the child sitting around and reading a comic book–the child must always be improving itself. As a result, *Red Ryder,* feature-for-feature, gives away nothing to its competitors.

"The love of my life is the program. I work 22 hours a day on it," says Watson. "I don't view it as a product but as a subscription. When one version goes out the door, I immediately work on the next version." He did six versions in 1985, each better than the last. Version 8.0, the second one of 1986, is shipping as I write this. My guess is that if you log on to CompuServe after you read this column, you will find version 10.0.

Do not make the mistake of thinking that just because you can download *Red Ryder* for free, Scott is some hippie giving away software–it is a business for Scott. Though the exact number of registered users stays between him and the IRS, Watson claims to have more paid users than all other Mac communications programs combined. Since his overhead is minimal, this makes him a very rich obsessive, and he

(continues on page 30)

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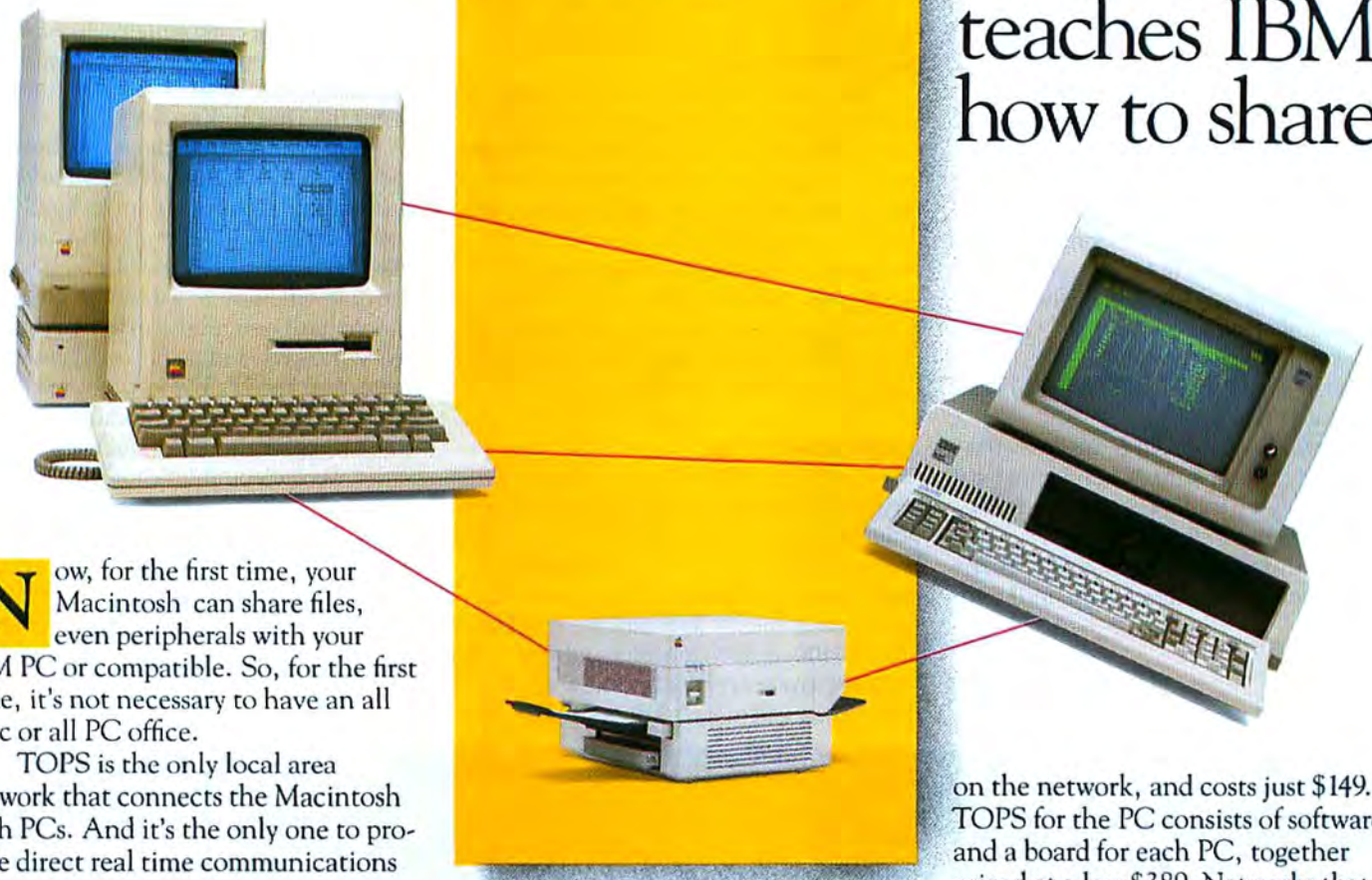

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TOPS for the PC, $389

TOPS for the Macintosh, $149

(continued from page 28)

plans to keep up the pressure. "In the time my competitors ship one version, I can get three versions out."

One of those competitors is Software Ventures, publisher of *MicroPhone*. In terms of hype, *MicroPhone* takes second place to no one. Marketing director Howard Zack calls it a "dream telecommunications program." Months before the program's release, Software Ventures took out full-page advertisements boosting the software written by "guru" Dennis Brothers, who was pictured in loosened tie and shirtsleeves (a big joke to those who know Dennis mainly by his cowboy hat). Readers of the ad were prematurely invited to order the software by calling an 800 number that spelled out D-E-N-N-I-S.

Meanwhile, D-E-N-N-I-S was busy trying to finish the software. When I spoke to him in January, he told me it was ready for release and he intended to sleep for a month. But the next day he found another bug, and *MicroPhone* didn't ship until mid-February.

It turned out to be worth the wait—the easiest log-on procedures I've ever seen and nice touches everywhere. But just as interesting is the way that Software Ventures is marketing it.

"We sell on a direct basis only," says Howard Zack. "So we can price it aggressively at $74.95."

Software Ventures, a company with but five employees, seems to try to combine Scott Watson's fanaticism with the professional tactics of a larger company like Hayes. They take out the ads and package the software in a flashy box with printed documentation—but in a Watsonesque move, they placated the customers who paid early by sending them, along with the tardy *MicroPhone,* a free disk of public domain games. And a $5 bill.

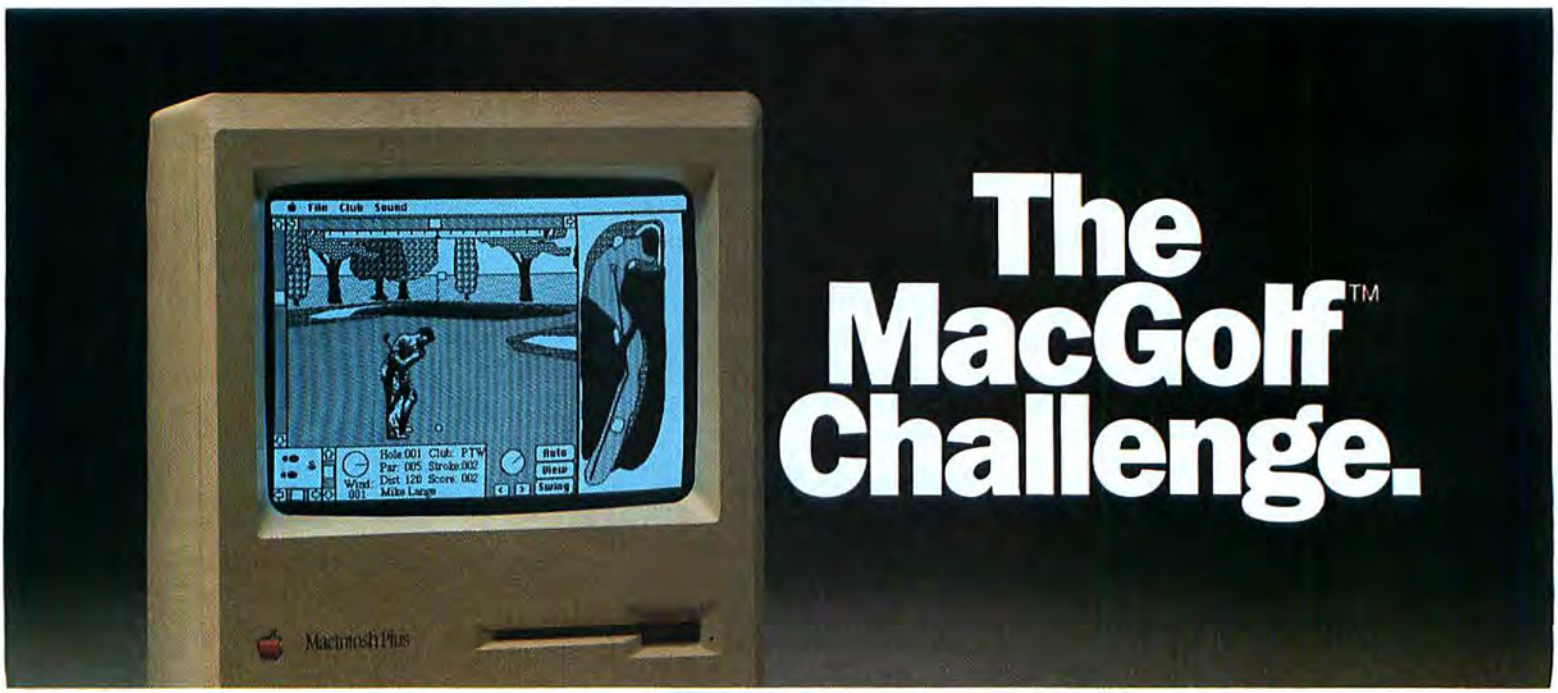
Apple Makes Out

Obviously, freedom of choice abounds in terminal packages. And while Apple Computer is happy to see third parties thrive, it has not forgotten its own woebegotten child. It seems that since *MacTerminal* was favored mostly as a package that emulated VT100 or 3278 terminals (if you're in a big company, you probably know what those numbers mean), Apple decided to go all the way and enhance those functions on the recently shipped version 2.0. "*MacTerminal* will never be *MicroPhone,*" says its product manager Rick Davis, but he promises that it will more than satisfy those who use Macs in a strictly corporate or networking environment. In addition, the new version no longer irrationally accesses the disk drive, and it's 30 percent faster than its predecessor.

Rick Davis appreciates the diversity of the communications software market for the Mac and thinks that Apple should do more to exploit it. After all, he admits, *MacTep* helped keep the Macintosh alive in the days when there was no alternative. "Apple has been remiss in telling that story," he says, and he hopes that new users take the trouble to look over the marketplace to choose a terminal program that's right for their particular needs.

"We see communications as the next great reason to use a computer," he says. "And communications on the Macintosh will be done by a combination of Apple and third-party solutions."

When an egg cracks, make scrambled eggs. Sometimes it beats a soufflé. □



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Keeping the Customer Satisfied

Customer support isn't what it ought to be, and it's up to consumers to get what we deserve

Taking care of the customer would seem to make good business sense.

An analyst facing a critical deadline crashes the program every time she tries to sort a database, and the program's maker, which discontinued its customer support department, can only suggest calling the dealer. Or an erratic typist buys a spelling checker only to find that its dictionary includes errors of its own—and the company that made it doesn't respond to his complaints. We've all heard such horror stories. We bought these machines and programs in the first place because we thought they'd make our lives easier. Most of the time that is exactly what happens, and we're glad we joined the computer age. But when an irritating glitch recurs and we get the runaround from the company and the people who sold us the product, it is indeed maddening.

Taking care of the customer would seem to make good business sense—it's the best marketing and public relations investment a software company can make. Vendors may find it bothersome to deal with the many "spurious" calls from people who just can't understand the instructions. But even those problems—which might have been avoided with better documentation—are very real to the callers, and people are not likely to buy from a company again if they think it means repeated frustration. The customers who call in for technical support are important to the vendor; they are opinion setters. They are more aggressive and assertive than the typical user. Their friends and associates turn to them for advice and support. If vendors support such customers, the customers will sell and support the product on their own.

The Sorry State of Affairs

Often, support is the missing link in personal computer product offerings. I believe that this reflects the immature stage of the industry today. In time, customers will assert their right to quality support, and wise vendors will stress the level of their support.

In the meantime, the availability and quality of support are surprisingly inconsistent and substandard. Typically, before the product goes to market, the developer fills the support role, installing the product in a handful of test sites and fixing any problems that surface. This is an exciting period in a product's life; the developer is thrilled to see the product in use and eager to diagnose and correct the problems the testers uncover. Adding to the relative ease of this honeymoon period of support, the archetypal test site users are technically minded—often friends of the developer.

A few months later the program goes out into the wide world, where it meets its true test in the hands of consumers. Soon the developer gets fed up with spending days on the phone answering customers' routine questions. Rarely does a caller discover a real bug at this stage. With most mature products, 90 percent of the calls are related to the documentation or the customer's attempt to do something with the product that is pushing the envelope.

(continues on page 38)

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Magnum Tape 20

How'd We Put 20 Meg Into Something This Small?

It wasn't easy. But when you use our MagNet 20X™ external 20 Meg hard drive, you'll agree it was worth the effort. We packed speed, portability and great software into the most powerful single or multiuser hard drive around. Plug it straight into your Mac Plus SCSI port. Or get SCSI "Plus" performance from your 512K Mac with our FastPort option. The MagNet 20X bundled with MacServe™ features print spooling, disk cache, volume partitioning, full or incremental file backup and true multiuser/multitasking. There's no question why we did it. The only question is how.

MagNet 20 External

The Money Saving 800K Drive

Magnum 800

When we first introduced our Magnum 800,™ Mac owners snapped it up. That's understandable. After all, it was not only the first 800K drive for the Mac, it was also very affordable. The Magnum 800 is fully compatible with your 128K, 512K or Mac Plus. It will recognize 400 or 800K formatted disks and write to them accordingly. And it's priced far less than the comparable Apple drive.

One Year Product Warranty

We warranty our drives for one full year. That kind of buyer protection is usually available only as an extended warranty, costing as much as $300. It's our standard warranty and it doesn't cost you a thing. Naturally, we wouldn't do this if we didn't have complete confidence in everything we make. Well, we have . . . so we do.

Your Mac Harder

Macintosh Storage Specialists

Our MagNet 20. The Full Inside Story.

The MagNet 20 internal offers you the capability to build your Mac into a powerhouse computer by internally mounting our drive. Imagine all the speed, portability and convenience of an internally mounted hard drive for considerably less than you would expect to pay the competition. The MagNet 20 also comes bundled with MacServe to give you the power to grow into.

MagNet 20 Internal

Hungry For Power?

The MagNet 85 Meg and 172 Meg hard drives combine blistering speed and enormous capacity with tape backup and multiuser/multitasking software to make your Macintosh office an incredibly productive reality. Using voice coil technology, these high capacity drives are three times faster than standard hard drives. Now an entire office of Macs can share data and peripherals for maximum performance and efficiency. The MagNet 85 and 172 can satisfy your hunger for power, no matter how big your appetite.

MagNet 85/172

Great Hard Drives Deserve Great Software.

And so do their users. That's why all our hard drive products come with MacServe™ from InfoSphere™ at no extra cost. MacServe includes some great single user features but also allows multiuser access to your Mac. With our MagNet drives and their MacServe software, you'll have the kind of power and performance you and your Mac deserve.

See your authorized Apple dealer for a convincing demonstration of Mirror Technologies storage devices for the Macintosh. Nobody drives your Mac harder.

The Macintosh Storage Specialists.

MIRROR TECHNOLOGIES Inc.

2209 Phelps Road
Hugo, Minnesota 55038
612-426-3276

Circle 406 on reader service card

(continued from page 35)

At the same time, our developer is undergoing coding withdrawal and is itching to build the next product. The management realizes that it's time for a new release. Maybe the OEMs and the large corporate accounts require some major new improvements. The salespeople want new features to sell, and the developer wants to return to coding. So who's going to handle support? Customarily, a junior developer, apprenticed to the original developer, fields the calls. Often, however, the junior developer lacks the maturity and the personal skills to deal with the public.

Support's stepchild status frequently contributes to its ongoing problems. The vendor rarely commits sufficient resources to guarantee quality support.

Dealers Get Into the Act

You may have noticed the assumption that a customer's support comes from the vendor. Most computer stores provide no software support. If you have a problem, they tell you to call the vendor. This experience has led me to purchase most of my software from discount mail-order firms or directly from the software vendors themselves.

In the last year, I have noticed a positive trend. A few select dealers have decided that they can make more money as value-added dealers (VADs) than as storefront resellers. In a few cases the vendor and the dealers work together to provide a higher level of support than before. For example, Aldus trains dealers, who become authorized support dealers for the Aldus products. Another approach is for independent consultants to work with users, helping them define requirements, select and install a system, and troubleshoot after the system is in place.

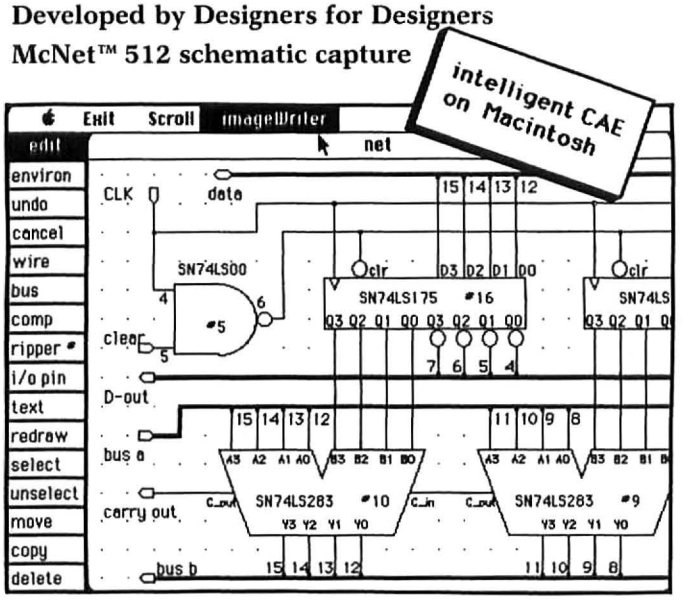
This value-added trend has been propelled by the storefront discounters. For those who want to buy locally, at close to mail-order prices, a number of stores sell cut-rate merchandise. They sell commodity items, and they don't profess to understand what they are selling, but their prices are hard to beat. The VADs understand that businesspeople value their time and are willing to pay a premium for information and support.

Recently I decided to purchase a laser printer, and I shopped around a bit. My requirements were very specific, and my decision came down to software support. I decided to purchase my printer for 5 to 10 percent more from a VAD because the people there were knowledgeable about my particular application, and I felt that I would save enough time and energy to justify the additional expense.

I believe that in the long term, very simple products will be sold based on price. For such items, the customer doesn't require support and shouldn't pay a premium for it. At the other extreme, for very complicated products, customers will evaluate the sources of support. If they can find a credible VAD, they will purchase the product there. Otherwise they will buy based on price alone and get to know the vendor's phone support people. The quality of vendor support will be critical to this purchase decision.

(continues on page 41)

Developed by Designers for Designers
McNet™ 512 schematic capture



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Echo's BRAND NEW protection scheme for the Mac is simply unbeatable.
Hard Disk Install with or without a KEY DISK is now a reality, with no danger of additional copies or user problems.
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And Priced at 35¢ a copy!

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Lionville, Pennsylvania 19353

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The C for the Macintosh

"Library handling is very flexible... documentation is excelient... the shell a pleasure to work in... blows away the competition for pure compile speed... an excellent effort."

COMPUTER LANGUAGES, 4/85

Why Professionals Choose Aztec C

Professionals choose Manx Aztec C development systems because they are the most powerful, portable, and professional microcomputer C development systems available. Professionals know that Manx Aztec C offers the features, dependability, and performance required for producing professional results.

Applications implemented with Aztec C development systems range from real time control of robot arms used in manufacturing, to message switching systems, to games, languages, operating systems, and business systems.

Much of the commercial software for the Apple Macintosh including top selling titles from software publishers Broderbund, Hayden Software, and Spinnaker is developed using Manx Azec C.

Value, Performance, and Flexibility

Manx Aztec C68k for the Macintosh is available as a line of three upgradable development systems: **Manx Aztec C68k-p, Manx Aztec C68-d, and Manx Aztec C68k-c.** Student, noncommercial, and small business discounts are available. Whatever your budget and requirements, there is a Manx Aztec C68k development system that offers you the best value and performance for your investment.

New Macintosh Mouse Interface

The highly acclaimed, powerful, and professional Manx Aztec SHELL development environment now includes a mouse interface. Developers unfamiliar with UNIX or MS-DOS can work entirely with the mouse interface. Those interested in learning the advanced features of the SHELL can do so at their leisure. Developer's familiar with UNIX or MS-DOS can ignore the mouse, if they so choose, and work entirely in a familiar command driven environment.

Aztec C, The Most Portable C.

Manx Aztec C Development Systems are available for the Apple Macintosh, Apple*II*, IBM PC, PC compatibles, CP/M-80 systems, Radio Shack Systems, and the Commodore 64/128. Manx Aztec C is also compatible with UNIX and UNIX ports. Manx currently is developing systems for the Amiga and other microcomputer systems. No other C Development System for the Macintosh comes close to the portability of Manx Aztec C.

Power To Spare

In benchmark after benchmark, Manx Aztec C appears in column after column as the clear winner.

The following sieve benchmark timings are reprinted with permissions of Computer Languages, 131 Townsend Sr., San Francisco, Ca 94107 from a Macintosh review that appeared in the April, 1985 issue:

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

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

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

Sieve timings for Manx Aztec C68k 1.06g:

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

Manx Aztec C68k - Professional Tools

Manx Aztec C68k is bundled with a rich abundance of tools to help produce superior results in reasonable time frames. The following is a list of features and facilities included in Aztec C68k-d, the Developer's System, and Aztec C68k-c, the Commercial system. Items that are marked -c are unique Aztec C68k-c.

Optimized C	Mouse Enhanced SHELL
UNIX-like SHELL	Creates desk Accessories
Macro Assembler	Creates Clickable Applications
Smart Overlay Linker	Phone Support
C-PASCAL Interface	PASCAL-C Interface
Resource Compiler	UNIX Library Functions
Debuggers	Terminal Emulator (Source)
Object Librarian	Easy Access to Mac Toolbox
Mouse Editor	unlimited code size
IEEE floating point	six register variables
Inline assembly	extensive sample programs
600 page manual	hard disk support
no license fees	PASCAL type strings
MacintTalk support	AppleTalk support
code optimizer	symbolic debugger (512k)-c
MacRam Disk-c	UniTools (ul, make grep, diff)-c
Library Source-c	One Year Of Updates-c

Summary

If you plan to program in C on the Macintosh or are currently doing so using a brand x C compiler, there is a Manx Aztec C68k system for you that offers the best value and the greatest degree of portability, power, and professional quality available.

Look around, evaluate, and compare. The more you look, the more you compare, the more you will see that Manx Software Systems has succeeded in its objective to provide you with the best C development system available at the best possible price. Then, give us a call, and join the 25,000 users who already know and enjoy the Manx Aztec C advantage.

Products and Prices

Aztec C68k-c Commercial System	$499
Aztec C68k-d Developer's System	$299
Aztec C68k-p Personal System	$199
C-tree database (with source)	$399
Lisa Kit	$ 99
MS-DOS → Macintosh Cross	$750

Discounts

Discounts are available for professors, students, independent developers, hobbiests, and small businesses.

How To Become an Aztec C User

To become an Aztec C user call 1-800-221-0440 or call 1-800-832-9273 (800-TEC WARE). In NJ or outside the USA call 201-530-7997. Orders can be telexed to 4995812.

Payment can be by check, COD, American Express, VISA, Master Card, or Net 30 to qualified customers.

Orders can also be mailed to Manx Software Systems, Box 55, Shrewsbury NJ, 07701.

How To Get More Information

To get more information on Manx Aztec C and related products, call 1-800-221-0440 or 201-530-7997, or write to Manx Software Systems.

30 Day Return Policy

Manx has a 30 day return policy. If you don't like your Manx Aztec C development system, return it within thirty days for a refund. Refunds do not include shipping costs, and might incur a small restocking charge.

Distribution Of Manx Aztec C:

In the USA, Manx Software Systems is the sole and exclusive distributor of Aztec C. Any telephone or mail order sales other than through Manx are unauthorized. Aztec C is available from qualified retail outlets under license to Manx Software Systems.

Circle 112 on reader service card

MANX

To order or for information call:

800-221-0440

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Now more than ever, there's more for you when you buy BASF Qualimetric™ FlexyDisks.® There's a special two-part game ticket that not only gives you 100 chances to win an Apple® IIc Computer in our Apple-a-Day Sweepstakes, but is also an exciting scratch-off game with 14,110 chances to instantly win cash prizes up to $1,000. What else is in it for you? Only the best...the BASF FlexyDisk, certified 100% error-free and warranted forever. See your BASF dealer today and look for the specially-marked boxes of 5.25" and 3.5" BASF FlexyDisks.

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Note Pad

(continued from page 38)

Reasonable Expectations

What should we consumers expect of product support? First and foremost, we should expect quality phone support from the vendor. That means we shouldn't routinely be put on hold for extended periods of time. The support people should be both pleasant and knowledgeable. At least 90 percent of the time, we should get a solution to our problem in one phone call. I refuse to buy any product if I know that its support fails to meet these standards.

Anyone who has a bad experience with a product should inform the company responsible and alert other users through user groups and a letter to the editor of his or her favorite magazine. Vendors will respond to economic pressure.

Second, the vendor should offer a 30-day, money-back guarantee. If the program doesn't work, I want my money back. I am willing to be much more experimental with products having guarantees. If they have no guarantees, I call up and confirm technical points before I buy. All software products should have a guarantee.

Third, it should be made very clear whether the retailer provides any support. If I know in advance, I shouldn't complain when the salesperson reminds me to call the vendor. If the dealer claims to provide support, the dealer must honor that commitment. If I base my purchase decision on dealer support, and that support doesn't live up to my expectations, I should make my disappointment known to the dealer. I should also let my friends and acquaintances know of my experience.

Consumers can exert significant pressure on software companies and value-added dealers to provide high-quality customer support. We'll have to pay for this support, but it is an excellent investment in making our computers cost-effective. Be assertive about your support needs and let others know of your experiences, both good and bad. You can make a difference.

David H. Bowen is a software consultant based in San Jose, California. He specializes in planning, marketing, and general management. □

HOW TO EXPAND YOUR MEMORY WITHOUT LOSING YOUR MIND.

MACSNAP If choosing a memory upgrade for your Macintosh is threatening your sanity, bring your problems to the silicon shrinks at Dove Computer. Our new MacSnap™, MacSnap 2™ and MacSnap+™ will give your Mac more RAM, and let you work up to 60% faster, without driving you or your machine crazy.

All you do is give your local computer dealer ten minutes to literally "snap" our RAM expansion board into your Macintosh. No trace cutting. No soldering. In fact, you can even do it yourself with a MacSnap User Kit, also available from your dealer.

Using all the extra speed and capability is a snap, too, because you get complete, easy-to-understand documentation and a quality upgrade designed to improve your productivity. MacSnap is fully compatible with all Macintosh system software, but it doesn't stop there. It comes with its own performance software package that includes Switcher, a user-configurable RAMdisk and a print spooler.

With up to 60 percent more speed than a 512K Mac, MacSnap speeds up those normally cumbersome programs like EXCEL and JAZZ and even allows them to run simultaneously with only a single disk drive. In addition, MacSnap's print spooling capability lets you print one document while working on another.

MacSnap is fully compatible with HyperDrive and Apple's 128K ROM, too.

The original MacSnap comes in three models: 128K to 1.5 megs, 512K to 1.0 megs, and 512K to 2.0 megabytes.

MacSnap 2 takes your 512K Mac all the way to 4.0 megabytes, and includes the new SCSI. It's the sane way for 512K Mac owners to get better than Mac Plus performance.

MacSnap+ takes a Macintosh Plus from 1.0 to 4.0 megs, to give you more of the performance and speed you bought it for.

So go ahead. Before you lose *your* mind, call Dove Computer toll free, for the name of your nearest dealer. Or visit your dealer, and ask for MacSnap.

1-800-MAC-SNAP

In NC, call (919)763-7918

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COMPUTER CORPORATION
P.O. Box 7008
Wilmington, NC 28406

PC Productivity Enhancement Products

Macintosh is a trademark licensed to Apple Computer Inc. Switcher, EXCEL, JAZZ and HyperDrive are registered trademarks of Apple Computer Inc., Microsoft, Inc., Lotus Development Corp., Inc., and General Computer Corp., respectively. MacSnap, MacSnap 2 and MacSnap+ are registered trademarks of Dove Computer Corp.

Letters

Readers write of upgrades, artificial intelligence, memory improvement, and more

Wide-Screen Computing
Who says the Mac screen is too small for use in a classroom? At the Pittsburg (Kansas) State University's Industrial Technology classroom, I saw a video camera connected to a large-screen TV and trained on a Mac. Because the Mac screen uses a faster scan than a conventional monitor, it worked beautifully, with no scan line interference.

David Boyt
Neosho, Missouri

The Latest Word
Word processing is probably the application most used on all computers. When will we see an update on the state of this art in *Macworld?* What has happened to word processors, spelling checkers, and other word processing enhancement utilities for the Mac?

Jere Bashinski
Oakland, California

See Macworld View *and our update on spelling checkers, "Letter-Perfect Documents," in this issue. There have been few developments in word processing programs recently, but some new products are finally on the horizon; we'll cover them as soon as they are available.—Ed.*

Macintosh Office Prototype
Two years ago, this 25-person advertising agency became a Macintosh office before the term ever existed. We've never regretted the move.

We've spent almost $30,000 on hardware and software, and we intend to spend more. Writers refuse to use typewriters anymore, and some administrative people have done productive work after 5 minutes of introduction and some help. We're serving our clients better and more profitably than ever.

Now that accounting software and the "serious" Mac Plus are here, we're thinking about doing the books on a Mac, too.

For us, Macintosh has always been a serious business machine. New hardware and software merely increase the possibilities for higher productivity.

Terence McArdle
Rochester, New York

Macworld from A to Z
Congratulations on the quality and completeness of the Macworld 1985 Annual Index [January 1986]. The index increases the value of all the information in the magazine and puts *Macworld* way ahead of the competing publications. Thanks for saving me a lot of time.

Michael D. Zuteck
Kemah, Texas

(continues on page 47)

Hot Problem

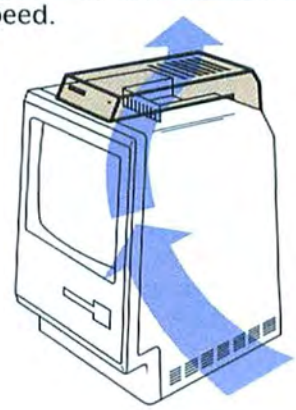
Introducing System Saver Mac.

Ever put your hand on top of your Macintosh™ after it's been running a while? Pretty hot, isn't it? And that's a problem.

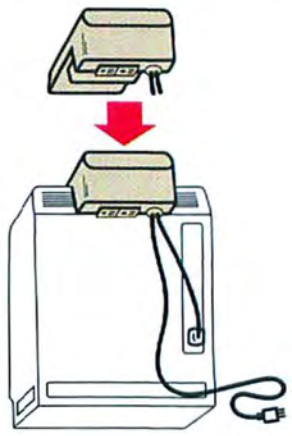
High temperature conditions can affect your computer's circuitry. Even shorten its lifespan. That's why we developed the System Saver Mac.

System Saver Mac keeps your Macintosh cool.

The System Saver Mac's quiet fan draws a breath of fresh air in through the ventilation slots on the bottom left and right sides of the Mac, across the circuit board, over the power supply (the primary source of heat), and out the top ventilation slot (the one hidden under your Mac's handle) at the rate of 17 cubic feet per minute. It leaves your Mac cool, calm and running at top speed.

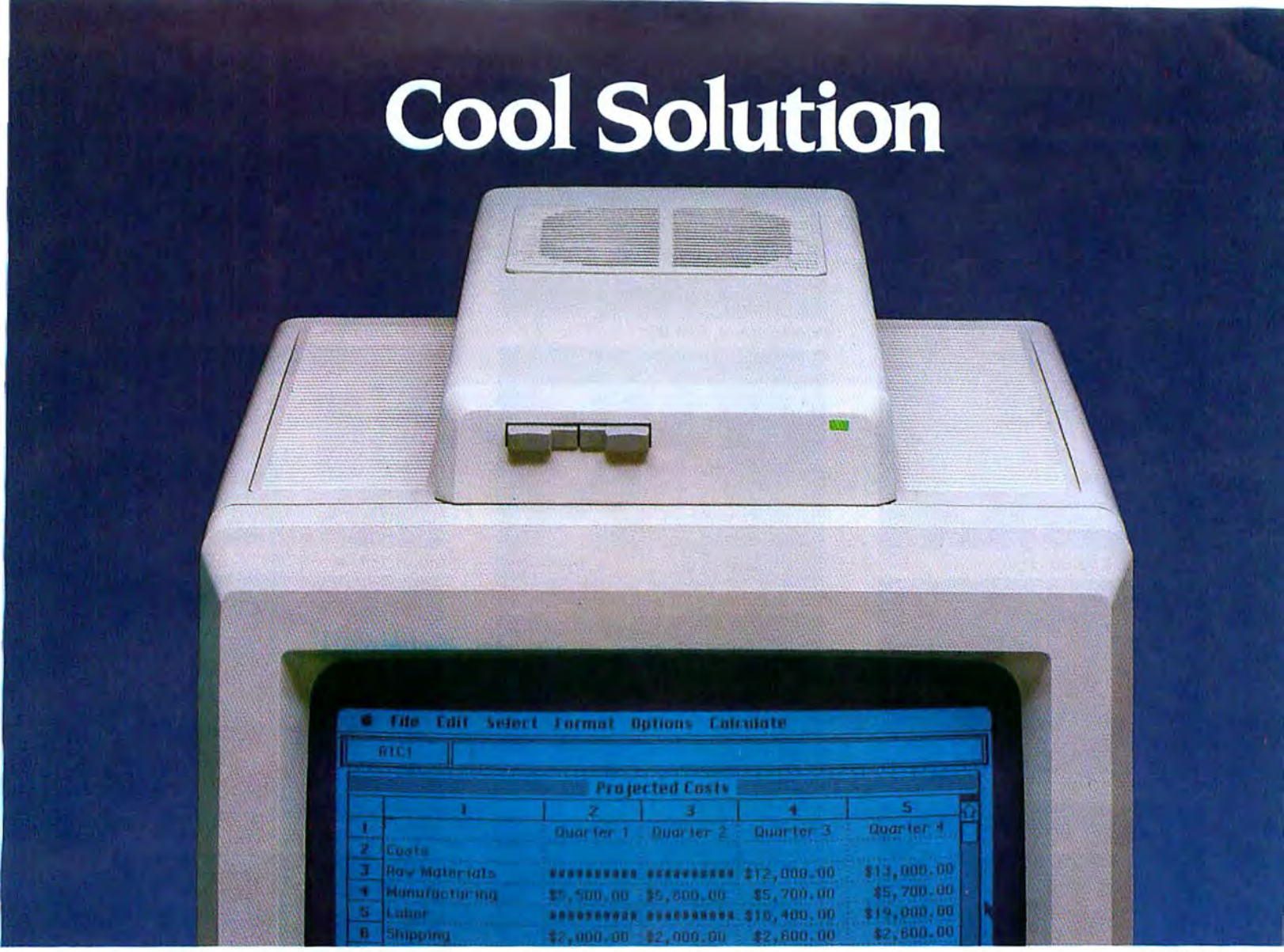


System Saver Mac stops the scramble for power.



No more reaching around to the back of your Macintosh to turn it on. No more fumbling for spare outlets. System Saver Mac organizes all your power needs. It provides outlets for two peripherals (like your printer and modem), while replacing the Mac's power cord.

Cool Solution



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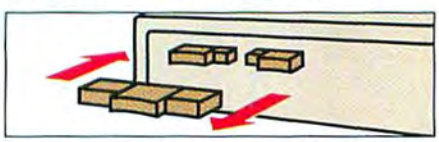
System Saver Mac has a great switch play.

System Saver Mac comes equipped with two switches—important for those of you who want to power one of your peripherals separately. For example, if you use a Hard Disk 20, you have to power up your hard disk first, before you turn on your computer. Just use one of the System Saver Mac's switches to control your hard disk and the other for the rest of your system.

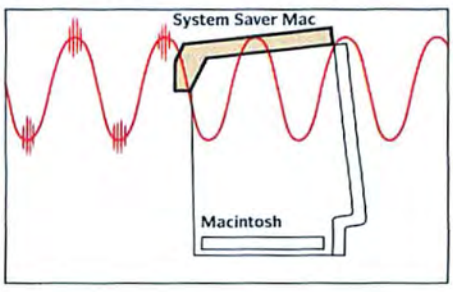


Of course, we realize that many of you would prefer the convenience of a single switch to control your entire system. That's why every System Saver Mac also comes with a special single switch cap. Just pop off the two separate switches and pop on the single one provided.

System Saver Mac provides pure power.

70-90% of all microcomputer malfunctions can be traced to impurities in the electrical current. Line noise can be interpreted as data, confusing your Macintosh and causing annoying system errors. Power surges and spikes can do costly damage to its delicate circuitry.

System Saver Mac clips surges and spikes at a safe level and filters out line noise. It provides pure power to make your Macintosh more accurate, efficient and reliable.



System Saver Mac is not a completely new idea.

Clever, yes. Versatile, convenient and useful, yes. But not completely new. After all, we've been making the original System Saver for years. It's the best selling accessory ever made for the Apple II—chosen by over 1/4 million Apple II owners. We thought you'd agree—Macintosh owners deserve the best, too.

System Saver Mac, $99.95, is available from Apple dealers everywhere. For the dealer nearest you, or to speak to a Kensington sales representative, call toll-free 800-535-4242. In NY 212-475-5200.

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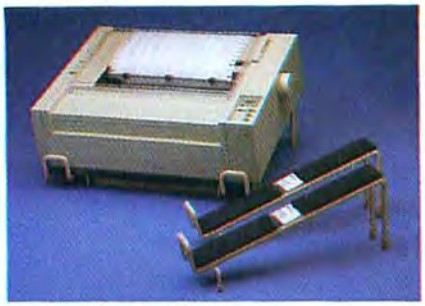
KENSINGTON™

Control Center, $99.95



Printer Stand, $29.95

Surge Suppressor, $49.95

Tilt/Swivel, $34.95

Mouse Cleaning Kit with Pocket, $24.95

Mouse Pocket, $9.95

Mouseway, $9.95

A-B Box, $99.95

Disk Case with Disk Pocket, $29.95

Circular Polarizing Filter, $49.95

Disk Drive Cleaning Kit, $29.95

Dust Covers, $9.95 to $13.75

Kensington has a solution for every Macintosh™ problem. Maccessories.®

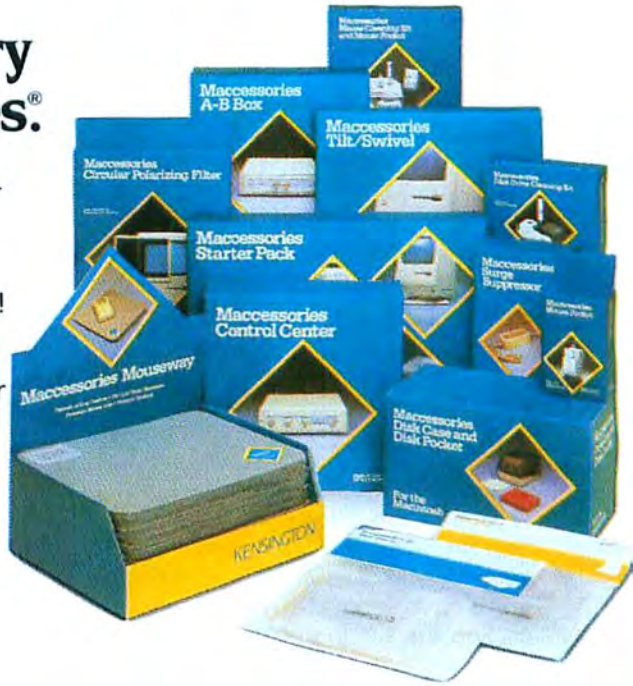
A whole family of enhancement products for the Macintosh.™

You'll find the perfect solution for every problem. From the complete power organization of a Control Center to the simple, portable protection of a Surge Suppressor. From the convenience of an A-B Box or Printer Stand to the comfortable relief of a Tilt/Swivel or Polarizing Filter.

Of course, the best way to solve problems is to prevent them. That's why we make a complete line of Cleaning Kits and Dust Covers for your Mac.

That's also why we've just introduced the System Saver® Mac! Turn back a page to see this important new peripheral.

For a Maccessories dealer near you, for a free 12 page brochure, or to speak to a Kensington sales representative, call toll-free (800) 535-4242. In New York (212) 475-5200.



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Circle 11 on reader service card

(continued from page 43)

Caveat Upgrader

I received Microsoft's update to its excellent *File* program (version 1.02) to find that it added nothing I really needed (a laser printer driver and Finder 4.1), but I then discovered an undocumented new "feature": a new copy-protection scheme that cannot be overridden by *Copy II Mac*. Those who prefer not to have to swap disks every time they start up their backup copy of *File* may want to skip this update.

Paul Brians
Pullman, Washington

Translate Freely

I am a 69-year-old artist/writer/publisher. A year ago, when my venerable Olivetti typewriter began to lose vital parts, I decided to buy a Macintosh instead of a new electric typewriter. At that time I subscribed to *Macworld*, on the grounds that it might hold the quivering hand of a nontechnical computer novice. It has been only minimally useful, since I understand at most only a tenth of its contents.

Could you include a glossary of computer terms in every issue for the uninitiated? Could there also be a department devoted to the common problems of the neophyte operator?

There are millions of people driving automobiles who know nothing about an internal combustion engine and don't particularly want to know—they just want to get someplace. Anyone interested in the computer chiefly as a word processor wants only to produce a letter or a manuscript expeditiously without having to learn a new language or technology. The vagaries and pitfalls of handling the English language present enough problems.

Charles E. Wadsworth
Portsmouth, New Hampshire

We sympathize. As Macintosh hardware and programs proliferate, the marketplace becomes more confusing. But stay with us; we're committed to providing an entré for the atechnical people likely to be intrigued by the easy-to-use Mac.—Ed.

Another Perspective

Some of us who use the Macintosh wear bifocals and don't particularly want to spend the day tilting our chins up to look at the screen through our spectacles. Can't someone design furniture so that the screen could be a mite lower than the keyboard?

J. D. Malbrain
Beaverton, Oregon

A Few Rocks on the Upgrade Path

Like many Mac owners, I've slowly moved from a 128K to a 512K, then a Mac Plus, and finally a hard disk. Making the transition to 800K drives or beyond isn't without penalty and frustration. Try copying certain copy-protected software from one environment to another, and you'll quickly find new meaning for the word *frustration*.

You call the vendor, usually long-distance, only to get bounced from one number to another. After finally reaching the ear of the right body at the right desk, you are told one of two things: "It isn't possible to transfer the program to the new

(continues on page 52)

MACINTOSH PLUS DUPLICATION & PROTECTION NOW AVAILABLE!

Disclone Service Won't Make You Nervous

Technical support, personal service, competitive prices.
Disclone full service quality tested diskette duplication, packaging, documentation production and processing ensures precise duplication, thorough quality control, and expedient response to your requirements.
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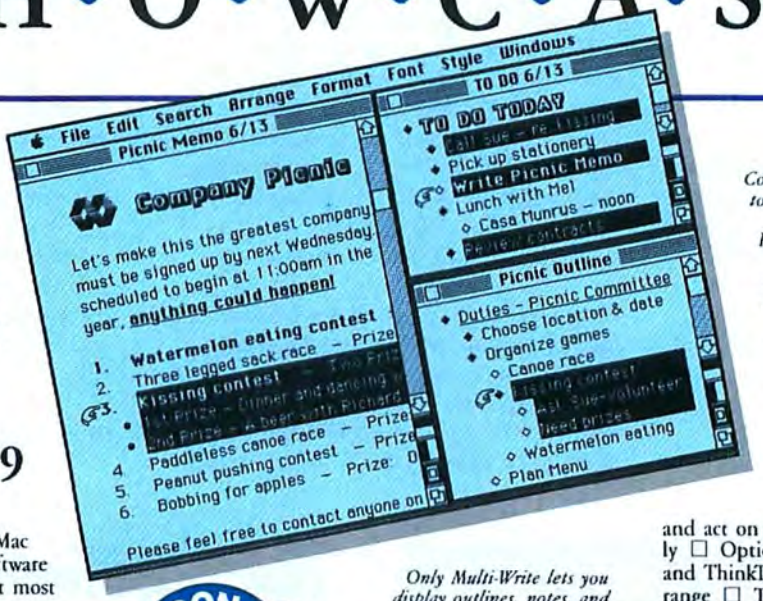
Icon Review

S·H·O·W·C·A·S·E

Power Word Processor With Integrated Outlining



Collpase/expand outlines to any level of detail; to reorder, drag with hand cursor.

Renumbers automatically as you rearrange text.

Both word processing and outlining features are always available.

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Multi-Selection lets you act on many items simultaneously.

MultiWrite™
From MindWork Software

$79

MultiWrite sets a new standard in Mac word processing. This superior software offers outlining where you need it most within a powerful word processor.

MultiWrite has all standard MacWrite™ features, *PLUS* MultiWrite is lightning fast and boasts these innovations:
☐ 12 Windows ☐ Number and renumber automatically ☐ Drag text with mouse — easier than cut and paste ☐ Multi-Clipboard accumulates ALL cuts and copies ☐ Multi-Selection — select and act on many elements simultaneously ☐ Optional Word Wrap ☐ Reads MacWrite and ThinkTank files ☐ AlphaSort any selected range ☐ Time and date stamping tracks revisions. ☐ Search — most extensive available ☐ Word Count counts characters, words, and paragraphs instantly ☐ Zoom window management

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ICON SELECT REVIEW

Only Multi-Write lets you display outlines, notes, and other pertinent information on screen for handy reference while creating final documents.

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Helix 2.0
From Odesta

Helix packs the punch of a full-featured relational database, yet performs complex tasks with icon-based simplicity. At last, anyone can quickly learn to custom-design applications. No other Macintosh database offers as many calculations with as much diversity.

Helix excels in forms generation. It will design entry forms, display lists, and create reports on many paper sizes, with flexible sort selection and unlimited text labelling. This new version 2.0 is faster and offers graphics storage.

SPECIAL!
NOW
$99

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Quantities Limited

Mac 10, Mac 20
From Paradise

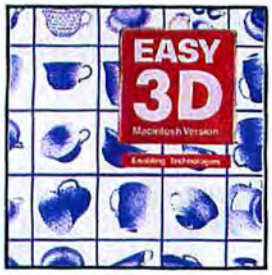
Your search for a quality, affordable hard disk drive is over. Paradise's 10- and 20- megabyte drives offer the storage you desire, and they excel in speed, reliability, and price. To get more speed you would have to spend a lot more money.

Paradise's drives connect to either the printer or modem port, and they have their own port that goes to the printer. They work with Apple's original Finder and the latest HFS system so they run all Mac software. Software installation, backup, and retrieval are easy. Printer buffering lets you work while your ImageWriter prints, saving you time. Can you afford to be without a Paradise drive any longer?

Mac 10 **$499** Mac 20 **$729**

Easy3D
From Enabling Technologies **$59**

Easy 3D lets you draw with dimension and depth, creating shapes and objects with true perspective. Easy3D lets you work with solid rather than wire frame shapes. It rotates, moves, distorts, glues together, cuts apart, compresses, and



stretches objects. And its multiple lighting effects, including custom lighting, help alter the image.

Easy3D images can be sent to MacPaint using a special print mode command. A few hours with this program and you'll wonder why you've limited yourself to two dimensions for so long.

LoDOWN Hard Disk Drives
From LoDOWN

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

ICON SELECT REVIEW

20 Meg SCSI Drive	$895
40 Meg SCSI Drive	$1795
80 Meg SCSI Drive	$3495

Order 800/228-8910
California 800/824-8175

MacFan
From Blowhard **$119**

The MacFan is cool and quiet, and it will keep your Macintosh that way, too.

Heat wears down your computer. MacFan cools your Mac with fresh air that will prolong its life, perhaps for years. It installs easily into the Mac's handle section, but unlike other fans it offers another handle in its place. Once inserted, MacFan becomes a control center with two outlets for a printer, a hard disk, or other peripherals. It has built-in surge protection to eliminate the risk of data loss. With summer here, it's time to get a MacFan.

OverVUE
From ProVUE **$149**

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

Templates for OverVUE
From ProVUE

ProVUE now offers Mail Manager and Personal Finance templates that let you start using OverVUE immediately for these common needs.

Mail Manager **$29** each
Personal Finance

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Doug Clapp's Word Tools *NEW* $45
Checks text for punctuation, wordiness, and more

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Sidekick $45
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Phone Link & Sidekick $59
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StatView *SPECIAL* $175
Excellent stat package—strong recoding and case selection
StatView 512 *SPECIAL* $179

Cricket Software
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Electronic Arts
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Execucom
Mindsight $179
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Forethought
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Quick analysis and graphics—easier than spreadsheets

Layered
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MicroPlanner *SPECIAL* $199
Sophisticated project management and scheduling
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MindWork Software
MultiWrite *NEW* $79
Power word processor with integrated outlining

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Double Helix *SPECIAL* $299

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Helps develop strategies, solve problems
Sales Consultant $179
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Think Technologies
Lightspeed C $129

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- Gen. Ledger *SPECIAL* $89
- 3 Modules *SPECIAL* $229
  (All the above)
- Inventory *NEW* $89
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Back to Basics
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Cricket Software
Cricket Graph $129
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Desktop Graphics
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Includes ReadySetGo, PictureBase, and your choice of Paradise hard disk
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- with Mac 20 $949

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Plotstart *NEW* $79
Printworks *NEW* $49

Symmetry
PictureBase *SPECIAL* $48
Organize your picture files for easy access!

T/Maker
ClickArt Effects $27
Add tools to MacPaint
ClickArt Letters $27
ClickArt Personal Graphics $27
ClickArt Publications *NEW* $27

MUSIC

Electronic Arts
Deluxe Music Construction Set *SPECIAL* $32

Great Wave
Concertware+ $39
An education in music

Electric Checkbook $29
From State of the Art

Electric Checkbook is a well-regarded personal financial manager now available through Icon Review at a special low price. Electric Checkbook will manage your bank accounts up to five on a 128K Mac, and ten on a 512K system and can print continuous checks on your printer. (Sample checks and order forms are included.) It can also reconcile your bank statements and print

elegant reports with ease. A special "What If?" feature shows the effect of a payment schedule before you implement it.

Let Electric Checkbook keep track of your income, expenses, assets, and liabilities. It can turn check bouncing into a thing of the past.

Spellswell $33
From Greene, Johnson Inc.

Spellswell lives up to its name, and then some. Mac Plus and HFS compatible, it checks your spelling against a carefully selected 60,000-word dictionary. You

can add as many words to Spellswell's dictionary as your disk storage permits, as well as create separate dictionaries for your special tasks.

Spellswell is fast and accurate. It scans documents of unlimited size, catches errors that other spelling checkers would miss, such as capitalization and abbreviations, and even checks homonyms. With Spellswell, your spelling will be perfect.

Publishing Starter Kit
From Icon Review

Here's a money-saving way to get everything you need to produce publications with your Mac and ImageWriter. The Publishing Starter Kit combines the best software and hardware for desktop publishing one package:

- ReadySetGo: the desktop publishing program that lets you design perfect pages quickly and easily;
- PictureBase: the art management system that helps you access the art you need;
- Mac 10 or Mac 20: Your choice of a Paradise 10- or 20-megabyte hard disk drive that gives you quick access to all your files.

These products work together smoothly to produce beautiful publications while saving you time and money. Here's your chance to get a complete desktop publishing system at a remarkable price!

Starter Kit with Mac 10 **$699**
Starter Kit with Mac 20 **$949**

CALL AND GIVE US A CHANCE TO MATCH ANY ADVERTISED PRICE!

Magnum Tape 20 $895
From Mirror Technologies

A hard disk is fast and convenient, but reliable backup is still essential. Magnum Tape 20, from the storage experts at Mirror Technologies, is one of the fastest, simplest, and most reliable ways to back up your hard disk. Magnum Tape 20 connects to the Mac Plus through the SCSI drive port, and it lets you daisy-chain multiple units for added convenience. Backup should mean security; with Magnum Tape 20 it does.

Requires Mac Plus

HOME

Camde Corporation
Nutri-Calc — *SPECIAL* $47

Rubicon
Dinner at Eight — $32
Silver Palate Collection — $29

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Powerhouse — *NEW*
Use Mac to control the on/off timing of household lights and appliances
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- Computer Interface — $69
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Davidson & Associates
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First Byte
Kid Talk — *SPECIAL $39*
SmoothTalker — *SPECIAL* $49
Speller Bee — *SPECIAL* $39

Great Wave
KidsTime — *NEW* $33

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MacNifty Sound Digitizer — $99
MacNifty Studio Session — $69
New version—better sound—includes speakers

Opcode
MidiMac Interface — $99
MidiMac Sequencer 2.0 — $159
MidiMac Patch Librarian — $59
MidiMac Patch Editor for DX/TX — $99

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SAT Combo Pack — $59
With Math, Verbal, and PreTests

Mindscape
Perfect Score SAT — $49

QED Information Services
Typing Made Easy — $35

GAMES

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Grid Wars — $28
Lunar Explorer — $33

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Ancient Art of War — $29
Knights, Archers, Cowboys, Indians, and more!

Electronic Arts
Pinball Construction Set — $27

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Deadline — $29
Sorcerer — $27
Starcross — $29
Wishbringer — $24
Zork III — $27

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Flight Simulator — *NEW* $33

Mindscape
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Match wits with the U.S.S.R. and prevent nuclear war!
Deja Vu — $33

Psion
Psion Chess — $31

Simon & Schuster
Paper Airplane Construction Kit — $23

Spectrum Holobyte
Gato — $25
Submarine simulation
Orbiter — *SPECIAL* $26
Space shuttle simulator

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Top Desk — $39

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75,000+ words, thesaurus, and hyphenation

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Quick&Dirty Utilities, *1 or 2* — $29

Dubl-Click Software
Calculator Construction Set — $32
New low price!

Jam
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Integrates appointment book with alarms—flashes timely reminders for appointments
Merriam Webster™ Thesaurus — $33
Medical Dictionary — $69
Legal Dictionary — $69

Target Software
MacLightning — *SPECIAL* $59
THE breakthrough design in spelling checkers

T-Maker Graphics
ClickOn Worksheet — *SPECIAL* $45
Great for casual spreadsheet use

UTILITIES

Affinity Micro Systems
Tempo — $79
Powerful macros with logic branching

Central Point Software
Copy II Mac — *SPECIAL* $18
Includes hard disk install

FWB Software
Hard Disk Utility — $59
Removes software copy protection to install on hard disk

Greene, Johnson Inc.
Spellswell — $33
New spelling checker catches capitalization & homonym errors too

Ideaform
MacLabeler — $29
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MacZap — $39
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New more powerful Disk Cache works with hard disks

New Canaan MicroCode
MacDiskCatalog II — *SPECIAL* $33
Organizes your disk library

COMMUNICATIONS

CompuServe
Starter Kit — $29
FREE with Hayes Bundle

DataViz
MacLink w/8' Cable — *SPECIAL* $109
Transfers and converts files between Mac and IBM

Hayes
Interbridge — *NEW* $CALL
SmartCom II — *SPECIAL* $89
Smartmodem 1200 — *SPECIAL* $359
Smartmodem 2400 — $579
Smartmodem-to-Mac Cable — $18
Please specify either 1200 or 2400
1200 Smartmodem, SmartCom & Cable (Bundled) — *SPECIAL* $449
We add FREE CompuServe Starter Kit!
Transet 1000 — *SPECIAL* $279
Multi-function buffer and switch—incredible!
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Transet Mac Accessory Kit — $29

Infosphere
MacServe — $250
Partitions hard disk, network disk server, print spooler & more!

Prometheus
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All options available — Call!

Think Technologies
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Send electronic mail over AppleTalk

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TopMail — $175
Unlimited Electronic Mail and file transfer over AppleTalk! No hard disk required.

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200 Watt Datasaver — $399
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MacBuffer 512K — *NEW* $299
MacBuffer 1024K — *NEW* $499
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Mac Plus to 2048K — $495

Kensington
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Surge Suppressor — $34

Koala Technology
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Puts images from your video camera into Mac

Kurta
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Quality digitizing tablet with cordless stylus

MacMemory, Inc.
The MaxPlus — $399
Upgrade your Mac Plus memory to 2MB Plugs into strd. SIM sockets, includes fan and software

New Image
Magic Video Digitizer — $249

Summagraphics
MacTablet — $299
Absolute pointing device, great for tracing and drawings

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

Thunderware
ThunderScan — *SPECIAL* $175

Video 7
Mouse Stick — *SPECIAL* $36

DISK DRIVES

AST
AST-4000 — $4,900
74 meg Winchester with 60 meg tape backup

LoDOWN
For Mac Plus
20 Meg SCSI Disk — $895
40 Meg SCSI Disk — $1795
80 Meg SCSI Disk — $3495
Tape Backup 20 Meg — $795
Tape Backup 60 Meg — $1595

Maple Technology
800K External Floppy Drive — $179

Micah
MicahDrive AT20 — $1299
Internal hard disk for 512 or Plus

Double Helix
From Odesta **$299**

Double Helix is *the* relational database for the Macintosh. Enhancements to Double Helix mean improved statistical and speed optimization. Create customized pull-down menus to replace the icon interface. Use global delete for speed. Making subforms is easy because Double Helix works hierarchically as well as relationally.

Double Helix works on a 512K Mac, and can exploit up to 4 megabytes of memory and an unlimited amount of external storage. It includes three levels of password protection to give you control over your data. Let Double Helix organize your valuable information with the flexibility and care it deserves.

Mirror Technologies
Magnum Ext. 800K Drive *SPECIAL* $249
20 Meg SCSI Drive Internal *SPECIAL* $1095
20 Meg SCSI Drive External *SPECIAL* $950
Mirror 20 Meg Tape Backup *SPECIAL* $895
20 Meg SCSI Drive External with Fast Port $1099

Paradise Systems
Mac 10 *SPECIAL* $499
Mac 20 *SPECIAL* $729

Western Automation Labs
Dasch
500K External RAMdisk $359
1000K External RAMdisk $399
2000K External RAMdisk $449

ACCESSORIES

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

Blowhard
MacFan *NEW* $119

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

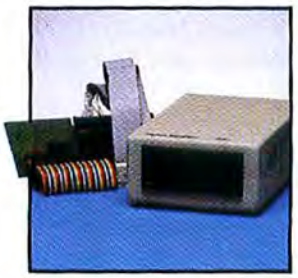
Computer Accessories
Power Line Strip $50

Computer Friends
MacInker *SPECIAL* $55
Save $$ by re-inking any ribbon cartridge—includes ink!
MacInker for ImageWriter $35
Re-inks ImageWriter cartridges only

MagNet 20X and FastPort
From Mirror Technologies **$1099**

Here is the practical and economical way to give your Mac 512 the storage capabilities of a Mac Plus and more. The MagNet 20X is a rugged external hard disk that comes with multiuser access, print spooling, disk cache, password protection, and more. The 20-megabyte drive comes with MacServe, which allows several Macs to share data and peripherals.

The MagNet 20X plugs



into your Mac 512 via Mirror's FastPort interface, which we recommend you take to a local technician for installation. FastPort gives you a SCSI interface without replacing your motherboard. With MagNet 20X and FastPort, your Mac 512 remains ahead of its time!

DrawArt
From Desktop Graphics **$29**

DrawArt offers the highest quality art you can obtain for your Macintosh. Designed for use with MacDraw on a 512K Mac, DrawArt is superior to anything you've seen for MacPaint.

The images come in six folders, ranging from practical business applications such as 3D/CAD and Drafting to entertaining creations in Cartoon and ClipArt folders. The Publishing folder has many images that will make your self-published newsletters and documents sparkle.

DrawArt is smart art. It allows you to customize borders and size while retaining the original high quality. You'd be smart to get DrawArt today.

Curtis
Ruby PowerStrip $50
EMI/RFI Filter, 6 outlets

Eichner
Disk Holder $25
Disk Holder with Lock $33

Environmental Software
Dust Covers $CALL
Mac Plus, Mac, ImageWriter I & II, etc. Available in grey, navy or burgandy

Ergotron
MacTilt $79
Swivel stands for Mac & 2nd drive

Icon Review
Head Cleaning Kit $15
MacCracker $20
Long-handled torx screwdriver and cover pry tool for qualified technicians
Extension Cable $19
Gives you distance from noisy printers, hard disk drives for Mac 128 & 512

Kensington
Control Center $60
Polarizing Filter *SPECIAL* $31
Printer Stand $19

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

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

MicroStore
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Highest quality, notebook-sized carrier for 32 diskettes—made in U.S.A.
Disk•book Plus
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Small disk•book $14
Holds 10 diskettes

Mountain Equipment, Inc.
Mac Carrying Case $79
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ImageWriter Carrying Case $59

Mousetrak
9" x 11" Mouse Pad $9
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N² Products—Cables
MacPlus to DB9 Adapter Cable $17
Adapts MacPlus serial port to Mac 512/128 standard
Mac ImageWriter II Cable $18
Mac to ImageWriter II/Apple Personal Modem
MacPlus to ImageWriter II Cable $18
Also works with Apple Personal Modem
Mac Printer Cable $18
Mac to serial printer

Nest Ridge Design
Mac Plus Bag $79

DISKETTES

Sony 3½" **(10) SS/DD** *SPECIAL* $17
The Best!
Sony 3½" **(10) DS/DD** *SPECIAL* $27

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NEW SUMMER CATALOG!

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(continued from page 47)

environment" (without having to insert your master disk for validation), or "Send us your original disk along with $xx.xx, and we'll send you a special unprotected version."

Give me a break! Why should I have to pay extra to use a program in a way I ought to be entitled to as a legitimate owner?

The same circumstance holds true for program updates. I have version 1.0 of a program, and then several months later version 1.5 comes out. Returning my disk with $5 or $10 allows me to receive the improved version, which has been debugged and enhanced. Why should users have to pay for the elimination of program bugs? Early buyers should also be entitled to enhancements at no charge for having the guts to buy the program during its early stages. The fee is "for handling," but what about all the handling that users have to put up with: long-distance calls, shipping disks back, losing valuable time without programs, and putting up with errors we didn't know we were buying?

Software providers should be required by law to state in their advertising that programs cannot be copied to another medium and to indicate on the packaging which version is contained. When software doesn't perform as advertised, or when copy-protection isn't clearly indicated in advertising, users should have the right to return software to developers for a full refund (not to dealers, since it isn't their fault).

How often is piracy an attempt by disenchanted users to get even with developers for shoddy business practices? I suspect the majority of buyers have little objection to shelling out a few extra bucks for quality software and subsequent support. I also suspect that protection schemes cause considerably more harm to legitimate owners than to pirates.

I know this sounds like another user venting his spleen, but the more I buy, the more I'm convinced that software providers deserve all the piracy they get.

Pat Laufenberg
Dublin, California

You Copy?

I wanted to register my dissatisfaction with the way some companies handle the software pirating problem.

Recently, I purchased *ThinkTank 512* and was looking forward to using it for sermon preparation. At the same time I purchased a hard disk drive for convenience' sake. After loading *ThinkTank 512* onto my hard disk, I found out that to use it I had to reinsert my floppy each time. To remedy this problem I have to pay another $40 for an unprotected copy. Nowhere in the advertising was I warned that I would need to spend another $40 to use *ThinkTank 512* on my hard disk without using the floppy. I think that I was the one who was pirated.

John S. Maniatty
Morrisville, Vermont

Notes from a Power Reader

The quality of its design, writing, and editing makes *Macworld* one of the finest magazines in the marketplace, regardless of subject. I look forward to more of the same.

