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The Macintosh® Magazine

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new powerful
laser printers*

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**Saving Time
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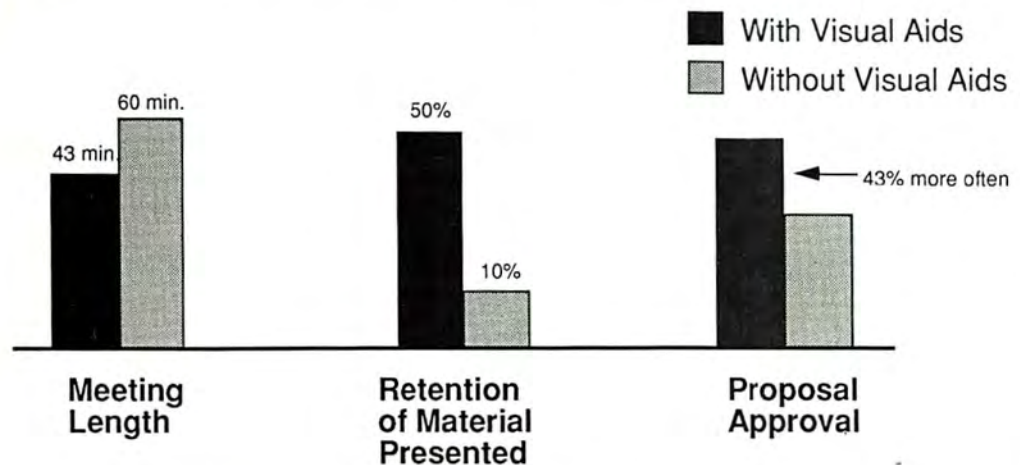


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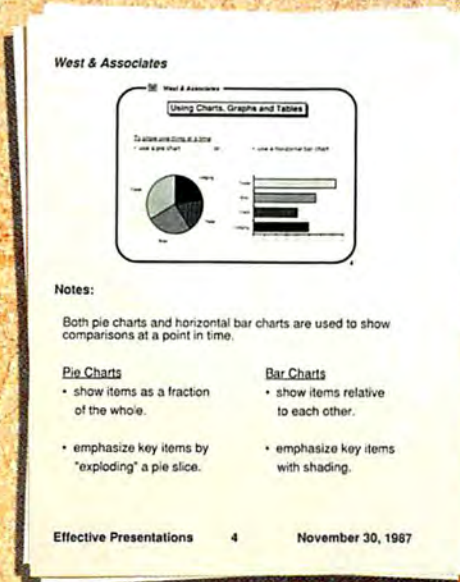
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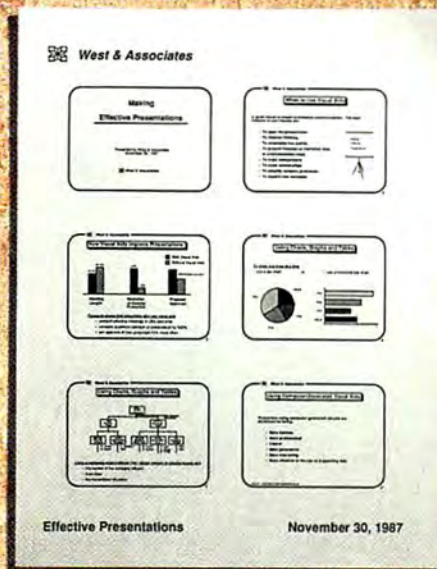


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MACWORLD

March 1988

The Macintosh® Magazine

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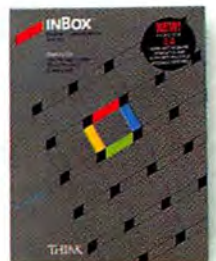
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Mac Bulletin

Lowest-Price Laser Printer?

► General Computer has lowered the price of its 300-dpi, QuickDraw-based Personal LaserPrinter (PLP) by \$600, from \$2599 to \$1999. Discounted prices go as low as \$1699, according to the Waltham, Massachusetts, company.

Two problems with the PLP have been its lack of PostScript compatibility and its inability to connect to a LocalTalk network (LocalTalk is Apple's new name for the AppleTalk Personal Network). To correct these limitations, General Computer is about to bring out a PostScript version of the PLP, as well as PLP Share, a \$499 device that will let a small work group access the PLP through LocalTalk. The PostScript PLP will include Adobe's PostScript, a 58000 processor, 2 megabytes of RAM (expandable to 3MB), and all the fonts that currently ship with Apple's LaserWriter Plus. List price of the upgrade is \$1999. The price of the complete PostScript printer hasn't been set, but it won't exceed \$3999.

Hurry, Limited Offer

► For a limited time, *Spellswell* by Working Software will be bundled with Microsoft's popular integrated program, *Microsoft Works*. *Spellswell* normally lists for \$74.95, but from February through the end of May the spelling checker comes free with the purchase of *Works*.

Inside the Mac II

► A new 275-page seminar notebook entitled *Programming the Macintosh II: Volume I of the Source Code Series* (Personal Concepts, 1987) includes software on a disk along with full source code for each program and extensive notes about how the programs function. Some of the *MPW Pascal* source code can be used to bring features to other programs.

The notebook and the four simple applications that accompany it were developed by Dave Wilson, who organized Apple's Macintosh Programming Seminars. The applications include CPaint, one of the first Macintosh color paint programs, which is not intended to compete with commercial color paint programs; Color, a program that creates segmented windows of colors; CText, a text editor that displays each character in its own font, style, size, and color; and Bench881, a benchmark program for testing Mac II performance during intensive math calculations. The \$79.97 book is available from Personal Concepts, 635 Wellsbury Way, Palo Alto, CA 94306.

Clone Me

► Do you want to distribute large quantities of software—perhaps a series of new *Excel* templates, some public domain software, or a full disk of new stacks? Or maybe you just want a stack of formatted disks. You can save your Mac's disk drive, your arm, and your own time by using a new disk duplicator from Ventuno of

Fremont, California, called V3 Autoloader for the Mac.

V3 Autoloader is about the size of a Macintosh Plus and stores up to 50 disks. It simply feeds blank disks into its own drive mechanism and produces either copied or formatted disks—rejected disks go into their own bin.

Ventuno's \$2795 duplicator won't copy protected software—V3 Autoloader uses the same copying algorithms as the Mac Plus, SE, or II to which it's connected. Ventuno's next model will be a stand-alone version much like the popular duplicator it offers for MS-DOS 5¼-inch disks.

Eight-Eyed Mac

► Up to eight video monitors can run off a single Mac II video card using a Vopex video expander from Network Technology. Intended primarily for demonstrations and classroom use, this video port expander allows you to install monitors up to 50 feet from a demonstration computer.

Vopex is completely transparent to the user. The device requires a 110-volt power supply, as well as a distribution amplifier. It accepts monochrome, gray-scale, and color signals and supports all frequencies and resolutions currently available for the Mac. Optional switches at each monitor allow students to alternate between the video signals of their individual computers and that of the demonstration computer.

A two-channel Vopex lists for \$279; the eight-channel

model sells for \$899. For further information, contact Network Technologies of Aurora, Ohio, at 800/742-8324.

What Say You, Apple?

► You've heard about 24-bit color and how its 16.7 million colors bring photographic quality to the Mac II's screen, but you haven't heard about applications that produce 24-bit color images—because there aren't any. That's an important omission for many engineers, publishers, and graphic artists who want to generate high-quality graphics on a personal computer.

There's a good reason for this lack of applications: deep in the Mac's latest System is a basic tool called Color QuickDraw, which works with 8-bit color (256 different colors) but not 24-bit color. Apple's reportedly working on an upgrade, but RasterOps of Cupertino, California, got tired of waiting and wrote its own color QuickDraw improvement, which it calls TrueColor. RasterOps is offering TrueColor as a standard for application developers, hoping that the resulting programs will help sell the RasterOps 24-bit video ColorBoards, which it's been shipping to developers and major OEMs since September. Jasmine, the hard disk systems manufacturer, is backing RasterOps by agreeing to sell its video cards.

The danger for everyone involved with TrueColor is that Apple will standardize on a different 24-bit Color Quick-

(continues)

Borland's new SideKick, Release 2.0, gives you MacPlan™ and a whole new Outlook™



Release 2.0 includes Outlook: The Outliner, the "thinking" desk accessory with more power than a standalone outliner, and MacPlan: The Spreadsheet, that does formulas, straight numbers, and also integrates spreadsheets and graphs.

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Draw. But if TrueColor gains enough momentum, perhaps even Apple will go along. What say you, Apple?

Optimization in Excel and Works

► It's relatively easy to conduct "what if" analysis to see how a spreadsheet's bottom line is affected—you simply modify the number in any cell and then order a recalculation. But the tedium involved in changing the value of many cells may prevent spreadsheet users from taking the next step: optimization.

Best Answer from Heizer Software of Pleasant Hill, California, makes linear optimization relatively easy—you plug in the desired number, like profits or total production, and the program recalculates all the new numbers necessary to achieve the desired result. *Best Answer* reads and manipulates spreadsheets produced by *Excel* and *Works*, thus enhancing those programs' abilities to help with decision making. *Best Answer* can run concurrently with *Excel* and *Works* using MultiFinder or *Switcher*.

Calling All MUGs

► Expect your Macintosh user group (MUG) to become more professional and businesslike following the 1988 National Apple Users Group Conference, which begins April 8 in Ann Arbor, Michigan.

During three days of seminars, your MUG officers will explore such key issues as membership, banking, finances, legal protection, marketing, and networking.

Apple will sponsor the conference, with the help of a few other corporations, and it will be hosted by MacTechnics.

MacTechnics, a 700-member MUG, more than doubled in size during the last year, according to Doug Hauseman, a MacTechnics officer and chair of the April conference.

Hauseman said the rapid growth in MUG memberships is prompting many group officers to become more professional and knowledgeable about MUG operations, which often depend on the cooperation of Apple, third-party developers, and major corporations.

The conference will be limited to 300 attendees. For further information, write to Hauseman at NAUGC '88, 1801 Independence #4, Ann Arbor, MI 48104, or on AppleLink at UG0137.

Listen Up, Wang

► Thousands of offices with Wang VS computer systems now also use the Mac. The question is, how to connect the two computer systems?

One answer comes from DataViz of Norwalk, Connecticut, with its *MacLink Plus/Wang VS*, which provides a window into both computer systems, file transfer capabilities, and Wang emulation on the Macintosh.

Mac users can choose from over 30 translators that preserve formatting between popular programs on Macintosh, Wang VS, and MS-DOS computers. Mac users can also connect to the Wang VS system and search for word processing documents by document number or name, author, operator, or comments. A document can then be converted to *MacWrite*, edited, and sent back to the Wang VS system like any other Wang file.

Other capabilities of the *MacLink Plus/Wang VS* allow

the Wang to act as a file server for both Macintosh and MS-DOS computers. Macintosh users can also send and read Wang mail and use full Macintosh pull-down menus that emulate Wang menu items and function keys.

Technology and Issues Conference

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

Technology and Issues Conference
Jerry Borrell, Editor
Macworld
501 Second St.
San Francisco, CA 94107

Medium-Speed LAN

► One of the world's largest manufacturers of digital equipment, Northern Telecom of Nashville, Tennessee, has integrated the Mac II into its digital telephone system. The result is the Lanstar AppleTalk Network, on which up to 1334 users anywhere in the world can share files, electronic mail, and printers.

Lanstar's version of AppleTalk is ten times faster than the AppleTalk Personal Network and uses low-cost telephone cabling rather than the coaxial cable normally used by the even faster Ethernet.

To connect to Lanstar, each Mac II requires a \$295 interface card. Software for the central controller, *Meridian Lanstar*, costs \$5400.

Atkinson's Army

► Here's a quick and fun way to see what's available on 20 disks that contain some 200 public domain *HyperCard* stacks. Just order the *Hyper Catalog* disk from the nonprofit Berkeley Macintosh User Group (BMUG).

Open the catalog disk using *HyperCard*, and you'll find that each card contains a picture of the first card of every other stack in the BMUG *HyperCard* library. In addition, your *Hyper Catalog* will automatically catalog any new stack you wish to add. *Hyper Catalog* provides pop-up documentation fields and a Go To function (click on the picture to open a stack) that lets *Hyper Catalog* serve as a Home stack.

Hyper Catalog is the creation of Scott Kronick, a BMUG volunteer and the author of *MPW and Assembly Language Programming* (Hayden Books, Howard W. Sams, 1987) and *Macintosh Pascal Illustrated: The Fear and Loathing Guide* (Addison-Wesley, 1985).

In keeping with the spirit of his *Hyper Catalog*, Kronick has organized "Atkinson's Army," a collective of *HyperCard* designers who offer training and custom stack development. Their raison d'être: "You can try asking for *HyperCard* support directly from Apple, but you'd have better luck getting through to someone at the Wailing Wall."

To order *Hyper Catalog*, send a \$3 check or money order to BMUG, 1442-A Walnut St. #62, Berkeley, CA 94709. You might ask for a listing of BMUG's continually updated public domain and shareware software that sells for \$3 for an 800K disk. And if you're interested, ask for a brochure about Atkinson's Army. □

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Reflex Plus Turns Disorganized Data Into Useful Information



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Dealing with data is an inescapable reality of modern living—at home and on the job. Especially on the job. Most of it is pertinent. Much of it is valuable. And almost all of it would make our lives more productive—if we could just figure out how to make it work for us without a staff of experts inputting, outputting and making all the right connections.

Dā-tā-bāse:

"a collection of data organized especially for rapid search and retrieval."

Some people are intimidated by the mere mention of the word "database." Don't fall into the trap. In today's computing world, power is measured by the ability to retrieve, manipulate and evaluate information. A database manager gives you that power.

THE FLAT FILE MODEL

The most elementary form of database manager is the flat file database manager. It allows you to manage lists—like inventories, basic mailing lists, payment records, prospect lists and so on, but its power is limited.

THE RELATIONAL MODEL

A relational database manager such as *Reflex Plus* can manage flat file databases. But its real power comes from the "relational" aspect. It allows you to create multiple flat files, then link and cross-reference records within these files. Oftentimes, the "relationship" established through linking is more important to a user than the original files. Up to now, the most popular relational databases have proven to be cumbersome, hard to learn and difficult to use.

HAVE IT YOUR WAY

Reflex Plus gives you amazing flexibility in creating databases, accessing data and producing reports. You can organize and sort your data any way you want—on as many fields as you want. You can display it any way you want. You can add graphics, change fonts, add calculated fields—all according to your own design.



It crunches numbers like a spreadsheet—with 49 arithmetic, text and statistical functions built in. Which means that it's an especially effective productivity tool on your Macintosh.

Reflex Plus gives you the opportunity to make sense out of all that data. *Reflex Plus* turns disorganized data into useful information, resulting in perceptive decisions.

Best of all, *Reflex Plus* is only \$279.00 and it comes from Borland.

HERE'S HOW IT WORKS (It's as simple as drawing a box.)



(1) Pull down the File menu and select "New Database File..." Enter the name you have chosen. Click on "create."

(2) Voila! Your database is on the screen and waiting for you to enter fields.

(3) Draw lines between the databases to establish the proper relationship between them. And that's it! You're now ready to enter your data.

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Advanced features, like command and accelerator keys, that

highest concentration of owners in a single age group with 12.7 percent. The combined age group of 25-54 accounted for the greatest concentration of total bicycle sales with 55.4 percent.

Relative to population in each age group, sales indicate that there is above average interest in bicycle products in the 15-44 age categories. Sales are relatively lower, at 27.6 percent, for the younger segment (age 15-24); this is significant given the fact that the population in this segment is almost half that of the 25-49 segment.

The discrepancy between the information from Lake City's warranty registrations and the current research finds may be due to the following:

could that the 25-49 age group had the highest concentration of sales in a single age group with 12.7 percent. The combined age group of 25-54 accounted for the greatest concentration of total bicycle sales with 55.4 percent.

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The discrepancy between the information from Lake City's warranty registrations and the current research finds may be due to the following:

- Lake City's warranty registrations are not collected consistently regarding the products.
- The current research may not be the primary source of the data.
- The most survey technique used for the current research is face-to-face interviews with respondents.

Lake City Bicycle Sales Report

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Turnaround Is Fair Play



||||| *The candidate for mayor was lagging behind. He needed a breakthrough—and found it, thanks to Macintosh.*

California state assemblyman Art Agnos was running for mayor of San Francisco, and he had some problems. Five months before the November 3, 1987, election, he was way behind in the polls, a local newspaper had reported on his failure to pay income tax on a questionable land deal, and it looked as if his leading opponent, San Francisco supervisor John Molinari, would win big.

Agnos had to do something quickly to distance himself from the bad publicity and gain the confidence of voters. If he could communicate with them in a personal way about his views on various issues, he might be able to turn the tide.

Even a week can be crucial in a campaign, and the clock didn't stop ticking. Agnos needed a secret weapon to make a breakthrough. He found one in desktop publishing—with the Mac.

Art Agnos wrote a book called *Getting Things Done: Visions and Goals for San Francisco*. It is 82 pages long. In it, he addresses a wide range of topics, including AIDS, housing, homeless people, downtown development, senior citizens, even parking—all of which he would face as mayor.

He captures the reader's interest right from the beginning with some compelling personal stories. He relates a horrifying incident in which he narrowly escaped becoming the sixth murder victim of the infamous Zebra killers, who in 1973 shot strangers at random on the streets of San Francisco. He recalls his involvement in arranging an emergency liver transplant for a dying 3-year-old boy. He describes his confrontation with a Soviet border guard who discovered he was carrying the card of a prominent Jewish refusenik in his wallet.

Getting Things Done is a political platform disguised as an easy read. The slim, 5-by-8-inch paperback, printed on newsprint, features the 10-point Times Roman font. It has a simple look and feel; you can easily browse without fear of brainwashing.

A six-page photo layout shows the candidate in action, posing with such political figures as Ted Kennedy, Desmond Tutu,

Cesar Chavez, Jesse Jackson. The back cover features a four-color photo of a smiling Agnos with his wife and two kids: just your typical middle-class family, posing outside Dad's campaign headquarters.

Agnos printed nearly a quarter of a million copies of *Getting Things Done* in September 1987. His well-organized grassroots supporters distributed the books to voters' doorsteps all over town in just a few days. His principal form of advertising was a sign that appeared everywhere with the simple message, "Read My Book."

After the November election and a December runoff, Art Agnos was elected mayor of San Francisco. He racked up a whopping 70 percent of the vote to Molinari's 30 percent—the biggest margin for a nonincumbent candidate in San Francisco in this century.

Most political analysts agree that Agnos's desktop-published book was a major factor in his big win. His method of reaching voters quickly and cheaply turned out to be a brilliant tactical move. *Getting Things Done* even appealed to those who didn't agree with Agnos. They appreciated his taking the trouble to explain his views carefully and sincerely in the book.

Here's how *Getting Things Done* actually got done. The idea was the brainchild of Agnos's campaign manager Richie Ross, who heads Ross Communications, a political consulting firm in Sacramento, California. Ross inspired Agnos to start the book last spring, before the campaign began to heat up. As he drove between political events in San Francisco and legislative business in Sacramento, Agnos began to dictate his ideas into a tape recorder.

The amazing thing is that Ross had computerized his office only a few months earlier. Chuck Haines, owner of a Sacramento design service bureau called The Graphic Studio, had convinced Ross to get on the Macintosh-and-laser-printer bandwagon.

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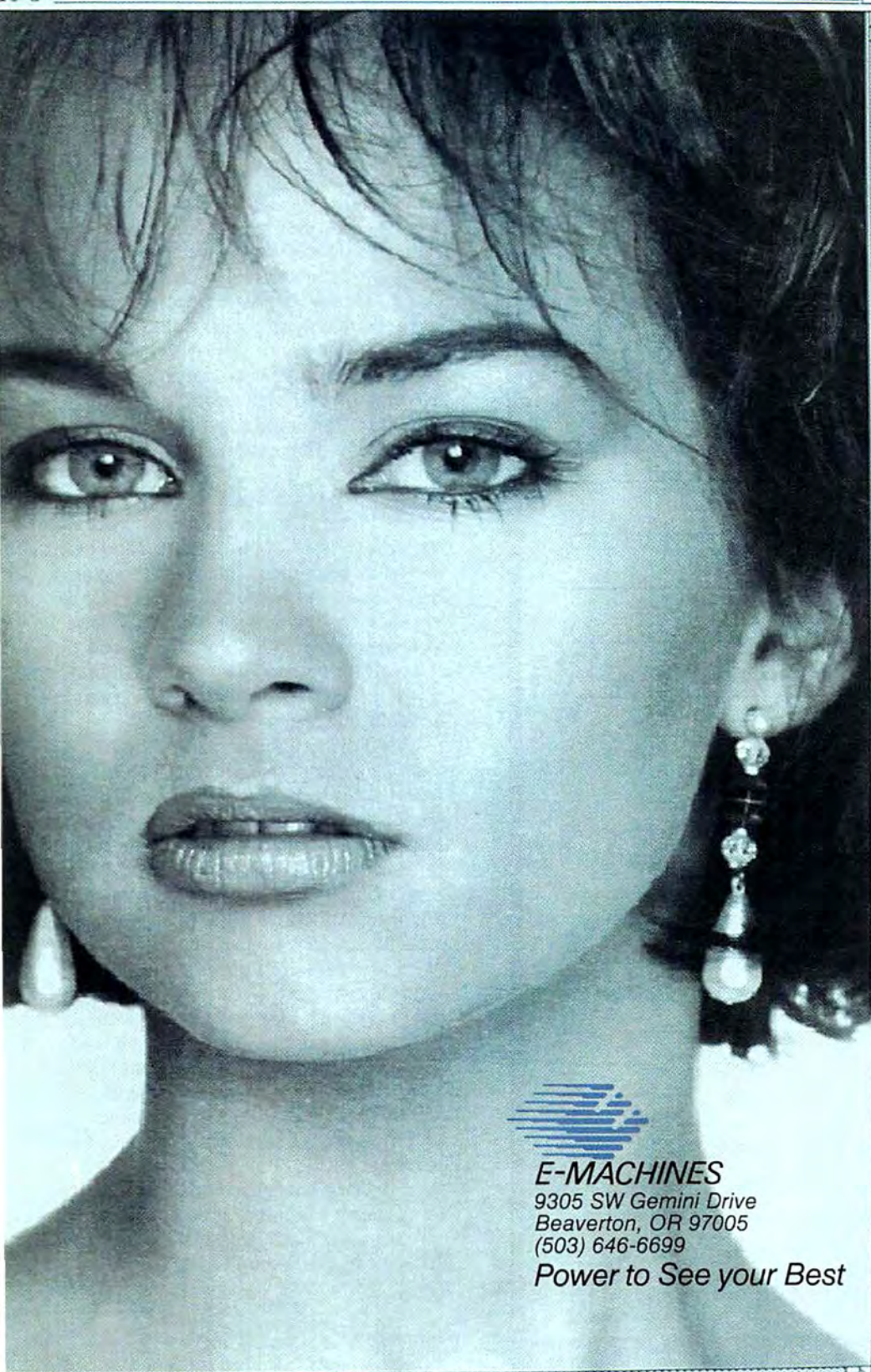
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David Bunnell

"I saw what was happening at the time in desktop publishing," Haines recalled. "I told Rich, 'Listen, this is what you've got to do. It's the wave of the future.'"

Prior to his conversion, Ross had hobbled along with an old Compugraphic typesetting machine, and all his pasteup work was done by hand.

So he stocked up on nine 512K Enhanced Macs, two Mac Pluses, and a Mac SE. *PageMaker* 2.0a was his page-layout program of choice. *Microsoft Word* 3.0 was the word processing program. Ross hired Haines to do the page layout and design of the book using a Mac SE with a 20-mega-byte hard disk. The laser printing was jobbed out to a print shop called The Electric Page.

Haines himself had only had four or five months' experience with personal computing, let alone desktop publishing. It was to be his first experience in designing a book.

"I was a boob when it came to computers. I didn't know a mouse from a donkey," Haines said. "I just sat down and waded through the manuals for the Mac, *PageMaker*, and *Microsoft Word*. As far as a grid or a layout was concerned, I just went to several bookstores and looked at how things were done, but a lot didn't really apply. I pretty much had to design it myself from scratch."

And did Art Agnos really write it? Campaign manager Ross, who needed access to his candidate at all hours, jokes, "I wish somebody else *bad* written it." Agnos constantly consulted experts in different fields to ensure that his specific proposals were realistic ones. That involved a lot of rewriting. And Agnos took full advantage of the technology to do that.

Ross Communications spokesman Marc Grossman, who was involved in developing the project, said, "There were so many changes and revisions that if it had been done traditionally, by hand and by typewriter, we never would have gotten it out. As it was, we made it to the printer with the boards just four hours before the deadline."

For any politician to care this much about the words and promises he or she makes is a decidedly mixed blessing. "There are some definite challenges associated with putting your plan in writing,"

(continues)

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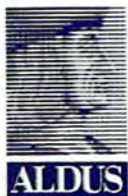
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Grossman reflected. "Many people will keep it around, and they will use it as a guide for their expectations. When Art becomes mayor, they're going to come back to him and say, 'Hey, Agnos, you said you were going to do this....What happened?' I think the book will have a lifetime that lasts far beyond the election campaign."

One of the most remarkable aspects of doing the book was its swift turnaround. "I remember coming in on the weekend and pretty much laying it out in two days," Haines said. "It was really intense. I probably did it in 12 or 14 hours. It was like a midterm on *PageMaker* for me."

The book was printed using a laser printer instead of a Linotronic phototypesetter because the inexpensive newspaper stock absorbs ink. "It would have fuzzed the edges of the words anyway," Haines said.

It was also more economical. Given Agnos's tight campaign budget and the 250,000-copy print run, laser printing was the most expedient method of typesetting. The book cost about \$60,000 to produce.

By comparison, a typical preelection television advertising blitz would have cost about \$250,000.

There's a really important lesson to be learned from *Getting Things Done*. The desktop book is a terrific example of how the technology can be used as a tool to change the political process. We already have such electioneering devices as mailing-list management programs, databases for merging and purging letters, and personal computers, which are invaluable for organizing political campaigns.

Now desktop publishing has added another dimension to the political process. The ability to turn out fliers, brochures, and booklets so quickly and economically is as significant a development for candidates as television.

In fact, I would venture to say that desktop publishing is sparking a rebirth of the political pamphlet. It harks back to the days of Thomas Paine and his tract *Common Sense*, when concerned citizens sometimes printed and distributed pamphlets expressing their views.

In an age when 15-second television commercials bombard the brain with sub-

liminal "images" of a candidate, it's refreshing to see content emphasized over packaging through the phenomenon of desktop publishing.

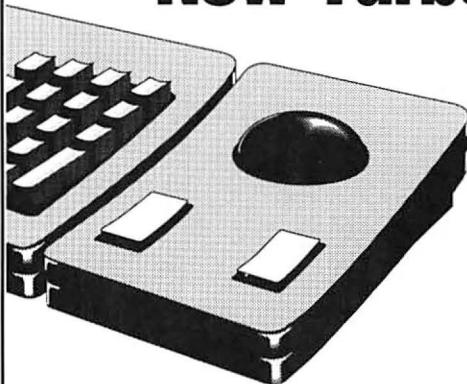
I'm waiting to see a senator give this a shot and pass out 25 million books. And what if a presidential candidate distributed 100 million books that really explained his or her views and proposals? That tactic might just swing an election.

I believe that Art Agnos's book is a milestone of political desktop publishing. Not only did it help him win the election, but it proved that you don't need a war chest the size of Fort Knox to run for office.

Lest any politicians lust after laser printers and visions of easy success on the campaign trail, though, they should heed Chuck Haines's final bit of advice. I asked him if he had any tips or insights that might help an aspiring candidate win an election using desktop publishing.

"Yeah, sure," Haines replied. "Write a good book." □

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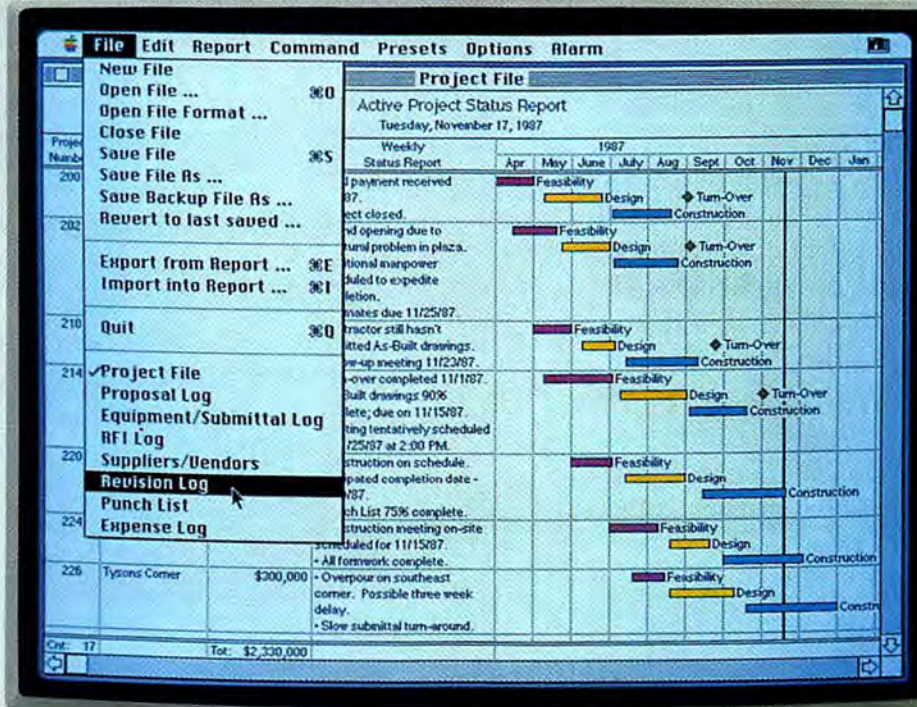
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Letters

A forum for Macworld readers

Fumble Recovery

Hearing complaints from *Mac Pro Football* players about our game's onside-kick glitch prompted me to create a faster, compiled version with several new features, including one that allows you to save strategy selections.

If you want a fixed version of 1.0, free of charge, send in your game disk—or send game and team disks plus \$11 for the 2.0 upgrade. It's been said that you can't please everyone, but I'll never stop trying.

David Holt
Avalon Hill Game Company
Baltimore, Maryland

SE Jitterbug

Out of five SEs I recently bought for my company, three are afflicted with screen jitters. Is this good quality-control? We don't think so. Please apply some pressure to Apple to solve this problem.

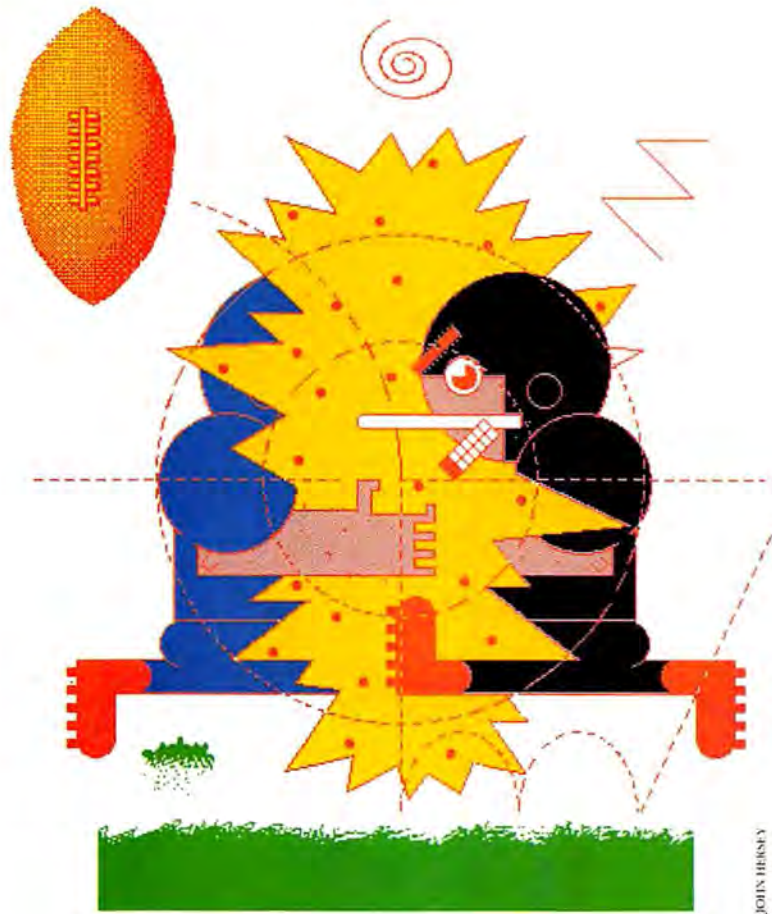
Victor M. Felarca
Fredericksburg, Virginia

Corrections

Micro Systems Consultants of Van Nuys, California, (818/997-0408) manufactures a graphics card for the Mac II, not accounting software ("Business Buyer's Guide," page 181, November 1987). The MSC Color Display Card provides 1280-by-1024-pixel resolution at 32 bits per pixel.

The phone number for 21st Century (New Products, November 1987) is 504/885-3600.

The phone number for Compatible Systems (New Products, December 1987) is 303/444-9532.



Users who are displeased with products they've purchased can and should demand refunds or exchanges. Magazines can do their part by publishing critical product reviews as well as letters from disgruntled buyers.—Ed.

Point of Sale

The system my store uses, *P-O-S/Mac*, was not mentioned in "The Accounting Software Match Game" (October 1987). This is unfortunate, since not only is *P-O-S/Mac* a very functional product, but its developer

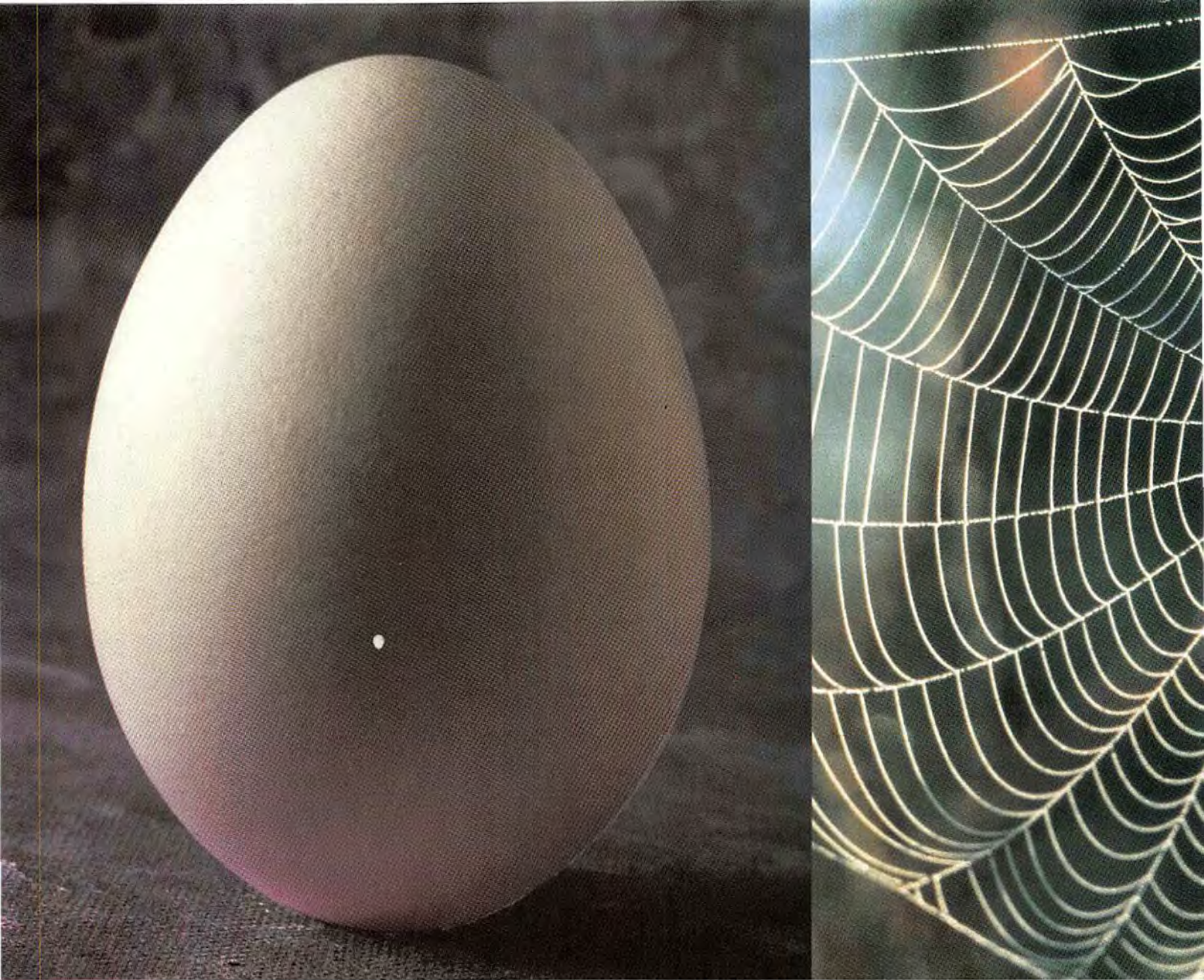
provides excellent technical support as well. Anyone looking for a point-of-sale system should check it out.

Jim Stensland
MacSource
Arlington, Virginia

Ashes to Ashes

I found a few quirks in the public domain game *Ashes* that was awarded an Honorable Mention in "Shareware and Public Domain Game Awards" (November 1987). First, the game lacks sound. Second, the highest score said to have been reached—

(continues)



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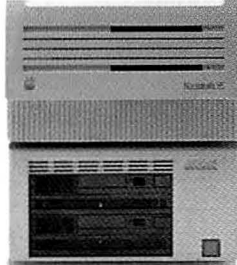
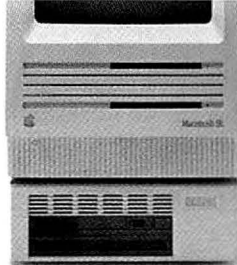
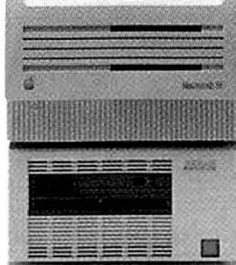
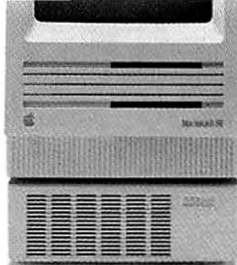
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250,000—seems suspect, since the chances of achieving a final score ending in four zeros are extremely slim. Third, when a player's score nears or exceeds 200,000, the score starts to decline. Is that a bug, or do the authors want to prevent anyone from breaking the manufactured high score?

Jim Flores
Oklahoma City, Oklahoma

The games we included were chosen by those we feel are best qualified—people who've played them consistently enough to become fans. Honorable Mention does not mean the game is flawless—just popular. Although the authors acknowledge the scoring bug, they can't be blamed for not wanting to put more time and effort into a game that's provided them no income. —Ed.

Stick to Your Guns

I'm a programmer who subscribes to *Macworld's* view that you should not give away copies of software. I recently had a nasty experience with my boss when I refused to make him a copy of *Works*, which I'd bought for my own use. (He later got a copy from another employee.)

While I still think I did the right thing, I worry that I may have some difficulty the next time I ask for a raise. And since there's always someone else willing to bend the rules, is it really worth the trouble not to?

Name and address
withheld by request

As more and more manufacturers abandon copy protection, many companies (including ours) are adopting strict policies that make software piracy among employees grounds for disciplinary action or dismissal. We applaud your integrity—even if your boss doesn't. —Ed.

Playback Mac

Do you know of any product that would allow me to record music from my CD player to a Mac disk, and then to play it back from the Mac through my amplifier and stereo speakers?

Wayne Blizzard
Oceanside, California

Although there's currently no way to play recorded music through a Mac, there are a couple of disk-drive-based peripherals that allow you to edit recordings on the Mac for playback through the peripheral—providing you've got at least a Mac Plus and money to burn. The Dyaxis 16-bit sampler for digital recording mix-down marketed by Julian Systems (415/686-4400) will set you back at least \$6500 (\$19,000 at the high end). The DSP 1000 by Compusonics (415/494-1183) costs \$6995 for the optical disk version, \$6000 for the Bernoulli Box version—plus \$495 for the MacSonics software. Within the next year, you may see a board for the Mac II's NuBus that replaces the peripheral, providing the Mac with playback capability. —Ed.

Keyboard Compatibility

In the Input and Output section of "Business Buyer's Guide" (November 1987), you say that the Mac-101 keyboard manufactured by DataDesk International is not available for the Mac Plus. According to DataDesk, the keyboard is Plus-compatible. Who is right?

Walter Ware
San Francisco, California

DataDesk is right—the Mac-101 works with all the older Macs: 128K, 512K, and Plus (see Reviews, Macworld, October 1987). Sorry for the confusion. —Ed.

Subterranean Mac

I've frequently read that if you raise the Mac to eye level, it's easier to see. Nothing could be further from the truth, especially for bifocals wearers.

On the contrary, if you bury the Mac—at an angle—in your desk, you'll be able to see both the keyboard and screen without moving your head, and all those headaches and shoulder pains will disappear. Everyone who's seen my Mac barely protruding from my desk agrees it's the only way to fly! Is there a furniture maker out there who needs an idea?

James T. Humbert
Rancho Mirage, California

It's already been done. With the MacTable, by ScanCoFurn of Redmond, Washington (800/722-6263), you can submerge or tilt your Mac at any angle. —Ed.

Kudos to HyperCard

In doing database development with *HyperCard*, I've found it to be the best micro-based database yet. Field size and attributes are limited only by your imagination. Record (pardon me, *card*) size and quantity go on forever. I have ten files (I mean *stacks*) operational in one application that are fully linked for listing, posting, merging, and so on. I can also autodial any clients in my cards by clicking on their phone numbers. Not too shabby, eh?

Reports produce grouped or individual cards, listings, or labels using a truly intuitive graphic menu. Searching through cards is incredibly fast, rivalling a RAM-based system.

Let the truth be known: Publishers of the so-called uppercrust database managers had best watch their backs, because now we have an information engine for \$49. Do you suppose Apple's spin-off of Acius was really to salve irate third-party developers? I think not. Apple was separating the chaff from the wheat.

Mike Brewer
Columbus, Ohio

HyperCard Déjà Vu

When I first saw *HyperCard* at the Macworld Expo, I was reminded of my first exposure to *MacPaint*. Although initially excited by the prospects of computer illustration, I soon found it took programs with real muscle like *GraphicWorks* and *Illustrator* to turn the Mac into a professional-level tool for graphic design and illustration.

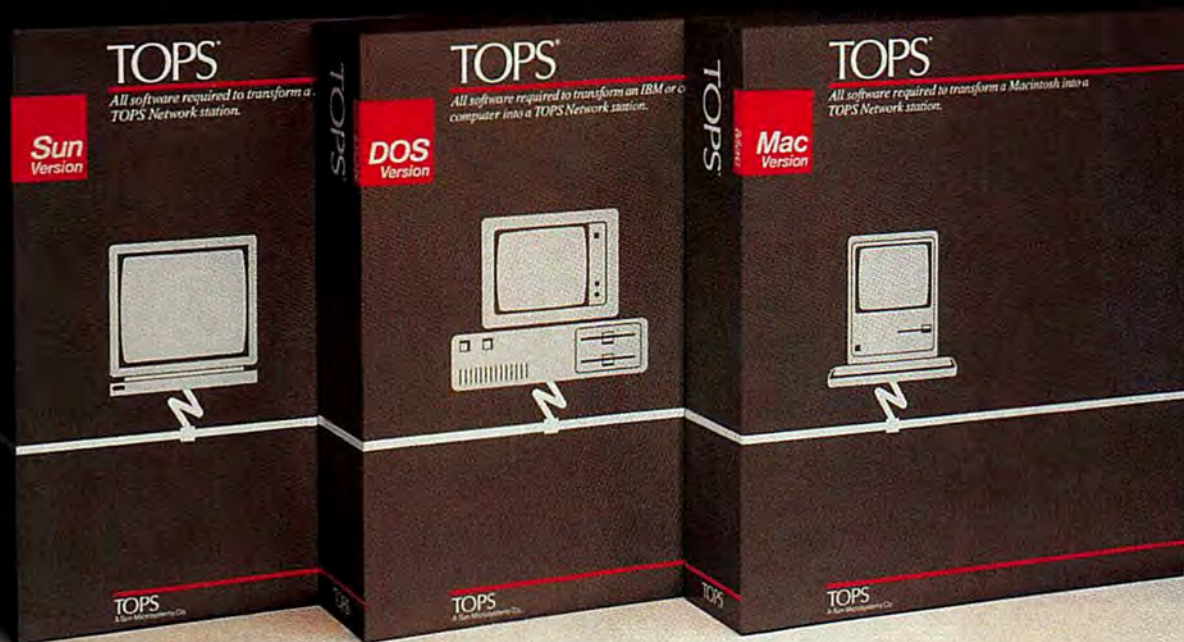
When I tried out *HyperCard* in our computer graphics studio, once again enthusiasm turned to disappointment. Among the other problems I discovered was that *HyperCard* paid only token notice to our Full Page Display and our LaserWriter. Although the idea behind *HyperCard* is boundless, the implementation is just as limited as that of *MacPaint*.

HyperCard has broken new ground, as *MacPaint* did, but I think it will be dwarfed by programs that take the "hyper" idea to its limits. Eventually "stackshops" will emerge that let users do what *they* want. Only then will *HyperCard* attain its

(continues)

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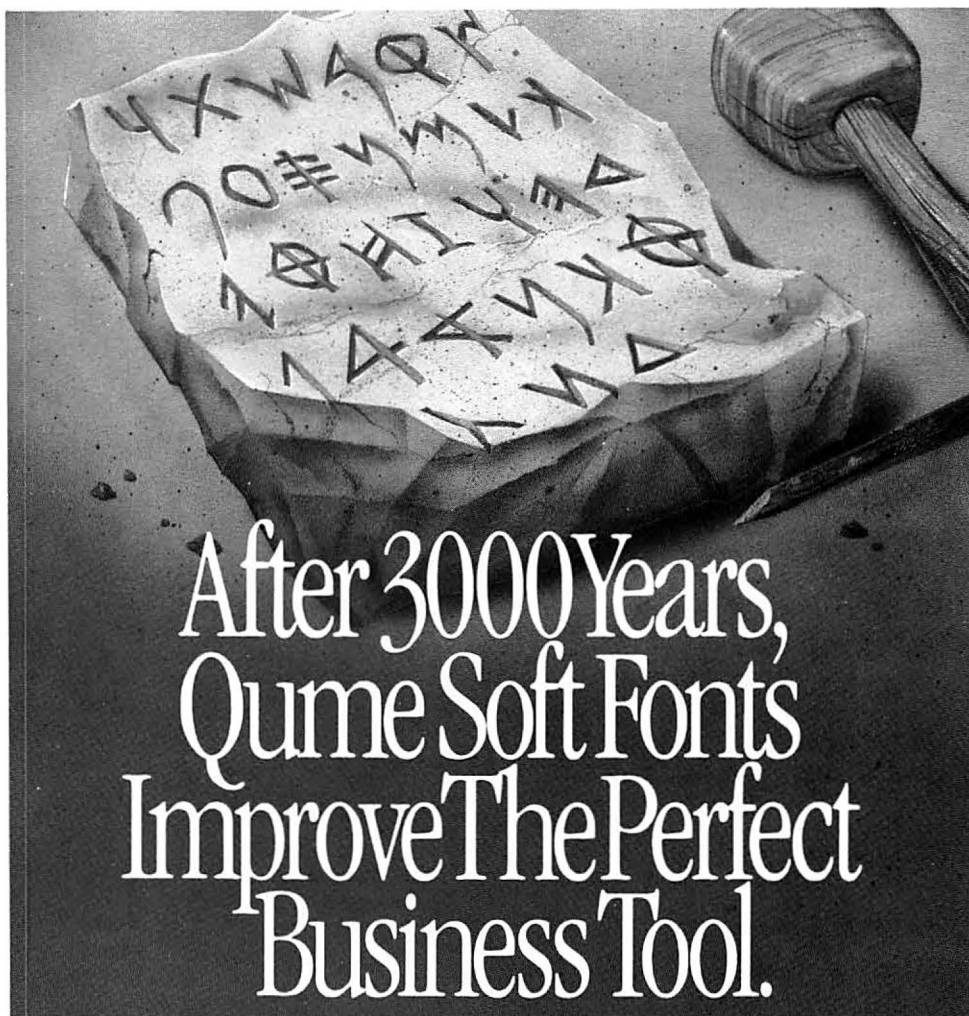
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Circle 115 on reader service card

Letters

rightful place on the shelf alongside *MacPaint* and the 128K as the first but inadequate member of a new generation.

*Michael Scaramozzino
Providence, Rhode Island*

CAD Benchmarks

In "Benchmark: Mechanical CAD" (November 1987), David Peltz was off the mark in his product evaluations. First, he gave no indication of whether or not the testers were equivalent to one another in their CAD ability and experience. Second, the computers tested were definitely not equivalent—there's no comparison in speed and performance between an unenhanced 512K with a HyperDrive and an SE with an internal hard disk. Third, the systems were not representative of what a CAD professional might buy. I doubt that any would invest in anything less than an SE or a Mac II. How can Peltz call this a benchmark?

*Robert J. Thorpe
Sun Valley, California*

First, all those who participated in the testing were suggested by CAD manufacturers as experts on their systems, and all have years of CAD experience. Second, timing is more a function of software than of hardware, and processing speed is not the major component of performance in such tests. Third, when the article was being researched, no Mac II programs were available, providing no user base from which to recruit testers. Besides, our main purpose was to show people what to look for when making their own comparisons—to help them find the CAD systems that best meet their individual needs.—Ed.

Full Speed Ahead

I'd like to clear up several errors about our Prodigy SE accelerator card that I found in "Beefing Up the SE" (September 1987). Although the Prodigy does have 1MB of RAM, it doesn't double the Mac SE's memory, since it operates from its own fast 32-bit memory rather than the memory on the SE's system board. And rather than recommending setting a 1MB cache via the Control Panel to use the system-board RAM for the cache, we discourage using the RAM cache for most applications, since it uses up much of the 32-bit memory and decreases processing speed.

*Curt Johnson
Levco Corporation
San Diego, California*

(continues)

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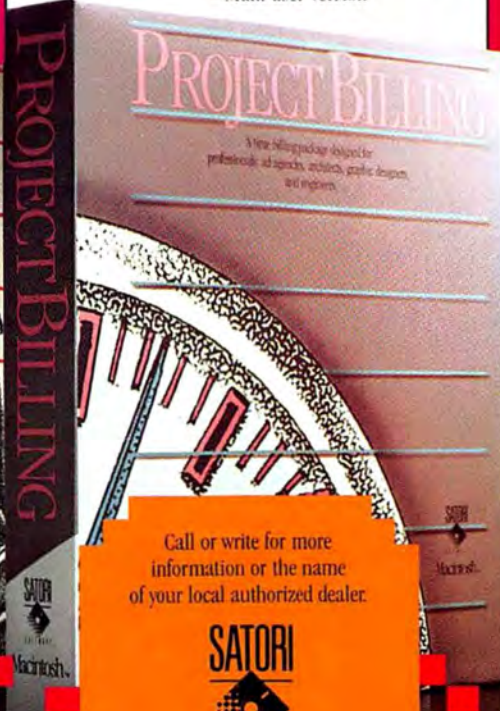
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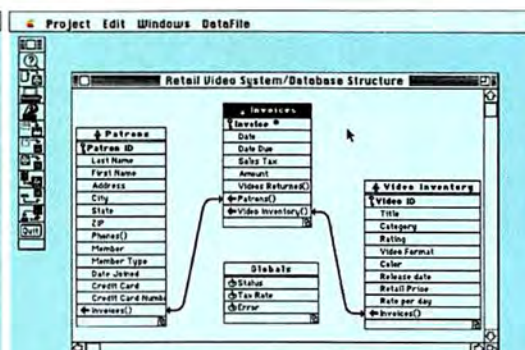
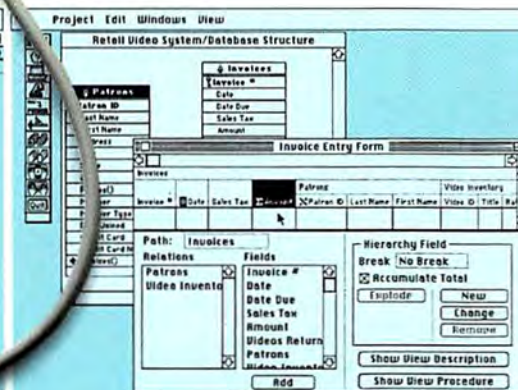
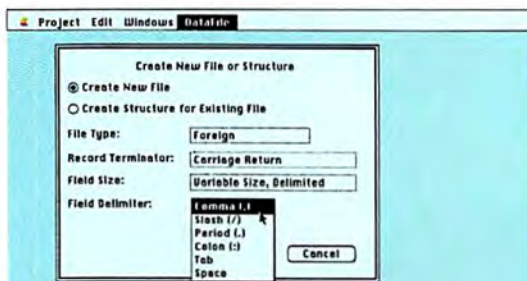
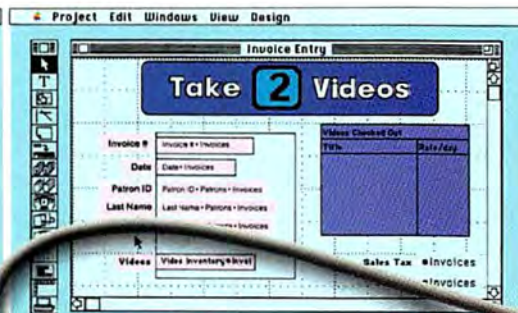
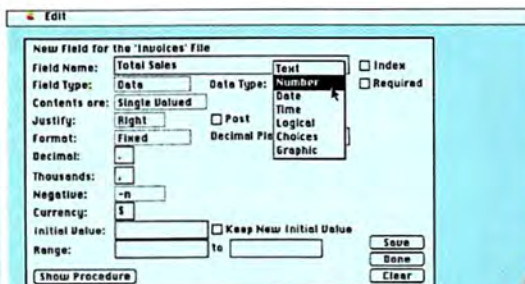





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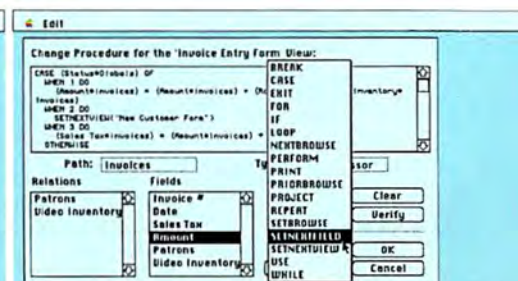
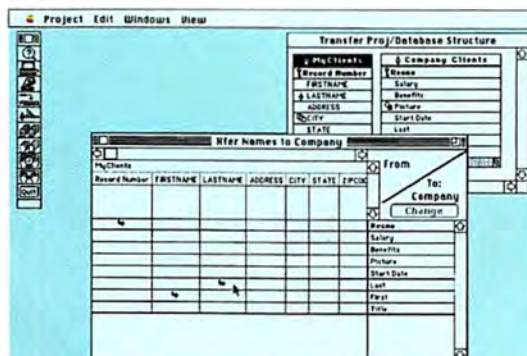


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Ashton-Tate announces the most powerful database ever



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							BREWSTER DOUGHERTY	EDMUND	
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Laure Layout Ltd.		10101 Magnolia	Chaparral	CA	90014		SOUTHERLAND PHILLIPS	HARRIS	
		4121 Main Street	Los Angeles	CA	49584		ARTHUR JONES	VINCE	
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Circle 73 on reader service card

Letters

We found that using the RAM cache worked well in some situations, depending on the configuration we used.—Ed.

Waiting for the Sequel

Your September issue's cover promised an article on 68020 accelerators for the SE ("Beefing Up the SE"). Then you reviewed two essentially identical products while hinting at two others for which you were unable to supply hard data. I finished the article in no better position to make any purchasing decisions. Presumably I'll have to wait for Part II, but I'd rather get the whole poop in a month or two than half a story now.

Mark Maranta
Roxboro, Quebec, Canada

Neither of the two missing products—the Radius and the Orion—was available when the article was being researched. (The Radius has since been reviewed in the November 1987 issue.) Because those products were not finished, we felt it would be unfair to compare them to the others. Such situations present a dilemma: should we penalize the products that are ready by waiting for the ones that aren't?—Ed.

Negative Positives

Neither of the scanned images that were produced on the Mac II using *The Lithographer* ("Magazine Quality," page 97, *Macworld News*, November 1987, and "Beyond Black and White," page 132, also in November) represent magazine-quality photos. In fact, the first one had a moiré pattern you could discern from five feet away.

I have no quarrel with electronic publishing—I produce my own publication almost entirely on the Mac. What I find objectionable are marketing claims of state-of-the-art graphic quality from technology that can barely manage scanned images of marginal quality.

John E. Parsons
American Demographics Magazine
Ithaca, New York

You're right—image processing on the Mac II cannot compare to what a stat camera produces. However, the quality of the photo shown in Macworld News suffered because the scanned image was ac-

cidentally shot as a halftone (in effect, it was screened twice), which accounts for the unintentional moiré pattern.—Ed.

Calling the Kettle Black

I enjoyed your interview with Borland's Philippe Kahn (*Verbatim*, October 1987), and I found one of his comments most interesting: "IBM and Microsoft are the only two companies that can get away with vaporware."

Along with Commodore's complete ineptness in marketing and supporting the Amiga, vaporware from companies such as Borland drove me to sell my Amiga and consider a Mac SE. Although I'll miss what my Amiga could have been, I look forward to the Mac and Apple's vision for it.

Frank Maddox
Austin, Texas

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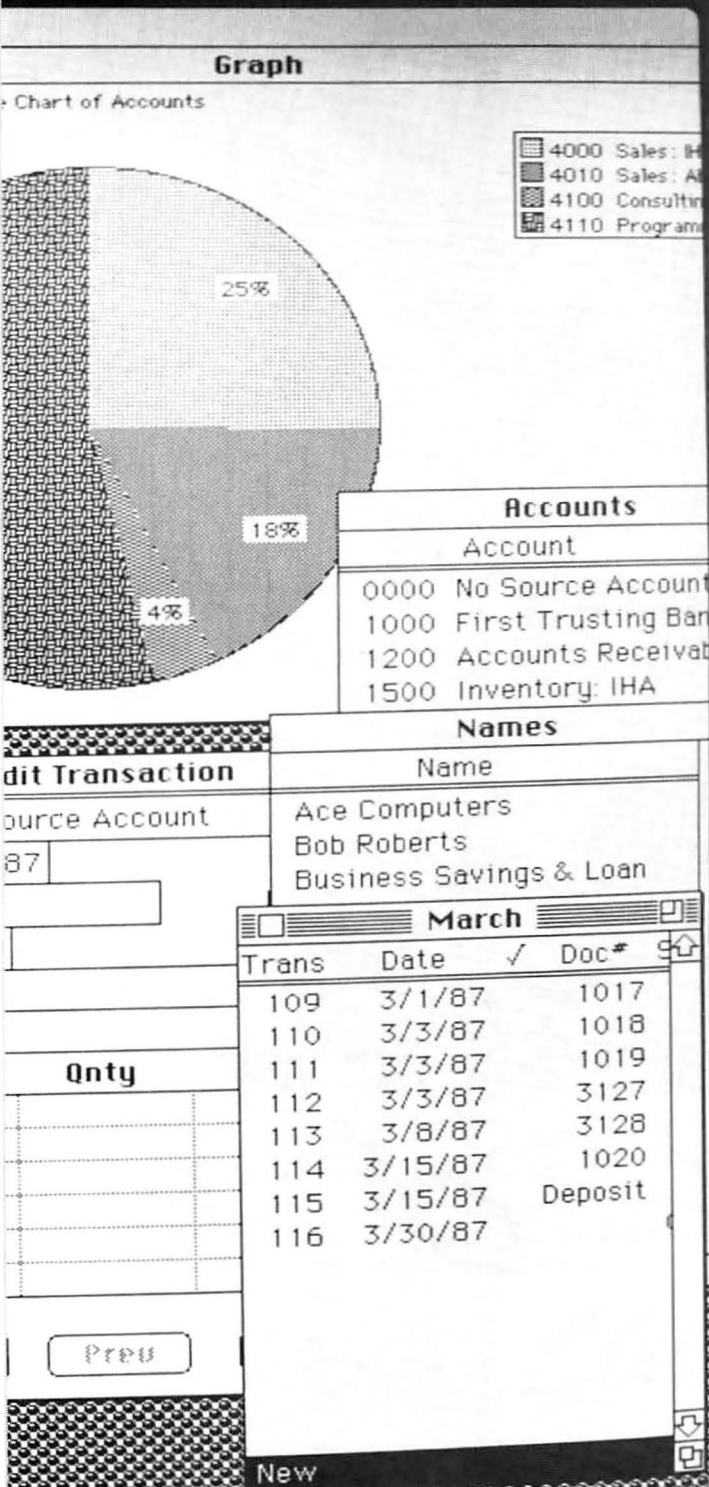
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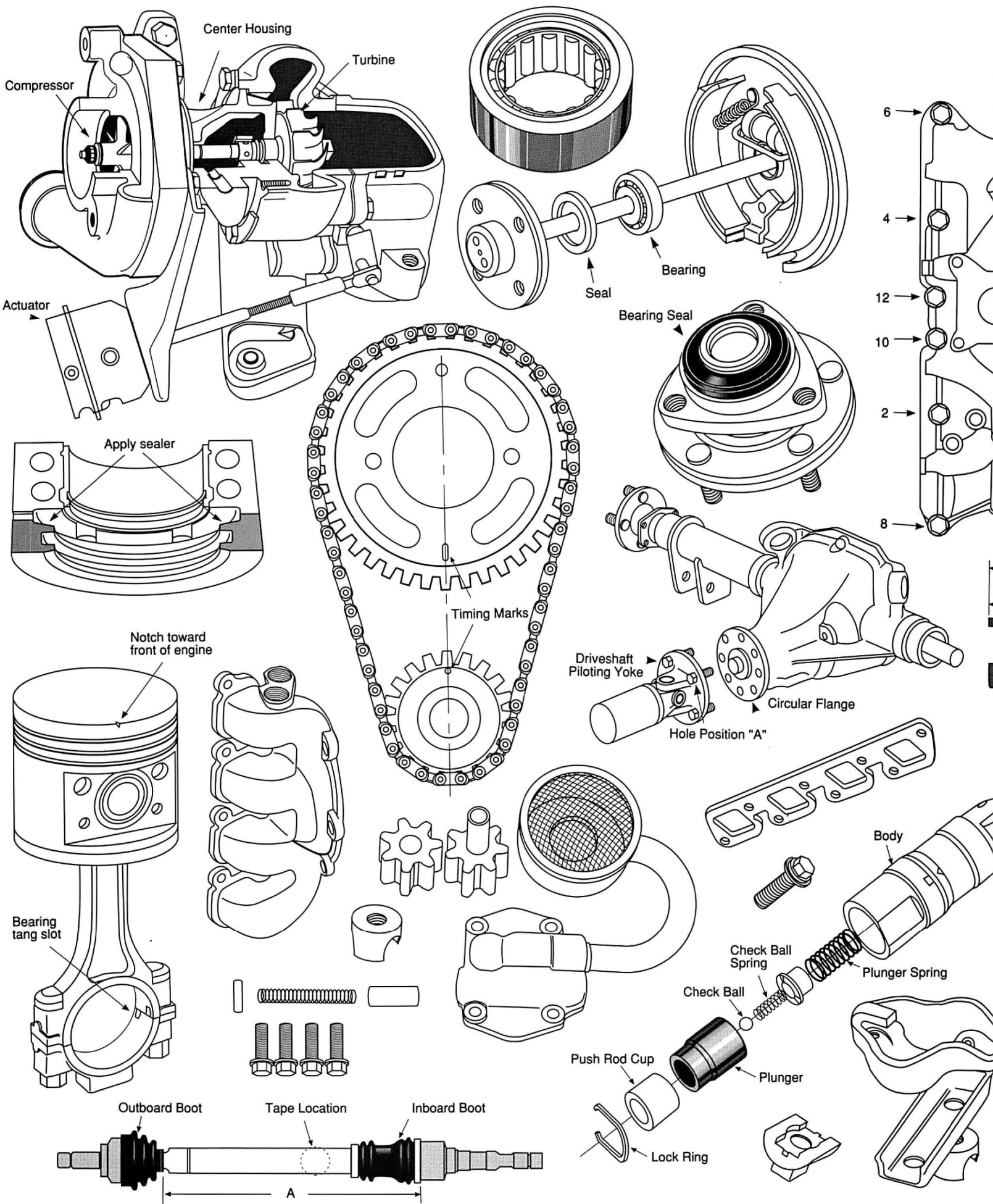


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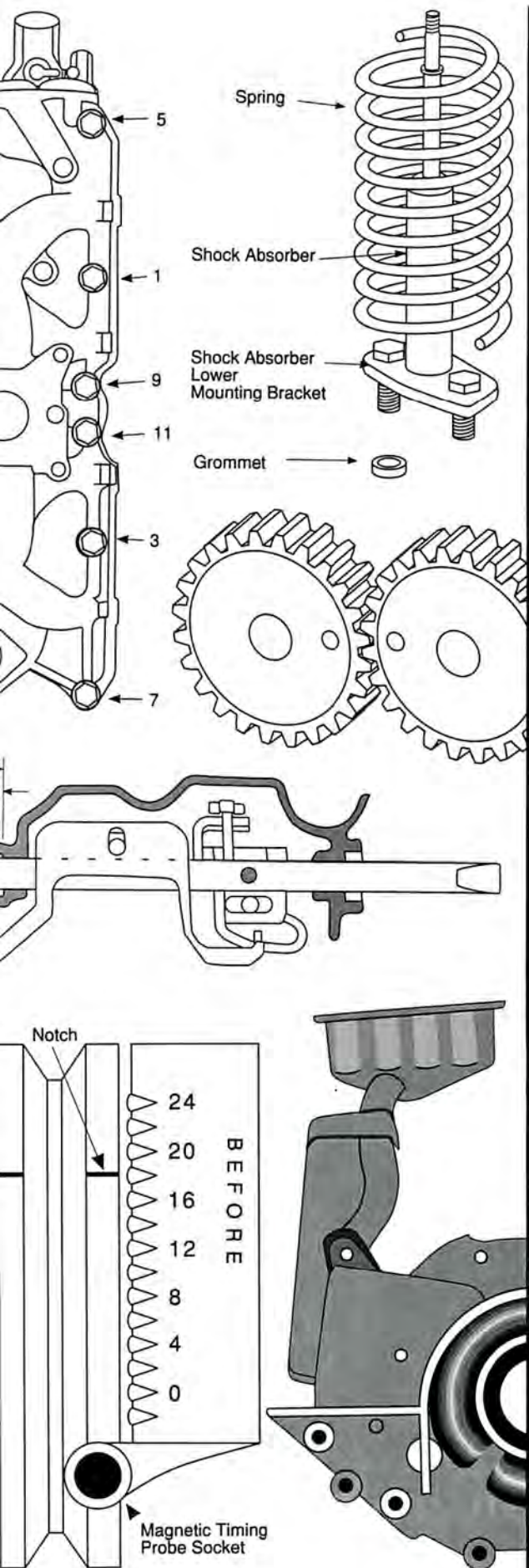


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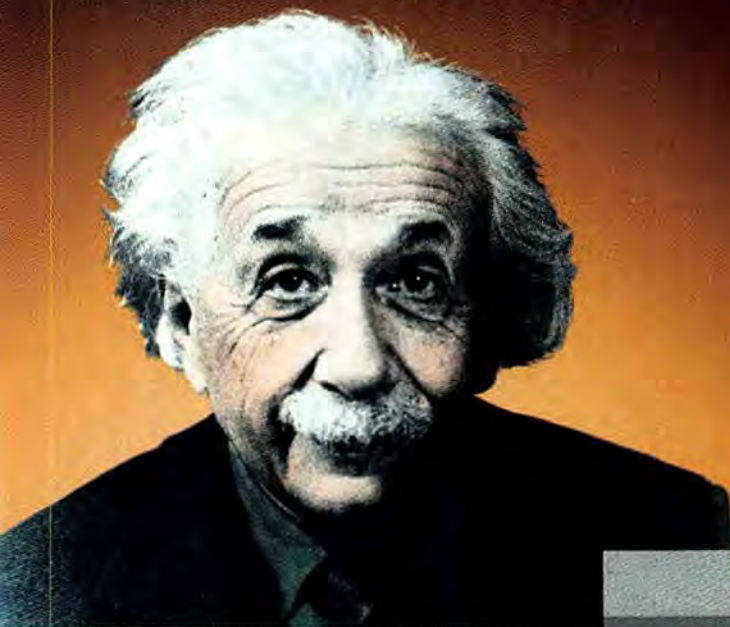
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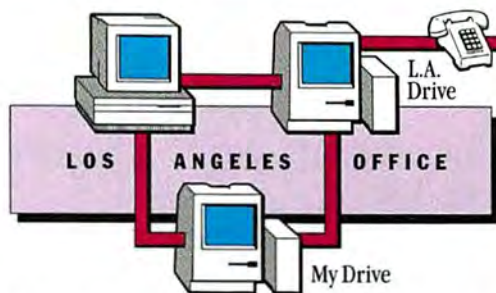
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time and space
meant everything.**



**For this man,
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All the Right Moves

Apple Computer comes of age

During the quiet months of winter, Apple Computer seems to have completed its transition to a large business, with all the advantages and disadvantages that implies.

For instance, the company finally has a world-class sales organization, put into place by Chuck Boesenburg in his first year as Apple's vice president for sales and marketing. Among other indicators of its maturity is Apple's new-found recognition, under Bill Larsen, head of consumer marketing, of the "home office" market. The home market that wasn't supposed to exist. During my first year at *Macworld*, Apple's public relations staff refused to allow me to speak with its consumer marketing staff because "the Macintosh does not sell into the home." This despite my protestations that (at that time) over 80 percent of our readers had a Macintosh in the home.

One area in need of improvement—and I hope already on Boesenburg's agenda—is Apple's dealers: how the company relates to its dealers; dealer policies for customers; and authorized versus non-authorized dealers. Many of our readers are less than happy with their authorized Apple dealers—particularly with their policies for repairs and service.

Jean-Louis Gassée's reign as product creator was reaffirmed by the success of the Mac II and the SE. After nearly two years of level sales, Apple revenues have leapt toward the \$3 billion mark. The Mac II continues to make progress both in terms of sales and, more important, with applications that take advantage of its color capability. And the SE is flourishing—selling as many as 40,000 units in a single month.

The new family of laser printers will surely enhance Gassée's reputation as someone always associated with innovative, successful products. At the same time,

these printers make the Apple product environment even more complicated for the consumer and more difficult for Apple marketers to manage.

HyperCard has emerged as an important statement of direction for the future of the Mac interface. While admitting that HyperTalk is not suitable as a programming tool for the average user, developers like Reese Jones at Farallon Computing are using it to create an imaginative interface for their products. Incidentally, publishing books about *HyperCard* appears to be as fruitful an enterprise as developing the

Many of our readers are less than happy with authorized Apple dealers—particularly with their policies for repairs and service.

stacks themselves. Danny Goodman's *The Complete HyperCard Handbook* (Bantam Books, 1987) has sold more than 160,000 copies, and Softpress of Foster City, California, published a handy reference manual last year for HyperTalk that makes a worthwhile supplement to Goodman's tome.

John Sculley, speaking before a group of financial analysts and representatives of the press, declared that Apple will be rewriting the Mac operating system—a welcome sign of the company's recognition that the path to true multitasking does not lie in making continual patches to the existing System software. Sculley has even mentioned an upcoming portable com-

puter, a sign that the project is nearing fruition.

Despite Apple's achievements, or perhaps because of them, a number of nagging problems continue in the background. *A/UX*, reannounced at UniForum, a computer industry event focusing on the UNIX operating system and its supporting systems, still lacks the sort of friendly interface that Apple promised. As with the company's DOS connectivity announcements, Apple was making all the right moves by proclaiming that it would provide a version of UNIX to run on the Mac II; the availability of UNIX allows government, technical, scientific, and engineering buyers to more easily justify Apple computers to their management. But the announcement belied the lack of a distribution method, the lack of dealer training programs (not that a similar lack slowed Sun Microsystems' first \$100 million worth of sales in the UNIX market), and even the lack of the product itself for one year.

Similarly, the Apple File Protocols announced in spring of 1987 are still missing, according to many developers. Apple has apparently not released all of the information that its developers need to provide that highly touted "seamless integration of data and applications between different operating systems." Seamless is becoming the more appropriate spelling.

Someone apparently also forgot all the promises about the ability to use color applications for the Mac II on the Mac SE. The ROM chips shipped with the SE do not incorporate the new color QuickDraw model. Worse, there's a growing recognition that color QuickDraw "breaks" when implemented beyond 16 bits. More than a

(continues)

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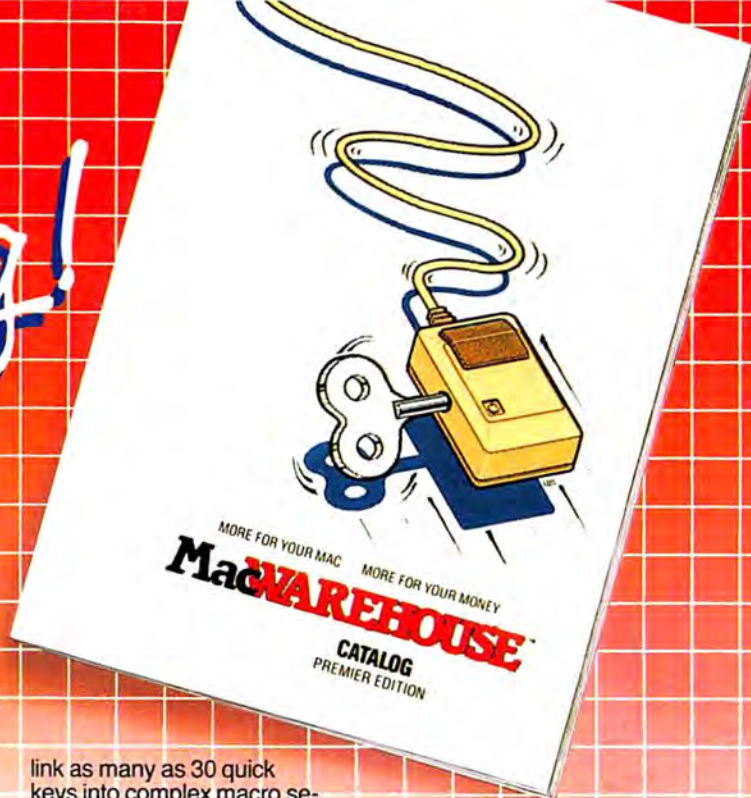
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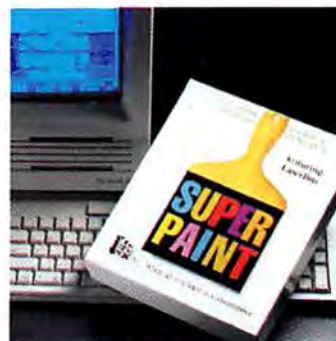
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dozen developers have reported to me problems with their efforts to move to 24-bit color on the Mac. A tacit admission is being made within the coterie of programmers who work with color on the Mac that mistakes were made in implementing the ROM's color code. Mistakes that cannot be corrected other than through software patches installed with new versions of System software (the cost of switching out ROM chips at dealers would be prohibitive).

Two color pioneers—SuperMac and the RasterOps/Jasmine team—announced in the winter that they have built 24-bit color cards that do extend QuickDraw to that level of color. When I learned of the contemporaneous announcements for 24-bit color cards, I thought of other companies: Infosphere, General Computer, Consulair, Orange Micro, and AST Research. Companies that have spent enormous resources to develop products for Apple CPUs that have, somehow, come to very little. I wish SuperMac and RasterOps/Jasmine luck in blazing a trail to true color. On behalf of consumers, I hope the products are not merely being used to demonstrate a capability, only to be made obsolete later because they don't conform to a new definition—or to new products—announced by Apple once the color issues are better understood.

My point is that Apple has made a lot of promises in the belief that they are strategically necessary, to fulfill statements about Apple releasing more products than ever before, and in keeping with the overall bombastic nature of computer marketing. This is a mistake. Industry influencers, the analysts, the national press, and the pundits might really be in the mood for a more stable, less glamorous approach to high tech. Apple is the only "other" computer company with the sort of consumer loyalty that most companies merely dream of. Perhaps Apple should consider setting an example not only through its technology, but also through its demeanor in the marketplace—and not succumb to the temptation to imitate IBM and its community of developers. □

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Contributors Notes

Scott Beamer ("1987 Taxes: Prepare Yourself") is an investor, journalist, and Mac consultant who has prepared his own tax returns for over 20 years. He uses MacInTax with a home accounting package to keep his audit trails clean.

Nanci Hamilton ("Well-Connected") is a technical writer for a Portland, Oregon, marketing communications firm. A Mac pioneer from the 128K days, she's the author of *Macintosh Notebook: Multiplan* (Prentice-Hall, 1985).

Jim Heid ("Getting Started with Mac-VAX Connections") is a contributing editor of *Macworld*. He has been writing about the

Macintosh since its introduction and is the author of *dBase Mac in Business* (Ashton-Tate Publishing, 1987).

David R. Kosiur ("The Invisible VAX") is the publisher and chief editor of *Connections*, a newsletter on networking Macs. He also consults on networking when he's not drawing fractals on his Mac.

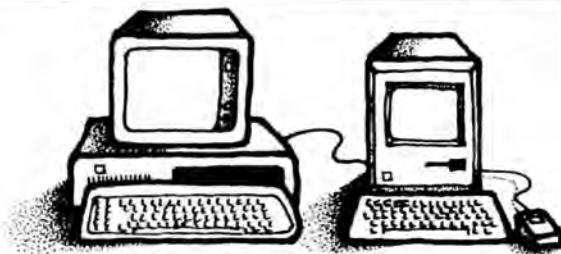
Steven Levy ("When You Wish upon a VAR") is a *Macworld* columnist and the author of *Hackers: Heroes of the Computer Revolution* (Dell, 1985).

Joel McNamara ("Insights on TOPS") has been working with the Mac since it first came out. In addition to writing articles about—and programs for—the Mac, he now runs his own *Macintosh* consulting

and development firm in Bellevue, Washington.

Lon Poole ("Mac Communications Tools") has been educating users since the Mac was introduced. In his *Quick Tips* column, he answers readers' questions and offers advice. A collection of these tips can be found in his book, *Mac Insights* (Microsoft Press, 1987).

Bruce F. Webster ("Room to Grow") is a *Macworld* contributing editor who has written extensively about personal computer topics. His first Mac was a 128K single-drive system; he's currently backing away on an 8MB Mac II. □



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Numeric•Turbo™ is ideal for use with **Excel Jazz Multiplan™** and any other Macintosh software where you want your figures faster.

NUMERIC

EASE

\$59.00



CAMBRIDGE AUTOMATION INC.

1 (800) 826-9214 • In California 1 (800) 345-8666
Macintosh is a trademark licensed to Apple Computer

Circle 119 on reader service card



InnerDrive Series



NEW

InnerDrive 40

Expand your Macintosh without removing or your drives. 40 Mega
29 msec
access time. **\$99**

Now that your Mac's
open for business, let
Jasmine provide the inventory.

Jasmine's InnerDrive Series brings you high speed, yet economically priced, internal hard disk drives for the Macintosh™. Pre-formatted, they work right out of the box and are very easy to install requiring no special tools or expertise. These self-parking drives include mounting bracket, cables and other hardware plus nine megabytes of public domain software, shareware and back-up software. Plus a full 1 year limited warranty. We also include the quality support and service you expect from Jasmine.

Technical Specs: InnerDrive 50, 90

Drive:	50/II	90/II
Capacity, after formatting:	51 Mb	88.0 Mb
Access Time		
Track to Track	5 msec.	4 msec.
Average	26 msec.	16.5 msec.
Max. Seek - Full Stroke	38 msec.	43 msec.
Average Latency	8.2 msec.	8.33 msec.
Mean Time Between Failure:	25,000 POH	30,000 POH

SCSI controller:

Transfer rate maximum: 1.25 Mbytes/sec., Supports 1:1 interleave.

Every drive is shipped with a technical hotline number to answer any questions. Jasmine and InnerDrive are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and PD software. Prices do not include shipping, CA sales tax (6.5%) or special rush handling. Macintosh is a trademark licensed to Apple Computer, Inc.

InnerDrive 90/II: **\$1499** InnerDrive 50/II: **\$999**
(Cash/Visa/MasterCard) (Cash/Visa/MasterCard)

To Order Call (415) 621-4339

Remember that Jasmine saves you 40% or more.
Our prices include a Full One Year Warranty.

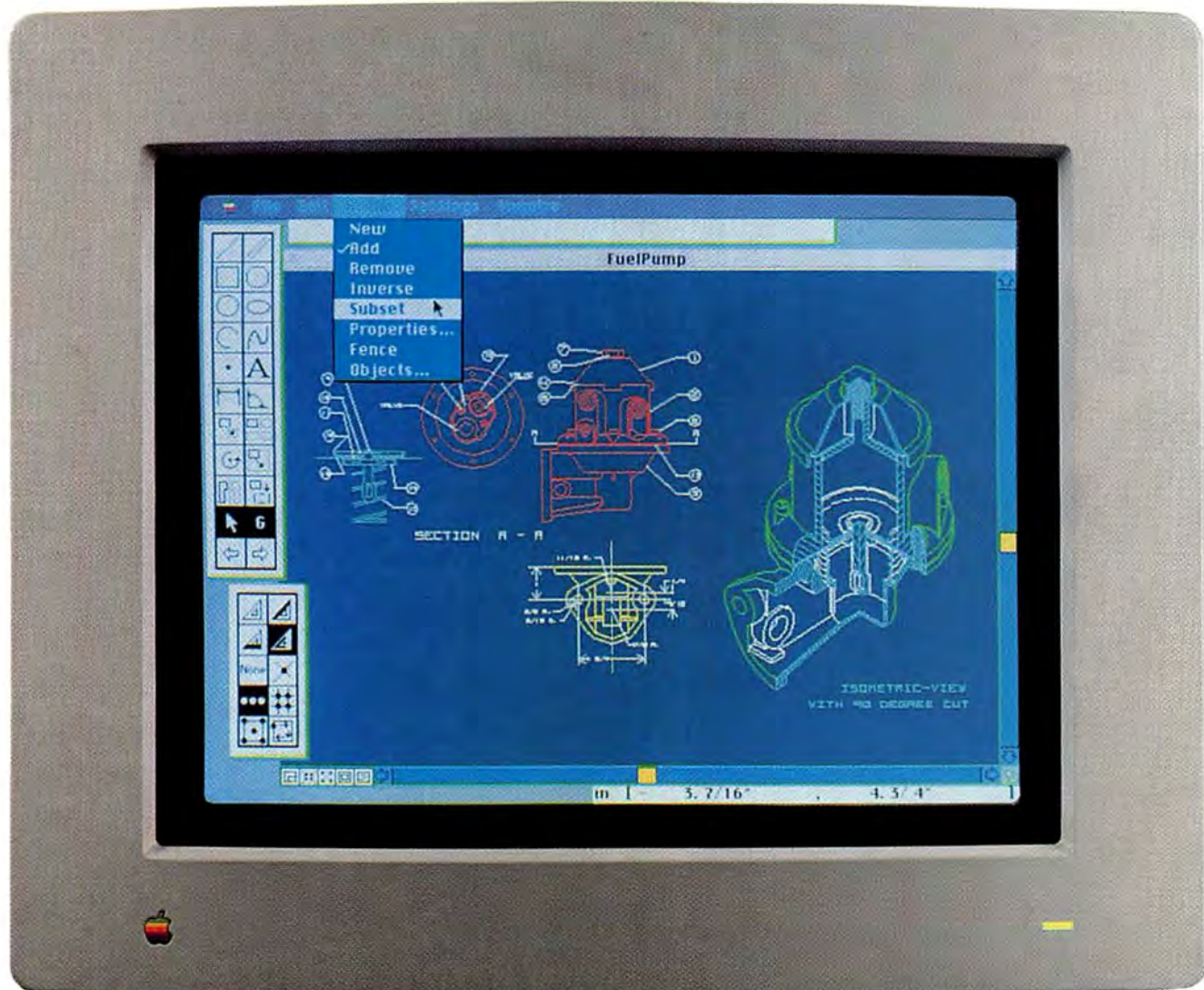


Jasmine Technologies, Inc.