Over the last few months, however, there has been a shift in the overall direction of the magazine toward the so-called power user. All of us want the Mac to succeed and understand that success means

(continues on page 54)

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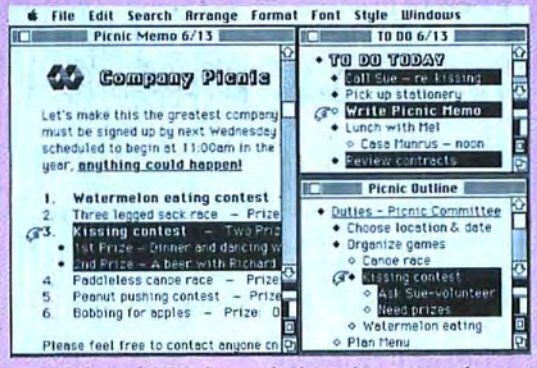

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Letters

(continued from page 52)

breaking into the corporate market, but the work done by all those IBM PCs in the major corporations isn't always very interesting to *Macworld* readers. Sure, the Mac can accomplish just as many overwhelmingly tedious tasks as any other machine, but aside from the small group of corporate personnel involved, who wants to look at a spreadsheet with several hundred thousand cells?

I don't mean to suggest that *Macworld* ignore the corporate environment. But we are dealing with a special machine here, one that most sophisticated users agree is a step in a new direction. The Macintosh is a unique graphics tool, and this should be highlighted in every issue. (I was especially disappointed to note the disappearance of the *Macworld Gallery*.) Consider running a regular comic strip, for example.

Finally, please remember that few of us have the hard disks and LaserWriters favored by so many of your authors, yet we still find the Macintosh a unique tool.

Wayne Johnson
Chicago, Illinois

More Detail, Please

I have enjoyed every issue of your fine magazine, particularly articles that described in detail the workings of *Microsoft Chart* and the Mac itself. I am disappointed, however, that you have included fewer of these articles in your later issues. Why not create a section devoted to detailed descriptions of top-selling software? This analysis should include hints and tips on using a different product each month, laying out the software's strengths and weaknesses. Your current articles describe the programs, but not in enough detail. If the articles are done properly, they become reference material instead of just good, light reading. When important features of a program are missing, let your readers know. Don't hesitate to give a software package or product a bad review; your readers will respect you for the honesty. Keep up the good work.

Todd Andros
Miami, Florida

Wishful Thinking?

I work in a computer store. Recently, we opened a Macintosh Plus and found that the 800K drive takes half the space of a 400K drive, so there is room for a second drive beneath it.

I sincerely hope that Apple will offer an upgrade to replace the front panel of the Macintosh and add a second internal drive.

Jean Francois Martin
Rimouski, Quebec
Canada

A Cool Customer

MPH Computer Products has a winner in the MacBCool fan/surge suppressor. Its easy installation and efficient operation make a very positive first impression. The fan is noticeable, but not objectionable.

I was curious about how well the MacBCool did its job, so after several hours I pulled the fan off the computer. I was amazed to find "Hades corner" (the upper left-hand corner of the Macintosh) only slightly warm.

Jim Slupe
Davis, California

Got Info

Lon Poole's *Get Info* has time and time again proven to be an invaluable resource for discovering new Macintosh "sleights of hand." I particularly appreciated his tips in the January 1986 issue on customizing the Imagewriter paper sizes by editing the resource file. Envelope, label, and file card sizes were just what my *MacWrite* needed. And then in the March issue, Lon provided information that makes the Sad Mac a useful diagnostic aid (something I don't recall reading about in the Macintosh manuals) and custom *MacDraw* patterns as easy as point-'n'-click. Kudos to a fine Mac mentor.

Karl J. Olinde
New Orleans, Louisiana

Upgrade Update

Your article "A Change for the Plus" in the April edition of *Macworld* states that you need to purchase the new Mac ROM before you can attach an 800K drive. Not so! All that is needed is a System Update disk from Apple to copy the required new files to all your application disks, and then you can connect an 800K external drive.

Eileen L. Danta
Barrington, Illinois

Right. A disk called System Update for the Macintosh 512K accompanies the 800K drive. Drag the files Finder 5.1, System 3.0, and Hard Disk 20 from the disk onto

(continues on page 56)

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(continued from page 54)

each startup disk you plan to use, and you're ready to go. If you already have those versions of the System and the Finder (or later versions), just add the Hard Disk file. One caution: because the files replace existing System and Finder files, you'll need to reinstall any special modifications you've made, such as a LaserWriter driver file.—Ed.

Mac Minus

I am a proud owner of a new Mac Plus ["A Change for the Plus," April 1986]. Many new features of the Plus are real testimony to Apple having thought out every aspect of their new product. However, I am surprised that they missed the mismatch of the numeric keypad to the keys on the calculator desk accessory. I hope someone comes up with a Calculator Plus so that when I press Enter, it won't come out a plus, nor plus a minus, nor even minus a divide. How did that ever get past them?

Todd Peterson
Riverside, California

Apple System software versions 3.2 or greater have Calculators that match the numeric keypad. Consult your dealer if you have an earlier release of the System file.—Ed.

Let's Give the Guitarist a Hand

Now that laser disks are on the way, how about putting sheet music on disks, with a foot switch to turn pages on the screen?

Tom Schlater
FPO San Francisco, California

Double Your Pleasure?

The March 1986 issues of both *Macworld* and *PC World* contained the same column by David Bunnell entitled "The Myth of the MIS Manager." I realize that the publisher of two successful magazines is probably very pressed for time, but I think the subscribers of his magazines deserve more than carbon-copy journalism.

Richard D. Graham
Carrollton, Texas

Mad with Power

Where has Charles Gajeway ["Confessions of a Corporate User," March 1986] been? For microcomputers, there is not a simple spectrum of price/performance/ease/intimidation in one dimension. A Mac Plus with an internal hard drive has performance comparable to any PC AT similarly equipped, but the Mac is much easier to use. A vanilla Mac costs a little less and is a little less easy to use. By comparison, a vanilla PC doesn't even place.

Gajeway's point about not paying for more performance than you need may be valid, but it won't sell more Macs because the Mac gives more performance, not less. To sell Macs into an IBM-dominated business world, Apple will have to keep slipping them in the back door as users discover how much more productive they are. And these sales will only continue as long as Apple keeps a good technical edge over the dinosaur IBMs. Whenever the Apple product starts to eat too much IBM lunch, IBM will improve its product. Remember, IBM keeps its 70 percent of the market with a product only 70 percent as good as the best. Everybody else has to try harder.

Tom Pittman
Manhattan, Kansas

CheapPaint Costs Less

"Five Easy Pieces" in *Macworld,* March 1986, contained two errors. First, it was stated that "CheapPaint can open only the one [Scrapbook] called Scrapbook file." In fact, the MacroMind Utilities Disk (M.U.D.) includes a Switch Scrapbooks feature that enables the user to select and open other Scrapbook files, even if they are on another disk. It is also possible to rename the Scrapbook file in the System Folder. And because CheapPaint always opens the Scrapbook file, if no such file exists, one will be created.

Second, the price of M.U.D. is $49.95. Included on the disk with CheapPaint are Art Grabber +, Music→Video, VideoWorks Player, and the Jukebox, plus a bunch of music and video.

Marc Canter
President, MacroMind
Chicago, Illinois

Tax-22

I thought I had it made when it came to doing the family taxes. For years my wife had taken on the IRS. But I figured with my mighty Mac and a tax program I could take them on myself. At the Boston Macworld Expo I saw SoftView's *MacInTax* package. I was impressed. You didn't need to understand anything more than how to use the mouse, enter numbers, and gather your receipts.

I bought the 1984 package with my eyes set on 1985. SoftView sold it with the promise that for a small fee you could get

(continues on page 59)

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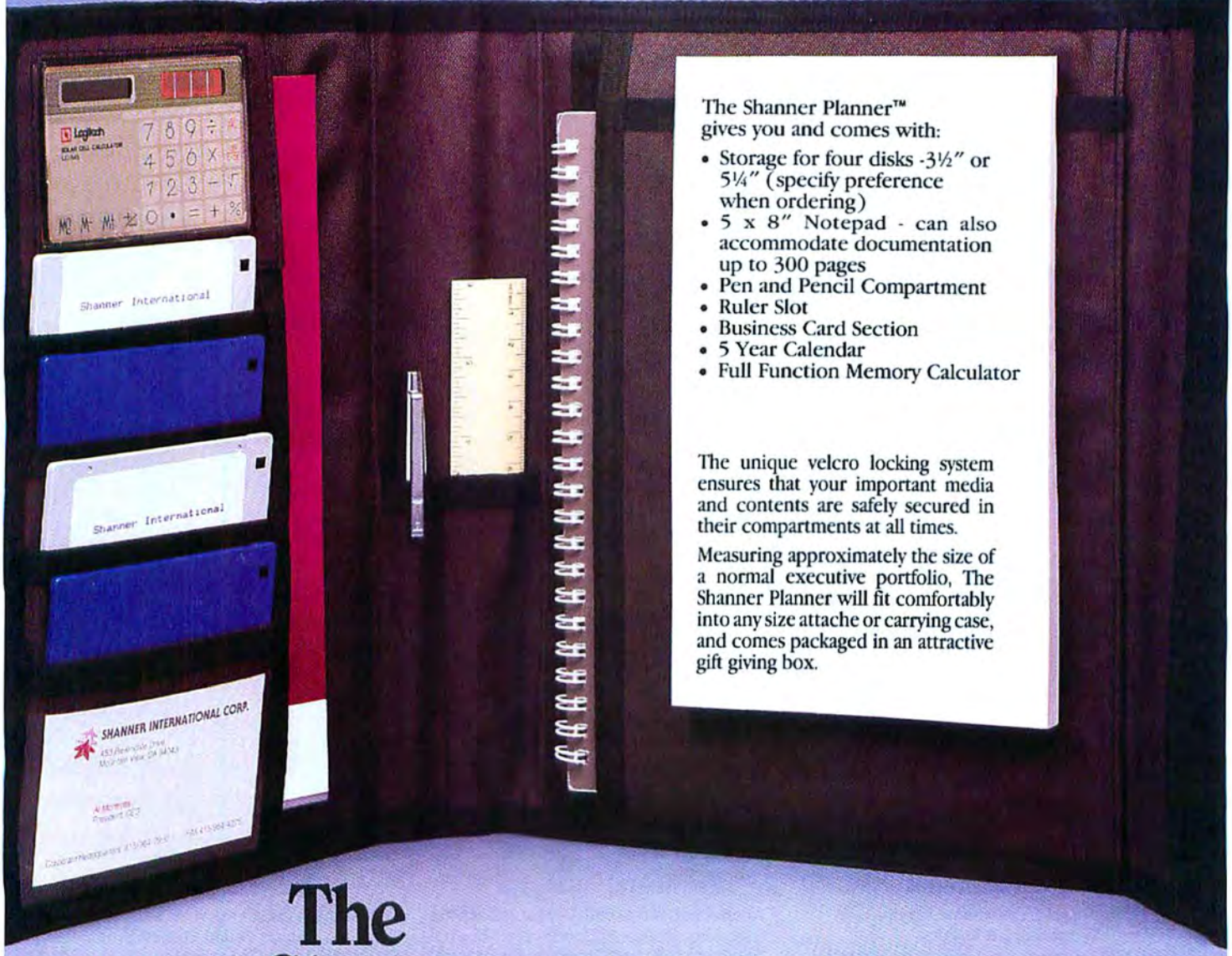

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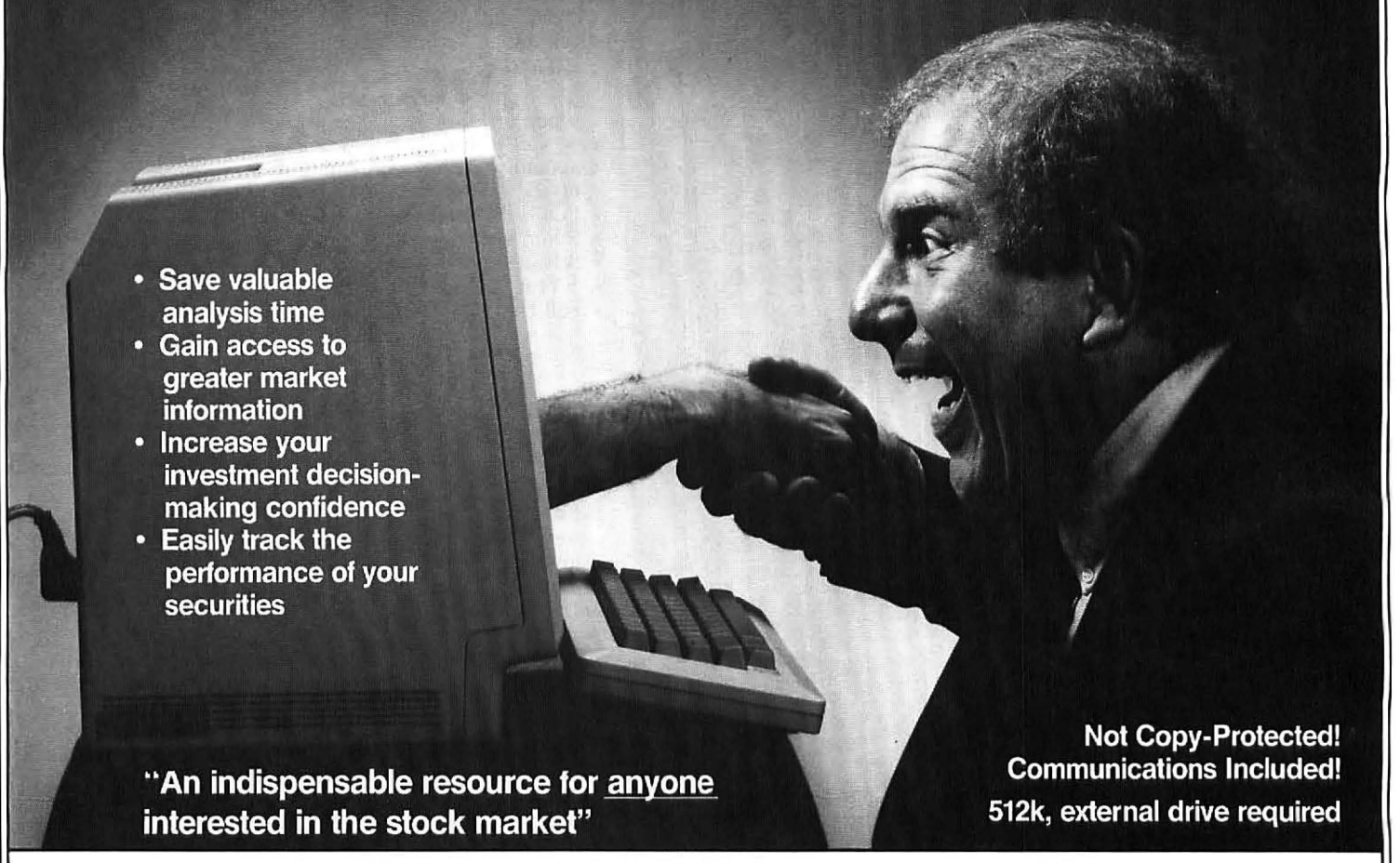

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Circle 516 on reader service card

(continued from page 56)

the new version. In mid-February of this year, I had just received the initial release version. As March drew to a close, I was still waiting for the final version for 1985. The initial release does not include the on-line IRS instructions—one of the program's big selling points. It does not include some of the IRS forms promised in the literature, and I have encountered some glitches when trying to convert some of the 1984 files to 1985 files. (The upgrade contains a special conversion program, which is a great idea.)

I have seen a number of computer magazines review the product, including *Macworld* ["Taking Care of Taxes," March 1986]. You gave it very high marks. I agree. Once it's inside the Mac, it's a great program. The problem is getting it. While the program is top-notch, the software support is lacking.

Steve Schwaid
Philadelphia, Pennsylvania

SoftView shipped the final version at the beginning of April, but company president Sue Morgan says the initial release was operational and could be used to finish a tax return, with the exception of a few schedules you'd have to fill out by hand.—Ed.

AI My Eye

The demonstration of intelligence by a machine is a research issue taken much too lightly by Richard Sprague ["The Macintosh LISP Machine," March 1986], and by most people. He would have us believe that such a feat not only is possible but is a fait accompli. It is not evident that a machine will ever be intelligent.

The success of systems developed with *OPS5* and other rule-based systems such as *Mycin, Prospector,* and *Cadeceus* are a result of their consistency, mathematical ability (in the case of probabilistic reasoning), and thoroughness, not their intelligence.

I recommend adding *Artificial Intelligence,* second edition, by Patrick Henry Winston of MIT (Addison-Wesley, 1984) to the article's reading list.

Kevin Long
Houston, Texas

(continues on page 61)

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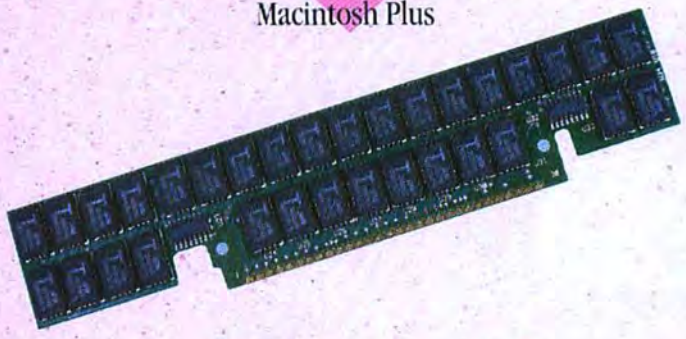

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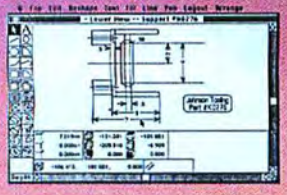

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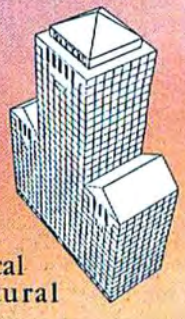

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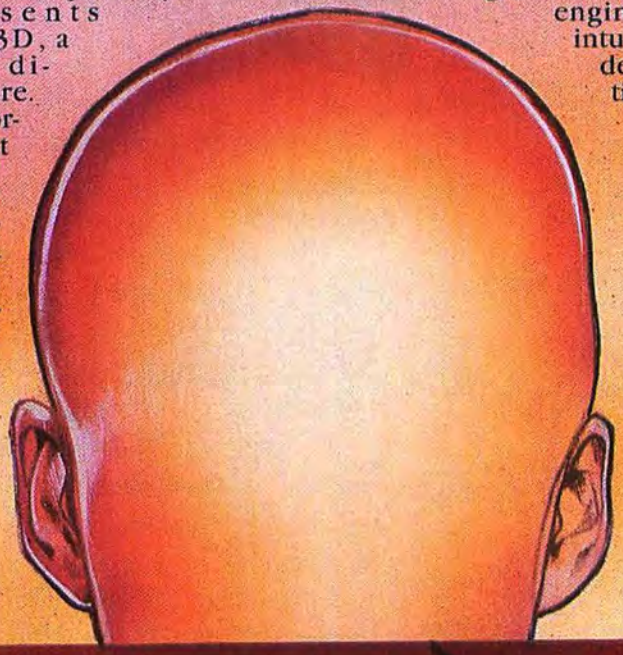

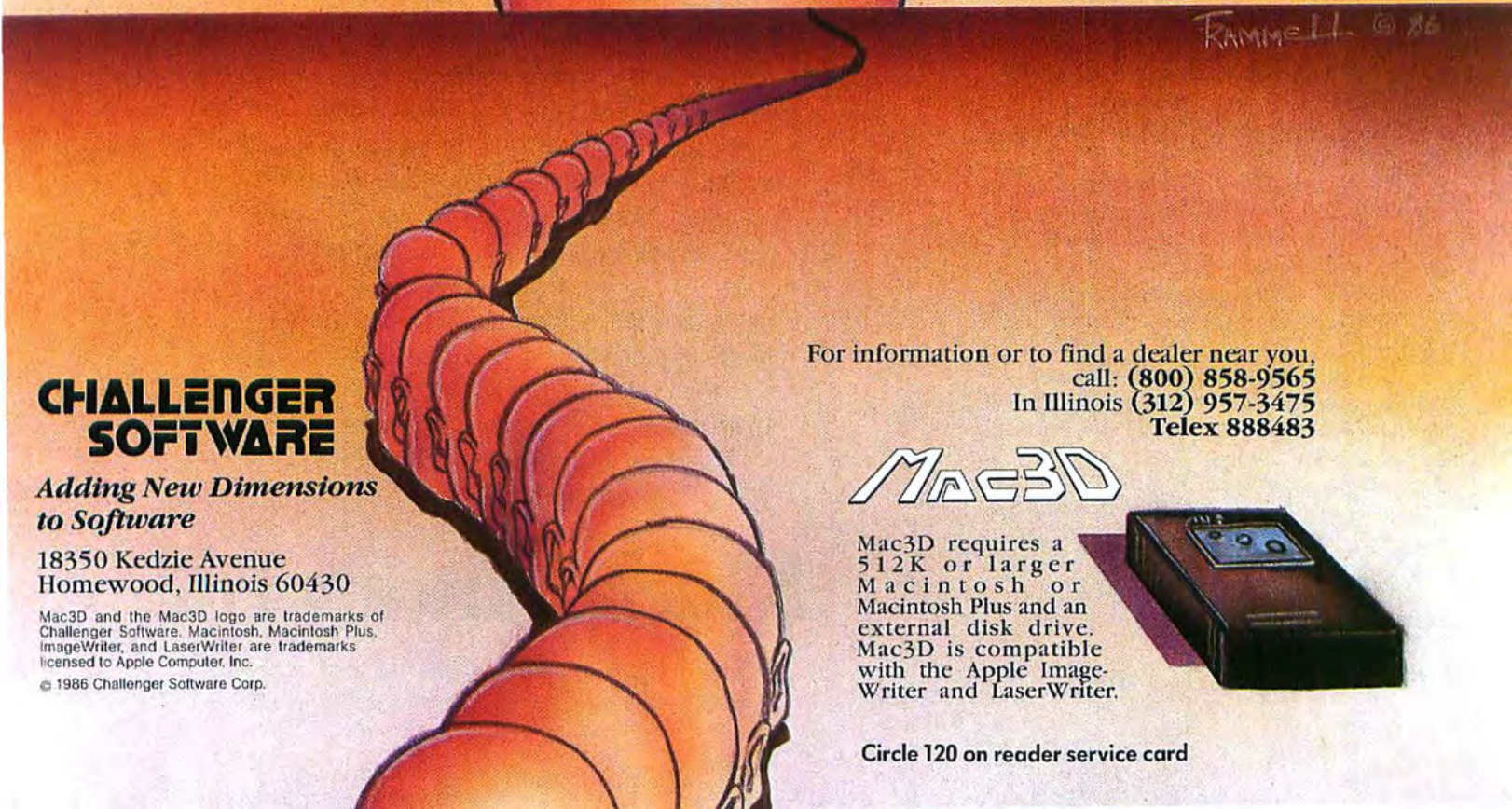

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Mac3D

Mac3D requires a 512K or larger Macintosh or Macintosh Plus and an external disk drive. Mac3D is compatible with the Apple ImageWriter and LaserWriter.

Circle 120 on reader service card

(continued from page 59)

Retrial for ExperLisp

"The Macintosh LISP Machine" [March 1986] left the impression that our ExperLisp compiler did not perform as well as Mac Pascal in the test program called Angel.

Our timing tests show that floating-point calculations accounted for nearly 80 percent of the execution time, while the overhead attributable to the ExperLisp compiler was less than 0.4 percent (only 0.23 second out of the 90 seconds). The fixed-point version we tried runs in less than 7 seconds.

The test was meant to compare the performance of compiled code (ExperLisp) versus interpreted code (Mac Pascal). Unfortunately, both versions of Angel rely almost entirely on Apple's floating-point package (SANE) and QuickDraw.

The SANE package offers three levels of precision: 32 bits, 64 bits, and 80 bits. ExperLisp supports 80-bit floating-point precision, the most accurate and hence the most time-consuming.

The documentation the reviewer complained about has been improved (all registered owners can get the new documentation by contacting us at 805/969-7874). The new manual is revised, expanded to include many additional examples and tutorials, and typeset on the LaserWriter.

Additionally, ExperLisp is the only Macintosh language that incorporates both load-on-call and load-on-return. This enables programs to be larger than available memory. Theoretically, only the currently executing function need be in memory. ExperLisp takes advantage of up to 4 megabytes of extra memory. For the first time, everyone has access to the tools necessary to write expert systems, not just the few people who have access to $100,000 machines.

Denison Bollay
President, ExperTelligence
Santa Barbara, California

Visual Memory

In "Megabytes and Beyond" [February 1986], you directly imply that the Macintosh ROM programming does not allow relocation of the screen buffers. Can this be true? How could anyone smart enough to write the Mac's ROM be shortsighted enough to do that? Is there something I don't know?

Darel R. Finley
Nassau Bay, Texas

Relocating the screen buffer requires both a hardware modification and changes to the ROM. The circuitry that continually writes the information from the screen buffer to the Mac's display—a process called refreshing—must be altered. The ROM patches are required so that the application knows where the screen buffer resides.—Ed.

A Hot Tip

"Megabytes and Beyond" [February 1986] includes the operating temperatures of the various configurations of mega Macs measured during evaluation. How did you measure the operating temperature of the machine?

David Sparrow
Ithaca, New York

We attached a temperature probe to the housing of the internal disk drive and fed its cable out through the passageway meant for the security cable.—Ed.

More Memory Improvement

I'd like to correct some points made about our products in the February 1986 issue. MacMegabytes ["Megabytes and Beyond"] is fully compatible with the new 128K ROM from Apple, and MacMegabytes owners will be able to purchase the new ROM from any Apple dealer, along with the 800K disk drive.

The free RAM disk program that comes with MacMegabytes does not have any bugs in the RAM disk. There is one minor bug involving REMOVE on Set Startup, but this is easily surmounted by restoring a fresh copy of the System Folder. In fact, several of the "free" public domain RAM disk programs suggested by the article have their own subtle bugs as well.

We also set new prices: 128K to 1024K $499, 512K to 1024K $449 (on a board swap basis).

Beck-Tech is also shipping a megabyte upgrade kit for $129 (not including RAM chips) for the technically able. This is an unsupported price, and technical help will be made available to registered owners for $1 per minute.

Finally, MacMegabytes 2+ is shipping for $995. This board adds 2 full megabytes to your 128K or 512K for a total of 2.1 or 2.5 megabytes. It uses the latest CMOS 1-megabit dynamic RAM, and only 17 chips are required for the 2.5 megabytes.

(continues on page 63)

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Circle 466 on reader service card

(continued from page 61)

Regarding the Chromatron item [*Macworld View,* February 1986], it is not true that *Business Filevision* from Telos requires special software to run in color. *Business Filevision* supports user-defined fill patterns—the only software requirement for working with color video using the Chromatron.

Also, we feel your statement about the Chromatron price being "bad news" is unfair. Scan converters in the video industry normally cost $20,000 to $75,000. Thus we believe that the $2995 price of the Chromatron is very reasonable.

Stephen Beck
President, Beck-Tech
Berkeley, California

Memory to the Max

With 34 years' experience in electronics, I've seen a broad span of design and quality in electronic equipment. The Max from MacMemory [see "Megabytes and Beyond," February 1986] impressed me with its physical quality, to me an important aspect of a product. Also, I found the connection of the Max to its host well designed. And the low power consumption, making a fan unnecessary, indicates good electrical design. I have had mine running for hours on end, long enough to expose any thermal design errors.

From a programming aspect, I have set up the Max on all the applications that I regularly use and have been running *OverVue* for about two months with no problems. I have found it to be fast, easy to use, and reliable.

I am told by MacMemory that the Mac's new 128K ROM will not work with the 1.5MB upgrade but that it is compatible with MacMemory's new 2MB upgrade, which 1.5MB owners can get at cost and can upgrade to 4MB when the 1-megabit dynamic RAM chips become available later this year. From what I've seen of the physical, electrical, and logical workmanship of the Max, I will be anxious to get one of the larger upgrades installed. It should be the ultimate.

As a hardware-oriented user, I put reliability at the top of the priority list, having an aversion to down time.

Judging by what I know of the Max and by what I see in the comparison chart on page 118 of the article, I'm convinced that I got the best buy.

Rick Carlson
Plano, Illinois

Paying Dues

I never thought I would be one of those Mac owners who write in to complain about the "unfairness" of Apple's pricing changes. But now I'm really upset. As a result of Apple's rebate plan for recent purchasers of 512K Macs or upgrades, my foolish friend who upgraded his 128K Mac at Christmastime can upgrade to the new 128K ROM and the 800K internal drive or the Mac Plus for $150 less than I can. Using a rebate plan as a form of price protection for recent purchasers makes a lot of sense to me, but in doing so Apple has actually rewarded those who bought at a time when it has always been foolish to buy—just before Apple's annual announcements.

Also, because Apple considers the external disk drive an accessory, it is not upgradable in the same way that the internal drive is. As a result I now have to either continue to live with a slow, limited second drive or try to find someone foolish enough to buy my drive so that I can buy the new, double-sided drive.

Don't get me wrong, though; I wouldn't trade my Mac for any other personal computer in the world.

Stanley K. Dorst
Pittsburgh, Pennsylvania

The Price of Experience

I've noticed that in almost every issue, there are letters from disappointed 128K Mac owners complaining that Apple won't upgrade their machines for free (or at a discount).

Reading these letters, one would think that the Macintosh was the only computer on the market back in 1984. I would like to ask the unhappy 128K owners a question: if you needed more memory, more software, faster disk drives, or higher capacity mass storage, why didn't you buy a system that offered them?

Clark Anderson
San Jose, California

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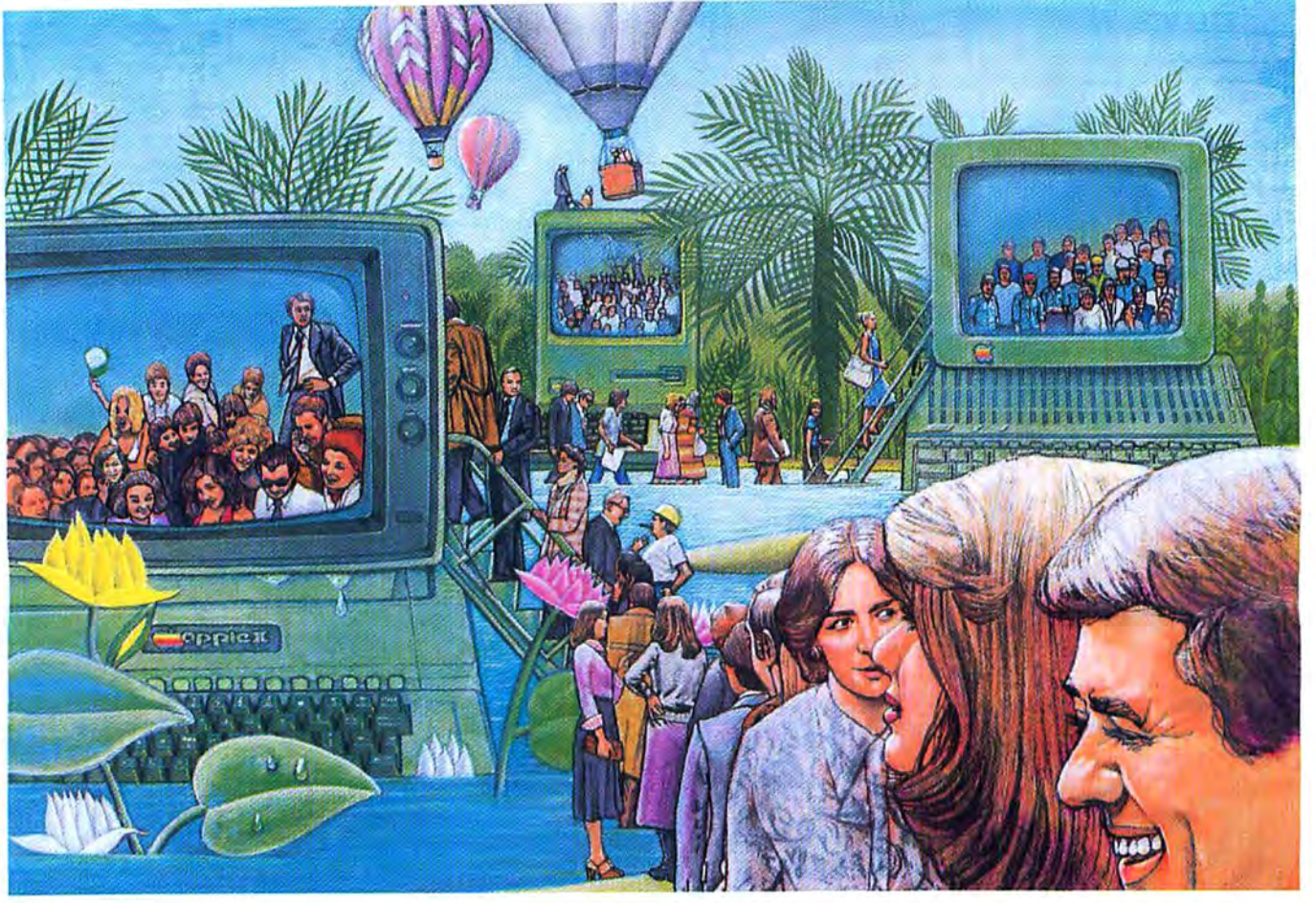

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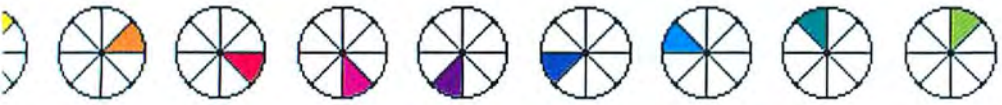
Macworld View

A preview of Microsoft Works, new word processors, a color Macintosh, and more

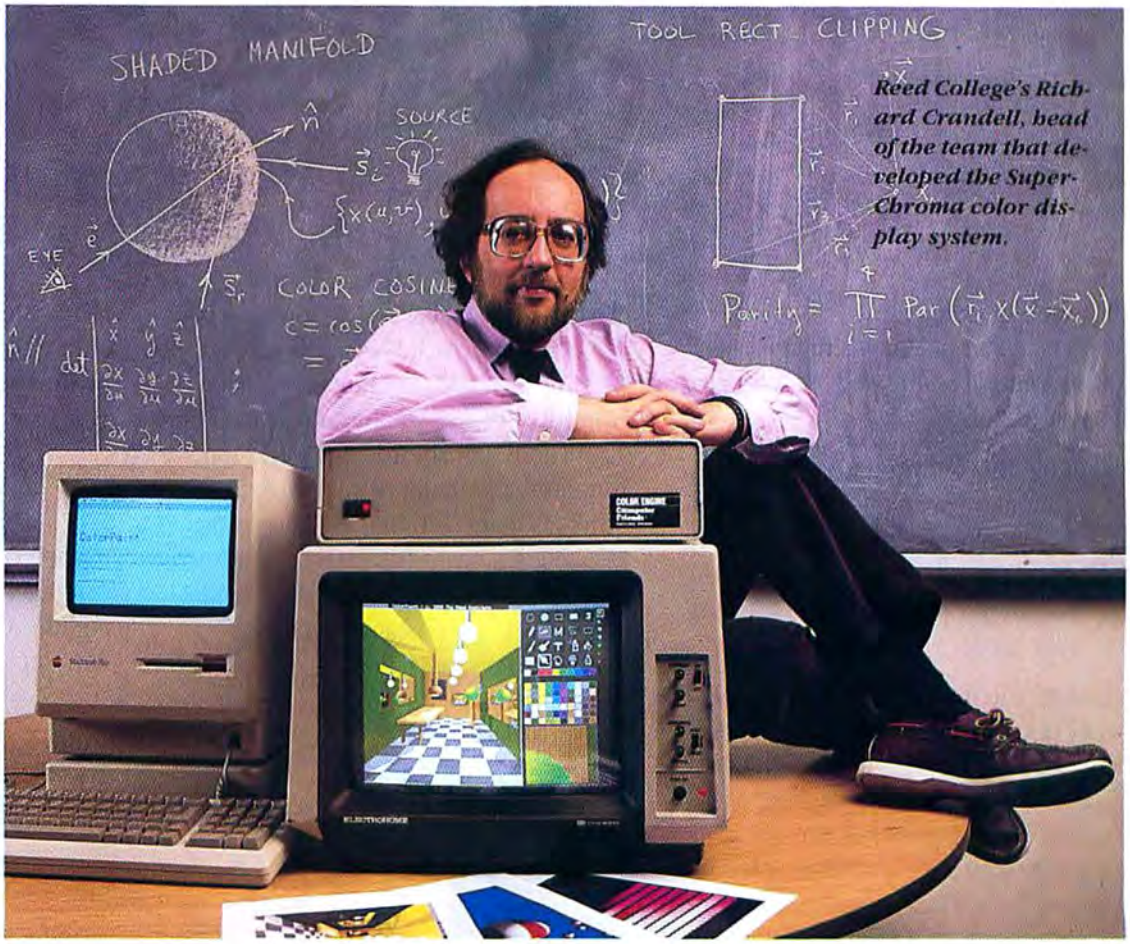
Edited by Daniel Farber

Color Mac



Among the colleges in the Apple University Consortium, Reed College is one of the most active in software development. One dramatic Reed Macintosh project is SuperChroma, a graphics system in the style of *MacPaint* that creates color images. The software, called *ColorPaint,* was developed by Richard Crandall, Marianne Colgrove, and Scott Gillespie. The three wrote *ColorPaint* entirely in Rascal, a real-time, I/O-oriented, compiled language based on Pascal and developed at Reed.

Besides the *ColorPaint* software, the SuperChroma system consists of a Vectrix VX384 color image processor with a high-resolution RGB color monitor connected to the Macintosh via the modem port. The *ColorPaint* software translates Macintosh graphics for display on the color monitor through a library of QuickDraw-to-Vectrix routines. Using the Macintosh mouse, you draw on, choose tools from, and paint on the color monitor screen as if you were working in *MacPaint*. The Macintosh screen is used only for choosing menu options. The software shuttles bidirectional data



Reed College's Richard Crandell, head of the team that developed the SuperChroma color display system.

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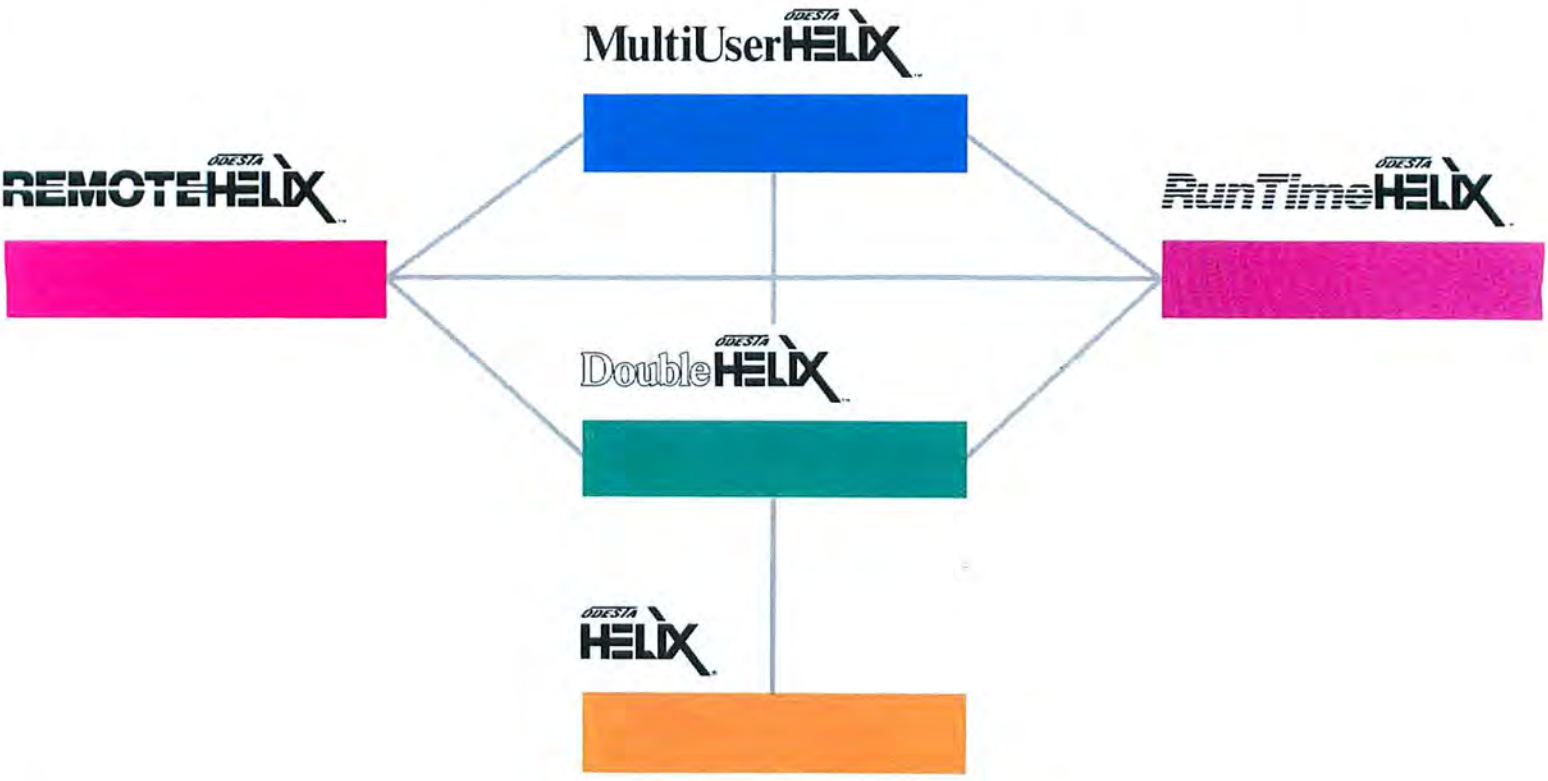

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Color Mac (continued)

between the Mac and the image processor at 19.2 kilobaud, resulting in reasonably smooth mouse coverage of the color monitor.

ColorPaint has several options for rendering images: a color FatBits feature; continuous spectral shading; and complete spectral access by hue, saturation, and intensity to the 16 million colors the SuperChroma produces. The system also lets you cut, copy, and paste regions and save and load whole pictures and palettes to and from disk. (A full-page picture takes about 100K of disk space.) Each of the drawing tools is color independent, and the set includes three-dimensional, box, ribbon, and sphere painting tools. You can use an editable 70-color palette or choose among seven 50-color automatic shading palettes.

The Dunn Instruments Film Recorder can be used as a direct film interface for producing slides. The Seiko D-Scan, an $8000 high-resolution color printer, takes direct RGB output from the monitor and produces good quality ink-printed images.

The SuperChroma system is distributed by Computer Friends, 6415 S.W. Canyon Ct., Portland, OR 97221, 503/297-2321. The system—including image processor, monitor, cables, and software—sells for $5690. You can buy the *ColorPaint* software separately for $350, and educational discounts are also available.

Apollo Workstation

Providing enough high-powered engineering workstations for faculty and students is a common problem at most universities. Hardware expenses alone are almost prohibitive—a dedicated engineering workstation costs upwards of $30,000. At the University of Michigan's College of Engineering, a team led by Dr. Dick Phillips, professor and chairman of the Computer Aided Engineering Network, solved the problem by using the Macintosh in conjunction with the Apollo workstation.

Phillips and his associates wanted a workstation that had a state-of-the-art user interface and that supported high-resolution bit-mapped graphics. "They're important in an engineering school, because after mathematics, graphics is the engineer's second language," says Phillips.

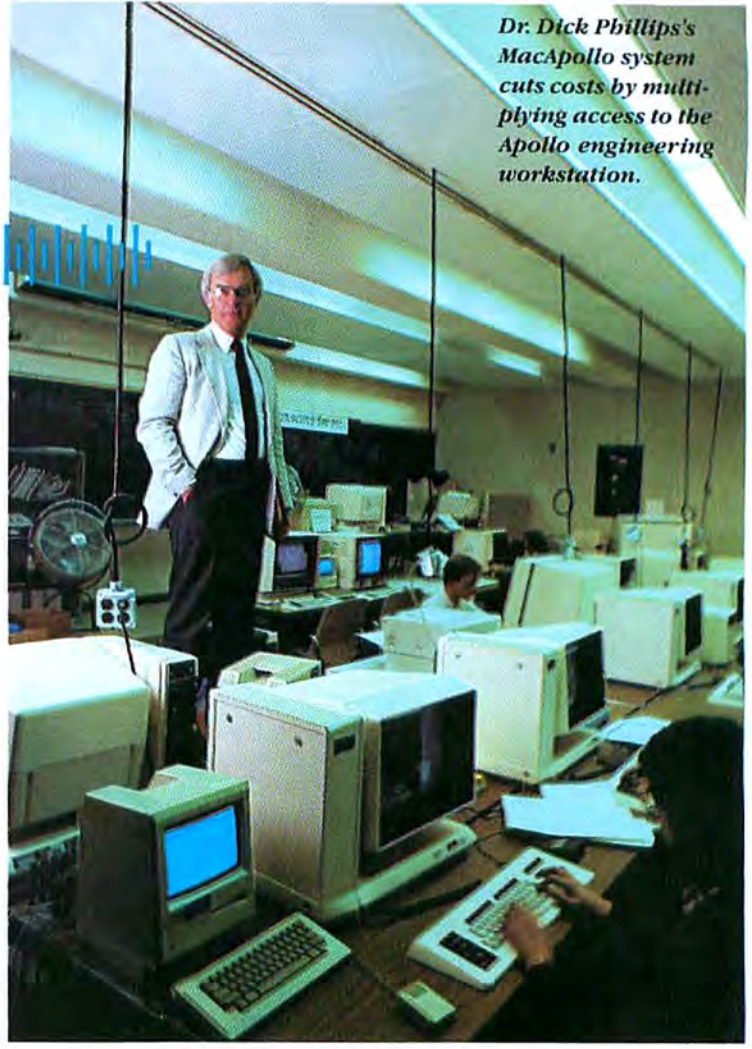
The Apollo workstation was the machine of choice for the College of Engineering. But with 300 faculty members and a student population of 6000, the school couldn't possibly purchase enough workstations for everyone. The college looked at other systems that met its criteria, and found that the Macintosh could ably function as an inexpensive, lower-capability workstation, with a user interface and graphics capabilities that are similar to the Apollo.

The success of the hybrid system hinged on creating a link between the Macintosh and the Apollo that would let students access the high-powered computing capabilities of the Apollo from the Mac. This system—called MacApollo—uses special software written for both the Apollo and the Macintosh. A sophisticated terminal emulator resides in the Mac, and a control and mediation program runs in the Apollo distributed file system (DOMAIN). Under this system, high-level computational tasks can run on the Mac without disrupting concurrent activities on the Apollo workstation, and most software for the Apollo runs unmodified on the Mac. MacApollo allows graphic data from the Apollo to be saved and retrieved on the Mac and converts graphic data to *MacDraw* format for further processing on the Mac.

MacApollo effectively multiplies access to the Apollo's capabilities. "If you want to triple the number of people who can use 20 Apollos, go out and buy 40 Macintosh computers, attach them to the Apollos, and you've effectively got 60 workstations. Depending on the configuration of the Apollo system, each node can support two or three Macintoshes, dropping the effective cost of each workstation console to about $6000 or $7000," Phillips says.

The MacApollo software is distributed by the Apollo Domain User's Society for a nominal fee to cover materials and reproduction costs. MacApollo is also in use at the University of Iowa College of Engineering and at high-tech firms including Hughes Aircraft and Electronic Data Systems.

Phillips's next projects include an AppleTalk network gateway into the Apollo environment and special software that will run Macintosh software in a window on the Apollo.



Dr. Dick Phillips's MacApollo system cuts costs by multiplying access to the Apollo engineering workstation.

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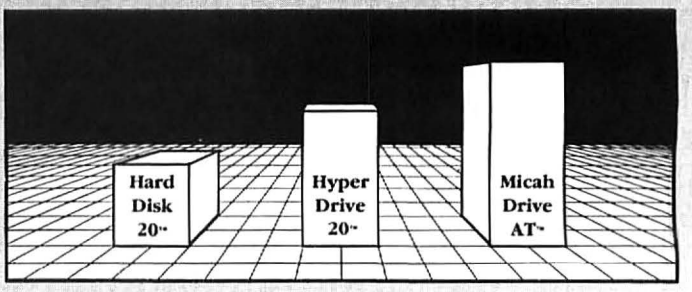

To find out more about the MicahDrive AT™, and the name of your nearest authorized Micah dealer dial up MicahLink™ -our 1200 baud, 24 hour a day BBS at (415) 771-1119 or call (415) 331-6422 during regular business hours.

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Power House

If you need to justify buying a Macintosh to use at home, perhaps the promise of a painless way to wake up in the morning will do the trick. At 6 a.m. the heater turns on, the coffee pot starts brewing, and soft music emanates from your stereo. At 6:30, your bedroom light comes on, the stereo turns off, and the radio starts broadcasting the morning news. Teamed up with the X-10 Powerhouse Computer Interface, from X-10 (USA), the Mac can direct a versatile and inexpensive home control system.

The X-10 Powerhouse, a hardware device that connects to the Mac's modem or printer port, controls lights, thermostats, and electronic devices such as radios, record players, and TVs by sending signals over a house's wiring. You plug your appliances, lamps, and other devices into separate modules that respond to signals from the Computer Interface. Macintosh software lets you program the Interface by clicking icons of household appliances arranged on a floor plan of your home and instructing each appliance to turn on or off at a specified time. Once you enter a schedule of timed events, the Computer Interface can be disconnected from the Macintosh, freeing the Mac for other uses. The battery-powered Interface contains its own memory and timer and functions independently of the Mac.

The X-10 Powerhouse system has other practical uses. It can help save energy by turning down your heater after you've gone to bed. The X-10 can also help make your home more secure, turning your lights, radios, and television on and off when you're away. A telephone responder/controller lets you phone home and turn as many as eight lights or appliances on or off. The X-10 system could also prove helpful to disabled people or invalids; special controllers are available for people with physical disabilities.

The X-10 Powerhouse Computer Interface is available from X-10 (USA) Inc., 185A Legrand Ave., Northvale, NJ 07647, 800/526-0027, 201/784-9700 in New Jersey, list price $79.99.
—Heidi Mitchell

Legal Macintosh

According to statistics gathered by the American Bar Association (ABA), about 50 percent of law firms in the United States use personal computers, primarily for word processing but also for billing, accounting, and docket control. And it's not just secretaries and paralegals who use the machines. Many attorneys do some of their own word processing and billing. Lawyers fresh out of law school today must know how to use the Westlaw and Lexis on-line databases for research. There is even a trend toward lawyers using laptop computers in the field to transfer case information to or from a computer in the office.

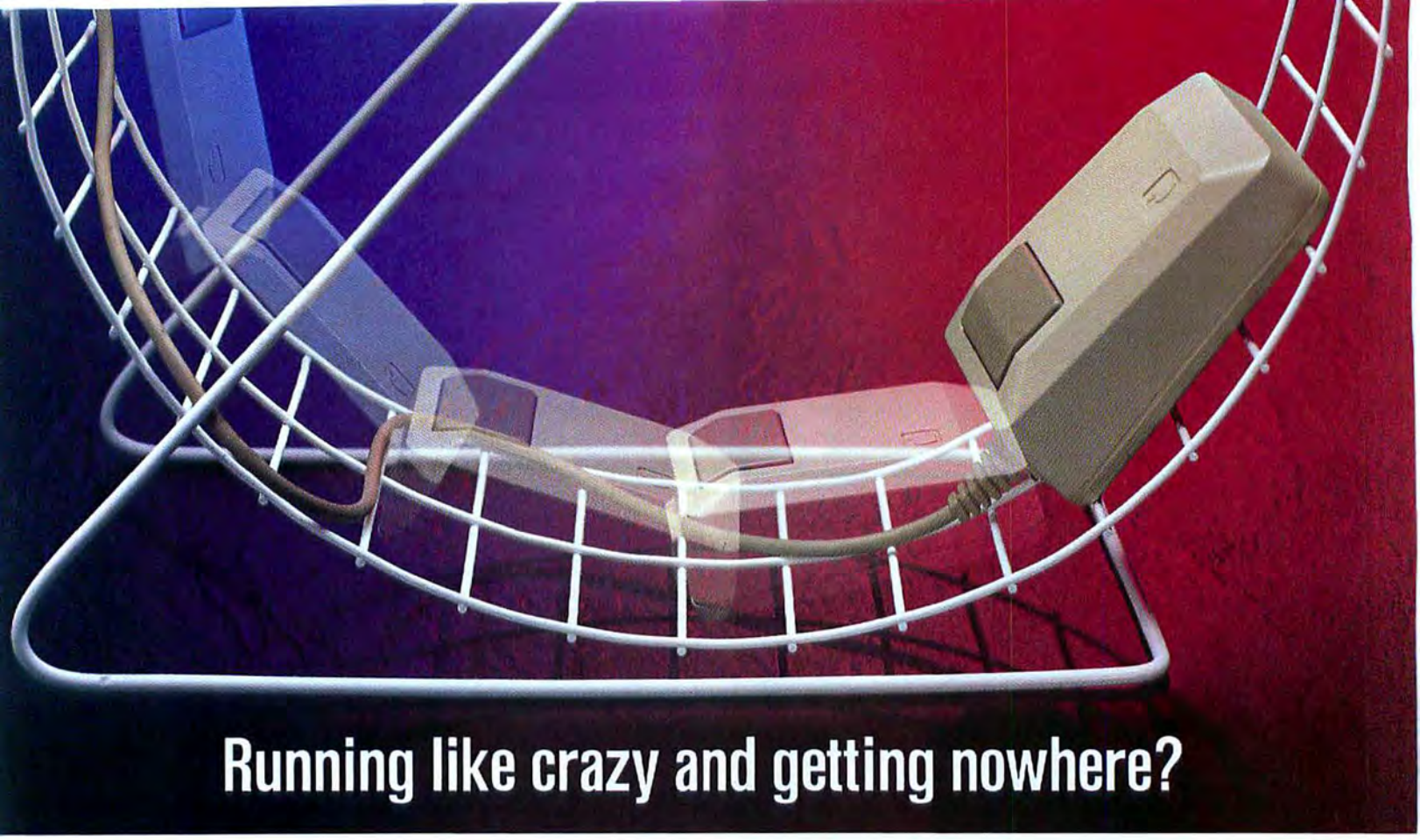
Of the 200,000 law firms in the United States, 74 percent have 12 or fewer attorneys, and 50 percent have 20 or fewer employees total. Those smaller law firms represent a sizable potential market for the Macintosh. "For many law firms, a flexible, easy-to-learn system like the Macintosh is ideal. The majority of lawyers don't have time to spend learning DOS," says John Ziesler, manager of business marketing for Apple.

Mark Hellman, a Chicago lawyer whose firm represents high-tech companies, including over 80 software firms, is convinced that the legal market is ripe for computers. "Large law firms that have expensive, sophisticated systems are saturated for the most part," says Hellman. "But the majority of firms are sole and dual practitioners, and their economic survival is dependent on a computer like the Mac."

Hellman is also chairman of the ABA Apple user group, which offers public domain software and periodically publishes a newsletter. The ABA has also set up a hot line to answer questions about computers in specific areas such as time billing, Apple, DEC, and artificial intelligence. A review board evaluates hardware and software for the legal market.

Larry Johnson, a Seattle attorney who publishes a monthly column about computers in the *ABA Journal,* be-

(continues on page 71)



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Legal Macintosh (continued)

lieves the Mac's user interface and business software constitute its main attraction for lawyers. "Programs like *MacPaint* and *MacDraw* are useful for creating presentation graphics, and time-billing programs, like Satori Software's *Legal Billing*, are essential for running an office." Johnson also recommends database programs for maintaining records of clients and cases, because those programs require minimal training. "*Filevision* can even be used to keep track of exhibits," he adds. Hellman proofreads documents for content and accuracy with *SmoothTalker* and considers *ThinkTank* the equivalent of the lawyer's yellow legal pad. *Document Modeler*, from the Model Office Company, creates boilerplate text for legal forms automatically. And electronic mail and desktop publishing with the LaserWriter present key attractions.

Some of the pieces are still missing—*MacWrite* and *Microsoft Word* don't include features needed for legal work, such as line numbering and footnoting capabilities. But Apple is working with developers to fill those gaps, and perhaps "desktop lawyering" will become another of Apple's key markets.

The User Group Alliance

Ellen Petry Leanse, Apple's user group "evangelist," is creating an electronic communications channel with user groups nationwide through AppleLink and the MicroNet Apple User's Group (MAUG) special interest group on CompuServe. AppleLink, an adaptation of the General Electric Information Services Company's (GEISCO) BusinessTalk, was codeveloped by GEISCO and Apple to provide Apple dealers and developers with product and technical information and electronic mail capabilities. The AppleLink user group project, which began in April with 60 groups, allows one individual per group direct access to Apple's technical library and contact with its developers. Apple publically posts answers to all questions on the system, so that all user groups can benefit from the information. Leanse plans to include most user groups in the AppleLink project.

Tom Warrick, president of Washington Apple Pi Club, praises AppleLink as the first communications system with the ease of use that people associate with the Macintosh. "But," Warrick says, "it is difficult to predict whether an answer to a given question is in the technical library."

Apple is also setting up a public forum on CompuServe. The Apple User Group will discuss common issues, such as how to recruit volunteers for office and bolster membership. Apple will post press releases and product updates and maintain a user group database, complete with current addresses, meeting schedules, and contact information.

User groups frequently ask Apple developers to give presentations at their meetings. Leanse says that although Apple is trying to coordinate a speakers bureau, it is difficult for the developers to go on the road for extended periods. One proposal is to send user groups videotapes of interviews with Apple personnel and product developers. The interviews could focus on questions asked on AppleLink or MAUG.

Apple has no plans to involve user groups in product distribution but would like to provide discounts to user groups (not individual members) for key hardware and software products needed to run such groups. The products would support such activities as printing newsletters and running bulletin board systems. Those key products, however, have not yet been defined.

Apple hopes that its investment in user groups will pay off in goodwill and market information gleaned from surveys conducted on AppleLink and MAUG and through user group newsletters.—*Janet McCandless*

User group "evangelist" Ellen Leanse, of Apple. Leanse's user group network gives groups access to Apple's technical library and a direct link to developers.

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The Word Processing Scene

Software Satellite International (SSI), publisher of *WordPerfect,* a highly successful word processing program for the IBM PC and compatibles, has recently announced plans to market versions of the program for the Macintosh and the Amiga. According to W. E. "Pete" Peterson, executive vice president at SSI, the Mac version is aimed at the high end of the word processing market: "We want to make sure power typists don't have to take their hands off the keyboard," says Peterson. With *MacWrite* and *Microsoft Word* firmly established on the Macintosh, SSI has a tough road ahead, but says Peterson, "There are a lot of *WordPerfect* fanatics who now use the Macintosh, and that provides us with a ready-made base of potential users." SSI hopes to have its Mac product available before the end of the year.

Advanced Logic Systems (ALS), of Sunnyvale, California, is introducing *WordHandler,* a $79.95 word processor that is a cross between *MacWrite* and *Microsoft Word.* The company has come up with a clever way to promote the product in a world dominated by Apple and Microsoft. According to Nathan Shulhof, vice president of sales and marketing, if you send an original *MacWrite* disk and $29.95 to ALS, you will receive *WordHandler* and the documentation. This offer is good until September 1.

· Icon Review is distributing *MultiWrite,* a combination word processor and outlining program. The $79 program is *MacWrite* compatible and allows you to have up to 12 windows open at once.

Steve Jobs's new enterprise, Next, is developing a full-featured word processor called *MacAuthor* (not to be confused with the British word processor of the same name, which is not yet distributed in this country). Given the expertise and experience of Jobs and company in Macintosh software, this word processor should be significant.

For engineers, architects, and scientists who prepare specifications, proposals, and structured technical documents, LM Software, of Belmont, California, has developed a specialized word processor. *MacSpec* features automatic section numbering, section indentation, and table of contents generation. The $199.95 program provides the usual Macintosh cut and paste functions and a variety of font and style options.

In addition, Microsoft is releasing a new version of *Word* sometime this year or early in 1987. The original *Word* was designed to work on a 128K Mac. Now that the 512K Mac and Macintosh Plus are standard, the program will no longer be constrained by the old Mac's RAM limit. Although Microsoft did not comment on the nature of the new version, we might expect to see style sheets, a preview mode for columnar text, and some modifications to the user interface.

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Macworld Best-Seller Software

This month	Business	Last month	Months on chart
1	Microsoft Excel, *Microsoft*	1	4
2	Microsoft Word, *Microsoft*	2	12
3	Microsoft File, *Microsoft*	3	11
4	MacDraw, *Apple Computer*	4	9
5	MacProject, *Apple Computer*	15	9
6	PageMaker, *Aldus*	–	–
7	Jazz, *Lotus Development*	6	8
8	Omnis 3, *Blyth Software*	10	3
9	Microsoft Multiplan, *Microsoft*	5	12
10*	Microsoft Chart, *Microsoft*	7	12
10*	pfs:file, *Software Publishing*	12	11
10*	Dollars and Sense, *Monogram*	8	12
10*	Odesta Helix, *Odesta*	9	7
14	pfs:report, *Software Publishing*	–	1
15	OverVue, *ProVue Development*	–	1

Source: InfoCorp survey of over 200 retail stores *Four products tied for tenth place.

Software Watch

Editors' choice: other recent software of particular interest

Microsoft Works, *Microsoft*
Integrated software

MacServe, *Infosphere*
Data communications

FullPaint, *Ann Arbor Softworks*
Graphics

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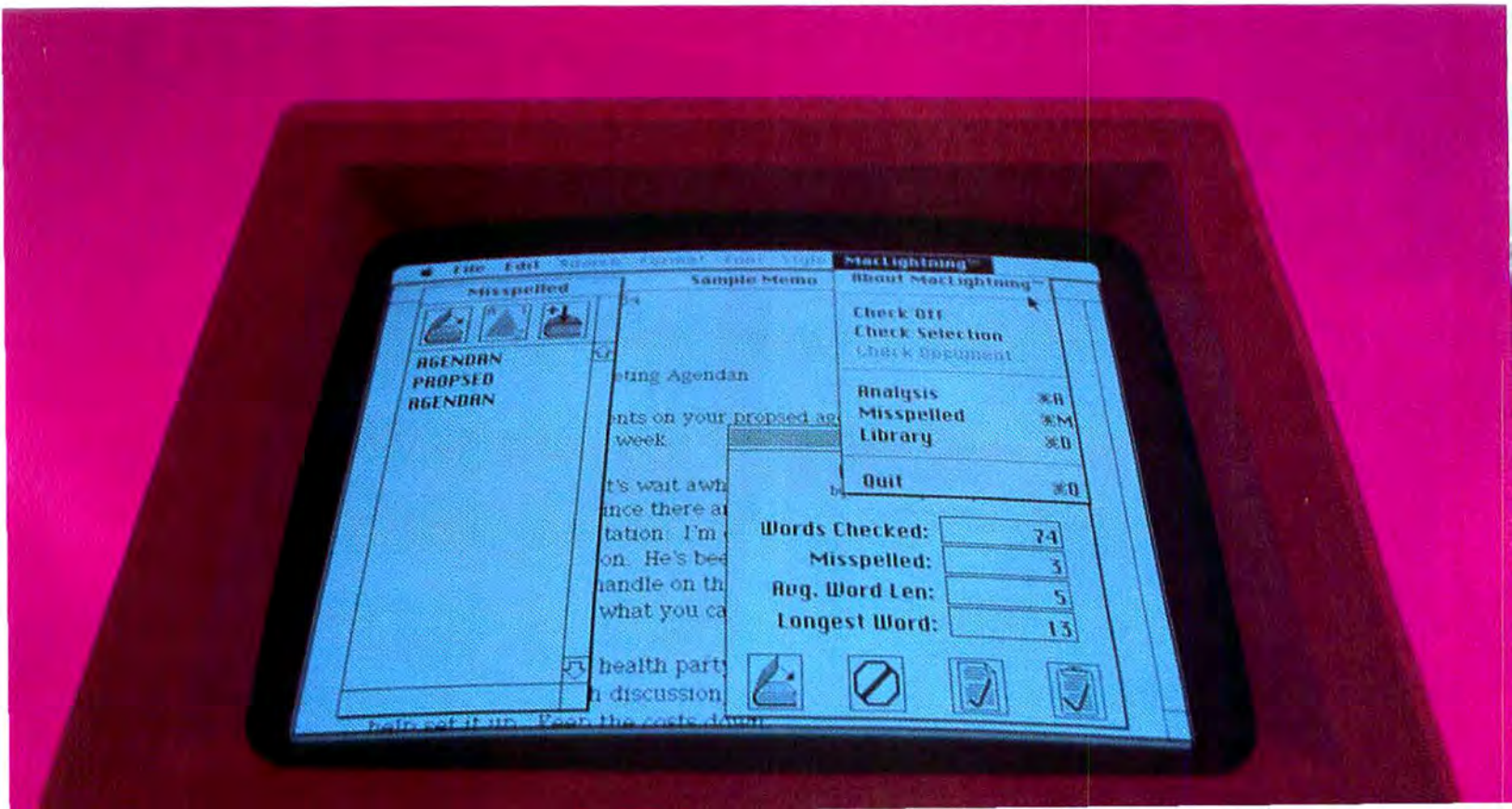

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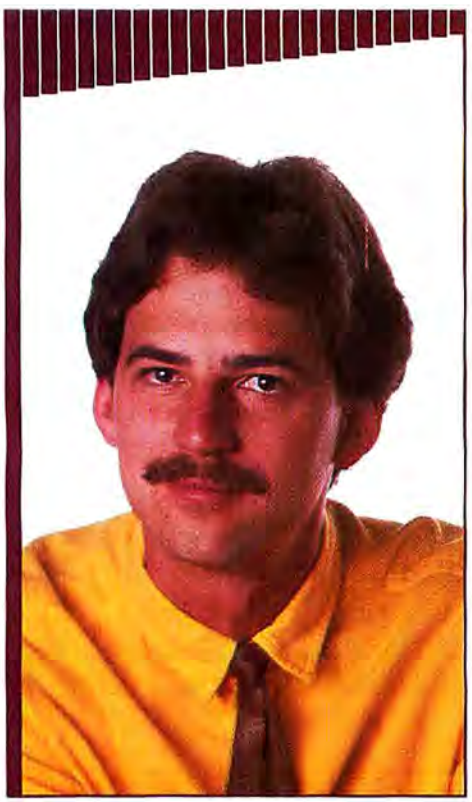
Create a ResEd template to simplify defining page sizes for printing, make room for fractions in your fonts, and more

Lon Poole



To print large MacDraw documents, reorganize your disks with the Finder.

This month readers ask about printing oversize MacDraw *documents, undoing the startup application, using* Sargon III *to replay a chess game between two people, "digitizing" printed BASIC program listings, fonts with fractions, and precise line spacing for filling out forms. And back this month, after an extended tour of the provinces, are the overrated system error code explanations. But first, a reader offers an easy method for changing page sizes in the Page Setup dialog box.*

Custom Page Sizes—Another Approach

Q. In January you described how to change the paper sizes listed in the Page Setup dialog box by modifying the PREC resource in the ImageWriter file using *Redit*. I have found a better method.

Recent versions of *ResEd* allow you to define your own resource-editing templates similar to the built-in templates for menus, strings, dialog boxes, and so on. By defining a template for the PREC 3 resource, you greatly simplify the process of changing page sizes.

To make the new template, start *ResEd*. When the window appears listing files on the disk, find *ResEd* and double-click to open it. A window opens that lists the types of resources in *ResEd* by their four-letter names. Open the template resources by double-clicking the name TMPL. A new window opens, listing all the currently defined templates.

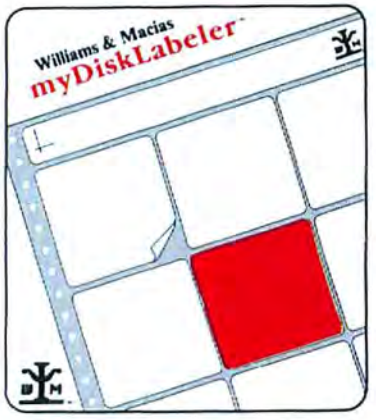
Create a new template—a TMPL-type resource—by choosing New from *ResEd*'s File menu. A template-editing window opens showing only a row of five asterisks. In this window you create a template that describes the PREC 3 resource (see Figure 1).

To add an item to the template-editing window, click the row of asterisks and choose New from *ResEd*'s File menu. Two fields, Label and Type, appear below the asterisks you selected. In the Label field, enter a word or short phrase that describes the item. In the Type field, enter a four-letter code that identifies the type of item. This template uses two types of items: DWRD "decimal word," a 2-byte integer displayed in the template as a decimal rather than a hexadecimal number, and PSTR, a text string whose first byte indicates its length (*ResEd* automatically handles the length, so you never see the first byte in the template).

The first item in the PREC 3 resource is the number of page sizes to be displayed in the Page Setup dialog box. The entry is a DWRD-type item. For example, type **# Sizes** in the first Label field and **DWRD** in the Type field.

The next 12 items in the PREC 3 resource are the paper dimensions. These entries are also DWRD-type items. Select the bottom row of asterisks and choose New 12 times from the File menu. For the next 12 items, enter **Height #1**, **DWRD**, **Width #1**, **DWRD**, and so on until you reach Width #6.

(continues on page 78)



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(continued from page 77)

The last six items in the PREC 3 resource are the paper-size names. Add another six items to the end of the template and enter labels such as **Name #1, Name #2,** and so on. The names are all PSTR-type items.

Carefully check the labels and types you have entered. Then close the template-editing window. The as yet unnamed TMPL resource you just created is selected in the list of TMPL resources. Name it by choosing Get Info from *ResEd*'s File menu and typing PREC in the space provided for the name. Notice that *ResEd* supplies a unique resource ID number in the space below the name.

Close the Info window, the TMPL window, and the *ResEd* window. When the Mac asks if you want to save the changes you just made, click Yes.

Next, to change the page sizes listed in the Page Setup dialog box, start the copy of *ResEd* in which you created the new PREC 3 template. Insert the disk on which you want to change the page sizes. When the window appears listing files on that disk, open the ImageWriter file. Open TMPL, and then open PREC ID = 3.

At this point you should see all the items in the PREC 3 resource displayed according to the template you created. You can now change the number of page sizes, the page-size measurements in units of 1/120 inch, and the page-size names.

Mark Bishop
Salem, Oregon

A. Thank you for the suggestion. Before starting, I recommend that you make a copy of your *ResEd* disk and do all your experiments on it. Go ahead and start *ResEd* from the original disk, but create the new TMPL resource on the copy of *ResEd*. The template, once created, is fairly easy to use. Since dimensions are measured in increments of 1/120 inch, be sure to multiply all dimensions by 120 before typing them (for example, enter 11 inches as 1320).

Printing a Large MacDraw Document

Q. I frequently create large *MacDraw* documents. When I try to print them, the system crashes (ID = 02). I've tried moving the *MacDraw* program to an empty disk, but to no avail.

Mark Dalrymple
Little Rock, Arkansas

A. *MacDraw* needs about as much disk space for a temporary print file as your document occupies. The space for the print file must be available on the disk that contains the *MacDraw* program.

When *MacDraw* can't find enough disk space to print, it usually advises you that "the print command was not completed." Probably the system error occurs because there's too little disk space to print.

(continues on page 80)

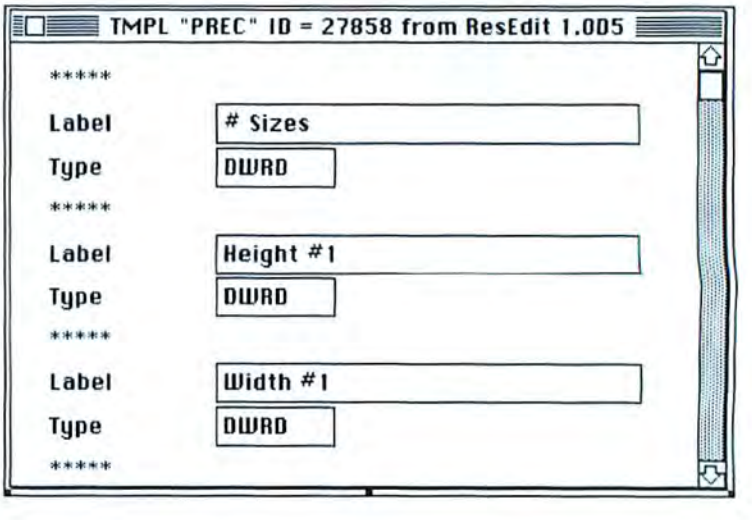
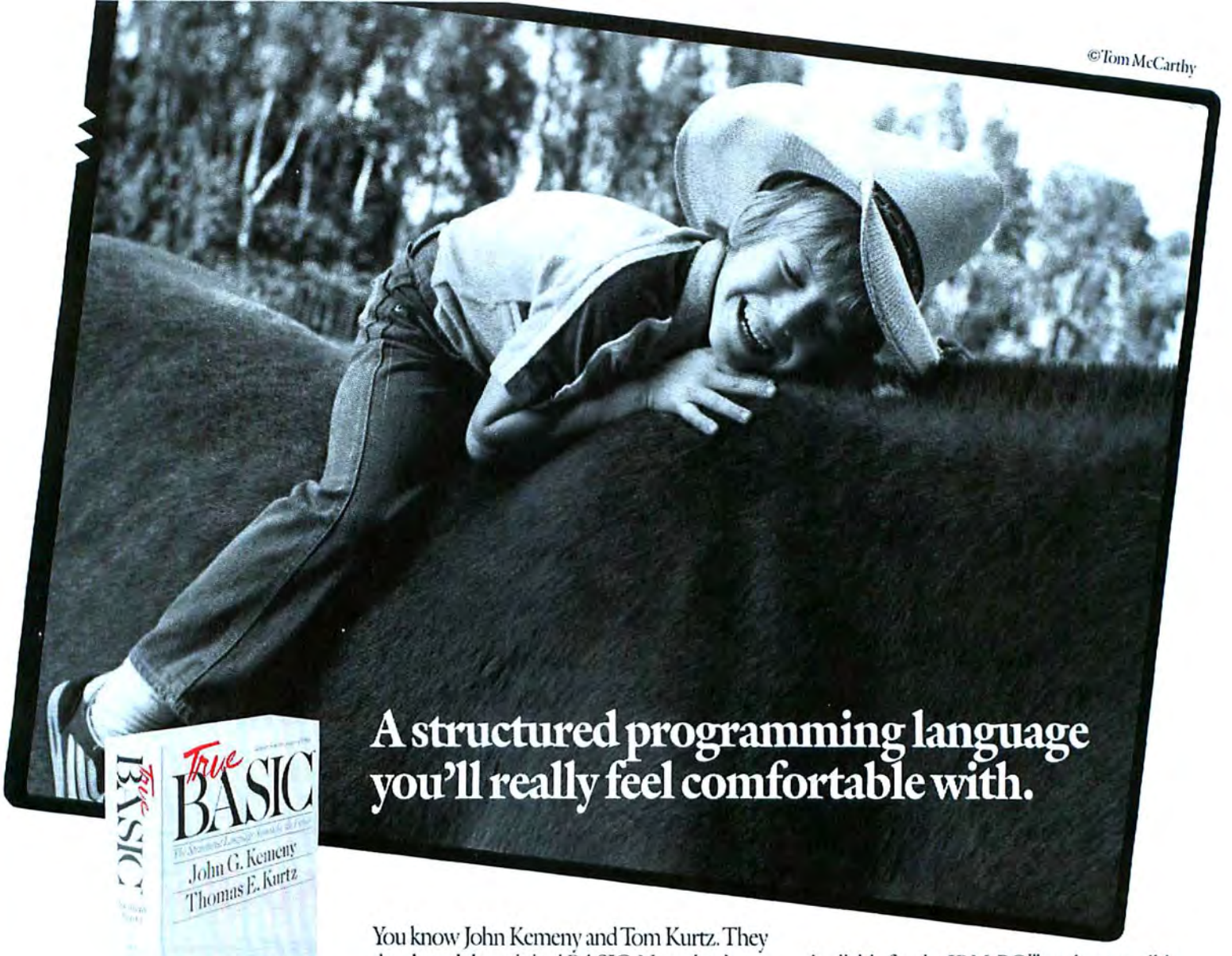


Figure 1
The template resource, TMPL, describes the PREC 3 resource, which contains the page size information for the Page Setup dialog box. The window shows the first 3 of 19 items you define for the template. The first item in PREC 3 is the number of paper sizes, followed by the dimensions and names of six sizes of paper.



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(continued from page 78)

You can reduce the amount of disk space required by printing one page at a time, but that's a tedious procedure. Often it's better to reorganize your disks with the Finder to come up with enough disk space to print successfully. If the document is on the startup disk (the one with the System file), move it to another disk. Remove as much from the startup disk as possible—unused fonts and desk accessories, stale notes on the Note Pad, junk in the Scrapbook, and incidental application programs. If you still need more room, copy *MacDraw* to a blank disk along with your document. If all else fails, print the document on a Mac that has a double-sided disk or a hard disk.

Chess Review

Q. Each move in a *Sargon III* chess game can be recorded on disk. If a friend and I play a game on a real chess set and mark all the moves on paper or in *MacWrite*, is it possible to transfer that listing into *Sargon III* and review the moves on screen? I realize that proper chess notation would have to be used.

C. Vogel
Winnipeg, Manitoba
Canada

A. *Sargon III* relinquishes its role as an active player and becomes a referee when you choose Verify Moves from its Options menu. As you make moves for both black and white, *Sargon III* checks the moves for legality and keeps a move list, which you can print or save on disk for later replay. So if you and your friend play your game near your Mac, use *Sargon III* to record the moves directly. If you play elsewhere, write down the moves and later replay both sides of the game in *Sargon III*.

To aid in your post-game analysis, you can ask *Sargon III* to suggest a move for either side by choosing Hint from the Features menu.

Scan Program Lines

Q. I have programs written in BASIC that I want to convert to Microsoft BASIC (MBASIC). Each program is about ten pages long and would be difficult to type in. I thought it would be easier to digitize the program listings with ThunderScan. Will I be able to cut and paste the text from *MacPaint* to MBASIC? Or is there a cheaper product that might do a faster and better job?

John Smith
Vandalia, Ohio

A. ThunderScan turns everything it reads into a *MacPaint* document. Once in that form, text is difficult to edit. In addition, unless the type in the scanned text is very large, ThunderScan renders only an approximation of the characters. Thunderware is working on an enhancement that will allow ThunderScan to convert text more accurately, but it still won't turn the text into a text file.

To scan text and create a text file that you can edit, you need an optical character reader (OCR). Oberon International's Omni-Reader (800/262-3766) is the only OCR for the Macintosh on the market at

(continues on page 83)

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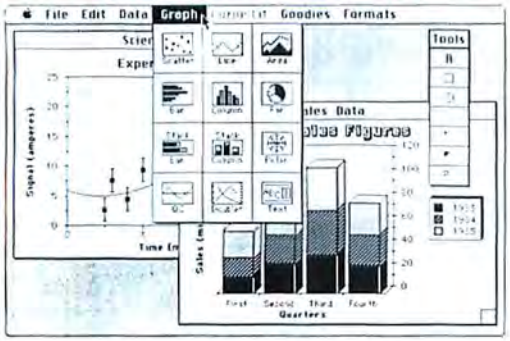

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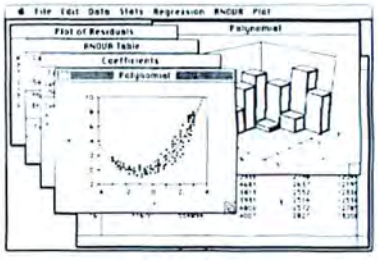

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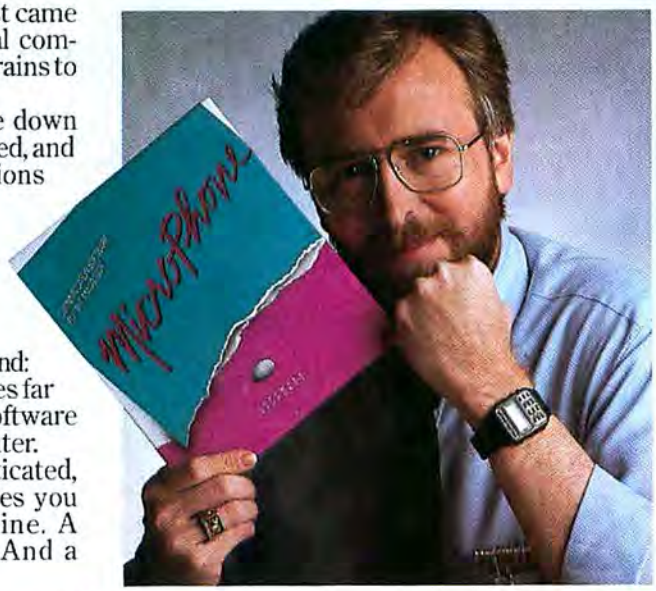

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When you open MicroPhone to the desktop you'll find a comprehensive collection of icons pre-programmed to access all major information services: CompuServe,® Dow Jones News/Retrieval,® The Source,℠ Delphi,™ the works.

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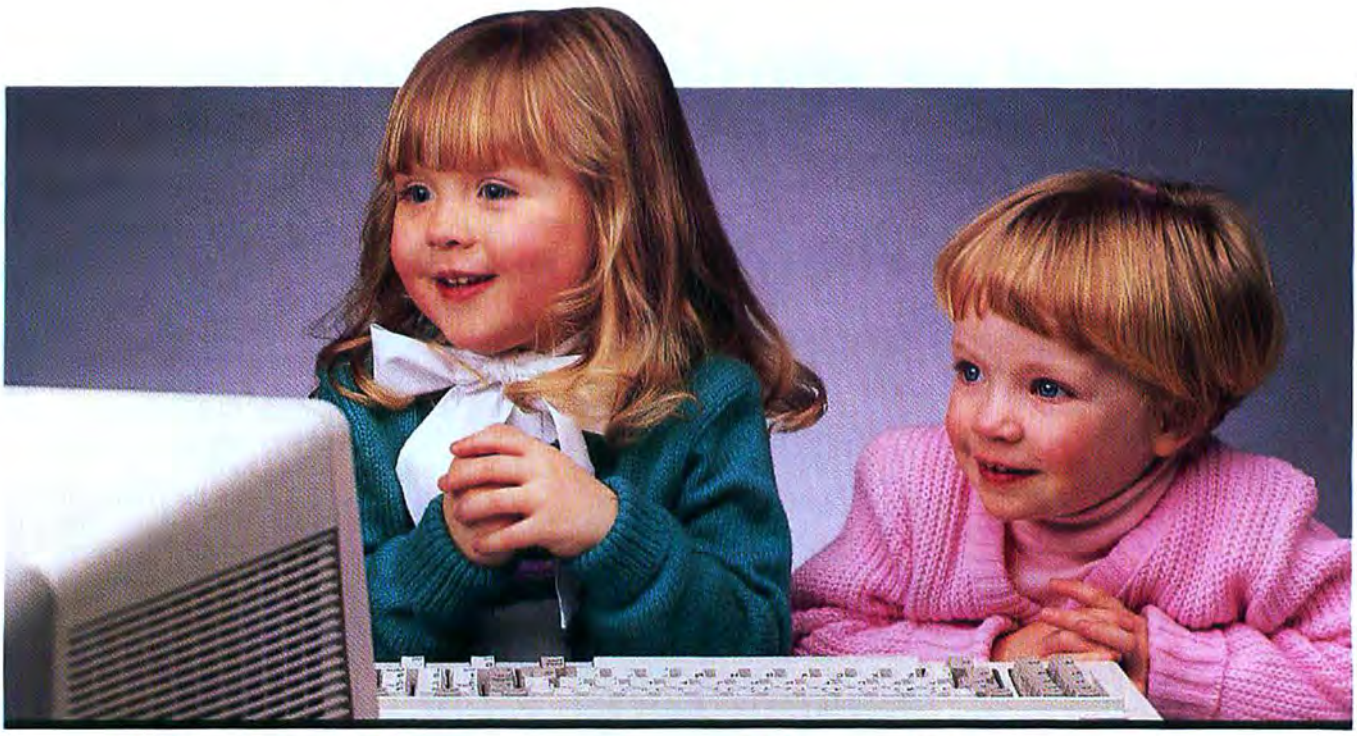

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(continued from page 80)

this writing; Omni-Reader scans double-spaced text at the rate of about 2 minutes a page. Knowledge Engineering (212/473-0095) is preparing OCR software for release this summer to accompany the Microtek scanners it distributes, but the price is steep for an individual—at least $2800 for the scanner and software. OCR software is said to be on the way for other scanners in that price range, including Abaton's Scan 300 (818/905-9399) and the SpectraFAX 200 (813/775-2737), which can scan color documents.

Until the next generation of OCR scanners arrives at a price under $2000, you might want to follow the advice of Scott Beamer, who examined this subject in an article in the Fall 1985 edition of the Berkeley Macintosh Users Group's newsletter. Beamer's comparison shopping revealed that hiring a good typist or word processor costs about the same as sending a manuscript to a commercial service bureau with OCR capability, but the turnaround at the service bureau can be dramatically faster. Beamer reported that rates for both typists and service bureaus vary widely, and he recommended calling around for the best rates.

Fractions

Q. I often find a need for fractions in my documents, and I know of no font that has them. I used *ResEd* to put fractions into Geneva 12 and 24, at Shift-Option-2 for ½, Shift-Option-3 for ⅓, and so on. It works, but the insertion point stays put, the way it does when you type an accent mark. Why doesn't the insertion point advance?

Scott McKay
Portland, Oregon

A. Actually, many fonts include fractions. The Boston II font includes the fractions ¼, ½, ⅓, and ⅔ (send $10.50 and a disk to Charles E. Maurer, 31 Forsyth Ave. S, Hamilton, Ontario L8S 2A4, Canada). Boston II is also one of the cleanest, most legible general text fonts I've seen for the Macintosh and Imagewriter. If you need lots of fractions, the Cursive font (part of *SciFonts*, $49.95 from Paragon Courseware, 4954 Sun Valley Rd., Del Mar, CA 92014) includes 14 fractions: ½, ⅓, ¼, ⅕, ⅙, ⅐, ⅛, ⅑, ⅒, ⅔, ¾, ⅚, ⅜, and ⅞.

If you use *ResEd* to add your own fractions to an existing font, you may have to change the characters' horizontal dimensions. The two black triangles along the bottom edge of *ResEd*'s font-editing window (see Figure 2) define the horizontal dimensions of the currently selected character. The left triangle marks the character's offset, which determines how close the character is to the character on its left. The right triangle marks the character's width, which determines how close the selected character is to the character on its right.

To change the horizontal dimensions of a character, drag the black triangles to the right or left and watch the effect on the sample text at the right side of the editing window. (You can change the sample text using normal text-editing methods.) If you drag the right triangle over the left triangle, the insertion point does not move at all when you type the character. The next character will overtype the previous one. As a rule of thumb for avoiding overtype, position the triangles with a one-dot gap on either side of the character.

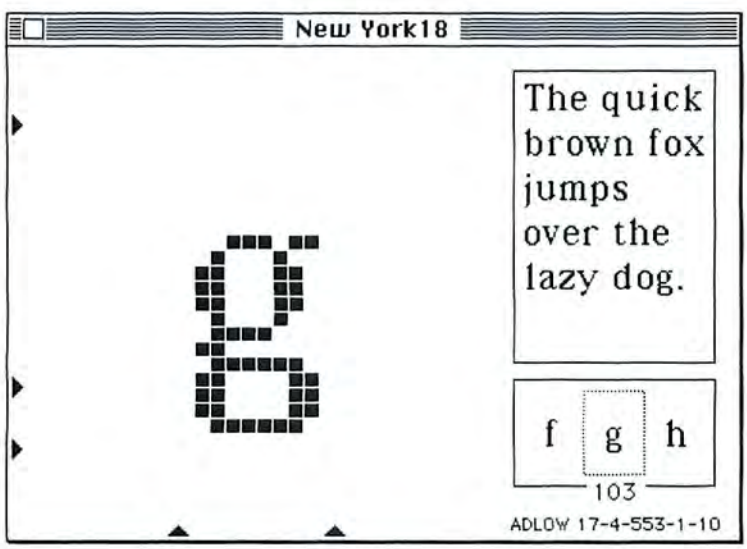

Figure 2
The two black triangles at the bottom of ResEd*'s font-editing window determine the horizontal dimension of the currently selected character. Normally there should be a one-dot gap on either side of the character.*

Line Spacing

Q. We would like to fill out certain forms using our Lisa and Macs. We can use tabs for horizontal spacing, but I am at a loss as to how to control vertical spacing. Can we use *MacWrite* or *Microsoft Word?*

John Purtle
Batesville, Arkansas

A. You can use a word processor if you set the line spacing to a fixed height. To fill out typewritten forms using *MacWrite* 4.5, click the 6 Lines/Inch option in the formatting ruler to force each line to be ⅙ inch tall, the same as a typewriter. In *Microsoft Word,* use the Formats command in the Paragraph menu to set line spacing. Enter a quantity and a unit of measure: inches, centimeters, points, or lines. For example, entering 12 pt. sets the line spacing at ⅙ inch.

You might also consider using a forms generator program such as *MegaForm,* from Megahaus, or a database program that includes flexible forms design, such as *Microsoft File.*

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

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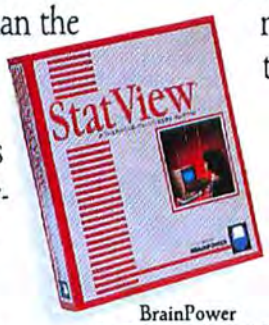

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Putting On a Good Face

James Felici and Walter Omstead

Life was simple back when the LaserWriter's Helvetica and Times Roman were the only font options available. The lack of typeface choice made design decisions a snap—no options, no design crises. Now those days are over, and a host of new fonts and font manufacturers is bringing choice and confusion back into LaserWriter typesetting.

You've reached the end of your rope with your three-face type library. You've been through all the permutations and combinations of the serif and sans serif archetypes, Times and Helvetica. You've tried to shoehorn Courier into the design mix, with limited success. It's time for some new fonts, and fortunately we're seeing a crowd of new laser printer fonts appearing from Adobe Systems, supplier of the ROM-resident fonts for the LaserWriter and LaserWriter Plus, and a number of third-party vendors, including Allotype Typographics, Century Software, Casady Company, and Zap Printing.

Unlike the ROM-resident fonts that come built into the LaserWriter, the Mac puts these new *downloadable* fonts into the LaserWriter's memory only temporarily; every time the printer is turned off, everything in its memory, including these fonts, disappears.

Because designing and then fine-tuning fonts is a labor-intensive job, scalable fonts—fonts that allow a wide range of point sizes to be generated from a single set of master character definitions—are not cheap. Building a font library represents a serious investment. This buyer's guide covers three basic buying criteria: design versatility, aesthetic quality, and ease of use.

This abstract face was created with letters from three of the Mac's new downloadable fonts. The uppercase U *is ITC Garamond Light, the* L *is ITC Avant Garde Gothic Book, and the small* g *is ITC American Typewriter Medium.*

Typography Basics

Typefaces fall into a few major functional and stylistic divisions (see "A Face for All Seasons," *Macworld,* February 1985). A well-rounded font library should have entries from three general typeface categories: text, display, and decorative.

Text faces, as the name implies, are used for lengthy passages of running text, as in the body of a book or a magazine. These faces are designed to help the eye scan quickly across lines of text by allowing easy recognition of all letterforms. To increase legibility, text faces are typically constructed using light, tapering strokes that are terminated with *serifs,* the small counterstrokes that aid the eye in recognizing individual letters.

Categorically labeling a particular typeface as text, display, or decorative is risky, because designers often cross traditional boundaries when selecting typefaces. Still, even though one often sees *sans serif* faces used for text, the construction of sans serif characters creates readability problems. The strokes that make up sans serif characters–as in the familiar Helvetica (this is Helvetica)–are usually almost uniform in thickness. This lack of variation over an entire page tends to produce a flat, uninviting shade of gray. On a subtler level, the lack of differentiation among the letters' constituent strokes can cause the eye to become befuddled by a mass of lines that fail to resolve into letterforms. The eye has to make greater efforts to recognize the letters, which makes for tiring reading.

In addition, sans serif faces built with very light strokes, such as Casady's Willamette Light, can yield *aliasing* errors in text sizes due to the relatively low resolution of the LaserWriter. In scaling down the light characters, the software rounds off partial pixels; for instance, a stroke that ought to be 2½ pixels wide shows up at 2 pixels. Figure 1 shows the effects of aliasing in the 10-point Willamette Light. Look at the *i*'s and the *l*'s, especially in the words *expedite, if,* and *help.* (In fact, in the next release of this font, Casady is discontinuing the light weight.)

Display faces are designed for short passages of eye-arresting type, as in headlines, billboards, book and magazine covers, and signs. The letterforms of display faces are usually bold, imaginative, or dramatic because their prime function is to attract the eye. Text-like legibility is not a major concern–readability is usually assured by position on the page. Since these faces are often used in sizes much larger than typical text, their stroke weights tend to the extremes: some heavier for extra punch, some with a thinness that would make them hard to read at text sizes. Of the handful of display faces now available for the Mac in downloadable form, few are versatile enough to double as text faces. Adobe's Souvenir (see Figure 2) is a notable exception (licensed from the International Typeface Corporation–ITC).

Graphic designers frequently choose text faces to serve as display faces because of the type's connotations. Text faces evoke an impression of factualness and honesty, so a designer might, for example, set the headline of a straightforward, honest-sounding sales pitch in a text-style face. Bold versions of these faces work best, as they have enough heft to hold their own on the page. Many of the ads you see in *Macworld* use some member of the Garamond family (a text face) because Apple has chosen a variation of Garamond as part of the Macintosh's graphic identity.

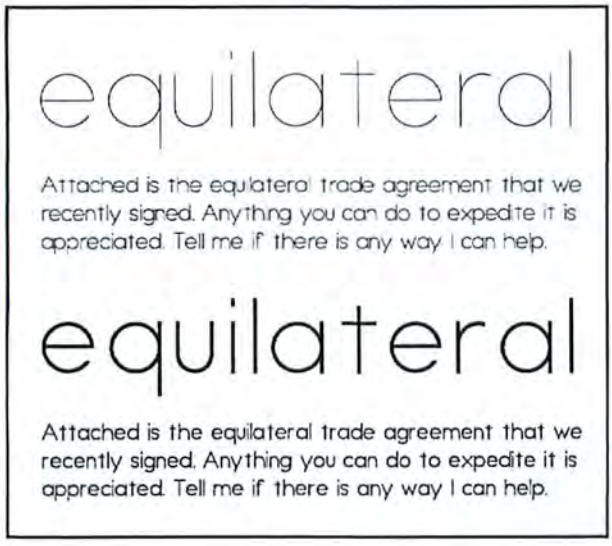


Figure 1
Character strokes in the text size of Willamette Light (bottom sample) are uneven due to the LaserWriter's rounding off of the very fine specifications used in this face. Paradoxically, the Extra Light face prints evenly.

Figure 2
ITC Souvenir from Adobe, shown at the top in light and demibold weights, is a face you'll surely recognize, partly because it's a mainstay of ad typography. The ITC Garamond Light and Garamond Bold faces should be familiar from the pages of Macworld.

Specialized Typefaces

In any type library, decorative faces are apt to be the least used. Decorative faces are to typography what a sand wedge is to golf: you don't use it often, but when you need it, nothing else will do. A wedding invitation in Helvetica, for instance, just doesn't cut it. The same invitation in Century Software's Thames, however, corresponds more to our expectations.

Sometimes the letterforms of decorative faces are embellished or distorted almost to the point of illegibility. These often fanciful faces are commonly used when an exotic or nontypeset look is desired. In general, decorative faces are used where the typeface itself must bear a significant part of the narrative message.

Decorative faces sometimes show up as display type, but designers generally avoid such flamboyant faces because they are too distinctive to blend well with the informational typefaces that usually accompany the display type. An effective display face should be flexible and adaptable, and decorative faces assert themselves too strongly to be neutral. Despite their limited applicability, decorative fonts constitute a high percentage of the new fonts appearing for the LaserWriter (see Figure 3).

Another valuable addition to a font library is a pi font—a font of utility characters such as mathematical symbols, dingbats (decorative elements), and commercial symbols. The LaserWriter's ROM-resident Symbol font is a mathematical pi font. Allotype Typographics offers many pi characters—including scientific symbols—in its expanded versions of the Helvetica family. Allotype has also created a chemistry-symbol pi font (for creating molecular schematics) called Structure, a version of Times Roman with special accented characters for setting Polish, and a font for typesetting in Greek (see Figure 4).

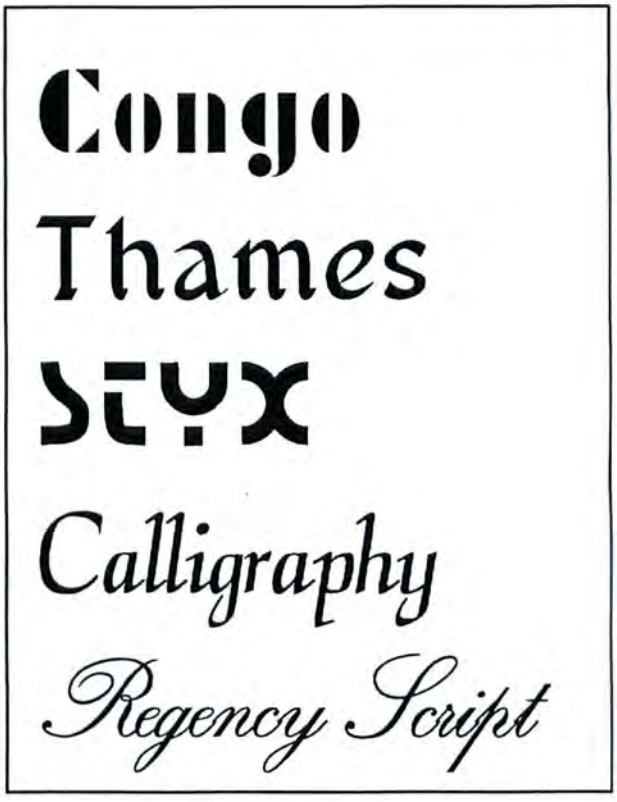


Figure 3
A collection of decorative faces. These styles are distinctive, but their versatility is limited. Congo, Thames, and Styx are from Century Software's LaserFonts series. Calligraphy and Regency Script are from Casady Corporation.

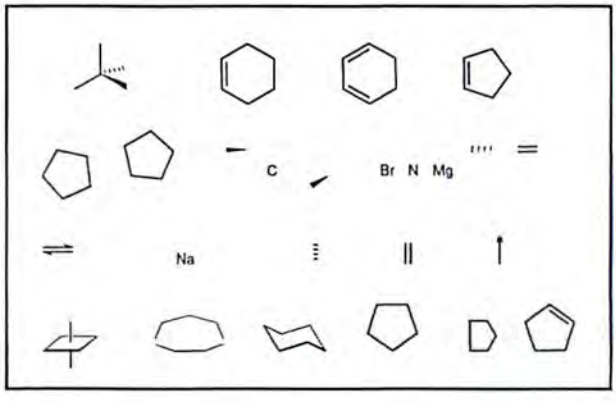


Figure 4
A sample of characters from Allotype's Structure font, a pi font designed for typesetting chemical and molecular diagrams. These basic units can be jockeyed into position to create elaborate schematics.

Selecting a Font

Whether you're buying text or display faces, select versatile fonts that perform several roles. For instance, choose sans serif fonts with a stroke weight and letterspacing that allow them to double as text faces; find a serif face with a boldface version strong enough to work effectively as display type.

Don't count on the bold menu option in an application to create bold versions of scalable fonts. The bold option automatically selects a face's bold complement if it exists in memory (as with the LaserWriter's Times Roman), but when the LaserWriter converts an existing scalable font to boldface, the result is not pretty (see Figure 5). The Italic option often works well, though, as the San Serif example in Figure 5 demonstrates.

Rating a font's appearance is straightforward. The stroke weights of all the characters should be consistent, alignment of characters on the baseline should be precise, and letterspacing should be even throughout. In short, it should look as professional as possible within the LaserWriter's capacity.

Don't buy a font on the basis of a small output sample. Insist on seeing full pages of the type, so you can assess the overall consistency of color among the letters, as well as the evenness of the letterspacing. Find out what the full character set is; the contents of fonts vary widely, and the typeface you prefer might lack characters you use routinely, such as the cents symbol, the plus sign, or angle brackets. Examine the

Figure 5
Typefaces that have no italic complement can be slanted using the italic option from the menu, as demonstrated by this sample of Casady's Sans Serif. However, the bold option from the same menu can cause gross distortion, as shown in the sample of Bodoni, also from Casady.

Facing Technical Demands

Aside from aesthetic concerns, there are important computer issues to consider when choosing a typeface.

Until Apple releases its new printer driver, using downloadable fonts with limited RAM space will create problems. These snags are even more complicated on networked LaserWriters, because multiple users make even heavier demands on the system.

The LaserWriter has less than 200K of RAM set aside for downloadable information, including fonts as well as information supplied by application programs. *PageMaker*, for instance, takes over 50K of this space just for its own basic set of PostScript instructions.

Version 3.1 of the LaserWriter driver, expected sometime this summer, will address this memory problem by allowing for automatic font swapping through the small RAM area. Swapping means the Mac automatically downloads fonts as they are needed.

In the future perhaps Apple will offer a LaserWriter upgrade with more RAM for font and program information storage. As things stand, the reserved area of RAM overloads easily. After *PageMaker* and *QuickDraw* have loaded their instruction sets into the memory cache, you have less than 60K left for fonts, which currently average about 35K apiece. If you overflow that RAM area, one of two things happens: you get an "Error in PostScript" message when you attempt to print and you have to reboot the printer to clear the RAM, or the LaserWriter spontaneously reboots. In either case you have to reinstall the downloadable fonts.

The best strategy for avoiding that situation is to download the application headers—the programs' PostScript instruction sets—into RAM first (by printing a small file from each program) and then to download the fonts. Casady and Adobe fonts come with a short program you can run that lists the fonts that are currently in RAM; without this program you can find out the RAM's limits only by trial and error, packing fonts into RAM until the printer reboots. This sad state of affairs should be remedied by Apple's new printer driver, once application designers take advantage of its font-swapping capabilities.

Memory demands also come into play in the Mac itself, where there may not be enough room on the startup disk to add all of the screen fonts necessary to represent the new fonts on screen. The Mac Plus and its 800K floppies reduce this problem, but a 400K disk fills up very quickly when you are storing six or eight bit maps on disk for every typeface you intend to use. For these reasons, it is important for you to note how much font's output in a range of sizes you are likely to use, since what looks good at display size may not look so hot at text sizes, and vice versa.

Then there's the issue of output time—the time it takes for the LaserWriter to print a file once it has been sent by the application program. Output times vary widely, with the script and calligraphic fonts generally running much slower than text faces. One single-page business letter set in Casady's Regency Script took us more than 3 minutes to print.

Adobe Systems adds one more aspect to your purchase decision—copy protection. Adobe pays licensing fees to commercial font libraries to adapt their faces to PostScript format. Added to the expense of adapting the fonts, these fees represent a substantial investment that Adobe and its licensors are bound to protect. The means Adobe chose was to limit the number of printers (including phototypesetters) that can use each copy of an Adobe font. In other words, when you install a font, it is imprinted to work only with a particular printer and no others (the LaserWriter on your desk, but not on your office mate's). A more expensive version of the same font can be used on up to five printers. Adobe is alone among current laser font manufacturers in limiting use of its fonts.

LaserWriter font vendors are rapidly proliferating, and each week brings word of new fonts. As an informed font shopper, you can appreciate the diversity rather than cringing at the confusing wealth of choices. □

James Felici is the Technical Editor of Publish! *magazine. Walter Omstead is a San Francisco author and editorial consultant.*

memory both the downloadable portions and the bit maps of your new fonts eat up.

You could get away with using only one screen font size for each typeface you want to use, but this creates legibility problems when you display other sizes on the screen. If you plan to do on-screen editing in a specific typeface, make sure you have a screen font on the system for the sizes you prefer for editing.

Loading screen fonts is time-consuming, sometimes unnecessarily so. The *Font/DA Mover* can grab only one typeface at a time from Century's disk, for example. In contrast, Casady's fonts are bundled, so they can be loaded into the system in one fell swoop. It's a good idea to make a set of startup disks with different font combinations, so you can avoid copying the screen fonts every time you want to use them.

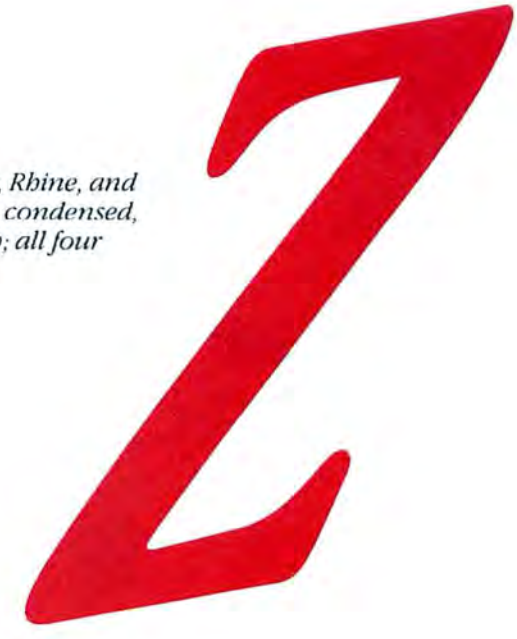
Adobe Systems Typeface Collection
Adobe Systems, Inc.
1870 Embarcadero Rd.
Palo Alto, CA 94303
415/852-0271
List price: $185 per four-typeface disk for one printer, $375 for five printers; offerings include Palatino, ITC Bookman, ITC Zapf Chancery/ITC Dingbats, ITC Avante Garde Gothic, New Century Schoolbook, Optima, ITC Souvenir, ITC Lubalin Graph, ITC Garamond, ITC American Typewriter/ITC Machine, ITC Benguiat/Friz Quadrata, and Glypha (each font comes in roman, bold, bold italic, and italic)

Downloadable PostScript Fonts
Allotype Typographics
1600 Packard Rd. #5
Ann Arbor, MI 48104
313/663-1989
List price: Kadmos (classical Greek) $85; Haber and Thomson (two scientific text fonts) $75; Structure $125 ($160 with Haber and Thomson); two Polish fonts, Czasy and Szwajcarskie, $85 each (all faces are offered in roman, italic, bold, and bold italic)

Fluent Laser Fonts
Casady Company
P.O. Box 223779
Carmel, CA 93922
800/331-4321, 800/851-1986 in California
List price: Bodoni and Sans Serif $69.95, Calligraphy and Regency Script $69.95 (the disks we saw provide plain type only; upgrades due soon will offer other styles)

LaserFonts
Century Software, Inc.
2306 Cotner Ave.
Los Angeles, CA 90064
213/829-4436
List price: MicroFonts, Willamette (Medium and Extra Light), Styx, Congo, Thames, Cumberland, Mannistee (Bold and Light), Devoll, Spokane, Neosho (Bold and Light), and Columbia $29.95 each; Package 1 (Willamette, Styx, Congo, Thames) and Package 2 (Columbia, Mannistee, Devoll, Spokane) $95 each (all fonts include condensed, expanded, and regular versions)

LaserWriter Fonts
Zap Printing, Inc.
1307 W. Sixth St. #127
Corona, CA 91720
717/734-8181
List price: Hudson, Potomac, Rhine, and Yukon (each with regular, condensed, and expanded) $149 each; all four $447



The Kingpin of Presentation Graphics

Prasad Kaipa and Adrian Mello

Some programs appear quietly on the scene but receive almost immediate acceptance. The latest example of a software rapid deployment force is *Cricket Graph,* a general-purpose presentation graphics program from Cricket Software. Despite its Disneyesque name, *Cricket Graph* quickly jumped through back doors into the laboratories and offices of several major corporations including Knight Ridder, Du Pont, First Boston Bank, and McDonnell Douglas.

Cricket Graph addresses the special requirements of scientists and advanced business users with features such as polar, double *y,* and quality-control graphs; error bars; and curve fitting. The program is powerful and easy to use,

and for the most part it conforms nicely to the Macintosh interface.

Basically, you create graphs by entering data into the program and choosing one of several chart types. Various options let you mathematically alter the data on which the graph is based and summarize data by drawing curves calculated with the program's regression and interpolation formulas. Once you choose a type of graph and plot it, you can embellish it with color, depth, fonts, patterns, symbols, and other visual elements. You can produce the finished graph on a variety of output devices including printers, plotters, and film recorders. *Cricket Graph* prints color graphs on the ImageWriter II and works with several plotters without requiring extra software.

2500 Points of Data

In terms of sheer number-crunching power, *Cricket Graph* clearly exceeds the capacity of other chart-producing programs such as *Microsoft Chart, Excel,* and *Jazz. Cricket Graph* can plot charts with over 2500 data points per series compared to 64 points per series for *Microsoft Chart* and 100 data points per series for *Excel.* The ability to handle large amounts of data makes the program well suited for plotting complex groups of data. For example, a biologist or medical scientist measuring cell growth in an experimental culture while monitoring temperature might record hundreds of data points. The only problem with charting so much data is that it takes *Cricket Graph* a long time to load large data files. In one test it took more than 12 minutes to load approximately 2000 data points. A spokesperson for Cricket Software says the problem arises because the program loads data with the Mac's text editing routines, which prove to be inadequate to handle large volumes of data. The problem is due to be fixed before the end of summer.

You create graphs from numbers, which you enter in one of three ways. You can type numbers directly into the program's data window, which resembles the columns and rows of a spreadsheet. If you want to include data from other programs or documents, you can use the Clipboard or Scrapbook to copy it into a desired data window. (*Cricket Graph* includes *Switcher* to facilitate working with other programs.) *Cricket Graph* also reads files stored in the SYLK format used by programs such as *Excel, Omnis 3,* and *OverVue.*

Cricket Graph also imports any data that is tab-delimited or stored as text files. *Cricket Graph* works well with many statistics programs, making it valuable for marketing and production analysis applications. *Statworks,* also designed by Cricket Software, creates data files that can be opened directly by *Cricket Graph.* If you want to read *Stat 80* files, however, you must force the file open. Put the data file to be opened on the same disk as *Cricket Graph,* select both files, and open them simultaneously. Sometimes you can also open otherwise incompatible data files by copying the data into a word processor such as *MacWrite* and replacing the spaces between the data points with tabs.

Mathematical Manipulation

When creating a graph, you can often make a point most effectively by plotting a derivative of the data, such as the percentage of change or the sum of two series. *Cricket Graph* provides an impressive array of mathematical functions that help you present data in different forms. You can sort text and numeric data on several levels and recode values that meet specified criteria. You can perform arithmetic calculations on one or more data series and create a new series by manipulating the current series with a number of functions such as trigonometric, log, or power functions. You can also smooth the data or compute running averages.

These capabilities are useful for creating error columns and forming normalized data series. Though you can make a new series that is a subset of the original series, you can't plot a partial selection of a series without recoding the variables you don't want to plot. A partial selection capability would permit users to add and subtract data to see trends and reduce a crowded data set.

Curve Fitting

In studies involving statistics, modeling, or experimental work, analysis can be improved by understanding the functional relationship between correlated data variables. To accomplish this, *Cricket Graph* provides five formulas for fitting curves to scatter and line graphs. The formulas include four types of regression: simple, polynomial, exponential, and logarithmic. If you choose the polynomial curve fit, you can also choose its order, which can be as high as five. The fifth formula provides an interpolation routine that requires the curve to fit through every data point using the Steinman method. The interpolation routine did not produce smooth lines on the LaserWriter. Cricket Software is aware of this problem and claims to be working on a solution.

Applying one of the regression formulas to an existing line or scatter graph overlays a fitted curve and places the equation used to compute the regression on the graph (see Figure 1). Unless a specific data series is selected, the fit commands apply to the last series added. You can fit the same data to different equations, determining the best fit from the error values located at the end of the equation displayed on screen. Be careful not to clutter graphs by trying too many equations on the same graph. You can remove extraneous curves and equations from the graph.

Plotting Graphs

Once you have entered the data to plot, you select one of 12 basic graph types from the Graph menu, including scatter, line, area, bar, stacked bar, column, stacked column, and pie charts. You can add new data series on the same graph and overlay different types of graphs. The program's many options let you create over 100 graph variations, including semi-log and log-log varieties, compared to *Chart*'s 40 variations.

A few graph types are especially valuable to scientists and business users, including polar graphs, quality control charts, and double *y* axis graphs (see Figure 2). Polar graphs—used by scientists, mathematicians, and engineers—plot data points that are described by their distance from the center of a circle (radius) and their relative angle in degrees from a reference point. Quality control charts are for studying and controlling repetitive processes. Double *y* charts are ideal for comparing combined trends in two sets of experimental data measured in different units. *Cricket Graph* also lets you prepare color overheads and slides for text presentations.

Dressing Up the Plot

The initial plot is just a starting point ready for enhancement. You can change the size, location, and color of almost every aspect of the graph. You can resize plot frames, add depth, change patterns and symbols, and explode pie segments. Selecting Show Tools from the Goodies menu produces a tool palette that lets you emphasize significant points with text, arrows, lines, and rectangles. All fonts, styles, and sizes available in the System file can be used for text on the chart. Unlike with *Chart* and *Excel,* however, you can't adjust the width of lines or bars.

Once you have selected the basic graphic format, you edit the graph or chart by clicking on any portion of it. Double-clicking any element of the graph such as text, axis, legend, or plot area produces a dialog box offering the editing features that logically apply to that element. For example, double-clicking text produces the dialog box for editing text and setting its font, style, size, and orientation. If you save the customizing parameters from one graph in a format file, you can apply the same parameters to new data by choosing that file from the Formats menu. Stored formats can also be understood as graphics macros. They are useful for creating graphs employing the same design or creating custom setups for different printers such as the ImageWriter II and the LaserWriter.

One confusing feature of *Cricket Graph* is the implementation of Undo. Choosing Undo from the Edit menu removes the most recently plotted series; it does not restore the graph to its condition prior to the last edit. Undo is largely unavailable for manipulating data. A spokesperson for Cricket Software says that a standard implementation of the Undo command would have added 100K to the program's code and would have contributed to the program's memory overhead, prohibiting its use with *MacDraw* in *Switcher* on a 512K Macintosh.

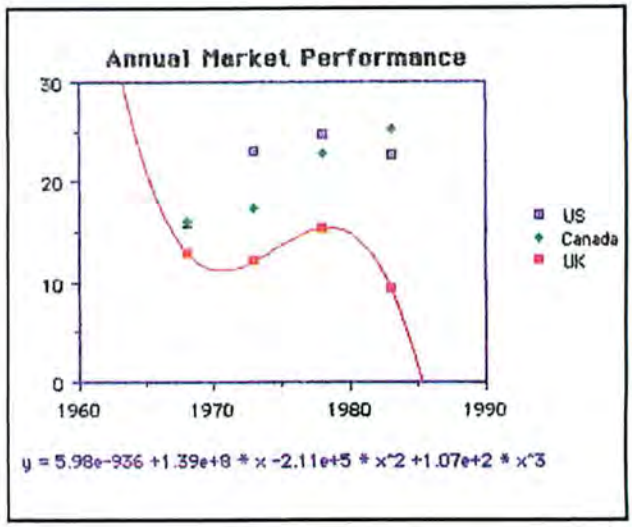


Figure 1
This scatter chart fits a curve through one series of data.

Error Bars

Cricket Graph lets you add error bars to graphs (see Figure 3). Error bars indicate the error associated with a measurement and are often used in technical reports. In judging scientific data, error limits are often as crucial as the results. The validity of most scientific experiments requires the consideration of instrument errors, measurement errors, and calibration errors. Some advanced business applications also evaluate the margin for error, especially when making financial projections where the possible range of future performance is often adjusted in light of past performance. You can present horizontal error bars on bar, scatter, and line graphs; you can add vertical error bars to column, scatter, and line graphs.

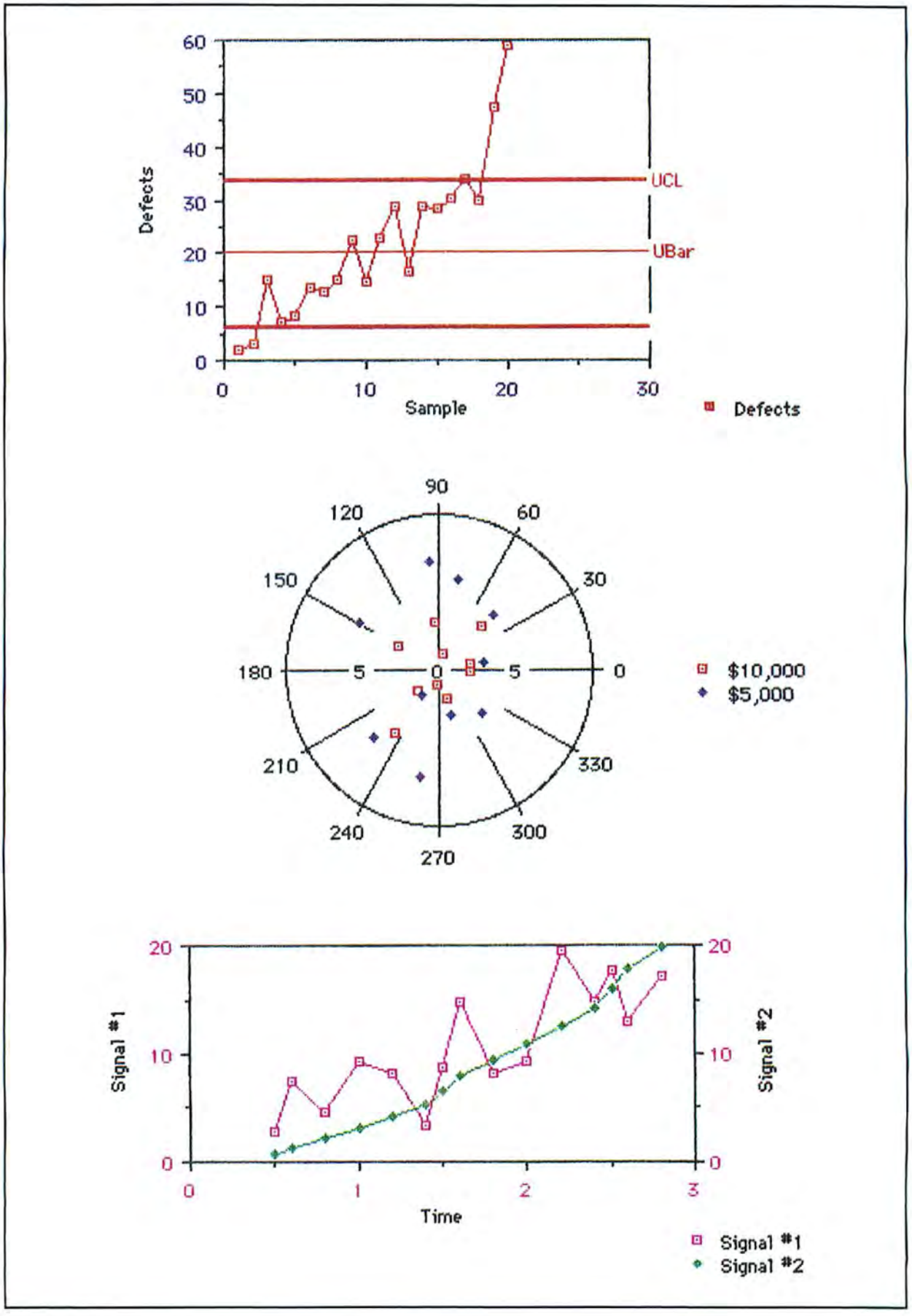
In early versions of the program, a bug prohibits selection of the specific column in the data window in which the error bars appear if the column number is greater than seven. If you have a version of *Cricket Graph* dated earlier than February 13, 1986, write to Cricket Software for the updated version, 1.0B.

Lost Windows

Cricket Graph allows multiple data and graph windows on the screen at the same time, so you can produce comparison graphs from different data windows without copying the data into a single data window. The maximum number of windows is limited only by memory. However, the way *Cricket Graph* implements windows creates problems. The program fails to prompt you to save an unsaved window containing a graph, and if you close an unsaved chart window, it's completely lost. The original data still resides in the data window, but if you make substantial format changes and forget to save them, the problem can be quite annoying. Creating stored formats for complex graph enhancements helps you reconstruct graphs you've forgotten to save before closing.

(continues on page 99)

Figure 2
Production supervisors and business managers use quality control charts (top) to define and track management goals. Polar graphs (middle) use a polar coordinate system for applications such as showing occurrences of damage at various distances from an earthquake's epicenter. Double y charts (bottom) represent two sets of data that have different scales but depend on the same x variable.



(continued from page 97)

Unlike *Chart, Jazz,* and *Excel, Cricket Graph* doesn't provide a dynamic link between charts and the data used to create them; changing data does not modify the graphs. The only way to incorporate changes is to make another chart. You can work around this problem by creating a format file that re-creates the original graph using the updated data.

The way the program names and controls windows is also confusing. Graphs are all named "untitled," making it difficult to identify the data used to create a specific graph. When you create new windows, they overlap and conceal other windows. These problems would have been overcome if the program named windows and listed them in a menu. Get into the habit of naming and arranging charts so that you can find and identify them. A public domain desk accessory called *Windows* provides a modicum of window organization by listing named windows in a menu.

Color Prints, Plots, and Slides

A chart's ultimate success rests on its visual impact during presentation. Consequently, powerful graphics software should take maximum advantage of high-resolution printing and other advanced output features. *Cricket Graph* provides more printing features and controls a broader range of output devices than competing chart programs. Plotters and high-resolution printers like the LaserWriter take advantage of the object-oriented files created by *Cricket Graph* to produce high-resolution graphics superior to screen resolution. *Microsoft Chart* cannot print scatter and line charts properly on the LaserWriter. *Excel* and *Jazz* both work well with the LaserWriter but can't print in color on the ImageWriter II. *Cricket Graph* lets you print charts in color on an ImageWriter II without requiring extra software. You can assign up to eight colors to nearly any section of a chart. By combining color with the program's 16 fill patterns you can produce 128 fill variations. You can also produce color plots on the Apple plotter and the Hewlett-Packard 7470, 7475, 7550, and Color Pro plotters by assigning pen colors in the Plot Setup dialog box. *Cricket Graph* can't always create fill patterns for HP plotters, so if you are interested in these features, you should investigate further. The company is developing drivers for specific plotters but does not anticipate supporting all plotters. Custom versions of the program let you produce high-resolution color slides with film recorders sold by companies such as Dunn Instruments, Lasergraphics, and Matrix Instruments (see Figure 4). Custom versions are also available for 13 color printers including impact, ink-jet, laser thermal, and electrostatic printers.

(continues on page 100)

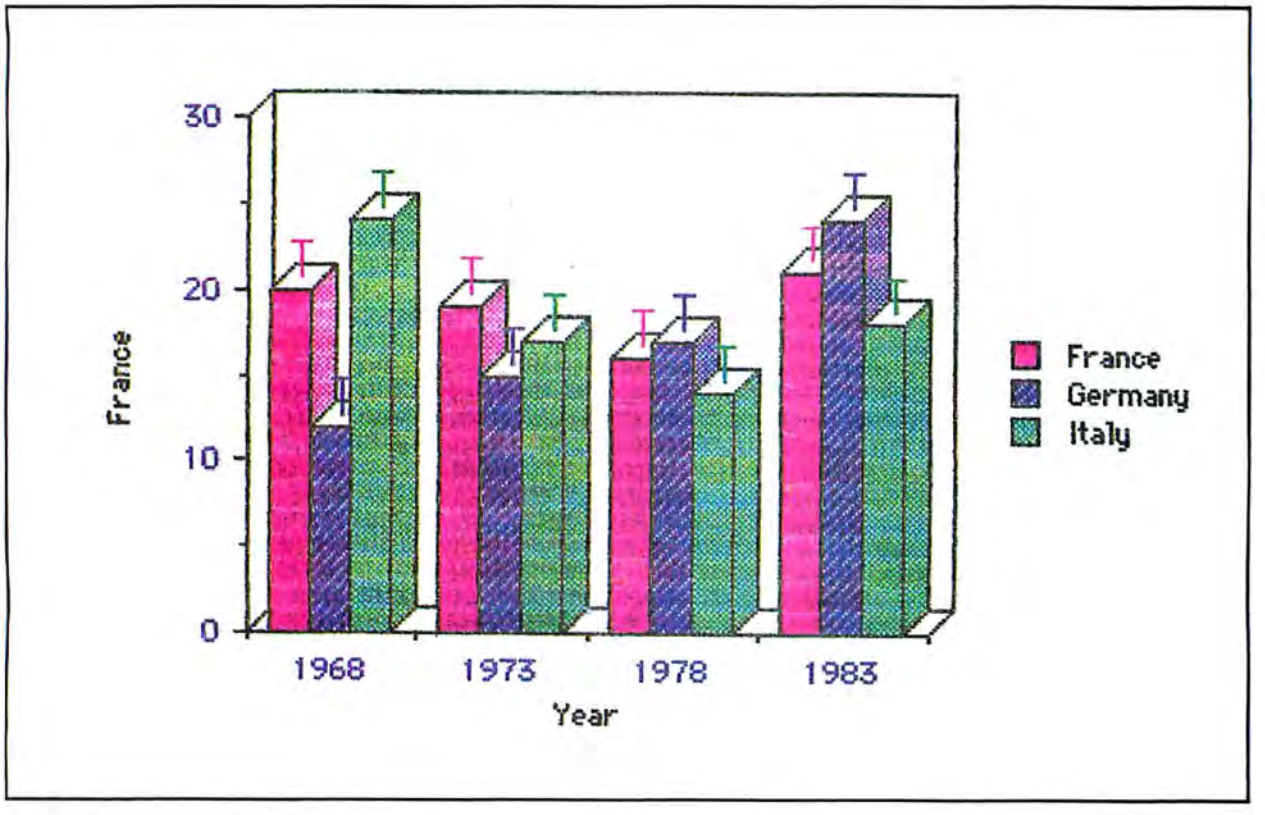


Figure 3
The T-shaped extensions at the top of each column are error bars. On column and bar charts, error bars indicate half the margin of error. Line and scatter charts show the full margin of error with double bars. Note the use of depth on the bar chart.

Technical Reference

Cricket Graph was one of the first programs optimized for the Macintosh Plus, and tests uncovered no apparent problems with the Hierarchical File System. The program requires a 512K Macintosh with two disk drives. It needs a minimum of 192K in *Switcher* but works better with about 256K. The program is not copy protected. Documentation is well written and complete and includes several appendixes for help with *Switcher, MacDraw,* and data transfer—it even gives Pascal programs for converting data formats. There is no on-line help facility, but Cricket Software provides free phone support and answers inquiries on MCI Mail, CompuServe, and AppleLink.

System Slipups

The only noticeable technical problems seem to result from bugs present in Finder 5.1 and System 3.0. For example, *Cricket Graph* occasionally stops printing in color midway through a document and prints the remainder of the document in black. Early versions of *Cricket Graph* were shipped with problematic versions of the Finder and System, and Cricket Software recommends the use of Finder 4.1 and an earlier version of the System file until Apple corrects the bugs. A spokesperson for Cricket Software said that Apple was aware of the problems and plans to correct them in upcoming versions of the Finder.

Undocumented Features

There are several hidden features in the *Cricket Graph* versions dated later than February 13, 1986. Selecting variables in the dialog box for double *y*-axis graphs and holding down the Option key while pressing Return results in a double *y* scatter graph instead of a double *y* line graph. Responding to the dialog box for error bars by clicking the standard error option and then holding the Option key while pressing Return causes the program to use the standard deviation of the series rather than the standard error. While working with quality control graphs, responding to the variable selection dialog box by holding down the Option key and pressing Return lets you specify the values of the control limits of the graph.

(continued from page 99)

Exporting Charts and Page Layout

Cricket Graph works well with other programs. Because the color printing codes are embedded in chart documents, you can print graphs created by *Cricket Graph* in color on the ImageWriter II even when they are pasted into other programs such as *MacWrite, MacPublisher II,* and *Microsoft Word.* You can save charts in PICT file format so that you can open them with programs such as *MacPublisher II, PageMaker, MacDraw,* and *MacDraft.* Sending charts to *MacDraft,* for example, lets you take advantage of sophisticated drawing-program features such as single-degree rotations, polygons, circles, and precise measurements to further enhance a graph's visual appearance. *Cricket Graph* also includes a unique multiple-graph page-layout capability (see Figure 5). When you select the print command, the graph in the frontmost chart window automatically appears on a screen image of the page, and any other open chart windows move to a border area. You can move, resize, overlay, and otherwise position up to ten graphs on a single page for printing or plotting. Unfortunately, when you resize graphs in the page-layout window, fonts aren't rescaled when you print documents, even though the text is resized on screen.