555 De Haro Street, San Francisco, CA 94107

Circle 457 on reader service card

Professional Design.



Fuel pump design courtesy Harald Belker, Georgia Southern College.

Simplified.

1.

Professional Tool —

You're a professional. You know the importance of a CAD program that'll expand your capabilities — not limit them. And so does VersaCAD, the pioneer of micro-computer CAD since 1981. That's why we designed our new Macintosh Edition to conquer your most complex design challenges.

2.

Macintosh Simplicity—

Taking the time to master a new tool costs money, so you need a package that's quick and

easy to use. Building on our reputation for user friendliness, VersaCAD/Macintosh Edition adds "point and click" simplicity to get you designing fast.

3.

Top Support —

Even a pro needs a little help now and then.

Whether you want to master detail editing or build complex symbol libraries, our top-rated technical support department will lend a hand. You'll soon know every shortcut in the book.

And until March 31, 1988, we'll give you \$100 in trade on any CAD program.

Just bring your master disk to a participating dealer.

To find out for yourself why VersaCAD is the new CAD standard on the Macintosh, see your authorized VersaCAD/Macintosh Edition dealer today — or call (714) 960-7720.



For the Macintosh Plus, SE, and the new Macintosh II.
Versacad Corporation, 2124 Main Street, Huntington Beach, CA 92648
A Company of Prime Computer, Inc.

Circle 67 on reader service card

How to Buy the Right Monitor

Let's cut through the hype and misinformation about large-screen monitors for desktop publishing. At Moniterm, we developed the first large-screen monochrome monitors. And based on 9 years of OEM experience, we've now built a family of large-screen, hi-res monitors for every application.

What size and shape monitor is best?

Page-size portrait monitors are great for word processing, but impractical for desktop publishing. To avoid constant zooming and scrolling, we recommend a 19-inch landscape monitor, like our Viking 1 for the Mac SE and Mac II. Professionals who want to view two full-size facing pages will need an even larger monitor—our new 24-inch Viking 2400—Moniterm's largest monochrome monitor.

What resolution is required?

Optimum publishing resolution for 19-inch or larger monitors is 1280x960 pixels, featured on our Viking 1 and Viking 2400 monitors. At less than 72 dpi (dots per inch), fine print becomes too hard to read. Resolutions more than 95 dpi also make characters hard to read and unfocused. And screen updates are painfully slow.

Should I get a monochrome or color monitor?

We recommend our 19-inch gray-scale monitor for



Viking 2400 24" monitor.

differentiating objects on the screen. It features 256 shades of gray for near-photorealistic images. And, you'll benefit from sharper text and lower cost.

For previewing spot color and creating desktop presentations, the Viking 10 19-inch color monitor offers flicker-free, totally sharp color images.

Get the facts from the source.

Those are just a few of the many tough questions people are asking about large-screen monitors. We've got the answers. Write or call us for your free copy of our informative booklet, *How to Buy the Right Monitor*. It includes simple tests you can perform to check for flicker, refresh rate, screen update speed, readability, glare, ease of use, and other critical factors in large-screen monitor performance—before you buy!



MONITERM

5740 Green Circle Drive
Minnetonka, MN 55343
(612) 935-4151
Fax # (612) 933-5701
Telex #753626

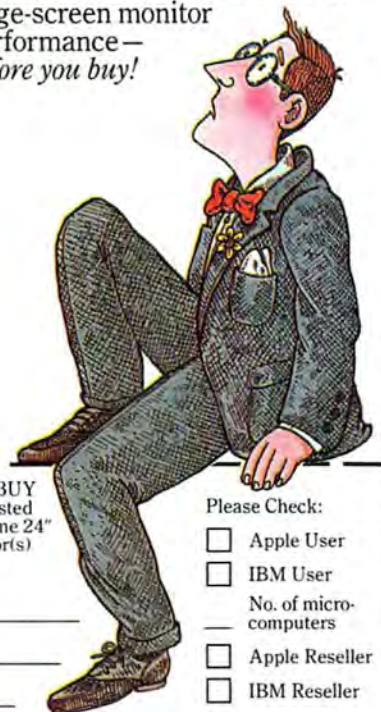
Circle 133 on reader service card

Yes! Send me a free copy of HOW TO BUY THE RIGHT MONITOR. I am interested in ☐ monochrome 19" ☐ monochrome 24" ☐ color 19" ☐ gray scale 19" monitor(s) for desktop publishing!

Name _____
Title _____
Company _____
Address _____
City, State, Zip _____
Telephone _____

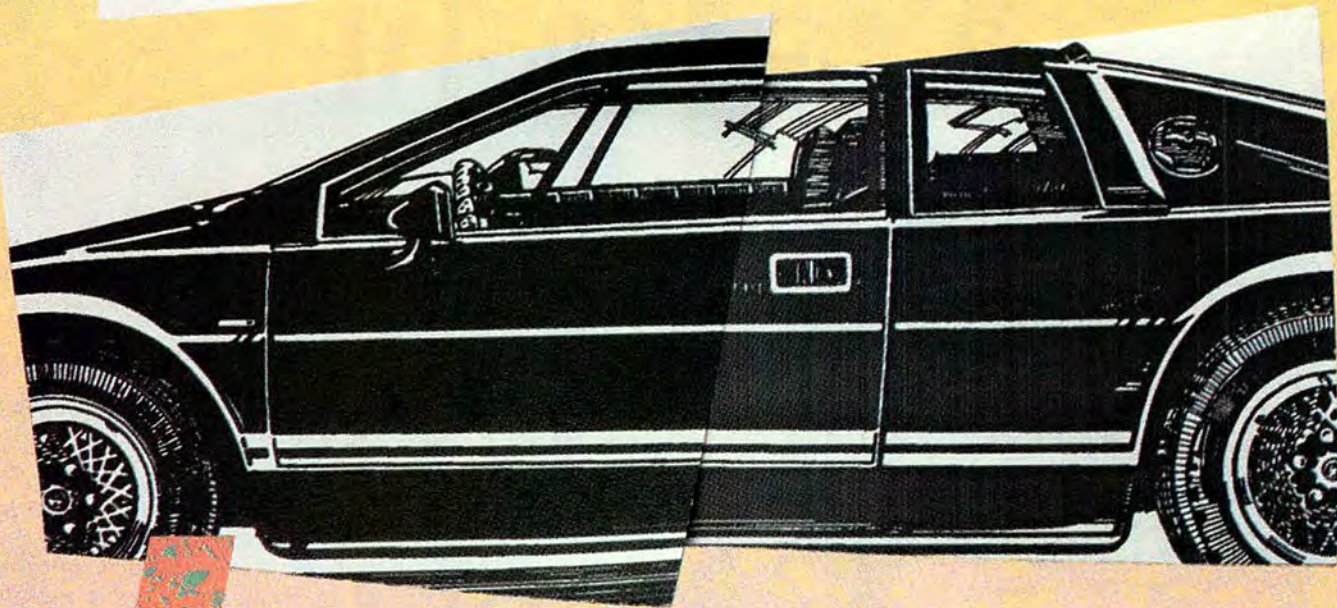
Please Check:

- ☐ Apple User
☐ IBM User
☐ No. of micro-computers _____
☐ Apple Reseller
☐ IBM Reseller





These unretouched print samples show the superior print quality of QMS-PS 810 over printers using first-generation print engines.



Introducing the PostScript laser printer that blacks out at high speeds.

The new QMS-PS[®] 810 can compose and print the most complex pages in record times, with richer, more saturated blacks than ever before. All with the desktop publishing power of Adobe PostScript[®], and the superior print know-how of QMS, an industry leader.

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

Fast start, strong finish You can adorn your documents with one or all of the 35 Adobe typefaces. Thanks to PostScript, there's an infinite number of font variations available. You can also make type as large or as small as you want. And put it anywhere on the page. In fact, with PostScript you enjoy total control over the design of your page. It gives you the complete desktop publishing power to do things that would otherwise be virtually impossible. So you get high-quality output exactly how you want it.

Along with PostScript, the HP LaserJet⁺[™], Diablo[®] 630 and HP-GL[™] printer emulations are added for your non-PostScript software.

The QMS-PS 810 laser printer is easy to use, maintain, and comes with a one-year warranty. It's available from Laser Connection dealers. Laser Connection is a sales and marketing subsidiary of QMS. For the dealer nearest you call **1-800-523-2696**.

**The new
8-page/minute
QMS-PS 810
laser
printer**



**LASER
CONNECTION[™]**
A QMS[®] company

The following are trademarks of their respective companies: QMS, QMS-PS, ASAP, Laser Connection of QMS, Inc. PostScript of Adobe Systems, Inc. Canon, Canon SX of Canon, U.S.A. LaserJet+, HP-GL of Hewlett-Packard, Diablo of Xerox Corp.

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Circle 104 on reader service card



When You Wish upon a VAR

The ComVest people sell Macintoshes—and dreams. Should Apple be endorsing them?

Before I began my interview with Al Rotola—chairman of an Apple-authorized value added reseller (VAR) called ComVest—the former broadcaster, real-estate dealer, and television talk show host wanted to ask *me* a question. Was I approaching this column as his adversary? After all, he told me, “because we deal in business opportunities,” it’s a favorite approach of columnists to treat companies like ComVest as flimflam operations. If so, he added, I need only tell him, and he would then provide me with proper “education” about the company—presumably to banish any thoughts of flimflam.

This was certainly an unusual way to begin an interview, one unprecedented in my years of computer journalism. But then ComVest is an unusual company. It first came to my attention through its newspaper advertisements, which appear in local papers before ComVest runs one of the business forums that generate its sales. First of all, the ad I saw was a bit confusing—at first glance it seemed to have been placed by Apple Computer or one of its retail dealerships. The typeface and layout were similar to some Apple print ads I’ve seen; it would be fair to say that ComVest’s advertising has the look and feel of Apple’s pitches. But its headline promised something I’ve never seen in any Apple advertisement: “Make up to \$10,000 a month,” it said, “run your own business, and have all the freedom you’ve ever dreamed of.”

Underneath that was a drawing of a ticket to the business forum, identified in large type as “Your Ticket to Wealth and Freedom.” Just how this ticket would gain me these desirable qualities was not clear from reading the rest of the ad. There was



something about “making you look and perform like a real estate champion,” a promise that what was being sold was a complete turnkey system “like owning a McDonald’s,” and then a note that you had to pay \$25 to attend the seminar that would explain just how this was to be done. Most puzzling of all were a picture of a Macintosh whose screen read “Get this machine FREE,” several other references to the Mac,

and the Apple logo itself in the corner of the ad, with the phrase “Authorized Value Added Reseller.” It was only at the bottom of the page, in letters somewhat bigger than a flea, that we learned that ComVest business forums “are not connected with Apple Computer, Inc., except as described above.”

Being a computer writer, I knew what a value added reseller was—a company that a computer manufacturer allows to sell its

(continues)

Purchase Requisition

QUANTITY	DESCRIPTION
1	MACINTOSH II
1	IBM PC AT

Impossible!
Warren!
Choose one or
the other —
S.

*The obvious solution
was unrealistic.*

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

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

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

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

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

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

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

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

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

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

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

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

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

as if I were working on a PC.

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

Back in the Macintosh environment, I still had immediate access to all of my PC files.

Using Macintosh software, I reopened a PC file, enhanced it, then merged it with a Mac file. And when I was finished, I printed it on the LaserWriter®.

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



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



Circle 463 on reader service card

AST
RESEARCH INC. *We Make Apples Grow!*

machines on the condition that the VAR adds something of value to the product and sells only to a specified market interested in the computer with that particular value added. For instance, Apple has sanctioned the Interleaf company as a VAR—Interleaf sells high-end desktop publishing systems that include Macintosh IIs. A sanction like this is sort of an endorsement—Apple's computers are its crown jewels, and when it allows another company to repack-age and sell those computers, it's almost like a partnership.

But ComVest looked different. To be honest, after reading all the get-rich buzz-words in the ad, I wondered whether there was indeed a flimflam cast to this company. If so, what was Apple doing in bed with them? Rather than jump to conclusions, I decided to check out the facts so I could make an objective evaluation. I called the toll-free number to reserve a space in the upcoming ComVest business forum in New York City.

The Forum

The all-day affair was well run, with just a touch of glitz. As potential ComVest customers filed into the ballroom, *Rocky-*

style music burst from loud speakers, giving the event a this-is-it excitement. Our host for the day was Craig Whitney, a hand-some fellow described in *Hotline* maga-zine as, at 31, "one of the most successful entrepreneurs in America." Whitney is also the chairman of the board of *Hotline* maga-zine, which was distributed to all at the gathering.

Casual conversation with my forum-mates revealed that some thought Apple itself was a cosponsor of the event, a mis-impression laid to rest when Craig Whitney specifically said that ComVest was the sole organizer.

But the mark of Macintosh was every-where. The morning was largely taken up by Craig Whitney's explanation of the im-portance of computer literacy for business people. Using the same slides I had seen Apple's marketing staff use in 1984, he not only delineated how computers provide an edge over competitors, but also empha-sized how the Mac in particular was the easiest, most powerful machine, one that ComVest had chosen as the best for its cus-tomers. During the first break, people were invited to a demonstration area to become familiar with the Mac.

Only after this thorough grounding

were we to learn just how we could use those computers to make money. ComVest offers several different packages, but they seem to have one thing in common—they use information about various real estate transactions and regulations to gain profits.

The one discussed in most detail at the forum I attended was something called The Mortgage Consultant. We were told that using it, we could begin to make money instantly, to the tune of more than \$500 a day. The Mortgage Consultant was the winner of the 1986 Software Program of the Year Award, an honor apparently bestowed by ComVest upon itself. This package in-cludes a Mac system, a selection of third-party software (heavy with Microsoft applications), and ComVest software that enables laypeople to instantly present themselves as experts in mortgages, capa-ble of saving clients thousands of dollars.

The price of The Mortgage Consultant package—including Mac Plus, ImageWriter, modem, and external floppy drive—is \$10,000. A more complete ComVest offer-ing, also containing the MacInvest package that helps you run a business, retails for \$17,000.

(continues)

LIFE LINE.

You've put a lot of money into your Apple system. And what's more, it's provided you with the power to be your best. Power you can't afford to lose.

Protect Your Investment.

For just a few dollars you can have the extra assurance that your equipment will be there when you need it. The Grimes Universal Security Kit has been thoroughly evaluated by Apple Computer, Inc. and carries an excellent overall rating. We are an approved Apple manufacturer of peripheral hardware and accessories. So you know the security system will fit like a glove. It plugs right into your

Apple making it virtually theft-free and "borrow-free."

It won't matter if they take your calculator, your phone system, or your entire office. As long as the real power... your Apple Computer System, is still there, you're open for business.

A 24-hour security guard for \$44.95.

Pick up a Grimes Universal Security Kit at your local Apple Dealer today. Or call Grimes for a dealer near you.

GRIMES

115 S. Arovista Circle, Brea, CA 92621 714/671-3931 • FAX 714/671-1426

Grimes continues to expand! If you're a manufacturer's representative, contact the sales department at (714) 671-3931 for opportunities marketing the Grimes Universal Security Kit or other Grimes products in your area.

Three smart steps to doin' the "Mac."



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

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

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

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

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



2. Back-up.

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

It knows its way around the disk so well that it backs up on a *file-by-file* basis, requesting additional backup media only as it needs them. It conveniently keeps your files in a finder accessible format. And with MultiFinder, DiskFit runs in the background, automatically keeping your data compact, safe and secure. For AppleShare or TOPS, *Network DiskFit* will back up your servers and your workstations with full ownership attributes intact.

How's that for a neat turn?

DiskFit: \$99.95
Network DiskFit: \$395.00



3. Click your files closed.

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

of protected files for you. Just enter one password and you can lock or unlock all the files in the set—in one swift move.
Sentinel: \$295.00

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 Trademarks: SuperMac, SuperLaserSpool, SuperSpool, DiskFit, Sentinel, SuperCrypt, WorkSet. Apple: MultiFinder, Finder, AppleShare. Sun Microsystems: TOPS.
 Aldus: PageMaker. Registered: Apple, Apple, Mac, Macintosh, ImageWriter. Iomega Corporation: Bernoulli. Prices listed are suggested retail price.



Do "The Super Mac" today:

Visit your SuperMac dealer
 or order direct:

(800) 952-6300, ask for Dept. 912.

(In CA: 800-423-4440, ask for Dept. 912.)

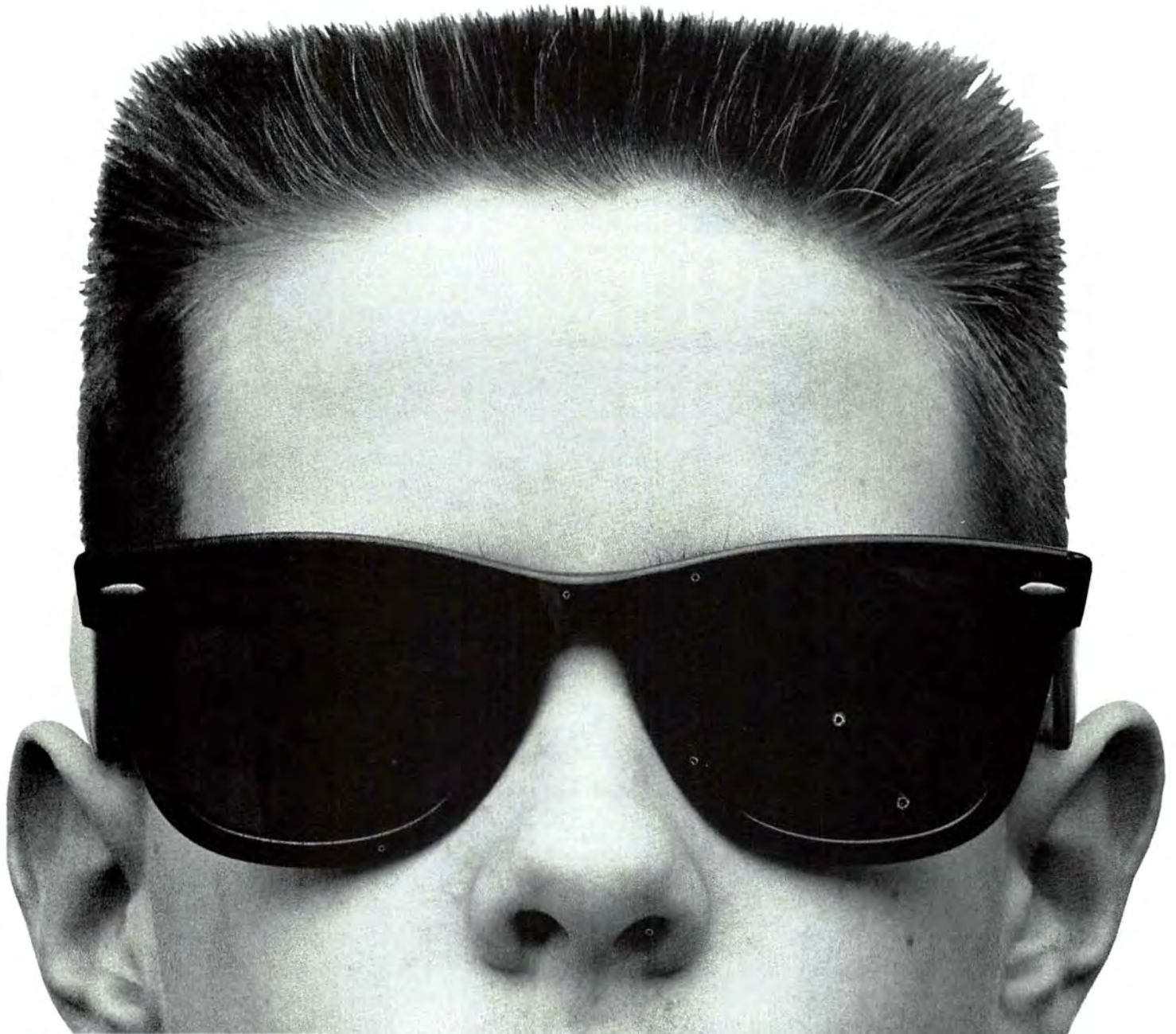
SuperMac Software
 295 N. Bernardo Ave.
 Mountain View, CA 94043
 (415) 962-2900

SuperMac Europe
 Langley Business Center
 11-49 Station Road
 Berkshire SL3 8YL
 011-44-(573)-49336



SUPERMAC
 SOFTWARE
 A division of Scientific Micro Systems

THE FLATTOP: 1958



THE FLATTOP: 1988

To get noticed in 1958, you had to trim your head to look strangely like the top of your mother's dining room table, put on your shades and act like you could care less.

Well, in 1988 it's a little bit easier. And it doesn't matter what crowd you're in. With the Flattop™ overhead projector screen from Network Specialties, you're groomed for any presentation. And we guarantee your business meetings will never be the same.

The NSI Flattop lets you project your Mac® screen directly onto a large screen, allowing you to control and enhance your presentation with movement and screen changes. Or project instant calculations larger than life. Your presentation becomes live for the first time. And your audience won't play dead.

STAY COOL

Layout documents as a group, or study drawings and plans in team meetings. In fact, anything you could normally do with your Mac, the Flattop lets you do bigger. And better. No need to have everyone crowd you. Or around your Macintosh, for that matter. They can sit back and catch your ideas wall size.

All you do is attach the Flattop screen to your Mac, place it on top

of an overhead projector, and you're ready to cruise. Its 640 by 400 image area lets you show 40% more data than the standard Mac screen.

A built-in system keeps it cool (even if you're not), and its dual-screen (stepping-out) software makes you even more efficient. Plus the Flattop is light-weight and comes with its own durable nylon carrying case that will slide right into the bag next to your Mac. Which of course improves your appearance.

The Flattop works with every Macintosh, from the 128k to the SE and comes with a full 90 day warranty. And price? You can project all this style for only \$1,795.

DON'T GET CLIPPED

One of the best things about the NSI Flattop is that it's available now. Just call (212) 995-2224 or (415) 467-8411 and have your VISA or MasterCard ready (COD orders are available too).

We'll deliver the Flattop to you within two weeks.

And you can put away the shades.

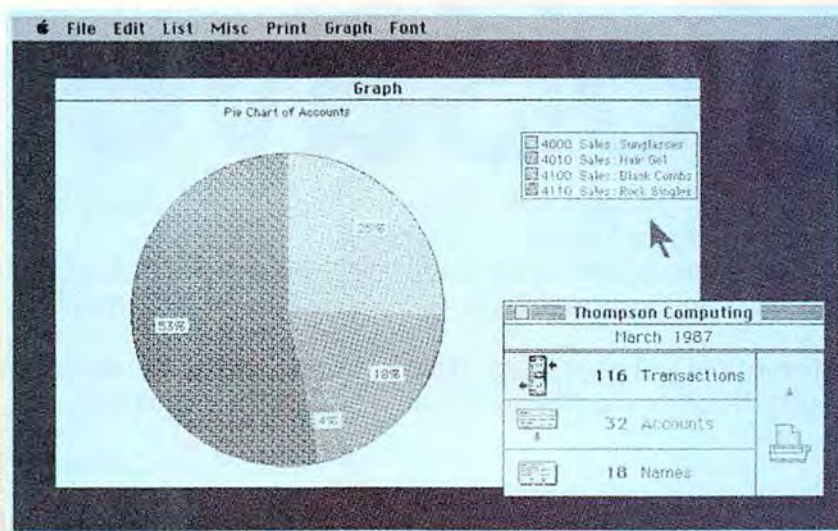
The NSI Flattop. It's a cut above the rest.



Network Specialties, Inc.



Network Specialties, Inc.



Instant Consultant

Bear with me while I explain how this system works. The linchpin of the plan is something called a biweekly mortgage. This is a trendy method of paying off a personal mortgage. Instead of paying, say, \$1000 on a mortgage at the end of each month, a homeowner pays \$500 every two weeks. The logic is, who can't afford to pay a few days early each time? Paying off a mortgage biweekly instead of monthly means a homeowner has to pay much less over the period of a home loan, and gets the mortgage paid off much sooner, too. How much less? Well, a mortgage for a \$100,000 home, which might amount to about \$300,000 over 30 years, paid off biweekly instead of monthly means paying about \$75,000 less during the course of the mortgage—which will be paid off nine years sooner.

So ComVest system owners call up potential clients and say, "Let me show you how I can save you thousands of dollars on your mortgage." Then the new consultant uses the Macintosh and ComVest software—which seems decently written and uses the Mac interface well—to run the figures, pre-

sending them to the client. The ComVest person deals with a bank to set up an escrow account that allows the client to pay biweekly. The Macintosh even prints out little coupons to tell the client when to pay. ComVest recommends that mortgage consultants charge \$500 a shot for their services; if they can get away with it, though, they can charge 1 percent of the amount they save the client. One ComVest customer, Whitney said, collected a \$17,000 commission for a single consultation.

Whitney then built up a scenario where, using another ComVest package, we could actually control the escrow accounts ourselves. (If we could convince our clients to write their mortgage checks to us, rather than to a bank.) He outlined how, within a year, we could conceivably be in control of bank deposits totaling more than a million dollars, providing us leverage with the bank to get hold of real estate foreclosed by the bank—for bargain-basement rates. In other words—millionaires! Real estate emperors!

To be sure, Craig Whitney was careful to note that in no way did ComVest *guarantee* that we would make lots of money. We would have to work hard. He explained how we would, in effect, proba-

bly have to call about thirty leads to find one client. But he figured that even if we *didn't* work too hard at it, we should be able to make thousands of dollars of extra income.

As the day progressed, Whitney kept mentioning special "today-only" deals that enabled us to buy ComVest systems at a discount. To get the ball rolling, he promised free Macintoshes to the first buyers (in other words, he deducted \$1500 from the system price). A section of the room was cordoned off for those interested in buying. Our credit, we were told, was very good here.

People bought. The woman sitting next to me paid around \$14,000 for a package of several ComVest modules. Another fellow I spoke to, a Hispanic man who spoke English poorly, also sprang a five-figure sum for a ComVest package. He told me that the ComVest people assured him that he could use a better speaker of English to make sales pitches for him.

I left the forum with a free Entrepreneur's Start-up Kit, including an auto-graphed booklet by Al Rotola on banking tactics (part of The Megatactics Series), an

(continues)

AutoSave DA

When you use AutoSave DA you will never lose information due to forgetfulness, power loss, or system errors ever again! AutoSave DA is transparent to you and your software.

AutoSave DA automatically saves data from any Macintosh application to the current logged drive.

AutoSave DA will work with all current Macintosh applications. AutoSave DA also works with add ons such as SuitCase™ and Tempo™.

Send orders and inquiries to:
Magic Software, Inc.
1706 Galvin Rd. S.
Bellevue, NE 68005
(402) 291-0670

Save frequency can be from 1-99 minutes.

AutoSave DA works on both Hard disk and Floppy disk media.

AutoSave DA is compatible with all versions of the Macintosh.

AutoSave DA works with MultiFinder!

AutoSave is valuable tool for Writers, Artists, Publishers, Programmers and others!

Only **\$49.95**

Ask your Dealer for a demonstration or order direct from Magic Software at **1-800-342-6243**.

Apple is a registered trademark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. licensed to Apple Computer, Inc. and used with the express permission of the owner. Magic Software and AutoSave DA are trademarks of Magic Software, Inc.

Circle 1 on reader service card

COLOR SE?

**YES.
It's real!**



Introducing ColorVueTM_{SE} by Orchid Technology.

Experience the world of color with Orchid's new color video interface card for the Macintosh SE. This unique product provides an affordable solution for those of us who want color for their Mac SE, but don't want to give up portability, or pay the price of a Macintosh II.

When connected to an AppleColor RGB monitor or an IBM VGA color monitor, the ColorVue brings life to your images with a choice of up to 16 colors out of a palette of 4096. On a screen that is 75% larger.

Imagine working in color with your favorite applications like: SuperPaint, MacDraw, CricketDraw, VideoWorks, QuarkXpress, Cricket Presents and More.

And when you finish, you can print them in color on your ImageWriter II.

For more information call your nearest dealer or Orchid at (800) 638-3322, or (415) 683-0300.

ColorVueTM_{SE} : Color for the rest of us!

Orchid Technology
45365 Northport Loop W.
Fremont, CA 94538



ColorVueTM_{SE} is a trademark of Orchid Technology. All other software and hardware products mentioned are trademarks of their respective manufacturers.

Circle 98 on reader service card

When you want to talk Macintosh

MONITORS

Mega Graphics	
Megascreen 2001 Video Sys.	1699.00
Megascreen SE Video Sys.	1599.00
Megascreen Plus Video Sys.	1599.00
Megascreen II Video Sys.	1699.00
Network Specialties	
High Top Full Page Display	Call
Proapp	
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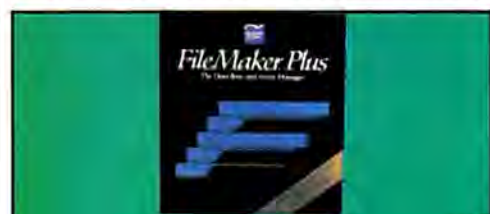


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Filing Status																											
1 <input type="checkbox"/> Single																											
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6a <input checked="" type="checkbox"/> Yourself b <input checked="" type="checkbox"/> Spouse																											
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Can claim: If you can be claimed as a dependent on another person's tax return (such as your parent's return), do not check box 6a. But be sure to check the box on line 22b.																											
(See instructions on page 7.)																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">(1) Name (first, initial, and last name)</th> <th style="width: 15%;">(2) Check if under age 5</th> <th style="width: 15%;">(3) If age 5 or over, dependent's social security number</th> <th style="width: 15%;">(4) Relationship</th> <th style="width: 10%;">(5) No. of months lived in your home</th> <th style="width: 15%;">(6) No. of times lived with you</th> </tr> </thead> <tbody> <tr> <td>Timothy B. Moore</td> <td style="text-align: center;">X</td> <td></td> <td>son</td> <td style="text-align: center;">12</td> <td></td> </tr> <tr> <td>Lisa S. Moore</td> <td style="text-align: center;">X</td> <td></td> <td>daughter</td> <td style="text-align: center;">12</td> <td></td> </tr> </tbody> </table>										(1) Name (first, initial, and last name)	(2) Check if under age 5	(3) If age 5 or over, dependent's social security number	(4) Relationship	(5) No. of months lived in your home	(6) No. of times lived with you	Timothy B. Moore	X		son	12		Lisa S. Moore	X		daughter	12	
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Al Rotola tape on computer literacy, and reports on subjects like the Four Easiest Ways to Make \$100,000 a Year. My ComVest package also included a flier on investment opportunities in Lee County, Florida, offered by the Eagle Construction and Development Company, a corporation with the same address and telephone number as CompuWorld International, sponsor of the ComVest business forum and apparently the marketing and support arm of ComVest.

Questions, Questions

After attending the ComVest business forum, I had some questions. This is why I found myself speaking to Al Rotola. First I wanted to hear a bit about the company.

In business since 1984. Built on the belief that computers are powerful enabling technology. So far, selling around 700 to 1000 systems a year. But plans are to grow much bigger, on an international scale. "There are many uses for this technology other than the traditional ones," Rotola said. "There should be a way to give people tools to work with to give them part of their dreams without unfairly raising expectations. One may be a bit creative and search for software that will give them profit centers—but we don't say software will make you rich."

Still, I suspect that all buyers of ComVest have high expectations, so I asked how many of ComVest's customers actually made successful businesses out of their purchases. Al Rotola told me that the figure was around the same as the national success rate of any entrepreneur starting a business. Around 10 percent.

I did not recall hearing that figure at the ComVest business forum.

"Ninety percent of new businesses don't make it," Rotola elaborated. "People have to ask themselves—am I in that 10 percent? If you don't make the effort, it's darn sure you're not going to make it." He said that he didn't encourage people with no aptitude for this type of work to buy his products—it's not for the guy "driving a cab in New York City." He noted that even if the ComVest-related business did not work, the customer at least had a Macintosh system to run future business ventures. (Of course that customer also paid thousands of dollars for ComVest software.)

I asked Rotola if he would put me in touch with some successful customers, and he did. Both were doing well with The

(continues)

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Steven Levy

Mortgage Consultant, though one bought a Mac II from ComVest: overkill for this software, which runs fine on a 512K machine. Diana Humphrey, a Texan who makes a full-time living helping clients switch to biweekly mortgages, says that using The Mortgage Consultant has been particularly gratifying since she had been praying for a way to help people and this enabled her to do so.

But do the instant mortgage consultants really earn their \$500 fees? That biweekly mortgages exist is no dark secret: after hearing about it at the forum, I had all the knowledge I needed to put one into motion. Isn't ComVest actually selling knowledge, for a very high price, that's already in the public domain? Of course, said Rotola. Information translates to wealth. The ComVest chairman said he believed that to those who would not otherwise hear of biweekly mortgages, their eventual savings would be well worth the \$500.

I was wondering about those savings. Weren't there cases where a biweekly mortgage wouldn't be a good idea? Take someone paying \$1000 a month on a mortgage. With a biweekly mortgage, by the end of the year, instead of paying \$12,000, the homeowner will have paid \$13,000 (26 payments of \$500), the extra \$1000 going directly toward the principal and therefore not tax-deductible. Since the mortgage holder would wind up paying more during the course of the year, could the lesser amount paid over the life of the mortgage really be called savings?

Rotola was adamant that people did save money with the biweekly mortgages.

I spoke to a disinterested expert about this: Robert Johnson, the director of the Credit Research Institute at Purdue University. After I explained The Mortgage Consultant system to him, Dr. Johnson said emphatically that "there are no savings. All the client is doing is paying off the loan sooner." While he said that doing so might be a good idea for some, the \$500 consultant fee that ComVest suggests is not in his view a fair price. "It's a trivial service," he said. "They're not revealing any secret. Many companies sell biweekly mortgages." He also said that many banks would be willing—free—to set up the kind of escrow accounts for which these mortgage consultants charge \$500. "It's in banks' interest to get those payments in early," he said.

(continues)

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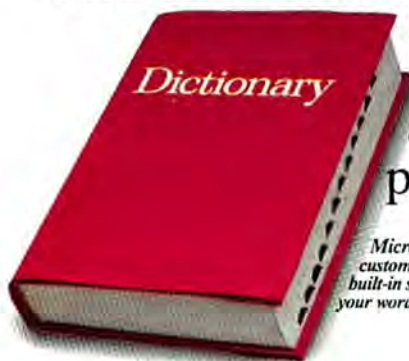
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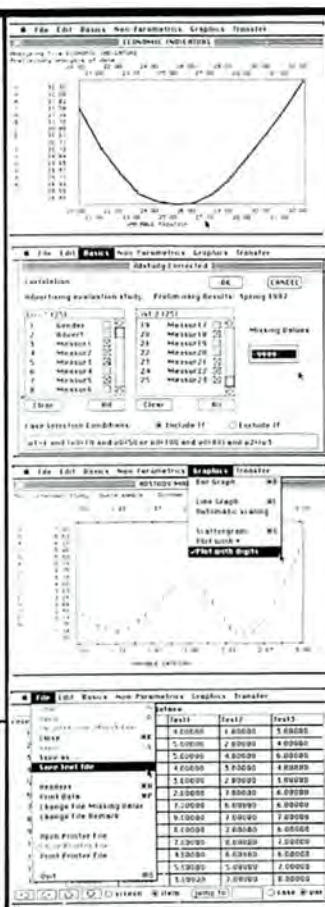


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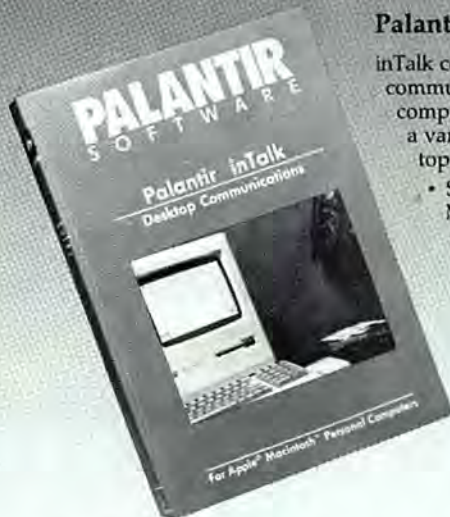
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For PC compatibles there's Windows inTalk with the same features and ease of operation. Both are perfect for corporate use, because there's no retraining when office personnel are shifted between computers.

Whether communication with another Macintosh, a PC, or the corporate mainframe, no one does it better than Palantir!



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Circle 99 on reader service card

Steven Levy

Johnson also pointed out that ComVest-created mortgage consultants had a natural conflict of interest. Since they only get paid if a client allows them to change a mortgage, it is in their interest to present a case whereby this appears an attractive alternative—even though this is not always the situation.

VAR Exam

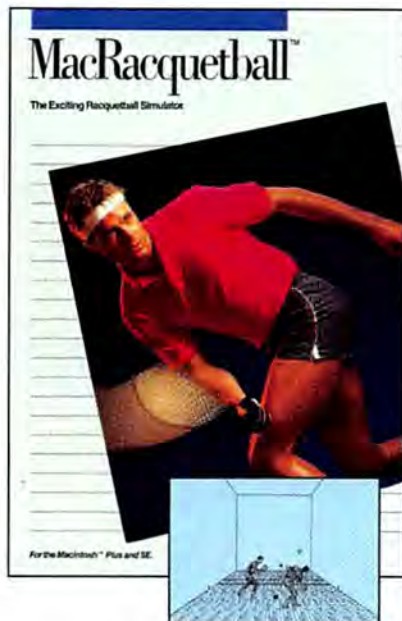
So what are we to make of all this?

ComVest does not appear to be a fly-by-night flimflam operation. It does not issue bogus guarantees, it arranges training sessions to help customers learn to use its system, it has plans for new products to increase the system's value, it makes money for at least some of its customers, and it seems to do a credible job in writing its software. ComVest doesn't seem to be breaking any laws, though as of this writing the Consumer Law Division of the California State Attorney General's office is looking into "a number of inquiries about the company."

It is also true that Apple Computer considers ComVest a valued partner in its VAR program. Erna Arneson, the executive in charge of Apple VAR relations, says that "we definitely evaluate our companies. We want to be sure they don't reflect badly on Apple." After this routine evaluation, Apple had no problem with ComVest's advertising, marketing, business forums, or products, which, Arneson said, certainly qualify as "adding substantial value" to the Macintosh. She said that there were other VARs with similarly unusual approaches, but she would not tell me who they were.

Who am I to question Apple? I guess it doesn't matter that by ComVest's chairman's own admission, only a minority of ComVest customers will have success with the packages they bought at premium prices. Nor should I be bothered by Dr. Johnson's comments about The Mortgage Consultant providing only a trivial service. And I guess that Apple loses nothing by publicly blessing a company that lures customers by painting pictures of "wealth" and "all the freedom you've ever dreamed of" and runs a program that in some ways seems to have more in common with Herbalife than Ashton-Tate.