Taking the Throne

Cricket Graph takes the high ground of presentation graphics software by providing more value than *Microsoft Chart,* the principal competing stand-alone chart application, at the same price. If you already own *Chart, Excel,* or *Jazz* and you produce charts only occasionally, you probably don't need *Cricket Graph.* But owners of *Chart* and *Excel* should consider *Cricket Graph* as a worthy supplement if they have advanced charting requirements. Anyone who wants to produce color graphs on the ImageWriter II or other color output devices should also consider *Cricket Graph.*

Combined with its color capability, the program's page-layout features and compatibility with *MacDraw,*

MacDraft, and some page-makeup programs make it valuable to desktop publishers. *Cricket Graph* is an excellent choice for scientists and engineers who need advanced mathematical and data-handling capabilities, specialized graphs, and features such as error bars. Like most successful programs, *Cricket Graph*'s acceptance can ultimately be attributed to an accurate assessment of the specialized computing requirements of a silent but significant group of users. In *Cricket Graph*'s case, it was scientists, engineers, and advanced business users who collectively took the role of kingmaker. □

Prasad Kaipa is president of MacWiz consulting and an Assistant Professor at the University of Utah; Adrian Mello is an Associate Editor of Macworld.

Cricket Graph, version 1.0A
Cricket Software
3508 Market St. #206
Philadelphia, PA 19104
215/387-7955
List price: $195, customized versions for film recorders and specialized printers $495

Dunn Color Macintosh System
Dunn Instruments, Inc.
544 Second St.
San Francisco, CA 94107
415/957-1600
List price: $13,000

Lasergraphics MPS-2000
Lasergraphics, Inc.
17671 Cowan Ave.
Irvine, CA 92714
714/660-9497
List price: $6995

Matrix PCR
Matrix Computer Graphics
1 Ramland Rd.
Orangeburg, NY 10962
914/365-0190
List price: $11,795

Windows desk accessory
Written by Marsh Gosnell
Public domain
Available on CompuServe and from many user groups. If you decide to keep the software, send $5 to the author.

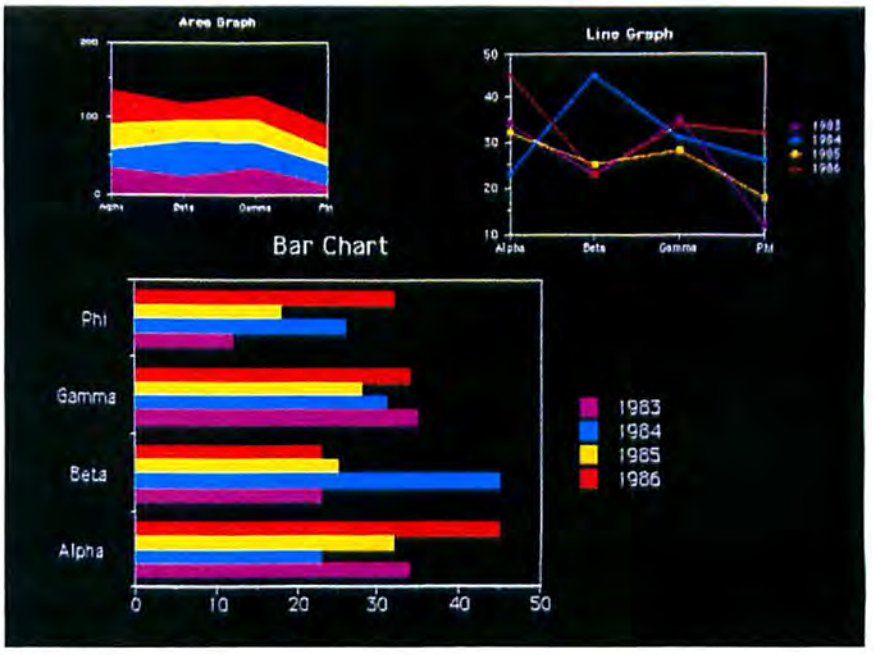


Figure 4
A customized version of Cricket Graph *produces high-resolution color slides on film recorders marketed by companies such as Dunn Instruments.*

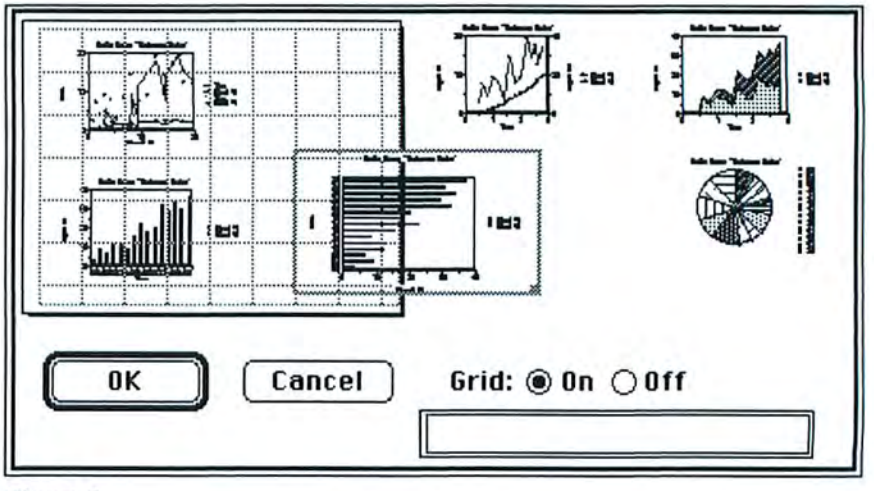


Figure 5
A page-layout feature lets you position several graphs on the same page without cutting and pasting. You can move and resize the individual graphs.

Letter-Perfect Documents

Walter C. Burns

A comparison of eight Macintosh spelling checkers

A spelling mistake in a business letter can be embarrassing. A typographical error in a legal document can be disastrous. No matter how carefully you proofread a document on the Mac's screen, errors have a way of turning up on the printed copy. Correcting and reprinting a document is a time-consuming task. A spelling checker catches errors the first time around, sparing you trips to the dictionary or the printer.

Neither *MacWrite* nor *Microsoft Word* comes equipped with a method to check for spelling errors or typos. To fill this void, numerous spelling checkers have appeared. This diversity of programs allows writers to select checkers that suit their individual work habits and needs. But choosing among the many spelling checkers now available can be confusing, because no two are alike (see "A Spelling Checklist"). Some spelling checkers work as desk accessories, while others exist as stand-alone applications. Some checkers review a document or a block of text after it has been typed, while others are *interactive*—that is, they check your spelling as you type, flagging potential errors as they occur.

A spelling checker reads individual words, blocks of text, or entire documents and attempts to match each word with the words in its dictionary. If it finds no match, it flags the word as a possible misspelling. You then have the choice of correcting the suspect word (either by typing in the correct word or accepting an alternative spelling offered by the spelling checker), ignoring the word, or adding it to one or more dictionaries. All the spelling checkers tested here allow you to add words that don't appear in the program's standard dictionary. However, some programs add these words to the main dictionary, while others allow you to create numerous custom, or "document," dictionaries. These separate dictionaries prove especially useful to people who use technical or specialized terminology.

The size of the dictionary shouldn't be your only consideration when purchasing a spelling checker. Checkers with large dictionaries catch more misspelled words but are generally slower than checkers with small dictionaries and may exceed the memory capabilities of some systems. Small dictionaries take up less space but may identify correctly spelled words as misspellings.

Dictionary sizes advertised by manufacturers can be misleading. Some manufacturers count only root words (for example, *plain*), while others include variations of root words in their counts (*plains, plainly*). The type of words included in a dictionary differs from program to program: some dictionaries omit common words and include esoteric ones; others flag contractions or plurals as errors. The true test of a dictionary's usefulness is how many incorrect spellings it identifies—and how few correct words it flags as misspellings.

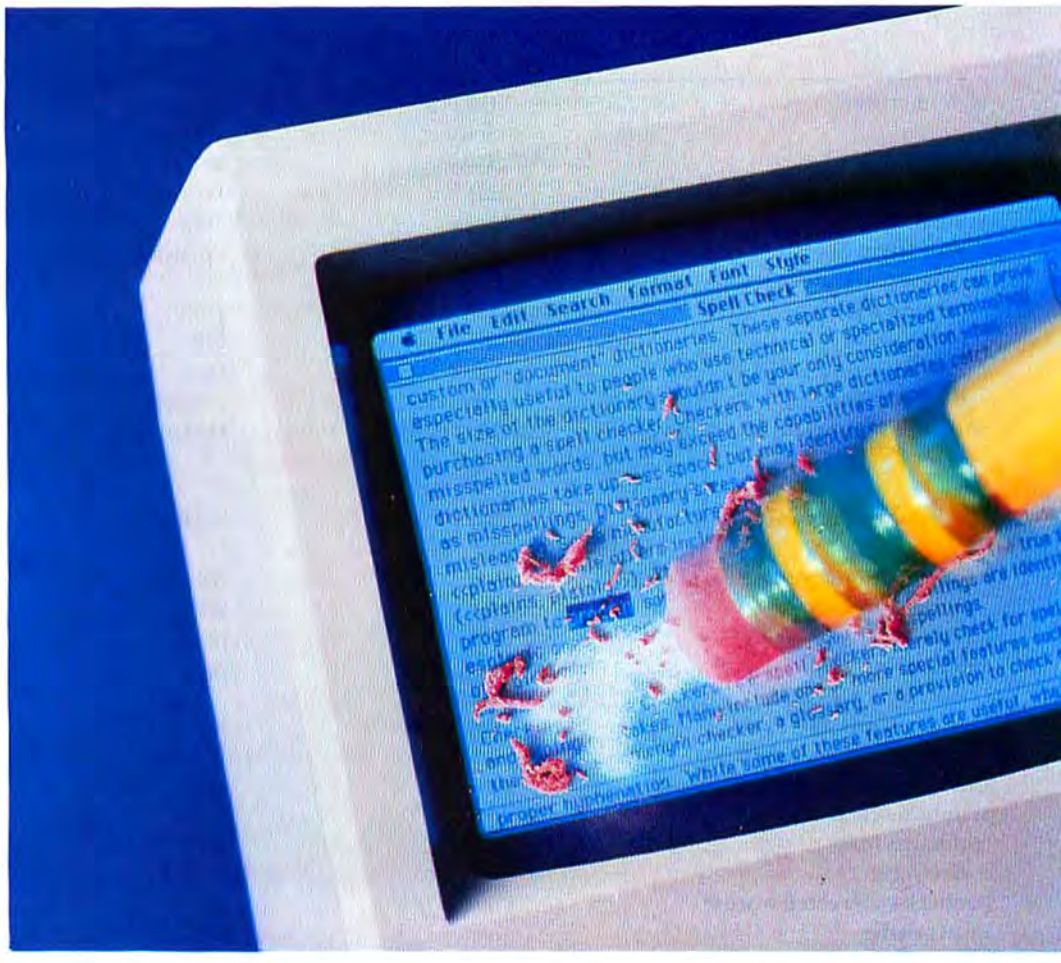
Checking Out the Checkers

Few spelling checkers merely check for spelling and typing mistakes. Many include one or more special features such as a thesaurus, a homonym checker, a glossary, or a provision to check for proper hyphenation. While some of these features are useful, what's most important in a spelling checker is how well, and how fast, it catches misspelled words.

Seeking the ultimate in error eradication technology, I created a 700-word document containing 25 intentional misspellings and typos. I compared each spelling checker's ability to identify these errors and offer the correct spellings (see "Performance Test"). While the performance test yields no clear-cut winner, it does point out the comparative strengths and weaknesses of each program.

Two of the spelling checkers reviewed—*Liberty Spell-Checker* and *MacLightning*—work interactively. You install these checkers as desk accessories in a word processor or other program and activate them while you're typing a document. As you type, the Mac beeps each time you enter a suspicious spelling. Interactive spelling checkers are not for everybody. Writers who compose at the keyboard may find this method distracting; the intermittent beeps can break a train of thought. Fast touch-typists may discover that looking at a word each time the Mac beeps interrupts

the rhythm of their typing. Therefore, both programs give you the option of turning off the interactive mode and checking a document or a block of text after you type it. This method is only marginally effective, however. Although these programs list spelling mistakes and suggest corrections, they don't display mistakes in context, forcing you to search the document to correct the misspelled words.



Liberty Spell-Checker

Liberty Spell-Checker is fast, identifying errors almost instantaneously. Beyond that, however, the program has problems. First, *Liberty Spell* uses a laborious cut-and-paste routine to insert corrected words into the text, negating its impressive speed. When a spelling error is flagged, you must copy the correct word from the program's dictionary into the Clipboard and then paste it into the document. Second, in the interactive mode the program displays a dialog box each time you type a word that is not in its dictionary, forcing you to click a button to continue typing. As if this weren't frustrating enough, *Liberty Spell-Checker* flags numerous correctly spelled words. Finally, the program does not conform to the surrounding font, size, or style of type when you paste a word from its dictionary into your text, nor does a word maintain its capitalization.

Liberty Spell-Checker's pluses include its relatively low price tag and the ease with which you can add words to and delete words from its dictionaries. However, these assets don't begin to compensate for the program's shortcomings.

MacLightning

MacLightning is by far the better of the two interactive programs. While initially not quite as fast as *Liberty Spell-Checker,* it gets faster as you go along. This is because the program remembers any word you use more than five times and stores that word in RAM, along with 5000 of the most commonly used words in its dictionary.

MacLightning also features several *hot keys,* or keyboard shortcuts, which allow you to rapidly identify and correct errors in the interactive mode (⌘-2, for example, pastes a word from the dictionary into a document). Unlike *Liberty Spell-Checker, MacLightning* merely beeps when you type a word that is not in its dictionary, rather than halting the typing process at each suspected error. You can either make the correction on the spot or wait until you get your thought down in writing.

Currently, *MacLightning* has a rather limited dictionary, so it beeps at you quite a lot. An expanded version and a thesaurus will soon be available as modular add-ons and should help alleviate the problem. Like *Liberty Spell-Checker, MacLightning* is less efficient when checking an entire doc-

(continues on page 105)

A Spelling Checklist

	Liberty Spell-Checker	MacLightning	Hayden:Speller	MacGAS
Manufacturer	DataPak Software	Target Software	Hayden Software	EnterSet
List price	$59.95	$99.95	$79.95	$99
Version tested	2.0	1.0	1.2c	1.0
System requirements	512K	512K, ext. drive	128K	512K, ext. drive
Disk space required				
Dictionary	91K	173K	55K	123K/271K[1]
Application	8K	24K	47K	—
Application or desk accessory	Desk accessory	Desk accessory	Application	Desk accessory
Software supported	Most programs	Most programs	MacWrite, Word, text docs.[3]	MacWrite, Word, Jazz, text docs.[3]
Dictionary size (# words)	34,000	31,000	22,000	25,000/80,000
Allows dictionary scan[4]	yes	yes	yes	yes
Separate dictionaries[5]	yes	yes	yes	yes
Modifiable dictionaries[6]	yes	yes	yes	yes
Interactive spell checking[7]	yes	yes	no	no
Suspect words presented in context	no	yes	yes	yes
Checks contractions	yes	yes	no	yes
Maintains capitalization	no	yes	yes	yes
Maintains font/ size/style	no	yes	yes	yes
Rechecks corrected words[8]	no	no	yes	no
Reads entire document before corrections entered[9]	no	no	yes	no
Special features	—	—	—	Two dictionaries

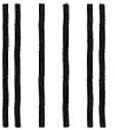
[1] *MacGAS, Mac Spell Right,* and *The Right Word* provide two separate dictionaries, each requiring different amounts of disk space. *Mac Spell Right*'s dictionary/thesaurus requires a 512K Mac. In some cases, the application and the dictionary reside in the same file.

[2] *Mac Spell Right* works within *MacWrite* to create a separate menu called Spell.

[3] Most spelling checkers are capable of reading text from other programs. However, when working with such programs, all features of the checker may not be functional.

[4] Many spelling checkers allow you to scan their dictionaries to look up words. For the most part, such programs display the appropriate page of the dictionary when a suspect word is encountered; you must search the page to find the proper spelling.

[5] Document, or custom, dictionaries allow you to build one or more personalized dictionaries for specific documents. Document dictionaries are useful for documents containing a large number of technical terms. Such dictionaries are small, taking up far less space than the main dictionary.



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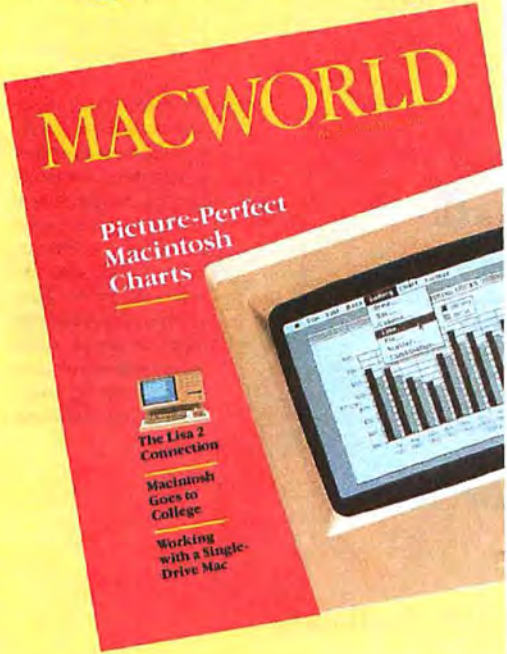

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4A5H2

(continued from page 103)

MacSpell +	Mac Spell Right	The Right Word	Spellswell
Creighton Development	Assimilation	Assimilation	Greene, Johnson
$99	$89	$89	$59.95
1.10	Revised	3.0	1.2
512K, ext. drive	128K, ext. drive[1]	128K, ext. drive	128K, ext. drive
399K	99K/193K[1]	61K/94K[1]	191K
32K	—	32K/33K	60K
Desk accessory	Application[2]	Application	Application
MacWrite, Word, text docs.[3]	MacWrite, text docs.[3]	MacWrite, Word, Jazz, text docs.[3]	MacWrite, Word, ThinkTank, text docs.[3]
75,000	40,000	40,000/ 200,000	60,000
no	yes	yes	yes
no	yes	yes	yes
no	yes	yes	yes
no	no	no	no
yes	yes	yes	yes
no	yes	yes	yes
yes	yes	yes	yes
yes	yes	yes	yes
yes	no	no	no
no	no	no	yes
Thesaurus, hyphenation helper	Thesaurus	Two dictionaries, homonym checker	Homonym checker

[6] Modifiable dictionaries allow you to delete as well as add words.

[7] Interactive spelling checkers check your spelling as you type. While both of the interactive programs tested also allow you to check the spelling of an entire document or block of text after it is typed, neither is efficient in this mode.

[8] A few spelling checkers will, either automatically or on demand, check the spelling of the corrections you type. This ensures that you do not "correct" a misspelling by misspelling it another way.

[9] Some spelling checkers scan an entire document and identify suspect words before letting you input corrections, while others require that you sit by while the program searches for each suspect word. The latter option is time-consuming when you are checking large documents.

ument or block of text, as there is no provision for quickly inserting corrections into a document.

The rest of the spelling checkers described here scan a document or a section of text after it has been typed, displaying suspect words in context and letting you correct or ignore them as appropriate.

Hayden:Speller

Compared to the other programs tested, *Hayden:Speller* is neither particularly fast nor particularly effective. Because of its small dictionary (22,000 words), many correctly spelled words are flagged as possible misspellings, slowing down the checking process considerably. In addition, you may waste a good deal of time trying to determine if a suspect word is indeed misspelled or if it is merely not included in the dictionary.

Hayden:Speller's main advantage is that its dictionary takes up comparatively little disk space and can therefore be used on a 128K Mac with a single drive.

MacGAS

MacGAS (Glossary and Spellchecker) is both effective and flexible. Installed as a desk accessory, *MacGAS* has two dictionaries to choose from. The 25,000-word dictionary does an adequate job of flagging errors and is probably appropriate for most tasks. The 80,000-word dictionary requires more disk space (and calls for the eviction of some files, fonts, and desk accessories) but increases the accuracy of the checking process. Whichever dictionary you select, *MacGAS* is fast, straightforward, and easy to use.

MacGAS includes an outstanding "glossary" feature that allows you to build a table of abbreviations for frequently used terms or phrases. When you type the abbreviation, the program automatically enters the expanded text into your document. In addition, a predefined series of keystrokes enters either the time of day or the date into your document. *MacGAS*'s glossary is a real time saver—by far the most useful of the special features found among the eight spelling checkers reviewed.

Performance Test

	Hayden: Speller	Liberty Spell-Checker	MacGAS (standard)	MacGAS++
Suspect words identified	57	60	43	28
Errors correctly identified (out of 25)	23	24	23	23
Words incorrectly identified as errors	34	36	20	5

MacSpell+

MacSpell+ operates as a desk accessory, with its massive 75,000-word dictionary residing on a separate disk. The dictionary takes up 399K of disk space and is therefore inappropriate for users with a single-drive system. Because of its large dictionary, *MacSpell+* is extremely efficient at catching spelling errors and seldom flags a correctly spelled word (it has been known to offer misspelled alternatives to correctly spelled words, however). The program does a good job of offering corrected spellings, which is important because *MacSpell+* doesn't allow you to access its dictionary. *MacSpell+* is the only spelling checker reviewed that doesn't allow you to delete words from its dictionary; however, a utility program, available at extra cost, allows you to do so.

Mac Spell Right

Mac Spell Right installs itself in *MacWrite,* creating a separate menu called Spell. Since it works within *MacWrite,* the program is the fastest of the noninteractive spelling checkers tested. *Mac Spell Right* is easy to use, as it finds and corrects errors in a manner similar to *MacWrite*'s Search function. The program does an outstanding job of matching the correct spelling with a misspelled word; in this respect it is by far the best of the eight programs tested.

Mac Spell Right's dictionary is large enough to be effective but small enough to allow the program to work on a 128K, single-drive system, although you have to remove a few files and desk accessories from your word processing disk. (The thesaurus function does not work on a 128K Mac.)

Mac Spell Right's major shortcoming is that it works only with *MacWrite;* users of *Microsoft Word* must make another selection.

The Right Word

The Right Word gives you a choice of two dictionaries. The smaller, 40,000-word dictionary is adequate for most needs. The larger, "utility" dictionary (*The Right Word XL*) contains an amazing 200,000 words and catches just about any spelling error you throw at it. When you use the larger dictionary, however, the program can't look up correct spellings; you have to perform that task yourself. Unless you're a spelling champ, this slows down the correction process. In addition, because the utility dictionary is so large, the program takes longer to determine whether an individual word is correctly spelled.

Like *Mac Spell Right, The Right Word* works on a 128K, single-drive system if you throw away a few files and accessories. The utility dictionary, however, requires a 512K Mac.

Spellswell

Spellswell is the least expensive of the noninteractive spelling checkers tested, and it is a good value for the money. The program performs on a par with some of its more costly competitors, and in some cases its performance is superior. The program's speed is adequate, and while it sometimes flags a correctly spelled word, it does so less often than some of the other checkers.

Spellswell reads an entire document before asking you to make corrections, which makes it an appropriate choice for reviewing large documents (it can't scan large documents on a 128K Mac, however). *Spellswell* offers a unique feature: when you add a word to the custom dictionary, the program offers a number of suffixes and allows you to automatically add several variations of the word.

Choosing a Checker

You should base your selection of a spelling checker on your particular needs. Don't make a choice based on the add-on features that a package offers. Features such as hyphenation helpers (*MacSpell+*) and homonym checkers (*Spellswell, The Right Word*) are attractive but hardly essential. Built-in thesauri may sound like a good idea, but none of those tested (*MacGAS, MacSpell+, Mac Spell Right*) offer much improvement over paging through a copy of *Roget's.* Even *MacGAS*'s excellent glossary feature is not, in itself, enough to justify the program's purchase if its document-checking capabilities don't suit your needs.

Your writing style should determine which spelling checker you prefer. For example, if you frequently create long documents (over 20 pages), you may want to

MacLightning	MacSpell+	Mac Spell Right	The Right Word	The Right Word XL	Spellswell
49	25	29	32	26	35
24	23	24	24	25	24
25	2	5	8	1	11

Performance Test
Each of the eight spelling checkers was given the task of reviewing a 700-word document containing 25 spelling and typing errors. The top row of numbers shows the number of times the checking process was interrupted; the following numbers indicate how many of the interruptions were justified.

avoid checkers like *MacSpell+*, *Mac Spell Right*, and *MacGAS*, which require that you sit patiently at your Mac while the program searches for each suspect word. Programs that scan the entire document and then present a list of possible mistakes make more sense for long documents.

If accuracy is your most important consideration, *MacSpell+*, *Mac Spell Right*, and *The Right Word* rate the highest scores. If speed is your goal, *Mac Spell Right* and *MacGAS* are probably your best bets. If you're concerned with speed and you like the idea of a program that checks your spelling as you type, you can choose between *MacLightning* and *Liberty Spell-Checker* (I suggest you choose *MacLightning*). However, if you like to pound out copy without interruptions, you should avoid these interactive programs.

System considerations may narrow your choices. A 128K Mac limits your options to *Hayden:Speller*, *The Right Word*, *Mac Spell Right*, or *Spellswell* (the last three are the most effective). If you use *Microsoft Word*, eliminate *Mac Spell Right* from your shopping list.

Finally, upgrades for many of the programs are currently in the works, so you should check to see what enhancements have been made before you make your buying decision. □

Walter C. Burns is a free-lance writer based in San Francisco.

Check One

Liberty Spell-Checker
DataPak Software, Inc.
14011 Ventura Blvd. #402
Sherman Oaks, CA 91423
818/905-6419
List price: $59.95

MacLightning
Target Software Inc.
14206 S.W. 136th St.
Miami, FL 33186
800/622-5483, 305/252-0892 in Florida
List price: $99.95

Hayden:Speller
Hayden Software Co., Inc.
650 Suffolk St.
Lowell, MA 01854
617/937-0200
List price: $79.95

MacGAS
EnterSet, Inc.
410 Townsend St. #408
San Francisco, CA 94107
800/621-0851, 415/543-7644 in California
List price: $99

MacSpell+
Creighton Development, Inc.
16 Hughes St. #C106
Irvine, CA 92718
714/472-0488
List price: $99

Mac Spell Right, The Right Word
Assimilation, Inc.
485 Alberto Way
Los Gatos, CA 95030
800/622-5464, 800/421-0243 in California
List price: Mac Spell Right $89, The Right Word $89

Spellswell
Greene, Johnson Inc.
15 Via Chualar
Monterey, CA 93940
800/331-4321, 800/851-1986 in California
List price: $59.95

A New Angle on Integration

Gordon McComb

Executive Office is a personal file clerk with a word processor, a forms generator, and a spreadsheet

Despite its often melodic names–like *Jazz, Ensemble, Quartet,* and *Harmony*–integrated software for the Macintosh hasn't exactly been music to the ears of Mac owners. One new program designed as an all-in-one solution is *Executive Office,* from DataPak Software. *Executive Office* is billed as a "complete integrated management system." Although the program is integrated, perhaps more smoothly than most other multifunction applications, it isn't complete. *Executive Office* opens a lot of office doors, but the portals may be too small for you to fit through.

Like *Jazz, Executive Office* opens to its own desktop. Instead of seeing several small icons for the program's individual applications, you see an immense, three-dimensional icon representing a file cabinet (see Figure 1). The cabinet holds a variety of documents created with the program's built-in word processor, forms generator, and spreadsheet.

The modules are bantam weight designed for people new to computers. The program's strength doesn't come from the muscle of its integrated modules, as is the case with *Jazz* and *Excel,* but from the way the file manager manipulates the documents created by all the modules.

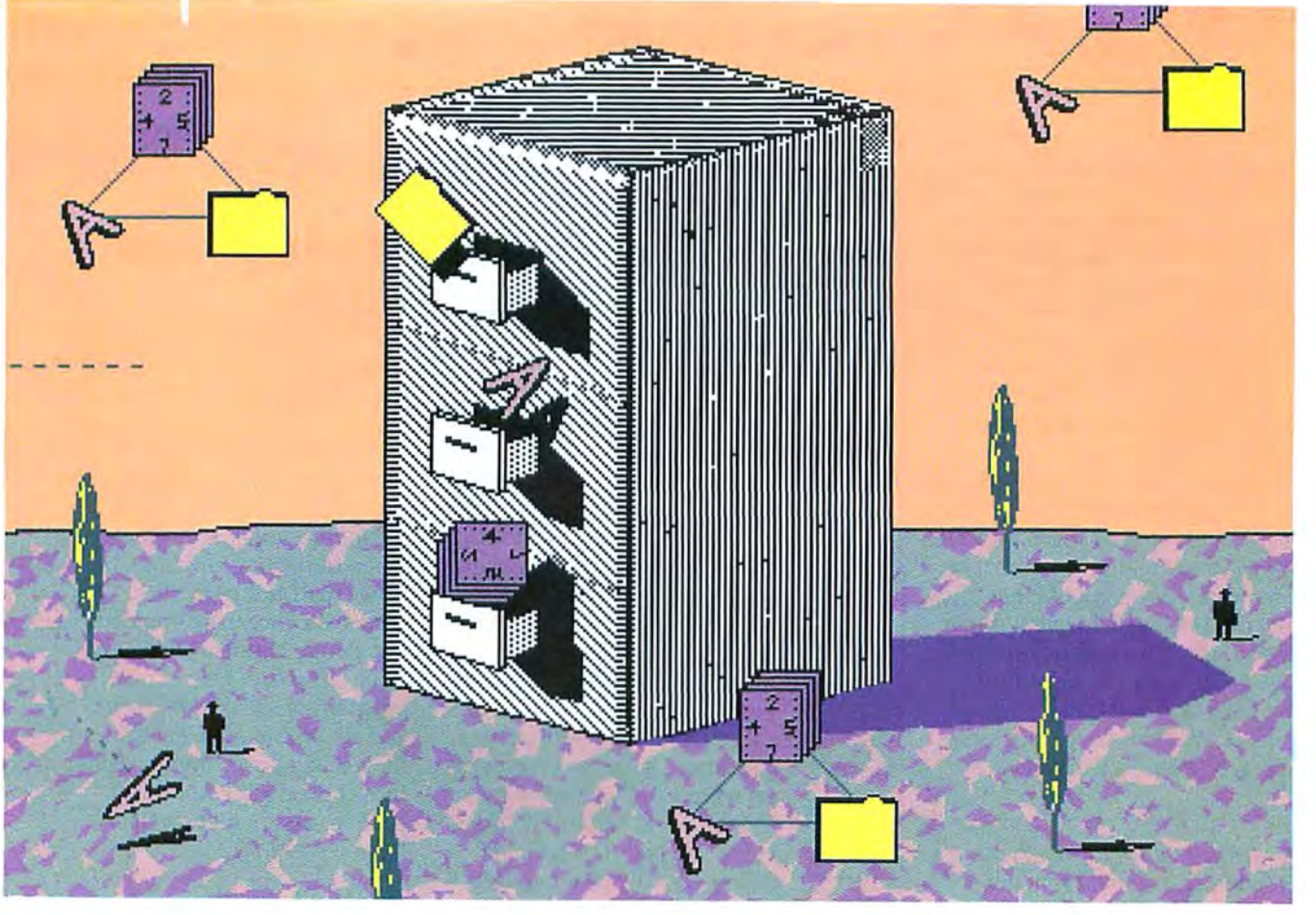
Beneath the file cabinet are four icons: stock, copier, archives, and trash. The stock icon opens up to a selection of presized documents. You can print documents by dragging them to the copier icon, which opens to reveal a printer control panel modeled after a Xerox 9500 copier. The archives icon lets you make room for new documents by storing older documents in an archive utility.

Drawers Full of Folders

The heart of *Executive Office* is a file manager that looks and behaves as a three-drawer file cabinet does. Representing a data manager with a file cabinet isn't a new idea, but it provides a familiar work setting and overall flexibility. Each of the cabinet's three drawers holds any number of records, called folders, up to the capacity of the disk. When a drawer is open, you see the top portion of the folders and the names you've given them. An open drawer shows up to eight folders at once; you scroll through additional folders by pressing the up and down arrows on the front of the drawer.

The folders are designed to represent individuals or companies. You create different types of documents with the program's various modules, but you keep them organized by subject by storing them in the company's or individual's folder. This is one of the program's best features. Few other Macintosh applications make document storage and retrieval as easy. A note written to one of your clients, for instance, can be dropped into that client's folder. To get the note, you open the folder and select the document from the directory that appears on the screen. You can edit the note, print it, or throw it away.

You fill in information about the person or the business in a summary sheet, which you open by double-clicking on a folder. There are four styles of summary sheets, though the only real differences



among them are the organization and size of the fields. You can change the headings of the fields, if you like, but you can't change the appearance of the sheet.

Sorting and Searching

Folders are sorted within each drawer alphabetically or numerically, depending on the sort field you've selected. Unless you specify otherwise, folders are initially sorted on the name field. Unfortunately, you can't change the sort order of the folders all at once. You must change the sort field for each folder, one at a time. This is a serious drawback if you want to fundamentally reorganize folders. For printing reports or viewing them on screen, you can sort folders and choose subsets of folders and documents.

You search for specific folders with the file index and the file clerk. The file index flips to an approximate folder location when you press an alphabet key, and the directory flips open to folder names that begin with that letter. The file clerk searches for all occurrences of names, addresses, or any other text string throughout a drawer, within folders, or within documents. The file clerk doesn't accept wild-card characters in searches, but it works exceptionally fast. A search through 500 folders took less than 4 seconds.

A document is stored by subject rather than by the application in which it was created.

New Documents from Stock

You create new documents by opening the stock icon at the bottom of the *Executive Office* desktop. This approach differs from most Mac programs, which create new documents by opening the module or application associated with the document. The Stock window contains seven presized documents ranging from a 2- by 3½-inch memo to a legal-size document. Other presized stock includes letter paper, index cards, wide paper, time cards, and worksheet paper. The Stock window also holds any forms you create in the program's form designer.

After you choose the type of stock you want to work with, a 3- by 5-inch index card for instance, double-clicking on it displays a presized, untitled word processing document. After entering information into the document, you save it to an open folder or to the Stock window. Although somewhat unorthodox, this approach reinforces the idea of storing documents first by subject rather than by the associated application.

Word Processor

The *Executive Office* word processor is a glorified text editor suited only for undemanding work. It's easy to learn and use but is incomplete, even compared to *MacWrite*. You can learn to write letters, memos, and reports with it in less than 5 minutes without looking at the manual. The word processor has basic features, including cutting, copying, pasting, selectable fonts, and adjustable margins (up to 15 inches wide), but it lacks important features, such as headers and footers, forced page breaks, and text searching.

This isn't to say that the word processor is completely without merit. Its ruler system is similar to *Microsoft Word*'s; you can change the ruler for one paragraph without affecting other paragraphs below.

You can print personalized form letters by merging text from the word processor with data stored in the file manager. The file manager can also create mailing labels by itself. You print labels one, two, or three across, and you can vary the spacing between labels (see Figure 2).

The word processor is RAM based, and during tests with *Switcher,* I was able to fill about 16 single-spaced pages without problem. Not surprisingly, it was then that the program began to run out of memory—causing the Macintosh to fail. Without *Switcher,* I produced 30 pages before—inexplicably—most of the document was lost, leaving me with just the first page. With or without *Switcher,* keep documents small until this problem is corrected.

Forms

The *Executive Office* form generator has a lot of hidden power and is better than some of the competing stand-alone form-making products. You can even use it as a limited desktop publishing aid. The forms are templates that can serve for everything from personal finance to inventory management. A checkbook template might include fields for entering check numbers, payees, and amounts. The template would automatically calculate the balance and deduct any check charges.

The forms generator has *MacPaint*-like drawing tools for creating a graphics backdrop for forms (see Figure 3). You can also add preexisting *MacPaint* pictures to forms via the Clipboard. Once the graphics are in place, you specify the size and the location of data entry fields. You simply drag the fields from a well onto the form, where you can stretch or shrink fields to any size you like. Fields are labeled alphabetically, and one form can contain up to 2600 fields (A0 to Z99). The only significant drawback to the forms generator is that it can't create multipart forms, only single-sheet forms up to 15 by 11 inches in size.

You can format fields for text or numbers and character length. The program checks for entry errors, so if you specify a five-character number field for zip code information, the program alerts you if you try to enter a nine-character zip code. You can also create calculated fields that perform simple math functions (add, subtract, multiply, and divide) on other fields in the form. Fields can also be lookup tables, like tax or equivalency tables, and they can refer to data from other forms and folders.

Technical Requirements and Data Transfer

Executive Office requires at least 512K of RAM and comes on a single 400K disk. Creating large databases or printing on the LaserWriter requires an 800K drive or an external drive. A 400K floppy disk can hold about 3000 folders, each containing roughly three letters, memos, or other average-size documents. The program works with *Switcher* and most desk accessories. You must allot a minimum of 256K under *Switcher.* The program is copy-protected, but you can copy it to floppy and hard disks provided you insert the original disk before the program fully loads. File cabinets are the equivalent of disk files; additional cabinets can reside on the same disk or on other disks.

Executive Office reads text files created by other Mac word processors, though you lose settings for fonts and rulers when importing anything other than *MacWrite* files. The spreadsheet can also import, but cannot export, SYLK (Symbolic Link) data files, created by programs such as *Multiplan* and *Excel.* Unfortunately, the file manager can't import data files created with other database managers such as *OverVue* or *FileMaker.*

The form generator is better than some stand-alone form-making products.

The Spreadsheet

The spreadsheet module is *Executive Office*'s weakest link. The worksheet measures only 5 columns by 72 rows. Based on customer research, DataPak decided that a large spreadsheet was unnecessary because most spreadsheets are less than 360 cells. Column widths can't be adjusted, and there is no provision for inserting columns or rows. The only math function is SUM; you must create formulas for other functions, such as averaging or counting. Even *ClickOn Worksheet,* an inexpensive spreadsheet desk accessory, has more features.

DataPak is quick to point out that the spreadsheet is not meant to replace *Excel, Jazz,* or *Multiplan* but is for creating small spreadsheets, like budgets or loan schedules. In its present state I don't think it has much use except as a simple scratch pad. A few additional features and a larger worksheet area would enhance the spreadsheet greatly.

Should You Buy?

Executive Office seems to have been written for beginners who don't require sophistication or power but who like to have their paperwork available at a mo-

ment's notice without learning complex commands. The program's chief asset is that it lets you file different types of documents by individual or company. The filing system works well as long as you don't have to reorganize it and you create only

Executive Office is for beginners who don't require much sophistication or power.

short documents like letters and memos. Aside from the forms generator, the modules are limited.

If you need a more powerful word processor, database manager, or spreadsheet, you'll be stifled by *Executive Office*'s limitations. To get the features you want, you'd have to supplement *Executive Office* with more powerful programs such as *Microsoft Word, Interlace,* or *Excel.* Adding programs, however, is not only expensive, it defeats the purpose of *Executive Office*'s scheme of centralized document storage. Unless you find the idea of storing and retrieving different types of documents from the same file overwhelmingly useful, you can do better by combining existing applications in *Switcher.* For the same price as *Executive Office,* you could combine the data management and form design strengths of *FileMaker* with *MacWrite* and install *ClickOn Worksheet* as a desk accessory to create a more powerful software setup. All-in-one software isn't for everybody, and *Executive Office* is no exception. □

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Executive Office, version 2.1
DataPak Software
14011 Ventura Blvd. #402
Sherman Oaks, CA 91423
818/905-6419
List price: $349.99

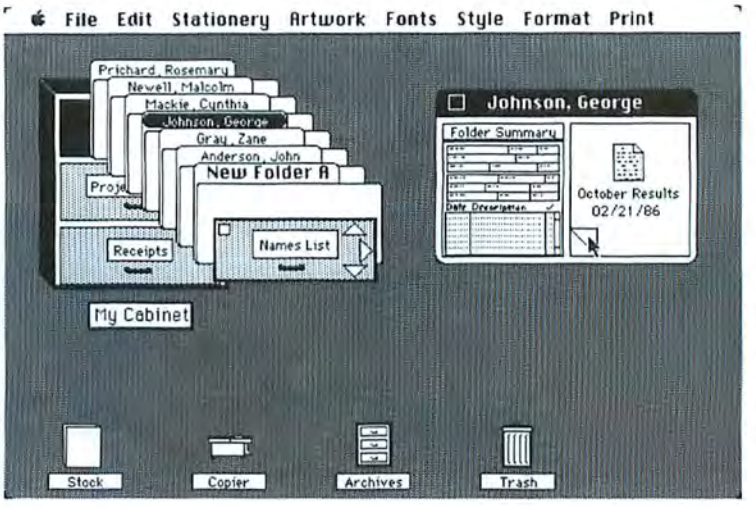


Figure 1
The Executive Office *desktop shows a single three-drawer file cabinet containing folders and documents created with the program. The summary sheet, shown to the right, expands to full size when you double-click on the sheet's name. Document templates are stored in the stock icon.*

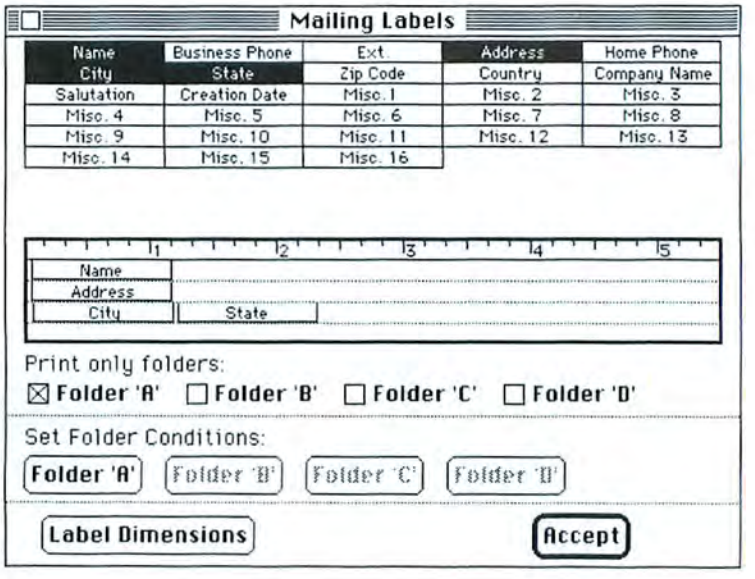


Figure 2
You generate mailing labels by dragging folder summary fields from the field listing to the ruled label bar beneath. In the background, the open stock icon lists documents in a window.

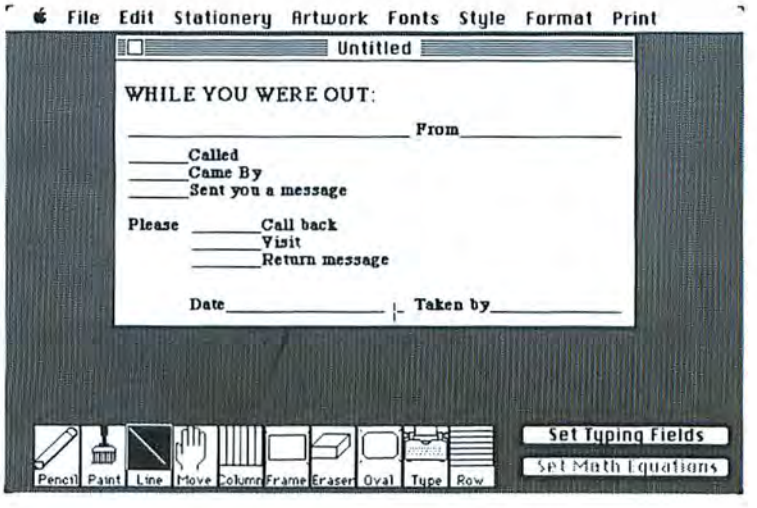
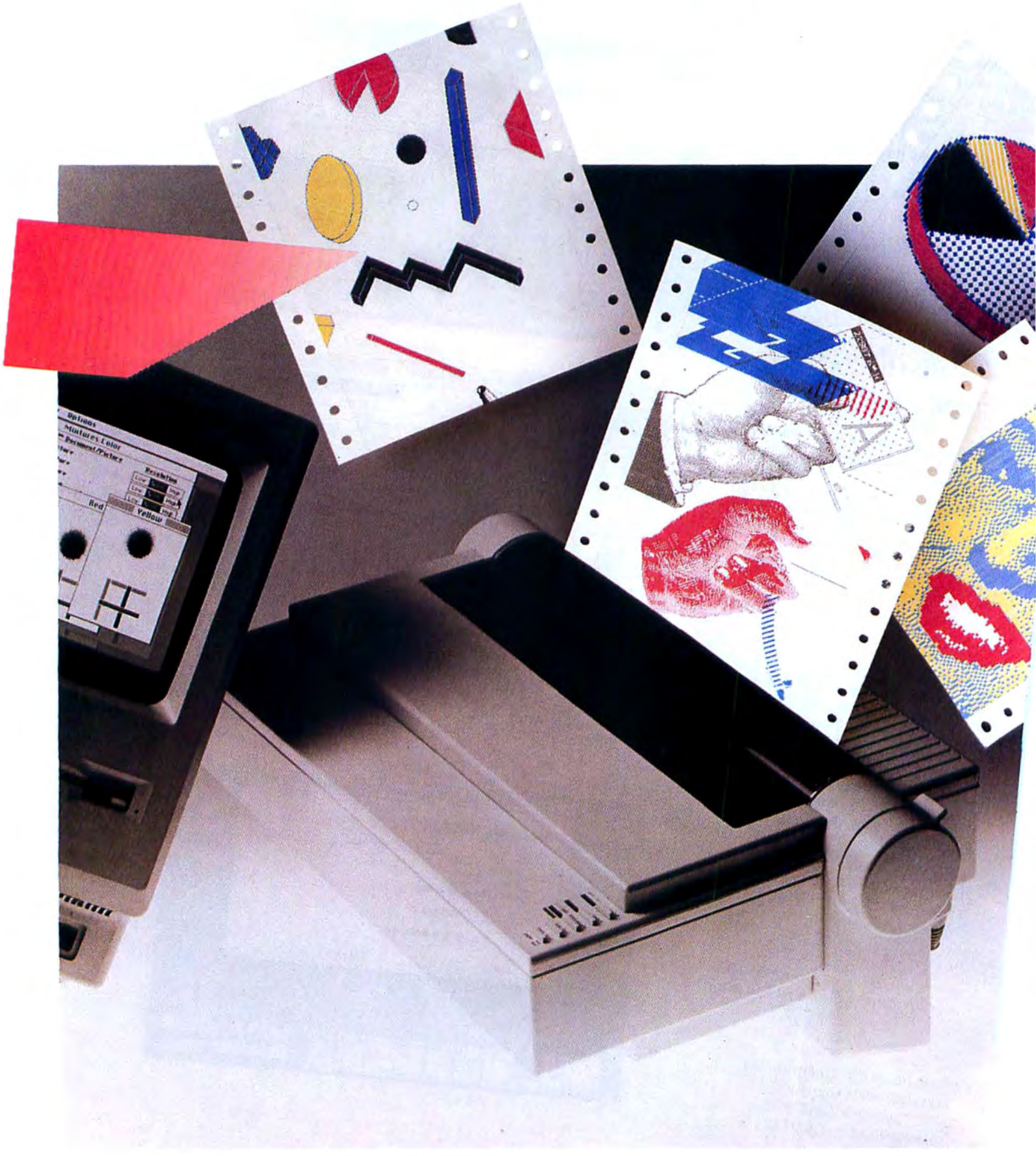


Figure 3
The forms generator provides ten MacPaint*-like graphics tools to make background pictures and frames for forms. You fill the blanks with data entry fields.*


Options
Resolution
Red
Yellow

Coming Out in Color

Carol Johnson

You don't have to wait for the inevitable arrival of a color Mac or invest in expensive color video display hardware to see black-and-white Macintosh images take on color. With the ImageWriter II, a four-color ribbon, and the right software, you can produce full-color printouts without ribbon swapping, without rewinding and aligning the paper, and sometimes without having to prepare a separate image for each color.

Several color printing programs are currently available–*ColorPrint* from Esoft, *ColorMate* from SoftStyle, and *ColorPress 1* from Diversions–that give you the means to print color versions of *MacPaint* documents. *MacPalette* from Microspot (distributed in the United States by CompServCo) offers sophisticated coloring and shading of

MacDraw and other object-oriented graphics. Some application programs, such as *ColorChart* from Esoft and *MacPublisher II* from Boston Software, offer color printing as a feature. *Silicon Press* from Silicon Beach is unique in the spectrum of color printing software; it lets you print full-color graphics from either *MacDraw* or *MacPaint* but is designed primarily to be used with a database to merge-print mailing labels, stickers, cards, or similar material.

Ways to Color

How can you get a color printout of a black-and-white screen display? Each of the Mac's more than 175,000 independently controlled pixels is either on, in which case it is black on screen and printed on the Imagewriter, or off, in which case it is white on screen and not printed. An "on" pixel prints black or any designated color on the ImageWriter II's four-color ribbon. Every color in the rainbow can be made with combinations of the ribbon's colors: the three primary colors (yellow, red, and blue) and black.

Most programs that print *MacPaint* images in color, like *ColorPrint,* emulate four-color printing and therefore require a separate drawing for each color on the ImageWriter II's four-color ribbon. *ColorMate,* on the other hand, requires only one *MacPaint* image, although it is difficult to vary color intensity with the program. Either program can convert *MacPaint* clip art drawings to color. In addition, color-coded clip art for both *ColorPrint* and *ColorMate* is available from their respective distributors.

MacPalette, designed for preparing colored versions of object-oriented graphics such as those in *MacDraw, Microsoft Excel,* and *Jazz,* works by replacing the black-and-white patterns of a filled object with color patterns that you define.

ColorPrint: Patterns for Flexibility

Because color separations allow you to overlay patterns of different colors, you can print nuances of shade and tone using *ColorPrint.* Various flat levels of gray (or any other color) can be produced with benday patterns, which have even ratios of black dots to white space. The ratios are traditionally rendered in terms of a percentage; a light gray, for example, might be described as a 30-percent gray. Several patterns on *MacPaint*'s palette are similar to benday patterns and can be used to create varying levels of color by overstriking or juxtaposing pixels of different primary colors, as well as black (see Figure 1).

The levels of color saturation cannot be set at traditional 10-percent increments because *MacPaint* patterns are defined in an 8-pixel by 8-pixel matrix. Only the predefined patterns labeled 1 (100 percent) and 6 (0 percent) and patterns 5 and 10 (each 50 percent) are exact complements, or *negatives,* of each other. You have to edit the 25 percent screen (pattern 9) so that it is the complement of the 75 percent screen (pattern 3) and edit pattern 8 so that it is the negative of pattern 2. For a full range of patterns, you need to create two new patterns, one the complement of pattern 4 and the other the complement of pattern 7.

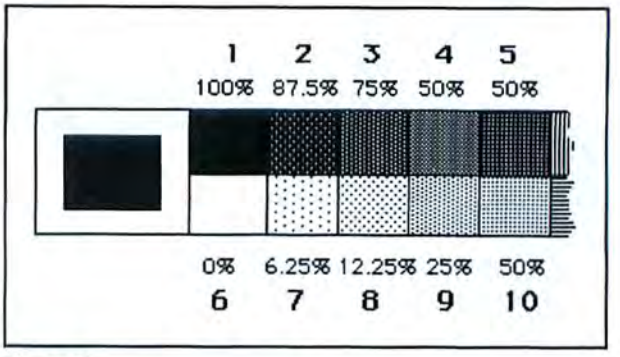


Figure 1
Several MacPaint *patterns are simple dot screens that are similar to the benday patterns used in traditional printing. You can edit the patterns to yield various levels of color saturation.*

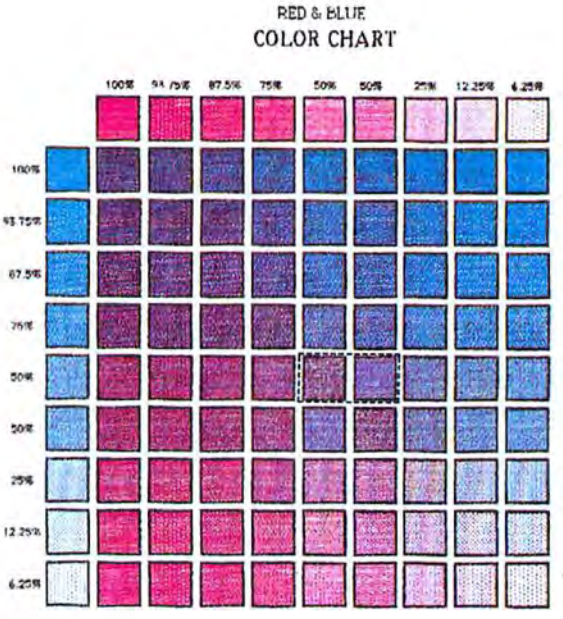


Figure 2
Produced with ColorPrint, *this chart shows a wide range of purples. Notice, within the dotted lines, the differences in hue that result from overprinted colors (left) compared to juxtaposed colors (right).*

The best way to predict the effects of overlaying color patterns is to make a color chart for each of three basic color combinations: yellow and red, yellow and blue, and red and blue (see Figure 2). The chart starts using the darkest *MacPaint* pattern (100 percent) and ends with the lightest (6.25 percent). The result of all

that editing and combining is a palette of patterns that, when used in color separations, allows for smooth shades and tones.

Take a look at the color drawing of the California coastline (see Figure 3). The sky is composed of gradations of blue, warmed up with a little red. The mountains are in tones of purple, with those in the foreground the darkest (solid red, solid blue, and 25 percent black). The mountains get progressively lighter as they approach the horizon. Without the color charts, setting down the color plan for the drawing would have been a trial-and-error process. As it was, making the color separations turned out to be only slightly more complicated than the following example.

Most programs require a separate drawing for each ribbon color on the ImageWriter.

Separations Aren't Hard to Do

At first blush, the idea of making four black-and-white *MacPaint* drawings to end up with one color picture seems daunting. But the process is actually simple and allows you to be flexible. All of *MacPaint*'s tools and patterns are available while you prepare the color separations.

A simple illustration is one showing an orange sun in a blue sky over a blue-green sea, all outlined in black. First, frame the picture in a black rectangle, and then draw an open circle for the sun and a straight line to mark the horizon between sea and sky. When you are finished, save the drawing as Picture and print a draft copy of it. The hard copy is handy for planning the color separations.

You decide on a solid blue (100 percent) for the sky. For the blue-green sea, you plan on using a solid blue over a 50 percent yellow pattern, resulting in a color pattern that is composed of blue dots and green dots in a 50-50 ratio. If you want a greener blue-green, use a denser pattern of yellow dots.

An orange sun, theoretically, can be obtained by printing a 100 percent red pattern over a 100 percent yellow pattern. In reality, however, this results in a red-orange because the red on the ImageWriter color ribbon is closer to magenta. Using a 75 percent red pattern printed over a solid yellow more closely approximates orange. Now that you've finished the color plan, you are ready to make the separations, or color plates.

(continues on page 117)

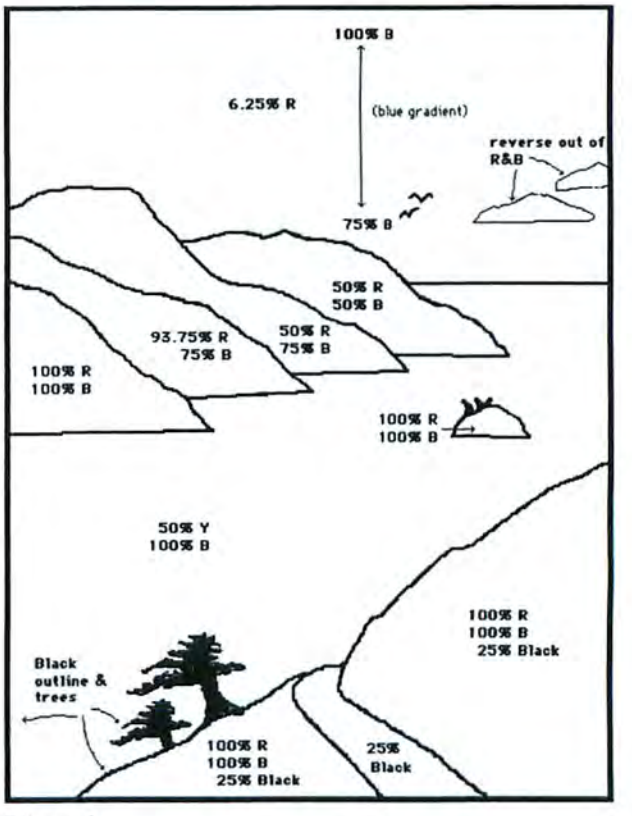


Figure 3
ColorPrint *allows subtle gradations of color because you can overlay color patterns. The color plan shows which patterns were used in each of the four* MacPaint *drawings that served as color plates.*

Ensuring a Colorful Future

J. E. Arcellana

Driving the ImageWriter II or a Hewlett-Packard plotter with a commercially available color printing program is the easiest and least expensive way of producing color output from the Macintosh, but it's not the only way. A version of SoftStyle's *ColorMate* working with the NEC Pinwriter, for example, provides even more in the way of options.

Another approach involves investing in the CPS-200 color thermal printer from Lasergraphics of Irvine, California. The $14,000 price includes a rasterizer—a hardware interface between computer and output device that translates the data stream from a Mac or another computer into the dot-on, dot-off information that tells a printer if a specific dot should be printed and in what color. Whether the result is text or graphics or a combination is irrelevant: the rasterizer manipulates the dots as a digital image.

Lasergraphics markets rasterizers for a variety of color output devices, from laser printers (such as the Xerox 6500) and thermal printers (the Seiko D-Scan) to ink-jet printers (the Diablo Series C) and film recorders (the Matrix QCR). Sold separately from the output device, the rasterizers range from $4500 for the Diablo to $11,000 for the Xerox. The only additional hardware required to connect any such color device and the appropriate rasterizer to the Mac is an RS-232C cable.

While costly, the hardware is at least available. Color drivers are not readily obtainable at any price. The drivers—software that enables the Mac to generate color output through printing devices—would reside in the System Folder and work with any application, as the ImageWriter driver does. The closest you can come now is with certain Macintosh programs, such as Cricket Software's *CricketGraph,* that can drive various color devices from within the application (see "The Kingpin of Presentation Graphics" in this issue). To give programs this capability, developers have to custom-build interpreters into their programs that can translate data into the graphics language used by a specific output device, such as the SCODOL graphics language used by Matrix thermal printers and film recorders. Partly for that reason, customized versions of *CricketGraph* list for $300 more than the "street-legal" version, which drives only the Imagewriters, the LaserWriter, and HP plotters.

Jim Rafferty, Cricket Software's vice president for research and development, doesn't view his company as being in the printer driver business but says it custom-builds drivers into *CricketGraph* to enhance the application. He bemoans the reluctance of printer manufacturers to perform their traditional role in developing and marketing device drivers that would enable specific computers such as the Mac to use their products.

With the release early this year of version 2.1 of the ImageWriter driver, Apple Computer, at least, has fulfilled its role as a color printer manufacturer. Any application that uses the Mac's QuickDraw routines in ROM to assign foreground and background colors (called forecolor calls) can use the driver to print color on the ImageWriter II. Those routines have been in ROM since the original Macintosh was released, of course, but were not used by software developers because of the lack of a color display or a color printer for the Mac. Apple Computer's Curtis Sasaki, former Imagewriter product manager, expects developers to revise their existing programs to take advantage of the new driver. Boston Software, for example, has already done so with *MacPublisher II.*

The logical next step is color output from PostScript-driven devices, although there is no such color device yet on the market. Later this year Adobe Systems is expected to announce agreements with manufacturers of color printers and film recorders that will be able to produce color output from PostScript files. Meanwhile, you can be sure software developers are learning how to use PostScript's color calls.

This image comes from a slide generated by the Dunn Color Macintosh system. The Dunn includes a self-contained graphics generator, software, an RGB color monitor, and a film recorder and sells for around $13,000.

(continued from page 115)

First, prepare the blue plate. Open the document you named Picture. Use the marquee to select the entire image and choose the Invert command to reverse the white and black areas. Since you want a solid blue for both the sea and the sky, use the paint bucket to fill the sun with white. Save this document as Picture.Blue.

Open Picture again to make the yellow plate. Reverse the black and white areas again. Use the paint bucket to fill in the sea with the 50 percent checkerboard pattern. Since you don't want any yellow in the sky, fill the sky with white, but leave the sun a solid black. Save this document as Picture.Yellow.

For the red plate, reverse the entire image in the Picture document, pour a 75 percent pattern in the sun, and make everything else white. Save this document as Picture.Red. The black plate is even easier. Because all you want to do is outline the elements of the picture in black, open up Picture again and then save it as Picture.Black.

That's all there is to color separations. Move the four documents to the *ColorPrint* disk and print them to produce a color drawing.

ColorMate: Like a Coloring Book

ColorMate is the only coloring program for *MacPaint* drawings that isn't based on color separations. Instead of starting with a basic outline drawing and then preparing separate *MacPaint* drawings with solid and shaded areas for each color, you transfer a *MacPaint* drawing into *ColorMate* and then "color" it (see *Macware Reviews, Macworld,* January 1986).

ColorMate's one-plate process makes coloring simple, but it leads to simple results. Because all the coloring is done in *ColorMate,* once you transfer your drawing into the coloring program you no longer have access to the usual *MacPaint* tools and editing aids. You can use only the tools available in *ColorMate:* a lasso and a selection rectangle for defining areas, a paint bucket for filling areas with color, a crayon for applying colored lines one pixel wide, an eraser, and a magnifying glass for examining the color of individual pixels. Clicking on the magnifying glass while holding down the ⌘ key takes you into ColorBits for pixel-by-pixel detail work. You specify the current color by clicking on one of eight boxes: black, violet, blue, green, yellow, orange, red, or white. The Edit menu gives you a choice of Revert, Copy, Paste, or Clear.

ColorMate is a valiant and creative attempt at simplification, but it can frustrate your efforts to create even slightly complicated color effects. It has tools with names identical to *MacPaint*'s that work altogether differently, and useful *MacPaint* features are missing. Instead of the hand tool, for example, you use scroll bars to move the image. A more significant drawback is the absence of an undo command. *ColorMate*'s closest approximation, Revert, returns the drawing to the version you had when you last printed, opened, saved, or used the scroll bars—whichever happened most recently.

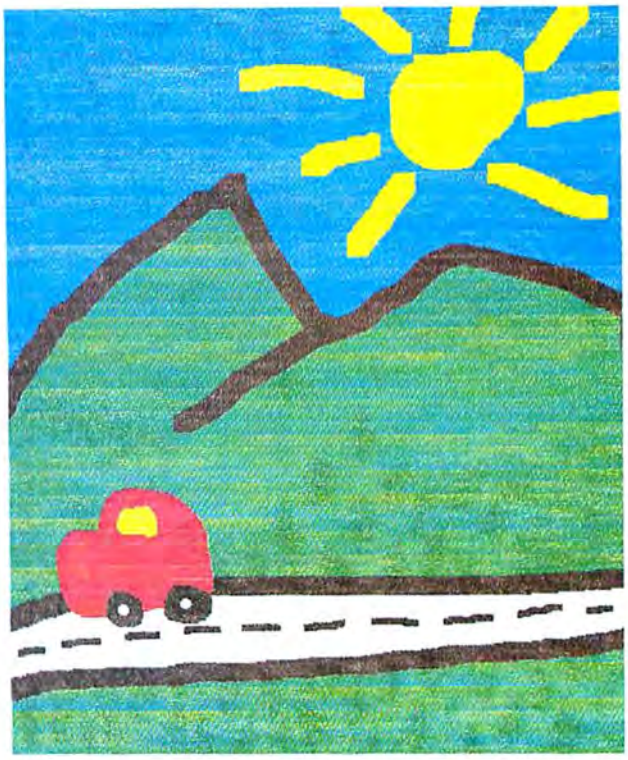
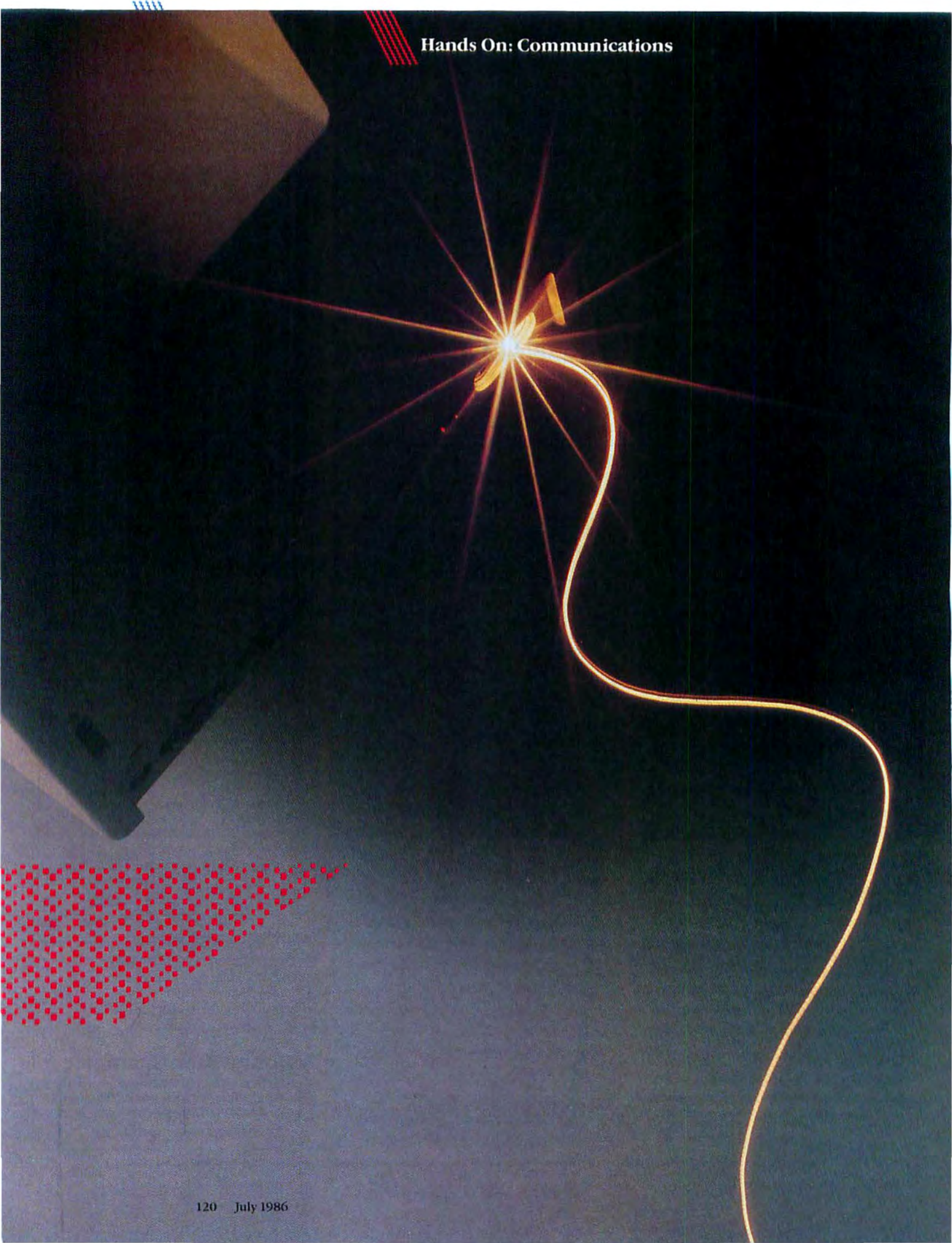


Figure 4
ColorMate *makes it difficult to achieve subtle effects. You can print a picture in six solid colors plus black without using color separations, so the program is most suitable for posterlike graphics.*

The selection rectangle also works differently. It doesn't turn a collection of pixels into an object that can be dragged, duplicated, rotated, or otherwise manipulated. It just defines a rectangular area that you can color with the paint bucket. The lasso defines an irregular area in a similar way, without tightening up around a shape and turning it into an object, as it does in *MacPaint*.

The paint bucket works like *MacPaint*'s paint bucket, but instead of pouring patterns, you pour solid colors by positioning the tip of the bucket on an enclosed area. You can color *MacPaint* fill patterns this way, turning, for example, a 75 percent gray pattern into a 75 percent orange pattern by selecting the area and pouring orange on a black pixel. However, it's almost impossible to position the bucket precisely enough to color the 25 percent of the pattern that is white. ColorBits is not helpful in producing color patterns, since the crayon is the only tool that works in this FatBits-like mode.



Mini and Mainframe Connections

Bill Catchings

With the right software and hardware, the Macintosh is no longer an island in the sea of computing

Communication with mainframe and minicomputers may seem incomprehensible, but it's an area ripe for the Macintosh's accessible approach. The benefits derived from linking to a more powerful computer are numerous: accessing on-line information from home, downloading files to your favorite Mac application, and running mini or mainframe applications from the Mac are just a few examples.

The first step toward satisfying your mini or mainframe communication needs is identifying the type of computer with which you want to connect. Are you trying to talk to an IBM mainframe or to a DEC (Digital Equipment Corporation) minicomputer? Or do you need to connect to several different minicomputers?

Communications with mini and mainframe computers (both of which will be referred to as *remote hosts* in this article) fall

into two categories. The first, and most common, is *asynchronous communication*. The Macintosh normally communicates with information services like CompuServe or MCI Mail asynchronously, which means that the Mac sends and receives characters at irregular intervals. In *synchronous communication,* characters are sent only at specific intervals. Synchronous communications require specialized hardware such as synchronous modems or protocol converters. The Mac communicates synchronously when it sends information over an AppleTalk Personal Network. Talking to any of the IBM 370 series of mainframe computers, such as a 4341 or a 3083, requires synchronous communication.

Asynchronous communication is the method used with most minicomputers and some mainframes. In order to communicate asynchronously, the Macintosh usually mimics the keyboard and screen, or *terminal,* of the remote host. That procedure is called *terminal emulation.*

Emulating Terminals

Terminal emulation software lets the Mac imitate the features of a given terminal, such as DEC's VT100, one of the most popular terminals of the last ten years. The remote host sends character sequences that give the terminal instructions about such things as how to display and format text on screen. Different terminals respond to different character sequences and have different features. Many so-called smart terminals do more than just display text; for example, they let you edit text and position the cursor.

A more advanced type of terminal, the graphics terminal, uses special character sequences to draw lines, fill shapes, or execute other graphics functions. Because the Macintosh has good graphics capabilities, it can emulate some graphics terminals very well with the help of appropriate software, such as *Tekalike* or *Griffin Terminal.*

Transferring Files

Another way of communicating with a mini or mainframe is to transfer files to and from a remote host. For example, you might want to download data from your departmental minicomputer into a Macintosh database program. File transfer differs from terminal emulation in that the recipient of transmitted files can process them independently of the sending computer. In this way, files can be manipulated using the specialized software of the Mac or the mainframe. The simplest form of file transfer saves whatever appears on the Mac's screen in a file. Similarly, you can send a disk file to the remote host as if you were typing the file. Both methods are prone to errors, and neither method can transmit or receive binary data, such as a *MacPaint* document.

Another means of file transfer is "guarded," or protocol, transfer. During a guarded transfer, the communications programs running on the remote host and on the Mac transfer files according to a set of rules, a protocol, to ensure the accuracy of the data. When the programs detect an error, they retransmit the data. The most common Mac file transfer protocols are Xmodem and MacBinary. MacBinary has the advantage of being able to transfer Macintosh files—*MacPaint* documents for example—without converting them to a standard file format that may not be capable of representing the Mac document's idiosyncratic formatting. Unfortunately, many host computers don't recognize MacBinary. A third protocol, Kermit, works with the widest variety of machines and communications channels, but most Macintosh

Mini and Mainframe Communications Products

Product	Company	Device Emulated	Phone
Apple Cluster Controller	Apple	3274/6	408/996-1010
AppleLine	Apple	3278-2	408/996-1010
Blast	Comm. Res. Grp.	—	504/923-0888
Griffin Terminal	Metaresearch	VT100, Tektronix 4012	503/232-1712
inTouch	Palantir	VT52, VT100, ADS 60, IBM 3101, Beehive DM5A, Televideo 925	800/368-3797
Mac/2392	DPEX	HP 2392	415/965-3639
MacDasher	Kaz Bus. Sys.	DG Dasher 210	212/757-9566
MacKermit	Columbia University (Kermit Distribution)	VT100, VT102 (subsets only)	212/280-3703
MacLine	TouchStone	VT52, VT100	213/598-7746
MacMenlo	Menlo Bus. Sys.	Tandem PATHWAY	415/948-7920
MacTerminal	Apple	VT100, 3278[1]	408/996-1010
MicroPhone	Software Ventures	VT100	800/336-6477
Netway 1000	Tri-Data	3278[2]	415/969-3700
pcLink	Pacer	VT100, VT132, TV 950, PST100, ADDS 60	619/454-0565
Red Ryder	FreeSoft	VT52, VT100	314/423-2190
Smartcom II	Hayes	VT100	414/449-8791
Straight Talk	Dow Jones	—	609/452-2000
Tekalike	Mesa Graphics	Tektronix 4010, 4014	505/232-1712
Telescape	Mainstay	(over 100 different)	818/991-6540
VersaTerm	PCS	VT100, DG D200, Tektronix 4010, 4012, 4014	215/779-0522
Visions-Plus	Rammas Vision	VT100, DG D200, Tektronix 4014	415/969-2662

[1] With *AppleLine* protocol converter

[2] Includes hardware that works on AppleTalk

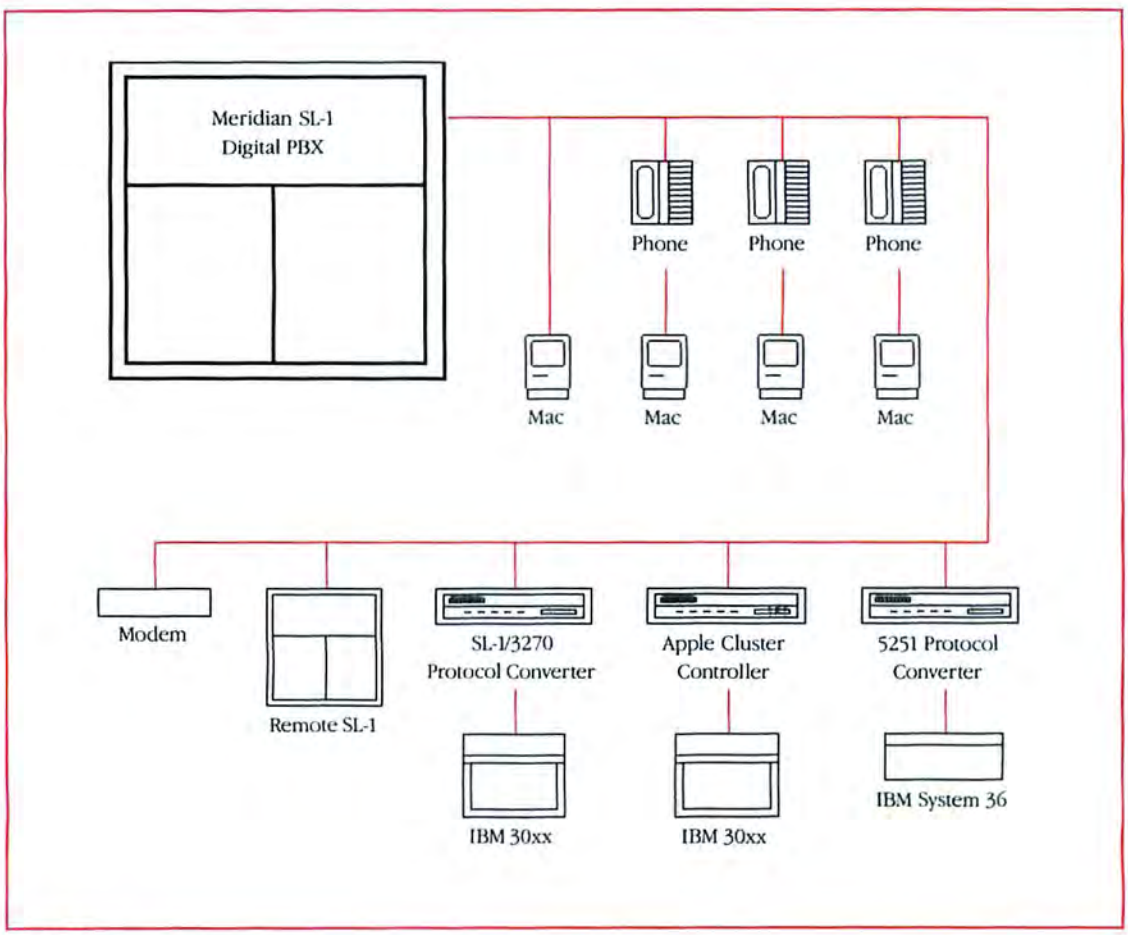
The PBX Connection

David Needle

Apple Computer has an agreement with Northern Telecom that has resulted in products that let you connect Macintoshes to Northern Telecom's LANSTAR network and Meridian PBX phone system, about 17,000 units of which are already installed.

The LANSTAR connection is available from Northern Telecom. The Macintosh printer or modem port connects to the phone system through a standard RJ11 phone jack and phone wiring (see "Meridian"). Additional hardware called a *line card* (about $300) is installed in the central PBX for each Mac. Using any of several standard Macintosh communications programs, you can access LANSTAR's many features, including automatic log-on and data retrieval from remote computers, file transfer with other Macintoshes on the network, IBM 3270 protocol conversion for connection to mainframe computers on the network, and call queuing to automatically connect to the first available phone line.

Macs on a LANSTAR network can also share access to modems and printers. "One of the things we see happening is people sharing information on Macs and being able to talk on the phone at the same time," says Roger Fetterman, director of Northern Telecom's integrated systems program in Santa Clara, California. Northern Telecom also plans to release file servers and print spoolers for the network in the near future.



Meridian

Northern Telecom's Meridian SL-1 PBX system can tie together Macs and voice telephones using existing telephone wiring. Mainframe hosts like the IBM 30xx series or the IBM System 36 can also be attached to the PBX using the appropriate protocol converters.

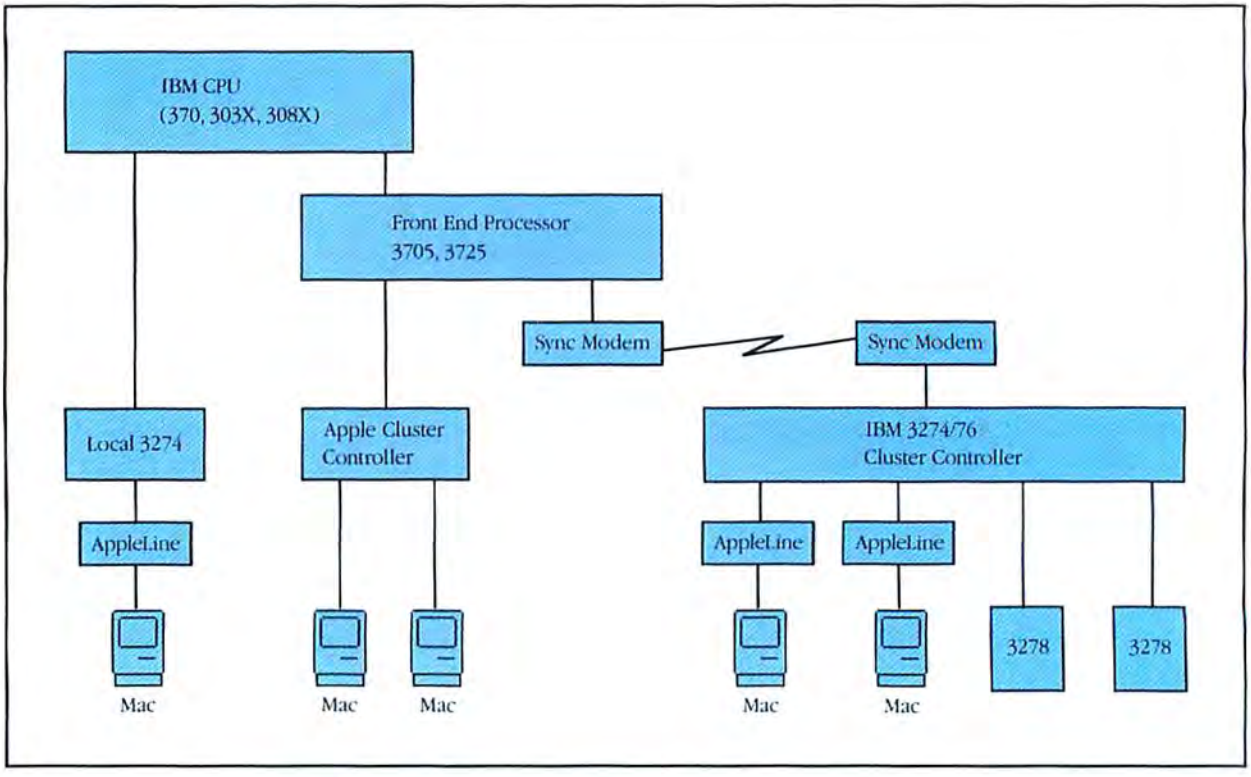


Figure 1
The Macintosh communicates with an IBM mainframe by emulating a 3278 terminal. One cluster controller can handle a number of Macintoshes.

communications programs don't yet support it. In order to transfer data reliably, you need to know which protocol the remote host supports.

What follows are brief descriptions of products for asynchronous and synchronous terminal emulation and file transfer systems. These descriptions and the information in "Mini and Mainframe Communications Products" should give you a good start toward selecting a mini or mainframe communications product.

Communicating Asynchronously

Like all communications methods, asynchronous communication requires a physical connection. In most situations where the Mac is not physically near the host, a modem is the best way to connect the Mac with the remote computer. Good choices are the Apple Modem 1200, the Hayes Smartmodem 2400, or a Hayes-compatible modem. If you are within 1000 feet of the host computer, you may be able to use a special cable called a *null modem cable* rather than a modem.

One of the first communications programs for the Macintosh was *MacTerminal,* from Apple. *MacTerminal* lets the Mac emulate the VT100 terminal as well as the IBM 3278 synchronous terminal (more on the 3278 later). *MacTerminal* 2.0 provides the Xmodem and MacBinary file transfer protocols.

VersaTerm, from PCS, is another good general asynchronous communications program. *VersaTerm* provides many of the same capabilities as *MacTerminal,* plus emulation of the Data General Dasher 200 and the Tektronix 4014, a popular graphics terminal. To the file transfer protocols of *MacTerminal, VersaTerm* adds Kermit.

If budget is your major concern, you may want to consider one of the shareware, or freeware, products. One of these "pay-if-you-like-it" programs, *Red Ryder,* emulates the VT100 and supports the Xmodem, MacBinary, and Kermit file transfer protocols. *MacKermit,* written at Columbia University, is available free from user groups. It emulates a VT100 but, as the name implies, uses only the Kermit protocol for file transfer.

A program that is tailored for transferring files between a remote host and a Macintosh is *Blast,* from the Communications Research Group. Because *Blast* transfers files using its own asynchronous protocol, two pieces of software are required: a program that runs on the remote host and one that runs on the Mac. Versions of *Blast* are available for over 85 different mainframes, minicomputers, and micros.

Some people need a program that lets the Mac emulate a more esoteric terminal. Terminal-specific products may also provide easier methods for using a particular host. As an example, *MacDasher,* by Kaz Business Systems, not only emulates a Data General D210 terminal but also allows you to set up commands for CEO, a Data General office automation product, in Macintosh pull-down menus.

If you work with Prime minicomputers, *pcLink,* by Pacer Software (also sold by Prime Computer as *Primelink*), may be the product for you. *pcLink* emulates the Prime's terminal and even works in conjunction with special software on the Prime minicomputer to provide virtual disk service, a method of accessing files on the Prime as you would access files on the Mac. For Tandem computer users, *MacMenlo,* from Menlo Business Systems, emulates the Tandem Pathway terminal.

If you need to access many different hosts that require special terminal types, *Telescape,* from Mainstay Software, has a repertoire of more than 100 terminals, including the VT100, the Heath H19, the Televideo 950, the ADM-11, the IBM 3101, the Datamedia 1520, and the Tektronix 4014.

Telescape lets you define your own terminals if you need some not supplied by Mainstay.

A useful product for communicating with a UNIX host is *MacLine,* from Touchstone Software. In addition to emulating a UNIX terminal, *MacLine* creates a Mac front end to the UNIX host. By clicking on commands, you can easily transfer files to and from a UNIX file server, convert the files from UNIX to Mac format and vice versa, send and receive electronic mail on the UNIX host, and use the UNIX host's remote printing facilities.

Communicating with an IBM Mainframe

IBM 3270 communication differs from asynchronous communication with respect to the hardware it requires. Asynchronous communication requires at most a modem, while 3270 communication requires a device called a protocol converter and sometimes a modem as well. As shown in Figure 1, 3278 terminals attach to a 3274 cluster controller, which in turn connects to the mainframe's front-end communications processor. Based on this configuration, there are several ways to communicate as a 3270 terminal.

One method requires a protocol converter that lets the Macintosh connect to an IBM 3274 cluster controller as if it were a 3278 terminal. The protocol converter connects to the modem port of the Mac. Apple sells a protocol converter of this type, called AppleLine. When you run *MacTerminal* with the AppleLine, the Mac works like a 3278-2 terminal. The original version of the AppleLine had a number of shortcomings. A new ROM for the AppleLine and improvements to *MacTerminal* version 2.0 have fixed most of these problems.

A second approach, emulating a 3274 cluster controller to the IBM host and controlling a number of Macintoshes, is more cost-effective if you want to use more than a couple of Macs as terminals. Apple sells the Apple Cluster Controller (ACC), manufactured by Protocol Computers, as a low-cost alternative to the IBM 3274/6. Up to seven Macs or serial printers can attach to the ACC.

Netway 1000, from Tri-Data, takes another approach. Netway 1000 attaches to the AppleTalk network and emulates a 3274 cluster controller to the IBM host. It then allows up to 16 Macs on the AppleTalk network to act as 3278 terminals. You can attach more than one Netway 1000 to the AppleTalk network so that you can communicate with multiple IBM hosts. This facility is even more interesting when coupled with Tri-Data's *MacWindows* 3270 program. *MacWindows* lets you have up to four different 3270 sessions in separate windows (see Figure 2). With multiple Netway 1000s, you can log on to different IBM hosts simultaneously. This multisession capability lets you run several mainframe applications at one time from a single Macintosh.

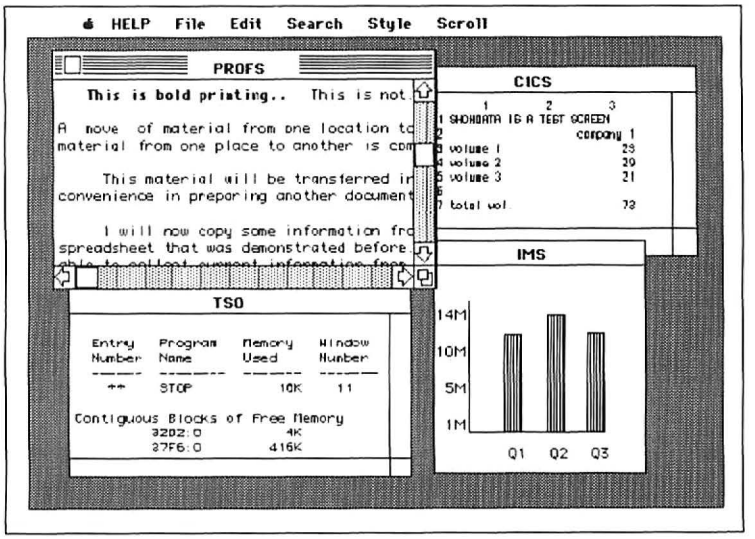


Figure 2
MacWindows *allows the user to run multiple IBM 3270 mainframe application sessions simultaneously.*

Another option has recently appeared—using a private branch exchange (PBX) in conjunction with a protocol converter to access mainframes and minis (see "The PBX Connection").

Of Macros and Objects

An alternative that takes full advantage of the abilities of the Macintosh is rapidly emerging: products that use macros and object-oriented commands to simplify communications. The basic philosophy of this approach is that the person at the terminal shouldn't even be aware of the mechanics of transferring files or even logging on. These products also enable users to do more than one thing at a time.

This technology stems from the use of macro commands in terminal programs. Macros let you execute a group of mainframe commands with a single command from the terminal keyboard.

One product that uses macros extensively is *inTouch,* from Palantir Software. This program has a comprehensive macro-definition language that lets you set up a script to dial a phone number, send characters, wait for a string of characters, and send and receive data. From these primitives you can build sophisticated scripts to automate common communications tasks. *MicroPhone,* from Software Ventures, and *Smartcom II,* from Hayes, have similar capabilities.

Macros are a first step toward the even greater convenience of using a graphics interface to control such communications procedures as collecting your messages from an electronic mail service by clicking on an icon. A good example of an object-oriented program is *AppleLink.*

Another product of this type, *Visions-Plus,* from Rammas Vision, allows you to view multiple windows and to log on to multiple hosts (using one modem on the printer and another on the modem port). You can transfer a file from one host at the same time as you are editing a file on a different host. Used with special host software, at present available for UNIX and the VAX VMS operating system, *Visions-Plus* can handle concurrent multiple sessions with a single host. This capability lets you simultaneously upload, download, and edit files while on line. With a powerful macro facility, you can also execute a group of UNIX or VAX VMS commands with a few clicks of the mouse.

Though minicomputer and mainframe communications can be confusing, the Macintosh can insulate you from some of the technical details. □

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Going On-Line with Excel

Danny Goodman

A trio of programs automatically downloads and graphs stock quotes, sales figures, or other reports

No Macintosh application—not even powerful *Excel*—need be an island. By combining a communications program and a macro processor with *Excel,* you can create an automatic system to download, import, and graph data with a minimum of fuss.

Regional managers, for instance, might download weekly sales reports or monthly budgets from *Excel*-equipped branch offices under their purview and then consolidate the data into a summary spreadsheet. Or an investor might use the stock reports from a database service to chart the daily valuation of a stock portfolio.

Even though *Excel* lacks communications abilities, you can build a somewhat integrated system that can do these jobs (see "Disk Management Strategies"). The investor in my example could create an almost entirely self-propelled system of three programmable applications—*Red Ryder* (communications), *Tempo* (macro processing), and *Excel* (spreadsheet and graphics)—that would perform the following tasks:

- Wait until 1:00 a.m. before dialing and connecting with CompuServe.
- Automatically log on to the service and download a predetermined set of stock market quotations.
- Import the downloaded data into an *Excel* stock portfolio valuation spreadsheet.
- Display or print a line graph of recent performance of the entire portfolio.

While one could use other communications software and stock services, I chose *Red Ryder* and CompuServe because of their low cost and popularity. This approach could be adapted to other combinations of programs and services.

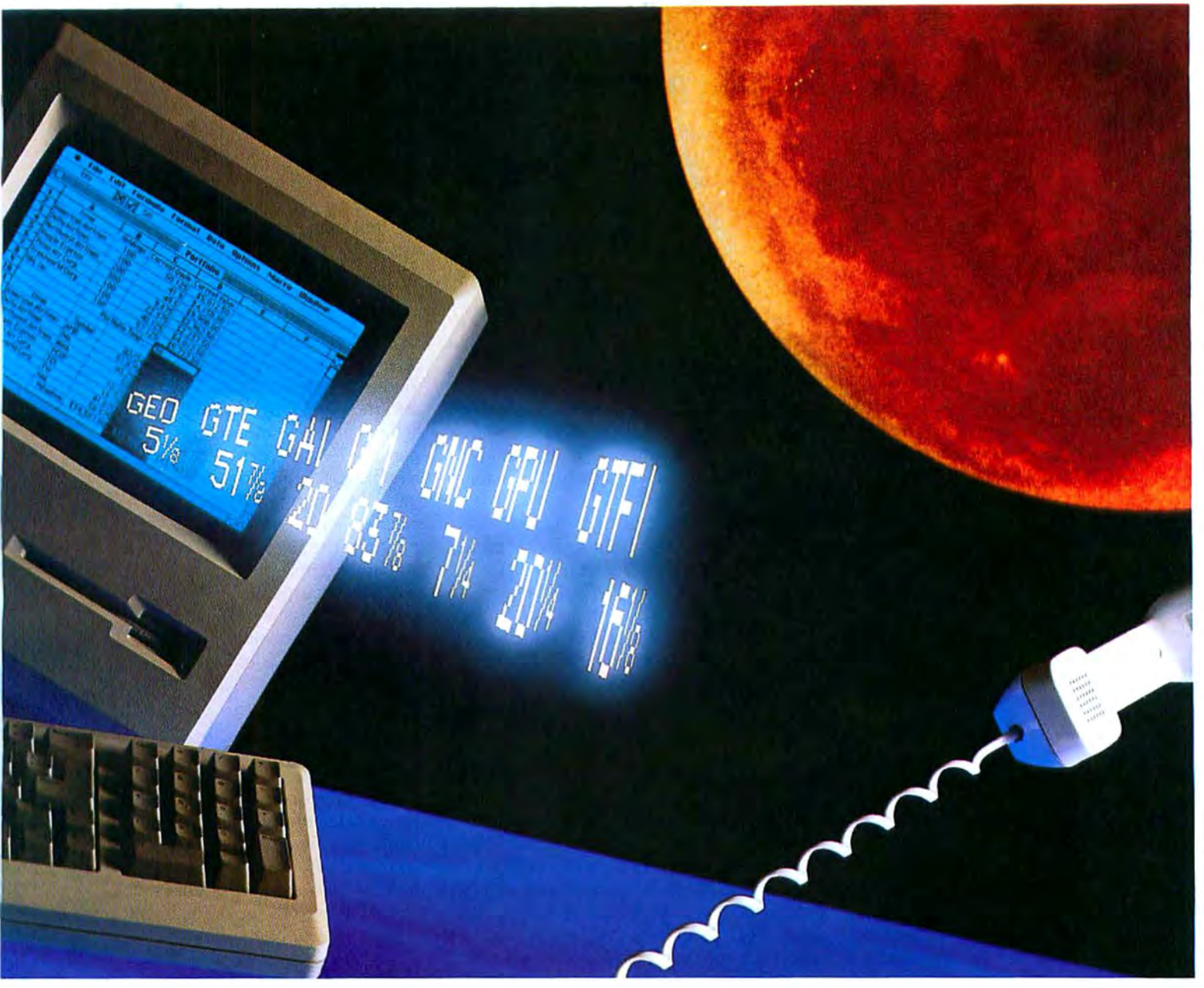
Three applications share the labor, from downloading to the final graph. *Red Ryder* handles all the dialing, connecting, and downloading. *Tempo* supplies a feature missing from *Excel:* starting *Excel* and initiating a macro, all in one step. *Tempo* isn't absolutely essential, but it saves you steps and therefore time at the keyboard. An *Excel* macro, the third part of this combo, opens the requisite files, including the downloaded data file, and copies, updates, and charts the spreadsheet data. At first glance, setting up the macros may seem like a lot of work, but most of the drudgery is done the first time you manually run through the procedures.

The Red Ryder Procedure

The first step in building this system is to create the *Red Ryder* procedure. Release 7.0 of *Red Ryder* includes the menu option Write a Procedure for Me, which is a learn mode for writing *Red Ryder* procedure programs. As you go through the steps the first time manually, *Red Ryder* records the remote computer's prompts and your mouse and keyboard actions. If you make a mistake, you can later edit the procedure listing with a word processing program or text editor.

Figure 1 shows the procedure listing that dials, logs on, requests the quotations, downloads them, and logs off the system. Each PROMPT command is followed by the character(s) that *Red Ryder* expects from CompuServe. The 2-second pauses after each prompt give CompuServe time to prepare itself for your reply. Each TYPE command is followed by the response you would give if you were typing on the terminal.

The first line instructs *Red Ryder* to wait until 1:00 a.m. before dialing CompuServe. When you start the procedure, *Red Ryder* continually compares this WAIT time against the Macintosh's internal clock. When the two times match, the procedure



goes on to the next instruction. In this example, an instruction changes *Red Ryder*'s communications settings to work with CompuServe—300 bps, no parity, 8 data bits, 1 stop bit, and full duplex. Next the procedure sends a reset command (ATZ) to the modem, in this case any Hayes-compatible modem. The ^M character at the end of each TYPE line is the equivalent of pressing the Return key, which all responses require. When the message "OK" indicates that the modem is ready, *Red Ryder* gives it the dial command (ATDT), complete with the local CompuServe phone number. As soon as your modem and CompuServe shake hands, the modem sends a CONNECT prompt to the screen, and *Red Ryder* begins the log-on procedure, which starts with a C (equivalent to ⌘-C on the Mac running *Red Ryder*). The rest of the log-on sequence sends the user ID number and password in response to requests from CompuServe.

Regardless of the opening message (sometimes a What's New menu, other times the TOP menu), CompuServe always presents an exclamation point as its prompt. As shown in the procedure listing, when *Red Ryder* sees that prompt, it instructs CompuServe to go directly to the Quotes section. Since the valuation spreadsheet model needs only the day's closing quotations, it chooses the simpler of the two stock quotation offerings available on CompuServe. The procedure accesses this service by typing GO QUOTES at any CompuServe prompt. At the next prompt, which appears after the Quotes menu has been displayed, *Red Ryder* automatically selects item 1—the Current Quotes selection, which displays quotes approximately 20 minutes after the actual trades take place on the exchange floors.

Disk Management Strategies

Combining applications requires different disk storage logistics depending on your Macintosh configuration. Here are some suggestions for users who have either two floppy disk drives or a hard disk.

Mac 512K, external disk drive. Use the one startup disk in the internal drive to serve both *Red Ryder* and *Excel;* use the external drive for *Red Ryder* and *Excel* disks (no System file on the application disks). Save the downloaded file to the startup disk and keep both the macro and the portfolio model there. Simply swap application disks when changing from *Red Ryder* to *Excel.*

Mac Plus, external disk drive. Consider setting aside about 400K for a RAM disk that will hold your System Folder. This frees the two disk drives for application disks—one for *Red Ryder* (no System file), one for *Excel* (also no System file). Save the downloaded file to the *Red Ryder* disk, which also has plenty of free space for the Portfolio document and the *Excel* macro file. If you don't use a RAM disk, you have plenty of space on an 800K double-sided disk for the System Folder, *Red Ryder,* and *Excel* documents on the internal drive, with the *Excel* application in the external drive.

Mac 512K or Mac Plus, hard disk. Run both applications and all files from the hard disk.

Hierarchical File System (HFS). The only caution under HFS is that all *Excel* documents—macro sheet, Portfolio, and Current Quotes—must reside in the same folder. When *Tempo* starts *Excel* from the macro document, *Excel* opens only files in the same folder. Consult the *Red Ryder* manual for details on downloading files to a folder within HFS.

Switcher. Ample room exists in the Mac Plus RAM to load both *Red Ryder* and *Excel* into *Switcher.* Therefore, you could open the macro in *Excel* and then switch to *Red Ryder* to start the procedure for its overnight vigil. In the morning, start the *Tempo* macro that switches back to *Excel* and starts the *Excel* updating macro. (*Tempo* switches only by way of the *Switcher* selection in the Apple menu, however.) That leaves *Red Ryder* in RAM available at an instant if you have other communications tasks during the day.

The next prompt is "Issue:," which awaits input of issues to search. But first, *Red Ryder* types the **/capture** command, which alerts CompuServe that you want only the raw numbers and none of the headings and labels that usually accompany the figures. This option was created by CompuServe especially for spreadsheet users who download raw figures and import them into their models.

To retrieve the date of the stock quotes, *Red Ryder* types **/items=7** at the next Issue: prompt. This tells CompuServe that you want only item number seven from the seven pieces of data usually sent for each quote: (1) ticker symbol, (2) volume (in hundreds), (3) high/ask, (4) low/bid, (5) close/average/last, (6) change, (7) date of quote.

The procedure begins a Receive an ASCII File sequence with the RECA command. After *Red Ryder* executes the RECA command, anything that comes from CompuServe or from the *Red Ryder* procedure appears in the downloaded file. When you are recording this procedure in the learn mode, a dialog box pops up asking you to type in the destination of the downloaded file in the format *volume:file.* Volume is the name of the disk, and file is the name of the file (you must also include folder names in this specification if you are using the Hierarchical File System). Later the procedure instructs *Excel* to open the same downloaded file. In the sample listing, the file is called Current Quotes on a disk labeled *Red Ryder* 7.0.

You should retrieve the trading date with a commonly traded stock, such as IBM or GM, as shown in the listing. If you pick an infrequently traded stock, you risk retrieving a noncurrent date if there was no trading on that issue.

To retrieve the closing stock prices, the procedure next advises CompuServe to supply only item 5, with the **/items=5** command. The list of issues consists of all the stocks in the portfolio whose valuation you want to chart. In the listing in Figure 1, the symbols represent seven airline stocks, but you can retrieve quotations for up to 20 stock symbols. CompuServe now retrieves the closing prices for each stock and sends them to your file, each on a separate line.

At the Issue: prompt following the stock price request, *Red Ryder* closes the downloaded file so that no further information goes into it. Next comes the **/EXIT** command to leave the Quotes section, then the off command to quit CompuServe, followed by the modem instructions to hang up the phone.

The Downloaded File

As mentioned earlier, the downloaded file contains everything that was sent and received between the RECA and CLOSE commands in the *Red Ryder* procedure. *Excel* allows you to open a text file like the one created by *Red Ryder.* It places the data from each line into the column A cell down the document, with each line appearing in its own row. If you were to open the Current Quotes file in *Excel,* it would look like Figure 2. The important cells are A3, which holds the date (in an *Excel-*

incompatible *yyyymmdd* format), and the range A10 to A16, which holds the closing quotes for the day in the order of the stock symbols typed in by *Red Ryder*. Next *Excel* must copy this data from the Current Quotes file to the document that calculates the portfolio value.

The Portfolio Model

Figure 3 shows the spreadsheet model that tracks the portfolio valuations based on the daily data downloaded from CompuServe. The model has two parts. The first, in the range A1 to D9, is a simple table that shows the issues in the portfolio, the number of shares owned for each issue, the current quote (copied from the downloaded file), and the current value (number of shares times the current quote). Cell D9 displays the total value of all holdings based on the day's quotes. This figure eventually goes into the running history kept in the second part of the model, which starts at cell A11 and expands to the right as you update the file each trading day.

The next step is to define the names of several cells and cell ranges so the *Excel* macro can perform its operations on those cells. Some cell definitions remain in the same place in the model no matter what, while others shift each time the macro executes, as you'll see later. The definitions that stay the same are

Current.Quote	$C$2:$C$8
Current.Value	$D$2:$D$8
Graph.Start	$B$19
Holdings	$B$2:$B$8

Definitions that shift one column to the right each day are listed below in the positions they hold in Figure 3:

Dates	$F$11
Formats	$F$11:$F$18
Valuation	$F$19

The Excel Macro

Figure 4 shows the listing of the *Excel* macro that transfers the downloaded data into the Portfolio model and graphs the history of the portfolio's value. Following is a line-by-line explanation of the macro instructions.

Line 1 gives the name of this macro—"insert.today's.quotes."

Lines 2 and 3 open the file downloaded by *Red Ryder* (Current Quotes) and the document Portfolio. Line 4 turns off echo to speed up execution of the macro.

```
WAIT 01:00:00                    PROMPT Issue:
COMM 300-N-8-1-FULL              PAUSE
TYPE ATZ^M                       TYPE /items=7^M
PROMPT OK                        PROMPT Issue:
PAUSE                            PAUSE
TYPE ATDT 5915846^M              RECA Red Ryder 7.00:Current Quotes
PROMPT CONNECT                   TYPE IBM^M
PAUSE                            PROMPT Issue:
TYPE ^C                          PAUSE
PROMPT User ID:                  TYPE /items=5^M
PAUSE                            PROMPT Issue:
TYPE 75775,1731^M                PAUSE
PROMPT Password                  TYPE AMR,DAL,NWA,PEXP,TEX,TW,UAL^M
PAUSE                            PROMPT Issue:
TYPE your password^M             CLOSE
PROMPT !                         TYPE /EXIT^M
PAUSE                            PROMPT !
TYPE go quotes^M                 PAUSE
PROMPT !                         TYPE off^M
PAUSE                            PROMPT NO CARRIER
TYPE 1^M                         PAUSE
PROMPT Issue:                    TYPE ATH^M
PAUSE                            TYPE ATZ^M
TYPE /capture^M
```

Figure 1
This Red Ryder *procedure consists of a list of steps that* Red Ryder *follows to dial and log on to CompuServe, download a predetermined list of stock quotations to disk, and log off.*

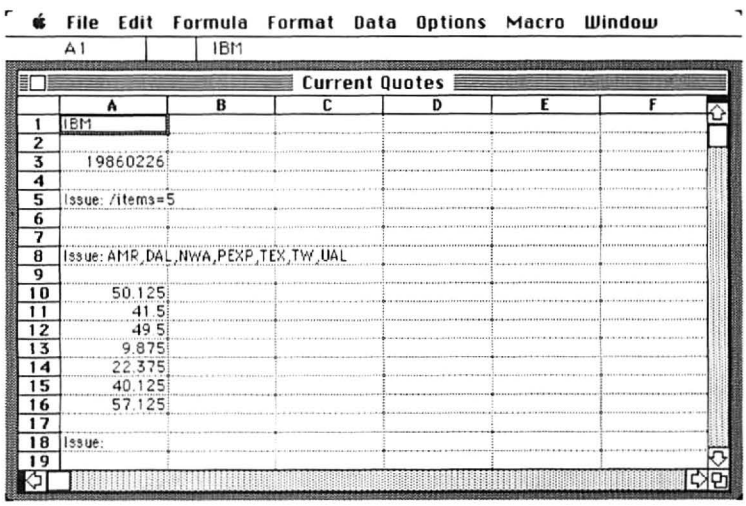


Figure 2
Information captured by Red Ryder *can be opened as a text file in* Excel. *Each line of captured text appears in its own cell in column A. The procedure can then copy and paste the numeric data into another* Excel *worksheet that calculates the portfolio value for these quotations.*

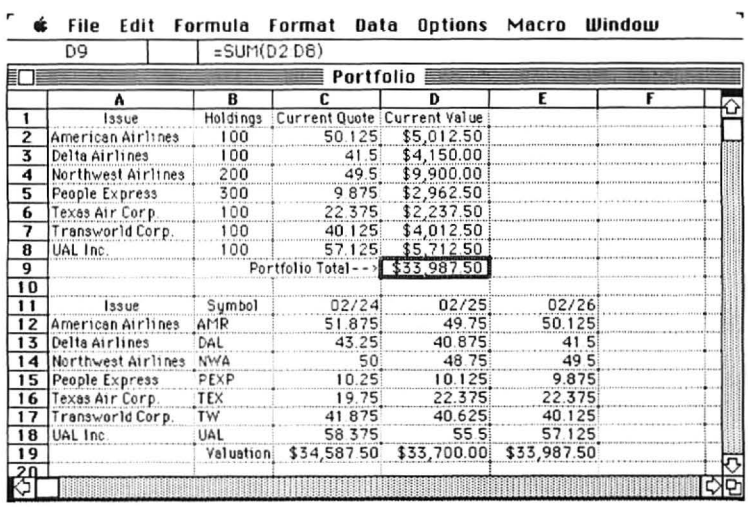


Figure 3
The portfolio valuation model consists of two parts. The top calculates the day's value based on current quotes copied from the downloaded text file. The lower section is an ongoing history of stock quotes and portfolio value.

Lines 5 and 6 select and cut the range defined as "Formats" in the Portfolio document. Line 7 selects the paste destination, one column to the right in adjacent cells, and line 8 executes the move of the range. The macro uses this defined range to mark the right edge of the historical data. Each time the macro executes, this marker shifts one column to the right. The two single-cell defined names, "Dates" and "Valuation," which come into play later in the macro, move along with the marker.

Line 9 selects a cell offset one row below and one column to the left of the cell defined as Dates. This offset location is in the column just vacated by the previous commands. The cell stays selected even though the next macro command activates another document. Lines 10 to 12 activate the Current Quotes document and select and copy into the Clipboard the range of cells containing the quotes. *Red Ryder's* downloading procedure always places the data it receives in the same cells, so the macro can rely on finding the data there every day.

Portfolio Macro

	B
1	!insert today's quotes
2	=OPEN("Current Quotes")
3	=OPEN("Portfolio")
4	=ECHO(FALSE)
5	=SELECT(Portfolio!Formats)
6	=CUT()
7	=SELECT(OFFSET(SELECTION(),0,1))
8	=PASTE()
9	=SELECT(OFFSET(!Dates,1,-1))
10	=ACTIVATE("Current Quotes")
11	=SELECT('Current Quotes'!$A$10:$A$16)
12	=COPY()
13	=ACTIVATE("Portfolio")
14	=PASTE()
15	=COPY()
16	=SELECT(!current quote)
17	=PASTE()
18	=SELECT(OFFSET(!Valuation,0,-1))
19	=FORMAT.NUMBER("$#,##0.00")
20	=FORMULA(SUM(!Current Value))
21	=SELECT(OFFSET(!Dates,0,-1))
22	=FORMAT.NUMBER("mm/dd")
23	=convert date()
24	=SELECT(Portfolio!Graph Start:OFFSET(!Valuation,0,-1))
25	=NEW(2)
26	=GALLERY.LINE(2)
27	=FILE.DELETE("Current Quotes")
28	=RETURN()

Figure 4
This Excel *macro automatically opens the downloaded text file and the portfolio document. Then it copies the new data into the portfolio model, updates the valuation history, and charts it with a line graph.*

In line 13, with the day's quotes still in the Clipboard, *Red Ryder* reactivates the Portfolio document where the cell selected in macro line 9 is still selected. The PASTE command in line 14 places the numbers from the Clipboard into the column starting at this cell location. Since *Excel's* Copy and Paste commands empty the Clipboard, the command in line 15 recopies the numbers while they are still selected in their new column. Line 16 selects the range "current.quote" in the Portfolio document, and line 17 pastes the numbers in there as well. The instant that happens, *Excel* calculates the Portfolio Total value in cell D9, which contains the formula =SUM(D2:D8).

The macro in line 18 selects the cell one column to the left of the cell defined as "Valuation" and then formats it as dollars and cents in line 19. Line 20 performs the equivalent of temporarily typing the formula "SUM(!Current Value)" into the cell. By so doing, the macro has *Excel* enter the total portfolio value, but not the formula itself. This is an important distinction because the number in that cell must not be linked to the defined range by a permanent formula; if it were, it would change each time the current value of the portfolio changed. Without the formula, the day's valuation appears in the bottom cell of the column representing only the day's quotes.

The macros in lines 21 to 23 do basically the same thing for the date at the top of the column as the three previous lines do for the value. They select the cell one column to the left of the Dates cell, put it in the *mm/dd* format, but then branch to a special macro, called convert.date, which uses the date supplied by CompuServe as the date for the Portfolio document (see "Bridging the Date Gap").

Lines 24 to 26 perform the graphing. The data in the valuation row to be graphed starts at a cell defined as "Graph.Start" (cell B19 in Figure 3) and ends with the most recent entry—one cell to the left of the cell defined as Valuation at the right edge of the table. A new chart document is opened, and the chart type is set to line graph style number two. As the model receives more data, the macro automatically charts the increasing number of points between Graph.Start and the most recent addition.

Line 27 deletes the file downloaded from CompuServe. If you don't delete the Current Quotes file, *Red Ryder* will not write over it when you try to download tomorrow's quotes. The last instruction, line 28, ends the macro.

After you've entered the macro listing, select the top cell of the macro and choose Define Name from the Formula menu (or press ⌘-L). Click the Command button at the bottom of the dialog box to inform *Excel* that this listing is a command macro. Then specify an Option-⌘-key equivalent for starting the macro. This last step is optional, since *Tempo* will be running this macro.

You could go further with a macro like this and have *Excel* automatically print the chart or one of the tables in the Portfolio document. You could also establish an index of all the stocks in the portfolio (the sum of the values of one share per stock) and graph the daily index along with the portfolio's value. Such a graph would show how well your holdings are performing compared with the index.

The Tempo Macro

The *Tempo* macro runs the *Excel* part of the show. You create *Tempo's* macros by manually stepping through a sequence of keystrokes and mouse moves while *Tempo* records your actions. When creating the Portfolio macro, have a Current Quotes file downloaded from CompuServe, since the initial run-through of the macro expects that file to exist. If the file isn't there, you'll have to put extraneous mouse clicks into the *Tempo* macro in response to *Excel* dialog boxes.

To begin creating this macro, start at the Macintosh desktop. When you launch *Tempo* from the list of desk accessories in the Apple menu, respond to the initial dialog box by selecting the disk that holds the *Excel* model and macros. This places the *Tempo* macro file on the same disk as the *Excel* model for the sake of logical organization.

Pull down the *Tempo* menu and choose Start Recording. Double-click on the stock quotes *Excel* macro icon. This starts *Excel* and automatically opens the macro sheet. Next, choose Run from the Macro menu. Select the stock quotes macro from the listing and click the Run button. The *Excel* macro works its wonders. When it is done, select Stop Recording from the *Tempo* menu. Name the macro and assign it a ⌘-key equivalent. To update the portfolio valuation with downloaded data and create a chart, simply press that keyboard command.

Bridging the Date Gap

Commercial databases handle numerical information such as dates and stock quote figures in various ways. CompuServe gives stock quotes in decimal numbers, for example, while Dow Jones uses fractions. Neither one conforms to *Excel*'s date format. In our stock quote example, the downloaded numerical information must be converted into a format *Excel* understands. The CompuServe stock quotation date for February 26, 1986, looks like 19860226, while *Excel* expects a format like 2/26/86. A separate macro—convert.date—bridges the gap between the downloaded date text and an *Excel* date.

The first line names the macro and the second extracts the last two characters of CompuServe's date and places them into a cell defined by the name Day (cell A10 in "Date Conversion"). The next line defines "Counter" in cell A5 as −1. Line 4 begins a loop that keeps running until the condition in line 6 is met. Each time the loop executes, including the first time, the value of Counter increases by 1. Therefore, the first time through the loop, the value increases from −1 to zero.

In cell A6, the IF conditional statement tests the value of the text in the cell defined as Day to see if it is equal to *Excel*'s reading of the day digits from its internal clock minus the value of Counter. Since Counter is zero on the first time through the loop, the value of "Day" is being tested against today's date. If the two values are not the same, the macro starts the loop again, and the value of Counter increases by one. This makes the IF test check the value of Day against yesterday's date. When the values coincide, the macro places the equivalent of the NOW( ) formula minus the value of Counter in the active cell of the worksheet. Therefore, even if you wait until Sunday night to retrieve the closing stocks from Friday, the macro subtracts the correct number of days from Sunday's date and places Friday's date in the portfolio model.

Date Conversion

	A
1	convert.date
2	=SET.VALUE(day,MID('Current Quotes'!A3,7,2))
3	=SET.VALUE(counter,-1)
4	loop
5	=counter+1
6	=IF(VALUE(day)=DAY(NOW()-counter),FORMULA(NOW()-counter),GOTO(loop))
7	=RETURN()
8	
9	
10	26

Date Conversion

This short macro converts the text date from the downloaded file into an Excel-*compatible date for the portfolio model.*

Other Possibilities

The regional manager who wants to retrieve branch spreadsheets can automate the entire process, with each branch Macintosh using *Red Ryder* set to Host Mode and equipped with a password-protection procedure. The regional manager's *Red Ryder* dials each branch's Mac and requests the appropriate file. This could all be done overnight, when phone costs are at their lowest and the machines aren't being used for other tasks. The next morning, the regional manager has all the individual files on disk ready to go. An *Excel* macro could then combine the data into a summary worksheet.

As you can see, Macintosh integration need not stop with an integrated software package like *Excel*. By adding readily available, low-cost programs, you can build a customized, practical system that takes care of much of the busywork while you're not even looking. □

Danny Goodman is a Contributing Editor of Macworld *and the author of a book on advanced* Excel *techniques,* Hands-On Excel *(1986, Scott, Foresman & Co.).*

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10828 Lacklink
St. Louis, MO 63114
314/423-2190
List price: $40

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Affinity Microsystems, Ltd.
1050 Walnut St. #425
Boulder, CO 80302
800/255-5550, 303/442-4840 in Colorado
List price: $99

Microsoft Excel, version 1.0
Microsoft Corp.
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Redmond, WA 98073-6399
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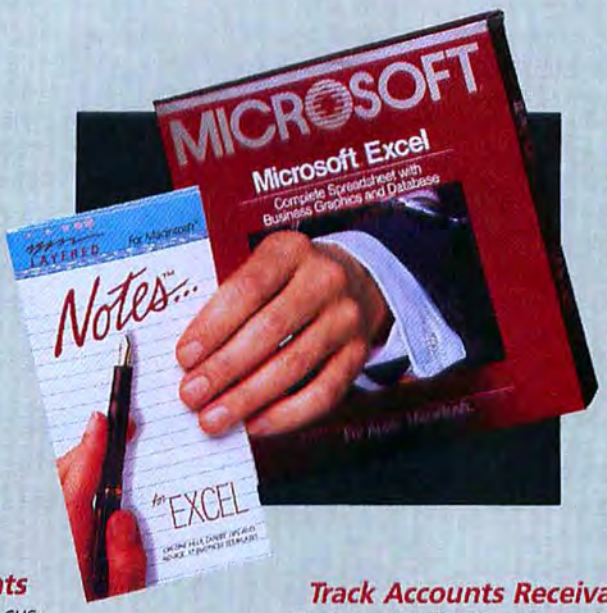

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Macware Reviews

MicroPhone, Fontographer, Balance of Power, PictureBase, and Bulk Mailer

Edited by Erfert Nielson

Grab That Microphone

News that Dennis Brothers had written a new communications program hit Macintosh telecommunicators like news that Isaac Singer had improved the sewing machine would have struck seamsters in the 1850s. When the Mac was introduced, Brothers was frustrated that no communications software was available, so he wrote *MacTep* using Microsoft BASIC and gave it away, satisfying other software-starved Mac owners anxious to tap into information services like CompuServe and The Source. For a while, *MacTep* was king of the Mac communications mountain, but ***MicroPhone,*** Brothers's new program, may soon claim that title. *MicroPhone* is easy for beginners, like Hayes's *Smartcom II,* yet powerful, like FreeSoft's *Red Ryder* and Palantir's *inTouch.*

In *MicroPhone,* Brothers brings together the best traits of every Mac communications program. The program supports all the popular file-transfer protocols as well as DEC VT100 and VT52 terminal emulation. For automated communications, there's an autopilot facility that's as easy to use as *Smartcom II*'s. *MicroPhone* even creates autopilot sequences itself by "watching" a communications session and recording your actions.

Characters in a Script

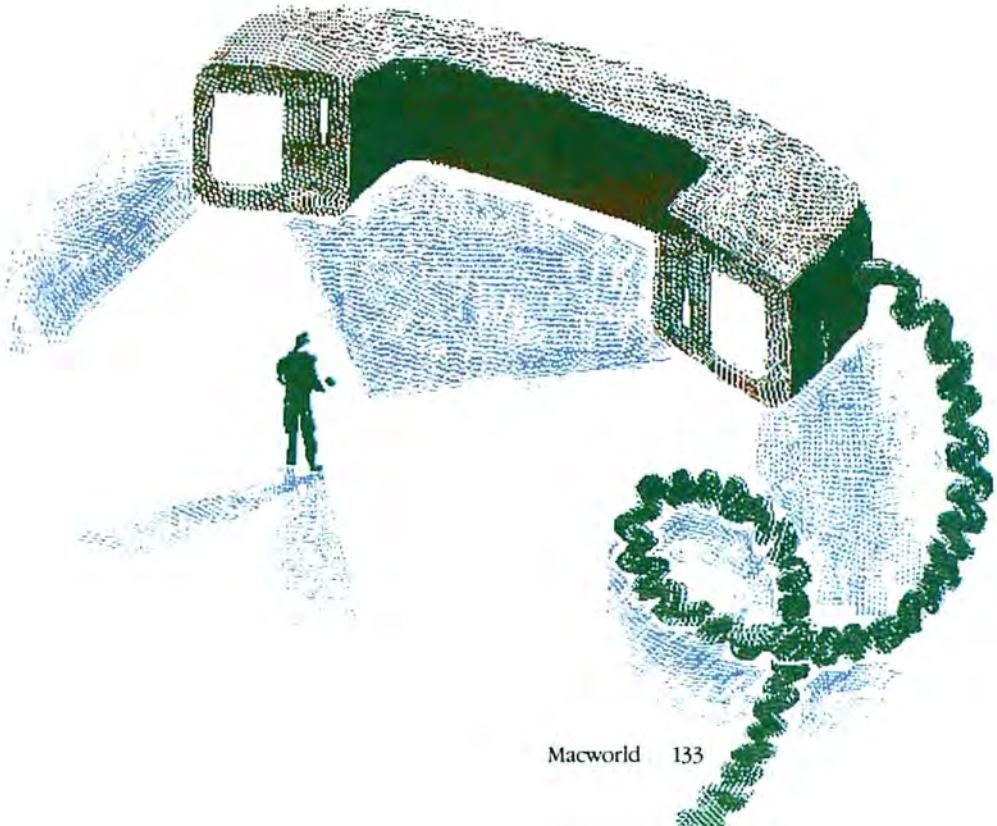
MicroPhone lacks a separate macro facility for sending strings of characters with a single keystroke, but its autopilot feature does anything a macro can, and then some. *Red Ryder* and *inTouch* let you create macros that send frequently typed text, such as commands or user ID numbers, when you type a ⌘-key combination or click a displayed button. With *MicroPhone,* you create a script file and specify whether you want the script's name to appear on a button, in the Script menu, or both. Scripts can also be activated by a ⌘-key combination.

Listing script names in a menu isn't vital to communications, but it makes using the program less intimidating. Most communications programs force you to choose a Run or Perform command before choosing the script's name from a selection box. That's a more time-consuming process than making a menu selection, and time is not something you want to consume when the telecommunications meter is running.

Creating scripts for navigating complex information services like CompuServe puts an information service in a Macintosh-like environment (and lets you throw away the cheat sheets of commands and ciphers taped to the front of your Mac).

Creating autopilot procedures for performing repetitive tasks such as dialing a service and signing on is convenient, too, thanks to *MicroPhone*'s construction-set approach to programming. While *Red Ryder* 7.0 and *inTouch* make you type entire procedures, including hard-to-remember commands, *MicroPhone* provides a scroll box listing dozens of available commands (see "Writing a Script").

(continues on page 134)



(continued from page 133)

You choose commands with the mouse, typing only the information needed to complete a command, such as an ID number. *MicroPhone*'s autopilot language provides sophisticated control structures like IF . . . THEN . . . ELSE and WHEN . . . ENDWHEN, letting you create procedures to automate even complex communications tasks. And to keep the bugs out, a Check button tells *MicroPhone* to scan a procedure for syntax errors.

Pointing and clicking to create autopilot procedures is handy; letting *MicroPhone* create them for you is even better. Choose the Watch Me command, and *MicroPhone* creates a script based on what you type and what the other computer sends—a talent matched only by *Red Ryder* 7.0. You can edit the resulting script to correct any typing errors.

Bells, Whistles, and BBSs

For file transfers, *MicroPhone* can use the Xmodem error-checking protocol with or without the MacBinary format. The program also supports the Ymodem batch protocol, which lets you download numerous files with only one command. Unlike *Red Ryder, MicroPhone* doesn't support the Kermit protocol—not a major shortcoming, since Xmodem and MacBinary dominate the Macintosh world.

When sending text files, you can specify a line length for outgoing text, which is handy when you're sending a file to a computer with a different screen width. When capturing incoming data in a text file, you can selectively start and stop capturing with the Capture On and Capture Off commands, or better still, you can use the script facility to create Capture On and Capture Off buttons.

Anyone who has fought with FILGE, CompuServe's ungainly text editor, will appreciate *MicroPhone*'s MicroEditor desk accessory, which lets you edit text without quitting *MicroPhone*. MicroEditor is useful for editing captured text and makes creating electronic letters and outgoing text a snap. Of course, you can add C.E. Software's *MockWrite* or another desk accessory editor to any communications program, but the fact that *MicroPhone* includes one is indicative of the thought that went into *MicroPhone*'s design.

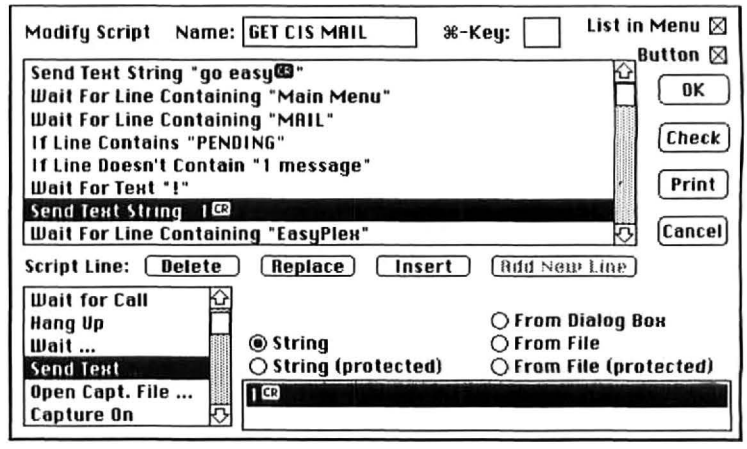
MicroPhone is replete with such niceties. There's a preprogrammed script that turns your Mac into a simple bulletin board system for exchanging files, as well as an information-packed manual authored by MAUG chief system operator Neil Shapiro. The manual contains an appendix listing dozens of hobbyist bulletin boards that you can investigate for nothing more than the cost of a phone call. *MicroPhone* also includes *Switcher* and a *Switcher* document for using *MicroPhone* with *MacWrite*.

What does *MicroPhone* lack? It doesn't have the gimmicky interactive drawing feature of Hayes's *Smartcom II,* which lets two *Smartcom II* users draw pictures using *MacPaint*-like tools. It also lacks *Smartcom II*'s more useful bottom-of-the-screen icons for dialing, printing, and sending and receiving disk files. That isn't a major shortcoming, however, since you can create buttons to perform those tasks. Finally, it doesn't have on-line help, but such a feature is of questionable value anyway; most people struggle more with cryptic information service commands than with communications programs.

(continues on page 142)

Writing a Script

With MicroPhone, *you create an autopilot sequence, or script, by selecting commands from a list and then typing additional information, such as a user ID number or password. For fast access, list the script's name in a menu, a button, or both.*



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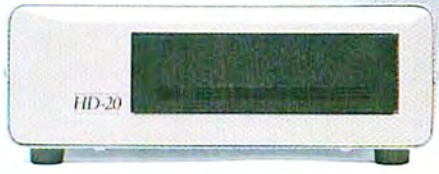

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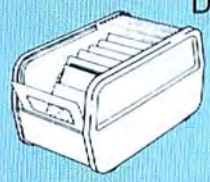

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(continued from page 134)

The only other thing *MicroPhone* lacks is a high price tag. *MicroPhone* is a first-rate communicator with a great deal to offer beginners as well as pioneers who still have a copy of *MacTep* in their disk libraries. Because of its ability to create buttons, list scripts in menus, and create scripts automatically, *MicroPhone* has without a doubt become my favorite communications program.—*Jim Heid*

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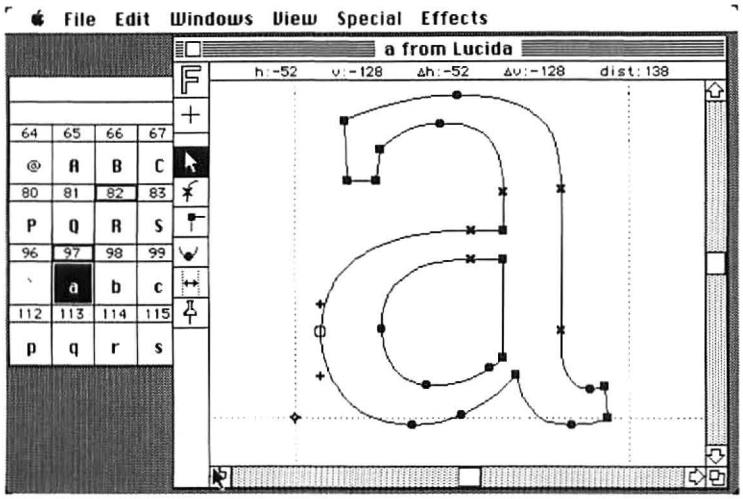
A First for Fonts

Bit-map font editors have been available on personal computers for some time. *FONTastic,* from Altsys, enables Macintosh owners to construct letters and symbols, pixel by pixel, on the Mac's screen (see "The Mac Font Shuffle," *Macworld,* December 1985). ***Fontographer,*** Altsys's latest product, is the first outline font editor ever released for a personal computer.