I only have one suggestion. Along with Apple's various corporate mottos—"The Journey Is Its Own Reward," or "The Power to Be Your Best"—perhaps another should be added: "Caveat Emptor." Let the buyer beware. □



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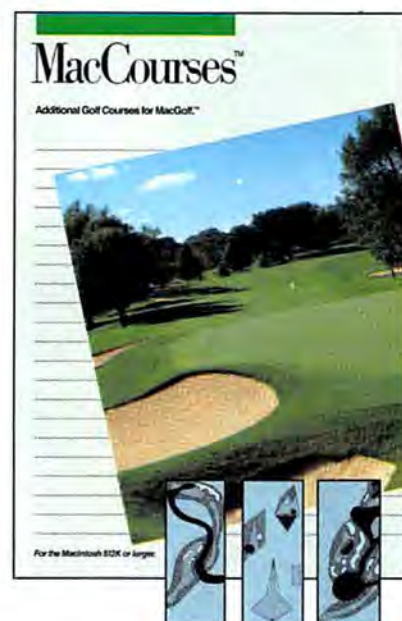


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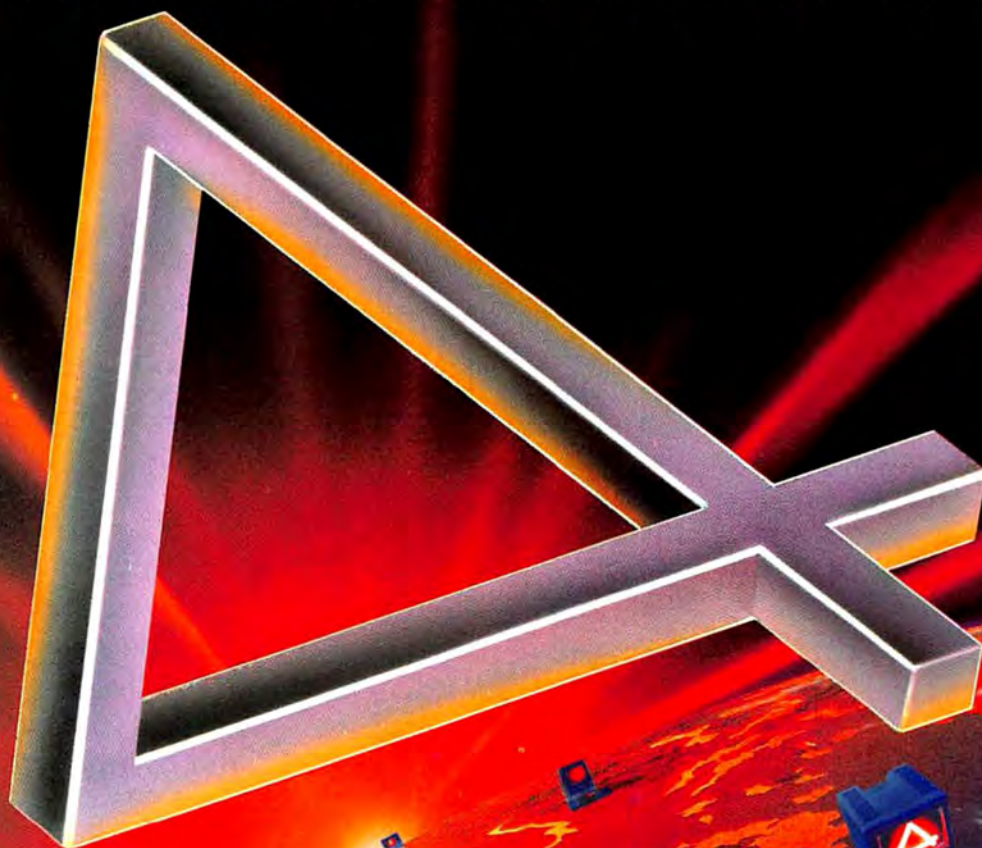


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Verbatim

*An interview with Mike Boich,
president of Radius Corporation*



After leaving Apple Computer in search of more entrepreneurial pursuits, Mike Boich cofounded Radius with Burrell Smith (Macintosh digital designer), Matt Carter (the original manufacturing director for the Mac), and Alain Rossmann (former head of Apple's software evangelism group). Andy Hertzfeld, who was responsible for much of the Macintosh Operating System and Toolbox design, has also been active in the design of the company's products.

Though the Sunnyvale, California, firm is little more than a year old, Boich reports that Radius achieved a \$1 million-per-month sales rate in its first 12 months of shipments.

Boich became interested in personal computing while studying economics at Stanford University, when he purchased an Apple I. He followed up with an MBA at Harvard University, and an Apple II. After a stint at Hewlett-Packard's Personal Computer Division, he was hired as Apple's original evangelist.

How did you move from business school to the personal computer industry?

I went to work for the Corvallis division of HP, which became the personal computer division just after I arrived. It produced all the HP calculators, starting with the HP-35, as well as desktop computers. Mike Murray was there at the same time; he left early in 1982 to join the Macintosh project at Apple.

About three weeks later I interviewed at Apple, and Steve Jobs showed me the Macintosh prototype. I was totally sold. I probably would have gone to work for free, just to get my hands on the machine two years before the rest of the world. Two weeks later, I was living at the Howard Johnson in Cupertino, and working at Apple.

Why do you think HP has never succeeded with a personal computer?

I suppose it's cultural. HP is known for making great instruments because the "next bench syndrome" works well in the technical market. The engineer turns to the guy at the next bench and says, "Would you want feature A or feature B?" The guy at the next bench is a typical customer, so the answers are right. But this didn't hold true for personal computers. At Apple, almost everyone was a personal-computer enthusiast in the early days, and their product ideas were usually right.

What was it like being at Apple then?

It was great! Steve was in charge, and he was at his Steve-most then. My first job at Apple was to conclude the contractual negotiations for MacWrite with Randy Wigginton. Randy and I quickly reached a stalemate on two key issues. Steve walked into my office after I had been there about

two weeks and said, "I just want you to know that you've blown it. I trusted you to get this contract signed by now and it's not, and now we need to go fix it." We took Randy to lunch and came to terms fairly quickly after that.

You were the first evangelist at Apple; what was that like?

My mission was to re-create the Apple II third-party software phenomenon. In most cases, we weren't offering to publish the software or otherwise have a tangible business relationship with the companies, so Mike Murray coined the term *evangelism*, which is really apt. At the time, we had a handful of prototypes, which were quite different from the machine that we actually shipped. They had 5¼-inch floppy drives, 128K of RAM, and 384-by-256-pixel displays (as opposed to the 512-by-342 displays we finally shipped).

We're used to the Mac now, but the first time I showed the machine to astute developers, it blew their minds. All the magic graphics routines, the mouse, and the tiny package really captured their imaginations. I would then explain that the machine was totally incompatible with everything, that it had an installed base of zero, and that we wanted them to develop applications for it at their own risk—and by the way, don't just port your old stuff, because we have a new user-interface that we want you to follow.

Some of those original companies you seeded with prototypes didn't turn out to be great developers.

(continues)

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Verbatim



*The original Macintosh was the
most graphics-oriented machine,
yet it had the smallest display.*

I remember the first software poster we
produced. It had Mitch Kapor of Lotus, Bill
Gates of Microsoft, and Fred Gibbons of
Personal Software Publishing wearing their
Mac Team shirts. They obviously had var-
ied degrees of success.

In general, we had about a 50 percent
hit rate with our initial seeds. There are
several reasons for this. The machine was
novel, and it required a novel approach to
user interface and application design. The
development tools—and the Macintosh
Toolbox itself—were in a very preliminary
state, and this meant implementers re-
quired more technical savvy than is neces-
sary today.

Do you have a favorite story from that
time?

My worst story: in May of 1982, Mitch Kapor
showed me a prototype of a product that
was code-named Trio and said he would
sell his mother to do a version for the Mac-
intosh. The product looked a lot like *Visi-
Calc* to me, so I didn't encourage him, but I
suggested that he do a personal finance
package instead. Trio, of course, was 1-2-3.

What happened to *Jazz*?

It was far too ambitious. We needed great
applications for the Macintosh. *Excel* is a
great application. *WriteNow* is a great ap-
plication. Lotus tried to do six great appli-
cations, plus all of the glue to integrate
them. No one has succeeded in doing that
yet, and I think the system software of the
near future will eliminate the need for in-
tegrating all that in a single application.

What do you think is the best software on
the Mac today?

My personal favorite is *WriteNow*.

Why?

Quality does not depend on having the
longest list of features, quality depends on
how well a product carries out its intended
application. A Mercedes probably has a
shorter features list than a Toyota Supra,
but each feature is an incredibly well engi-
neered part of a carefully conceived whole.

What products, other than your own,
would you recommend for someone set-
ting up a small business today?

I would provide Macintosh SEs to most
people, a LaserWriter, *AppleShare*, and *In-
Box*. An SE with an 80MB disk, an accelera-
tor, and *AppleShare* makes a good file
server. I like *WriteNow* for most word pro-
cessing tasks, *Microsoft Excel* is certainly
the spreadsheet of choice, *4th Dimension*
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As Burrell Smith would say, this is where
you separate the men from the other men.
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doubt the most difficult component of a
personal computer to execute well. De-
flecting an electron beam across the screen

(continues)

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IBM is a registered trademark of International Business Machines Corporation.
Macintosh, Macintosh II and Macintosh SE are trademarks of Apple Computer Inc.

MAC MAKES OFF WITH IBM FILES

It sounded like a phony claim.

An insurance company was transferring files to IBM mainframes coast to coast and all points in between.

Without using IBM PCs.

And it wasn't just text, it was spreadsheets and documents too.

One name kept popping up—
MacMainFrame.

Turns out MacMainFrame is a micro-to-mainframe link.

And it had Mac uploading and downloading data to IBM mainframes before you could say 3270 connectivity.

Mac IIs and SEs were also in on the action.

They all did a pretty good imitation of a 3270 terminal to boot.

And for MacMainFrame, CICS, TSO and CMS environments seemed like the old neighborhood.

But was it just another 3270 connectivity solution? Hardly. Instincts said this one had Avatar written all over it.

Avatar Technologies Inc.
99 South Street,
Hopkinton, MA 01748.

Avatar. All you need to know about 3270 connectivity.

800 289 2526
617 435 6872



Circle 319 on reader service card

Programs & Peripherals

Picks of the Month



Numeric-Turbo by Cambridge Automation

Now you can cut your data input time in half with **Numeric-Turbo**, a new high-speed input device combining the fast response of a track-ball with a full-scale numeric keypad. The **Numeric-Turbo** includes cursor keys and direct function keys and its ideal for use with Jazz, Multiplan, Dollars & Sense, and any other Mac software where you want your figures faster.



Numeric-Turbo (Mac128k/512k/MacPlus) 99.

Utility Software

Apple Computer		Icon-It! (Assign Icons to Menu Items)	39.
Switcher Construction Kit	14.	Read-It! TS (For ThunderScan)	89.
ALSoft		Read-It! O.C.R.	179.
Disk Express 1.10	26.	(For Image Scanners)	
Berkeley System Design		Software Supply	
Stepping Out (Macintosh Screen Extender)	55.	Suitcase or Power Station	38.
CE Software		SuperMac Software	
QuickKeys (Macro Program)	65.	SuperSpool (ImageWriter Print Spooler Utility)	42.
DiskTop 3.0		SuperLaserSpool	82.
(Portable DA Finder)	32.	Multi-User SuperLaserSpool	199.
CalendarMaker 3.0		Diskfit 1.3	54.
(Custom Calendars)	32.	(Backup & Restore Utility)	82.
Central Point Software		Sentinel	
Copy II Mac (Includes MacTools)	22.	TOPS	119.
Fifth Generation Systems		Tops For The Macintosh 2.0	
FastBack For The Macintosh	59.	Williams & Macias	
Infosphere		myDiskLabeler	24.
MacServe (Network Software)	163.	myDiskLabeler w/Color	31.
LaserServe (LaserWriter Print Spooler)	63.	myDiskLabeler w/LaserWriter Option	34.
Olduvai Software		Working Software, Inc.	
DA-Switcher II		Findswell (Document Finder)	29.
(Switch Multiple Sets of DA's)	25.		

C.A.T. by Chang Laboratories



C.A.T. stands for Contacts-Activities-Time and lets you link events, people, and schedules to keep track of the relationships in your business or personal life. You can organize contact information into views that allow automatic follow-up on strategies, contacts, correspondence, dates, names, key facts and figures. **C.A.T.** integrates database, mailmerge, and calendaring functions without you having to learn a programming language!

C.A.T. (Contacts Activities Time) 229.

PixelPaint by SuperMac Software

PixelPaint's familiar Macintosh operations unlock the power of color hidden inside your Macintosh II. You can customize palettes of up to 256 colors from the Mac II's 16.8 million. Produce breathtaking color comps and create incredible effects: zoom, rotate, vary brush strokes, use drop shadows, free rotation, airbrush, tile, fill and color. **PixelPaint** allows you to send your output to a LaserWriter, Linotonic, Postscript or QuickDraw-compatible printer, film recorder or slide maker.



PixelPaint (Macintosh II) 249.

Desk Accessory Programs

Affinity Microsystems Tempo II	89.	Imagine Software	
Tempo 1.2	53.	Smart Alarms & Appointment Diary	35.
AffiniFile	49.	Multi-User Appointment Diary	95.
Borland SideKick V2.0	59.	with Smart Alarms	
Cortland Top Desk	32.	Solutions, International	
Greene, Inc. QuickDex 1.4	24.	SmartScrap & The Clipper	35.

Languages

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

Communications Software

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

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with Special Pricing!

Specials good through March 31, 1988

Double Helix II by Odesta Corporation

Double Helix II gives business professionals the power to create integrated solutions to information management problems. Using words and pictures rather than a complex programming language, **Double Helix II** is both easy to learn and even fun to use. Time billing, inventory control, project planning, accounting, and business analysis applications can be easily developed. And, applications are instantly expandable to share information with other Macintoshes and/or DEC's VAX computers.



Double Helix II 329.

Cutting Edge 800k Drive by Cutting Edge, Inc.



The **Cutting Edge 800k Drive** features an LED in-use light, a manual eject button, and a compact case (available in beige or platinum) that matches Mac aesthetics. It's compatible with old and new Mac ROMs so you can use it on a standard Mac 512k, a MacPlus, or a Mac SE. The **Cutting Edge 800k Drive** also has a MTBF rating of over 11,000 hours, and offers advanced power and design at an economical price.

Cutting Edge 800k External Drive 175.

Focal Point by Activision



Focal Point is a HyperCard-based desktop application that has everything needed to manage your time and tasks. **Focal Point** records everything from expenses to exciting ideas and it's completely customizable. HyperCard links **Focal Point**'s tools to each other so your calendars are linked to your to-do lists, which are connected to your phone directory and call-logging system. And, **Focal Point** even has a document launcher that connects directly to your reports, letters, spreadsheets, whatever!

Focal Point 59.

MacKids Educational Programs by Nordic Software

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

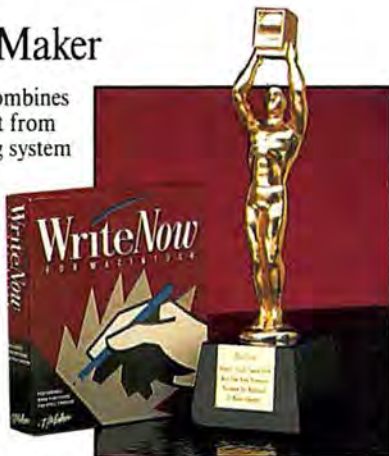
Preschool Disk 1 (3-7), Preschool Disk 2 (3-7), CoinWorks (4-12), ClockWorks (4-10), Early Elementary 1 (6-9), Lemonade Stand (6-16), FlashWorks (6-adult), Naval Battle (6-adult), Word Search (6-adult), Alphabetizer (7-adult), EarthWorks (10-adult), or Bodyworks (10-adult).

Each Program 29.



WriteNow by T/Maker

WriteNow for Macintosh combines the power you would expect from a dedicated word processing system with the ease of operation that you are used to with MacWrite. **WriteNow** is fast especially with large documents and allows true WYSIWYG editing in one, two, three, or four columns directly on-screen. And, **WriteNow** also includes fast on-line spelling checking, graphics in the same line as text, and unlimited open documents.



WriteNow 97.

Positively A Plus

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... Positively A Plus!

Disk Drives/Hard Disks/Upgrades

AST Research		FI/40 (40MB Internal Hard Drive for Mac SE)	889.
Mac86 Co-Processor (Mac SE)	419.	HyperCharger 020	Call
Mac286 Co-Processor (Mac II)	1049.	MacMemory, Inc.	
Central Point		Turbo SE (16 Mhz 68000 Accelerator for the Mac SE)	399.
Central Point 800K External Drive	185.	Motorola 68881 (Math Coprocessor for Turbo SE)	349.
Cutting Edge		MaxPlus Mega (2MB Upgrade with 1MB Chips for MacPlus)	345.
Cutting Edge 800k Drive	Special 175.	Personal Computer Peripherals	
Dove Computer Corporation		Beige or Platinum Color. Optional Built-In Modems Available.	
MacSnap 524 (512K to 1MB) or 524E (512E to 1MB)	139.	MacBottom HD-21 (20+MB SCSI Hard Disk)	749.
MacSnap 524S (512E to 1MB w/SCSI)	219.	MacBottom HD-32 (32MB SCSI Hard Disk)	879.
MacSnap 548 (512K to 2MB) or 548E (512E to 2MB)	359.	MacBottom HD-45 (45MB SCSI Hard Disk)	1139.
MacSnap 548S (512E to 2MB w/SCSI)	449.	MacBottom 20 (20+MB Serial Hard Disk for Mac 512k & MacPlus)	839.
MacSnap Plus 2 (MacPlus to 2MB Non Expandable)	249.	ProAPP	
MacSnap 2S or 2H (1MB to 2.5MB for MacPlus/SE)	449.	ProAPP 20S (External 20MB SCSI)	649.
MacSnap 4S or 4H (1MB to 4MB for MacPlus/SE)	879.	ProAPP 20SEi (Internal 20MB for Mac SE)	569.
SCSI Interface/Port	125.	Rodime Rodime 20 Plus (External 20MB SCSI)	629.
MacSnap Toolkit (torx driver, opener & grounding set)	15.	Rodime 201 Plus (Internal 20MB for MacPlus)	629.
First Class Peripherals Sider C-46 (40MB Hard Drive with 60MB Tape for MacPlus/SE or Mac II)	1399.	Rodime 45 Plus (External 45MB SCSI)	939.
General Computer Corporation		Rodime 450RX (Internal 45MB for Mac SE & Mac II)	829.
FX/20 (20MB External Hard Drive for MacPlus)	629.		
FX/40 (40MB External Hard Drive for MacPlus)	889.		

Laser Printers & Digitizers

AST Research TurboLaser P/S	2995.	New Image Technology	
TurboScan (Optically Scans & Digitizes at 300 Dots-Per-Inch)	1329.	Magic Digitizer (Mac 128/512k or MacPlus Version)	249.
General Computer Corporation		Summagraphics MacTablet 12x12 size	379.
Personal Laser Printer	1449.	ThunderWare	
Impulse Impulse (MacNifty) Audio Digitizer V2.0 w/Soundwave	149.	ThunderScan V4.0 with Power Port (Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)	199.
Koala Technologies Corp.		Mac II Power Accessory	42.
MacVision (Digitizer)	169.		

Accessories

Abaton ProPoint (ADB TurboMouse for Mac SE & Mac II)	119.	Apple Security Kit	34.
Bech-Tech		Polarizing Filter	33.
Fanny Mac (Beige or Platinum)	69.	Printer Muffler 80	38.
Cambridge Automation		Printer Muffler 132	51.
Numeric Turbo	Special 99.	Control Center	63.
Central Products		System Saver Mac (Beige or Platinum)	64.
MacOpener (All In One Mac Tool)	16.	A/B Box (MacPlus Only)	63.
Curtis Manufacturing		Turbo Mouse (Reg. or ADB)	82.
Diamond-Surge Suppressor-SP-1	29.	Lightgate Felix (Second Generation Pointing Device)	99.
Emerald-Surge Suppressor-SP-2	36.	Mouse Systems A+ Mouse (MacPlus)	69.
Ruby-Surge Suppressor-SPF-2	55.	A+ ADB Mouse (Mac SE/Mac II)	89.
Sapphire-Surge Suppressor-SPF-1	47.	Moustrak MousePad 7"x9" Size	8.
DataDisk		MousePad 9"x11" Size	9.
MAC-101 Keyboard/Beige (128k/512k & MacPlus)	149.	Moustrak L/F (Low Friction)	9.
MAC-101 ADB Keyboard/Platinum (Mac SE & Mac II)	149.	Nutmeg Systems Nutmeg 15" Monitor (Displays One Full Page)	Call
Ergotron		Nutmeg 19" Monitor (Displays Two Full Pages)	Call
MacTilt or MacTilt SE (Platinum Color)	69.	NuVotek	
Mouse Cleaner 360°	15.	EasyNet (Specify Din 8 or DB-9)	27.
I/O Design		Orange Micro	
Mac Luggage Available in Navy or Platinum Gray		Grappler L/Q (Parallel Interface for 24 Pin & Laser Printers)	99.
Macinware Plus Carrying Case	64.	Ribbons Unlimited	
Macinware SE Carrying Case	44.	Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
Imageware II Carrying Case		ImageWriter Ribbon-Black	4.50
Kalmar Designs		ImageWriter Ribbon-Color	5.
Teakwood Roll-Top Disk Cases:		ImageWriter Rainbow Pack (6 Colors)	25.
Micro Cabinet (holds 45 disks)	14.	ImageWriter II-Four Color Ribbon	11.
Double Micro Cabinet (holds 90 disks)	20.	Silicon Comforts MacChimney (Very Effective Cardboard Laminated Convection Cooling Device)	16.
Triple Micro Cabinet (holds 135 disks)	28.	SoftStyle MacEnhancer	165.
Kensington External Disk Drive Cover Mouse Pocket (Reg. or ADB)	8.	The Madison Line	
Mouseway (Mousepad)	8.	Professional Series Carry Cases In Black Ballistic Nylon	
ImageWriter or ImageWriter II Cover	9.	Mac(Plus) Carry Case	79.
Macintosh Plus/SE Dust Cover	9.	Mac SE Carry Case	99.
Mouse Cleaning Kit w/Pocket	17.	ImageWriter I (II) Carry Case	75.
Disk Drive Cleaning Kit	20.		
Tilt/Swivel	22.		
Universal Copy Stand	23.		

Blank Media

Single Sided 3 1/2" Diskettes		Double Sided 3 1/2" Diskettes	
BASF 3 1/2" SS/DD Disks (box of 5)	8.	BASF 3 1/2" DS/DD Disks (box of 5)	9.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Bulk (Sony) 3 1/2" DS/DD (10)	16.
Sony 3 1/2" SS/DD Disks (box of 10)	13.	Centech 3 1/2" DS/DD Color Disks (box of 10)	19.
Centech 3 1/2" SS/DD Color Disks (box of 10)	16.	Sony 3 1/2" DS/DD Disks (box of 10)	18.
Fuji 3 1/2" SS/DD Disks (box of 10)	13.	Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Maxell 3 1/2" SS/DD Disks (box of 10)	13.	Maxell 3 1/2" DS/DD Disks (box of 10)	20.
Verbatim 3 1/2" SS/DD Disks (box of 10)	13.	Verbatim 3 1/2" DS/DD Disks (box of 10)	20.
3M 3 1/2" SS/DD Disks (box of 10)	14.	3M 3 1/2" DS/DD Disks (box of 10)	20.
C.Itoh Color Disks SS/DD (box of 10)	22.	C.Itoh Color Disks DS/DD (box of 10)	25.

Modems

Hayes Microcomputing		Prometheus	
Smartmodem 1200	299.	Promodem 1200 (Hayes Compatible)	239.
Smartmodem 1200 Mac w/Smartcom II & Cable (MacPlus)	359.	Promodem 2400 (Hayes Compatible)	309.
Smartmodem 2400	449.	Mac Pack w/Procom M and Cable (Specify Mac or MacPlus)	49.
Transet 1000-128K	269.	U.S. Robotics	
Transet 1000-512K	429.	Courier 1200 (Hayes Compatible)	199.
Transet 1000 Mac Accessory Kit	29.	Courier 2400 (Hayes Compatible)	349.
InterBridge (Connect Appletalk Networks)	599.	Courier 2400E (Hayes Compatible)	379.
Migent		Courier HST 9600 (Hayes Compatible)	689.
Migent Pocket Modem (ext. 300/1200 Baud)	169.		

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DataBase Management

Activision Focal Point	Special 59.	Chang Laboratories C.A.T.	Special 229.
Business Class	32.	Contacts*Activities*Time	110.
Acius 4th Dimension	559.	Microsoft Microsoft File 1.05	179.
Apple Computer HyperCard	44.	Nantucket Software	149.
Ashton Tate dBase Mac 1.0	295.	McMax (dBase III Compatible)	Special 329.
Blythe Software Omnis 3 Plus/Express	279.	Nashoba Systems FileMaker Plus	429.
Omnis 3 Plus Multi-User		Odesta Double Helix II	149.
(MacServe, Tops Network, Corvus,		Multi-User Helix	45.
Appleshare or Hypernet 2-5 users)		ProVUE Development OverVUE 2.1	
Borland Reflex Plus	165.	Software Discoveries RecordHolderPlus	

Business Software

Apple Computer MacProject	159.	Mainstay Think 'n Time	69.
Bravo Technologies MacCalc	79.	(Time Management Package)	
Cricket Software Cricket Graph	124.	Micro Planning Software	299.
Cricket Presents...	289.	Micro Planner Plus	179.
Pict-O-Graph	105.	Microsoft	110.
Deneba Software Comment		Microsoft Works 1.1	72.
(Attach Electronic Notes to Files)	59.	Microsoft Multiplan 1.11	224.
Xtra 2.0	109.	Microsoft Chart 1.02	Call
Layred		Microsoft Excel 1.04	79.
Notes For Excel, Jazz, PageMaker,		Microsoft PowerPoint	195.
Microsoft Works or Word 3.0 (each)	41.	Satori Software Bulk Mailer 3.0	369.
Legisoft/Nolo Press WillMaker 2.0	30.	Bulk Mailer Plus	539.
Lotus Jazz 1A	189.	Legal Billing	409.
Lundeen & Associates		Legal Billing II	
WorksPlus Commands	62.	Project Billing	
MacroPac International		Turner Hall Publishing	
101 Macros For Excel	45.	MacSQZ!	59.

Word & Outline Processors

Apple Computer MacWrite	99.	Microsoft Write	109.
Living Videotext		MindWork Software MindWrite 1.1	159.
More 1.1C (Color Version)	Call	Symmetry Acta V2.0	36.
Microsoft Microsoft Word 3.01	239.	T/Maker Company WriteNow	Special 97.

Spelling & Grammar Checkers

Aegis Development		Coach Merriam Webster's Thesaurus 2.0	36.
Doug Clapp's Word Tools	42.	Lundeen & Associates	
A.L.P. Systems MacProof 3.0		WorksPlus Spell 1.1	46.
(Requires MacPlus)	119.	Microlytics, Inc.	
Batteries Included		Word Finder (Synonym Finder)	39.
Thunder! (Interactive Spelling Checker)	31.	Sensible Software Sensible Grammar	57.
Deneba Software Spelling Coach 3.0		Working Software, Inc.	
(Webster's/Medical/Legal/Hyphenation)	59.	Spellswell 2.0	42.
Spelling Coach 3.0 Professional		Spellswell Medical or Legal Dictionary	57.
(Adds Definitions & Thesaurus)	109.	Lookup (Makes Spelling Suggestions)	29.

Desktop Publishing

Addison-Wesley TEXTures	279.	Postcraft International, Inc.	
Aldus Corporation PageMaker	399.	Laser FX (Special Effects	
Allan Bonadio Associates		for Desktop Publishing)	120.
Expressionist 1.11 (Equation Processor)	49.	Quark, Inc. QuarkXPress	479.
Ann Arbor FullWrite Professional	169.	Solutions, International	
Boston Publishing Systems		Super Glue	52.
The MacPublisher III	119.	(Graphics Integration Software)	299.
Letraset Ready, Set, Go! 4.0	279.	Target Software Scoop	
ImageStudio		Word Perfect Corporation	
(Image Processing Software)	279.	Word Perfect for the Macintosh	199.

Accounting Packages

Chang Labs		Migent In House Accountant	119.
New Enhanced Version III Modules!		Monogram Business Sense	285.
Rags to Riches GL, AR, or AP	120.	Dollars & Sense 4.0	89.
Rags to Riches 3-Pak (GL/AR/AP)	289.	Peachtree	
Inventory Control or Professional Billing	239.	Back To Basics Three Pack	139.
Professional 3-Pak		(GL/AR/AP)	69.
(GL/Professional Billing/Payables)	359.	Softview MacInTax Federal 1987	39.
Retail Business 3-Pak	359.	California or New York	49.
Layred Insight One Write	189.	Supplement (1987)	
Insight Expert G/L, A/R, or A/P	349.	TaxView Planner (1987/1991)	40.
Insight Multi-User		Survivor Software MacMoney	
A/R, A/P, or Inventory	529.	(Financial Planner)	

Statistics & Math Packages

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

Graphics Software

ABA Software Draw It Again Sam...	94.	MacAtlas Professional	129.
Adobe Systems Adobe Illustrator	379.	Miles Computing	
(MacPlus, SE & Mac II)	47.	Mac The Ripper, Orchestra of Fonts,	
Altsys Corp. FONTastic Plus	239.	People-Places-Things, or	
Fontographer 2.2	49.	Taking Care of Business (each)	27.
Ann Arbor Softworks Full Paint	99.	Mindscape ComicWorks	47.
Apple Computer MacPaint	37.	GraphicWorks 1.1	87.
Broderbund Print Shop	118.	Olduvai Software Post-ART (3-Disk Set)	35.
VideoWorks II	46.	Silicon Beach Software	
Casadyware Fluent Fonts 2.0 (2-Disk Set)	109.	Digital Darkroom	114.
Fluent Laser Fonts Vol. 1-15 (ea)	59.	SuperPaint	79.
Deneba Software Canvas 1.0		Silicon Press	41.
(Includes Desk Accessory)		Solutions International The Curator	79.
Canvas DA	36.	Springboard Certificate Maker	24.
Dubl-Click Software	36.	SuperMac Software Pixel Paint	Special 249.
World Class Fonts! (Both Volumes)		Symmetry PictureBase	59.
WetPaint (Both Volumes)		T/Maker	
Enzan-Hoshigumi USA		Click Art Letters I, Letters II, Personal	
MacCalligraphy 2.0	115.	Graphics, Publications, Effects,	
Japanese Clip Art Scroll 1		Business Image, or Holidays (each)	28.
"Heaven" or Scroll 2 "Earth"	59.	Christian Images	35.
Japanese Clip Art "Borders" Scroll	69.	Click Art EPS Illustrations	Call
Foundation Publishing		Click Art Laser Fonts: Plymouth,	
Comic Strip Factory	45.	Bombay, or Seville (each)	45.
Comic People	26.	Unison World Chest Top Publishing	38.
Micro: Maps MacAtlas Paint Version	32.	Zedcor DeskPaint 1.0	39.

CAD Products

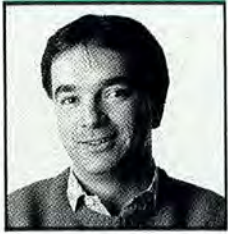
Apple Computer MacDraw	159.	Professional 3D	199.
Challenger Software		Innovative Data Design	
Mac 3D (Enhanced Version 2.0)	119.	MacDraft 1.2A	149.
Cricket Software Cricket Draw	169.	Silicon Beach Software Super 3D	159.
Enabling Technologies Easy 3D	79.	Super 3D Enhanced (Mac II)	249.

Educational/Creative Software

Baron's Baron's SAT	35.	CrystalPaint	32.
Bogas Productions Studio Session	52.	Concertware+ 4.0 or American Discovery	39.
Broderbund Jam Session	30.	Concertware+ MIDI 4.0	79.
Geometry, Calculus or Physics	63.	Hayden MusicWorks	29.
Compu-Teach Once Upon A Time	24.	Score Improvement System for the SAT	58.
Stepping Stones Level I or Level II	24.	Learning Company Reader Rabbit	34.
Davidson & Associates Speed Reader II	39.	Mindscape Perfect Score SAT	
Math Blaster or Word Attack!	27.	w/The Perfect College	46.
Electronic Arts		Nordic Software	
Deluxe Music Construction Set V2.0	62.	MacKids Educational	
1st Byte/Electronic Arts		Programs (each)	Special 29.
Kid Talk, Speller Bee,		Rubicon Publishing	
First Shapes, or Math Talk	32.	Dinner at Eight-Silver Palate Bundle	51.
Mathtalk Fractions, First Letters &		Simon & Schuster Typing Tutor IV	35.
Words, or Smoothtalker	32.	Speed Reading Tutor IV	32.
Great Wave Software TimeMasters	22.	Springboard Early Games for	
KidsTime or NumberMaze	27.	Young Children or Easy as ABC	28.

Game Software

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



What would I do differently? At Apple I would have fought harder for more memory in the first Macintosh.

60 to 80 thousand times per second is tricky business. The procedure requires lots of power, and the components used, such as inductors and electrolytic capacitors, are more prone to fail if they're not carefully selected and life-tested. I think that if you asked manufacturing people at Sun or Apple what problem gave them the most gray hairs, they would tell you the same thing.

How did you decide to build the Radius company?

Burrell had assembled a prototype of the Full Page Display, and I went over to see it—primarily because I really wanted one. His feeling was that the most formidable third-party hardware activity to date had been

building dust covers. By that time the size of the Macintosh market and the architecture of the machines provided a real opportunity for us to bring Apple-style engineering, marketing, and manufacturing to bear on hardware to complement the Mac.

At first, there was a natural tendency to think in terms of successful IBM third-party hardware makers, such as AST. That's not a good model for Radius at all, though. To be an AST requires incredibly fast turn-around of commodity-like products. We came from a background where there was less deadline pressure, so we could lavish lots of time and engineering on unique and proprietary products. In general the

higher the engineering ante, the better our competitive position will be. You're not likely to see us doing RAM upgrades or Winchester drives.

When you look back at your time at Apple and the founding of Radius, what would you do differently?

At Apple, I would have fought harder for more memory. Half of the difficulty of writing Mac applications in that first year was cramming the applications into a 128K machine.

At Radius, I would do almost everything the same, but six months earlier.

And in terms of the original Mac? What would you do differently?

Some of the marketing stuff. We geared our marketing campaign to attract people who were intimidated by computers, and that wound up giving us a bit of a wimpy image with everyone else. Then again, if you consider the applications that were available at the time, and the lack of memory, we cer-

(continues)

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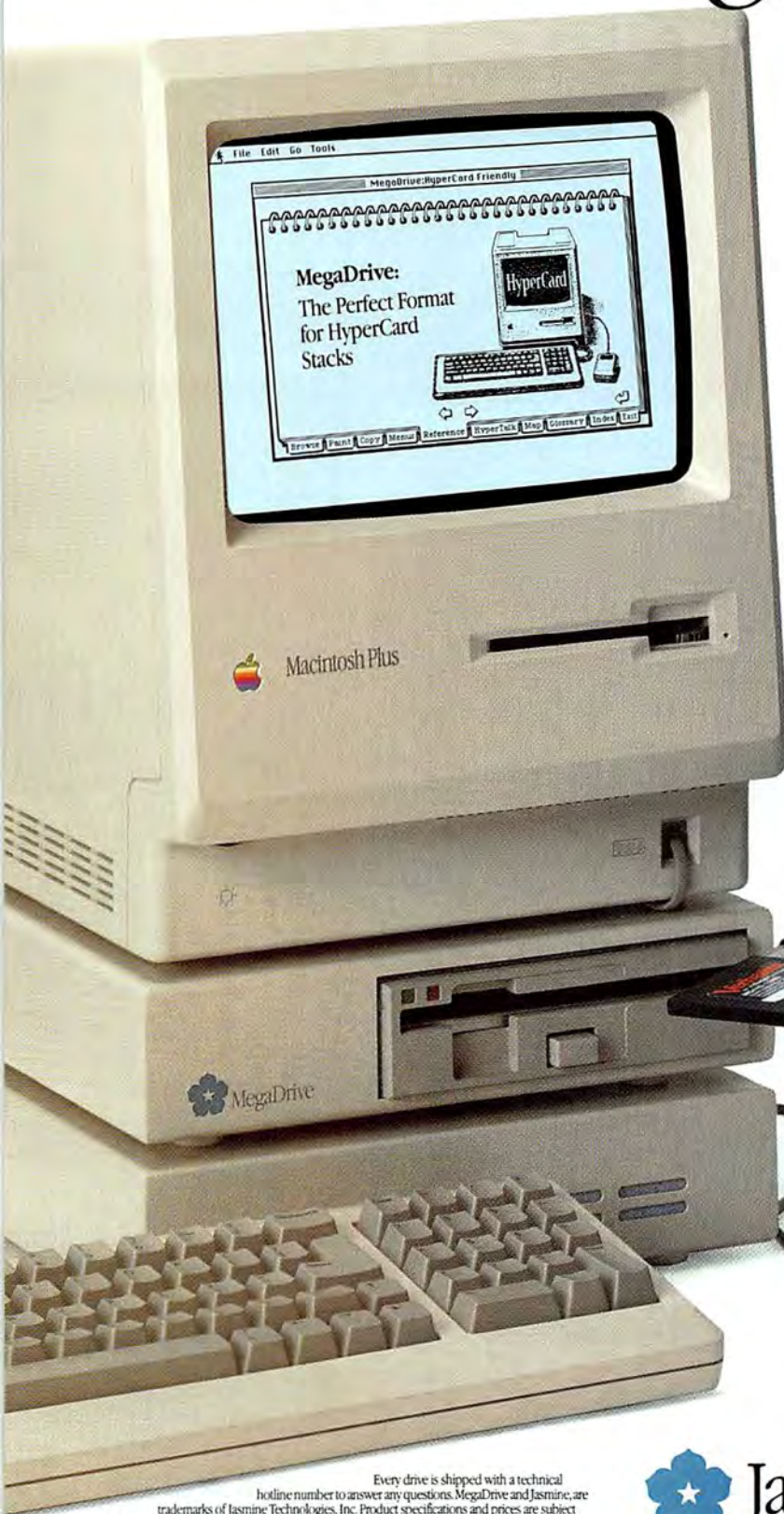
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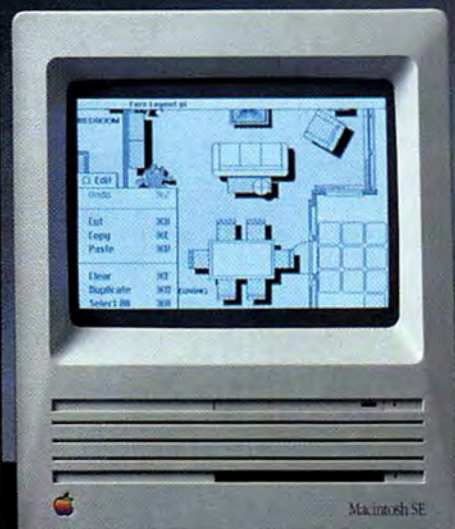
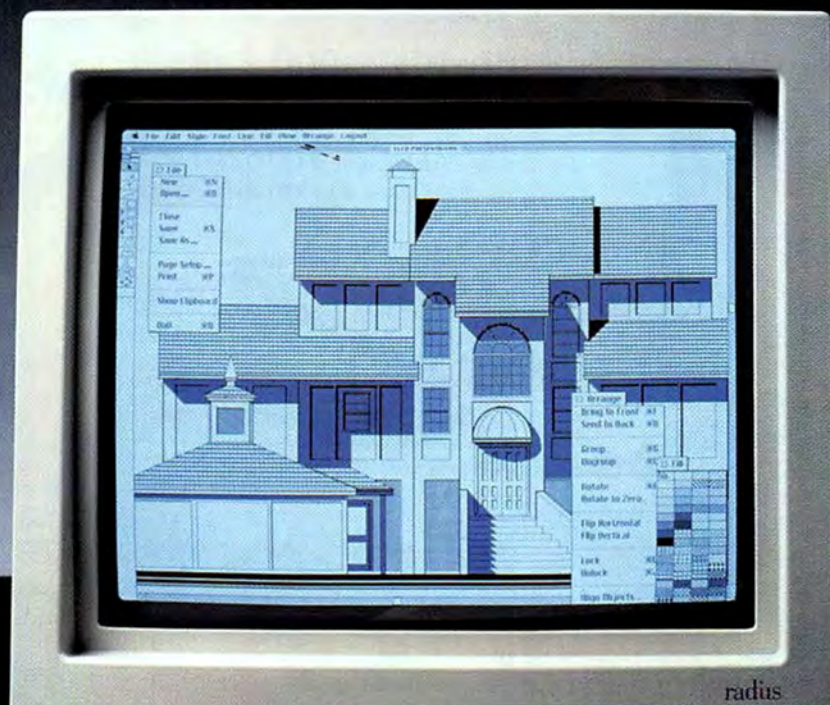
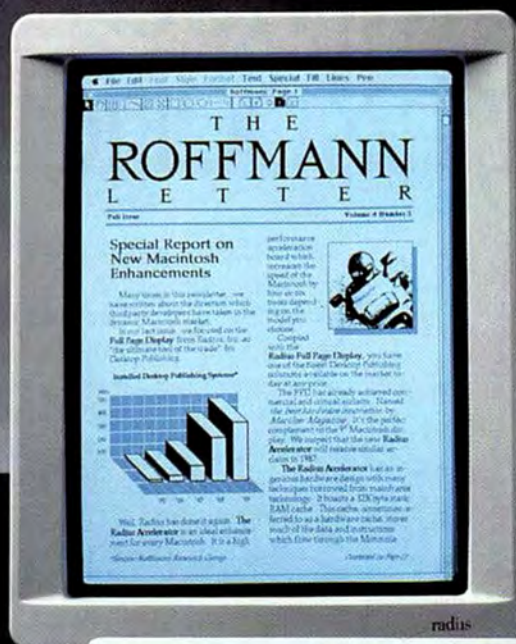


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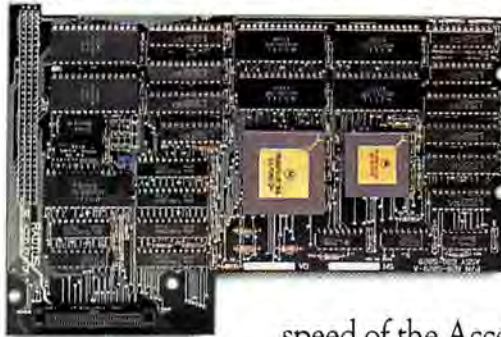
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People who want a compact, transportable system will do well to buy an SE and an accelerator.

tainly couldn't have marketed to today's Macintosh user. Desktop publishing, Laser- Writers, and AppleTalk didn't exist yet. All we had was MacPaint, MacWrite, Multi- plan, and dust covers.

After working at Apple for so many years, how did it feel starting up from nothing to build your own company?

The lack of resources in those first few months was striking, but fun. When we first moved into our offices in Sunnyvale, the phone system hadn't been installed, and we had one Radio Shack phone on the factory floor. When someone would call to place an order, we'd say, "Let me connect you to somebody in sales." Then I would count to three and hand the phone to Alain Rossmann. Already we look back on those days with nostalgia.

What's the thinking behind your shift to a 19-inch monitor?

It's not a shift, but an additional product. We still expect to set records with the Full Page Display every month this year. There is a large group of people, though, who need to see two-page layouts, or B-size engineering drawings, and who don't need the compact footprint of the Full Page Display. For those people we've done the Radius Two Page Display.

What is the accelerator market like?