Fontographer compares to *FONTastic* roughly as *MacDraw* compares to *MacPaint.* Instead of representing a character as a field of black and white pixels, the character is defined as an outline, which is later filled in by an output device. The primary advantage of outlines over bit maps is that outlines are not restricted to any particular size or rotation. Furthermore, because the font is defined with PostScript, it can be used on many devices, from medium-resolution laser printers to high-resolution typesetters.

Font Construction

With *Fontographer,* you construct a character by entering "control points" at key locations on the character's contour (see "Drawing a Letter"). The program connects these points automatically and saves the font as a *Fontographer* document and a PostScript text file that can be downloaded to a LaserWriter or other PostScript-compatible device.



Drawing a Letter
Fontographer *has three kinds of control points: corner points, where the outline has a sharp corner; curve points, for smoothly curving portions of the outline; and tangent points, where a straight portion smoothly joins a curved portion. You adjust curves between control points by moving control handles.*

HOVR hoya

HOHVHRH OHOVORO
hohyhah ohoyoao

Lucida Printout
These characters from the Lucida typeface, designed by Bigelow & Holmes, were produced with Fontographer *and printed on a LaserWriter. (Reproduced with the permission of Bigelow & Holmes.)*

Fontographer has a number of features found in industrial typeface production systems, plus some new ones. Two additional drawing planes allow you to sketch guidelines and templates that are visible while editing a character but do not become part of the PostScript font. You can easily cut, paste, rotate, mirror, and slant outlines and parts of outlines. You can also print a hard-copy proof of the current font (see "Lucida Printout").

Fontographer automatically generates on-screen versions of outline fonts for use in Macintosh applications. Unfortunately, the quality of the bit maps is very poor (this is not surprising, since no software ever written has produced readable screen fonts automatically). To address this problem, *Fontographer* includes a copy of *FONTastic* for touching up screen fonts by hand.

Also included with *Fontographer* is LW Download, a program that sends PostScript files to the LaserWriter over the AppleTalk network. Until a printer driver that supports downloadable fonts becomes available, LW Download must be used to download fonts created with *Fontographer*.

Hardware Considerations

Fontographer requires a Macintosh with at least 512K. I used the program on a 512K Mac, a Macintosh XL, and a Macintosh Plus and encountered very few bugs. Although *Fontographer* works on a single-drive (400K) system, operation is cumbersome. Having two 400K drives or a single 800K drive increases efficiency.

Fontographer is copy protected, but hard disk owners take heart: an install feature lets you copy the program onto a hard disk and run it without the master disk. You can perform only two installations in a row, but the program can be installed and uninstalled indefinitely.

Limitations

I should point out that simple outline fonts like those created by *Fontographer* have limitations. Every output device ultimately represents its image as a bit map.

(continues on page 144)

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When MACazine (Jan. 1986) bestowed OverVUE with its **Readers' Choice Award,** they wrote: "We selected OverVUE because of its ease of use, clairvoyance and statistical capabilities. The fact that OverVUE was subsequently selected by our readers as Best Database simply confirms our original assessment: the product is a jewel and the customer support a bonus!"

OverVUE's clean sweep of these two prestigious awards only confirms what everyone else has been saying all along:

Infoworld (July 8, 1985): "...it is Macintosh software done right."

Icon Review (Fall 1985): "OverVUE 2.0 is our favorite database workhorse...it simply offers the best balance of power and ease-of-use available on the market today."

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(continued from page 143)

On PostScript devices, the conversion from outline to bit map takes place in the printer. At low resolutions, simple outlines don't convert faithfully to bit maps. This isn't a problem on a high-resolution typesetter or when you're printing large logos and display type on a laser printer, but small text may not print perfectly on a laser printer. Several firms have developed ways to add structural information, such as alignments and stem weights, to outline fonts. These structured fonts convert much more effectively to bit maps, and I would encourage Altsys to consider adding such capabilities to *Fontographer*.

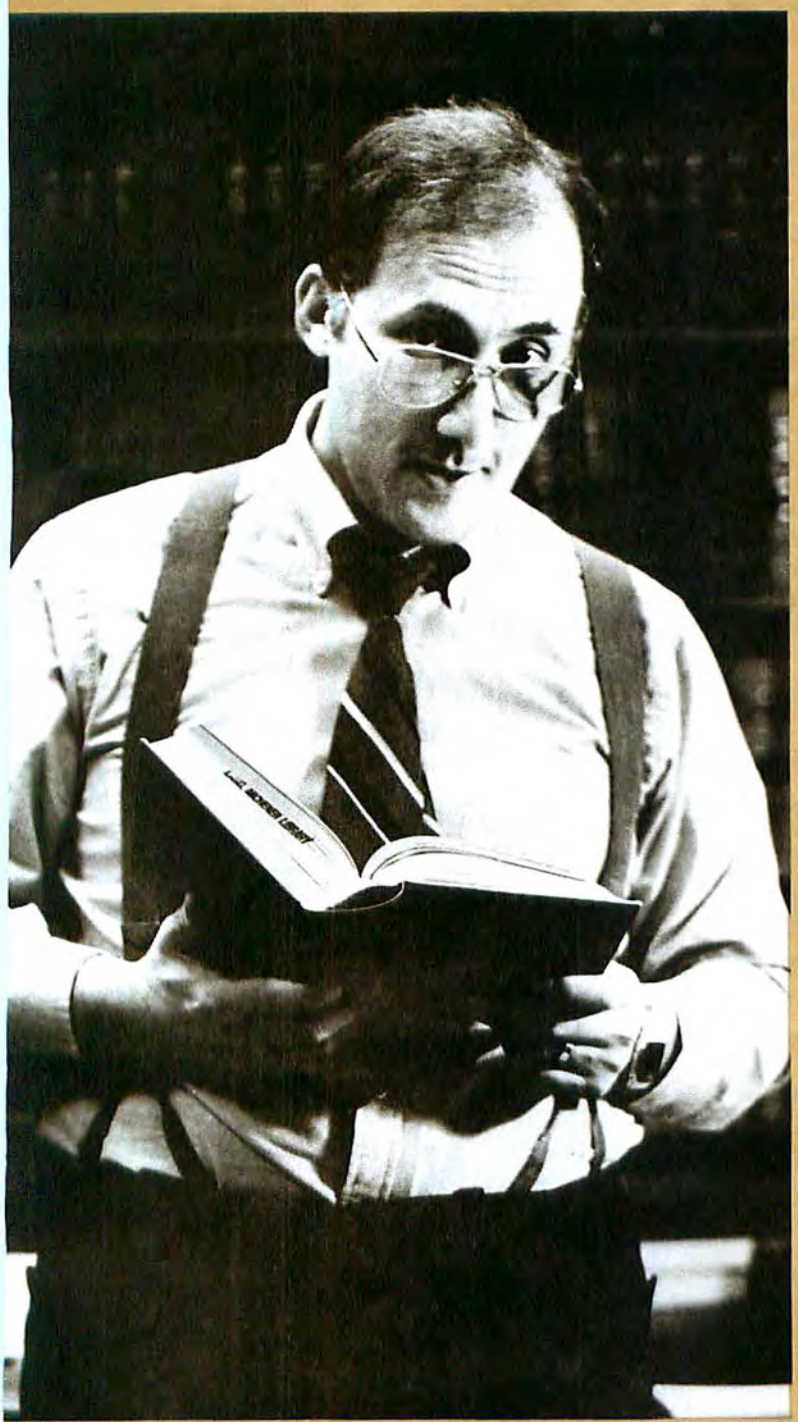
For professional work, another useful addition to *Fontographer* would be a method for accurately entering designs from drawings. You can enter a digitized picture into *Fontographer*'s background drawing plane via the Clipboard to reproduce logos or other illustrations. This method is not very effective for capturing details of small characters, however. I would like to see a link to a high-resolution digitizing tablet with a puck for entering control points directly.

The first line of Altsys's manual states that "*Fontographer* has been developed to allow almost anyone with creativity and an eye for detail to create professional quality fonts." While it's true that *Fontographer* is easy to learn and use, it would be a mistake to underestimate the difficulty of professional-quality font production. Designing attractive, readable fonts requires years of study and practice, and skilled practitioners of this art are few. I expect *Fontographer* to be used most often to produce logos and special characters, a task for which it is well suited. In this capacity, *Fontographer* would be a real asset to the many businesses that offer design, composition, and printing services with PostScript-compatible systems.—*Daniel Mills*

Fontographer, version 1.0
Altsys Corp.
P.O. Box 865410
Plano, TX 75086
214/596-4970
List price: $395

(continues on page 146)

Gold Collar Worker



Photographed by Brian Thompson at the law library of Lang, Michener, Toronto, Ontario.

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Profession: Managing partner, major Canadian law firm.
Hobby: Crafting reproduction William and Mary furniture.
Work style: Perfectionist. Demands 100% accuracy, superior quality and appearance in every legal document.
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Favorite software: Document Modeler™, a powerful expert system toolbox for documents. It enables Bruce to "clone" his 12 years of legal experience to assist other lawyers and staff. And it saves time.
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(continued from page 144)

Staying Alive

Chris Crawford's ***Balance of Power*** has attracted a lot of media attention. The game is part simulation, part strategy, part reality-check for game players accustomed to arcade-style shoot-'em-ups. *Balance of Power,* published by Mindscape, puts you in the role of leader of either the United States or the Soviet Union. For an eight-year period beginning in 1986, you compete with the other superpower for prestige and power among the world's nations. That's the easy part.

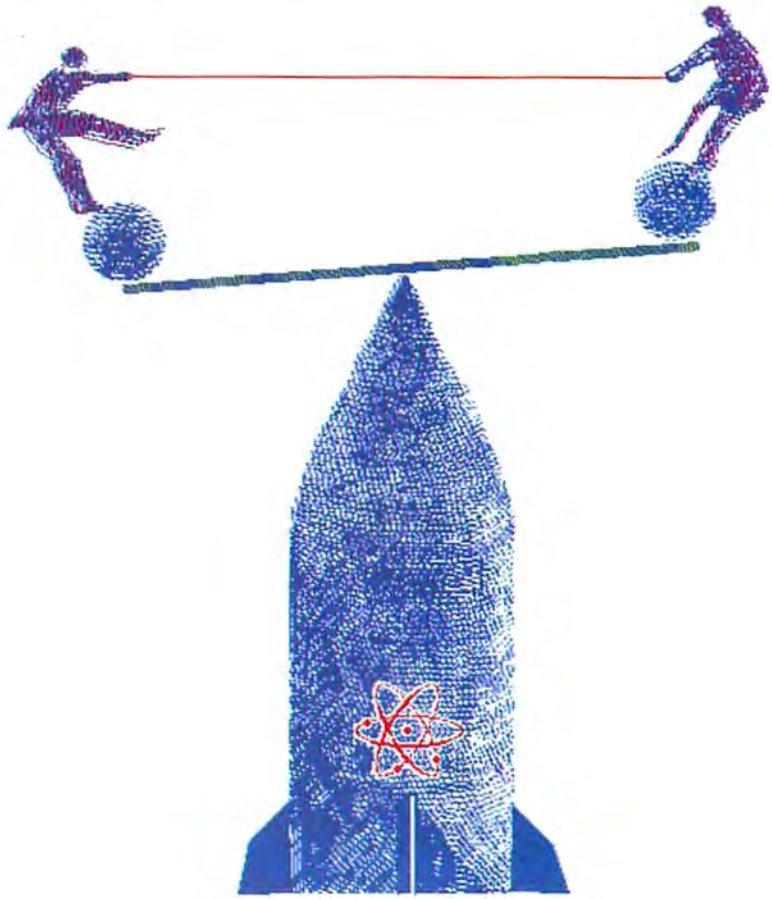
The hard part is avoiding nuclear war. In *Balance of Power,* such a war would end not only all wars but all life–it certainly ends the game. There is no victory in the usual sense; the only way to win is by not losing. *Balance of Power* is not for those who want their computer games to be action-packed and exciting. But that's because *Balance of Power* is as far removed from *Space Invaders* as *Requiem for a Heavyweight* is from *Rocky IV.*

Balance of Power attempts to define a new genre of computer game. As in simulation games, you perform tasks under conditions re-created as faithfully as possible from the real world. As in strategy games, you confront an adversary in a test of wills and wits. As in text adventure games, you assume the role of a protagonist in a plot whose outcome you can control. The result might be termed by a computer-savvy Truman Capote as the interactive nonfiction novel–based on fact, richly textured, and disturbingly familiar, but a product of the imagination and still a game.

Required Reading

More than any Macintosh game and even most Mac applications, *Balance of Power* requires a careful reading of its manual. The game's setup screen includes the matter-of-fact statement "People who play this game without reading the manual are wasting their time."

Also written by Crawford, the manual explains the objectives of the game and how best to play each level. Its comprehensive reference section offers caveats and reminders on the most effective use of menus, options, and available information.



Appendixes include a discussion of the game's level of realism as a simulation, a description of the models used to program the game, and instructions on how to interpret an information-packed screen display. Finally, an annotated bibliography lists the reference books Crawford used in his research.

A Small World

Balance of Power's main screen display is a map of the world showing 62 countries, which are individually filled in with any of four shades according to a country's ranking under criteria such as level of insurgency, likelihood of a coup, amount of Soviet economic aid, and amount of U.S. military aid. Of course, there are many more than 62 countries in the world. Crawford points out that display size was a major factor in limiting the number of countries shown.

The map is topped by menus that let you select the information you want displayed. Selecting Spheres of Influence from the Countries menu, for example, shows which countries are in each superpower's turf. The USA and USSR menus have identical items that let you view how you and your rival relate to the rest of the world in terms of diplomatic relations, treaties, military and economic aid, intervention on behalf of insurgents and governments, and subtler aspects of foreign policy such as destabilization efforts and diplomatic offensives. The Briefings menu allows you to look at detailed data for a selected country. The menu lists options that display information on a country's GNP, population, military strength, level of insurgency, and relations with each superpower.

Enough data is stored in *Balance of Power* to fill a respectable atlas or two. In fact, Crawford culled a wealth of actual data from atlases and other sources and fictionalized it for the game. There are problems–acknowledged in the manual–inherent to that approach. The problems arise whenever your own facts about the real world are inconsistent with Crawford's extrapolations, and you confuse real countries with those in the game. At the outset of one game I played, for example, the Nicaraguan government was termed extreme right. Apparently, a counterrevolution had prevailed, yet the government was "cold" to the United States, which was aiding Sandinista insurgents. Such inconsistencies are rare, however. In general, *Balance of*

(continues on page 150)

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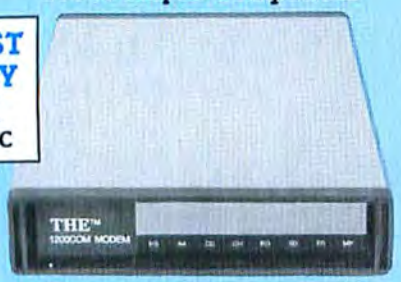

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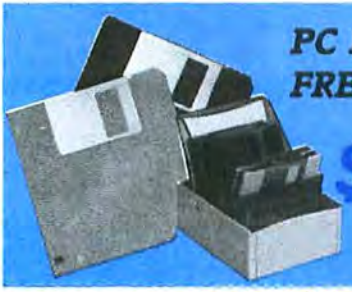

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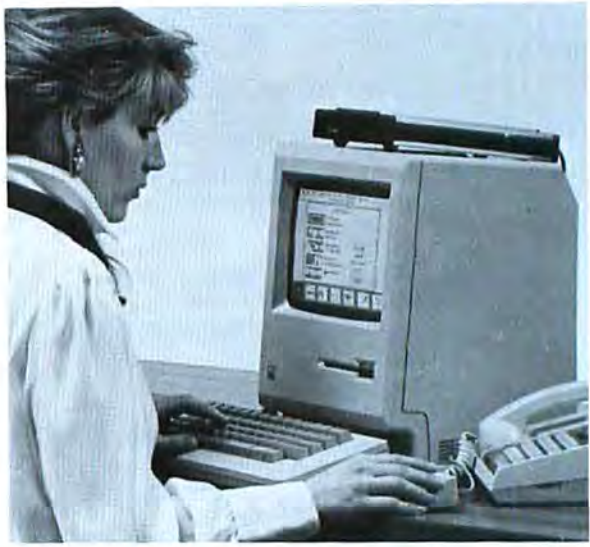

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(continued from page 147)

Power is true to the real world. (As the months go by, *Balance of Power* risks losing its effectiveness as an interactive nonfiction novel. However, Mindscape can hardly be expected to issue an update following every significant election, coup, or war.)

Policies and Events

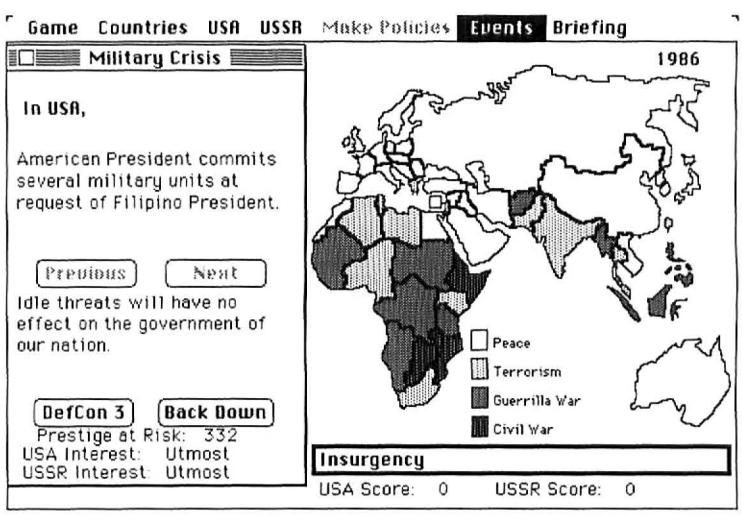
Players make their moves through the Make Policies and Events menus. You set policy toward a country by selecting the country on the game screen and choosing an option from the Make Policies menu. At the beginner level, you can send military aid or troops to either the government or the insurgents. At the intermediate level, two additional options become available: you can send economic aid or destabilize the government through covert operations. The expert level allows you to conclude treaties and apply diplomatic pressure. (The nightmare level is for the experts who think they can resolve the Middle East situation by the middle of next week.)

The events window is where the world is lost or saved (see "Current Events"). *Balance of Power* may surprise you with how easily the world can be lost. One game I played ended when the United States opened the silos over Soviet economic aid to Tanzania. Disagreement over diplomatic relations with Burma caused the superpowers to go into DefCon2 (Defense Condition 2), one step short of the final fireball. While neither scenario is likely in the real world, the game's logic is unassailable: if you won't back away from the brink of nuclear war over some insignificant policy, why should your rival?

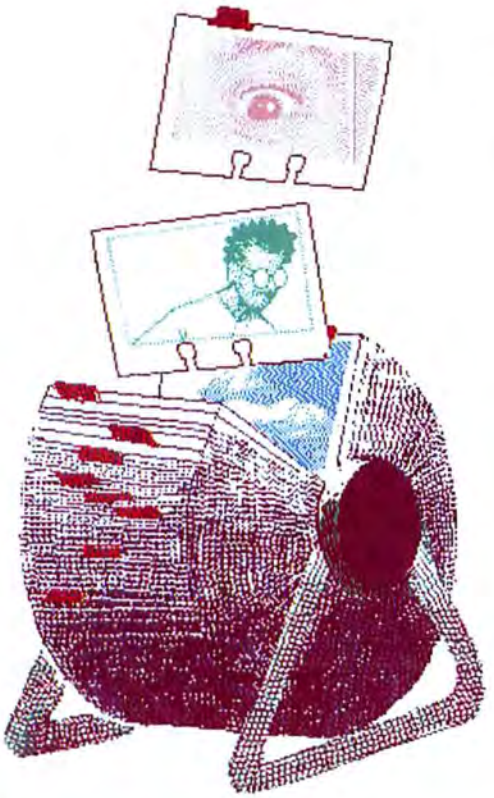
Although the discrepancies mentioned earlier between the world of *Balance of Power* and the real world can prove confusing, the game has a more serious flaw: it doesn't acknowledge the independence of countries other than the two superpowers. In the real world, nations seek recognition of their rights as sovereign states, independent of both the United States and the Soviet Union. Crawford says that he experimented with a multipolar version in which numerous countries pursued independent policies, including neutrality, but he had to give up what he describes as a "shootout at the saloon on a Saturday night" for the more playable, bipolar showdown at high noon that was released.

Despite its superpower-oriented view of world politics, *Balance of Power* is worth adding to your game collection. By being firmly based in reality, the game helps you appreciate how much easier it is to restart the Mac than to rebuild civilization. *Balance of Power*'s best lesson is that the real world is not a game.
–J. E. Arcellana

Balance of Power
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
312/480-7677
List price: $49.95



Current Events
Would you blow up the world over superpower intervention in the Philippines? In this Balance of Power *Events window, the crisis has escalated to Defense Condition 3—two short steps from nuclear war.*



Get Your Art Together

If you're a Macintosh artist, an art director, a newsletter editor, or a convert to desktop publishing, you're faced with the problem of organizing and accessing large quantities of Mac artwork. You may have hundreds of illustrations stored on piles of floppy disks or in stacks of folders on a hard disk. How can you keep track of all those proliferating files of art–especially clip art–and quickly choose which piece is needed in a given situation? It's possible to waste a good half-hour popping poorly labeled disks into the drive in search of that drawing that you know is there *somewhere*.

Of course, if you're a born organizer, you may have already avoided this muddle by creating categorized *MacPaint* file disks and using a desk accessory like *Art Grabber* or *QuickPaint* to transfer art files into other applications. This solution is a step in the right direction, but it doesn't go far enough.

(continues on page 152)

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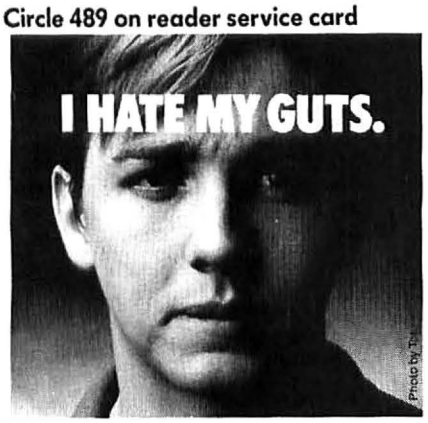

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(continued from page 151)

Accessible Art

Enter Symmetry Corporation's ***PictureBase,*** a self-described "art management system" that addresses the art cataloging problem in a clever way. *PictureBase* enables you to organize *MacPaint* and *MacDraw* documents in libraries, which are categorized by general subjects of your choosing (Symbols, Borders, Holidays, and so on). You can summon up and preview several libraries at once, flipping through their contents in a window that resembles the Scrapbook (see "Paging through a Portfolio").

When you find the drawing you want, you can paste it into a document by using PictureBase Retriever, a desk accessory that can be installed in other programs, or by using *PictureBase* in conjunction with *Switcher,* which is included on the *PictureBase* disk. To facilitate easy retrieval, you can attach keywords to each illustration. Keywords serve as memory hooks, in case you've forgotten a drawing's name, and work with the program's Search function as a form of cross-referencing. For example, you might use the keyword "decoration" to flag various illustrations that would be appropriate as decorative elements in a newsletter. The Search function allows you to ask for art by title or keyword and searches either single libraries or all libraries on a given disk.

PictureBase is particularly well suited for use with desktop publishing programs such as *PageMaker,* since you may want to scan clip-art files without leaving the page-design application. I had no problem installing PictureBase Retriever as a *PageMaker* desk accessory and using it to paste artwork directly onto a publication page.

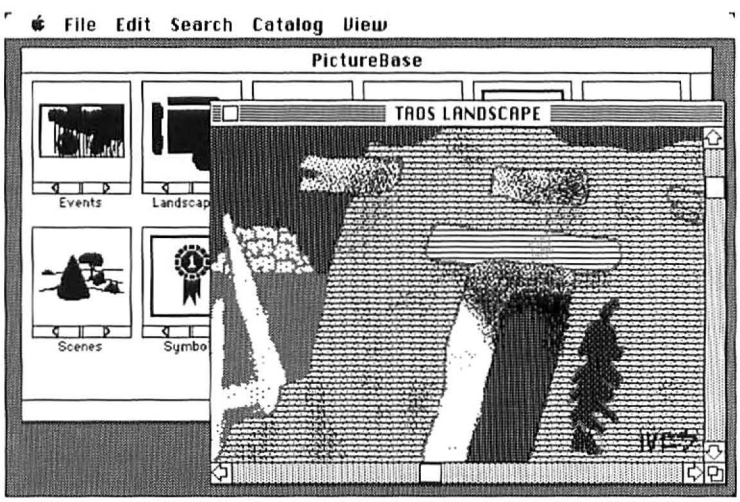
What's Wrong with This Picture?

With *PictureBase,* Symmetry Corporation has delivered the first graphics database, and the program may well be the solution to your Macintosh art file chaos. However, *PictureBase* has a few limitations that you should take into consideration.

First, the program converts *MacPaint* and *MacDraw* files into *PictureBase* "library format" (actually QuickDraw format) as a prelude to categorization and filing. While you can copy and paste *PictureBase* files into most applications, the files can't be opened directly by *MacDraw* or *MacPaint.* This could present a problem if you wanted to modify a drawing before pasting it into a publication. The Copy to Paint command, which saves library files as *MacPaint* documents, solves part of this problem, but what about *MacDraw* files?

If you copy a library file created in *MacDraw* with *PictureBase*'s selection rectangle, the program changes the *MacDraw* image to a bit map instead of an object-oriented drawing. The solution is simple: don't use the selection rectangle. If you simply choose Copy from the Edit menu, the selected library file retains its *MacDraw* characteristics. Unfortunately, the manual does not explain this technique.

PictureBase has a few shortcomings as a database. Although the program encourages you to attach keywords to every picture in each subject library, there is no mechanism for listing all the keywords in use. Keywords lose some of their punch as a device for summoning up art files if, six months down the line, you've forgotten most of the keywords you originally invented. In addition, there is no simple way—short of returning to the desktop—to



Paging through a Portfolio

Once you've arranged a collection of artwork by subject, PictureBase *lets you flip through a library file to locate the drawing you need. You can also search the drawing database by keyword to find a particular illustration or group of related illustrations.*

see at a glance the names of all the files within each subject library. You must click through a miniature depiction of each library's documents to see what is in the library.

As with any computer filing program, *PictureBase* won't relieve you of the initial task of choosing categories for your art documents, renaming them, and reshuffling them onto disks with other associated documents. If you're struggling with 20 or 30 disks in need of organization, you've got many hours of cleanup work ahead of you. Once you've organized your files, however, *PictureBase* provides an efficient way to view dozens of related illustrations in quick succession.

PictureBase has great potential for newspapers or other publications with large collections of clip art. The program has been tested on a network of Macs using Infosphere's *MacServe* disk server and successfully gave multiple users access to a central library of drawing files. Several companies plan to make clip-art collections available as *PictureBase* libraries, saving Mac art collectors the task of imposing order on their libraries. –*Jay Kinney*

PictureBase, version 1.1
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(continues on page 154)

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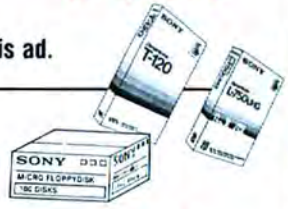

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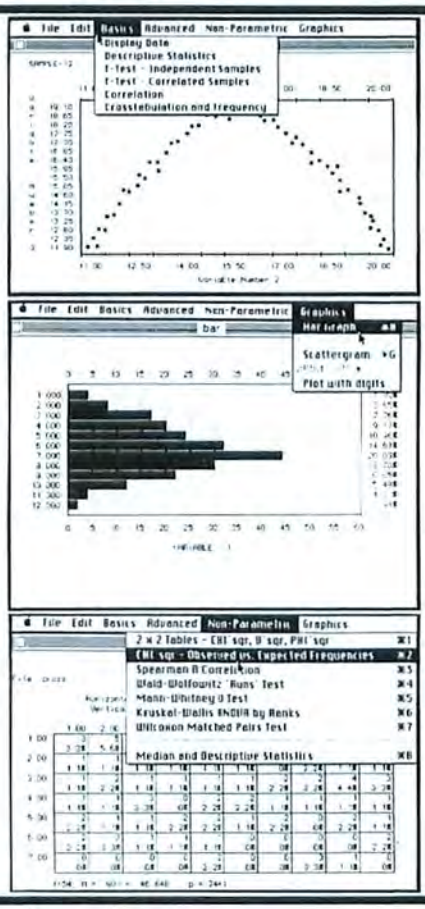

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(continued from page 153)

While a hard disk may be more practical for large mailings, *Bulk Mailer* can be used on a 512K Macintosh with an external drive. With a 512K Mac, *Bulk Mailer*'s link feature lets you combine and print the data from two disks in alphabetical or zip code order. The link feature also gives you the option to link mailing lists for a larger mailing and unlink them when the mailing is completed.

Entering Information

Bulk Mailer has a predefined format for data entry. A record includes fields for name, company, address, city, state, zip, phone number, and two search codes. You can't add fields or change the length of a field. This inflexible format can cause problems. For example, the total number of characters for city, state, and zip code can't exceed 28; this size could prove insufficient for long city names or foreign addresses. The record format does offer some flexibility, however: any field that doesn't contain information can be used for comments.

If you are building a large mailing list, entering data quickly and accurately is essential. *Bulk Mailer*'s record layout makes it easy to enter data, but there is no way to back up to an earlier field without using the mouse. To quickly enter repetitive data, you can use the program's default entry feature for city, state, and zip and for the two search fields. After setting a default, you can fill fields by pressing the Return key.

Maintaining Lists

Although not extensive, *Bulk Mailer*'s searching and sorting capabilities are flexible. One option sorts a list alphabetically by client or company name, another by zip code, and a third by record number. The program sets aside two search fields—one for customized codes and the other for setting ranges such as maximum and minimum zip code or date.

Part of the job of maintaining a mailing list is finding duplicate entries and deleting records for clients who have moved. You can search for duplicates by address, company, or name. The program automatically eliminates identical records but lets you view similar records before deleting.

Since the post office does not forward mail after 12 months, managers rely on returned mail to clean up their mailing lists.

To help you easily identify returned mail, *Bulk Mailer* prints record numbers on the labels. *Bulk Mailer* lets you clear and reuse a record rather than purging the file and changing the record numbers associated with each client. Unfortunately, the program does not provide a listing of the reusable records.

Labels

Bulk Mailer is currently the only mailing list program that prints four kinds of labels, from one-up (single) labels to four-up (four across a page) labels. With single labels you can choose to pause between labels to change envelopes or labels that are not tractor fed. A test print option lets you adjust the vertical spacing between labels.

Bulk Mailer prints a five-line address on labels. A sixth line is reserved for printing greetings, the record number, a search code, or carrier route information. Unfortunately, *Bulk Mailer* is not designed for overseas addresses. If your mailing list contains overseas addresses, check to see if the data entry structure can accommodate the addresses.

The program doesn't give you a choice of fonts; it uses the printer's native font. However, *Bulk Mailer* does provide a number of style options, including ultra-condensed, condensed, extended, pica, elite, bold, and normal. The program has been upgraded to work with the LaserWriter.

Bulk Mailer includes a mail-merge module that works with *Microsoft Word,* but since the program is primarily an address list manager, the merge variables are limited to name, address, and salutation.

Bulk Mailer could be used by any organization with a mailing list of up to 90,000 addressees. The program simplifies list maintenance with features such as file linking, elimination of duplicate records, default entry, and flexible sorting. *Bulk Mailer*'s impressive record capacity, combined with the availability of memory upgrades for the Mac, make using the Macintosh for mailing list maintenance increasingly practical.—*Janet McCandless*

Bulk Mailer, version 2.01
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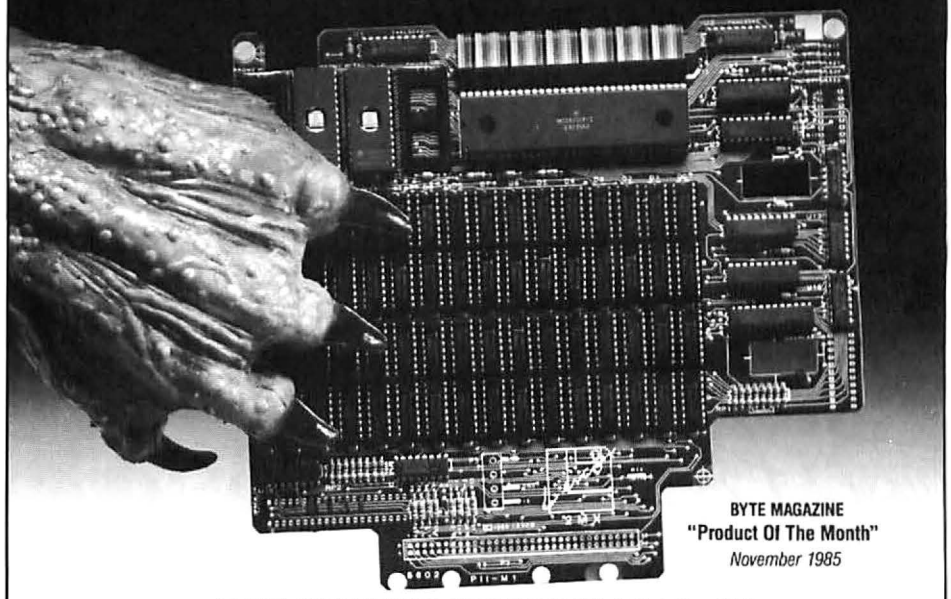

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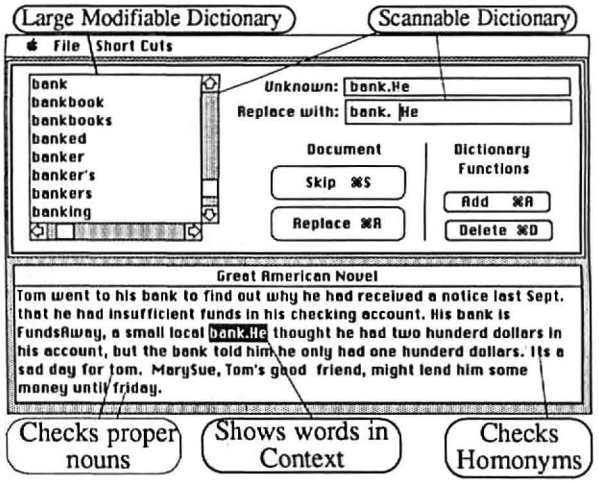

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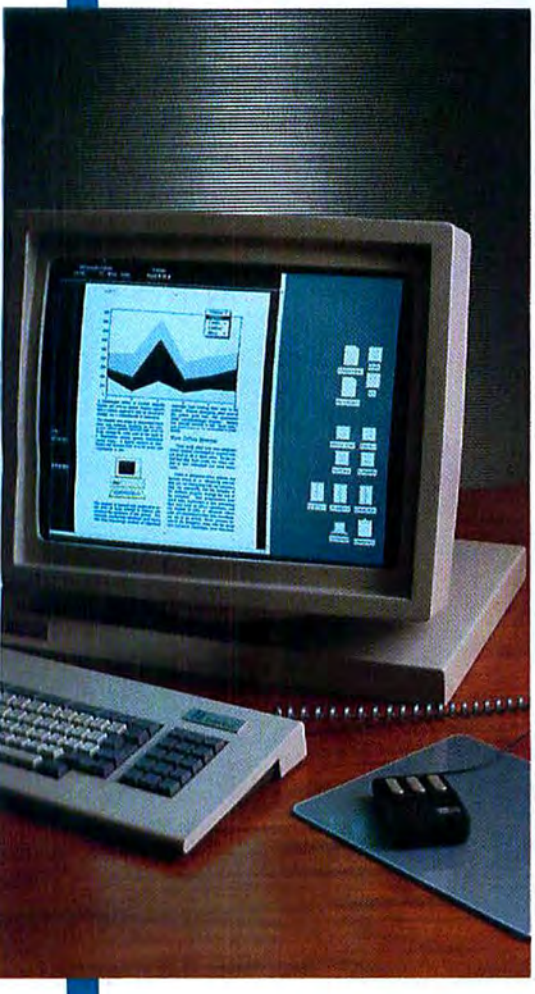

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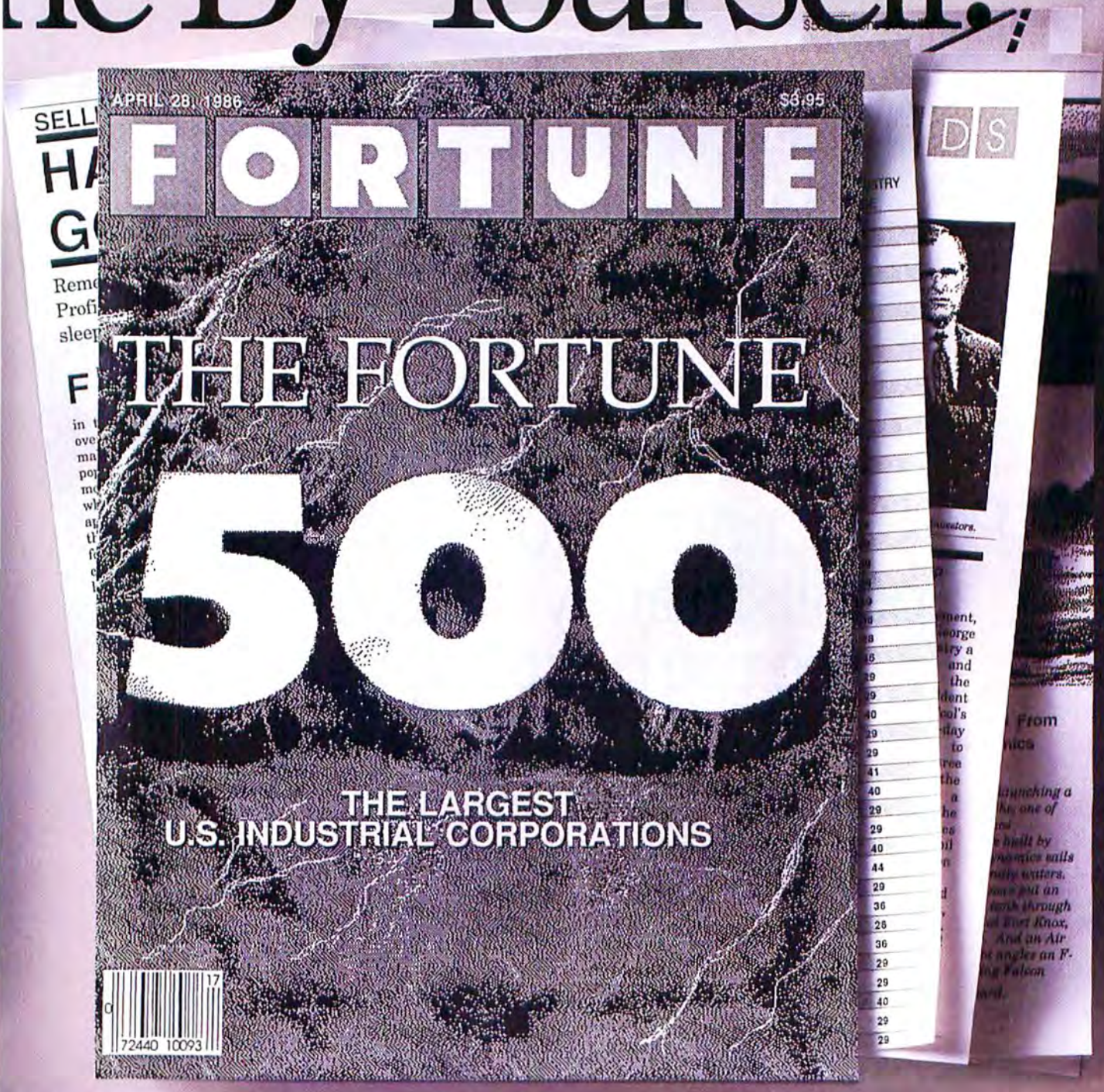

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Publish!

The Magazine of Desktop and Personal Computer Publishing

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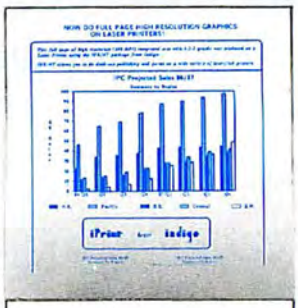

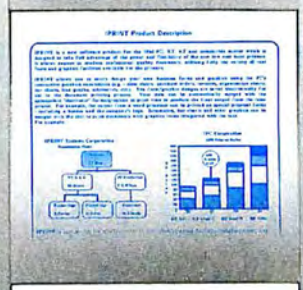

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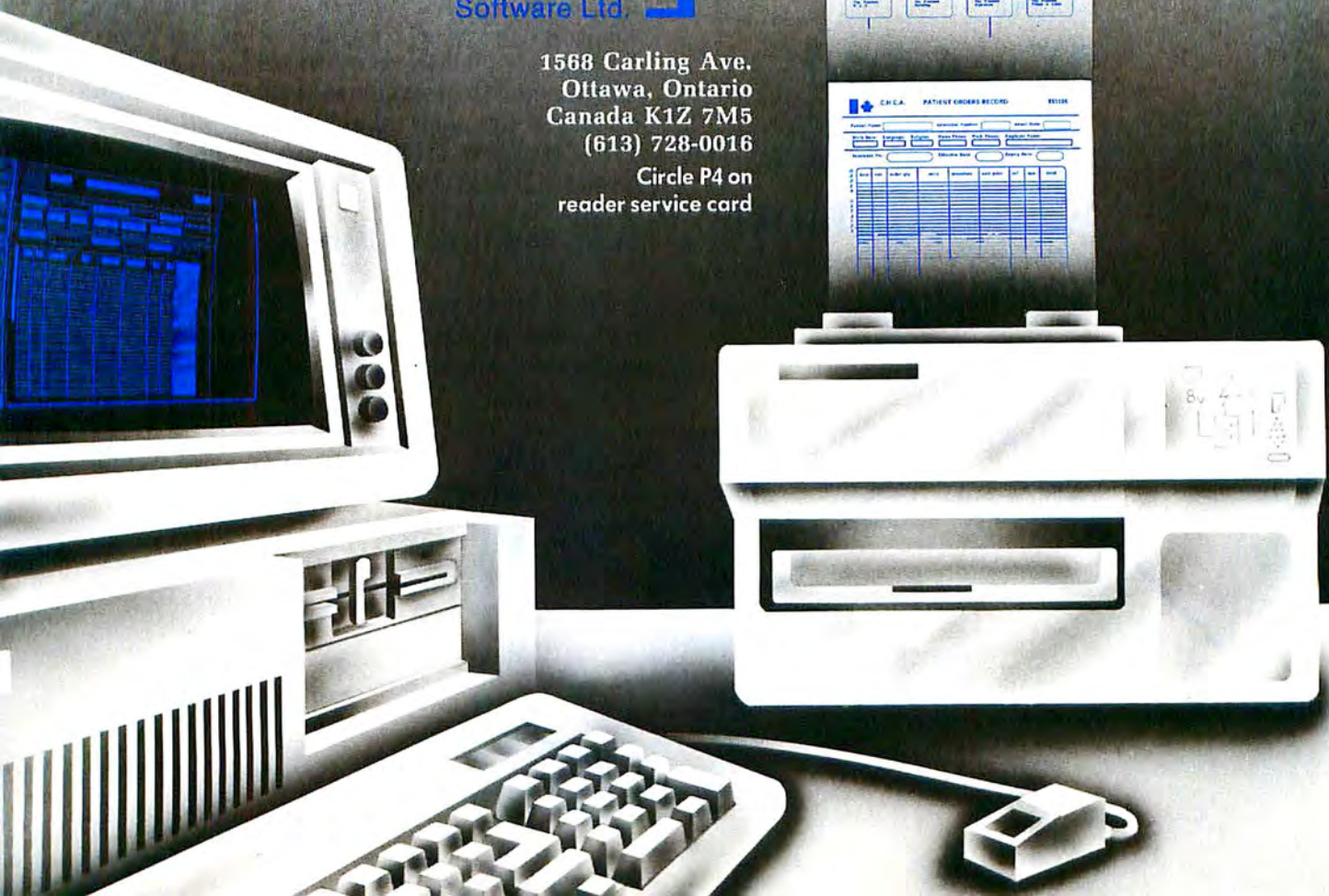

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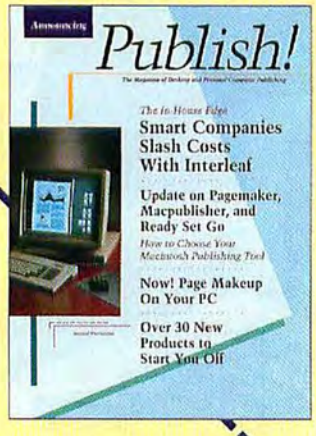

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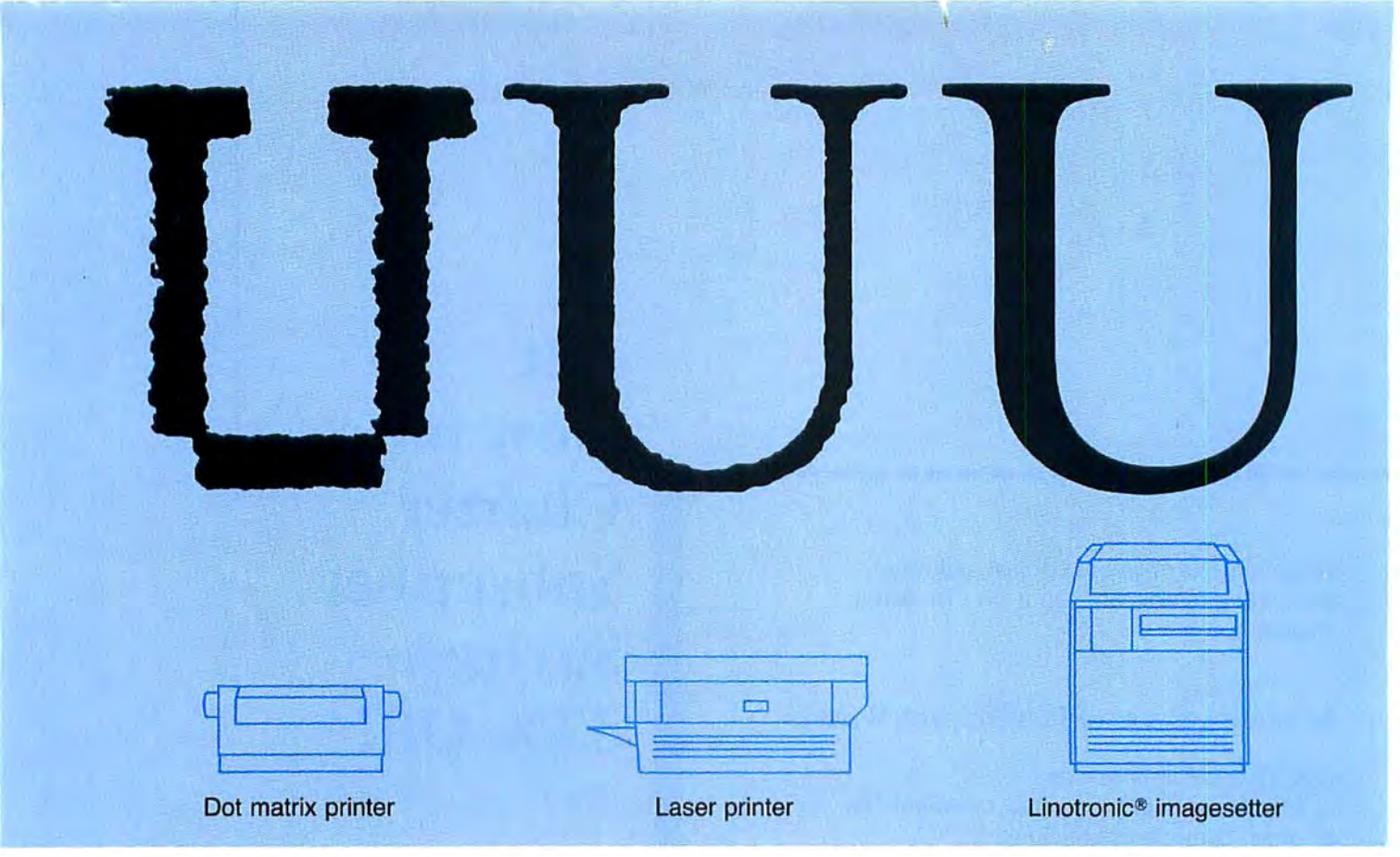
4CYW9



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Now Word can give you the world's highest-quality typeset output.

Microsoft® Word makes it very easy to put words on paper.

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Turn keystrokes into masterstrokes.

Whether you're using an IBM PC or compatible, or an Apple Macintosh computer, you have the beginnings of a professional typesetting system.

Just connect your computer to a Linotronic laser imagesetter and you'll be able to create professional quality typeset documents that really stand out. (This ad was written using Word, and output on a Linotronic imagesetter.)

The result is printed communications that are more effective and more economical, too. Because typesetting dramatically reduces the costs of printing and postage. (The tight letterfit of typeset characters can reduce the bulk of many documents by as much as 50%.)

Combine Word and pictures.

As good as Word is, sometimes pictures tell the story better.

That's why you're also taking advantage of programs like Chart, MacPaint and MacDraw. And preparing visuals that you electronically cut and paste into your memos, reports and presentations. Most typesetters can't reproduce these pictures. They give you only the words, and you have to prepare the graphics some other way, adding time and money to the job. Only Linotronic imagesetters take exactly what you have on-screen and give it to you on paper. Or film. Positive. Or negative.

One thing Apple and IBM agree on.

Apple's LaserWriter™ printer uses typefaces licensed from Linotype's Mergenthaler™ library. And IBM chose Mergenthaler type for their mainframe printer.

Most of the typefaces that have become industry standards were developed by Linotype. (Helvetica® and Times®, for example.) And they're available only from Linotype.

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Welcome to the World of Publish!

Every good magazine is born of a vision. *Publish!* represents a vision of a magazine about a new technology—a technology used to produce the magazine itself. Our medium really is our message.

The vision of using personal computer publishing to put out a magazine about personal computer publishing began in the minds of Tony Bove and Cheryl Rhodes. As pioneer reporters on this exciting new medium, they created *Desktop Publishing*, a magazine completely written, edited, and produced on a personal computer.

We shared their vision. In fact, we bought their magazine and expanded on it. The result is this trailblazing new publication—*Publish!, the Magazine of Desktop and Personal Computer Publishing*.

Tony and Cheryl are very much a part of our team as contributing editors and keepers of the flame. They will also continue to produce *Desktop Publishing* for us in its new form as a developers' newsletter and guide to new technology.

The beautifully designed magazine that you're now reading speaks volumes about where we're heading with *Publish!*. Tony and Cheryl may have planted the original seeds, but the magazine's vitality springs from the collective vision of a group of outstanding editors, writers, artists, and designers who have poured their ingenuity, talent, and creativity into it.

I hope you feel life stirring in these pages. And I hope you are as stirred by it as we are.

To make *Publish!* happen, we had to be convinced that it was a good business proposition. But we're not bringing out *Publish!* just for business reasons. That's not our nature.

We're doing it because we really care about publishing, especially personal computer publishing and corporate publishing. We value the process of communicating well. We also care about freedom of speech and people's ability to publish whatever it is they want to express.

"Freedom of the press belongs to those who own one," said writer A. J. Liebling. Obviously, if publishing technology becomes more accessible to a broader group of people, they can disseminate their ideas more widely.

My own personal vision of *Publish!* goes back to my high school days, when my father was the managing editor of the *Alliance Times Herald*, a daily newspaper in Nebraska. I worked for him, and at the young age of 16, I became the sports editor. I went to the office every morning and put out the wire copy. I wrote headlines and covered the basketball and football games.

While I was working there, I had the strange notion that someday one person, using a huge computer screen, wire copy, and photographs coming down the lines, could completely run a small-town newspaper: put in the stories, write articles about the council meetings, sell the ads, and put it all together.

That day is here. The significant economies that can be realized, the accessibility, the control, the ability to do your own publication from scratch—all of these are possible today with desktop and personal computer publishing.

And you don't have to be a small-town newspaper to benefit from this publishing revolution. You can be a corporate colossus, a midsize mogul, or even a small business, and still come out ahead with this powerful new technology.

Publish! is your link to the state-of-the-art future. Whatever your publishing level, *Publish!* will provide the answers.

"If you want to be a leader, find a parade and march in front of it." That's another saying I fondly subscribe to. We see personal computer publishing as a giant parade, and we intend to lead it by pushing the technology to the ultimate.

Publish! will help you build personal computer-based systems to publish everything from memos to encyclopedias. Businesses already publishing massive amounts of data (trillions of pages are put out by corporations every year) will be able to produce documents faster, better, and cheaper.

Thus, publishers, corporate employers, and those who run small businesses can all participate in the grand spectacle of our *Publish!* parade.

Equally important is that this is a magazine for people who are being drawn into the publishing arena for the first time.

We expect to see a boom of new publishing companies in addition to a wealth of new publishing opportunities. And I really believe that this technology will lead to a revitalization of the small-town newspaper business.

It will also spark the creation of a multitude of specialized magazines and publications not yet feasible because of prohibitive costs.

Although our vision of *Publish!* embraces the IBM PC and the Macintosh, it's much more than that.

We're also concerned with the growing use of workstations like the Sun Micro, the Apollo, and the IBM RT PC. We see this trend developing from two directions.

One is at the grass-roots level, where desktop publishers, who use largely Macintosh-based systems, will be producing more of their own newsletters, reports, and in some cases, newspapers and even magazines.

At the same time, we see minicomputer-based software and computer-aided publishing systems migrating down toward the personal computer area.

Publish! will cover the range, keeping tabs on both sides of the personal computer publishing phenomenon. We'll assist the individual publisher who has one personal computer and a laser printer; and we'll also show how to build networks and larger systems, what the best hardware choices are, how to integrate software into those systems, what the best software is, and how to obtain the optimum results.

As writers and editors gain new power and control over their output, it's important to note that the basic rules of design and aesthetics have not changed. What makes a page look great has already been established. We're seeing the results of documents being produced without considering the rules of style: a lot of ugly stuff is coming along with the good stuff.

Publish! will cover the elements of good design—how to pick typefaces, how to size columns and headlines, how to make pages look right. We will also help writers and editors develop expertise in page makeup and layout.

We see *Publish!* as a real testing ground for personal computer publishing technology. We promise to push the technology to the absolute limit as part of our challenge to be on the leading edge of the revolution. We will test and report on software systems the moment they hit the market and in many cases, even earlier.

We will also point out questionable products and pitfalls to avoid. And we are committed to steering you toward the truly fine products. We want you to enjoy the positive experience of personal computer publishing.

This magazine will be a kind of industry watchdog, keeping track of all the latest developments. We will run down the rumors and report the inside story to you before anyone else does.

We will present profiles of people who use this technology, and display some of the best examples of their work.

By reading *Publish!* you will be informed, you will save money, and you may even find that the magazine itself will inspire you to attempt greater things in your own work.

Although we have an exciting vision of what *Publish!* is about and what the technology entails, we also know from our experience in the fast-moving computer industry that things change very fast and are quite unpredictable.

So we also promise that *Publish!* will follow the turns, provide solutions, and decipher whatever it is that might be perplexing or unpredictable.

That's what makes personal publishing such an adventure. And *Publish!* is the grandest adventure of all because it's the true realization of the medium as the message. For us, it's an unparalleled opportunity to bring together the two worlds we care about most—personal computers and publishing. ❑

How to build a design studio, a type house and a print shop on 3.1 square feet of desk.

Introducing Desktop Publishing Plus.

You can hook up to 31 Macintosh Plus computers up to one LaserWriter Plus over the AppleTalk network.

If you're in charge of producing your company's newsletters, flyers, forms and manuals, we'd like to give you something:

Our sympathy.

Because we understand the pressure of getting a newsletter out while it's still news. The frustration of having a manual with more type bills than pages. The panic of revising a presentation ten minutes before you present.

Sympathy, of course, won't solve your problems. But we have something that will. Our Desktop Publishing Plus™ system.

The whole idea of Desktop Publishing Plus is based on the concept of desktop publishing, a category we virtually invented.

That concept being, when you need typesetting and production work done, you don't need to run to outside vendors anymore. You can just run to your desk.

Which will save you time because you can create, revise and, in many cases, produce mechanicals without going back and forth to type shops all day.

And you'll save money, because of all the monstrous type bills you won't be paying.

Desktop Publishing Plus actually consists of two pluses.

Our Macintosh™ Plus computer and our LaserWriter™ Plus printer.

The Macintosh Plus is the most powerful personal computer

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ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz Helvetica Narrow

Here are some of the new faces you'll be seeing around the office. And you'll be seeing them in sizes from 4-point to 720-point.

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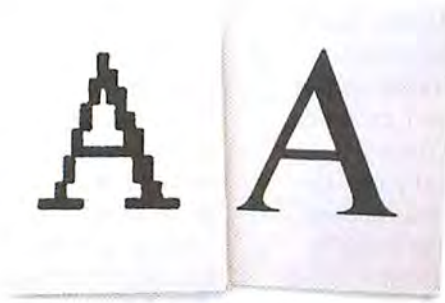
we've ever built. Its Motorola 68000 microprocessor and full megabyte of memory allow you to run powerful graphic and page design software programs. As well as powerful word processing, spreadsheet, database, and other business programs.

And its point-and-click mouse technology makes it easier to use than Letraset. So you can spend more time doing work instead of learning how to get the computer to work.

The LaserWriter Plus printer has the same 68000 microprocessor that's in the Macintosh Plus. Not to mention a hefty 1.5 megabyte of memory and a megabyte of ROM.

And inside its ROM is PostScript,® the page description language that is quickly becoming the industry standard.

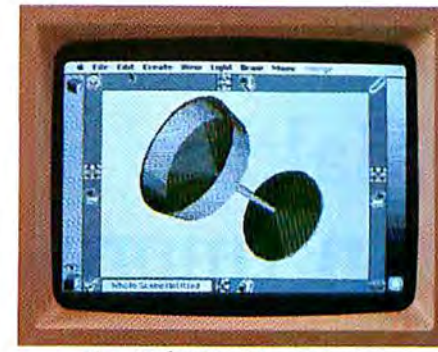
Translated, this means the LaserWriter Plus can cover an entire page with virtually any combination of near typeset quality text and high resolution graphics.



The crisp looking "A" was done on a LaserWriter Plus. The fuzzy one was done on a standard dot matrix printer.

PostScript also allows the LaserWriter Plus to generate dozens of different type styles and hundreds of sizes from its 11 built-in typeface families. These families being Helvetica,® Helvetica Narrow, Times,® Palatino,® ITC Avant Garde Gothic,® ITC Bookman,® New Century Schoolbook, ITC Zapf Chancery,® ITC Zapf Dingbats,® Courier and Symbol. And more families are becoming available all the time.

MacDraw from Apple



Easy3D from Enabling Technologies

PageMaker from Aldus

Word from Microsoft

All of which means, you can now generate professional quality manuals, reports, presentations and overheads faster than you can say "you can now generate professional quality manuals, reports, presentations and overheads."

And if you decide you need commercial typeset quality printing, the Macintosh Plus can easily hook up to larger PostScript compatible typesetting machines like a Linotype Linotronic 100 or 300.

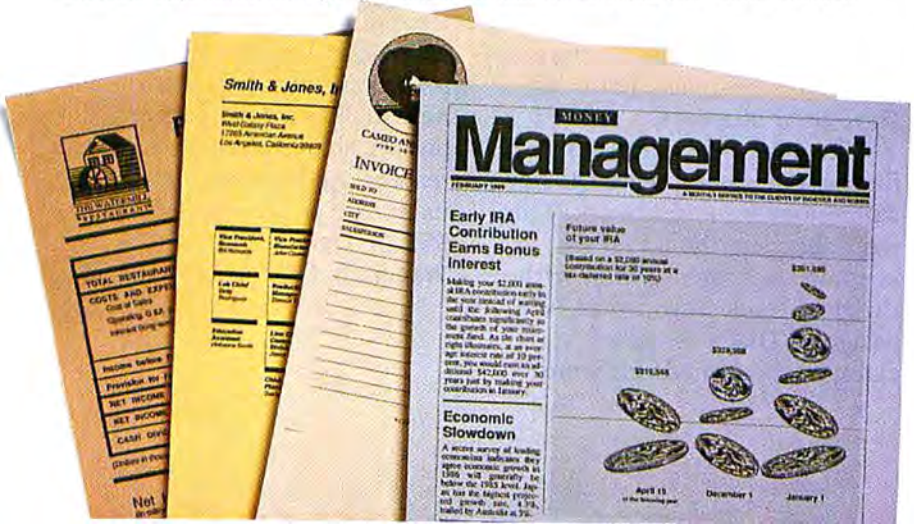
So visit your authorized Apple dealer.

And start making plans to build a design studio, a type house and a print shop on your desk.

But don't expect to have a ground-breaking ceremony in your office.

Just expect to break some new ground in it.

These were produced with nothing more than a Macintosh Plus, a LaserWriter Plus, and software like Aldus' Pagemaker, Microsoft's Word and Excel, and our own MacDraw™ and MacPaint.™



Making An Impression

The trouble with dubbing something a revolution before the fact is that you're bound to make some people defensive.

And understandably so. A successful revolution produces permanent, fundamental changes in roles, responsibilities, identities, and, ultimately, a redistribution of resources, a radical shift in power.

I've heard rash predictions from manufacturers and fellow journalists alike that the combination of laser printer, personal computer, and page composition software—the package we've come to identify as the basis of desktop publishing—will destroy the "publishing elite's" stranglehold on the communications industry; subvert censorship behind the iron curtain; and conquer illiteracy in the Third World.

The more mundane promises of increasing productivity in the office and eliminating typesetting and pasteup costs pale beside such hyperbole.

Let's be reasonable and admit that new technology alone won't foster change that can be defined as revolutionary.

Instead, I want to mollify some legitimate concerns I've heard expressed about its impact. Are the careers of trained graphic designers now threatened? Will professionals be replaced by do-it-yourselfers? And if so, will mediocrity in design, as well as in editing and in writing, proliferate?

When these questions arise, I find myself thinking about a graphic artist I know in rural New England. Beth Krommes is a wood engraver and papermaker. A few years ago she knew little about computers and wanted to keep it that way.

After taking a position as a magazine designer, Beth found less time for her own work. Then she latched onto the opportunity to learn automated page makeup on a new system her company had installed. The retraining let her devote half of her time to freelance work.

Once the least likely proponent of computerized methods, Beth now says she'd never revert to mechanical pasteup. Traditional skills and modern technology coexist gracefully in Beth's life because she faced the tools with the question, How can I make them work for me?

Too often we're easily cowed by the supposed power of tools. But we, ourselves, endow them with power whenever we assume that technology could replace human creativity.

Some of Beth's framed engravings hang on my walls. Her magazine designs have a more ephemeral existence. Both serve their purposes.

Like Beth, other designers will find ways to incorporate the new technology into their work. This won't happen, though, if we keep up the pretense that, with the right tools, *anyone* can be a designer. That's as foolish a claim as those made for word processing. The word processor hasn't made the real work of writing any easier; yet writers appreciate the new tools, however skeptical they may have been at first.

The other concern—the anticipation that we'll see a rash of badly designed publications—hardly gives me pause. I know we will but I'm sure that the mere existence of amateur writing or unprofessional design has never, however distracting, suppressed good work.

And finally, I'll gladly put up with the thousands of ugly newsletters, silly memos, and bad novels, knowing that the availability of the new tools, in the hands of someone like Beth, promote creativity.

We inaugurate *Publish!* as a laboratory staffed by editors, writers, and graphic designers for whom the efficacy of these new tools is a daily concern, one we share with you, our readers. Address your letters to us in care of Letters, *Publish!*, 555 De Haro Street, San Francisco, California 94107. ❑

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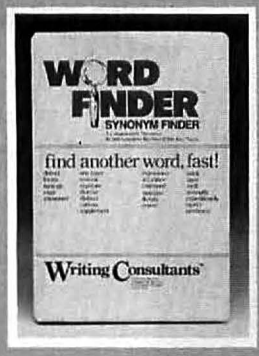

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Contributors' Notes

John Barry, coauthor of *Desktop Publishing* (Dow Jones-Irwin), is a writer and editor in Redwood City, California.

Diane Burns and S.Venit, graphic designers in San Francisco, write frequently about personal computers.

Sharon Efroymson is an instructor at the Productivity Center, a New York-based microcomputer training and consulting firm.

Jim Heid is a freelance writer and coauthor of *The Complete Guide to the Tandy 1000* (Ashton-Tate).

Marjorie Spiegelman, designer of *Publish!*, *PC World*, and *Macworld*, has taught graphic design at the University of California, Berkeley.

Jeff Walden is a freelance writer based in Sunnyvale, California.

Publish! is produced on Macintosh Plus computers using the following software: the Trump Mediaeval family of Adobe Postscript fonts, Fontastic, Fontographer, Macdraw, Macpaint, Microsoft Word, and Pagemaker. Page proofs are created on Apple Laserwriter Plus printers, and camera-ready copy is typeset on a Linotronic 300.

News Beat

Great Expectations For PC Page Makeup

There are some sure signs that desktop publishing for the IBM PC and compatibles is being taken seriously for use in business, as well as in graphic design.

Much-awaited desktop programs for the PC are slated to be available by the end of this year. Among them, Ventura Publisher from Ventura Software and a yet unnamed program from Bestinfo Inc. will be marketed not by their developers but by large corporations who want a share of the desktop market.

Xerox Corporation recently obtained worldwide rights to market Ventura Publisher; Software Publishing (publisher of the popular Pfs series of business productivity software) has signed a letter of intent to acquire marketing rights to Bestinfo's desktop product, which is based on Superpage, Bestinfo's professional pagination system for the PC.

A third desktop product for the PC, being developed by Skisoft, reportedly has caught the attention of Ashton-Tate, publisher of Dbase.

Along with Aldus Corporation's PC AT version of Pagemaker (also slated for release before year's end), these and other page makeup programs will be contending for the attention of corporate buyers, many of whom are inexperienced at page composition.

However, developers of many programs plan to address the novice as well as the seasoned graphic designer by combining a stylesheet approach with interactive screen displays of page layouts.

President of Skisoft, Ken Skier, even describes his product in language familiar to the corporate world: he refers to his page processing program as "a spreadsheet for words."

While no final retail prices have been announced for any of these programs, they're likely to fall within the $500–$700 range.

Under $5,000 And Original

"We're introducing a new measurement: *originals* per minute," says director of marketing at AST Research, Chuck Cortright, referring to his company's new laser printer. To be priced under $5,000, the Turbolaser, which AST expects to release in the summer, can print an eight-page publication in one minute.

Most laser printers under $10,000 can print only eight *copies* of a single page per minute.

The Turbolaser is powered by the Ricoh printing engine and comes with three built-in fonts: Courier, Letter Gothic, and Times Roman. AST has also licensed Bitstream's bitmapped and outlined fonts, which can be loaded into the printer's memory.

Machines That Bind

Now two new products from Velobind, Inc. (Sunnyvale, California), enable you to do your own binding. The Personal Velobinder ($60) fastens up to 25 sheets into a softcover binder. The Model One Eleven strip binding system (about $600) can handle books up to one inch in thickness, as well as most reports and technical documents.

They Said It Couldn't Be Done

The following magazines have more in common than meets the eye, at least initially: *Newservice* (Phoenix, Arizona), which reports on religion, health, drug abuse, and alcoholism; *Balloon Life* (Sacramento, California), a monthly for balloon enthusiasts; and the *American Revenuer* (Rockford, Iowa), a monthly journal of an organization of tax stamp collectors.

The publishers of all three use the Apple Macintosh and Laserwriter with Aldus's Pagemaker program to prepare camera-ready pages. ❑

Dedication

Hamish Norton, corporate finance associate at Lazard Freres, an investment banking firm in Manhattan, and secretary Janet Burgan incorporate late-breaking stock market information into presentations prepared on an Interleaf system.

Pays Off

Today's Interleaf workstation sets goals for your evolving desktop system

By Jeff Walden

It takes money to save money. The investment in an in-house publishing system, a major corporate expense, can pay for itself even in the short term. The Interleaf electronic publishing system—publishing software running on a dedicated workstation—costs at least $29,900, yet Interleaf owners report that their equipment payback periods run between six months and three years. Lazard Freres, a New York investment firm, estimates that its system paid for itself in one afternoon.

Less dramatic but no less persuasive returns are reported by other companies as well: Xanthus Corporation, a technical documentation firm in Austin, Texas; Loral Instrumentation, a manufacturer of electronic testing equipment in San Diego; and Bank of the West in San Francisco. Interleaf applications seem ordinary enough—technical documentation, brochures, presentations, and forms—but they yield extraordinary rates of return.

Interleaf combines machines and software to computerize the design and layout process, from unformatted text and graphics to camera-ready copy. At each step, what you see on screen resembles what is finally printed on paper. With text, tables, graphics, and art from several sources all handled on screen at the same time, Interleaf leaves the IBM PC, its work-alikes, and the Macintosh and Laserwriter combo in toner dust. The 19-inch screen of the Sun, DEC, and Apollo workstations that Interleaf runs on is about four times the area of a Macintosh screen and gives you a new perspective on the term *micro*computer.

Interleaf anticipates the capabilities of word processing and page-layout software that will someday be running on personal computers, when those machines become more powerful and less expensive. A $1,995 version of Interleaf software is already available for a rather modestly labeled "personal" computer—the IBM RT PC.

An Interleaf system handles six types of data: text, tables, graphics based on information from a spreadsheet or data base, scanned art, files from CAD (computer-aided design) programs, and freehand drawings that are created at the workstation. Besides its large, high-resolution screen, an Interleaf workstation includes a keyboard, a three-button mouse—and no floppy disk drives. The central processing unit, hard disk(s), ports, and tape backup reside in a chassis that sits on the floor.

Some Interleaf systems also include a scanner, costing as much as $40,000, to bring in existing artwork and photos. A more common component, a laser printer, produces galley and page proofs before typesetting. In fact, many companies using Interleaf consider laser printing acceptable final output. "The average user would never know the difference," claims Xanthus president David Shepherd. "Anyone who says otherwise must be in the typesetting business."

Interleaf runs under several operating systems: UNIX, Apollo Aegis and IBM's AIX (both UNIX work-alikes), and DEC VMS. Loral Instrumentation selected Interleaf in part because it could be connected via Ethernet to the company's three UNIX-based systems. Nonetheless, most Interleaf systems stand alone or

are connected directly to a single personal computer, so a vote for Interleaf is not necessarily a vote for UNIX.

Xanthus writes and publishes technical documentation for clients such as Texas Instruments and AT&T. The company's 30 writers prepare text on personal computers. The text is then passed by disk to a Compaq connected to the Interleaf system. Shepherd has kept careful records of Interleaf costs at Xanthus. "At most companies," he explains, "a documentation group is considered a cost center, but we have to be a profit-making group."

Xanthus's Interleaf system—two workstations, storage, and a laser printer—cost $82,000. Straight-line, five-year depreciation results in a per-month charge of $1,367 for both workstations. Monthly maintenance runs 1 percent of the total purchase price, or $820. The salaries of two operators at $28,000 each per year total $4,667 per month. Thus the total monthly operating expense is $6,854.

Shepherd estimates that his workers regularly process 100 pages per day. Based on 21 working days in a month, the Interleaf system creates 2,100 complete pages per month. Fully laid-out pages—including tables, charts, and some freehand graphics—thus cost $3.26 per page. Shepherd compares that to typesetting costs alone, which he estimates at $10 per page, or $21,000 per month, excluding type correction and pasteup. Based on these figures, the Interleaf system saves Xanthus $14,146 per month. The company recoups the system's purchase price every six months.

In "softer" numbers, Shepherd claims that Interleaf has chopped 3 weeks off the 13-week schedule of a typical project. "With the same number of writers," he says, "we can increase our billings 30 percent."

Hamish Norton, an associate in the corporate finance department of Lazard Freres, explains, "With us, it wasn't a matter of doing something cheaper—it was a matter of doing something we couldn't have done at all before."

Lazard Freres underwrites securities, negotiates mergers and acquisitions, and gives financial advice to corporations and governments. The highly focused task to which Norton sets the Interleaf system is preparing presentations for clients and potential clients. Those presentations must incorporate the latest market information; ideally, they should include data that is almost literally up-to-the-minute.

For Norton, a presentation with late-breaking information and Interleaf's typeset quality makes the best possible impression on clients. "I don't think, for the most part, that we're putting together presentations any faster using the Interleaf system—but what we were producing before looked like junk. Now it looks professional. It would have been impossible to get the same quality in the same amount of time."

How does Norton justify the expense of the corporate finance department's Interleaf workstation? "If we get one deal that we would not have gotten without this machine, it pays for itself several times over," he says. The system has already enabled the group to completely recompose a client's proposed *Wall Street Journal* ad an hour before deadline—thus saving an estimated $70,000 for running a blank page. More often, Norton says, the firm's asset management group uses the system for work it had been sending out for typesetting. "They're saving about $1,500 a month on work that takes them 10 minutes a week to do on Interleaf."

Loral Instrumentation manufactures microprocessor-based electronic test equipment for aerospace and defense companies. Its products can have any combination of 35 printed circuit board options installed. Each option requires its own voluminous documentation. Loral's three Interleaf workstations allow the company to ship documentation that's customized for each product.

"Because we put systems together," says Kelly Anderson, manager of technical publications at Loral, "we create unique manuals to serve customer needs. But the look must be consistent across all the manuals."

When Anderson came to Loral, it had no art department. Draftspeople from the circuit board design department were sometimes asked to ink organization charts and create presentations. Anderson hired her first artist to create a graphics library for use in the manuals. But revisions to the art kept hindering progress.

"It took an artist 10 hours to make one change on a drawing that had taken her 10 hours to create in the first place. I knew the value of having word processing on line," she says. "Why couldn't we have our art on line as well?"

Word processing at Loral was already on a computer—a VAX 750 running UNIX. Anderson could trade files between Interleaf and the VAX after connecting them via Ethernet. Interleaf integrates text from writers with the artwork that graphic artists draw in the Interleaf system. Any revisions to art are also made on the system. Anderson says that by the third project on the system, "We were doubling and tripling our productivity."

If an army travels on its stomach, a modern financial institution travels on its forms. The Bank of the West has billion-dollar assets and an administrative services department that's been using an Interleaf system for almost two years. According to Susan Mesches, vice president of administrative services, designing forms represents about 75 percent of the work done on the bank's single workstation. "The bank has 650 inventoried forms," explains Mesches, "and those are only the forms used by more than one department."

Before the bank started using Interleaf, the six writers in administrative services would first sketch each form on graph paper and then send it out for typesetting. Mesches estimates that a form took as long as a full day to create. Typesetting required several more days, and then corrections had to be made. Mesches says that with the Interleaf system, the same job takes between 20 and 30 minutes from start to finish.

Besides the forms, administrative services writes and produces almost a dozen manuals for the bank on operations, loan policies, automatic teller machines, and other systems the bank has installed. Mesches estimates that the system saves as much as $9,400 in typesetting charges on a single manual. She originally planned for the system to pay for itself in five years. At the current rate of savings, she says, the system can pay for itself in less than three.

Ed Kashi

Kelly Anderson (facing camera), manager of technical publications at Loral Instrumentation, oversees the work of graphic artists, who apply their drawing, design, and pasteup skills to page composition on screen.

Leafing Through the System

Interleaf is commonly compared to the Macintosh. Both systems use windows, icons, bit-mapped graphics, a mouse, and a Motorola 68000 series microprocessor. There the resemblance ends.

Screen size on Interleaf workstations is between 17 and 19 inches. The system needs the screen real estate: it displays an oversized 8½-by-11-inch page that accommodates bleed effects and registration marks placed outside the printing area while taking up only 60 percent of the Interleaf screen.

The three-button mouse is the key to interacting with the system. The Interleaf design suggests that you type text but lay out pages by pointing and clicking. One mouse button activates pop-up menus, which appear wherever the cursor happens to be. During an hour-long demonstration, the keyboard was used only to log on to the system and to show how existing text is reformatted as new text is typed.

Interleaf documents can be printed out on most phototypesetters that have image-processing capabilities, including the Compugraphic 8600G, the Autologic APS-Micro 5G, and the Linotronic 300. More typesetting options will be available with the release of a Postscript driver. (At press time, Interleaf expected to have the driver available in the summer.)

Interleaf markets three laser printers, each with a resolution of 300 dots per inch: an 8-page-per-minute unit built by Imagen ($11,500), a 26-page-per-minute unit from Dataproducts ($27,500), and a Canon printer equipped with Interlace's raster image processor ($8,000). The system also drives a laser printer from Data Recording Systems with a resolution of 800 dots per inch.

The Interleaf system software is available in two forms. Technical Publishing Software (TPS) is a fully integrated graphics and text system; the Workstation Publishing Software (WPS) version, designed as additional software for already installed engineering workstations, offers some similar capabilities.

Additional Interleaf workstations with 86 megabytes of storage (expandable to 190 megabytes) cost $15,000. They are directly connected to the central processor with cables, or networked through Ethernet at $750 per node. Storage sizes under the UNIX operating system can be deceptive to people used to personal computers. According to Interleaf, a system with 86 megabytes of storage actually has about 35 megabytes of storage left for data. Although text takes up relatively little storage space, graphics take up a lot more. A scanned photo, for example, can occupy 2 megabytes.

With 400,000 lines of code, the Interleaf program is complex and powerful. Yet three specific operations are beyond its talents (and will remain so in the forthcoming version 3.0).

First, Interleaf mixes text and graphics easily on the same page, but it can't handle runaround: the same column cannot hold both text and graphics on the same horizontal line. The closest Interleaf can come to runaround is redefining a section of text as two columns and placing the graphic in one of the columns. This kind of fix defeats the purpose of a dedicated system. It works, but it isn't elegant.

The second problem is the lack of a true style sheet, that is, a set of named paragraph and line definitions. You reformat a document by changing style sheets, as you can using Microsoft Word on an IBM PC. Interleaf lets you name paragraph styles and define an individual set of properties for each name but forces you to save the definitions either in the document itself or in an empty text document, rather than as an actual style sheet. Such de facto style sheets are reasonably easy to use but are cumbersome, considering the sophistication of the rest of the system.

Interleaf also cannot create a layout style sheet or template that would define the graphics and text areas on a page, the location of rules and graphics elements, and the position of running heads and other recurring text.

Although it's a microprocessor-based publishing system, Interleaf is not a personal computer, and companies don't use it like one. The Interleaf system is best run by a specially trained operator because it's costly, and—despite its ease of use and text-processing features—it's dedicated to page makeup and document design.

The graphics skills of the people who use the Interleaf system vary from company to company. At Loral and Xanthus, Interleaf operators are trained graphic artists who've transferred their skills from drafting board to computer screen. Writers use the system at Bank of the West, and secretaries use it at Lazard Freres.

Anderson says that the Interleaf system at Loral "directly duplicates" how documents were designed at the company before it installed the system, "although now we can bypass several steps. For example, the graphic artist had to get together with the word processor to figure out how big a hole to leave for a drawing. Because of the system's flexibility, that doesn't happen anymore."

The Interleaf system gives graphic artists a new tool, rather than shifting layout responsibility onto the writer. As lower-cost systems put Interleaf-style capabilities on everyone's personal computer, however, employers may place a premium on people who can use computers and have both writing and layout expertise.

"We would love to have our writers use Interleaf workstations as word processors," says Xanthus's Shepherd. "If the price comes down to $12,000 or $15,000, we'd look very seriously at throwing 20 PCs out the door and equipping our writers with Interleaf."

When will Interleaf reach your desktop? In five years, perhaps sooner. A personal computer system would need, in effect, the same hardware that Interleaf runs on now: 32-bit processors, 200 megabytes of storage, a 19-inch bit-mapped screen—but with a $5,000 price tag.

Better ways are being developed to configure existing hardware. For example, a "slave" processor to handle graphics routines takes a huge load off the main microprocessor, resulting in a faster personal computer that doesn't need the next generation of microprocessors.

Storage technology is also improving. The biggest boon may come from optical disks, which can hold data in the gigabytes (billions of bytes). Optical disks are already used for digitized pictures. DEC has developed an Interactive Video Information System that integrates a video disk with its computers. The system isn't designed for publishing, but the screen display integrates words and pictures. Improvements don't have to be as radical as optical disks. Better recording-head technology, less expensive and more efficient magnetic media, and data-encoding chips may combine to produce 200 megabytes of storage in the personal computer price range.

The last hurdle: how to obtain a large, inexpensive screen display with high pixel density and good gray scale, or depth of color. The most difficult requirement to meet is *inexpensive*, since cathode ray tubes—the stuff of television sets—are costly. Liquid crystal displays or some other technology might help overcome the cost factor.

Don't underrate the need for such a screen. "If graphic artists are going to use a system," warns Anderson, "you'd better buy a system that brings them as close as possible to actually using their hands on the layout. They will not accept a screen smaller than the size of an actual page. Maybe an engineer can. Maybe a secretary can. My graphic artists won't." ❑

Tips! ➪ Extend the Life of a Toner Cartridge

Don't assume you have to change your EP (electrophotographic) cartridge just because the indicator on the laser printer has turned red. The indicator automatically turns red after about 3,000 pages, based on the number of turns of the drum. The estimated life of 3,000 pages assumes 4 percent print coverage, or 50 characters per line and 40 lines per page. If you print graphics, you may get fewer than 3,000 pages from a cartridge, but most people should get much more than that. Passing the 3,000-page mark does not harm the printer.

A new cartridge contains about 160 grams of toner. To keep track of the amount of toner in a cartridge, weigh an empty one, then weigh a new one when you buy it. Weigh the cartridge from time to time so you can tell when it's close to running out of toner.—*Michael Gardner (Orinda, California)* ❑

Slow Down the Presses

Page layout on the IBM PC—will it work for you?

By Jim Heid

Running page composition programs, especially those that represent your actual layout on the screen, is hard work for any personal computer. Calculating character widths, determining line breaks, drawing fonts and images, and shuffling text in memory are all demanding tasks that push the limits of the IBM PC.

T/Maker Graphics' Clickart Personal Publisher is the first offering for people who use the PC and need a page makeup program with pull-down menus, scroll bars, and a tool palette. Personal Publisher looks and works like a Macintosh program, yet in doing so, shines a harsh spotlight directly on the PC's shortcomings in desktop publishing: a relatively slow microprocessor, no built-in typographic facilities, and poor screen resolution.

Initially, Clickart Publisher presents a blank screen and a blinking cursor. You can type text directly into the program, or you can write the text in a word processor, save it in ASCII (text only) form, and bring it in through the Edit menu's Get Text command. For publications with a great deal of text, you'll probably opt for the latter approach because of Clickart Publisher's tendency to lag behind your typing.

The product has four disks: a program disk for PCs with Color/Graphics Adapters, one for PCs with Hercules high-resolution adapters, a fonts disk, and a disk of "clip art" illustrations. Many of the program's dozen type styles are based on Macintosh fonts. To make T/Maker's several volumes of Clickart illustrations and fonts accessible to buyers of Clickart Publisher, the program can use Mac fonts and Macpaint images. You can transfer illustrations or fonts via a modem, a direct cable connection, or a network. You add or remove fonts using the font-moving utility that is included.

Because the Macintosh's pixel ratio differs from that of the PC, text and graphics imported from the Mac appear elongated when you use IBM's Color/Graphics Adapter, and only one-fourth of a page is visible at once. (T/Maker is developing a Clickart Publisher version that's compatible with IBM's Enhanced Graphics Adapter.) With the Hercules card, however, a half page is visible, and its contents don't look squeezed. A Show Page command displays an entire page reduced to fit, but you can't change the layout in this mode.

Clickart Publisher elegantly handles the tough job of electronic page makeup with just the keyboard available, though of course it works better with a mouse. Function key icons appear next to the menus, and most commands have Alt-key equivalents, such as Alt-S for "Save." The F9 key steps through the palette's tools, and F10 simulates a mouse button.

Producing a publication involves typing or importing text, creating columns, specifying margins and justification, and then adding graphic elements such as rules or pictures. You can

perform these tasks in a different order—creating columns first, for example—but Clickart Publisher's sluggishness becomes more apparent because the program has to readjust line breaks, margins, and columns with each text alteration.

The key to defining a publication's look and refining its layout is the Baselines menu. You set up columns through the Layout command and fine-tune text positioning though several Adjust commands, which draw a *baseline* under each line. Click on a baseline, and three *handles* appear. Dragging the left handle adjusts the left margin. The middle one moves lines up or down, and the right one controls the right margin. Unfortunately, you can't see the text as you move it; all you see are its baselines.

When you've filled a page with text from an ASCII file, you can store leftover text in Clickart Publisher's Clipboard and then paste it into a subsequent page. The program, however, does not automatically link text from a file that is sectioned across several pages. Each page has an overflow buffer that stores any text pushed off the page by editing changes, and you have to adjust the pages manually to make sure that the text flows correctly.

To place images on a layout, you use the Art menu's Get Art command. Clickart Publisher can't read files created by programs like Microsoft Chart or Lotus's 1-2-3, though an included background utility lets you capture any screen image. After you load the utility, you press Shift-PrtSc to capture a screen. You then run another program that lets you crop, enlarge, or reduce the image, and then save it as a Clickart Publisher "art" file.

A Picturewrap command automatically fits text around images, but only in a rectangular shape. You can, however, wrap text around an irregularly shaped graphic by making the baselines near an image shorter or longer.

The Print command commits your work to paper. With dot matrix printers, Clickart Publisher offers draft and high-quality printouts. You run a separate program to tell Clickart Publisher which printer you're using. Owners of Hewlett-Packard Laserjets and Apple Laserwriters must purchase a separate option to exploit their

On a PC with a Color/Graphics Adapter, you see only one-fourth of a Clickart Publisher page, and Macintosh fonts and graphics seem squeezed. You see twice as much of the page with a Hercules graphics board.

printer's capabilities. Laserjet owners can select a dot matrix emulation mode, but using a Laserjet this way is like using a Cuisinart to mix instant potatoes. (At press time, Clickart Publisher's laser printer option was not ready, although T/Maker expects to have it available in the summer.)

Clickart Publisher is an easy-to-use, well-designed program, whose pace—even on a PC AT—is like a snail's compared to similar Mac programs. Like a Ferrari in a traffic jam, it's capable but held back by its surroundings. Also, its compatibility with Macintosh fonts and Macpaint images is of marginal value. Clickart Publisher is billed as a publishing program for the PC owner who doesn't want to buy a Mac. Such a person isn't likely to have a large library of Macintosh images and fonts. And without a Hercules card, T/Maker's screen display of Mac fonts and graphics looks like their reflection in an amusement park mirror.

But in fairness, Clickart Personal Publisher succeeds in bringing publishing to the IBM PC, which was never designed to handle graphics or fonts. And speed is relative. Waiting a minute while a page is reformatted still beats waiting a day or two for corrections to come back from the typesetter. If envy of the Mac and Pagemaker have made you as green as a monochrome screen display, Clickart Publisher deserves your careful, though patient, attention. ❑

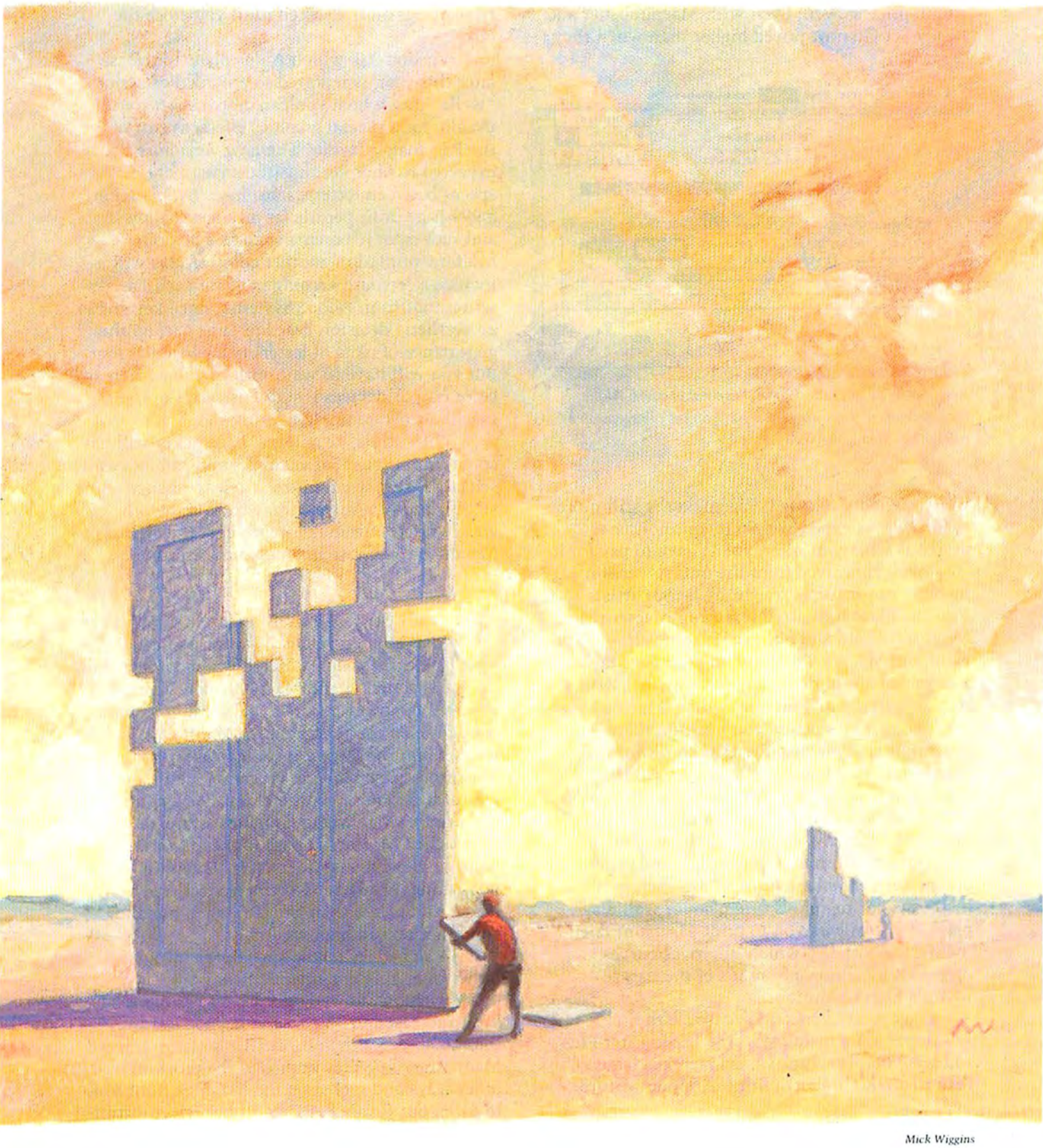
Revised Editions

Which of these will help you meet your deadlines?

By Diane Burns and S.Venit

As personal computers become faster and more powerful, and page makeup programs approach the capabilities of systems with six-digit price tags, telling the type from the hype becomes increasingly difficult. But for now the best bets are Pagemaker, Ready Set Go, and Macpublisher. Here are the pluses and minuses of the latest versions of these three Macintosh programs.

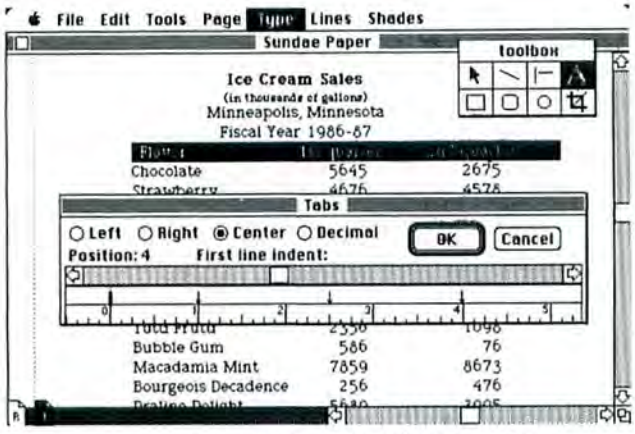
Pagemaker, from Aldus, has changed the least since its initial release, but that's because it started further ahead on the road to the dedicated workstation. Run by people who are familiar with the computer-integrated publishing systems used by major magazines and newspapers, Aldus approaches desktop publishing from the high end, adapting the features of dedicated workstations to the limitations of personal computer technology. With an intuitive, interactive screen display and powerful



Mick Wiggins

text and graphics handling, Pagemaker set the standard for page makeup programs on the Macintosh almost as soon as it was released.

At $495, Pagemaker started out at the high end in price as well. Even with Macpublisher and Ready Set Go now priced higher than when they



Responding to suggestions from Pagemaker users, Aldus included tab settings in version 1.2. You set tab stops on a ruler, as in Microsoft Word.

were originally released, Pagemaker is still more than twice as expensive. So if commonsense design is what you want, you'll have to pay for it.

Well conceived from the outset, version 1.0 incorporates features sought by layout artists. You can place formatted text from Macwrite and Microsoft Word and full-page graphics from Macpaint and Macdraw directly on your page layout. Pagemaker simplifies the process further with a handy "pasteboard" feature, which lets you view text and graphics before you position them, and several interactive displays that show on screen the layouts that you'll see on paper. All the layout tools work at all display sizes.

Aside from having corrected minor bugs, version 1.1 can lay out an 11-inch by 17-inch page (for large-format publications) and print a 300 percent enlargement of an 8½-inch by 11-inch page (for materials intended for wall display). It also allows you to print Macpaint documents "smoothed," which improves curves and diagonals by taking advantage of the Laserwriter's high resolution.

Pagemaker version 1.2 can use the additional fonts installed in the Laserwriter Plus and lets you place bit-mapped graphics larger than the 32K Clipboard limit. Another feature, sorely lacking from earlier releases, is the ability to set tabs in text. A dialog box lets you set left, right, centered, or decimal tabs along a ruler. Unfortunately, you can't see the effects of your tab settings on the screen until you close the box.

Version 2.0, which Aldus plans to release later this year, is reported to provide Postscript "wells" into which you can drop a short routine, usually for a special graphics effect, as part of the Pagemaker layout. The new version is also expected to offer kerning (the adjustment of spaces between letters), automatic hyphenation, a 999-page limit per file (as disk space allows), and spot color (elements such as a box or a headline printed in another color). Aldus will include a separate kerning table for each Laserwriter font from Adobe Systems, since kerning is an aesthetic decision based in large part on the appearance of pairs of letters in a particular font. But you will have to wait until manufacturers of color output devices install Postscript in their machines before implementing spot color.

With all its advantages, Pagemaker still has some limitations. For example, you cannot easily select the text of an entire article to change point size or leading. Another drawback is the program's price. Pagemaker represents the ceiling of Macintosh software in any major category.

Ready Set Go, from Manhattan Graphics, has changed radically since its initial release, which suffered when compared to Pagemaker and Macpublisher. Version 2.0, however, was a major improvement—enough of an improvement for Manhattan Graphics to claim the largest installed base among Macintosh page makeup programs (neither competitor has made a counterclaim). As a commercial printer, Manhattan Graphics seems to have approached Macintosh page makeup from the point of view of customers involved in low-volume publishing. Ready Set Go emphasizes free-form layout and is less than graceful when handling columnar text in high volume.

Designed to handle single-page layouts rather than long documents, Ready Set Go's initial version allowed only 1 page per file. That limit increased to 32 pages in version 2.0 and then to 40 pages in version 2.1, the latest release. Manhattan Graphics improved the program in other ways and increased the list price from $149 to $195, but Ready Set Go still has fewer features than Pagemaker or Macpublisher II. It seems to

Buyer's Checklist

Here's what you should look for in a page makeup program:

WYSIWYG Pronounced "wizzy-wig," for what-you-see-is-what-you-get—from screen display to printed page. The display should enable you to move and edit text and to place, size, and crop graphics—and see the results. The program should have options for precisely controlled placement of elements, such as snap-to guides, interactive zoom views, or dialog boxes.

H & J Hyphenation and justification. Discretionary (or manual) hyphenation involves typing a "soft" hyphen that appears when a word is broken at the end of a line; automatic hyphenation is based on an on-line dictionary or an algorithm in the program. Justification is the process of filling lines with as much type as will fit.

Leading A measure of line spacing, leading should be adjustable in points and on any line of text.

Kerning Adjusting the space between specific letter pairs to create more even letter spacing.

Text processing You should be able, while in a page makeup program, to open word processing documents with formatting intact. How does the program accommodate changes in multipage text? How can you wrap text around a graphic element?

Graphics handling While in the layout program, you should be able to open graphics created in Macpaint, Macdraw, and Macdraft. How do you crop and resize graphics? What tools are available for creating rules, boxes, screens, and so on?

Page processing A program should let you create templates. Can you insert, delete, and swap pages within a document?

Performance Includes printing time, speed, and how well your work style meshes with the program.

Support What are the warranty terms? How much time and support (from dealer or manufacturer) are available as you learn the program?

be the product of "Lite beer" software design: only the minimum capabilities you might need in a page makeup program, and less. Layout measurements, for example, can be expressed only in inches—not in centimeters or, what would be more useful, picas and points. Although Ready Set Go may produce layouts substantially similar to those produced in the other programs, it requires more time and effort.

For example, your hand grows weary using the mouse because you need to draw rectangles, representing blocks, to hold the text and graphics on your layout. Text continued from another page, from another column on the same page, or from text interrupted by a graphic element has to be in its own block. Page design can thus be a boxy, rather clumsy proposition. Manhattan Graphics seems to have realized the problem. Earlier this year the company announced the release of Ready Set Go templates called Desk Design.

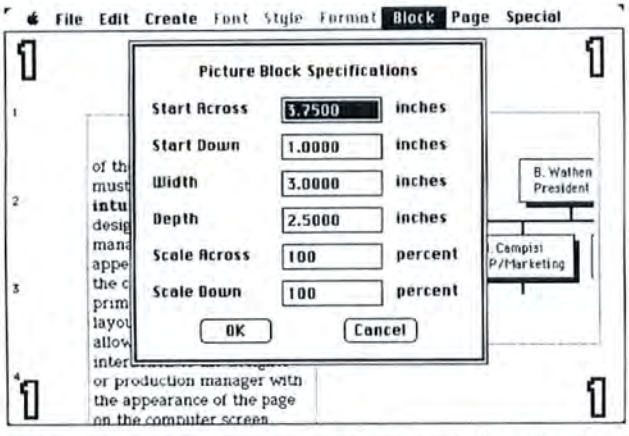
Ready Set Go blocks are Macintosh windows; they are sized and positioned like windows, although they lack the title bar and the sizing box that you click and drag to reposition and resize a window. Instead, you must position the pointer on the block's top line or lower right corner—an exacting task that you must do routinely.

The program's minimalist approach pays off somewhat in the single screen display, where you do all your work: text editing, graphics resizing, and positioning of elements in the layout. You won't become confused about what you can or cannot do in one display option or another because there are no others. You can't zoom in for an enlarged view of the page to fine-tune the position of a graphic element or to work with text in small point sizes. Positioning elements on the display is also made difficult by the lack of a "snap-to" command, which automatically aligns an element with the nearest grid lines. For precise placement (to .0001 inch) of a block and to set other attributes, you need to open the block specification dialog box.

Ready Set Go now has a scrolling feature that eases moving around on the page. In the past the program used a "show page" feature in which you moved an outlined rectangle to change the full-size display. Unfortunately, Ready Set Go does not use the Mac's familiar scroll bars; rather, you click a sector of the

screen while holding down the ⌘ key and the display moves in that direction. It's difficult to control scrolling distance using this technique.

Ready Set Go's strength, relative to the competition, is its text editing capability, a result of the fact that its initial release could not accept text imported from word processing programs. The current version can, but imported text loses its formatting—font sizes and styles, tab settings, and so on. Conveniently, Ready Set Go lets you set commonly used font sizes with a pull-down menu rather than in a dialog box as Macpublisher and Pagemaker do, although you need to open a dialog box for less popular sizes.



Instead of snap-to guides or zoom displays, Ready Set Go has you fine-tune the position of a text or graphic element in the block specification dialog box.

Ready Set Go still cannot directly open graphics from another program. Instead, you bring them in via the Clipboard (limited to 32K, well within the average Macpaint document but below the probable disk space requirements of scanned graphics) using a desk accessory like Artgrabber Plus, which lets you copy full-page Macpaint graphics. The accessory makes up for Ready Set Go's limitations so well that Manhattan Graphics now packages it with the program.

Macpublisher, by Boston Software, is the most improved of the three programs. In fact, the new version is called Macpublisher II to emphasize that, according to Boston Software, the program is rewritten from the ground up. Macpublisher II tries to set new standards in features, although its screen display is still cluttered. The clutter results from an almost tedious literalness (the cursor turns into scissors when you clip an article onto the layout, and loose clippings pile up next to the mockup). Still, Boston Software should be credited with boldly expanding the program to fit the technology. First among these programs, Macpublisher II allows you to perform kerning.

If Ready Set Go is minimalist, Macpublisher is baroque. It offers capabilities you never thought you'd need in a page makeup program, and most of them are on screen and in the way. So many features have been worked into Macpublisher II, in fact, that its shipping date was postponed several months. At press time, the Macpublisher II version described here was expected for immediate release.

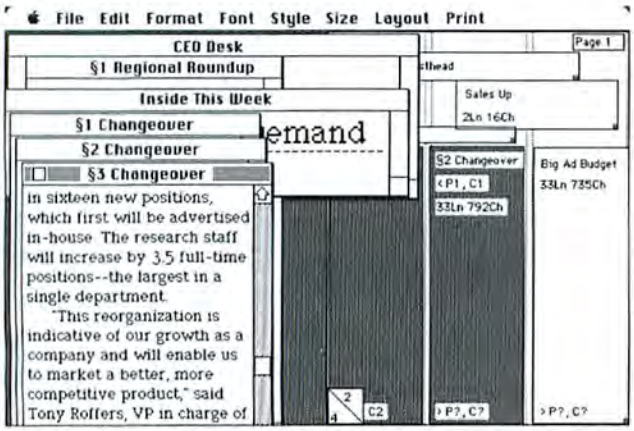
Unique among Macintosh page makeup software, Macpublisher was designed for the 128K Mac and the Imagewriter printer, and at $99 it appealed to the for-the-rest-of-us attitude of early Mac buyers. At $195 Macpublisher II continues to represent the low end of the price spectrum, runs (painfully) on the 128K Mac, yet is chock-full of features.

Its basic operation is unchanged from the original Macpublisher: you work in windows. One window shows the entire page layout as a dummy with rectangles indicating the position of text and graphic elements. The Minipage display option reduces the entire page to fit on screen; Maxipage shows the layout at actual size. Either display is not as useful as it should be because you cannot resize graphics or edit text; interaction is limited to repositioning elements.

Other windows—where you edit text and crop graphics—contain elements that you "clip" onto the layout. As you lay out an article, the text file is displayed in as many windows as it has sections in the layout, with each window linked to its section by an automatically generated section number. After laying out only one or two articles and a picture, Macpublisher's working area already seems like a hopelessly disorganized drafting table. A Windows menu that lets you choose which on-screen window to make active would alleviate the messy situation. (A desk accessory appropriately called Windows installs such a menu and is available in the public domain.) Still, you need to keep the text windows open to reset tabs, perform kerning, or make other changes, and then wait for the display to be updated to see what you've done. As a result, your work lurches along even as you produce page layouts.

This incomplete interaction between you and Macpublisher's screen also detracts from an otherwise valuable kerning capability. The program offers automatic kerning, based on a table of 26 pairs of letters, as well as manual kerning. Unfortunately, you can't see the results of manual kerning in the text window while you work—you must wait for the Maxipage view to be redrawn.

Discretionary hyphenation, another highly touted feature, would be less valuable if Macpublisher II could open Microsoft Word files with formatting intact, including Word's discretionary, or "soft," hyphens. (Macpublisher II keeps the



Cluttered clippings in Macpublisher II: if these windows were in a building, the heating bills would be horrendous.

formatting of Macwrite files but opens Word documents as text only.) As in Word, soft hyphens are entered in Macpublisher's text window by pressing ⌘-hyphen. Soft hyphens remain invisible unless a word falls on a line break. Automatic hyphenation is possible if you run Macpublisher files through Machyphen, another Boston Software program scheduled for release this summer. The program also works with Pagemaker and Microsoft Word documents.

Macpublisher II offers an embarrassment of riches in the graphics department. You can import full-page graphics directly from Macpaint or Macdraw (in PICT format) and resize them proportionately on the dummy. For rules, rectangles, or ovals, the program has a graphics palette that includes 99 patterns for lines and areas. But most remarkable are the features that reaffirm Boston Software's commitment to the low end, even unto output. Using Macpublisher II you can drop gray screens over text and indicate spot color for printing on the Imagewriter II, but not on the Laserwriter. The program also has an oversized printing option, intended for Imagewriter users who reduce the printout photostatically.

Macpublisher II has a handful of little gems in the tradition of its transparent ruler. Its "page jump" feature automatically sets continuation lines when an article breaks at the end of a page or column. You write the wording of the "continued on..." line in a dialog box, and the program fills in the appropriate page number. You need to add the "continued from..." line at the beginning of the subsequent section. You can swap pages within an issue, a handy feature that will undoubtedly be copied by the competition.

Macpublisher's 96-page maximum can theoretically accommodate magazine layouts. But in practical terms 96 pages of text and graphics won't fit on two 800K disks, so a hard disk would be required—as it would in any high-volume desktop publishing system. More bothersome is Macpublisher's filing system on the Macintosh desktop. It creates a separate file for each text or graphic element, as well as a file for the page layout itself. Even with the hierarchical filing system used by the latest Macintosh Finder, keeping track of all those files would be a major challenge to any publisher, desktop or not.

Other considerations remain, printing performance foremost among them. Pagemaker hits the streets way ahead of the other two in this regard, mainly because it addresses Postscript-driven printers or typesetters directly. By comparison, most Mac programs address Quickdraw, the Mac's internal imaging utility. This Quickdraw output is in turn translated into Postscript. Because the Quickdraw routines were intended primarily to draw the Mac's screen, Quickdraw is less efficient when it must take advantage of the higher resolution available in the Laserwriter or a Linotronic.

While these programs continue to evolve, you can reduce their price and performance differences to a single question: which program will meet your deadlines? Between Ready Set Go and Macpublisher II, you'll have to decide which features you really need and which program seems less cumbersome to use. Between Pagemaker and its lower-priced competitors, the difference is not in the features list but in how you interact with the program. As your deadlines approach, you realize that you spend either money on one or time on the others. ❑

Eye-Catching Pages

Beyond white space: mastering the basics of design

By Marjorie Spiegelman

If you've never so much as drawn a square box, you may feel hopelessly overwhelmed by the task of designing a page on a computer. It's so easy to get carried away by the choices of typefaces, type sizes, graphics, formatting. And too much of a good thing means confusion for you and for your readers.

Avoid the pitfalls by using some simple design rules. Far from limiting you, a design system liberates you from endless decision making and error correcting. The examples described here can be adapted to almost any printed material. The accompanying newsletter page illustrates the terms used.

Analyze the content. This involves more than merely reading the story—it means looking at it critically to decide which of its elements are more important than others. After you've determined your priorities, assign type sizes and styles to convey to the readers the levels of importance.

In most newsletter articles, the most important element is the headline, which distills the article's message into a few words. The headline should be the first and largest element. Next in importance is the subtitle, which supplements the headline; it's smaller and is the second element on the page. Subheads (short headlines that break up columns of text and signal a change in topic) are often the same type size as the text itself, with emphasis provided by boldface type.

Warning: Keep it simple. For example, if subheads are all different sizes, the reader won't know where to start.

Develop a grid, that is, a standard page structure. It helps you organize text and art on all your pages with consistency.

In page composition programs the basic grid is often referred to as the master page. It's made up of top, bottom, and side margins; columns; and the spaces between columns. Once you've established a master page format, you'll never have to "eyeball" elements on the screen (place them according to how they look rather than according to a measured format).

Perhaps the most important element in your grid or master page is *white space*, or empty space. White space creates a viewing ground for the information and adds visual interest. It also conveys information itself. If the amount or positioning of white space changes, readers expect a change in content.

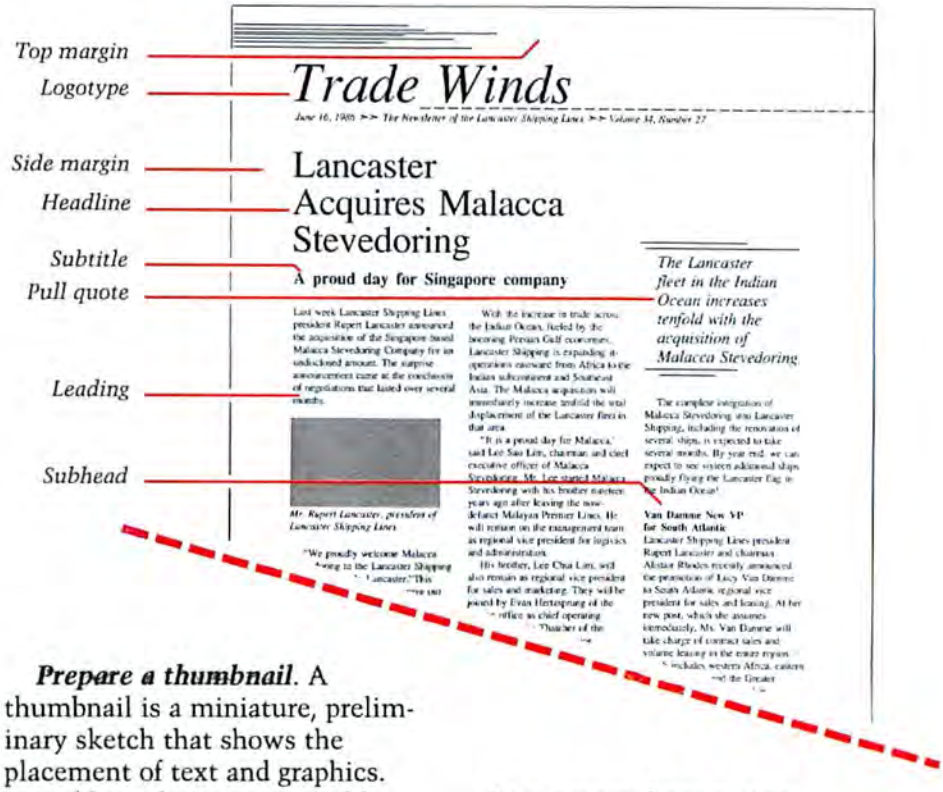
Start defining your grid by standardizing your margins. On a typical newsletter page measuring 8½ by 11 inches, the right and left margins should be equal—usually at least 3½ picas wide. (Six picas equal 1 inch; a pica is divided into 12 points.) Top and bottom margins shouldn't be equal—the top is usually smaller than the bottom—and they must be consistent from page to page. An example for newsletters is 4 to 5 picas for the top margin and 5 to 6 picas

for the bottom. Smaller margins make the page look crowded and uninviting.

Next, determine a column width. Generally, a newsletter page contains either two or three columns separated by 1 pica of white space. Use your column measure to size photographs, charts, and drawings. For example, in a three-column grid, graphics can be one, two, or three columns wide—not an arbitrary measure but one related directly to the grid.

Finally, decide on a type size for text. Generally, one of the most readable type sizes is 10 points, with 2 points of *leading* (white space between lines of type). In designers' and typesetters' language, this is called "10 on 12" and is often written "10/12." (The "12" comes from adding the 2 points of leading to the 10-point type measure. The total is called *line spacing*.)

Another advantage of 10/12 type is that because 12 points equal one pica, you can set up a system based on even multiples of picas. For example, the line spacing between text and subhead might be 24 points (2 picas) and the line spacing between the subhead and the text below it might be 12 points (1 pica). Paragraph indentations could all be 12 points, too. Simplifying the mathematical relationships reduces the number of design decisions you have to make, creates a stronger page, and leaves you free to experiment with graphics.



Prepare a thumbnail. A thumbnail is a miniature, preliminary sketch that shows the placement of text and graphics. It enables a designer to quickly determine how much room the text takes up and how much is left for graphics.

If you're eager for a finished product, you may be tempted to skip the thumbnail. Don't. Otherwise, you may find yourself on the last page of your newsletter with no text to put on the page. Before you do your thumbnail, format your text on screen at the proper type size, leading, and column width. If there is little copy, count the number of lines on screen; if your text runs for pages, count the lines on a printout.

Next, make your thumbnail sketch. Does the text fit into the space you've allotted? Is there enough room for charts, illustrations, photos? If you need more or less text, make the adjustments now.

You should also decide where illustrations will go. Try several thumbnails, putting the illustrations in different places. Remember that illustrations should be as close as possible to the text they depict.

Suppose you have a page with text but no graphics. How do you break up the monotonous columns of words? You might try a trick that adds visual variety and stimulates reader interest. A pull quote (also called a deck, readout, or teaser) is a provocative phrase or sentence pulled from the main text and reproduced in a larger type size. To set it off from the text, you might add plain or decorative lines or bars (also called rules) above, below, or next to the pull quote. One pull quote to a page is plenty.

These guidelines will help you create strong, simple, visually interesting pages that involve readers. They'll also streamline your production process so that you can spend more time on words and art.

Page Make-Over

Does your newsletter, memo, brochure, or report lack visual impact? We can help you do a complete page make-over. Send us a copy of the page or pages. We'll select examples and show you how to improve your design. Send samples to Page Make-Over, Publish!, *555 De Haro St., San Francisco, CA 94107.* ❑

A Menu for All Seasons

The Four Seasons publishes its bill of fare in-house

By Sharon Efroymson

Manhattan's famous Four Seasons restaurant takes pride in its superb menu. But the delicately prepared entrees—including such appetizing choices as breast of pigeon and curried mussels with mango—are only one source of satisfaction. The menu itself is a feast for the eyes, a work of art printed on parchment stock.

For the past 26 years, the menu's distinctive layout has figured importantly in the Four Seasons' image of quiet good taste. Now, thanks to today's personal computer technology, the restaurant can update the menu daily and print it in-house.

Daily menu production, management's wish for some time, didn't become a reality until the restaurant's advertising agency suggested using a personal computer—an IBM PC/XT—with a Hewlett-Packard Laserjet printer and a Canon NP-7050 two-color copier.

Besides increasing overall efficiency, the new system enables the Four Seasons to offer its guests better service. For one thing, the constantly changing special dishes are now incorporated into the menu. Manager Alex von Bidder explains, "Sherbets are made only when the fruit is perfectly ripe. You can't predict when that will be. Under the old system, the menu couldn't say whether the sherbet was plum or raspberry because outside printing needed a month's lead time."

Using the new system, the restaurant creates a laser-typeset master mechanical for each menu in minutes. Such efficiency is almost a necessity, since the Four Seasons generates lunch and dinner menus for six dining rooms, as well as the ever-changing wine list.

Although personal computer publishing promised efficiency, conversion to the process was not instantaneous. The system had to print the same menu, on comparable high-quality stock, with the same typography and design that the restaurant had always used.

Based on these considerations, the word processing program chosen was Microsoft Word, selected for its sophisticated formatting capabilities and its ability to take full advantage of the printing features offered by the Hewlett-Packard Laserjet. The Laserjet was purchased because it is quiet and uses numerous typefaces.

However, the Laserjet doesn't accommodate documents beyond legal size and doesn't print in color. To produce the oversize, two-color menu, each laser-printed page is enlarged

Bob Sacha

Four Seasons' manager Alex von Bidder (center) with executive chef Seppi Renggli and executive secretary Vicki Eckstein. In-house menu production improves service and efficiency.

LUNCHEON

COLD APPETIZERS

Seviche of SCALLOPS	10.00	Smoked Scottish SALMON	12.00
A Service of SHRIMP	13.00	Cherrystone CLAMS	9.50
RADICCHIO with Grana	11.00	LITTLE NECKS, A Platter	9.50
Service of Beluga CAVIAR	48.00	CRAB Lump Cocktail	13.00
Smoked STURGEON Mousse with Caviar	14.00	Blue Point OYSTERS	10.00
Garried MUSSELS with Mango	12.50	Spring Greens with RABBIT	12.50

HOT APPETIZERS

Grilled GRAAVLAX, Dill Sauce	17.50	SCALLOPS and FROGS' LEGS Ravioli	14.00
FETTUCCINE Primavera	10.50		

SOUPS AND BROTHS

DUCK Consomme	6.50	RED SNAPPER Chowder	9.00
Spring VEGETABLE Soup	6.00	Chilled CUCUMBER and WATERCRESS	6.50

TODAY WE ARE PREPARING... SPRING 1986 MONDAY APRIL 14th

APPETIZER
Broiled Filet of RED SNAPPER 16.50

ENTREES
A Ragoût of SEA SCALLOPS with Tarragon 36.00
Broiled Fish SWORD FISH 37.00
TODAY'S SHERBETS Strawberry, Passion Fruit, and Lemon 6.50

EGGS AND SOUFFLES

OMELETTES Prepared Table Side	16.50	SPINACH Soufflé with Mushrooms	18.00
EGGS BENEDICT	18.50	Scrambled EGGS with Smoked Salmon	20.00

SEA AND FRESH WATER FISH

DOVER SOLE Meunière	36.00	A VARIETY OF SEASONALS	
Crisp SHRIMP with Mustard Fruits	32.00	Escalope of VEAL with Ginger	34.00
Blackened RED FISH with Refried Beans	35.00	Sautéed CALF'S LIVER with Braised Maui Onions	32.00
SHAD and ROE with Crisp Bacon	37.00	Filet of VEAL with Crabmeat and Artichokes	37.00
RED SHRIMP with Fennel	33.00	CARPACCIO 28.00 A CHEF'S SALAD	25.00
Rosemary Roasted TROUT	36.00	Cold Poached SALMON with Dilled Cucumbers	37.00
		Breast of PIGEON in Merlot	37.00

STEAKS, CHOPS AND BIRDS
BROILED OVER CHARCOAL

BEEF STEAK Pallard	31.00	Three French LAMB CHOPS	32.00
SIRLOIN STEAK or FILET MIGNON	32.00	SKILLET STEAK with Smothered Onions	34.00

SPA CUISINE ®

APPETIZERS		MAIN COURSE	
Spring FRUITS with a Kiwi Purée	14.00	Cold Filet of DOVER SOLE	36.00
Timbale of VEGETABLES, Peanut Sauce	14.00	A Skewer of SHRIMP and CHICKEN	35.00
Buckwheat NOODLES with Watercress and Crabmeat	15.00	Escalope of VEAL with Mustard Seeds	36.00

SPRING SALADS
AS A LUNCHEON ACCOMPANIMENT

		VEGETABLES AND POTATOES			
Spring GREENS	8.00	Ginger Glazed CARROTS 7.00			
Bibb LETTUCE and WATERCRESS	8.00	STRING BEANS, Red Peppers 7.00			
Raw MUSHROOMS, Pepper Dressing	8.50	Sautéed CAULIFLOWER 7.50			
Wilted SPINACH and Bacon	8.00	Creamed SPINACH	7.00	POTATOES	
		ASPARAGUS, Any Style	12.50	Rosti	6.50
		SNOWPEA PODS	8.50	Baked in Jacket	5.50

DESSERTS

		BEVERAGES	
A Selection from the Dessert Wagon	7.50	Pot of Linden, English, or Jasmine TEA	3.00
The Four Seasons SHERBETS and ICE CREAMS	6.50	Pot of COFFEE 3.00 ESPRESSO	3.00
CAPPUCCINO Soufflé	6.50	CAFE Cognac Chantilly 8.50 Irish COFFEE	8.50
Soufflé for Two: MACADAMIA AND BOURBON	15.00	VIENNESE COFFEE, Whipped Cream	4.50

THE FOUR SEASONS

Designed 26 years ago, the menu at New York's Four Seasons is now printed in-house using an IBM PC, Microsoft Word, an HP Laserjet, and a Canon copier.

137 percent when it is reproduced on the custom menu stock. In addition, each menu passes through the Canon copier twice, once to print in black and once for brown. The restaurant's four-color logo is preprinted on the stock.

The Four Seasons' first efforts to set up the system met with frustratingly little success. The menus presented some unusual formatting challenges: the complex design used double and triple columns with a mixture of decimal, center, left, and right tab alignments. The text processor had to create a true typeset look, which required precise control over line spacing and type size as well as commercial-style typefaces.

James Nadler, a New York-based computer consultant was called in to teach the Four Seasons staff how to use Word. But it soon became evident that consulting was needed more than training.

For each menu, Nadler created a master file that he split into two files for printing, one for each color. He also developed elaborate style sheets. "Hewlett-Packard's and Microsoft's telephone hot-line support made this possible," he says.

Nadler trained Four Seasons executive secretary Vicki Eckstein to maintain the system. Eckstein was unfamiliar with even basic word processing. "I began learning the system a week before we started production," she recalls.

But now Eckstein is a pro. She even uses the system to create all her letters, memos, schedules, and logs for parties.

There's still room for improvement, says von Bidder. For example, since the copier can't handle the menu's regular paper stock, the computer-generated menus are one-third the weight of the originals, the Four Seasons' only major concession to adopting the new technology.

Although the restaurant is still perfecting the details, it is already realizing the benefits: the system has increased efficiency, cut costs, and enabled the Four Seasons to continue to offer its guests a beautifully printed menu, with even better service. ❑

Tooling Up

Bending the technology to the task

By James Felici

Personal computer publishing abounds with promises of new ways of working, promises of million-dollar technologies that run on personal computers, and promises of vastly improved productivity. Fulfilling those promises challenges all of us who use these still-evolving tools.

Choosing the right tools for a particular job demands hard decisions. Right now the chances of finding a system that exactly meets your needs are slim. The easiest road—tailoring publications to the capabilities of the tools—inevitably leads to limitation and compromise.

But at *Publish!* we decided to push the available tools as far as they would go, to produce a magazine that does not compromise on quality in text or graphics or on its ability to meet its deadlines. We've designated ourselves a laboratory to run personal publishing tools through one of the most strenuous tests for any publishing system—the production of a national magazine. This is like driving a family station wagon in a rugged Grand Prix—not a course recommended for everyone but a sure way to find out what the buggy will do. For us, writing about the tools and using them had to go hand in hand, even if the grasp occasionally led to white knuckles.

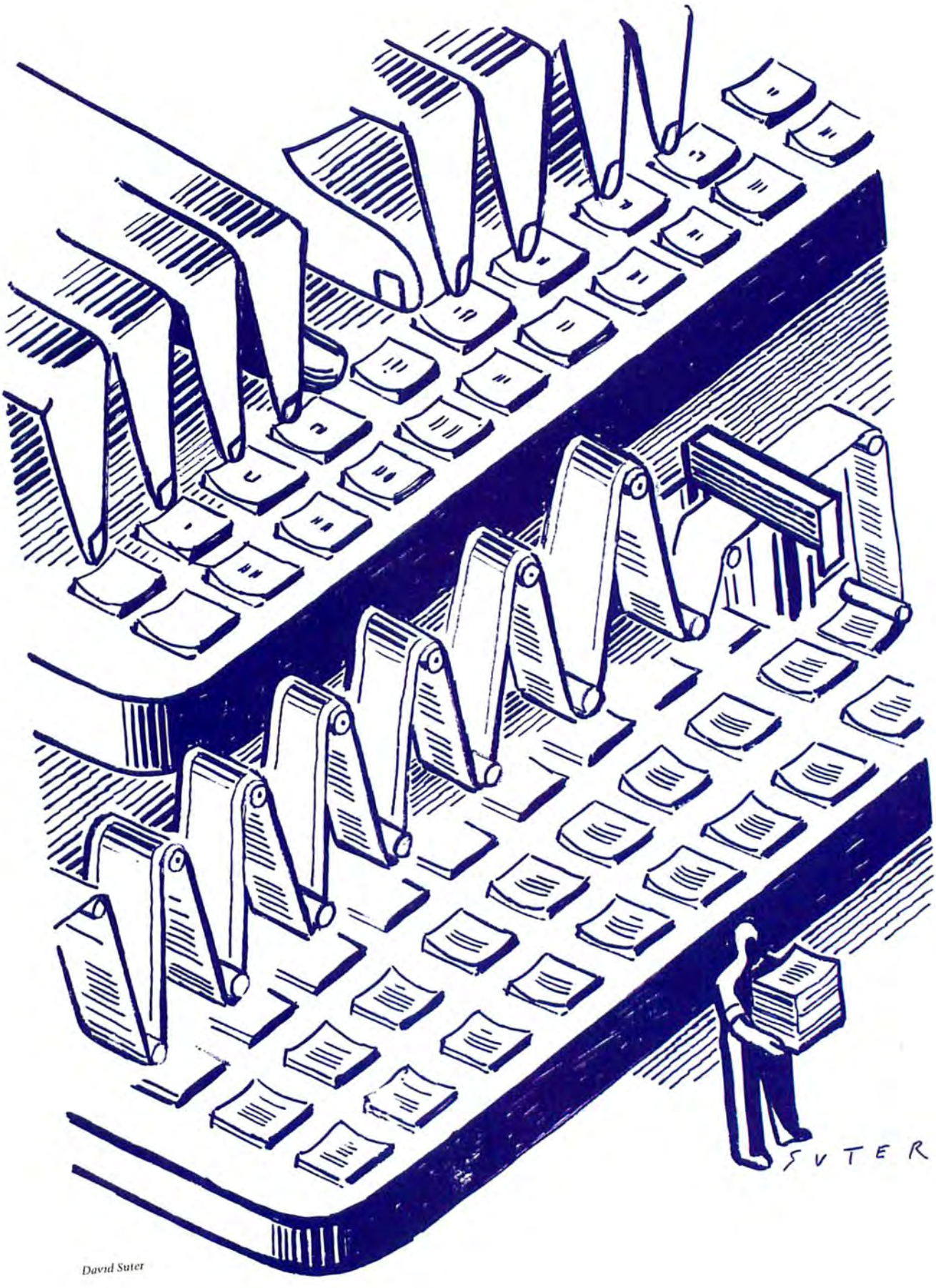
Making *Publish!* look the way we envisioned it entailed what one of our editors referred to as the "graceful kludge"—a practical, workable system pieced together from an assortment of machines, methods, and programs selected for their individual strengths. Like others who use desktop computers, we found that every available application had its strong point but that no one product could do everything we needed it to. So we assembled a battery of equipment much the way a carpenter outfits a toolbox: with a hefty assortment of specialty tools.

Our starting point was Apple's Macintosh Plus. The Mac's graphics interface requires that programs developed for the machine conform to its approach. This characteristic was essential in helping us build a cohesive publishing system. We decided against an IBM PC or compatible because the very factor that has led to those computers' popularity—their generic approach to computing—currently puts them at a disadvantage in integrated publishing applications.

Apple's Laserwriter printer, a machine we didn't want to be without, is driven by the Macintosh. Postscript, Adobe Systems' versatile page description language that integrates text and graphics, makes the Mac-Laserwriter connection possible. Postscript is a common tongue of computer graphics, used by computers and printers of all sorts.

Postscript also provided us with access to commercial phototypesetting by enabling us to drive the typesetter with the Macintosh. Commercial phototypesetting offers a higher resolution than anything a laser printer can produce, and it also makes available a larger number of high-quality traditional typefaces.

Typography must do more than simply put words on a page; it must look attractive. When a reader has a choice of what to buy and what to ignore, good-looking type can swing the decision. *Publish!*'s typeface is Trump Mediaeval. Of the limited number of Postscript text faces currently available, Trump has a lively quality that is well suited to our subject matter.



David Suter

Even though we chose to use commercial typesetting, we didn't abandon the laser printer. Far from it. Laser printers are wonderful typesetting tools. They allow you to proofread corrected text before you phototypeset it—much cheaper and faster than making corrections on final typeset pages. We value our printer for what it is: a low-resolution typesetter.