Accelerator cards are certainly no substitute for a Mac II. We feel that users who find color and expandability important are Mac II customers, while people who want a compact, transportable system will do well to buy an SE and an accelerator. Likewise, people who already own an SE or a Mac Plus can upgrade to Mac II performance for under \$1000.

On the technology side, the move from an 8-MHz 68000 to a 16-MHz 68020 provides an unusually large performance gain. It's rare to be able to get a fourfold performance increase for so little money, and therefore companies like Radius are moved to turn this situation into a product.

Because the SE slot is the only high-bandwidth connection to the system, we feel that acceleration and video are the most appropriate uses for it. Modems, mass storage, and even high-speed networks can be accommodated well via the SCSI port or serial ports.

Why didn't Apple ship the SE with a 68020?

I'm sure it was partly economics and partly a desire to have clear differences between the Macintosh II and the SE. As a result, though, they have created a dislocation in the market, which is our big opportunity.

How large is the market for accelerators?

The unit volumes for accelerators are larger than those for displays, although the dollar volumes probably won't be. Monthly volumes for the whole industry are certainly in the thousands, rather than tens of thousands. If we assume 40,000 SEs sold per month, and if 5 to 10 percent of users elect to buy an accelerator, then it's a two-to-four-thousand-unit-per-month market. We find that the current sales rate of a system is a much better measure than the installed base for forecasting the sales of our products.

How are the manufacturers of IBM PC products changing the Mac market, now that they're entering it?

(continues)

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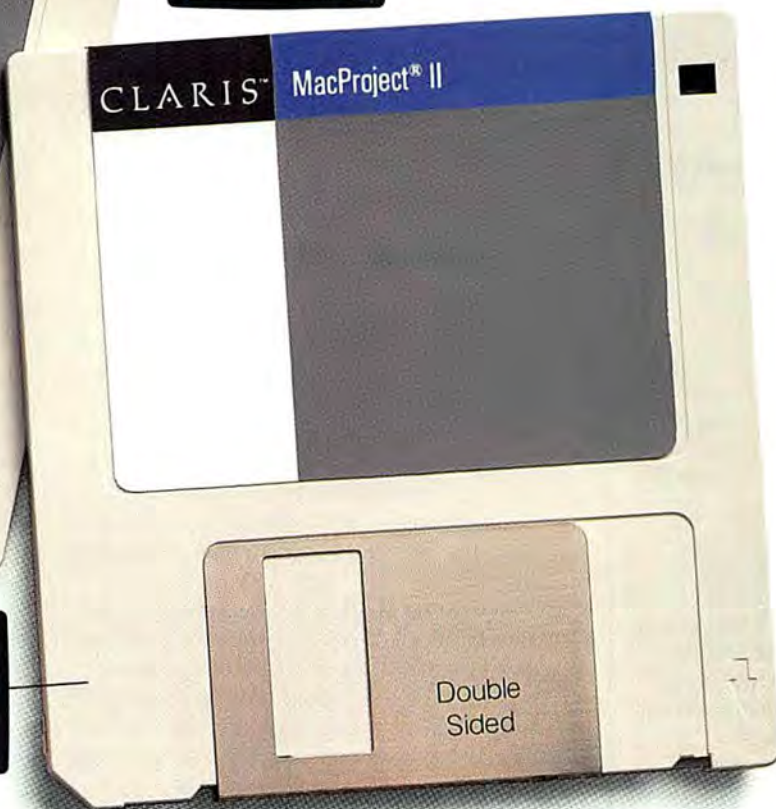
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We want to have a lasting effect on personal computing, like Software Arts did with VisiCalc.

In many cases they are financially stronger than the typical Mac companies and have more manufacturing expertise. On the other hand, I don't think that there is as much transfer of expertise on the product design and marketing side as you might suspect. IBM left a lot of holes in the PC. There were no serial ports, parallel ports, clocks, networks, and the like built in, nor was there enough memory. Finally, there weren't enough slots to add all the things that needed to be added. That created a great market for products like the AST Six-PakPlus, which is still an enormous part of AST's revenues. That stuff is all built into a Mac II, so more creative application-specific products are needed.

What's next at Radius?

We're very focused on graphics, so everything under development will involve the processing of pixels, whether it's displaying them, acquiring them, or somehow transforming them.

We don't want to do a lot of incremental products—the ones that Burrell calls “salami slice”—20 percent faster, 20 percent cheaper. We want to create new categories of products.

That's a challenge, of course. We have a lot of people to please: the products have to be interesting and challenging for the engineering team; they have to make some sense relative to our company identity and marketing strategies; and they have to offer the prospect of financial rewards.

We also try to restrict ourselves to products where we can add enough value that we're not just selling a commodity. By commodity products I mean products where price is the primary differentiation, rather than quality or performance. Those situations turn into competitive bloodbaths.

Some people suggest that we should develop a Macintosh clone. To us that

would be the most depressing business possible, because it's the antithesis of technological leadership. Our sole mission in life would then be tracking every step in the evolution of Apple's hardware and software—our idea of corporate hell.

In the long term we want to have a lasting effect on personal computing, like Software Arts did with *VisiCalc*, or Apple did with the Macintosh user interface.

One of the issues that seems to be delaying faster development of a new generation of graphics products is how to accelerate QuickDraw. What's the problem?

I think Bill Atkinson's aim in designing QuickDraw was more to get super performance out of a general-purpose microprocessor than it was to pave the way for a coprocessor assist in the future. QuickDraw contains a lot of special-case code for common operations, and the flow of control doesn't lend itself well to a hardware implementation. I think Apple is the most likely party to solve this problem, since Apple has control of the standard and can choose how to develop QuickDraw.

What are the issues in speeding up the model for QuickDraw?

It's always tough when you don't start with a clean sheet of paper. The evolution has to remain compatible with the current QuickDraw, just as it did when it moved from 1-bit deep to color. Apple wants to make QuickDraw amenable to hardware acceleration and may want to extend it in other ways, for instance real 24-bit support.

(continues)

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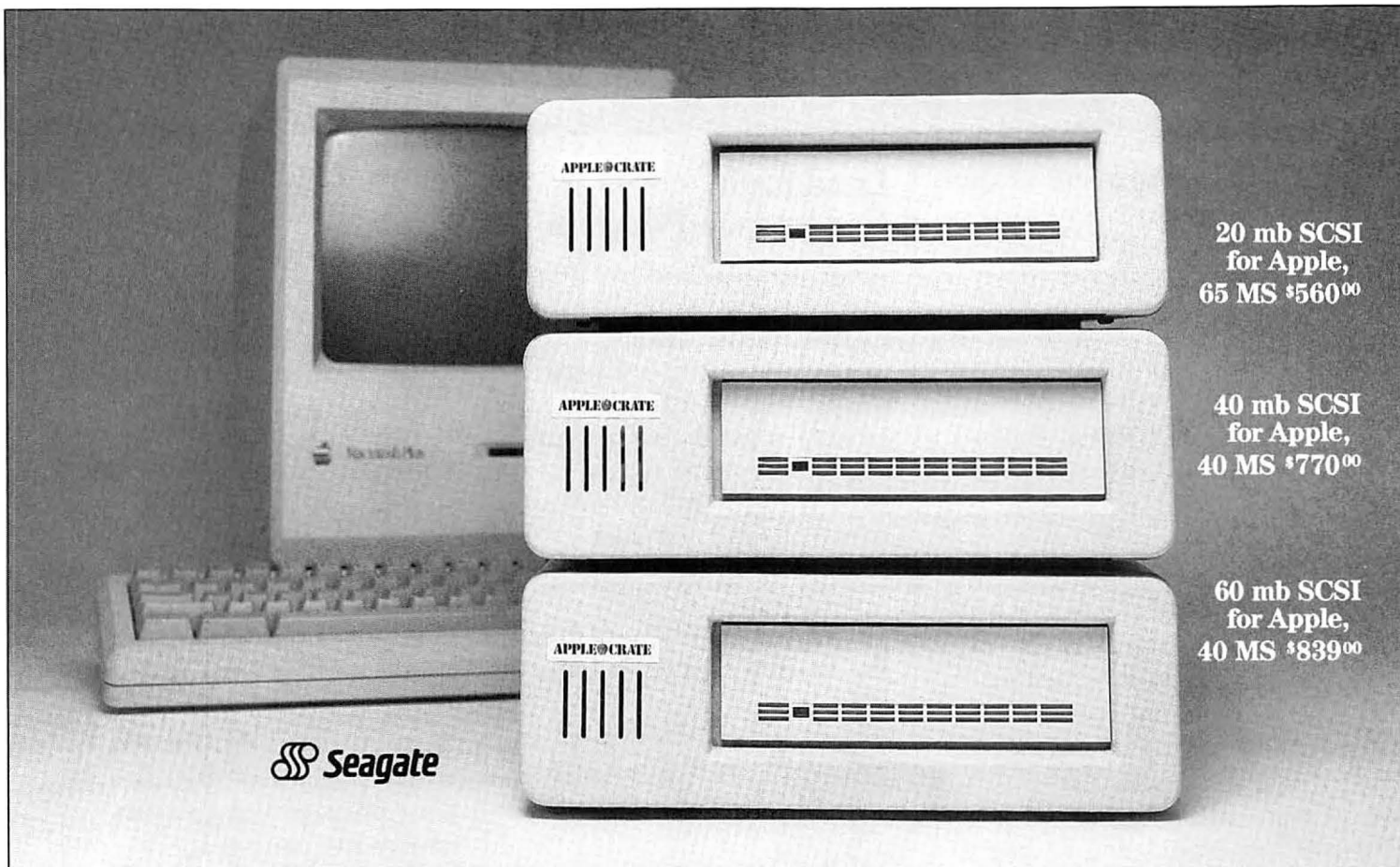
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From 'Project Management' by Barry Keating, *Macazine*, June 1986

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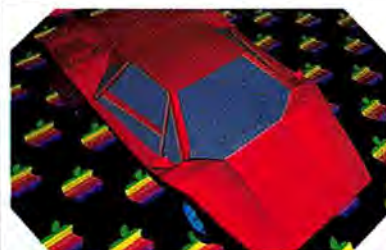
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Apple is playing for very high stakes and will always do products that make sense strategically.

How important is UNIX for the Macintosh?

It's not mainstream Macintosh. Having UNIX on the Mac allows Apple to look pretty serious about marketing a workstation-class machine, but it still feels like a trial balloon to me. I'll give Apple credit for putting a lot more resources behind A/UX than it did for Lisa UNIX, though. This version supports QuickDraw, the Toolbox, and lots of other interesting Macintosh features.

What is the impact of the MultiFinder environment?

MultiFinder is overwhelmingly positive. People grumble that they're being left behind if they have only 1MB of memory, but

I think that's the negative view. The positive view is that people with more than 1MB now have something very useful to do with that extra memory. And Apple has priced RAM aggressively, perhaps to blunt complaints about MultiFinder's RAM appetite.

Will the change in System software cause a lot of problems for customers?

There's always tension between innovation and stability, but Apple is bringing enough new functionality to the table that it's worth some adjustment. When we did the Macintosh, there were people at Apple who thought it had to be compatible with the

Apple II. The key is to make the big leaps infrequently and make sure you deliver enough benefits that the transition is worthwhile.

How many Macs do you estimate are out there now?

Let's see. I believe they shipped the millionth unit in March 1987, and I've seen estimates of 175,000 in the summer quarter of 1987, which would make three-quarters of a million per year. I suppose they'll be at around a million and a half by the end of the year.

What kind of problems are small developers having these days?

Having worked as an evangelist, I've looked at developers' problems from both sides. We hear lots of complaints whenever Apple appears to be competing with developers.

I have no illusions in this respect. Apple is playing for very high stakes and will always do products that make sense strategically. To suppose that Apple really wor-

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ries about what its next move will do to Radius is silly. No company can expect to thrive in the long term if benevolence is the only thing preventing another company from taking away all of its business. Every company in the Macintosh market had better be providing enough unique value to justify its own existence.

When will Microsoft Windows compete with the Mac in a real way?

To the extent that Aldus sells as many copies or more of PC *PageMaker* as of Mac *PageMaker*, Windows already does compete. Macintosh still has the edge in most

respects, though. The environment is relatively standard on every Macintosh, so Mac *PageMaker* comes on one disk, not on 10 or 12. The graphical user interface is available for all Mac applications, not just a few, as with Windows. There aren't disks and disks full of device drivers for every graphics card and printer in the world. But the systems are converging more and more.

Until the whole OS/2 Presentation Manager thing is real, and a large body of software supports it, there is a clear reason to buy Macintosh. Apple needs to use that

time to consolidate its position and to build new advantages. The enthusiasm and aesthetic sense that exist at Apple still count for something.

Many developers are talking about producing programs that cross environments, with a core of shared code and different front ends for Apple and IBM environments. How can Apple differentiate its software?

The advantages for developers in having nearly identical versions of their applications running under Windows and on the Mac are enormous. One way to differentiate the Apple environment is to minimize the pain of configuring and actually using the system. Apple has the lead there today, but IBM systems will become easier, and Apple systems are becoming more difficult as the number of system configurations multiplies. □

Interviewed by Jerry Borrell

General Ledger

- entire fiscal year available for reports
- user definable chart of accounts
- produces full audit trail

Payables/Receivables

- uses open invoice method
- prints checks, invoices and statements
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Payroll

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- accumulates QTD, YTD, W-2, 940 and 941 information

Inventory

- fully integrated with payables and receivables
- uses average weighted cost method
- handles adjustments and transfers

Jobcost

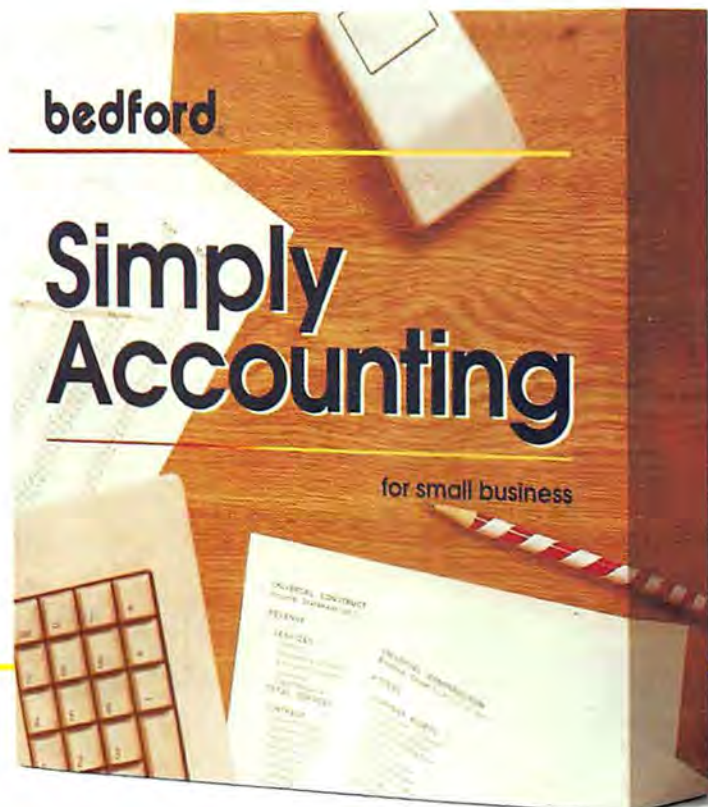
- distributes revenue or expense to projects or profit centers
- paycheck distribution includes the company's portion of FICA, SUTA and Disability Insurance

Requirements

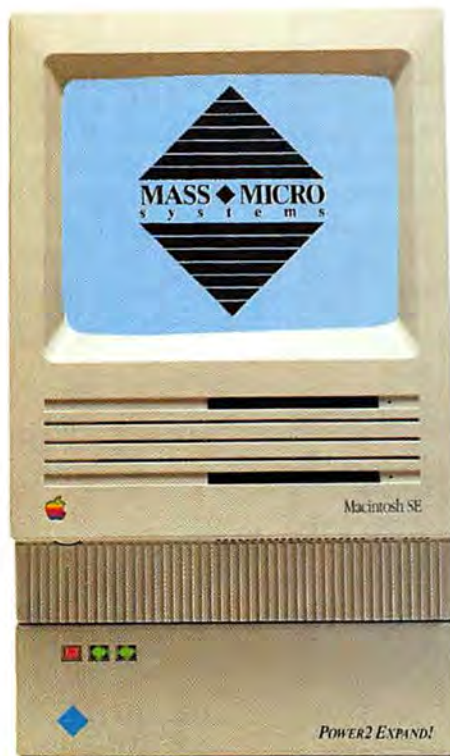
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Standard Features

- Six fully integrated functions
- Reports can be displayed, printed or exported
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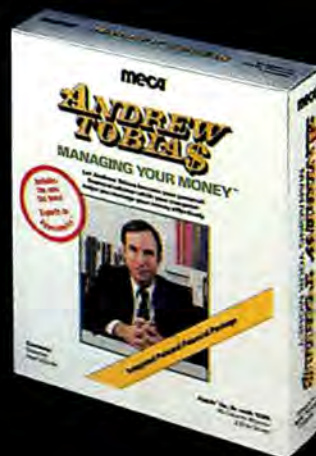
Compatible with all Mac Plus, SE, & II's		1 to 4	5 or more
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up to 32 Mb). And, like the Mac II, Prodigy SE includes a socket for the PMMU chip that is essential for Apple's® upcoming A/UX™. Boards without the PMMU lock you out of Apple's next-generation software.

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Macworld News

by Gil Davis



Professor Richard Dawkins teaches at Oxford University, where he wrote a program that simulates evolution.

The Blind Watchmaker



The paperback edition of *The Blind Watchmaker* (W.W. Norton & Co., 1986) illustrates the process of natural selection with a unique appendix—a Macintosh program. Author Richard Dawkins uses a computer model to support the central argument of the book—that evolution, as Darwin stated, is a cumulative series of gradual changes brought about by random mutation. Any mutation that makes

an organism better suited to survive in its environment is passed on to the organism's descendents via genetic encoding.

While the theory sounds straightforward, many people find it hard to believe that intricate biological wonders such as a bat's sonar or the human eye are the results of random changes. Dawkins, who teaches animal behavior at Oxford University, hopes *The Blind Watchmaker* will dispel popular misconceptions about Darwinism. Readers with access to a 512K or a more powerful Mac can send \$9.95 to W.W. Norton

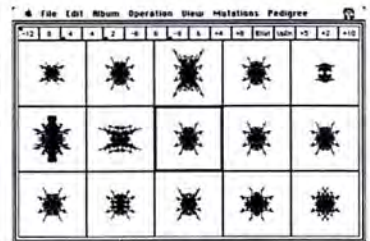
& Co. and receive a disk containing the *Blind Watchmaker* program.

The program starts with a random pattern—the parent *biomorph*—and applies various rules to a branching algorithm to create mutations. You then select the “best” offspring (selection criteria can be anything from meeting your aesthetic standards to resemblance to a real creature). The chosen offspring becomes the new parent, generating its own batch of mutated offspring. The process continues as long as you wish. A genetic-engineering option allows you to tinker with your creation's 16 genes, fine-tuning it by controlling aspects such as type of symmetry and number of segments.

According to Dawkins, simulating evolution on a computer is a vivid way to illustrate the processes involved: “I wanted the program to have the real-life quality of emergence—things should emerge that nobody had ever seen before.” The program certainly accomplishes that goal, on occasion creating organisms out of a science-fiction writer's nightmares. On the other hand, Dawkins was surprised at how closely many of the organisms resemble real-life plants or animals.

The program has aesthetic as well as educational appeal: *The Blind Watchmaker's* patterns could be used by artists or designers as graphic elements.

If neither science nor art motivates you to play with evolu-



These “insects” were created by Macworld's Cathy Abes.

tion, perhaps money will—the publisher is offering \$1000 to the first person to duplicate a specific biomorph (aptly called—and shaped like—the Holy Grail) published in the appendix. According to Dawkins, the program is capable of generating about one million trillion unique biomorphs, give or take a few million, so don't start counting your prize money yet.—Erfert Nielson

New Music High



We already have software that lets us create, play, and print music using a Mac. A whole new level of creativity is now possible with a combination of hardware and software that integrates computer music and sampled sounds within a new digital audio console controlled by a Mac—instead of by hundreds of knobs.

This is now possible with digital signal processing (DSP),

(continues)

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Animation adds power and persuasiveness to any presentation, whether it's next year's business plan or today's lesson plan.

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Plus comprehensive timing options, sound effects, music...and the excitement of color. VideoWorks II works great with the Macintosh II (in either 16 or 256 colors) or the 512, Plus, or SE.

Create animated presentations without being an artist.

The VideoWorks II package comes with its own library of ready to use pre-created artwork, movies and "clip animation" (e.g. flags waving, a cannon firing). In addition you can take images from PICT, MacPaint, Glue or other sources and animate anything from a business presentation to a rock video. (You can also use VideoWorks II for your *nonanimated* slide shows.)

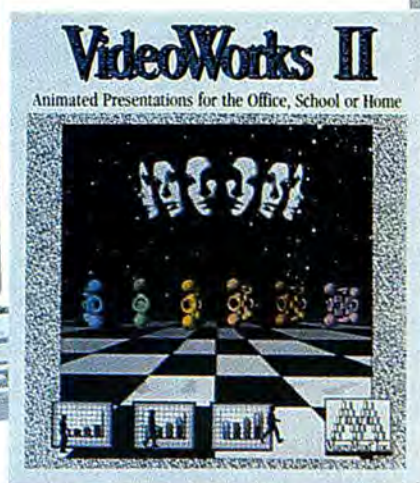
The original VideoWorks made history. (*MacUser* called it "the most innovative program of the year." Disney Animator Frank Thomas said it was, "the best program I ever used.")

Now, VideoWorks II is so improved it's virtually a whole new program. It gives you more than just graphics, it makes your presentations come alive! See it at your local software dealer.

Suggested retail price: \$195.

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Comes with three 3.5" disks (800k each): the Program, Clip Animation, Artwork and Movies; and a Guided Tour training disk. Not Copy Protected. *Clip Animations™*, *Clip Charts™*, *Clip Sounds™*, *Movies*, the *VideoWorks II™* *Hypercard Driver* and *VideoWorks II™ Compiler* disks are also available.

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which employs new sampling technology and application-specific integrated circuits. DSP has taken the studio- and stage-sound processor market by storm.

Up to now, DSP technology was limited to inexpensive units based on small, 8-bit microprocessors. Users had to punch in arcane multifunction button combinations and decipher cryptic readouts. (Doug

any mix setup as a "snapshot." As a librarian, it catalogs those snapshots. And as an interactive controller, it provides real-time mixing using the mouse and instant recall of snapshots.

To record and play back automated mixes, you'll also need a MIDI sequencer program, a tape deck, and/or a synthesizer. During playback, you'll see knobs move on your display screen while your Mac recre-

ates a recording session. As a mix runs, you can perform real-time changes if inspiration strikes. For more information about *DMP7 Pro*, which lists for \$395, call Digital Music Services in Laguna Hills, California, at 714/951-1159.

avor of its MS-DOS cousin. MicroPro president Leon Williams maintains that to subvert the most advanced interface in the business is to deny evolution. MicroPro promises a powerful blend of word processing, desktop publishing, and drawing capabilities that will exceed anything now available for microcomputers; the company describes it as a full-featured word processor with 85 to 90 percent of the features found in Aldus's *PageMaker*, plus a comprehensive drawing tool kit.

The product differs, however, from integrated programs like Lotus's *Jazz* or Microsoft *Works*, which require mode switching to use different aspects of the program. Drawing tools, for example, pop up over a document much like the palettes in *VideoWorks II*.

For handling text, Mac *WordStar* will offer complete control over leading and kerning and will contain the Houghton-Mifflin spelling and hyphenation dictionaries. At first, that might sound a lot like Ann Arbor Softworks' *FullWrite Professional*, but Williams claims that his product will provide superior layout and drawing capabilities. Aside from business considerations, MicroPro's entry into the Macintosh market may be partially fueled by the

fact that Williams is a long-time Macintosh enthusiast.

For more information, call MicroPro in San Rafael, California, at 415/499-1200.

—Daniel Brogan

An Entertainer's User Group



In addition to the latest in Macintosh music (and its associated film, video, recording, and graphics capabilities), attendees at last December's Mac-Music Fest 1.0 in Los Angeles (cosponsored by Apple Computer and Filmsonix) saw the offerings of a unique new Macintosh user group: MEGA, the Macintosh Entertainment Group of America.

MEGA is a professional organization for the entertainment industry and related academic departments. As such, it provides an exclusive environment in which its users can address industry-specific topics.

It is the brainchild of three people: Chris Stone, owner of the Record Plant; Joel Moss, noted recording engineer; and Peggy McAfee, codirector of Filmsonix (an affiliate of the Record Plant).

MEGA meets once a month in Hollywood on the lot of Paramount Pictures. In keeping with the film and spirit, each meeting is recorded and members are sent audiocassettes (videotapes carry a \$15 surcharge). The group's newsletter, *MEGAzine*, features departments on Macintosh applications for every facet of the entertainment industry. And Filmsonix is developing exclusive stackware and other tools of the trade that are available to

(continues)



DMP7 Pro software lets a Mac control Yamaha's DMP7 Digital Mixer, providing high-end capabilities at a low price.

Adams's game *Bureaucracy* seems tame by comparison.)

The Mac is coming to the rescue with the combination of Digital Music Services' *DMP7 Pro* and Yamaha's DMP7 Digital Mixer (list price \$3995). *DMP7 Pro* is a full-function editor/librarian/interactive controller for Yamaha's DMP7. It does everything a traditional eight-channel stereo mixer can do, and more.

Used by itself, the DMP7 sets levels, pans, equalizations, subgroupings, mutings, fade-ins, and fade-outs via traditional moving faders and multifunction knobs. Unfortunately, the DMP7 has a tiny liquid-crystal display for monitoring its many complex functions.

Connect your Mac to the DMP7 via a MIDI interface, and the *DMP7 Pro* software fetches previously hidden functions and displays them. As an editor, it allows changing and resaving

ates a recording session. As a mix runs, you can perform real-time changes if inspiration strikes. For more information about *DMP7 Pro*, which lists for \$395, call Digital Music Services in Laguna Hills, California, at 714/951-1159.

If only Jimi Hendrix were still around to see it.

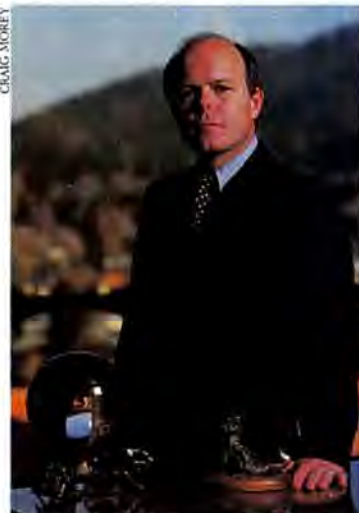
—Craig O'Donnell

Mac WordStar



MicroPro's *WordStar*, the granddaddy of microcomputer word processors, is coming to the Mac—though you'll hardly recognize the old boy.

Unlike *Microsoft Word* and *WordPerfect*, MicroPro International's first Mac offering won't even try to incorporate the fla-



Leon Williams, president of MicroPro, looks forward to bringing WordStar to the Mac.

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

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Celebrating the first MacMusic Fest are (from left) Joel Moss, Peter Szilosi, Peggy McAfee, and Chris Stone—all with MEGA.

MEGA's members on a 24-hour BBS.

Other perquisites for MEGA users include Filmsonix's new Apple VAR satellites at the Record Plant and on the Paramount lot. There, MEGA members have the opportunity to put together their Macintosh systems with the aid of a fellow entertainment-industry professional. MEGA membership cards assure significant discounts at local dealers, and MEGA also has a 24-hour hotline in the works. Finally, an annual "MEGIES" awards show is planned.

In addition to supporting the lobbying efforts of this large segment of the Macintosh community, observes MEGA codirector McAfee, "MEGA will ensure that all third-party developers will now have a veritable sea of powerful endusers for their products."

MEGA's annual membership fee is \$300. For further information, call MEGA at 213/653-0240.—Christopher Yavelow

UNIX Enhanced on the Mac



Apple has strengthened the Macintosh connection to the widely used UNIX operating system by acquiring a 25 percent interest in List, an Italian software developer. List developed *MacNixNet* and *Makeasy*, products that provide a Macintosh interface to UNIX via Ethernet and VMS operating systems, respectively, and RS-232 serial lines. The delayed release of *A/UX*, Apple's own version of UNIX, and the absence of a Macintosh interface for *A/UX* no doubt influenced this move.

Like *AlisaTalk* from Alisa Systems, *MacNixNet* lets you transfer files between Macs and other computer systems running UNIX by simply dragging icons from the desktop into separate windows running un-

der UNIX. It also prompts the UNIX user for appropriate responses, using Mac-like dialog boxes. Both capabilities make UNIX much easier to use.

Makeasy is similar to *Helix/VMS* from Odesta in that it provides file-transfer capability between the Mac and DEC's VAX computers. *Makeasy* goes one step further, though, allowing applications under DEC's VMS operating system to run on the Mac. Thus VAX users can access all Macintosh applications, and Macintosh users can access applications running on VAX computers through standard Macintosh features: windows, icons, and mouse interaction.

Apple Computer Italy originally became involved as a result of List's development work for the Italian telephone monopoly, Italtel. List joined a codevelopment project with Italtel to develop software that allows the Mac, while running *A/UX*, to act as a terminal to Italtel's PBX network.

MacNixNet updates *MacNix*, which has been marketed for over a year in the United States through Eurosoft International, in Saratoga, California, (408/741-0739). List prices vary from \$900 to \$7500 depending on the server—there is no limit to the number of Macs that can be connected to this network.

Affordable Electrostatic Plotting



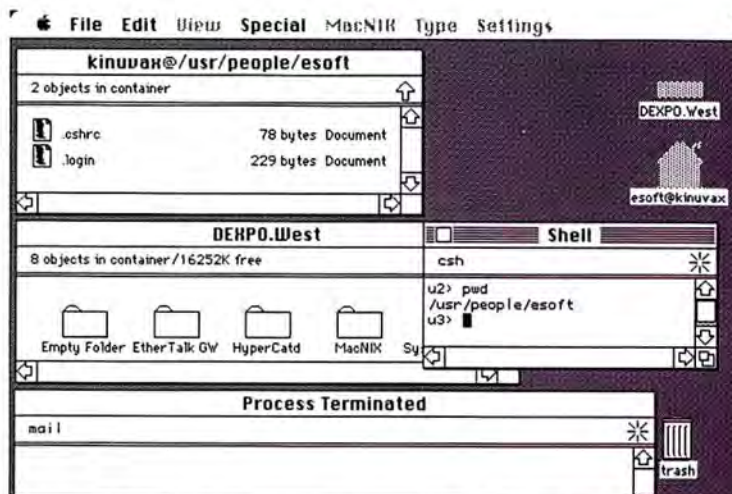
As architects and engineers know, ink plotters can leave a lot to be desired—especially because of ink skips and slow throughput rates. And although electrostatic plotters offer a fast, accurate, and clean printing alternative, they can cost anywhere from \$60,000 to \$150,000.

For a less expensive alternative, Blue Print Service Company and Macroprint of San Francisco, in cooperation with Versatec of Santa Clara, California, are offering Macroprint Electrostatic Plotting. This service uses a Versatec 7444 plotter that can produce a drawing up to 44 inches wide and virtually any length—at 400 dots per inch—in just 45 seconds.

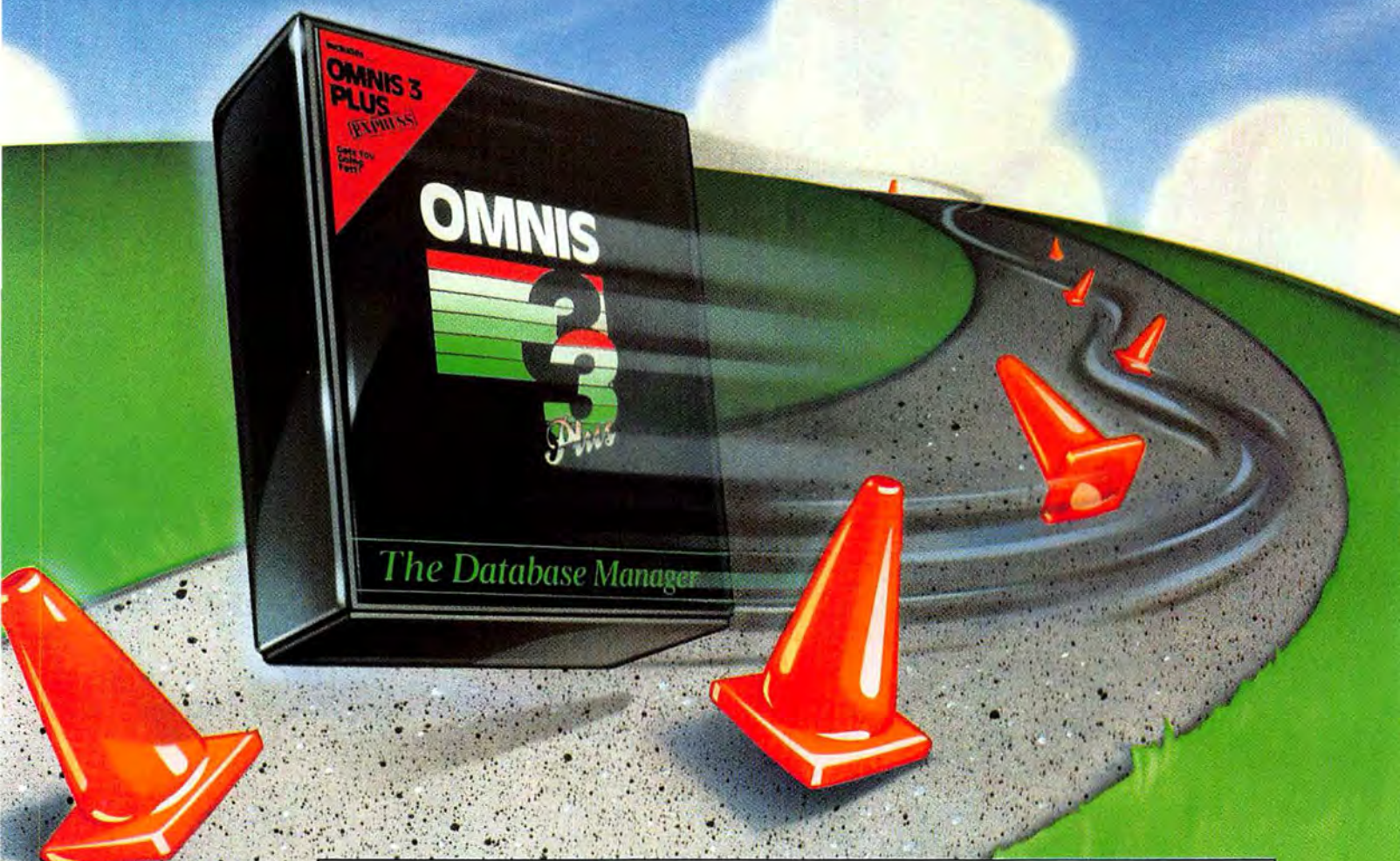
Although the plotter's vector format prints only in Geneva, other formats can produce any bit-mapped font. The Versatec plotter also supports adjustable crosshatching and bit-mapped patterns. Drawings can be plotted on vellum, bond, or mylar, either right or reverse reading.

For companies that own their

(continues)



MacNixNet brings an important new capability to the Mac II by enabling you to run applications written for DEC's VMS operating system using standard Mac windows and icons.



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own Versatec plotters, Macroprint also sells the *Macroprint* software and cables for connecting up to 386 PCs, workstations, mainframes, micro VAXs, and Macintoshes to the same plotter.

Michael Greene, of Greene Inc., was one of those 80. He and his family loved the game. When Buckland sent out the long-promised announcement of the enhanced version of *CrystalRaider* last summer,



Rolling out of this electrostatic printer, which is much faster than a plotter, comes a 44-inch-wide blueprint at 400 dpi.

The service costs \$125. This includes the registration fee, a one-year subscription to *CAD/CAM Journal*, the Versatec plotter-driver software necessary for converting your drawings, and two free prints. After that, the price is \$3 per square foot of printed material. Macroprint outputs virtually every program currently available for the Macintosh. For more information, call Blue Print Service Company at 800/221-PLOT; in California call 800/521-PLOT. —Jim Morton

Honesty Pays

Brilliant British programmer Patrick Buckland had a smash hit with *CrystalRaider*: Thousands of people downloaded or copied the shareware game and quickly became hooked on its fast, arcade-quality action and sharp, intricate white-on-black graphics—but only about 80 players actually sent Buckland the modest £12 (about \$22) shareware fee.

Greene was delighted. But this is such a great game, he thought—it's a shame it isn't commercial.

Greene Inc. approached Buckland, who lives in Ventnor on the Isle of Wight, and Buckland leapt at the chance to take *CrystalRaider* commercial. Thanks to Greene's previous shareware honesty, Buckland decided to let Greene Inc. market the game.

Through extensive market surveys, Greene discovered that adults and kids alike wanted the game to have a two-player option—there was too much fighting over who gets to play. Another inspiration was to make *Crystal Quest*—the newly



Watch out for *Crystal Quest's* laser-shooting Menaces.

named game—play in color on the Mac II. The sounds have been completely redone (the new sounds occupy 350K), and there's a new way to score high bonuses: capture the special crystal. Further enhancements include improved mouse control, a demo mode, several new and unspeakable "nasties," and smart bombs that blow up a whole screenful of enemies when things get too crowded.

Crystal Quest is priced at \$39.95. For information, call Greene Inc. in Monterey, California, at 408/375-0910.

—Felicity O'Meara

Bargain-Basement CAD

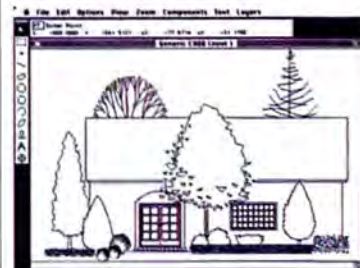


More than 20 computer-aided design (CAD) packages are currently available for the Mac, attesting to engineers' and architects' growing interest in the Macintosh. The packages range in price from less than \$50 to more than \$7000; capabilities run from basic 2-D drafting to sophisticated 3-D solid modeling.

New to the Macintosh CAD scene is Generic Software's *Generic CADD Level 1*, which is primarily differentiated from other Macintosh CAD products by its affordable \$74.95 price and its history of success in the MS-DOS market. Scheduled for release last month, it offers an array of basic CAD functions, including Undo, Redo, Rotate, and Zoom commands; 256 drawing layers; and the ability to snap to existing geometry. *Level 1* doesn't provide features like filleting and chamfering, automatic dimensioning, advanced splines, or macros for automating command routines. However, these capabilities will be available in the future in *Level 2* and *3* and in add-on packages to those levels.

Level 1 supports Generic Software's line of symbol libraries and is compatible with MultiFinder. It also lets you cut and paste *Level 1* drawings into other programs that use standard PICT format, such as *MacDraw* or *SuperPaint*, and edit multiple drawings in separate windows simultaneously.

Level 1 won't display colors on a Mac II screen, but it will allow you to assign colors to plotter pens using an add-on utility



Computer-aided design is affordable with this new offering from Generic Software.

program. Plotter support also requires an add-on program.

For a relatively low price, *Level 1* offers a fairly broad range of introductory-level features. For more information, call Generic Software in Redmond, Washington, at 800/228-3601. —Marina Hirsch

Hi-Res Presentations



Using an unusual liquid-crystal display (LCD) technology, In Focus Systems has developed a line of advanced PC Viewers that allow standard overhead projectors to enlarge Macintosh screen images for viewing by large audiences.

Computer-screen projection panels that work with overhead projectors aren't news; they've been available for PCs for a couple of years, and Macintosh-

(continues)

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One model of the In Focus overhead projection unit stores up to 75 screen shots that can be displayed without the Mac.

compatible models were introduced in late 1987. But although these devices use the same kind of display panel found in most laptop computers—standard, flat, LCD panels that can be used like transparencies on overhead projectors—the process is not without problems.

The biggest problem is the heat generated by projectors. Standard LCD panels don't work effectively at temperatures above about 120 degrees Fahrenheit. Early users of projection panels complained of loss of contrast or even total blackouts after the panels heated up during long presentations.

Several companies dealt with the heat problem by adding fans to their units. Now, In Focus has incorporated a heat-resistant LCD that works at temperatures up to 149 degrees Fahrenheit. The company has introduced three PC Viewers that work with all Macintosh and IBM PS/2 models. Each Viewer offers 640-by-480-pixel resolution.

The top-of-the-line PC Viewer includes an infrared remote-control unit that allows windowing, paging, and scrolling. The most unusual feature is a full megabyte of display memory that can store up to 75

downloaded screen shots, allowing users to make computer-generated presentations without the computer. It can recall stored screen images in any order, and a special-effects generator allows for wipes, fades, and other transitions.

For more information, contact In Focus Systems, Inc., Tualatin, Oregon, at 503/692-4968.—George Beekman

MacDraw II Is Major Upgrade

Long one of the most popular graphics programs for the Macintosh, *MacDraw* is about to be upgraded to *MacDraw II*, which will include color, ultra-fast screen redrawing, a high degree of customizability, and a whole range of other new features. *MacDraw II* comes from Claris.

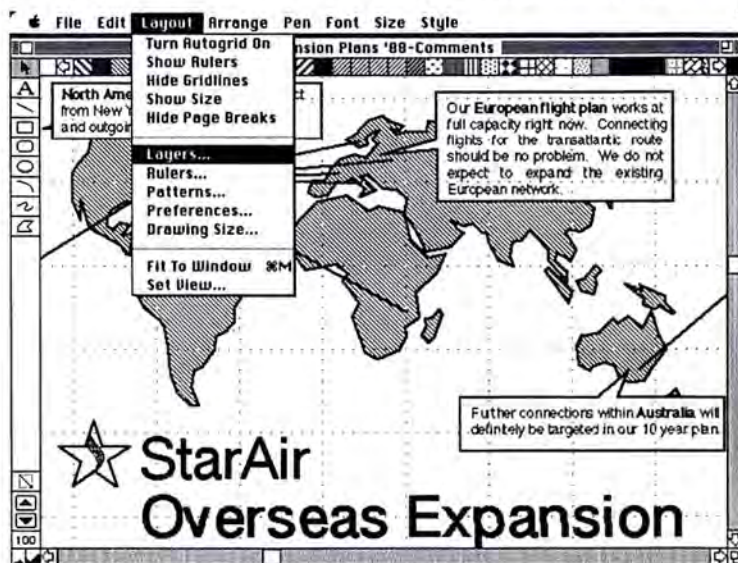
The first apparent difference from the original program is *MacDraw II*'s ability to simultaneously display up to 256 colors on the Mac II. Besides regular color printouts, color

separations can be created using *MacDraw II*'s layers (only layers visible on the screen are printed).

The second big difference is *MacDraw II*'s blazingly fast screen refresh, in which even complicated color drawings come to life in their new positions in a few seconds or fractions of a second.

You'll also notice a horizontal strip of little boxes across the top of the drawing screen. This strip is like a scroll bar, except that it contains up to 16,000 instantly available, customizable patterns or colors.

Use *MacDraw II*'s 30-level zoom feature and you'll find yourself positioning objects at the equivalent of 2000 dots per inch. The program supports both QuickDraw and PostScript printers, but not encapsulated PostScript.



MacDraw II, a major upgrade of *MacDraw*, includes much faster screen redrawing and up to 256 colors.

Other *MacDraw II* capabilities include justification and rotation of text; customization of fonts, sizes, and styles; custom leading; creation of a graphics library using any element in a drawing; custom rulers and dashed lines; reshaping of polygons and the addition and removal of handles; and alignment of different shapes to a grid—you specify which point

on the shape should align to the grid.

Claris will provide an upgrade path for owners of the original *MacDraw* and support for *MacDraw* owners who register their programs with Claris. For more information, call Claris in Mountain View, California, at 415/960-1500.

True dBase Compatibility

Fox Software intends to bring all the features of its best-selling *FoxBase + MS-DOS*-version database to the Macintosh. Called *FoxBase +/Mac*, it's expected to have the same high level of compatibility with

dBase III Plus as the MS-DOS program.

The Mac version will be able to read files from the MS-DOS version, as well as read *dBase III* code. This means the immense library of third-party applications written in *dBase III* will become available to Mac

(continues)

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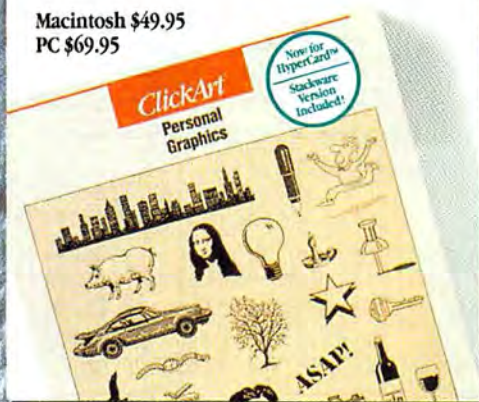
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users. Nantucket's *MacMax* and VersaSoft's *dbMAN-MAC* already offer this ability, but Ashton-Tate's *dBase Mac* does not. *FoxBase*, however, promises fuller compatibility and greater speed. The program is written entirely in C, and Fox claims its product will be at least twice as fast as *MacMax*.

FoxBase+Mac will support a command window and up to nine open output windows simultaneously. They will be moveable, scrollable, and sizeable with full support of cut and paste functions, font styles and sizes, and even color for the Mac II. *FoxBase+Mac* will enable you to create user-definable controls such as menus and buttons, and the program will support multiple import and export formats. Among the export options will be the ability to save a database as a *HyperCard* stack.



FoxBase+Mac sports commands for dBase functionality.

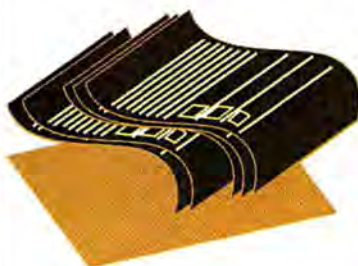
The Macintosh version of *FoxBase+* is expected to ship by March, and will probably list at \$395. For more information, contact Fox Software, Perrysburg, Ohio, 419/874-0162. —Scott Beamer

A First for Apple's Claris

Apple's spin-off software company, Claris, has chosen two related forms-generation programs as its first all-new offerings. Claris expects a big response to these products because in corporate

America and in government, almost every organization needs its own tailor-made forms.

Claris's *SmartForm Designer* has many tools specifically created for laying out forms. Most form designs include one of four write-in areas: a field, list, check box, or comb (that irksome series of small boxes that forces you to



write a letter in each box). Each of these form areas can be quickly and easily produced with a single tool. What would normally take hours with a drawing program can be reduced to minutes with *SmartForm Designer*, which also has highly precise positioning tools for lining up each area with other areas.

SmartForm Manager optimizes how a form is printed and utilized. A company may keep its forms on disk so they can be filled out, transmitted, and read on screen, or it may print out its forms on QuickDraw or PostScript printers.

Filling out a form with *SmartForm Manager* is far different from completing a paper form. A field can limit the types of characters allowed. The form designer can include instantly available information about how to fill out each area. Certain fields can have scratch pads and calculations available for preliminary work, and fields can be linked to fields in other forms so that some data has to be entered only once.

SmartForm Designer and *SmartForm Manager* will list for \$395 and \$149, respectively. For further information, call Claris in Mountain View, California, at 415/960-1500.

This Little Game Went to Market

In this day of Mac IIs and 1000-megabyte hard disks, you wouldn't think a programmer could do much with a 512K unenhanced Mac and two 400K floppy drives. But when Cliff Johnson, a former University of Southern California student and film animator bought his first computer, a 512K Mac, at the end of 1984, he decided to create a game for it, even though he'd never touched a computer before.

The game had started out as a mystery story that Johnson made up as a Christmas gift for his friends. He had bound together photocopies of his tale and challenged his buddies to solve its puzzles. When a friend suggested that Johnson might recreate the game on the 512K Mac, Johnson decided to give it a try. One slight problem though: he had no idea how to program. Not knowing any better, he taught himself *Microsoft Basic*.

Johnson's experience in animation helped to motivate, stimulate, and guide him dur-

ing the development of the resulting game: *The Fool's Errand*, the ultimate brain-teaser. Making an animated film is a very tedious frame-by-frame process. You create a huge blueprint—a jigsaw puzzle if you will—and then slowly put all the pieces together until you have the whole picture. Johnson figured he could approach programming in much the same way.

Two years later (after having switched to *ZBasic*), Johnson appeared on the doorstep of Miles Computing with a copy of *The Fool's Errand*. The company was so impressed that it bought the game then and there. A devilish mixture of adventure, mysteries, puzzles, and brain teasers, *The Fool's Errand* is one of the most entertaining, addictive computer games to appear, and it is fast becoming popular.

It's amazing that *The Fool's Errand* was Cliff Johnson's first effort at programming, but that's the Mac for you. Expect more offerings from Johnson in the future, including a game called *The Puzzle Gallery*. If *The Fool's Errand* makes you tear your hair out, *The Puzzle Gallery* is sure to send you to your local toupée store.

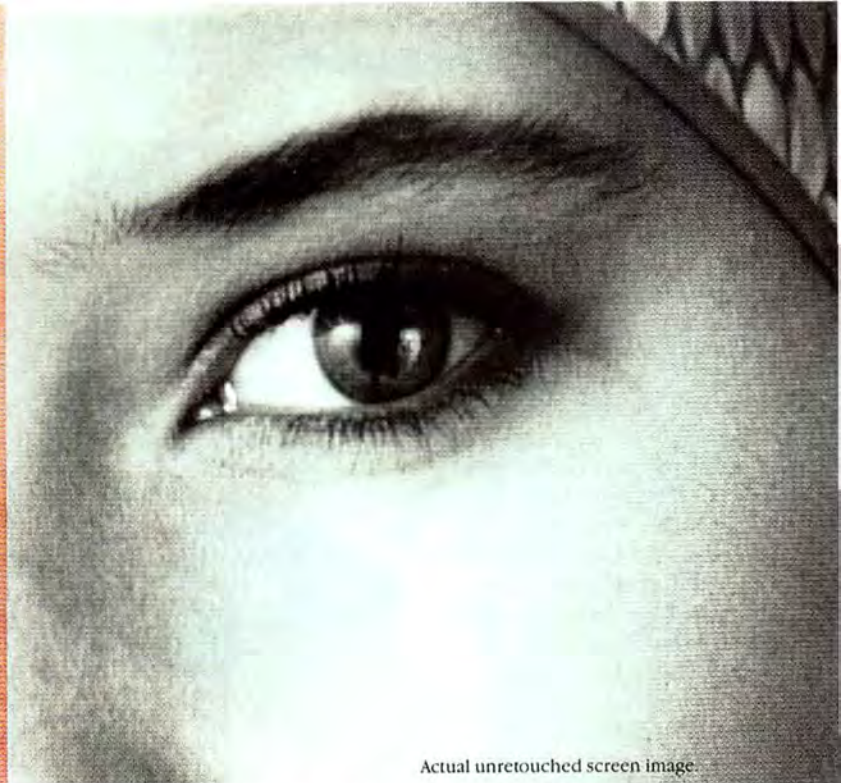
—Rob Hahn



Cliff Johnson's first program was *The Fool's Errand*: an addicting game that features adventures and puzzles.



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HYPERCARD

Hot Stacks

 HyperCard author Bill Atkinson recently toured the United States telling user groups about his ambition for *HyperCard*: to create a program-construction set so simple to use that programmers will feel comfortable sharing their work without asking for money. It appears the Macintosh world is giving Atkinson what he wants.

Public-domain and shareware libraries are hyper-stuffed, though as one would expect in an adolescent industry, some of the work is not worth sharing. Here's what has emerged as the most important stackware so far:



Stack Ideas is one of the hottest HyperCard stacks.

■ **Address** This stack, which is much like a Rolodex, is part of the disk set that shipped with *HyperCard*, and it stands alone among productivity stackware. *Address* shows *HyperCard* to be the first database program meant for mortals. It seems every *HyperCard* owner uses *Address*, and nearly all of them modify it to suit their tastes.

Here's a tip: once you've filled in an *Address* stack, you're going to want to print mailing labels. The Print Report menu item, which you use to print labels, doesn't offer the option of printing individual labels—it's either all the cards in the stack or none. The trick is to make a background button whose script creates a new stack containing only those address cards for which you want

labels. HyperTalk's doMenu command lets you automatically copy and paste to a new stack.

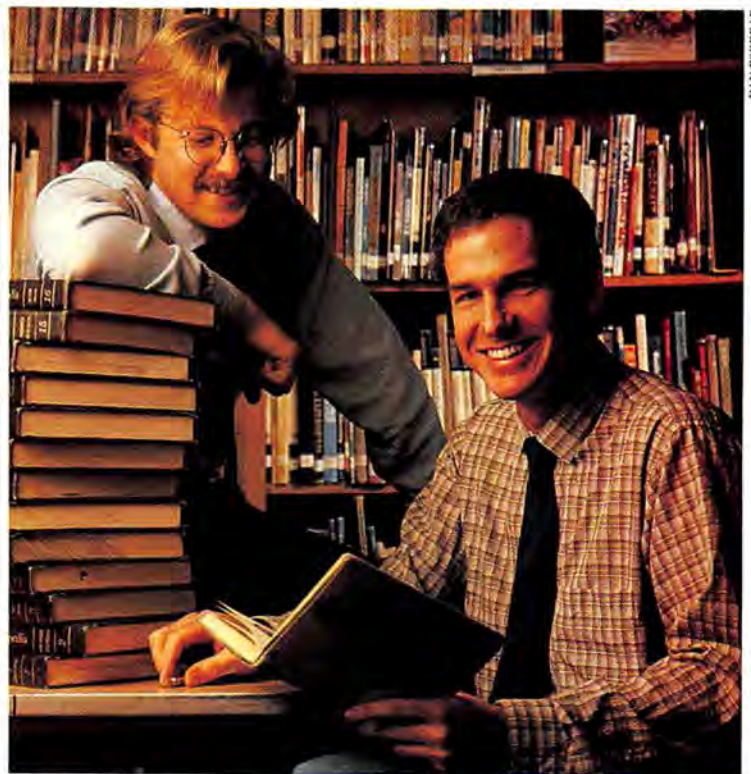
■ **Stack Ideas** Also part of the original *HyperCard* set, *Stack Ideas* is incredibly useful. If you want to produce a memo, calendar, sales invoice, disk listing, picture file, notebook file, or any of 66 other possibilities, you can start with a hand-drawn card plucked from the stack. Some enterprising author ought to create even more possibilities by publishing *Stack Ideas, Part 2*, since the most difficult part of creating a good stack is creating a good-looking design.

■ **Menus for HyperCard** Finally, a new stack that's hot. Written by Michael Long of Nine to Five Software, this one's for script writers who are tired of interacting with buttons. The stack uses a handful of external commands and functions to allow you to append pull-down menus to the *HyperCard* menus.

■ **Home Desk** This stack doesn't do much more than the multitude of other home-stack clones, but it looks great. A beautiful, fully supplied rolltop desk is packed with buttons for starting up other stacks or applications. (P.S.—The combination to the safe hidden behind the book is 2-4-6-8.) *Home Desk* was written by Russell A. Lyon.

■ **Script Report and Deprotect** These two stacks (as well as the application *Stack Detective*) are utilities for examining the scripts of stacks, including those not accessible through *HyperCard* dialog boxes. *Script Report* is by Eric Alderman, *Deprotect* is by Ned Horvath and Allan Foster, and *Stack Detective* was written by Peter Olson of SignalVideo.

Public domain and shareware stacks are available from nonprofit user groups such as the Berkeley Macintosh Users Group. Their prices (\$3 per



Mike Westphal (left) and Hunt Stoddard read *Old Yeller* in a Los Gatos, California, library that uses *HyperCard* library software.

800K disk at BMUG) are considerably lower than those charged by many commercial distributors. Order from BMUG, 1442-A Walnut St. #62, Berkeley, CA 94709. —Scott Kronick

HYPERCARD

Library Runs on HyperCard

 Use a \$5 *HyperCard* stack to run a library? That's the idea behind *Open Stack*, a new *HyperCard* application that eases the burden of library management. The stack helps librarians perform basic tasks for acquisitions, cataloging, circulation, patron cards, overdue notices, reserve notes, and book labeling. Each screen contains text and numerical-entry fields appropriate to that aspect of library management.

Open Stack operates interactively between cards. Each time you create a new card in any one of four stacks (acquisitions, cataloging, circulation, or labels), *Open Stack* creates a new card in the other three. Text typed into any field automatically replicates itself in

(continues)

Your Best Stacks

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

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*PC Tech Journal (August 1987) showed that 49.7% of readers who responded to a questionnaire felt that Macintoshes would be of importance to their companies in the future.



PC users can access and share files from Macintosh users' folders.



Macintosh users can access files from PC users' directories.



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corresponding fields in the other cards and stacks.

You can also customize *Open Stack*, creating or deleting fields and arranging them in any order. Users who normally tab to the next field to enter data can modify the tabbing order. *HyperCard*'s built-in painting tools even enable you to change the graphic appearance of each card and design custom printouts.

Open Stack authors Mike Westphal and Hunt Stoddard of Walking Shadow Press are encouraging users to make improvements so that *Open Stack* will serve as a seed for increasingly powerful and versatile applications. To order *Open Stack*, write the Apple Library Users Group, 10381 Bandlely Dr., Cupertino, CA 95014.

HYPERCARD

Turning HyperCard into a Database

Despite widespread complaints that many *HyperCard* stacks currently on bulletin boards are relatively useless, there are some signs that *HyperCard* is

becoming a serious development tool.

For example, Nine to Five Software's *Reports* overcomes one of *HyperCard*'s strongest deficiencies: its free-form database, which makes it difficult to extract field-specific information. This \$99 output generator greatly extends *HyperCard*'s database abilities by producing detailed row-and-column reports as well as complex, free-form output for invoices, checks, and statements.

HyperCard stacks have become an advertising medium. Publishing Resources has created a stack that contains over 800 PostScript-compatible typefaces from such vendors as Adobe, CasadyWare, Century Software, Image Club, Altsys, and T/Maker. Called *The Typefaces of Desktop Publishing*, it allows users to quickly browse font styles and alphabets.

Walking Shadow Press publishes a free monthly newsletter dedicated to *HyperCard*. Called *The Open Stack*, it contains tips on working with *HyperCard* and news of recent developments.

For more information, contact Nine to Five in Greenwood, Indiana, at 317/887-2156; Publishing Resources in Boulder, Colorado, at 303/442-1100; and Walking Shadow Press, P. O. Box 2092, Saratoga, CA 95071.



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Legend: Second Notices are sent at 30 days.
Third Notices are sent at 60 days.
Final Notices are sent at 90 days.

Stack: Accounts Receivable Sorted by Month of Invoice Date, Last Name, and Invoice #

CUST COMMENTS #	INVOICE DATE	INV #	CUSTOMER'S NAME	PHONE #	INVOICE	TOTAL DUE
1001	03/04/87	4105	Epperson, Hugh	317-881-1234	\$ 212.50	\$ 182.50
1001	04/12/87	4106	Epperson, Hugh	317-881-1234	\$ 185.00	\$ 185.00
1001	04/25/87	4107	Epperson, Hugh	317-881-1234	\$ 212.50	\$ 212.50
1050	04/14/87	4115	McKenzie, Spud	317-283-8978	\$ 405.00	\$ 405.00
Total For Month 04					\$ 802.50	\$ 802.50
Average For Month 04					\$ 267.50	\$ 267.50
1129	05/02/87	3223	Brown, David	317-861-7511	\$ 157.50	\$ 157.50
1001	05/30/87	4108	Epperson, Hugh	317-881-1234	\$ 267.50	\$ 267.50
1028	05/12/87	3412	Hardy, Florence	317-899-4731	\$ 450.00	\$ 450.00
1018	05/06/87	3349	Jones, Kim	317-763-6129	\$ 185.00	\$ 140.00
1016	05/13/87	3347	Shaw, Cindy	271-5552	\$ 640.00	\$ 400.00
1022	05/27/87	2298	Webb, Jimmie	556-4500	\$ 240.00	\$ 240.00
1021	05/30/87	2995	White, Beckey	317-462-5599	\$ 560.00	\$ 560.00
1024	05/07/87	3434	Zion, Joannie	317-861-6248	\$ 90.00	\$ 90.00
Total For Month 05					\$ 2580.00	\$ 2305.00
Average For Month 05					\$ 322.50	\$ 288.13

Contents of *HyperCard* stacks can be printed as reports. User-defined formats govern output of individual fields.

Double the View



Everybody used to talk about the Mac's small screen, but for the longest time nobody did anything about it. Then 15- and 19-inch screens with plenty of pixels hit the market, but they cost around \$2000, and many didn't connect to 128Ks or 512Ks.



Colby's Big Top doubles a standard Mac's screen size.

Colby Systems is attempting to fill this gaping hole in the screen upgrade market with its new 12-inch monitor. Called Big Top, because it's designed to sit at about eye level on top of a Mac 128K, 512K, Plus, or SE, the Colby screen features an internal fan for cooling your Mac.

Big Top's screen offers the same paper-white color as the regular Mac screen and simply doubles the Mac's 30-square-inch image. This duplication of the Mac's video output is a sharp departure from other big screens, which display up to two full pages by greatly increasing the number of pixels.

The Big Top costs \$299, plus \$99 for the adapter card that fits inside your Macintosh. Extra monitors (up to 51) can be added by attaching a "Y" adapter in video cabling (less than \$2 at most electronics stores) for each new monitor. If you have one of Colby's WalkMac portable computers, there's no need for the adapter card. For further information, call Colby Systems in Fresno, California, at 209/222-4985.

Macworld News: Readers' Views



Macworld News: Readers' Views will give you regular feedback from other readers about important Macintosh issues. You'll see how other readers view Macintosh hardware and software, and what they see as problems and potential solutions.

Macworld News: Readers' Views charts are based on questionnaires sent to 1000 randomly selected *Macworld* subscribers. We received approximately 500 responses to the first questionnaire, giving our results an accuracy of plus or minus 3.5 percentage points.

We welcome your ideas for future *Macworld News: Readers' Views* surveys. Please send your suggestions to News Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. Your ideas are important to us. □

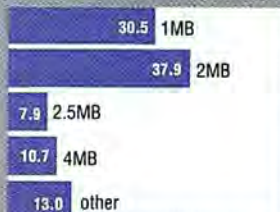
Percent of Responses

Within the next six months, which of the following products are likely to be added to the Macintosh you currently use?



Number of respondents = 500

What will be your total memory after the memory upgrade?



Number of respondents = 201

Readers' buying plans for the next six months.


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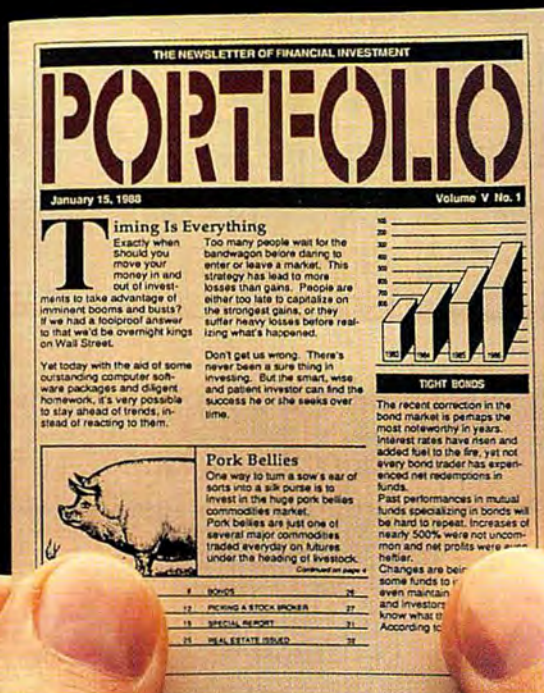
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Circle 111 on reader service card

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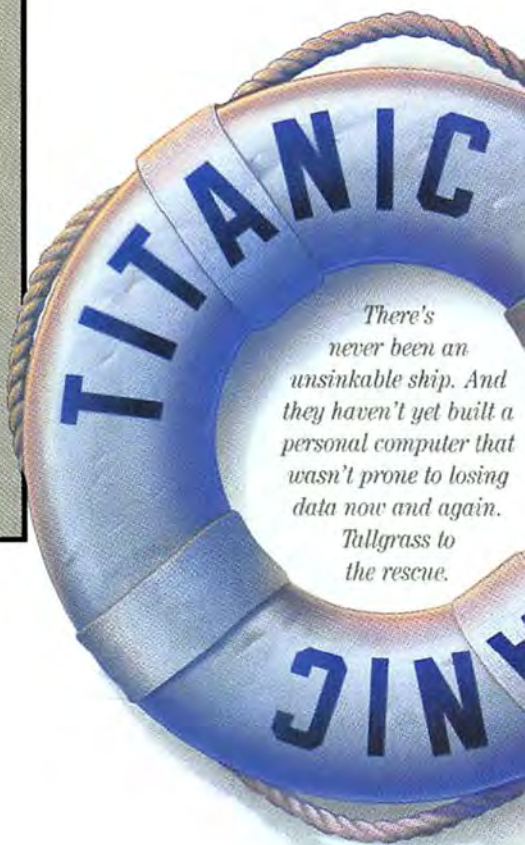
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The LaserWriter Lines Up

*An in-depth preview of Apple's
new line of laser printers*

by Adrian Mello

Owning a Macintosh can lead to a seemingly endless struggle between the urge to liberate fascinating new products from dealers' inventories and the need for financial temperance. More than a big-screen monitor, a hard drive, or even an accelerator card, the LaserWriter beckons to Mac owners. From the moment most people see their first printout, usually a page of dazzling Times Roman or Helvetica, they begin to rationalize how they can afford a printer that costs more than the Macintosh itself.

The LaserWriter II, Apple's replacement for the LaserWriter and the LaserWriter Plus, may make it even harder to hold on to your hard-earned dollars. The LaserWriter II is a family of three printers, and replaceable boards enable you to upgrade the two less expensive models to the top of the line. The foundation of the new line, the LaserWriter IISC, produces high-resolution text and graphics but doesn't work in a network and can't print PostScript fonts and graphics. A board-swap up is the IINT; this networkable PostScript printer is the LaserWriter II model that is most like the LaserWriter Plus. At the top of the line is the IINTX, a high-performance PostScript printer well-suited for large networks and demanding desktop publishing applications.

The Upgrade Path

The key to the LaserWriter II's pull on your pocketbook is its upgradability. In each of its incarnations, the printer looks identical, sharing the same printing mechanism and plastic case. But the basic LaserWriter II becomes remarkably different products. This scheme permits entry-level users to purchase the least expensive printer for a suggested retail price of under \$3000 (final pricing was undetermined at press time) and then upgrade as they can afford to. So you needn't wait to get impressive-looking documents. As your business grows or as you need more powerful imaging capabilities, you can add power by taking the printer to a dealer and having the board replaced.

Apple representatives claim that the upgrade cost will not penalize users who purchase the SC. The price of replacing the SC board should equal the difference between the SC and either of the higher-level printers plus an extra charge, probably in the neighborhood of \$200 to \$300, to cover the handling and inventory expenses associated with upgrades. Going from the NT to the NTX, however, is another story. This upgrade will be much more expensive than the difference in initial price (possibly \$1000 extra), partly because it is more difficult to recover the cost of replacing expensive elements that the NT and NTX boards share. Consequently, most SC owners should decide whether or not they will have a future need for the added capability of the NTX when they upgrade. An extra benefit of upgrading from an SC to an NTX is that you can expand the NTX's memory to 3MB using



the SC's compatible SIMMs. Asking your dealer to perform this operation will provide you with an extra megabyte at a \$250 savings.

Common Ground

The LaserWriter II series is blessed with one of the Mac's original virtues—this printer economizes on desk space. The smaller, cleaner-looking design is about 8½ inches high as opposed to the original LaserWriter's 11½ inches, and the new machine is also easier to move around, thanks to a weight loss bringing it down from 77 to 45 pounds.

The printing mechanism, often called the *print engine*, is the newer SX model from Canon. This engine is a significant improvement over the first-generation CX engine installed in all LaserWriters and LaserWriter Pluses. The new engine produces superior images, with bolder text and denser blacks. With a minimum-life rating of 300,000 pages versus the CX's 100,000-page rating, the LaserWriter II's engine should also last three times as long as the original LaserWriter's.

The LaserWriter II offers improved paper-handling facilities, as well. The most significant improve-

ment is a larger sheet-feeder. The new paper tray holds 200 sheets of either letter- or legal-size paper, compared to the LaserWriter's 100-page tray. A face-up output tray provides a straight-through paper path that permits trouble-free printing on heavier-gauge paper. Other improvements include an adjustable manual-feed slot and an optional 15-sheet envelope tray. All models of the LaserWriter II also include an Apple Desktop Bus port, which has no current use but gives third-party developers the option to create products such as sheet-feeders and collators in the future.

The LaserWriter IISC

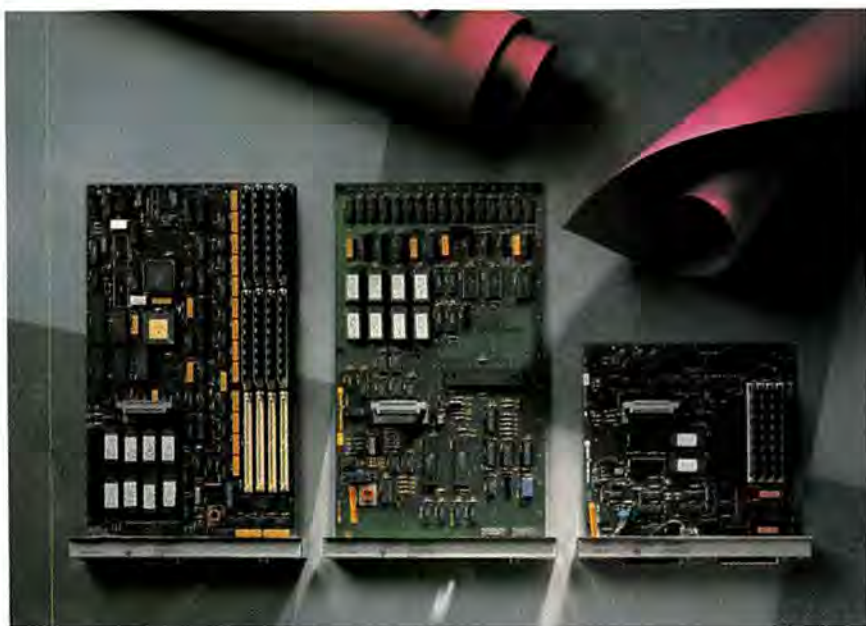
There's a classic cartoon scene in which Donald Duck wrestles with his conscience. Over one shoulder a little devil tries to persuade Donald to be selfish; over the other shoulder an angel encourages restraint. We can easily imagine potential SC buyers—those who resisted purchasing a LaserWriter—on the horns of a similar dilemma. Says the little devil: "Why not buy it? It's *under* \$3000. Hey, you can even upgrade later, so what's to worry?" The angel rejoins: "What's wrong with your trusty ImageWriter? How can you spend your savings on a new printer when you can't even afford to get your car fixed?" The devil usually conks the angel over the head with a mallet and our hero goes off on a gluttonous spree. Whether or not you can resist temptation is between you and your conscience. Of all versions of the LaserWriter II, the SC merits the closest scrutiny because it offers a new choice for first-time owners and also because it is technically quite different from the other LaserWriter II models and from PostScript printers in general.

The most striking difference between the SC and Apple's previous laser printers is hidden inside. The SC is the first laser printer from Apple to use the QuickDraw commands in the Mac instead of PostScript to describe the way printed pages are constructed. However, this is hardly the controversial issue that many people anticipated. Since it chose to put PostScript in the NT and NTX, Apple clearly endorses PostScript for more demanding printing applications. Still the SC's reliance on QuickDraw instead of PostScript raises a number of serious issues that you should consider before deciding which printer to buy.

Speed

On the surface, the LaserWriter IISC and the original LaserWriter seem quite similar. Both print high-resolution text and graphics at 300 dots per inch (dpi). Although both machines contain a 68000 processor, they differ in speed: 7.5 MHz for the SC and 12 MHz for the LaserWriter. They also have different amounts of memory, with 1 megabyte of RAM in the SC and 1.5MB in the LaserWriter. These differences have little effect on performance, though, because the processors and the memory in the two printers serve different purposes.

What does affect performance is the way the two printers create images. The SC uses memory primarily to store an image of the page sent by the Macintosh. In



Unique Boards

The NTX board (left) has SIMM sockets, located on the right side, that permit RAM expansion up to 12MB. The NT board (center) is noticeably less elaborate. The SC board (right), half the size of the NT board, houses only 1MB of RAM. SIMMs used on the SC can be transferred to the NTX as a 1MB memory upgrade, but not to the NT. The NT doesn't use SIMMs, so there is nothing to transfer to the NTX.

Lasers Compared

	LaserWriter IISC	LaserWriter IINT	LaserWriter IINTX	LaserWriter Plus	Personal LaserPrinter
Processor	68000, 7.5 MHz	68000, 12 MHz	68020, 16.67 MHz	68000, 12 MHz	none ¹
RAM	1MB	2MB	2MB	1.5MB	none ¹
Principal connection	SCSI	AppleTalk	AppleTalk	AppleTalk	SCSI
Imaging language	QuickDraw	PostScript	PostScript	PostScript	QuickDraw
Imaging location	Mac	printer	printer	printer	Mac
Print engine	Canon SX	Canon SX	Canon SX	Canon CX	Ricoh 1060
Maximum engine speed (pages per min.)	8	8	8	8	6
Paper tray capacity	200 sheets	200 sheets	200 sheets	100 sheets	150 sheets
Weight (in pounds)	45	45	45	77	37.8
Maximum RAM expansion	none	none	12MB	none	none
Font expansion slot			•		
Networkable		•	•	•	with upgrade
SCSI port for font disk			•		
ADB port	•	•	•		
RS-232C port		•	•	•	optional
Diablo 630 emulation		•	•	•	
LaserJet Plus emulation			•		
Type of fonts	bit-mapped ²	PostScript	PostScript	PostScript	outline
Times	•	P, B, I, BI ³	P, B, I, BI	P, B, I, BI	look-alike P, B, I, BI
Helvetica Narrow		P, B, I, BI	P, B, I, BI	P, B, I, BI	look-alike P
Helvetica	•	P, B, I, BI	P, B, I, BI	P, B, I, BI	look-alike P, B
Courier	•	P, B, I, BI	P, B, I, BI	P, B, I, BI	look-alike P, B
Symbol	•	P	P	P	look-alike P
Palatino		P, B, I, BI	P, B, I, BI	P, B, I, BI	look-alike P, B, I, BI
ITC Zapf Chancery		P	P	P	
ITC Zapf Dingbats		P	P	P	
ITC Avant Garde		P, B, I, BI	P, B, I, BI	P, B, I, BI	
New Century Schoolbook		P, B, I, BI	P, B, I, BI	P, B, I, BI	
ITC Bookman		P, B, I, BI	P, B, I, BI	P, B, I, BI	
Cooper Black					
Futura					

¹ Performs page imaging and processing with the Mac's processor and memory.

² The LaserWriter IISC uses bit-mapped fonts to print Times, Helvetica, Courier, and Symbol in 9, 10, 12, 14, 18, 24 points. Other

point sizes and all styles other than plain (including bold, italic, outline, underline, and shadow) are created algorithmically.

³ Key: P = plain, B = bold, I = italic, BI = bold italic.

the LaserWriter, the processor runs PostScript to create the image and construct fonts and uses memory to store any nonresident fonts and the image of the page. Basically, this second process has more overhead and requires extra processing.

In general, simple text files print faster on a PostScript printer, such as the NT and the NTX, than on the SC. Complex text files and any file that includes graphics will print faster on the SC (see "The Pace of Printing"). Printing documents using landscape page orientation, however, reduces the performance of the SC. Keep in mind that this performance is to a large extent affected by the Mac itself. Putting a faster processor in the Mac, for example, would improve the SC's overall printing performance relative to a PostScript printer.

It's interesting to note that a faster processor in the SC would be unlikely to yield a significant increase

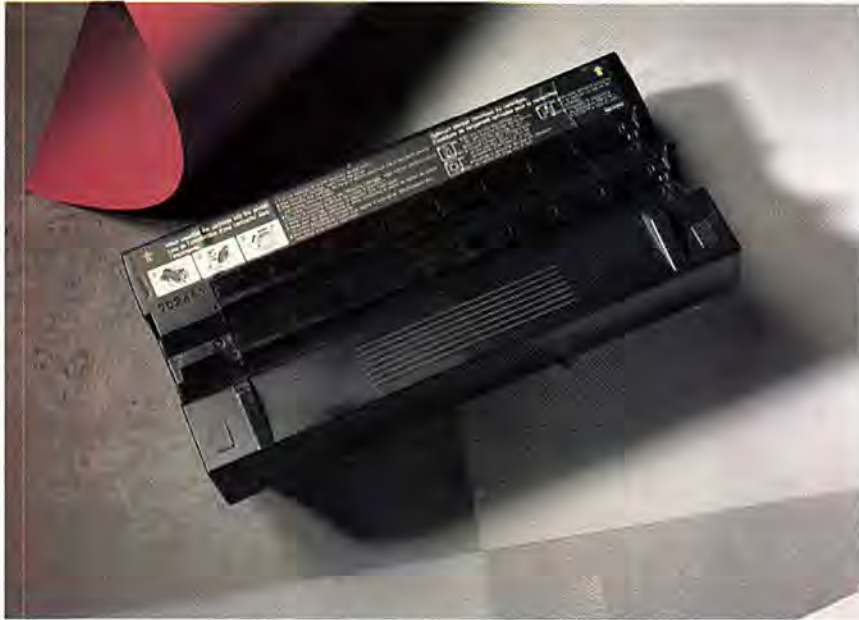
in output speed because images are not calculated within the printer. Furthermore, the speed of a 68020 in the SC would easily outpace the print engine's ability to output pages. Extra memory would not increase speed either, because a full page at 300 dpi requires only 1MB of RAM, and the SC does not use memory to calculate images or store fonts.

No Networking

Another factor that contributes to the SC's speed advantage is the way printing information moves from the Mac to the printer. With the SC, a page is first imaged on the Mac and then sent piece by piece to the printer via the SCSI bus. The SCSI bus is several times as fast as the common LocalTalk cabling scheme used in the vast majority of AppleTalk installations. Sending fully imaged, bit-mapped pages via AppleTalk would

be prohibitively slow. Transmission speed isn't a problem on the original LaserWriter and the new NT and NTX because these printers do not fully image a page on the Mac. Instead of sending a detailed bit map, the Mac sends a PostScript text file, and the printer then creates an image from that file.

Of course without AppleTalk, the SC can't attach to a network, so other users can't share this model.



Toner Cartridge

The LaserWriter II's disposable toner cartridge contains toner and the photosensitive drum.

Technically, Apple could have built the SC with an AppleTalk connection in addition to the SCSI connection. Apple product manager Jonathan Eder says that Apple chose not to do so because transferring large bit-mapped files over AppleTalk would have burdened the network, slowing down network performance. However, General Computer Corporation (GCC) has taken a different approach and has just announced an AppleTalk upgrade option for its QuickDraw laser printer, the Personal LaserPrinter (see "QuickDraw Laser Shootout" for a comparison). If you want to share a LaserWriter II over a network, you must purchase (or upgrade to) the NT or the NTX.

If you are already using your SCSI port for a hard disk or other device, you can easily daisy-chain the SC. The SCSI interface allows up to seven SCSI peripheral devices to be daisy-chained together. The SC's SCSI ID number, which is set via an external indicator, comes preset to the number 4.

Fonts

The SC also offers a less flexible set of font choices than PostScript printers do. Since PostScript uses outline fonts, it prints fonts in any size, resolution, and orientation from a stored formula. The SC uses bit-map fonts, which work best when there is a separate font for every size, style, and orientation at the printer's 300-dpi resolution. To understand this issue it's necessary to understand the way the SC creates type.

The SC achieves high-quality print by reducing a font that is four times the size specified on screen. This accounts for the difference in resolution between a page printed on an SC and the same page viewed on the Mac's screen. For example, to arrive at Times 12-point, the printer squeezes the Times 48-point bit maps—while retaining all their detail—into 12-point letters. To get the best results you should have two type sizes for every size you want in final output. You need one font in the final output size (for viewing on the Mac screen) and an additional font four times that size.

Type produced from the SC's stored bit maps looks good because each size font is optimized for the printer's exact resolution. However, for best results every size, style, and orientation that you plan to use must be stored on disk. This can fill a surprising amount of disk space. If you add up all the provided fonts it equals 1.4MB. Existing Apple and third-party bit-mapped fonts are compatible with the SC, but for best results SC users must restrict themselves to fonts for which the appropriate size pairs exist. Fortunately, many users do not need a wide variety of typefaces and will find the SC's selection quite acceptable. Desktop publishers, however, should probably avoid the SC in favor of a PostScript printer like the NT or NTX.

Scaling

In effect, the demand on disk space ultimately limits your choices. Even if you have enough disk space, it's difficult to plan ahead for the varieties of type you might use. In some cases QuickDraw creates font sizes and styles through an internal algorithm that smooths the constructed bit maps. This applies to point sizes for which there is no font four times larger and for bold, italic, outline, shadow, and underline styles. Although the result may not be quite as good as using the preconstructed bit-map fonts, in smaller point sizes it's surprisingly good.

Even assuming you have enough disk space for numerous bit-mapped fonts, the SC only scales fonts in increments of 25 percent. When you set the scale in the print dialog box you must choose between 25, 50, 75, and 100 percent. As mentioned above, QuickDraw can create unavailable font sizes, but this only applies to applications such as *WriteNow* that permit you to specify a custom font size. However, being able to specify custom fonts does not permit the reduction or enlargement of the entire document by an unusual percentage. For example, it's not uncommon to create a moderately large *Excel* spreadsheet that requires scaling to fit on a single printed page. You may need

QuickDraw Laser Shootout

Although the LaserWriter IISC was a first for Apple, it was not the first QuickDraw laser printer for the Mac. This distinction belongs to the Personal Laser Printer (PLP) from General Computer Corporation (GCC). *Macworld* previewed this printer in a September 1987 feature story and we've followed up with a review in this issue (see "Quality on the Cheap"). The SC and the PLP cry out for comparison since both printers offer high-resolution text and graphics for the Macintosh at a much lower price than has previously been available. Although a comparative review will not be possible until *Macworld* receives a production version of the LaserWriter SC, it is interesting to compare printer features and operation.

Although the PLP is also considered a QuickDraw printer, the way it creates output is very different from the way the SC does. It uses outline fonts (licensed from Bitstream) as opposed to the bit-mapped fonts used by the SC. This means that the PLP has some of PostScript's flexibility in creating different sizes and styles of type. But the PLP doesn't construct the outlines or build bit maps like a PostScript printer. This part of the printing process is com-

pleted on the Mac and the final bit-mapped image is then sent to the PLP.

The SC is faster than the PLP because it relies entirely on bit-mapped fonts and it has its own processor and 1MB of memory. General Computer has announced a software upgrade (available in late January) to improve performance on the PLP but the SC should still be significantly faster. The PLP is less convenient to use than the SC because it occasionally requires that the user quit and print from a separate application. This happens when there is insufficient memory in the Mac—the amount of memory available varies depending on the way the engaged application program uses memory and the complexity of the document. The SC also supports background printing under MultiFinder.