The typesetter's fonts must match those used by the computer that drives it. Adobe is creating an expanded library of fonts that work with Postscript. These fonts, based on designs licensed from commercial sources, will establish a common font base and give Postscript the potential to be a universal publishing language.

Unfortunately, the Adobe fonts we used lacked certain characters we needed, most notably the Macintosh's Command key symbol (⌘). We also needed fixed typographic spaces—such as em and en spaces—which are crucial to controlled positioning of type. We used Fontographer, a font editor, for these needs to create our own pi font (a font of utility characters).

No sooner had we met our commitment to provide excellent type than we crashed head-on into our first major production challenge: electronic page makeup—integrating text and graphics in the computer, rather than by hand. Electronic page makeup is a keystone of personal computer publishing; we could hardly meet our editorial mandate without using it to build our own pages.

Ideally, our text would have been fed through commercial typesetting software such as Magnatype, which runs on IBM PCs and compatibles and provides the aesthetic refinements that make for truly fine type—automatic hyphenation, precise control over letterspacing and word spacing, automatic document formatting, and sophisticated tabular capabilities. But Magnatype deals with words only. It can make up whole pages with all the text in place, but it can't integrate graphic elements. Therefore, we had to forgo what was otherwise the best possible typesetting program, because *Publish!* plans to use graphics abundantly. In these early days of personal computer publishing, one capability often seems to come at the expense of another.

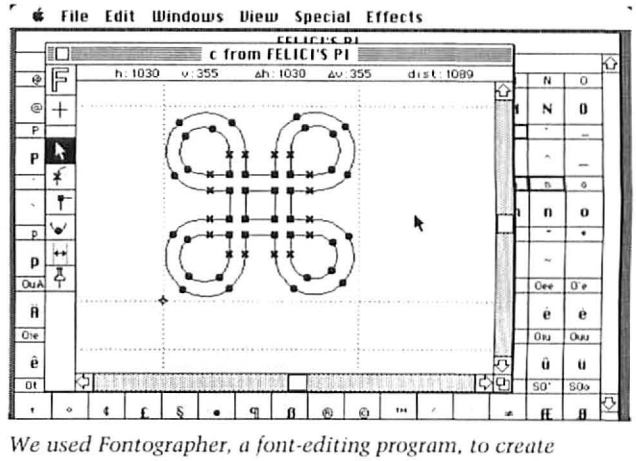
Our search for a workable page makeup program had to consider the needs of our art department; it had to give them maximum flexibility and freedom. The program that most closely simulates their traditional method of designing and pasting up layouts is Pagemaker. Pagemaker lets them place whole columns of text on the electronic page and then trim the text to fit. Other page makeup programs we investigated required us first to create a pretrimmed area and then to pour text into it. Pagemaker's approach is much more akin to the cut-and-paste methods most graphic artists are familiar with.

Fast, capable, and easy to use as Pagemaker is, it required a number of compromises. In its current form, Pagemaker is unable to automatically hyphenate text or adjust letterspacing, and it is not an efficient word processor. Eventually we solved each of these problems.

Publish!'s design calls for type that is uneven, or ragged, on the right margin rather than even, or justified. This design is advantageous when you're using a program such as Pagemaker, which doesn't hyphenate words automatically. The ragged-right design avoids the need for frequent end-of-line hyphenation.

With ragged type, any space left over after words are fit on a line is deposited at the end of the line, allowing word spaces and letterspaces to be of a consistent width. Even without hyphenation, unsightly deviations in the ragged margin can appear when a long word is forced down to the next line, leaving a very short line above it. When that happens, we hyphenate those long words manually. This is not an efficient way of typesetting, but we grin and bear it.

Another of Pagemaker's shortcomings is that it doesn't allow for changing the spaces between letters, a process called kerning. Kerning is necessary to compensate for the irregular spacing created by certain letter combinations. For in-



We used Fontographer, a font-editing program, to create custom characters. The Macintosh Command key symbol shown above consists of a series of curve, tangent, and corner points that create the character's outline.

stance, a visually disruptive gap exists between a capital *T* and just about any lowercase letter set next to it. Consistent letter spacing is essential for good-looking, readable type.

To get the spacing we want in our headlines, we set the letters one at a time on Pagemaker's pasteboard and drag them one by one into position. This is laborious, but worth the effort. Needless to say, our other type remains unkerned.

A third problem with Pagemaker is that it is not designed to be used as a word processor. So we had to find an additional program to handle all our text. We selected Microsoft Word because we liked its appropriation of certain typographic idioms. For instance, it can work in picas (one-sixth of an inch) and points (the 12 divisions of a pica), the standards of the graphic arts industry. Microsoft Word measures the spacing between lines in points, just as a typesetting system does.

Graphics proved to be the thorniest issue, primarily because it is a new field for all computer users, not just for personal computer users. Unlike typesetting, which has been computerized for decades, computer imaging is in its infancy. We finally realized that the marketplace wasn't yet adequately stocked with choices. Some of our art demands are met by "draw" and "paint" programs—mostly Macdraw and Macpaint—but we have yet to find a solution to the problems presented by photographic (halftone) art.

Photographs are first converted into electronic form by machines called scanners, or digitizers. Currently, the best photographic images that personal-computer-driven scanners can create are no better than those you see in the local newspaper. The quality of such images is about half as good as is required for magazine reproduction. Nowadays, for scanned images from a personal computer, "modest quality" is the name of the game. And color, for the near future at least, is out of the question.

So at that point we jumped off the computer bandwagon and into an old, comfortable buggy. The photos you see in this magazine were reproduced by traditional camera methods. Given the state of the art, we felt it was more economical and more aesthetically rewarding to reproduce photographs the old way.

This decision reminded us that all these new tools are a means to an end, not an end in themselves. How you plan to use your publication—who will read it, for what purpose, and how you want it to look—should determine what technologies you use. If what comes out of your printer will be your final product, ready for distribution, then electronic integration of text and graphics on the page is a must. But if you are going to reproduce those pages on any printing device, from a photocopier to an offset press, your final product may be better served by a combination of traditional processes and computer capabilities. Don't worry that traditional methods will be too expensive. A velox print—which is a photographic image rendered by camera processes into a dot pattern that a printing press can reproduce—costs less than $10, while the cost of a scanner is in the thousands of dollars.

The most important thing to keep in mind as you assemble a publishing system is exactly the kind of pages you want to produce. The complexity of your goals will dictate the tools and processes you need.

Just a few years ago, the cost of assembling an electronic publishing system was prohibitive. At that time, if you solicited advice on what system to buy, someone would certainly have said to wait another six months, because some really important new systems were just around the corner. Six months later, the advice would have been the same. Though personal-computer-based systems have brought costs way down, you're apt to hear the same advice still. What makes today's buying decisions easier is the faster return you can expect on your more modest investment.

The issue of systems capability, of course, is far more difficult to predict, given the rapidly evolving technology. The best any of us can do is to gamble on systems that promise avenues for growth, rather than obsolescence. It is surely worth the risk. ❑

Tips! ⇨ Convert Wordstar To Word

On the IBM PC, you can convert a Wordstar document into Microsoft Word format by using a utility supplied on the Word utilities disk. After making the conversion, you may find that Word style sheets do not format the document the way they should. To correct the problem, highlight the entire document by pressing Shift-F10. Then press Alt-Space. The style sheet will now have the intended effect.—*Kathleen M. Boone (New York, New York)* ❑

Buying Information

How to find products mentioned in this issue

Adobe Systems Typeface Collection
List price: family of four faces $185, family of two or three faces $145
Adobe Systems
1870 Embarcadero Rd.
Palo Alto, CA 94303
(415) 852-0271

Canon NP-7050
List price: $9,995
Canon, U.S.A.
1 Canon Plaza
Lake Success, NY 11042
(516) 488-6700

Clickart Personal Publisher
List price: $185; kits for HP Laserjet, Apple Laserwriter, or other Postscript printer $150 each
T/Maker Graphics
2115 Landings Dr.
Mountain View, CA 94043
(415) 962-0195

Fontastic
List price: $49.95
Altsys Corp.
P.O. Box 865410
Plano, TX 75086
(214) 596-4970

Fontographer
List price: $395
Altsys Corp.

Hercules Graphics Card
List price: $499
Hercules Computer Technology
2550 Ninth St. #210
Berkeley, CA 94710
(415) 540-6000

Hewlett-Packard Laserjet
List price: $2,995
The Hewlett-Packard Laserjet Peripherals Group
16399 West Bernardo Dr.
San Diego, CA 92127
(619) 592-8182

IBM PC/XT
List price: without hard disk drive, $2,145, with hard disk drive $2,895
IBM Direct
P.O. Box 1328
Boca Raton, FL 33432
(800) 426-2468

Interleaf Electronic Publishing System
List price: $29,900
Interleaf, Inc.
10 Canal Park
Cambridge, MA 02141
(617) 577-9800

Laserwriter
List price: $5,995
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010

Laserwriter Plus Kit
List price: $799
Apple Computer, Inc.

Linotronic 300
List price: $49,950
Linotype Co.
425 Oser Ave.
Hauppauge, NY 11788
(516) 434-2000

Macdraw
List price: $195
Apple Computer, Inc.

Macintosh Hard Disk 20
List price: $1,499
Apple Computer, Inc.

Macintosh Plus
List price: $2,599
Apple Computer, Inc.

Macpaint
List price: $125
Apple Computer, Inc.

Macpublisher II
List price: $195, **Machyphen** $59.95, **Pages for Publisher** templates $79.95 each
Boston Software
1260 Boylston St.
Boston, MA 02215
(617) 267-4747

Magnatype Laserwriter Package
List price: $5,250
Magna Computer Systems
14724 Ventura Blvd.
Sherman Oaks, CA 91403
(818) 986-9233

Microsoft Word
List price: DOS version $450, Macintosh version $195
Microsoft Corp.
16011 N.E. 36th Way
Box 97017
Redmond, WA 98073-9717
(206) 882-8080

Pagemaker
List price: $495
Aldus Corp.
411 First Ave. S. #200
Seattle, WA 98104
(206) 622-5500

Ready Set Go
List price: $195, **Desk Design** templates $69.95
Manhattan Graphics
163 Varick St.
New York, NY 10013
(212) 989-6442 ❑

Answers to Word Challenge

(See page 46 for Publish! *Puzzlers)*

1. Lead. A term imported from hot-metal typography, in which printers insert lead strips to add space between lines of type. The space between lines is called leading.

2. Proof. The copy of text used for examination and corrections.

3. Grid. A set of visual guidelines for positioning the elements of a layout.

4. Point. A typographic measurement: 72 points equal about 1 inch.

5. Pica. Another measurement: 1 pica equals 12 points, or about one-sixth of an inch.

6. Kern. To adjust the spacing between specific pairs of letters to improve their appearance.

7. Galley. A long sheet of typeset text not yet made up into pages.

8. Page layout. The placement of all the elements, including text and graphics, on a page.

9. Widow. The last line of a paragraph, appearing at the top of a page, separated from its related text.

10. Header. A line of text (such as a chapter or section title) at the top of every page of a document.

11. Boldface. Type that is thicker and weightier than the rest of the body type with which it appears.

12. Signature. A single sheet of paper with several pages printed on each side. The sheet is then folded into "booklets" from which books and magazines are assembled. One fold creates a four-page signature; two folds, an eight-pager. ❑

Product Watch

Software

Text Processing

Deskset, a typesetting system, performs data translation, kerning, tracking, disk conversion, and hyphenation and justification. The integrated system includes an IBM PC, composition software, eight fonts, and an Apple Laserwriter. List price: complete package $9,495, software plus Laserwriter driver $995, graphics input utility option $595. Copy protected. *G.O. Graphics, Inc., 18 Ray Ave., Burlington, MA 01803. (617) 229-8900.*

Machyphen and **Macindexer** help create text-intensive publications. Machyphen works with Macpublisher II, Pagemaker, and Microsoft Word. It uses a 30,000-word dictionary to invisibly flag hyphenation points. Requirements: 128K. List price: $89.95. Not copy protected.

Macindexer creates indexes automatically or manually using selected words in Macwrite or Microsoft Word documents. Requirements: 128K. List price: $79.95 copy protected, $109.90 not copy protected. *Boston Software Publishers, Inc., 1260 Boylston St., Boston, MA 02215. (617) 267-4747.*

Rimwriter IV works with all IBM PCs and compatibles and the HP Laserjet Plus. The program features precise letterspacing, 50 tabs, horizontal and vertical rules, boxes, halftone fills and patterns, and multiple columns. Requirements: 256K, 10-megabyte hard disk, DOS 2.0 or later version. List price: $2,000, additional fonts $150 each. Copy protected. *Genesys Systems, Inc., P.O. Box 277, Ellinwood, KS 67526. (316) 564-3636.*

Softtype, for all IBM PCs and compatibles, creates typeset output on the HP Laserjet and Laserjet Plus. Word processing programs supported include Multimate, Wordstar 2000, Displaywrite 3, Word Perfect, and Samna. Requirements: 512K. List price: $1,000. Copy protected. *Softest, Inc., 555 Goffle Rd., Ridgewood, NJ 07450. (800) 445-9292,(201) 447-3901.*

Graphics Processing

Cricket Graph generates charts and graphs that are stored in PICT files rather than in bit-mapped files and thus can surpass the Macintosh's screen resolution. Twelve chart and graph types are supplied, any ten of which can be overlaid and otherwise combined on a page. Requirements: 512K. List price: graphics program $195, film recorder and color printer version $495, demo $6.95. Not copy protected. *Cricket Software, 3500 Market St. #206, Philadelphia, PA 19104. (215) 387-7955.*

Drafix 1, a two-dimensional drafting package for all IBM PCs and compatibles, features "roll-down" menus for drawing, editing, and annotation functions. The program accepts input from a variety of mice and digitizers. Requirements: 512K; two disk drives; DOS 2.1 or later version; IBM CGA, IBM EGA, Hercules, Tecmar GM, Sigma 400, AT&T DEB, or Conographics graphics cards. List price: Drafix 1 $295, AutoCAD file exchange option $95. Not copy protected. *Foresight Resources Corp., 932 Massachusetts, Lawrence, KS 66044. (913) 841-1121.*

Easy3D creates three-dimensional shaded objects on the Macintosh. Features include geometric solids, tools for turning two-dimensional outlines into three-dimensional objects, adjustable lighting, and object merging. Requirements: 512K. List price: $99. Not copy protected. *Enabling Technologies, Inc., 600 S. Dearborn St. #1304, Chicago, IL 60605. (312) 427-0386.*

Graph-in-the-Box, a memory-resident program for all IBM PCs and compatibles, creates 11 types of charts and graphs from on-screen data. Requirements: 128K; IBM CGA, IBM EGA, or Hercules graphics card. List price: $97.60 copy protected, $157.60 not copy protected. *New England Software, Greenwich Office Park 3, Greenwich, CT 06830. (800) 633-2252.*

Picturebase archives, organizes, and retrieves electronic pictures. The program labels Macintosh clip art and Macpaint or Macdraw pictures with titles and explanatory notes, then files the pictures in the program's library at full or reduced size. Requirements: 512K. List price: $69.95. Not copy protected. *Symmetry Corp., 761 E. University Dr., Suite C, Mesa, AZ 85203. (800) 624-2485, (602) 844-2199.*

Page Makeup

Fontasy, for all IBM PCs and compatibles, mixes graphics and text on a single page in up to three columns. Requirements: 256K (512K recommended); IBM CGA, IBM EGA, or Hercules graphics card. List price: program disk with 28 fonts $69.95, additional fonts $24.95 per disk. Not copy protected. *Prosoft, 7249 Bellaire Ave., Box 560, North Hollywood, CA 91603. (818) 765-4444.*

Lasersoft/PC, version 1.0, for all IBM PCs and compatibles, designs forms, incorporates data, then prints the results on the HP Laserjet or the Xerox PC 4045 laser printer. Requirements: 128K, two disk drives, DOS 2.1 or later version. List price: $295. Not copy protected. *Business Systems International, 20942 Osborne St., Canoga Park, CA 91304. (818) 998-7227.*

Mecca III, a typesetting, composition, and computer graphics system for the IBM PC AT, features batch pagination, interactive page makeup, and CAD/CAM functions. Graphics elements can be moved, copied, scaled, rotated, and zoomed. A complete system includes an IBM PC, a Laserwriter, a color graphics display monitor, a graphics tablet, a 30-megabyte hard disk, and 2 megabytes of RAM. An AT upgrade kit includes the memory module, monitor, graphics tablet, graphics card, and software. Requirements: 2 megabytes. List price: complete system $22,000, upgrade kit $9,900. *Amgraf, Inc., 1501 Oak St., Kansas City, MO 64108-1424. (816) 474-4797.*

Spellbinder Desktop Publisher, for all IBM PCs and compatibles, is an upgraded version of the Spellbinder word processing program. It uses dot commands to format text and create pages. Requirements: 256K, two disk drives or a hard disk, DOS 2.0 or later version. List price: $650. Not copy protected. *Lexisoft, Inc., P.O. Box 1950, Davis, CA 95617. (916) 759-3630.*

Fonts/Font Editors

Fancyfont and **Fancyword**, for all IBM PCs and compatibles, provide fonts for typeset output on the HP Laserjet and, in sizes from 6 to 72 points, on Epson FX-80 printers. Requirements: 192K, DOS 2.0 or later version. List price: Fancyfont $180, Fancyword $140. Not copy protected. *SoftCraft, Inc., 222 State St., Madison, WI 53703. (800) 351-0500.*

Fontographer creates scalable, downloadable fonts for use with the Macintosh and Laserwriter and generates the corresponding screen representations. Requirements: 512K, two disk drives. List price: $395. Copy protected. *Altsys Corp., P.O. Box 865410, Plano, TX 75086. (214) 596-4970.*

System Tools

PC Em-U-Print and **Fontastic** are laser printer utilities for all IBM PCs and compatibles. Memory-resident PC Em-U-Print translates IBM graphics printer codes into codes for laser printers. Requirements: DOS 2.0 or later version. List price: $95. Not copy protected.

Fontastic provides English language menu selections for HP Laserjet and Laserjet Plus commands. List price: $89.95. Not copy protected. *Koch Software Industries, 11 W. College Dr., Bldg. G, Arlington Heights, IL 60004. (312) 398-5440.*

Printworks for Lasers, a memory-resident program for all IBM PCs and compatibles, offers typesetting functions and cut-and-paste graphics from within word processing and spreadsheet programs. Requirements: 256K, DOS 2.0 or later version (not DOS 3.0). List price: $125. Not copy protected. *Softstyle, Inc., Hawaii Kai Office Bldg. #205, 7192 Kalanianaole Hwy., Honolulu, HI 96825. (808) 396-6368.*

Hardware

Input Devices

Microtek Scanner 300A is a 300-dots-per-inch page-feed scanner that produces Macintosh images at Laserwriter resolution. The included software positions and scales images, displays a full page, and generates pure Postscript code directly. Images can be used with the Justtext typesetting program, with Macpaint, and with Thunderscan documents. List price: $2,500. *Microtek Lab Inc., 16901 S. Western Ave., Gardena, CA 90247. (213) 321-2121.*

PC Scan is a paper-feed scanner that translates either typewriter or letter quality printed pages into digital data. It operates with all IBM PCs or compatibles. The software supports Wordstar, Wordstar 2000, Multimate, Universal, and Displaywrite 3 word processors. Requirements: RS-232 serial port. List price: $2,785. *Dest Corp., 1201 Cadillac Ct., Milpitas, CA 95035. (408) 946-7100.*

Scan 300, a paper-feed image scanner for the Macintosh and all IBM PCs and compatibles, creates 300-dpi digital images. The scanner has 64 selectable gray scales and 12 built-in halftone screens with various resolutions. Software for editing images in Macpaint and Pagemaker is supplied. The IBM version of the scanner includes an interface board. List price: $2,495. *Abaton Technology Corp., 1526 Cloverfield Blvd., Santa Monica, CA 90404. (818) 905-9399.*

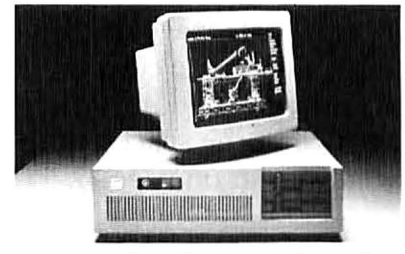
Computer Add-Ons

Genius is a 15-inch monitor that displays 66 lines of 80-column text—a full 8½-by-11 page—in 728-by-1,008 resolution. The portrait monitor displays graphics in black and white, and text in up to four shades of gray. The supplied interface card can emulate IBM PC monochrome and CGA graphics and text at the same time, displaying monochrome at the top of the screen and graphics at the bottom. Wordstar 2000, Wordperfect, PC-Write, Xywrite, Volkswriter, GEM, and Microsoft Windows all run on the monitor in full-page mode. List price: $1,795. *Microdisplay Systems, 1310 Vermillion St., Hastings, MN 55033. (800) 328-9524.*

Jlaserprinter, a board for all IBM PCs and compatibles, provides a high-speed interface to the HP Laserjet and other Canon engine laser printers. Jlaserprinter's extra memory allows it to print a full-page 300-dpi image that requires more memory than the Laserjet Plus has. Graphics software must be adapted to work with the board; however, the printer can be used in normal fashion by flipping a switch on the board. List price: $699, with 2 megabytes $1,029. *Tall Tree Systems, 1120 San Antonio Rd., Palo Alto, CA 94303. (415) 964-1980.*

Multisync, a "smart" color monitor, is compatible with the IBM PGA, EGA, and CGA. List price: $799. *NEC Home Electronics , Inc., Personal Computer Div., 1401 Estes Ave., Elk Grove Village, IL 60007. (800) 323-1728.*

Vega, a half-slot graphics card for all IBM PCs and compatibles, can emulate the IBM EGA and CGA and Hercules graphics cards. The Vega includes 256K of video RAM. Software enhancements allow programs such as 1-2-3 that write directly to display hardware to run on the board. Switches on the outside of the board control settings. List price: $599. *Video 7 Inc., 550 Sycamore Dr., Mipitas, CA 95035. (408) 943-0101.*



WY-700, for all IBM PCs and compatibles, is a 15-inch monitor capable of displaying black-and-white text and graphics in 1,280-by-800 resolution, and 50 lines of 160 characters. The monitor is bundled with a full-size, single-slot graphics card. List price: $1,595. *Wyse Technology, 3571 N. First St., San Jose, CA 95134. (408) 433-1000.*

Product Watch listings are based on information provided by the manufacturers; the descriptions are not product reviews or endorsements. Contact manufacturers for further information. Prices are as quoted at press time and are subject to change. ❑

Word Challenge

Test your knowledge of publishing terms

Publishing has its own specialized vocabulary, one that you may already be familiar with or will soon be learning.

Here are a dozen publishing terms, with clues—some obvious, some more obscure—provided in parentheses. Record your answers in the blanks.

One blank space in each answer is numbered. When you've completed the quiz, fill in the corresponding numbered spaces at the bottom of the page. If all your answers are correct, a "message" will be revealed in the spaces. Answers appear on page 42.

Questions

1. To add space between lines (British group Zeppelin). $\underline{}_{10}$ — — —

2. Page for checking (potency of potables). $\underline{}_{1}$ — — — —

3. The matrix on which pages are planned (football field, minus Fe). — $\underline{}_{9}$ — —

4. A typographic measurement (ballet position). — $\underline{}_{4}$ — — —

5. Another typographic measurement (Yankee pronunciation of a kind of tightwad). $\underline{}_{7}$ — — —

6. Putting the squeeze on a couple of characters ("coin" in Brooklyn). — — $\underline{}_{11}$ —

7. A long sheet of type (ship's kitchen). — — — — $\underline{}_{8}$ —

8. Planning the arrangement of a publication, by mechanical means or with software (congressional aide's floor plan). — — — — — — — — $\underline{}_{3}$ —

9. Dangling line of type (black arachnid). — $\underline{}_{12}$ — — —

10. Label at top of page (soccer move). $\underline{}_{6}$ — — — — —

11. Heavy type (brave visage). $\underline{}_{5}$ — — — — — — —

12. A sheet of paper folded to form pages in multiples of four (a John Hancock). $\underline{}_{2}$ — — — — — — — —

Rate your vocabulary

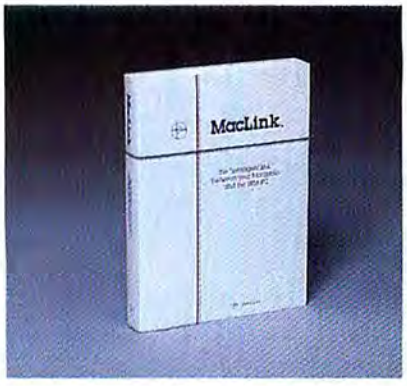
Correct	*Rating*
11-12	Master
9-10	Journeyman
7-8	Apprentice
Under 7	Tyro

Message

$\underline{}_{7}$ $\underline{}_{3}$ $\underline{}_{5}$ $\underline{}_{10}$ $\underline{}_{12}$ $\underline{}_{2}$ $\underline{}_{6}$ $\underline{}_{4}$ $\underline{}_{11}$ $\underline{}_{1}$ $\underline{}_{8}$ $\underline{}_{9}$ $\underline{}_{12}$ $\underline{}_{2}$ $\underline{}_{6}$

Text to tabloid. Three easy steps.

Step 1: MacLink
PC data in, Mac data out.

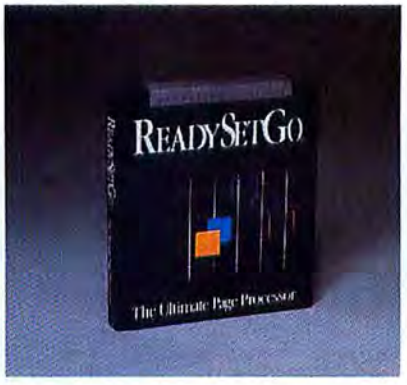


Still trying to shove those 5¼" PC diskettes into 3½" Mac slots? Well, before you hire someone to re-input all that data, take a look at MacLink. It converts and translates word processing, spreadspreadsheet, and virtually every other type of file from the IBM-PC into files readable by equivalent Mac programs.

Your writers can send you their data via modem, or you can do the transfer yourself with the optional PC to Mac cable.

Datavis MacLink **$89**

Step 2: ReadySetGo
Design and conquer.



You call yourself a desktop publisher and you don't own a copy of ReadySetGo? Shame on you. It's virtually all you need to go it alone.

First, you can do a rough page design and start throwing in blocks of copy. See how they fit. See how they look. See how they run onto the next page. Make some changes. Try a different type face, or a different size, or some borders, or some different graphics. You'll see instantly if your new idea works or not.

And as soon as everything's the way you like it you can print out a master on a LaserWriter, ImageWriter, or PostScript printer. Vol. 1, No. 1. You're in business.

Manhattan Graphics
ReadySetGo **$105**

Step 3: PictureBase
Stay organized.

It's 10:00 PM deadline night. Do you know where your favorite monarch butterfly icon is? You would if you had PictureBase. It keeps your clip art and original graphics organized.

Just copy MacPaint visuals into the PictureBase library. Whenever you need one, call it up by name or description, cut it, paste it into your ReadySetGo layout. And you're off!

Symmetry PictureBase **$45**

MacConnection™

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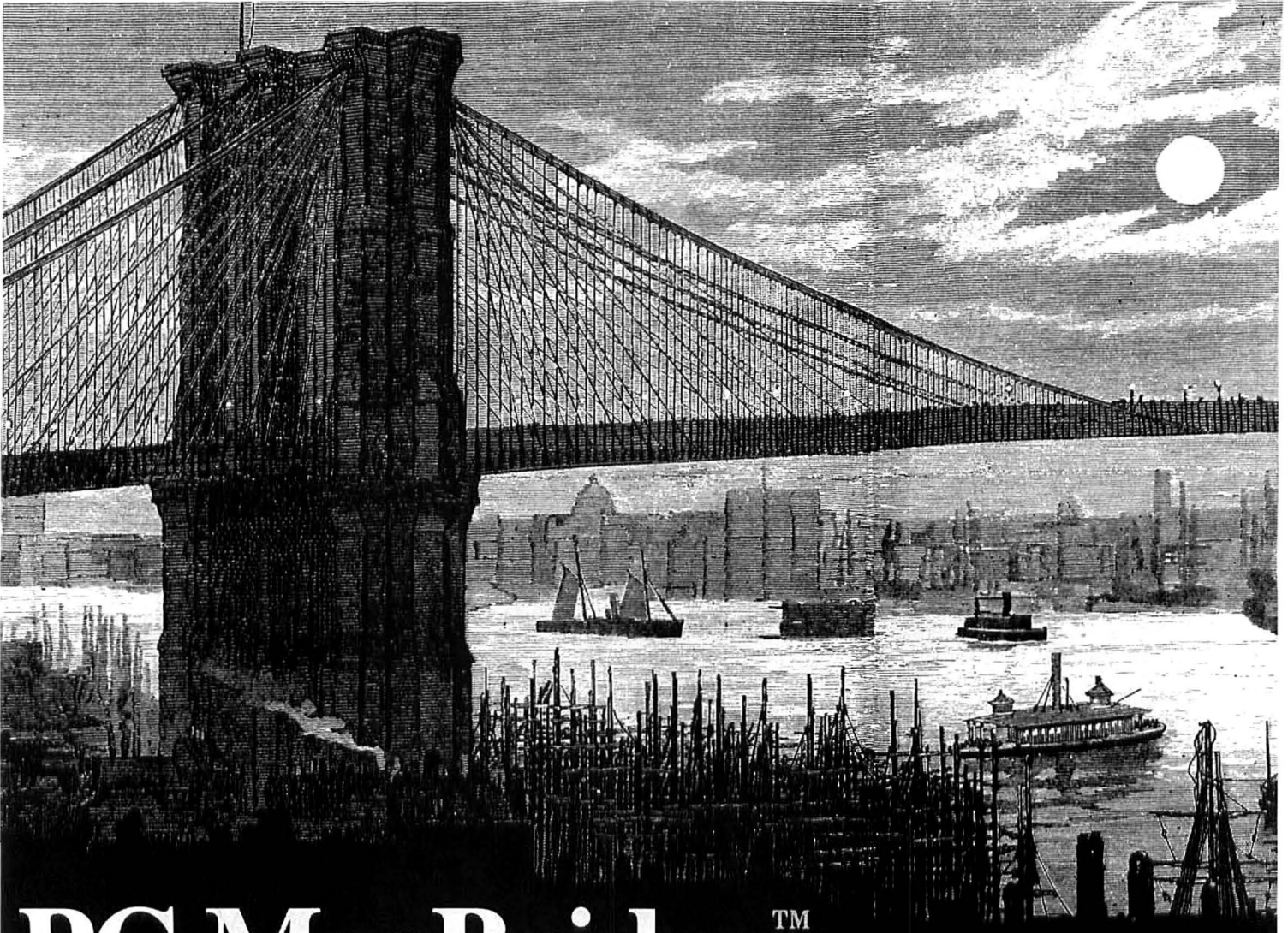
Circle P2 on reader service card



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Bridge the Mac-to-PC gap with PC MacBridge.

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Circle P10 on reader service card

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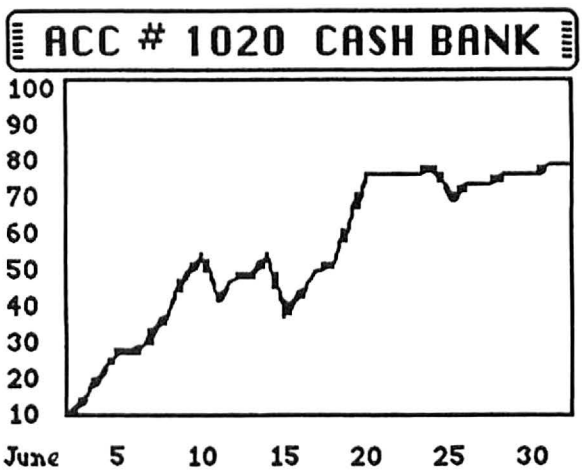

Graph of Cash Account

Sr. Accountant is an easy to use accounting software for the Macintosh that features a full graphics routine for analyzing each account. With ***Sr. Accountant*** you can graphically display expenses, sales, cash or any other account on the trial balance. Graphs can be displayed on the screen or printed on the Image Writer. Each account can be graphed by the month, quarter or year. All scales are automatic, you just select the account number and the period to graph.

Sr. Accountant includes *eight full feature accounting modules* each instantly selected for the main menu.

- General Ledger
- Accounts Payable
- Accounts Receivable
- Inventory
- Monthly Statements
- Job Costing
- Graphics
- Custom Reports
- Trial Balance
- Aging Reports
- Cost Centers
- Full Audit Trails

You can generate hundreds of custom reports with the above integrated modules. The software is designed to be used with either a service or product-based business.

Sr. Accountant checks each and every entry against the trial balance – if the operator tries to enter data that upsets the trial balance the data is rejected with an error message allowing the operator to correct the mistake.

Job Costing allows you to track costs on any job and print a report listing income and expenses by job. This is an excellent management tool that will allow you to control costs and increase profits.

First Accounting Program To Use Artificial Intelligence

Will not allow errors on the trial balance. Most offsetting entries are *automatic*. Full audit trails using GAAP standards are built into the software.

Minimum System Requirements: 128K with external drive, 512K or more & Hard Disks fully supported.

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Try it for 30 days – If you don't agree, send it back for a full refund (less postage and handling.) There is a $10 restocking fee if the program disk has been used. Non Copy Protected. Comes with excellent documentation. The software is machine languaged coded for the fastest possible speed.

Sr. Accountant performs the *same* accounting functions of software costing *$500 to $2000* and more.

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YES! Please rush me _____ copies of ***Sr. Accountant*** at **$69.95** per copy. I've enclosed $7.50 postage and handling. In Ohio, add 5.5% sales tax ($3.85 for each copy). U.S. prices only.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

☐ Check enclosed. ☐ VISA ☐ MasterCard

Acct. No. _____ Exp. Date _____

Signature _____

Circle 523 on reader service card

Macworld Directory

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

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

DEADLINE: For copy deadlines and further information please contact Niki Stranz, your Macworld Directory Account Manager, at 415/861-3861 or 800/435-7766 (800/435-7760 in California). Please send copy and prepayment to the Macworld Directory, 555 De Haro St., San Francisco, CA 94107.

■ *Artificial Intelligence*

ExperTelligence:

Is the world leader in the field of artificial intelligence products for the Mac. ExperTelligence is the only AI company that offers a full line of AI-related products. ExperLisp-Plus (full developers version), ExperLisp-Talker, ExperOPS5-Plus, ExperFacts, Prolog2 (the original Prolog developed by Marseilles University), ExperLogo, and ExperLisp 3600. For FREE info. call or write:
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

■ *Expert Systems*

MacKIT™ Version 2.0

The Knowledge Integration Toolkit for Building Expert Systems. This shell is written in FORTH as a turnkey application ... FORTH not required. *MacKIT* features a production rule compiler, back-chaining inference engine, certainty factors. Not copy protected. 512K req. $149, demo disk $10. MC/Visa.
Knowledge System Environments Inc., P.O. Box 261, Dept. M3, Grantham, PA 17027, 717/766-4496

■ *Hardware*

○ *Bar Code*

Bar Code/MagCard Readers

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

○ *Data Acquisition*

"Real World" Access

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

○ *Memory Upgrade*

Memory Enhancements

Upgrade your Mac to 512K, 1024K, or 2048K of continuous memory. SCSI port & fans available. Factory flow-solder techniques used for high reliability. 120-day warranty. Local 20-minute installation or mail order. Dealer inquiries welcome. Call for pricing and information.
Ehman Engineering, 2721 La Gran Via, Carlsbad, CA 92008, 800/227-2400 ext. 949

○ *Video*

MacMonitors/Projectors

17- & 23-inch hi-res monochrome monitors w/ antiglare, white phosphor, vari-scan. When your Mac must be seen in the classroom, trade show, office, etc. Only $1095 & $1295. Projector Systems w/ white phosphor, hi-gain screen, stand, cables. A complete system for the ultimate in Mac viewing pleasure. Only $5295. Dealer inquiries welcome.
National Data Systems, 2419 Rutland Dr., Austin, TX 78758, 512/837-1760, 800/531-5143, 800/252-8286 in Texas

Mentauris Corp.

Specialists in Macintosh video interfacing for over two years. Mentauris offers a wide range of products to satisfy any Mac or Mac Plus video interfacing need: our original, high-res Composite Video Adapter; our new, "no-drill" CVA; monochrome and color NTSC scan converters; Mac disassembly hand tools.
Mentauris Corp., 1658 IH 35 S, P.O. Box 1467, San Marcos, TX 78666, 512/396-1565

Special Offer:

$99.95 video adapter. Julian Systems is proud to announce its new composite video adapter for the Mac. Great for displays. Hook your Mac to large screens, projectors, etc. Why pay more for less? Won't void warranty. Order yours today! Call or mail chk/MO to:
Julian Systems, Attn: DVA Offer, 4345 Fairwood Dr., Concord, CA 94521, 800/447-2300, 415/686-4400 in CA

■ *Insurance*

Safeware

If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media, & purchased software. As little as $39 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 a.m. to 8 p.m. Mon. thru Fri.; Sat. 9 a.m. to 5 p.m.
Safeware, The Insurance Agency

Inc., 2929 N. High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469 (Natl), 614/262-0559 (OH)

■ *Publications*

Microcomputer Books

Selected Macintosh titles include:
- *Basic Microsoft Basic* $16.95
- *Mac Revealed, Unlocking the Toolbox* $22.95
- *Microsoft Macinations* $18.95
- *Excel in Business* $20.95
- *The MacPascal Book* $14.95
- *Using the Macintosh Toolbox with C* $20.95
- *Jazz!* $14.95

S/h extra. MC/Visa/AE. Send for free Directory.
Micro Books, P.O. Box 4068, West Richland, WA 99352, 800/547-9755 ext. 8, 509/967-5084

Mac Artist Wanted!

Do you miss *Macworld Gallery?* Do you have patterns or drawing tips to share? I am putting together a portfolio of computer artists. Send a self-addressed stamped envelope and a disk with your artwork on it, and it will be printed and published. Prizes awarded to top entries. For a copy of *Mac Artist* send $5 to:
Mac Artist, 12 Calvin Ct., Walnut Creek, CA 94595, 415/935-2270

Mac Tricks

Only $14.95 postpaid, a handbook of hundreds of helpful tips to make your Mac more useful, fast, and fun. If you read ALL of the magazines, you've seen many, if you could only remember where?! Full table of contents and index, information arranged by application. Probably the best $15 you'll ever spend on your Mac. MC/Visa accepted.
Digi-Graphics, 764 E. Village Way, Kaysville, UT 84037, 801/544-2009

■ *Services*

○ *Data Conversion*

Electronic Data Conversion

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CompuData Translators, Inc., 6565 Sunset Blvd. #301, Hollywood, CA 90028, 213/462-6222

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Laser Printing Services, 26058 W. 12 Mile Rd., Southfield, MI 48034, 313/356-1004

Laser Typesetting

Use your Mac for desktop publishing! Newsletters, brochures, and other graphics output at professional quality using your Mac and our Linotype™ typesetter or Apple LaserWriter. Great savings and 24-hour turnaround via disk or modem. Graphic design also available from our staff artists. Write or call:
Spectrum Arts, Ltd., 1823 Eutaw Pl., Baltimore, MD 21217, 301/225-7372

○ *Typesetting*

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MacTypeNet™, Box 52188, Livonia, MI 48152-0188, 313/477-2733

■ *Software*

○ *Accounting*

Shopkeeper

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Woodtec, 320 W. Maple, P.O. Box 675, Arkansas City, KS 67005, 316/442-7000

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Software Complement, P.O. Box 1123, Milford, PA 18337, 717/686-5592

○ *Apple Emulator*

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

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Mac + II is an ideal software package to run Apple II programs on the Macintosh. Mac + II emulates the Apple II (+ , e, enhanced, 128K, 80 column) and runs AppleWorks and thousands of DOS 3.3, ProDOS, BASIC, and Apple II machine language programs. Easy transfer software is included. The best Apple II emulator on the market. $149.95. MC/Visa.
Meacom, P.O. Box 272591, Houston, TX 77277, 713/526-5706

○ *Architecture*

MacPerspective™

Allows architects, draftspeople, and artists to rapidly construct perspective drawings of houses, buildings, or other objects. Viewpoint can easily be changed. Drawings can be printed in any size up to 100 inches. Easy to learn and use. Fast, professional program with many features, thorough manual. $149.
B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

○ *Backup/Restore*

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Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, FL 33614

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Datafood Software Co., 400 Country Dr., Ste. H, Dover, DE 19901, 302/736-9098

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Cognitive Concepts, 1219 Phelps Ave., San Jose, CA 95117, 408/243-6886

○ *Communications*

Mac240™

Mac240 is a DEC VT240 emulator that lets your Macintosh talk to DEC hosts using both text (VT100/VT200) and graphics (ReGIS). Features: file transfer (Kermit, Xmodem), dialing, printing, VT200 function keys, and copy text/graphics to other applications. $199.
White Pine Software Inc., 75 Rt. 101A, P.O. Box 1108, Amherst, NH 03031, 603/673-8151

○ *Educational*

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Medina Software, Inc., 2008 Las Palmas Circle, Orlando, FL 32822, 305/281-1557

○ *Engineering*

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LogiWorks is an interactive digital logic drawing and simulation package for the Macintosh. Features:
- built-in library of common gates, flip-flops, etc.
- user-defined devices, PROMs and PLAs
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- 3-state and open-collector devices
- produces timing diagram of selected signals
- $159.95 (U.S.)
- 128K version (no user-defined devices) $79.95 (U.S.)

Capilano Computing, 548 Beatty St., Vancouver, B.C. V6B 2L3 Canada, 604/669-6343

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Analysis & design programs. Any # of nodes, elements, loads. Structure, load, tension, shear, moment & deflected shape diagrams, in & out text, section table, more. Full mac interface. FRAME-MAC (2-D frames) BEAMAC II (continuous beams) $295; BEAMAC (simple beams) $95. $-back guarantee. Free support.
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Survivor Software Ltd./w, 11222 La Cienega Blvd. #450, Inglewood, CA 90304, 213/410-9527

○ *Fonts*

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Indiawrite, 735 W. 183rd St. #2A, New York, NY 10033 or 24 rue Macarez, Valenciennes 59300 France

Downloadable Laser Fonts

Specialized fonts for the LaserWriter. Classical Greek (SMK™ or WSU format) $85. Serif/sans-serif for scientific texts $75. Font of 100 chemical structures $125 (with scientific text fonts $160). Polish serif or sans-serif $85 each (4 styles). Soon: small caps and modern Greek. MC/Visa. As mentioned in "Putting on a Good Face" in this issue.
Allotype Typographics, 1600 Packard Rd. #5, Ann Arbor, MI 48104, 313/663-1989

○ *Games*

Fame and Fortune

Tarot for the Mac–full Mac interface, graphics, and ease of use make this a great update of an ancient art. $35 includes shipping. Check or money order.
Hack & Slash Software, 1525E S. Broadway, P.O. Box 6066, Santa Maria, CA 93456

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CompuCRAFT, P.O. Box 3155, Englewood, CO 80155, 303/850-7472

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A dynamic graphics program that brings to the Mac environment an exciting art medium stimulating untapped artistic talent. Slate provides

features typically found in expensive systems. Since you have a state-of-the-art computer, it makes sense to support it with similar software that opens the door to a fulfilling new personal experience.
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○ *Languages*

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Compiled libraries of high-level routines let you quickly & easily create windows, menus, scroll bars, & dialogs & support many other features of Mac interface. Flexible & modifiable. 200-pg. manual & demos. MacPascal 2.0 or TML Pascal compiler versions $69.95. Megamax C or Aztec C version $129.95.
Invention Software Corporation, P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

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Mach1™, a multitasking FORTH83 development system, is THE language for interactive Mac programming: COMPLETE toolbox access, MDS-format assembler, unlimited terminal/background tasks, FAST execution, text files, clickable applications (no lic.), *Switcher*/Edit, 400-p. manual. $49.95 (+s/h, CA tax). MC/Visa.
Palo Alto Shipping Company, P.O. Box 7430, Menlo Park, CA 94026, 415/854-7994, 800/44FORTH

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A LISP environment that makes a Mac feel like a LISP machine. MacScheme™ features a fast, reliable byte code interpreter, debugger, trace facility, and QuickDraw graphics. Its Smalltalk-like interface offers multiple windows and an editor that understands LISP syntax. Supports HFS, 512K or more RAM. $125.
Semantic Microsystems, 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

○ *Mathematics*

Math Package

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Greer Software Products (mw), P.O. Box 268, Annandale, VA 22003, 703/978-3327

○ *Printer Drivers*

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GDT Softworks Inc., P.O. Box 1865, Point Roberts, WA 98281-1865, 604/291-9121 or 800/663-MACC

○ *Public Domain*

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PD Mac, Dept. Q, P.O. Box 5626, Sherman Oaks, CA 91423

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Greene, Johnson, Inc., 15 Via Chualar, Monterey, CA 93940, 408/375-2828

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Macworld Directory

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Open Window

How to get Excel dates straight and other Macintosh discoveries

Edited by Jim Heid

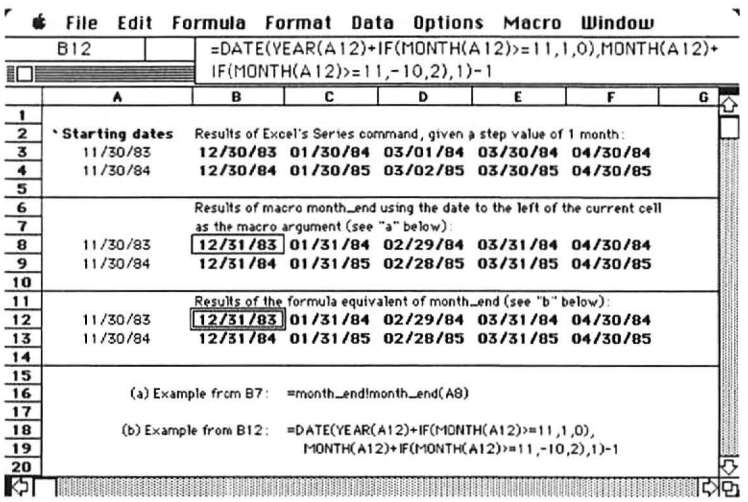
Read it here if you need accurate date values using *Excel*'s Series command, advice on using *MacDraw*'s Smooth command, or a way to disable the phone company's call waiting feature to eliminate telecommunications problems caused by incoming calls. You'll also find a handy tip for quick erasing in *MacPaint* and insights into *Microsoft Word*'s header and footer features. Finally, a reader offers advice on using the Mac with the Tandy 200 portable computer.

Dating with Excel

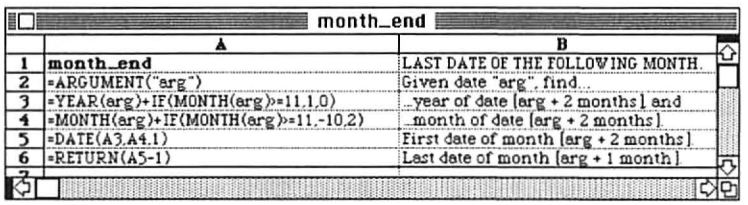
You can use *Excel*'s Series command to create a series of dates with a step value of one month. *Excel* can, however, give inaccurate date values if your starting value is the last date of a month and you want the Series command to generate the last dates of succeeding months.

I wrote a short routine that I call month_end, which works as a formula (see "Bad Dates") or, better still, as a macro (see "Month End Macro"). Given a date, month_end produces the last date of the following month. You can use each result to produce the next month-end date in the series. Using the month_end macro, here's how:

- Type the month_end macro into a new macro sheet and save it as month_end.
- Open the worksheet that will contain the date values and type the starting month-end date in the desired cell.
- Select the cells that will contain subsequent dates, choose Number from the Format menu, and select the desired date display format.



Bad Dates
The month_end macro gives you accurate month-end dates in Excel *by taking as its argument one date and then returning the last date of the following month. You can use month_end as a macro (middle example) or as a formula (bottom example).*



Month End Macro
The month_end macro listing. Column B contains comments, which you may omit.

- Select the next cell in the series and type **=month_end!month_end(##)**, replacing ## with the address of the cell containing the starting month-end date. When you press Enter or click the enter box in the formula bar, the next date in the series appears. With the same cell still selected, choose Copy from the Edit menu to copy the formula to the Clipboard.
- Select the next cell in the series and choose Paste from the Edit menu. The next month-end date in the series should appear. Repeat this step until you've created all the month-end values needed.

As written, the month_end macro sets the time of day in the resulting date to the start of the day (midnight, or zero). To set the time to the end of the day (11:59 p.m.), edit cell A6, changing −1 to −"0:0:1".

Edward Oerter
Winston-Salem, North Carolina

Smooth Operators in MacDraw

MacDraw offers many advantages over *MacPaint*—object manipulation, multipage capability, and high-quality laser printing. Still, I always had trouble drawing certain curves that I needed for scientific work.

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New York Times–June 23, 1985

"World Class Hard Disk Storage Award"

PC World–November 4, 1985

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The freehand curve tool never produced pleasing results, even with subsequent smoothing.

I then discovered that I could get excellent results by drawing the shapes using the polygon tool, then smoothing them using the Edit menu's Smooth command. "Smooth MacDraw" shows some examples. Remember that as far as *MacDraw* is concerned, a "polygon" doesn't necessarily have to be closed.

John Pezzullo
Warwick, Rhode Island

Making Call Waiting Wait

Many telephone companies offer an optional service called *call waiting* that interrupts a phone call with a brief (roughly 200-millisecond) click, which signals that someone is trying to reach you. Call waiting means major headaches in telecommunications, since the interruption often causes modems to terminate a connection. Until recently, all you could do to eliminate that risk was to communicate late at night or do without call waiting.

Many Bell operating companies are updating the phone system by installing electronic switching exchanges throughout the country. These exchanges use what's called the Model 1AE8 generic switch, which lets you disable call waiting on a call-by-call basis by simply dialing a special code prior to dialing a number. With rotary dialing the code is 1170; with tone dialing it's *70. The call waiting feature automatically resumes when you finish your call.

How do you know if your local exchange supports this feature? Simply try the code. If it works, you'll hear three short clicks followed by a dial tone. If call waiting cannot be disabled, you'll hear the all-too-familiar recording, "Your call cannot be completed as dialed."

If you use an auto-dial modem along with a communications program that stores your phone numbers, you must insert a pause command between the call waiting disable code and the number you're dialing. With Hayes-compatible modems, a comma (,) creates a 2-second pause, which is usually adequate.

Allan Warner
Clark, New Jersey

Whitewashing in MacPaint

I love *MacPaint,* but its big eraser has always struck me as clumsy. I've developed a few techniques for erasing large and small areas, and they all make use of the white fill pattern. By filling or painting black areas white, you can perform the equivalent of erasing.

The white fill pattern turns many of *MacPaint*'s drawing tools into handy erasers (see "White Paint"). The spray can softens the edges of a shape. The paint bucket erases areas that are black. The straight line and the paintbrush can erase smaller areas than the eraser. Perhaps the most useful tool is the filled rectangle. By drawing white-filled rectangles with no outline, you can quickly clear large areas with one sweep of the mouse.

Scott McKay
Portland, Oregon

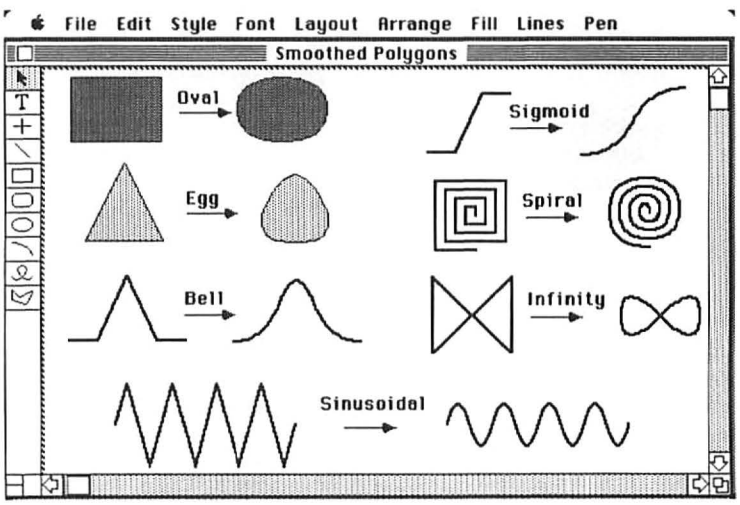
I agree that the filled rectangle is the most useful eraser of the tools you mention. When preparing a figure containing a dialog box, I use the filled rectangle to remove the screen image outside the dialog box.—Ed.

The Tandy 200 Connection

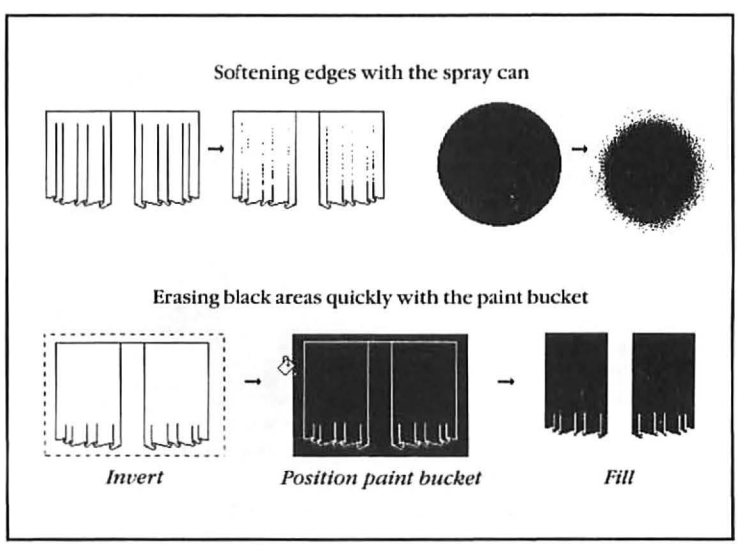
I've been following with interest the *Open Window* tips concerning Tandy's Model 100 portable computer [see *Open Window, Macworld,* July 1985 and December 1985]. I recently bought a Tandy 200 portable but was disappointed that the sales pitch, "if it works on the 100, it'll work on the 200," proved false.

After numerous trips to the local Radio Shack and several calls to Fort Worth, I learned that the Tandy 200 re-

(continues on page 170)



Smooth MacDraw
To create the rounded shapes shown here, use MacDraw*'s polygon tool to draw angular versions, then smooth them using the Edit menu's Smooth command.*



White Paint
If you find MacPaint*'s eraser too large for detail work, select the white pattern from the pattern palette, then use the paintbrush, the paint bucket, or a filled rectangle (with no outline) to erase black areas. Using the spray can with the white pattern softens the edges of a shape.*

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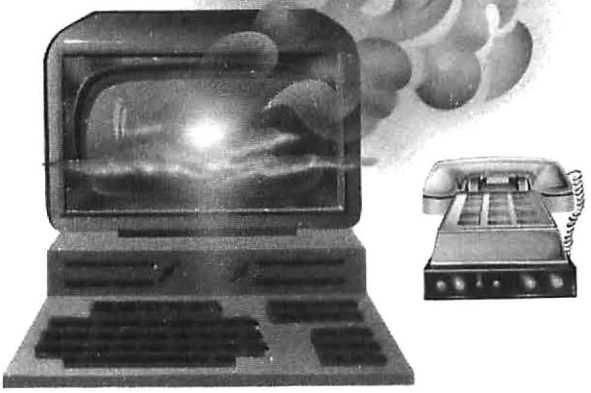

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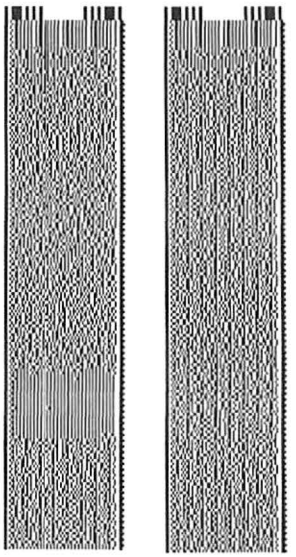

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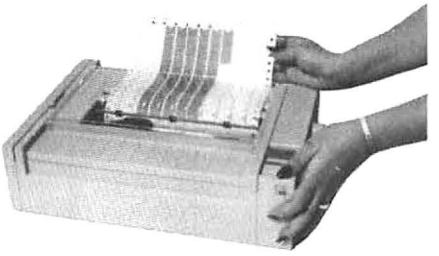

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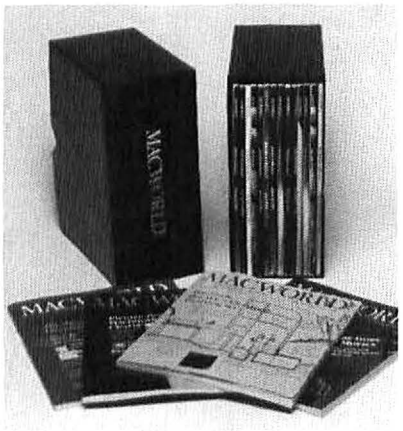

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(continued from page 168)

quires different signals than the 100, making it impossible to link the portable to the Mac using the Imagewriter cable. The necessary pin connections are shown in "Mac to Tandy 200."

There's still one hitch: the POKE statement required to correct the line-feed problems with *MacTerminal* does not work on the 200. I have found, however, that the MacTerm desk accessory in Borland International's *SideKick* transfers files properly and is more convenient, since you can use it while using *MacWrite* or *Word*.

David Betson
South Bend, Indiana

Getting a Head in Word

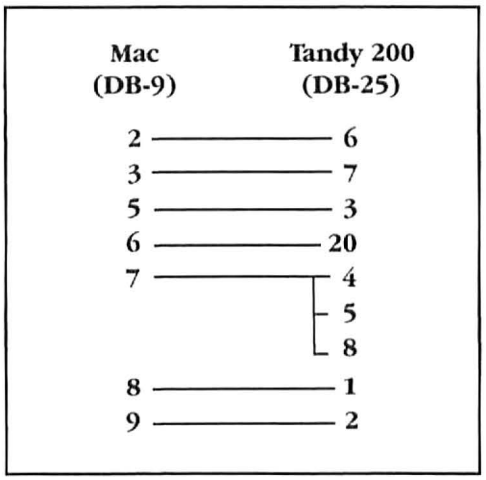
Microsoft Word is a more powerful word processor than *MacWrite*, and in most cases its power doesn't come at the expense of simplicity. One notable exception, however, is creating headers. *Word* allows more sophisticated headers than *MacWrite*, but they are more difficult to create. Most significantly, what you see when you create a header is not what prints. If you're used to creating headers in *MacWrite*, *Word*'s approach can be confusing.

The simplest *Word* headers contain only page numbers. To print a page number on each page, choose Division Layout from the Document menu, then click Auto Page Numbering and type a number in the Start Page Numbers At box. You can change the position of the page number by typing values in the From Top and From Left boxes.

For a running head containing text, type the text at the beginning of the document or division. To create an automatic page number, type **page**, then press ⌘-Backspace to recall the page numbering code from *Word*'s glossary. Next, select the header text and choose Running Head from the Document menu. A dialog box appears in which you specify where the text appears: on odd- or even-numbered pages, on the first page, and at the top or bottom of the page. Make your selections and click OK, and *Word* adds an international quotation mark («) to the left margin.

Word treats a header as a single paragraph—a fact that has important formatting implications. If you want a multiline header, press Shift-Return to advance to the next line rather than simply pressing Return. To adjust the header's left and right margins, select it, then choose Formats from the Paragraph menu. If the header contains more than one line, you may have to move it up on the page to prevent it from printing directly over other text. Adjust the header's vertical position using the Division Layout command.

David Gerbing
Hewitt, Texas



Mac to Tandy 200
To connect the Macintosh to the Tandy 200 portable computer, wire a cable as shown here. Note that pins 4, 5, and 8 on the Tandy 200 end of the cable should be connected to one another.

pfs:file to Microsoft File Correction

A bug flew into April's *Open Window* tip "One File to Another," which described how to transfer a *pfs:file* database to *Microsoft File* using *Word* as an intermediary. Instead of typing ^T in *Word*'s Change To box, you should type ^t. *Word* does not recognize the capital *T* as the code for a tab. We regret any inconvenience caused by this error.

Please submit contributions on disk (which we will return) along with a brief description on paper to Open Window, Macworld, *555 De Haro St., San Francisco, CA 94107, or send your contribution electronically to CompuServe 70370,702 or The Source BCW440. We pay $25 to $100 for each* Open Window *item published. All published submissions become the property of* Macworld.

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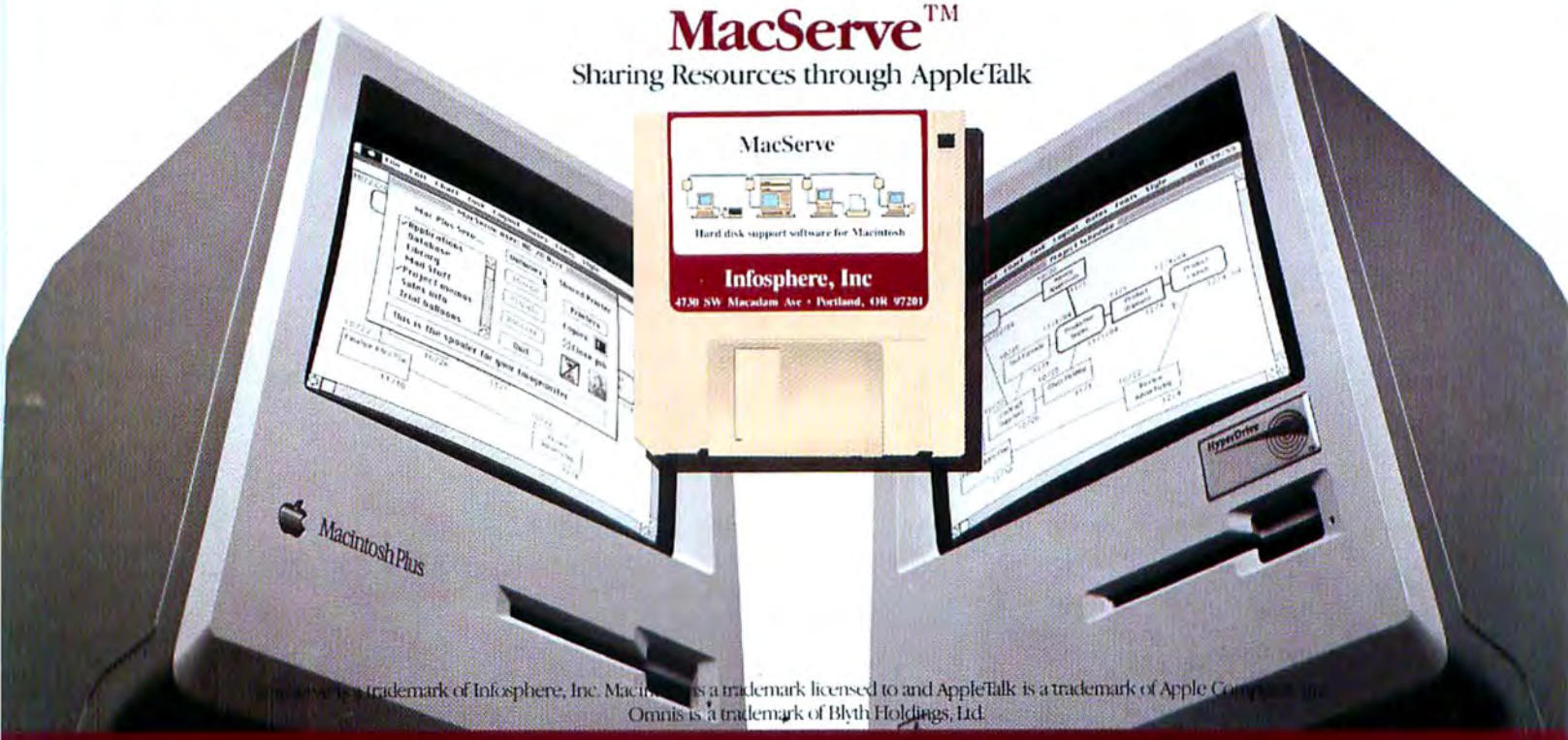

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