Like the LaserWriter II, the PLP now has an upgrade path. GCC has announced a PostScript upgrade for the PLP that should be available in February for around \$2000. The PostScript upgrade is achieved with a board swap that lets you connect to an AppleTalk network without any special equipment. GCC has also announced a network upgrade for the PLP, called PLP Share, that will be

available in April for \$499. PLP Share is a separate peripheral with its own 68000 processor and 1MB of RAM. It attaches between the PLP and the AppleTalk network and lets network users share the printer.

It's difficult to tell what impact PLP Share will have on printing and network performance. It may slow down the network since the Mac has to send large bit-mapped files over AppleTalk—a much slower way to transmit files than the SCSI connection usually employed by the PLP or the SC. GCC has attempted to alleviate this somewhat by having the Mac send compressed bit-mapped files to PLP Share, but they are still several times larger than most documents being sent over networks.

Finally, the most obvious point of comparison—price. The suggested list price of the PLP was just lowered to \$1999 at press time. Within days of the announced change, I'd already heard reports of discounts that would bring the PLP down to \$1700. The PLP wins on price and represents a remarkable value, but the SC promises to be faster, more convenient, and better integrated into the Mac computing environment.

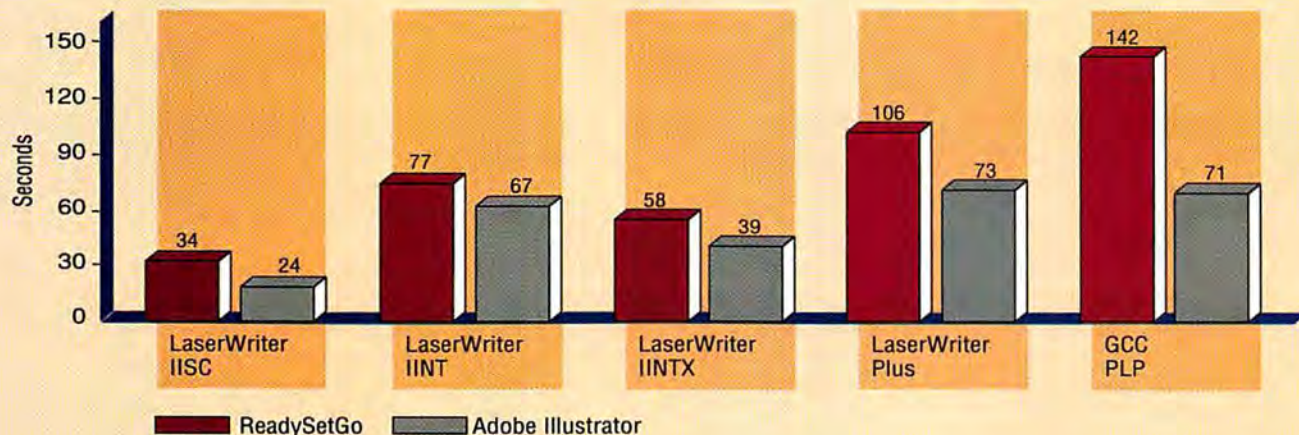
only a 90 percent reduction, but with the SC the closest you can get is a 75 percent reduction. This problem also arises in graphics applications like *MacDraw*, when it's important to have control over the way a graphic fits the printed page.

PostScript Effects

There are other limitations to the SC that stem from its reliance on QuickDraw. PostScript fonts and graphics can be treated with the following effects that are unavailable in QuickDraw: fractional point sizes,

setting font width separately from font height, rotating text, skewing text (slanting italics forward or backward), filling text with a shade or pattern, and setting stroke width of outline fonts. Many of these features are available in applications such as *XPress* and *Adobe Illustrator*.

Some examples of graphics limitations imposed by the SC include the inability to produce random, smooth bezier curves and fractional line weights, or to set unlimited percentages of gray fills and gray-scale fountains. These limitations are irrelevant if your soft-



The Pace of Printing

This chart offers a rough assessment of performance by LaserWriter II products. The GCC PLP and the Apple LaserWriter Plus (using version 47 of PostScript) are included for comparison. A ReadySetGo document and an Adobe Illustrator document were printed from a Mac II. The programs were run under MultiFinder without background printing; test times were recorded after the document had been printed twice. The time it took the QuickDraw printer to generate the Illustrator

document should not be compared with the time it took the PostScript printer to do the same. This test does not represent a formal benchmark and should not be used to make a final buying decision, since production versions of the new printers were not available for testing. It is also important to note that performance depends on the program used and the composition of the document.

ware does not provide any of these capabilities or you have no need for them. The only applications that provide these functions are those that access PostScript directly, such as *Cricket Draw* and *Adobe Illustrator*. While comparatively few applications today go beyond the graphics capabilities of QuickDraw, the number is likely to increase in the future, especially in the areas of graphics and desktop publishing.

The LaserWriter IINT

The middleweight printer in the LaserWriter II line is the IINT, the model that is most similar to the original LaserWriter Plus. Like the Plus the IINT is a PostScript printer, with the same set of fonts and a 68000 processor. Because of this similarity, there is less to say about the NT. Which isn't to suggest that it's not worth considering; like the Macintosh SE, the IINT may be the printer best-suited to the broadest range of Macintosh users.

Like the LaserWriter Plus, the NT connects to the Mac via AppleTalk for sharing among several users. This makes the NT the best product for small businesses or small work groups where it is more cost-effective to satisfy the printing requirements of several people than those of just a single user.

The NT's PostScript capabilities also make it more versatile than the SC for desktop publishing and graph-

ics. Basically, the NT overcomes all the SC's limitations. It gives you more font choices, more text effects, more graphics effects, more versatile scaling capability, and the ability to work with PostScript applications. The NT also lets you proof documents before you send them to a service bureau for high-resolution output on PostScript-compatible typesetters such as the Linotronic 100 and 300.

Most of the NT's improvements over the LaserWriter Plus are associated with the superior print engine and improved paper handling. In addition, an increase in memory from 1.5MB to 2MB provides more room for downloadable fonts and the font cache. More memory speeds up the printer, since it doesn't have to retrieve and construct font outlines and bit maps so frequently (see "Shuttling Fonts"). The NT and the NTX also permit the Mac's printing software to provide users with a bit-map smoothing option apart from the applications software. This is a feature shared with the original LaserWriter which is often overlooked when users make comparisons with other laser printers. The NT and NTX also include an RS-232 port and Diablo 630 emulation mode so that users of MS-DOS and other computers can take advantage of the printer.

The LaserWriter IINTX

The LaserWriter IINTX is the Mac II of Apple's new printers, with the extra zoom of a 68020 processor. The NTX's faster processor doesn't improve the mechanical print speed because the print engine itself

Shuttling Fonts

The LaserWriter IINT and NTX offer much more control in managing fonts than did Apple's earlier printers. Both new models contain the same 35 built-in fonts available in the LaserWriter Plus. As with earlier LaserWriters, whenever you print a document containing a nonresident font, the Mac downloads a copy of that font to an area in the printer's RAM. The printer then uses the downloaded font to print the document.

The first area in which the NT and NTX excel is in the amount of RAM they contain. Because both machines contain at least 2MB of RAM, 5MB more than was available in the LaserWriter Plus, more memory is available for downloading fonts. You can further expand the NTX's memory up to an incredible 12MB by adding SIMMs. However, because the

LaserWriter II requires special SIMMs designed for speedier access, you can't use SIMMs designed for the Mac II, SE, or Plus.

A second advantage is that both the NT and the NTX come with the LaserWriter Font Utility, a stand-alone application that enables you to download fonts directly to the NT's RAM or, if you have the NTX, to the optional SCSI-attached disk drive. According to Apple, only hard disk drives that follow Apple's SCSI protocols will work with the NTX. For users who need an extensive selection of fonts, the NTX coupled with a 20MB or 40MB hard disk can provide an extensive yet expandable font library.

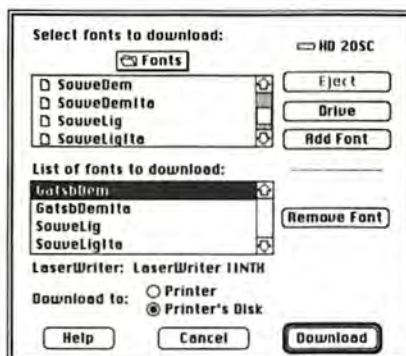
The LaserWriter Font Utility allows NTX owners to manage the fonts stored on the disk. The utility also lets you format the printer's hard disk; how-

ever, once formatted for printing, the disk drive only stores printer-related information—you must reformat the drive for use with the Mac. You can also view the fonts in the printer's font cache as well as those fonts stored on the printer's disk. For a more permanent record, the utility can print out a catalog of fonts. Adding fonts to the printer's font repertoire involves assembling a list of the fonts, then downloading the font outlines, or *splines*, to the printer's disk or directly to the printer's RAM.

As if the disk capabilities weren't enough, the NTX also contains an expansion slot for font cards. Although no cards are currently available, adding a font card would give NTX owners the speed advantage of a ROM-resident font for custom applications such as corporate logos.—David Usbijima

Font Control

Apple's LaserWriter Font Utility (top left) lets you initialize the hard disk attached to the LaserWriter IINTX (top right), download fonts to the printer's RAM or disk (bottom left), and view a list of fonts residing in the printer or on disk (bottom right).



When a Printer Is More than a Printer

The idea of a printer with a disk drive makes perfect sense if you view the LaserWriter IINTX as a computer dedicated to transferring text and graphic images onto paper. In fact the Mac with the LaserWriter IINTX bears an increasing resemblance to a dedicated typesetting system.

Let's examine the use to which the printer is put most commonly—printing text. Both the NT and NTX treat text characters as graphic images. In order to print a document, the printer assembles the bit-mapped image of the entire page in an area of RAM called the *page buffer*. To build the image of a text document, the printer must assemble an image for each character in the proper font, rotation, size, and style.

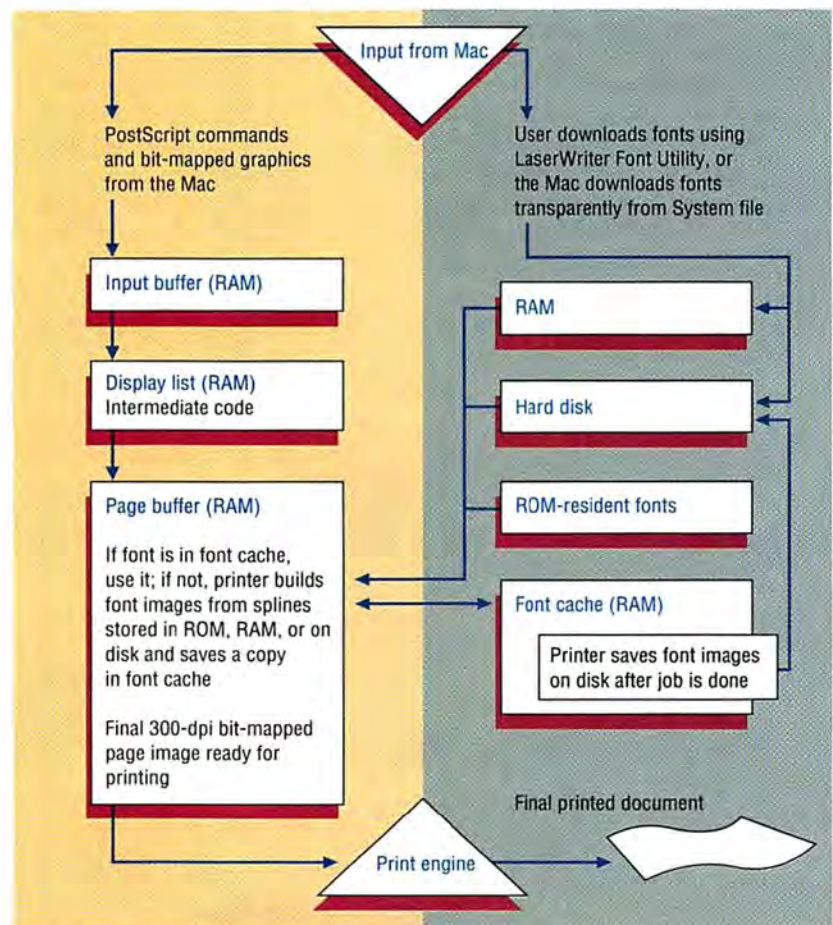
The NT and NTX contain ROM-resident descriptions of 35 fonts. The ROM contains the description of the font outlines, called *splines*. In order to print a character in one of the resident fonts, the printer builds the bit-mapped image from the spline. After building the character's image and placing it in the page buffer, the printer saves a copy of the image in another area of RAM called the *font cache*. When the printer encounters the same character later in the document, it uses the image stored in the cache, obviating the need to regenerate the image.

When the printer needs to generate a character from a font that is not ROM-resident, the printer looks for the proper spline in the printer's RAM. Splines can be downloaded directly with the LaserWriter Font Utility or transparently from the Mac's System file.

Finally, if the font is neither in ROM nor in the printer's RAM, the NTX searches the printer's hard disk for the proper spline. After copying the font's spline from disk to RAM, the printer generates the bit-mapped image as before.

Since the font cache can hold only a fixed number of fonts at one time, eventually, if enough fonts are used, the printer must purge the font cache to make room for new fonts. On the NT, purging flushes the font infor-

mation from the cache. The NTX, however, stores purged font images on disk and can recall them expeditiously, vastly improving performance. Even when the font cache is not purged, the NTX offers further performance improvements by saving the images in the font cache on the disk after a document has been printed. Once a font has been used, it is readily available; the printer doesn't need to re-create the character images.—David Ushijima



Font-Caching Basics

The LaserWriter IINT and NTX both contain outline definitions for 35 fonts in ROM. Both printers build the final bit-mapped image of the page in an area of RAM called the page buffer. The bit-mapped images for each character are saved in another area called the font cache.

cannot produce more than eight pages per minute. Where the processor's extra performance counts is in the area of constructing pages, calculating fonts from outlines, and moving information around the printer's memory during the page imaging process.

Also like the Mac II, the NTX is expandable. It comes equipped with 2MB of RAM, the same as the NT, but the NTX's memory expands to a total of 12MB of RAM, providing extra memory for downloadable fonts and the font cache. Why so much memory? Admittedly, most users will only need to expand to a maximum of 3MB to 5MB. The NTX provides memory expansion beyond this threshold for the possibility that people might want to download non-Latin alphabets such as Arabic or Kanji, or perhaps extensive symbol libraries for CAD applications.

Besides offering extra memory, the NTX has a SCSI port that lets you add a hard disk drive for managing fonts (see "When a Printer Is More than a Printer"). Both the NTX and the NT come with a font utility program that lets you download fonts directly to the printer's memory (see "Shuttling Fonts"). The NTX also has a slot for font expansion cards that contain extra fonts in ROM for added performance.

All these performance advantages make the NTX the best printer for demanding desktop publishing and graphics applications. It's also the best machine for large networks of 15 or more users or for networks where users regularly print complex documents. This is especially true for desktop publishing networks that can benefit from all the font-handling advantages of the NTX. Attaching a hard disk can relieve the problem of downloading fonts over the network.

Choosing from the Lineup

So which printer is for you? The LaserWriter IISC works best for individuals who want high-quality text and don't require a broad range of typefaces. The IISC offers a limited set of typefaces, but it can also produce high-resolution graphics—though those created by PostScript programs, such as *Adobe Illustrator* and *Cricket Draw*, print only at the resolution of the screen. If you don't have to share your printer and you aren't a desktop publisher, you should probably choose the SC. It lets you print impressive-looking documents very quickly for under \$3000, and it still gives you the opportunity to add networking and PostScript without being hammered financially.

The NT is the machine of choice for desktop publishers and small workgroups. It will have to compete in price and value against a proliferating collection of similar products from other manufacturers. If you think your needs might be on the upper border of the NT's capability, you should consider the NTX's extra performance and expansion options. This is especially true since the NTX will cost only about \$2000 more than the NT, but the upgrade penalty promises to add approximately \$1000 to this cost. The NTX is an industrial-strength print server. As sophisticated desktop publishing applications and graphics become more

common, a printer with the NTX's capability will be essential in many networking environments.

Overall, the LaserWriter II printers provide an impressive lineup to handle the requirements of different types of users. At one end, the NTX demonstrates design foresight by offering a printer that can keep pace with the demands of networked Macs making use of increasingly powerful software and hardware. At the other end, the SC provides the basic appeal of laser-printed text and graphics at minimum cost.

Perhaps most important, the LaserWriter II line avoids one of the most disgruntling mistakes of the original Macintosh—the closed architecture effectively disenfranchised Mac owners who couldn't continually meet the upgrade demands of "afterthought" engineering. What result will designing an upgrade into



Fonts Disk

The NTX attaches to a SCSI hard disk and lets you store fonts. You download fonts to disk with the LaserWriter Font Utility.

the LaserWriter II's product line have on the Mac owner's struggle to balance the desire for new products with fiscal prudence? More users will be able to talk their consciences into purchasing an expensive peripheral—a victory that remains bittersweet. □

The author would like to thank Robert Simon, president and founder of PS Publishing, for his valuable assistance in preparing this article.

See *Where to Buy* for product details.

Room to Grow

Tired of those "I've only got one megabyte on my Mac II" blues? Expand your horizons—and your system memory.

by Bruce F. Webster

Times have changed since the days of the 128K Macintosh. Apple's flagship, the 68020-based Macintosh II, is a wide-open box with lots of room for expansion. In fact, over half of the 68020's 4-gigabyte address space (over 2 billion bytes) is set aside for memory expansion. And both the slots and the system board are designed to allow you to add all the memory you want.

Well, almost all the memory. You can't run out and configure a Mac II with two gigabytes of RAM right now. In the first place, the cost would be prohibitive: at the conservative price of \$1000 for 4 megabytes, 2 gigabytes would cost over a half million dollars. In the second place, you couldn't fit all the chips into your Mac II: at current chip densities, 2 gigabytes would require 16,000 chips. And finally, you couldn't use it: the current Macintosh system software only recognizes 8MB, though that should change soon.

From the stratospheric realms of gigabytes, an 8MB ceiling brings us back down to earth. That's not so bad: 8MB provides 64 times the memory of the original Macintosh, 8 times the standard memory of the Mac Plus, and double the limit of the Mac SE. And that's plenty memory for doing most of what you want to do on the Macintosh II.

SIMM Expansion

The Mac system software easily recognizes memory installed on the system board, but it has trouble seeing memory in the NuBus slots. That's why most NuBus memory boards state that they only work with

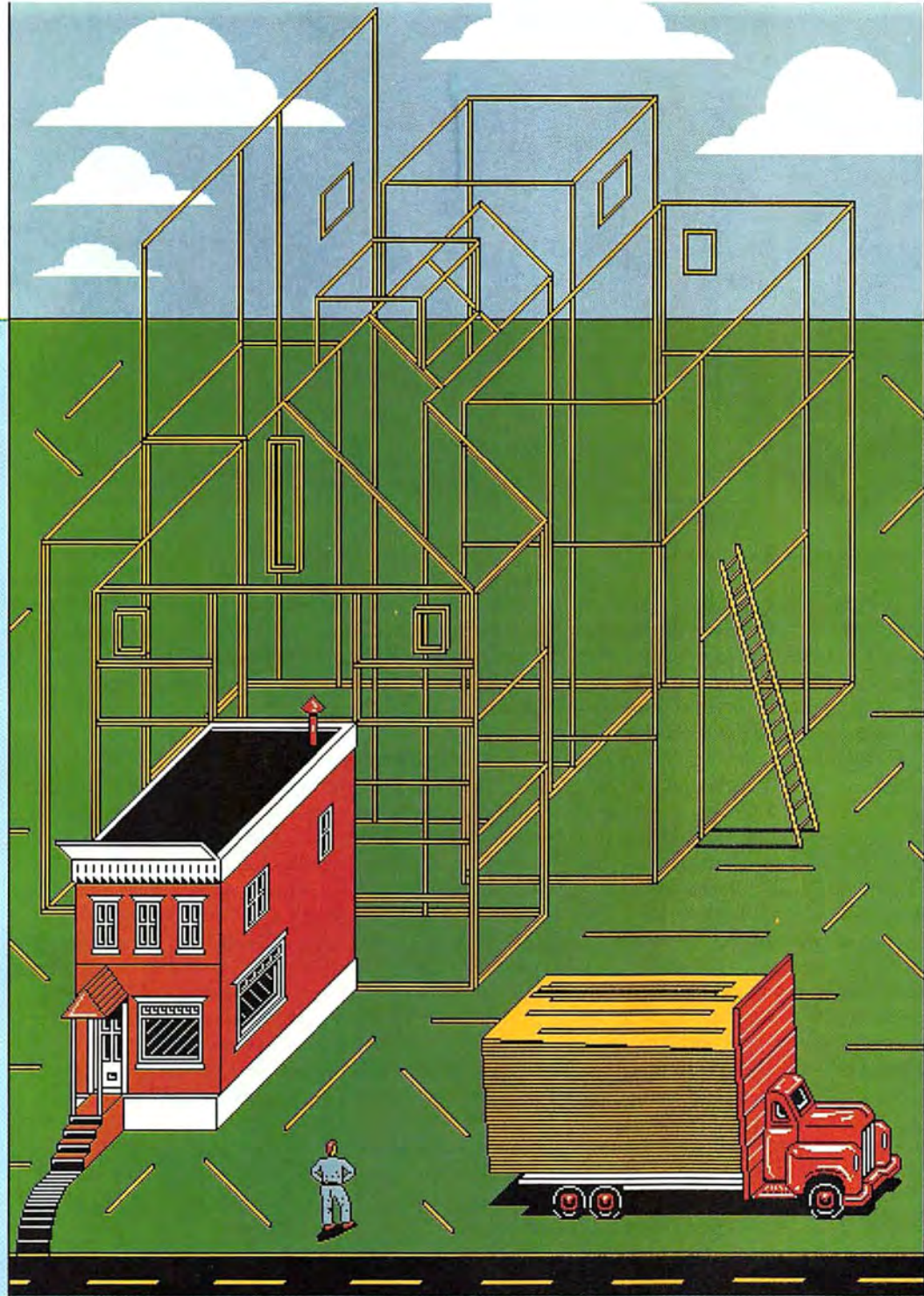
A/UX, Apple's version of UNIX, which hasn't been released yet. This will change soon—Apple is making the modifications to the Macintosh Operating System needed to support memory expansion via the NuBus slots—but for now, system-board expansion is the way to go.

Apple press releases indicate that the theoretical limit for system-board expansion is 128MB; that figure presupposes the existence of 16-megabit chips. Since the largest chips commercially available are 1-megabit chips, the current limit is 8MB.

Expanding to 8MB requires eight 1MB SIMMs (Single Inline Memory Modules). A Mac II SIMM is a circuit board 3½ inches long and anywhere from ⅝ inch to 1 inch high, with eight memory chips on it and metal connectors along one edge. Most SIMMs use special surface-mount RAM chips that make for a small, compact unit.

These SIMMs fit into special sockets on the Mac II located on the system board underneath the disk drive tray (see Figure 1). There are eight sockets, grouped into four pairs: SIM1, SIM2, SIM3, and SIM4. SIM1 and SIM2 form one 32-bit-wide bank of memory, while SIM3 and SIM4 form the other.

When configuring the memory on your Mac II, the SIM3/SIM4 bank must always be completely full, and the SIM1/SIM2 bank must be either completely full or completely empty. Furthermore, all four sockets of a bank must contain identically sized SIMMs (256K or



1MB). This leads to five possible memory configurations: 1MB, 2MB, 4MB, 5MB, and 8MB. The table "Configuring RAM" shows how to distribute the SIMMs to achieve the various memory capacities. A special note: for the 5MB configuration, the 256K SIMMs must be in SIM1/SIM2. If the 256K SIMMs are in SIM3/SIM4, the operating system only recognizes 2MB of RAM (instead of 5MB). This means that to upgrade from 1MB to 5MB you must remove the 256K SIMMs from SIM3/SIM4 and put them in SIM1/SIM2.

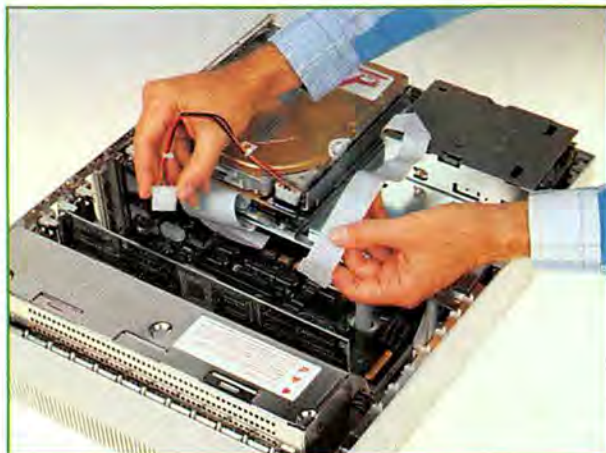
Comparing Memories

A number of companies, including Apple, offer memory expansion kits for the Mac II. These consist of sets of 256K or 1MB SIMMs, along with instructions that may or may not tell you how to upgrade your Mac II (most upgrade kits are oriented toward the Mac Plus and SE).

I received memory expansion kits from four different firms: Dove, MacMemory, Mass Micro Systems, and Open Mac Enterprises. Levco also sells 1MB SIMMs for the Mac II, but declined to send evaluation copies of its products. The table "RAM Costs" lists the manufacturers, their products, the cost for each prod-

Figure 1

The SIMM sockets are located beneath the hard disk drive. To remove or install SIMMs, you must remove the disk drive tray, which is held in place by four screws.



uct, and the corresponding costs for 4MB and 8MB upgrades.

The 1MB SIMMs from Dove, MacMemory, and MassMicro Systems all looked pretty much the same; in fact, Dove and MassMicro used the same chips. The Open Mac units, though, were half again as tall as those from the other three manufacturers. This is because Open Mac uses regular 1-megabit RAM chips rather than the smaller SIMM chips. This may explain why the Open Mac units are so much cheaper: \$999 for 4MB, compared with \$1198 to \$1798 for expansion kits from the other companies. Open Mac also promises to ship each order within 72 hours or pay the shipping charges; the salesperson I talked with on the phone claimed that in over three months of doing business the company hasn't missed the 72-hour deadline.

The documentation from Dove and MacMemory had no explanation of how to upgrade the Mac II, while Open Mac's coverage of this procedure took up less than half a page. Only the MassMicro Systems documentation had acceptable information on upgrading a Mac II: four pages, with diagrams and step-by-step instructions. For a detailed guide to installing SIMMs in the Mac II see "Mac System Tools," *Macworld*, December 1987.

Chances are that prices will come down by the time you read this, unless trade relations between the United States and Japan turn sour. It used to be that you could always hold off memory upgrades, because you knew that RAM prices were steadily declining. Thanks to the protectionist mood in Congress, that's no longer a sure thing.

Allocating Memory

How much memory should you put in your Mac II, and what should you do with it? Both questions, of course, depend upon how you use your Mac.

First, 2MB is pretty much the minimum you should have in a Mac II. Forget the fact that Apple ships it with just 1MB; Apple always ships systems with too little memory (48K Apple II, 128K Mac, 256K IIGS). Regardless of what you're doing, you should dig up the \$200 to \$300 needed to get another set of four 256K SIMMs. You might even get them at a better price if you can find someone who has upgraded a Mac II to 4MB or 8MB and wants to sell the leftover 256K SIMMs.

Second, consider springing for 4MB of memory, especially if you plan to use MultiFinder or if you're going to do any sort of color graphics—particularly on a large-screen display. Once you've made the leap to 4MB, you've actually got 5MB—just move your old 256K

Configuring RAM

Memory	SIM1	SIM2	SIM3	SIM4	Need to Buy	Left Over
1MB	empty	empty	two 256K SIMMs	two 256K SIMMs	n/a	n/a
2MB	two 256K SIMMs	two 256K SIMMs	two 256K SIMMs	two 256K SIMMs	four 256K SIMMs	n/a
4MB	empty	empty	two 1MB SIMMs	two 1MB SIMMs	four 1MB SIMMs	four 256K SIMMs
5MB	two 256K SIMMs	two 256K SIMMs	two 1MB SIMMs	two 1MB SIMMs	four 1MB SIMMs	n/a
8MB	two 1MB SIMMs	two 1MB SIMMs	two 1MB SIMMs	two 1MB SIMMs	eight 1MB SIMMs	four 256K SIMMs

The eight SIMM sockets on the Mac II's system board are grouped into four pairs, SIM1 to SIM4. When you upgrade to

2MB, 4MB, 5MB, or 8MB, you must fill the SIM3/ SIM4 bank. Slots in the SIM1/SIM2 bank must be all filled or all empty.

SIMMs over to SIM1/SIM2. Or sell them to someone else who wants to upgrade to 2MB; that'll bring your upgrade cost down even more.

Finally, power users will probably want to go for 8MB. Not that they really need that much memory—just because it's the most they can get right now. Of course, if you're a real power user, you've probably already upgraded your Mac II to 8MB.

Once you have as much memory as you are willing to spring for, what do you do with it? There are three choices: system memory, disk cache, and RAM disk. System memory is, of course, how the RAM is used by default, with the operating system, the Finder (or MultiFinder), and any application(s) using it as needed. If you're using MultiFinder, the About MultiFinder box shows just how much memory each application is using (see Figure 2).

You can also allocate part of your memory as a disk cache. When the Mac reads a file (application, document, whatever) from a disk, a copy of it goes into the memory set aside for the disk cache. When it writes out to a disk, the copy in the disk cache also gets updated. The next time you request that file, the Mac reads the copy in the cache—if it is still there. The result is faster performance in reading from hard disk(s). You turn the disk cache off and on, and set its size, using the General section of the Control Panel desk accessory.

A RAM disk speeds up disk I/O even more. When you set up a RAM disk, you use part of the memory as if it were a disk drive. You copy files into it, read from and write to it, and generally treat it the way you would treat any other disk drive—but with one big difference: when you restart or power down the machine, you lose all files on the RAM disk. A RAM disk is most useful when you have plenty of memory but no hard disk. Set up a large (1MB to 3MB) RAM disk, then copy all your system files and applications to it. You can then run your applications from the RAM disk while keeping your documents and data files on floppies. Several public domain RAM disk utilities exist, though some are incompatible with the latest System/Finder software (and especially with MultiFinder).

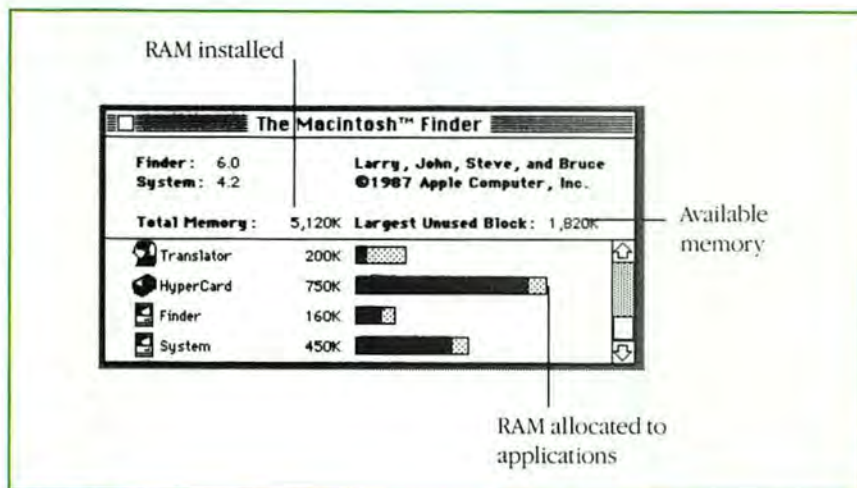


Figure 2

With the System 5.0 software, if you're unsure how much memory you have installed and how it is being used, choose *About the Finder* in the Apple menu. You can modify the memory allocated to an application by selecting the program's icon and choosing *Get Info*.

RAM Is RAM

When it comes down to it, RAM is RAM. There may be some disadvantage to Open Mac's taller SIMMs—indeed, one manufacturer hinted darkly about that—but I've had no problems at all. There's also no problem with mixing and matching from different firms; the Mac II that I'm using has 8MB, using SIMMs from three different manufacturers.

Barring hard evidence of obvious deficiencies, you might as well go for the cheapest SIMMs you can get. Right now, Open Mac and Mass Micro offer SIMMs at prices close to half what other competitors charge. In general I recommend that you call all of the listed manufacturers, get their current prices, and ask about warranties and delivery time—then order the RAM you need to make your Mac II really useful. □

See *Where to Buy* for product details.

RAM Costs

Company	Product Name	Contains	Cost	Cost for 4MB	Cost for 8MB
Apple	1MB Memory Expansion Kit	four 256K SIMMs	\$249	n/a	n/a
	2MB Memory Expansion Kit	two 1MB SIMMs	\$599	\$1198	\$2396
Dove	MacSnap 1024	four 256K SIMMs	\$299	n/a	n/a
	MacSnap 4H/4S	four 1MB SIMMs	\$1495	\$1495	\$2990
MacMemory	MaxPlus 2x4-S	two 1MB SIMMs	\$899	\$1798	\$3596
MassMicro Systems	MassPak	two 1MB SIMMs	\$479	\$958	\$1916
Open Mac Enterprises	RAM I	four 256K SIMMs	\$199	n/a	n/a
	RAM II+II	four 1MB SIMMs	\$999	\$999	\$1998

The Invisible VAX

by David R. Kosiur

In many corporate and academic computing centers, you'll find Apple and Digital Equipment Corporation (DEC) products linked together. The drive to connect Macs to VAXs has been propelled by the popularity of this DEC minicomputer. DEC's system architecture gives any Mac linked to a VAX access to the mainframe power of clustered VAXs; worldwide DEC networks; and resources such as larger disks, faster printers, and archiving facilities.

Macs offer a cost-effective, graphically based alternative to the regular line of DEC and third-party terminals. But the Mac can do more than simply emulate a DEC-style terminal. Kinetics, Dove, and Apple have developed products that transparently link Macs to VAXs through AppleTalk, Ethernet, or DECnet; they treat the VAX as if it were an extension of the Mac.

Other products expand Mac-VAX file compatibility. Increasingly, standard file formats enable you to exchange files in engineering (IGES, DXF), database (SQL), and spreadsheet (WKS) programs. Most applications that share formats let you exchange data directly, but others, such as electronic mail, do not yet offer a simple way to share files.

Although seamless Mac-VAX connectivity is still a thing of the future, Mac products available today enable you to emulate a DEC terminal, use a VAX as a file and print server, and exchange data in applications.

The Terminal Mac

Using a Mac to process data obtained from a VAX will appeal to those tired of waiting for the mainframe's slow responses or frustrated by the lack of suitable software. Since it's not a dumb terminal, the Mac lets you continue working on your data if the mainframe goes down. And replacing a DEC terminal with a Mac is as easy as plugging a modem or line driver into your old terminal's serial cable and buying a terminal emulation program.

You have a choice of several programs that support DEC's VT100 terminals, but only White Pine Software's *Mac240* offers the newer VT220/240 terminal emulation, which includes better graphics support. (White Pine also markets a product called *Reggie*, which helps you convert Mac graphics to and from DEC's relatively antiquated ReGIS graphics format.)

To access the full potential of the VAX, you will also need software that emulates the Tektronix 4010/4014 graphics terminal, which is standard on most DEC computers. *Mac240*, *VersaTerm*, *VersaTerm-Pro*, and *TextTerm+Graphics* (formerly called *Tekalike*) all emulate the Tektronix 4010/4014. If you're interested in Tektronix's newer 4105/4107 terminals, which include color support, then *TextTerm+Graphics* and *VersaTerm-Pro* are your only choices.

Tapping a VAX

Simply using the Mac as a DEC terminal emulator wastes the potential of a VAX. The VAX offers unlimited disk storage; the convenience of routine backups; and in networks, the VAX can also function as a file and print server.

The easiest file server to use is one that maintains the Mac interface even when it's not running on a Mac. To that ex-

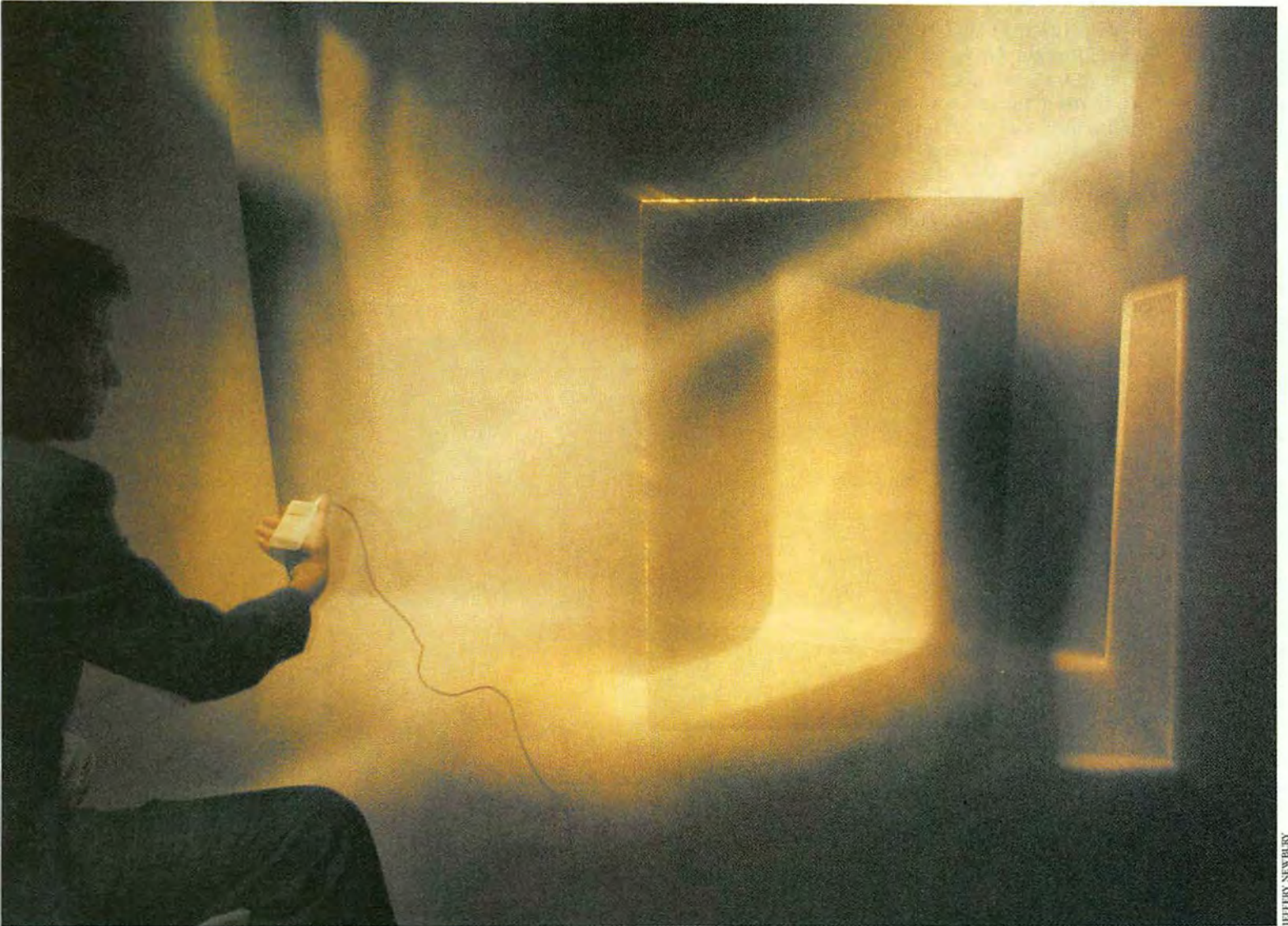
tent, *AlisaTalk* and *pcLink* have the advantage in the VAX server game. *VMacS*, on the other hand, requires a basic understanding of procedures for logging on to the VAX and of VMS operating-system commands.

To use the VAX as a file server you must connect the Mac to the VAX via a serial cable, or via AppleTalk or Ethernet. Two of the file servers, *VMacS* and *pcLink*, let you access the VAX directly with a serial cable, but serial communications lines have limited speed (usually 19,200 baud at best). To obtain better performance, set up an AppleTalk network and link it to your VAX (see "Mac-VAX Links"). Both the *AlisaTalk* and *pcLink* file servers support AppleTalk links using Ethernet cabling, which permits even faster data-access.

AlisaTalk, *pcLink*, *TOPS for VMS*, and *VMacS* file servers let the Mac tap VAX power for file storage, print spooling, file sharing, and connectivity to MS-DOS computers—though such usage doesn't exploit the full power of a Mac-VAX connection.

Designed for VAX computers running VMS, *AlisaTalk* from Alisa Systems provides AppleTalk support on the VAX and allows the VAX to act as both a file server and a LaserWriter spooler for the network. *AlisaTalk* is also *AppleShare*-compatible. You access files and applications on the VAX disk just as if they were on a Macintosh running *AppleShare*, complete with folder access privileges and file- and record-locking. Connecting a LaserWriter (or equivalent PostScript printer) to the VAX allows it to serve as a spooler for your network, giving VAX users ready access to the printer and thereby making the VAX more versatile and cost-effective.

*The integration of
Mac and VAX
hardware and
applications begins to
bring the VAX's power
to the Mac*



JEFFREY NEWBURY

Pacer's *pLink* resembles *AlisaTalk* in many ways, providing LaserWriter print spooling on a VAX and *AppleShare*-compatible file service through its product *PacerShare* (see "Mac-VAX Links"). In addition to the standard AppleTalk/Ethernet support offered by *AlisaTalk*, *pLink* supports direct RS-232C and modem-based links between Macs and a VAX. Similar Pacer software for IBM PCs adds another layer of connectivity between Macs and MS-DOS machines.

TOPS plans to offer a version of *TOPS* tailored to the VAX, *TOPS for VMS*. This file server will let you connect Macs, PCs, and VAXs in a system of distributed file servers using AppleTalk and Ethernet. Or, you will be able to make the VAX a centralized file server using *TOPS* in much the same way that you can use *AlisaTalk* or *pLink* now.

VMacS from White Pine Software is the only file server software for the VAX that does not support either AppleTalk or Ethernet. With *VMacS* you can transfer files

to and from the VAX by employing the Xmodem file-transfer protocol within a terminal emulation program, but you cannot access those files directly from within an application. Thus *VMacS* is really not a true file server but a file storage device that lets you save Mac files on a VAX.

Making the Transfer

If you're intent on trading information between Mac- and VAX-based applications, your task will be much easier if these programs can read each other's files. Unfortunately, getting the Mac and the VAX to exchange data has been less successful than getting the VAX to operate as a file and print server. Exchanging data means overcoming problems of incompatible standards and file formats. Manufacturers have been able to overcome these obstacles to developing data-sharing applications in several fields: desktop publishing, engineering, databases, spreadsheets, and to some degree, electronic mail.

Publishing and Word Processing

Long before the advent of the term desktop publishing, computer centers operated electronic typesetting and publishing systems based on DEC computers. One of the best-known publishing systems for the VAX and Sun computers is Interleaf's *Technical Publishing System (TPS)*. Interleaf now offers *TPS* for the Macintosh II. This program lets you exchange Mac II *TPS* files with files created by other Interleaf versions (see "Transferring Files to Interleaf *TPS*"). Interleaf also provides filters for handling outlined and bit-mapped graphics files within *TPS* documents on the VAX. By using other programs like *CAD Mover* you can transfer CAD drawings to *TPS*.

You can easily exchange word processing documents if they have been saved in text-only format. But to preserve formatting and style information, you need Mac and VAX applications that share a common file format (for example, IBM's Document Content Architecture [DCA] and DEC's dx

Mac-VAX Links

This block diagram shows how Macs running either *pLink* or *AlisaTalk* can use a VAX as file server or print spooler for a LaserWriter. *AlisaTalk* supports Ethernet connections via a Kinetics FastPath, and the VAX actually responds to the Mac as if it were another AppleTalk network. The *pLink* software uses either an ordinary RS-232C link or Ethernet.

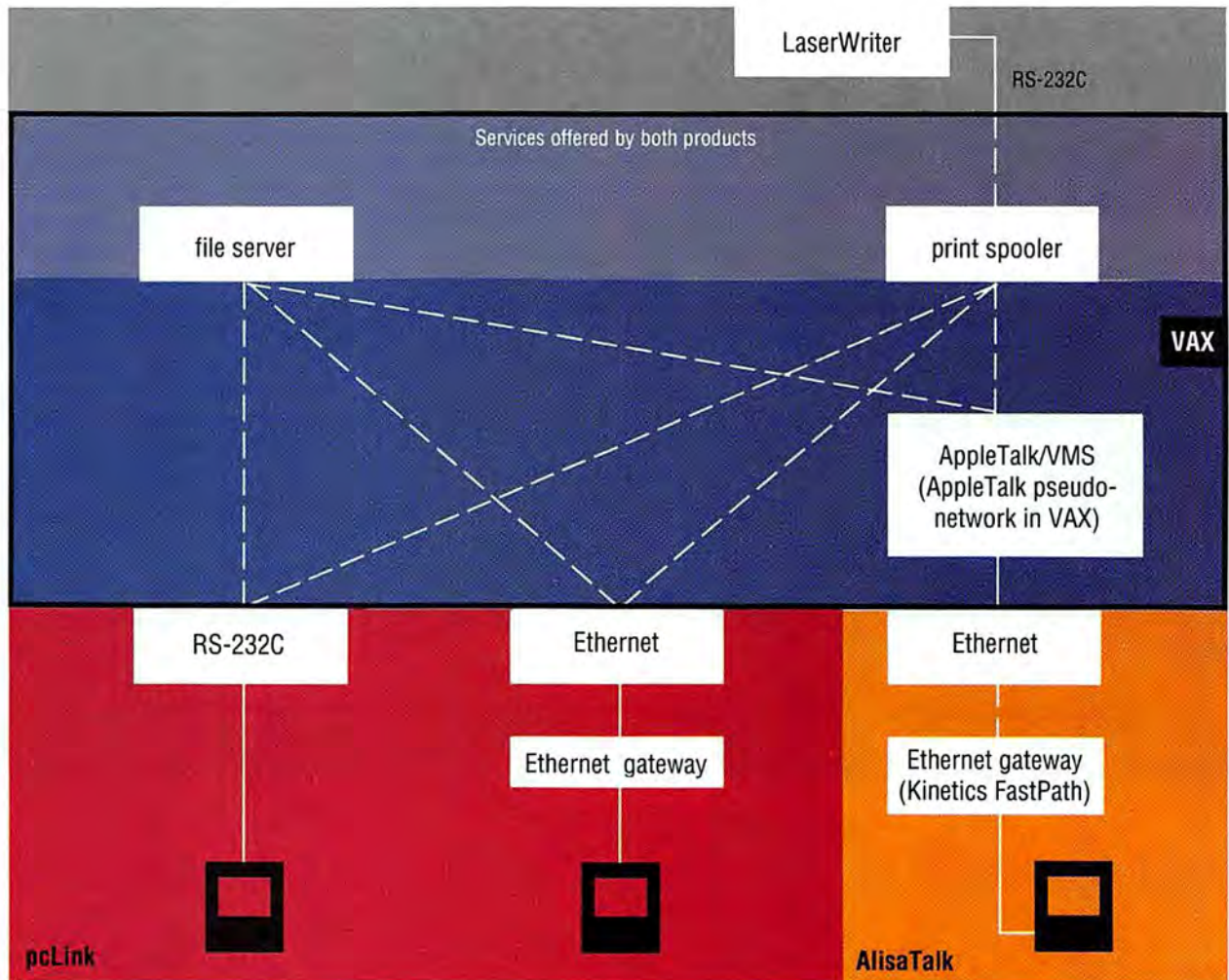


Figure 1- Invisible VAX

VAX Connections

Ethernet data transmission protocols and Ethernet-compatible cabling (thick or thin coaxial cable, fiber optics, or twisted-pair wire) let you establish high-speed links between Macs and VAXs. Since DEC's network architecture (DECnet) fully supports Ethernet, you may find Ethernet cabling already in use in many VAX installations. To join a Mac to the Ethernet network, you need to install an AppleTalk-Ethernet gateway. Gateways developed by Kinetics, Dove, and Apple allow the Mac to broadcast native AppleTalk protocols over the Ethernet network.

Kinetics was one of the first companies to develop Ethernet gateway products. Kinetics' FastPath devices enable you to attach AppleTalk LANs to an Ethernet backbone. The FastPath box links an AppleTalk LAN to a thick-cable Ethernet transceiver for data transmission. The FastPath 3 includes its own Ethernet transceiver to connect to thin-wire Ethernet, usually meant for smaller, more localized work groups.

If you need high-speed communications, use the EtherSC to connect the Mac via the SCSI port, or connect the Macintosh SE directly to Ethernet with the EtherPort SE board. The EtherSC is a box that attaches to the SCSI port; the EtherPort SE card fits into the single expansion slot of the Mac SE. Both devices offer faster data transfer rates than does the normal AppleTalk serial port connection used in FastPath boxes.

Dove Computer also offers a SCSI-based box that links Macs to Ethernet. Its FastNet uses an on-board 68000 microprocessor to handle most of the network overhead associated with

a gateway. Dove supports either a thick- or thin-cable Ethernet connection for FastNet.

Apple, Kinetics, and 3Com manufacture Ethernet boards for the Mac II. Kinetics has announced a NuBus board for the Mac II to support Ethernet; this board works in much the same manner as Apple's EtherTalk board. 3Com, which provides Apple with the basic Ethernet board for the EtherTalk package, also plans on marketing its own version of the Mac II Ethernet board.

Direct AppleTalk connections to VAX machines are available from Cybergraphics and Kinetics. Cybergraphics now offers an AppleTalk board—originally developed as part of a VAX-based publishing system—that plugs into the VAX. This board supports up to 16 AppleTalk networks, with four users per network. Kinetics also produces the FastPath/Q, which is basically a board that offers the functions of the FastPath box but plugs into the VAX using DEC's Q-bus.

Linking to DECnet

Although AppleTalk is the most popular network architecture for linking Macs together, you'll probably find DECnet systems, based on DEC's Digital Network Architecture (DNA), in more non-Mac computer installations than any other networking system. And DECnet has its advantages.

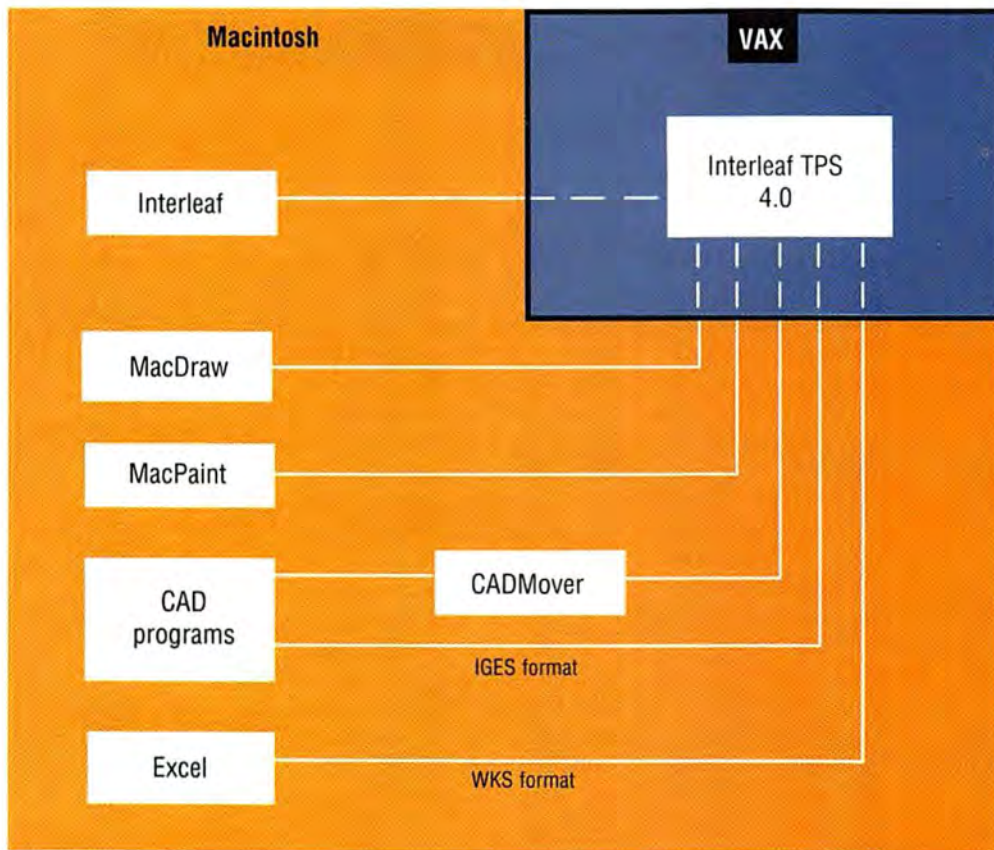
DECnet provides a ready link to DEC's mail systems, particularly *VMS Mail*. This network also offers task-to-task communication, which enables cooperating programs on different computers to exchange data. In the case of DECnet, these programs may run under different

operating systems and be written in different languages.

DECnet's remote file access feature lets you work with files on another computer. As with a distributed file server, the files you use can be located on a number of computers that are linked via DECnet. DECnet also includes a feature called *virtual terminal support*. With a virtual terminal you can use a terminal emulator on a local Mac to communicate with any remote computer on the network. For example, the Mac could be connected to one VAX and, by means of virtual terminal support, you could start a new session by logging onto another VAX connected to the network.

Two products run DECnet on a Mac, *TSSnet* and *CommUnity*. *TSSnet*, marketed by Alisa Systems, allows a Mac to become an *end-node* on DECnet (that is, the Mac cannot forward or reroute network traffic to another computer, it can only send and receive data). *TSSnet* supports either an asynchronous connection through the Mac's serial port at speeds of up to 57,600 baud, or an Ethernet connection through any available Ethernet gateway. *TSSnet* also includes an application for sending and receiving *VMS Mail* over DECnet.

Technology Concepts links *CommUnity*, its DECnet software, with Dove's Fastnet Ethernet box for the Mac. Like *TSSnet*, *CommUnity* supports remote file access, remote file transfers to or from the Mac, virtual terminal support, and task-to-task communications. Mac file requests generated by other computers on the network execute in the background and do not require any action by the Mac user.



Transferring Files to Interleaf TPS

Interleaf TPS on a VAX is capable of accepting files from a variety of programs. Mac users can either transfer files directly to TPS or use translator programs like CADMover to create files compatible with TPS.

or DDIF) or that work with file translators. The easiest way to ensure file compatibility is to use the same program on both machines, but even then complete file compatibility isn't guaranteed. For example *WordPerfect*—a popular word processing program—comes in VAX, Mac, and MS-DOS versions, but the VAX and MS-DOS versions do not currently support bit-mapped graphics.

Of the common file formats mentioned, IBM's DCA is the oldest and probably the most widely supported, but it doesn't handle graphics within documents—although this may change before long. Only *Microsoft Word* supports DCA files. DataViz's *MacLink Plus* can translate DCA files into *MacWrite*-formatted files (or vice versa).

On the VAX side, word processors such as *Word-11*, *Wordmarc*, and *Mass-11*

Making Macs Out of Mainframes

It's possible to have the best of both worlds—mainframe power with a Macintosh interface. Two products, *Makeasy* and *MacNow*, provide a Mac-like interface for the VAX running the VMS operating system. *Makeasy* from Eurosoft International lets you assign Mac-like icons to VAX files. You can also create and store VAX commands as scripts in pull-down menus. *MacNow* is Telos Systems Development's Mac interface for DEC's *All-in-One* office automation package. *MacNow* lets you process E-mail, perform word processing and file man-

agement within the *All-in-One* shell, and launch scripts using the mouse and command keys.

Apple's *AppleTalk/VMS* package lets you stay within the familiar Macintosh environment with products that link VAX computers to Macs on AppleTalk networks. The results are powerful. You can use the VAX as a file server and print spooler with packages like *AlisaTalk*. You also have the flexibility, with programs such as Odesta's *Helix VMX*, to use the Mac and the VAX to store and process a database.

Apple has introduced an-

other product, *MacWorkstation*, that provides more links between Macs and mainframe applications. *MacWorkstation* runs on VAXs as well as IBM mainframes and offers the graphics interface common to Mac-to-mainframe applications. This means mainframe applications can respond to Mac applications with dialog boxes, resizable scrolling windows, and so forth. Today's products combine, however awkwardly, the VAX's power and the Mac's ease of use, and suggest the next step toward transparent connectivity.



Alisa Systems president Bob Denny developed the first implementation of AppleTalk protocols on the VAX. Alisa now markets TSSnet, which gives the Mac worldwide access to DECnet.

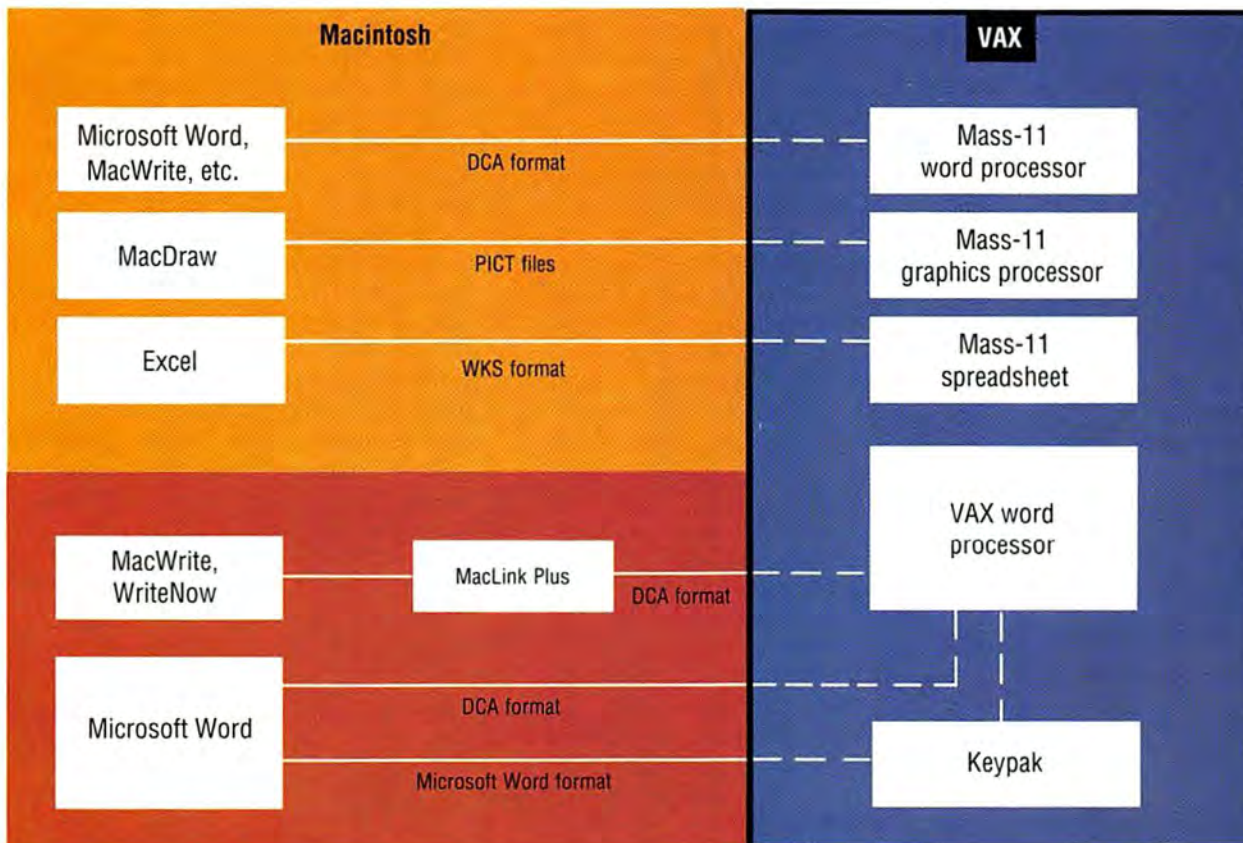
read DCA-formatted files. *Mass-11* modules also accept PICT and WKS files (see "Moving Files to a VAX"). *Keypak*, a VAX-based file translator similar to *MacLink Plus*, translates various PC word processor formats. With *Keypak*, the user must transmit a word processing file to the VAX via a PC- or Mac-based terminal emulator, then invoke *Keypak* to translate the original document into a format the target word processor can read. At this time, *Keypak* supports only *Microsoft Word* on the Mac, but it includes such file formats as *Mass-11*, DCA/RFT (revisable-format text), and DEC's dx on the VAX.

Engineering

Many computer centers purchase DEC's VAX for scientific and engineering applications. Companies such as Auto-Trol, Autodesk, Boeing Computer Services, Cadam, Computervision, IDS, Intergraph, MacNeal-Schwendler, and PDA Engineering offer a variety of CAD and engineering packages for the VAX. In recent years, the National Bureau of Standards and individual vendors have moved toward adopting a CAD file standard called International Graphics Exchange Standard (IGES). Most

VAX-based CAD programs support IGES, although alternative standards exist, such as *AutoCAD*'s DXF format. A few Mac CAD programs, for example *MGMStation*, contain their own IGES translators to simplify the import and export of files between different systems. For CAD programs that don't include IGES or DXF, you can use *CADMover* to translate IGES, DXF, *Mini-Cad*, PICT, and *MSC/pal* file formats.

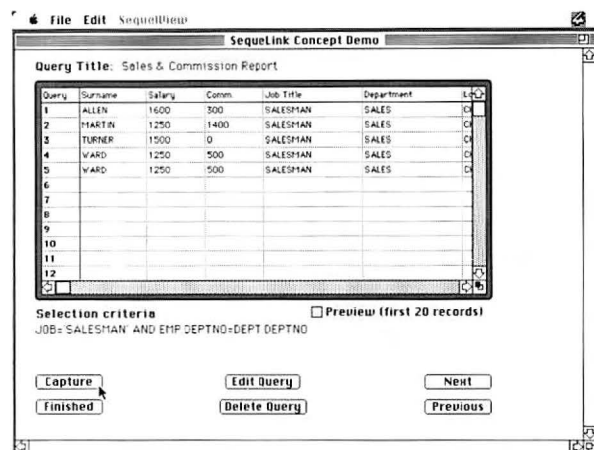
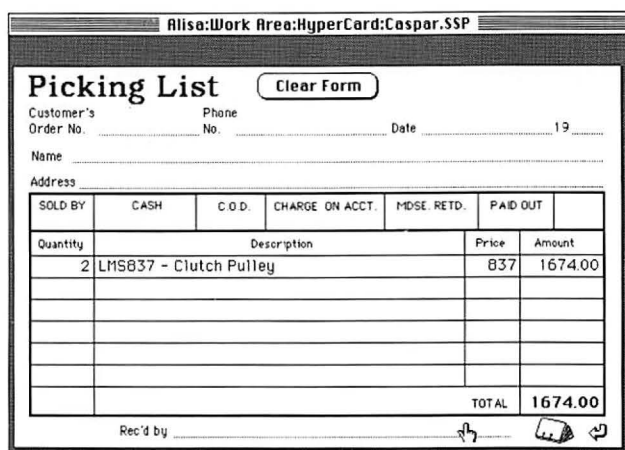
For engineers involved in finite analysis, MacNeal-Schwendler offers *MSC/NASTRAN* on the VAX and a limited version, *MSC/pal*, for the Macintosh (and other personal computers). Mac *MSC/pal* files are not directly transferable to *MSC/NASTRAN* for refinement and further calculation, but MacNeal-Schwendler plans to release a Mac-based translator that includes the same features as its PC-based translator, ADCAP2. Programs such as *Frame Mac* and *Beam Mac* will soon offer file outputs compatible with *MSC/pal*, as well as *STAAD*, *MSC/NASTRAN*, and *TRUDLE* on the VAX. This file compatibility will let engineers take advantage of the Mac's graphics capabilities and the VAX's computational power for handling large modeling problems.



Moving Files to a VAX

A Macintosh user can translate and transfer files to or from the VAX. The DCA format is often used to transfer popular Mac word processing files to the VAX.

SequeLink lets Mac users work with a VAX-resident Oracle database using HyperCard (left) or 4th Dimension. SequeLink provides HyperCard external commands and 4th Dimension language extensions for SQL, along with server software that runs on the VAX.



One of the major strengths of mainframes and superminis like VAXs is that they can store large, corporatewide databases. Most Macs simply don't have the processing power or storage to handle that much information, nor can they access databases designed to handle many users simultaneously. To enable Mac-based database programs to access VAX-based data files, Informix offers a version of *Informix-SQL* (Structured Query Language), a relational database system for Mac IIs running *A/UX*. Informix also offers an SQL-based language for database development on the VAX called *Informix-4GL*; the company plans to port this program to the Mac II.

Oracle, another leader in SQL databases for minis and micros, is developing similar products for the Mac. Apple's investment in Sybase may also lead to a Mac version of Sybase's SQL-based distributed database. Sybase's current products run under UNIX or the VAX/VMS operating systems.

Once you can exchange information between SQL databases running on the VAX and the Mac, you'll find it more efficient and useful to download only the information you need. Informix, Oracle, and Sybase will likely incorporate smart links in their products to allow you to extract information from the VAX database. Macintosh developers are building SQL tools. Alisa Systems has announced *Sequelink*, software that allows *4th Dimension* or *HyperCard* users on a Mac to access SQL

Odesta's *Helix VMX* allows Mac users to create and access a *Helix* database stored on the VAX. Odesta was the first company to announce a VAX-resident database that used the Mac as a front end.

More than any other application area, spreadsheet programs share standard file formats, thereby allowing extensive and direct file exchange. Whether they're stored on a VAX, an IBM PC, or a Mac, most spreadsheet programs can read or write WKS format. Many such programs also read the SYLK file format.

The most-used service on a network is invariably electronic mail, or E-mail. But vendors have a long way to go before E-mail works transparently between different types of computers.

Every VAX/VMS user quickly becomes acquainted with *VMS Mail*, a handy little utility for communicating with other network members. You can access *VMS Mail* with a regular terminal emulator on a Mac, or with *AlisaTalk* or *pcLink*. At present, however, there is no simple way to share an AppleTalk-based LAN mail program, such as *InterMail* or *InBox*, with *VMS Mail*. Nor does DEC's office automation package, *All-in-One*, provide a gateway for Macintosh E-mail programs—although you can give *All-in-One* a more Mac-like interface using Telos's *MacNow*.

Vendors have taken Mac-VAX connectivity beyond terminal emulation and file service to the exchange of formatted data. Future developments in Mac-VAX connectivity depend on the implementation of standards. For example, X.400, a proposed international standard for electronic mail being considered by the Consultative Committee on International Telegraph and Telephone, may result in straightforward, easier E-mail links.

As different products incorporate standards—DCA for word processing, tagged-image file format (TIFF) and encapsulated PostScript (EPS) for images, and IGES and DXF for CAD files—moving information between dissimilar programs on dissimilar machines will be increasingly possible and easy to do. Eventually you'll sit down before a Mac to perform a task and you won't know (or care) just which computer on the network is doing the work or storing the data. □

See *Where to Buy* for product details.

Win a Mac II in Macworld's first annual

Macintosh Masters

Macworld is holding a celebration of the new graphics, and we want you to be a part of it. Your Mac art for art's sake—or maybe for the sake of your business—but a little fame and fortune won't hurt! So enter, and be recognized as a Macintosh Master.



look of Macintosh. We know you create

Who: Artists, designers, publishers—anyone who works with Macintosh graphics.

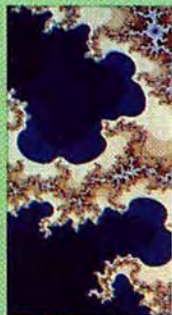
What: A Mac art competition and exhibition. Entries will be judged in eight categories: fine art/illustration, graphic design/publishing, image synthesis/3-D, video/animation, technical illustration, mechanical design, architectural design, and presentation graphics.

We will award one grand-prize winner a Mac II; two runners-up will receive cash prizes. The overall and category winners will be published in a *Macworld* feature article and in a Macintosh Masters graphics calendar that we'll produce at year's end. All winners will also receive their choice from among top Mac graphics software, including *ImageStudio*, *Adobe Illustrator 88* or any four Adobe fonts, *SuperPaint* or *Digital Darkroom*, *Pixel Paint*, *PageMaker 3* or *Aldus Freehand*, or any Cricket product.

When: *Macworld* must receive submissions by April 1, 1988.

Where: In addition to being published in *Macworld* and in the calendar, winning entries will be exhibited at the August SIGGRAPH 88 graphics convention in Atlanta.

Why: To inspire creativity among Mac artists, recognize the achievements of the Mac developers whose products make it all possible, and have fun!



How: Submit hard and disk copies of entries to Macintosh Masters, *Macworld*, 501 Second St., San Francisco, CA 94107. Include your name, address, and phone number as well as a detailed description of how you produced the piece. Work will be judged on aesthetic value and technical innovation. If your entry is larger than 800K, you may omit the disk copy, but make sure the hard copy is of suitable quality for judging. Color slides of mixed-media art or Mac-designed sculpture are acceptable. Publishers should submit a single spread or cover for judging, and may also omit the disk copy. Video and animation sequences may be on disk or videotape, as appropriate. Winning entries become the property of *Macworld*.

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Letraset

1987 Taxes: Prepare Yourself

*How to save money
by preparing
your own taxes*

by Scott Beamer

Did you notice? You may not be able to deduct tax-preparation fees from your federal income tax this year. People who owe what's called an Alternate Minimum Tax can't deduct preparation fees at all. And others can deduct only an amount exceeding 2 percent of their adjusted gross income. What better time to save on preparation fees by learning how to do it yourself on the Macintosh? Most people can save time and money by using SoftView's *MacInTax* to prepare their taxes, even on the first attempt at filling out their own tax returns. Accountant's fees of \$120 an hour are not unusual, and *MacInTax* may save you four or five hours of an accountant's time.

I chose *MacInTax* not only because it is the best-selling tax program for the Mac (*Macworld* readers voted *MacInTax* Best Tax Planning/Preparation Software in last year's World-Class Macintosh contest), but because it's easy to use. This is of key importance since most people use a tax program only once a year, and besides, tax forms are hard enough by themselves, especially this year. In *MacInTax*, the forms you fill out on screen look like actual IRS tax forms. And when you're done, you can print the forms, sign the 1040, and send the completed return to the IRS. If you're inter-

ested in some of the other tax products available, see "Tax Product Audit."

This article doesn't provide tax advice. Before you start working on your forms, a quick phone conversation with your tax preparer or accountant might alert you to how changes in this year's tax law affect you. When you've prepared the forms to the best of your ability, take working copies to your accountant along with copies of last year's forms and other relevant paperwork. For tax information while working on forms, you can refer to *MacInTax*'s online help, which includes the entire IRS 1040 booklet. For obvious liability reasons, SoftView doesn't provide tax advice, but you can call the toll-free IRS hot line. I find it helpful to work with a tax advice manual.

At press time, the IRS had not finalized the federal tax forms, so there may be some differences between the specific instructions I provide and what the IRS finally settles on. However, most items should be the same.

Gather Your Paperwork

The most time-consuming and difficult part of preparing income tax forms is gathering and organizing the year's paperwork. The government requires companies and banks to send you year-end income summaries, such as W-2 forms, dividends,

and bank interest, but you are largely on your own for expense receipts. If you used a personal financial management program last year, you're way ahead of the game. If not, this is the hard part, and *MacInTax* can't help you much.

Take a few minutes to organize your working disks. (You never work from master disks, right?) To save room, you can remove unnecessary modules (the Converter, for instance) and locked forms by holding down the option key and selecting and dragging them to the trash.

Get out last year's forms. Make sure you fill in a line on screen in this year's form for every line you filled in last year. Where there are changes, be alert. Some lines may differ due to changes in this year's form, or because of changes in your financial situation or the way it is affected by the new tax laws.

Form 1040

Since the 1040 is the central form for preparing taxes, we'll begin by filling it out (see Figure 1). All line numbers refer to the provisional 1040 form that the IRS provided to SoftView. Start by entering your vital statistics at the top of *MacInTax*'s 1040 form. If you used this program last year (or if you

use it again next year), you can save time by retrieving the appropriate information from the previous year's forms. *MacInTax* fills out your personal information at the top of the 1040 form and puts your name and social security number at the top of each page. The program can also collect financial information that is unlikely to have changed from last year—such as passive loss carryover, depreciation, and partnership information—and place it in the appropriate schedules.

You enter few numbers directly on the IRS 1040 because most information is transferred from other forms. In fact, you can't enter data on numerous lines. If you try, a message appears that reads, "This amount is determined automatically. Don't enter a value." As you work on the other



JOHN HERSEY

forms and schedules, *MacInTax* automatically fills in the appropriate totals in the 1040. This year the program has a status bar showing current subtotals for adjusted gross income, taxable income, and refund coming or taxes due.

To fill in your income, double-click on line 7, "Wages, salaries, tips, etc." A W-2 worksheet appears on screen. Enter information from all the jobs you (and, if you're married and filing jointly, your spouse) held during the year on the W-2 worksheet. The program will then correctly total and enter all income information on all appropriate spaces throughout your tax return.

Schedules

After you fill in line 7, you can begin filling in subsequent lines. Often these lines require the use of schedules or other forms (see "MacInTax Forms and Sched-

ules" for a list of them). If your interest income is more than \$400, for example, when you prepare line 8, "Taxable interest income," pull down the Schedules menu and choose Schedule B or double-click on line 8 or 9 of the 1040. Enter the amount and source for each item of income in the schedule; *MacInTax* automatically calculates the total and enters that amount on line 8 or 9 of the 1040 form, whichever is appropriate. You may also have to use Schedule B if your dividend income exceeds \$400. In that case, select Schedule B from the menu or double-click line 10. You follow a similar procedure with all the schedules.

A minor shortcoming of *MacInTax* is that it doesn't inform you when it is necessary or advantageous to file specific auxiliary schedules, such as Alternate Minimum Tax Computation or Credit for Child and

Dependent Care. It's worthwhile to go through the forms list carefully, making sure you have considered every form that might apply to you. It's easy to add an extra form to your calculations. *MacInTax* fills in all the information it can; it just doesn't advise you in advance of the appropriateness of a particular form.

Estimates

Depending on your financial situation, some of the line items you have to fill in may require estimates, itemizations, worksheets, and importation of ASCII text files (see Figure 2). When you are uncertain of specific numbers, you should use *MacInTax*'s estimating feature. For instance, perhaps a W-2 form hasn't shown up yet; enter your best guess, immediately followed by a question mark or the letter *e*. *MacInTax* performs all calculations requiring that

Tax Product Audit

Tax Templates from Excellent Exchange

If you already have *Microsoft Excel* or *Works* and are experienced at filling out your tax forms, this set of templates is a terrific bargain at \$35. California and New York state supplements are available. The IRS will accept signed copies of the 1040 printed on a dot matrix printer as legitimate submissions. The templates work very well, use macros to simplify operation, and include 28 forms as well as some worksheets, including the W-2. The on-screen forms look like the real tax forms. Drawbacks are that the templates work only with *Excel* or *Works*, there is no manual, and technical support is virtually nonexistent.

EZTax-Prep

EZWare makes three template packages to use with *Excel*. The *EZTax-Prep* tax template package is good and very complete, although its large manual

is sometimes obscure. The forms can all be printed by an ImageWriter or LaserWriter—and this year, for the first time, signed and submitted. The package includes a transparent 1040 overlay that can be photocopied with a printout of the formatted tax data. Some users, especially professional tax preparers, may still prefer the more polished look of the photocopied overlay. It and the Laser-printed forms are almost indistinguishable from the government 1040. EZWare will provide a laser printing utility that allows multiple 1040 forms to be printed in as little as 20 seconds each. State forms are available for California, New York, and Pennsylvania.

EZTax-Prep 1065

Especially interesting for professionals this year is a new package to do partnership returns, *EZTax-Prep 1065*. It includes 12 schedules and more than 25 worksheets to help you

complete the 1065 and Schedule K. The K-1s can be adjusted for partners who entered or left during the year, and then printed to reflect each partner's share. The database is permanent, requiring only changes in partner information and new financial figures for the next year.

EZTax-Plan

EZTax-Plan imports data from your current *EZTax-Prep* forms, then projects your taxes for up to 45 years, depending upon available memory. It incorporates all the known tax changes in the computations. You can set inflation rates and personal growth rates for every year and compare alternate strategies for the same year. There is even an Audit Alert, a bar chart that compares your projected deductions against historically claimed average deductions to warn you of the likelihood of an audit. A corporate version of this package is also available.

number, but continues to remind you that it is an estimate through to final printing.

It's easy to keep track of *soft*, or estimated, numbers. On the Schedules and Forms menus, each possible selection is marked Unused, Incomplete, or Finished. Select an incomplete form, then tab through it to select each estimate or each necessary item not filled in yet.

Itemizing

Sometimes a single entry represents a collection of items. For certain entries, the IRS requires an attached list accounting for these items. For example, if you made more than \$3000 in charitable contributions, you must itemize the individual contributions. *MacInTax* provides itemization windows for this purpose (see Figure 3). If you wish to add up a list of numbers to make a single total on your tax form, double-click where you wish the entry to appear, and a blank itemization window appears. As you type the list, numbers are totalled at the top of the window. You can both list the amounts of the individual items and label them. You can itemize an entry within an itemization window by double-clicking on it to create a new blank itemization window. The only limit to the number of itemization levels is available memory.

You can easily delete an itemization, but the corresponding entry on the tax form will remain unless you remove it separately. You can print any or all of the itemization windows, for filing with the return. Be careful to fill in the "Itemization of:" line precisely before printing, because *MacInTax* does not automatically label these windows.

I also use itemization windows to hold memos that remind me of how I arrived at the number in a specific line. I don't file those printouts with my return, but I keep them for future reference.

It would be nice if *MacInTax* let you mark screen forms to identify itemized lines. Currently, the only way to find out which lines are itemized is by choosing Open Forms in the File menu; it lists all itemizations by form and line.

Worksheets

MacInTax provides specific worksheets for situations that commonly require itemizations, such as a W-2 form, unemployment income, or social security income. Before opening an itemization window, it's a good idea to look at the



Elizabeth Anne Tinics, an enrolled agent in San Jose, California, uses *MacInTax* to prepare returns for nearly 200 clients. She likes the program's worksheets, the editable Schedule SE (for self-employed individuals), and the fact that the IRS accepts printouts of the forms.

Figure 1
MacInTax's screen version of the IRS 1040 form looks very much like the real thing. You fill in the form interactively, then print it and send it to the IRS, which will accept signed copies as legitimate submissions.

Category	Check/CrdChg	BnkDep/CrdRet	BnkWth/CrdSvc
Business Expense	13,052.95	0.00	0.00
	953.70	0.00	0.00
Charity	502.50	0.00	0.00
	144.25	0.00	0.00
Loan Interest	2,448.64	0.00	0.00
	0.00	0.00	0.00
Professional Maria	2,044.55	472.50	0.00
	49.26	0.00	0.00
Total	18,048.64	472.50	0.00

Figure 2
MacInTax's Import command opens any ASCII text file. To move the data onto the tax form, point to the data in the import window (a year-end report from MacMoney here, titled "Custom Transaction Activity"), click on the correct tax form, then the desired line. Text can be imported this way as well.

Figure 3

With MacInTax you can open an itemization window for any line that accepts data. Itemizations can be nested for as many levels as memory allows. The program automatically adds data and enters it on the correct line of the form. Itemization windows also work for writing memos.

Schedule B: Interest & Dividend Income		
Dividend Income		Amount
4 Dividend income (list name of payer - include on this line capital gain distributions, nontaxable distributions, etc.)		
Mexican Stock Portfolio - (Managed)		826
Schedule B/Line 4-a Itemization		
Itemization of: Mexican Portfolio Dividends		
3 Items	Total	826
Description		Amount
a 500 Shares Cermoc		58
b 1,500 Shares of Aurrera		657
c 2,450 Shares PEMEX		111
Schedule B/Line 4-a(c) Itemization		
Itemization of: PEMEX		
4 Items	Total	111
Description		Amount
a 1st Qtr. Dividend		-0-
b 2nd Qtr. Dividend		37
c 3rd Qtr. Dividend		37
d 4th Qtr. Dividend		37

With 30 forms and schedules (and about 15 worksheets) to choose from, even professional tax preparers will find most of their needs met. This list of 1987 forms and schedules is tentative because the IRS had not yet released an official list by press time.

MacInTax Forms and Schedules

Form 1040	U.S. Individual Income Tax Return
Form 1040A	U.S. Individual Short Form
Form 1040EZ	U.S. Individual Very Short Form
Form 1040ES	Estimated Tax Payments
Form 2106	Employee Business Expense
Form 2119	Sale or Exchange of Principal Residence
Form 2210	Underpayment of Estimated Tax
Form 2441	Credit for Child and Dependent Care
Form 3903	Moving Expense Adjustment
Form 4562	Depreciation
Form 4562A	Depreciation on Post-1986 Assets
Form 4684	Casualty and Theft Loss
Form 4797	Supplemental Schedule of Gains and Losses
Form 4868	Automatic Extension of Time to File
Form 4952	Investment Interest Expense Deduction
Form 6251	Alternate Minimum Tax Computation
Form 6252	Computation of Installment Sale Income
Form 8283	Non-Cash Contributions
Form 8582	Passive Losses
Form 8598	Home Mortgage Interest
Form 8615	Children Under 14
Schedule 1	Supplement to Form 1040A
Schedule A	Itemized Deductions
Schedule B	Interest and Dividend Income
Schedule C	Profit/Loss from Business or Profession
Schedule D	Capital Gains and Losses
Schedule E	Supplemental Income Schedule
Schedule F	Farm Income and Expense
Schedule R	Credit for the Elderly
Schedule SE	Social Security Self Employment Tax

Worksheets menu to see if there is a specific worksheet available. Individual worksheets label specific items that are likely to appear. For example, the W-2 worksheet provides labeled items for wages, income tax withheld, social security tax withheld, social security wages, and a place to check for spouse.

MacInTax automatically fills in labeled items if you have already filled them in elsewhere in the program. For example, if you trade stocks, the nine lines provided to enter short-term capital gains transactions are not likely to be enough. Just type "See Statement 1" on line 2a, then choose "D/2a: Short Term Capital Gains" from the Worksheets menu. The worksheet provides you with 23 lines labeled the same as line 2a. If these are not enough, you can choose as many more as necessary, and they will all be totaled and entered on Schedule D, then on line 14 of Form 1040.

If you are uncertain whether or not to itemize deductions under the new rules, try it both ways to see which one gives you a lower tax liability. This is one of the real strengths of MacInTax.

Printing

When you've completed your tax return, it's time to print out the forms to show to your tax preparer or to send to the IRS. MacInTax offers several printing options. I recommend against trying to feed actual forms through an ImageWriter and having MacInTax fill in the blanks. Feeding the forms through one page at a time is very tedious, and alignment is tricky. Never try this with your last blank copy of a particular form. Instead, use photocopies; you'll need several tries at most forms to get a good-looking final set printed this way.

The professional tax preparers I have talked to all use the ImageWriter in batch mode, printing out the entire form on plain paper. This is the method I have settled on, having tried all options available. Whether you use the Best or Faster setting is a matter of taste since the IRS is unlikely to be sensitive to the difference as long as your forms are reasonably legible. If you have a LaserWriter, you may wish to try using it, but it is slow because it treats each page as a graphic element.

When you send your final forms to the IRS, save a photocopy of your signed return, not a separate printout. Also save a list of the pages filed in case one becomes separated or lost.

Closing the Books

It is difficult to know when your taxes are finally done. I find myself going over the forms again and again, comparing them with my forms and financial records from last year, identifying problem areas, removing the last of the estimates. I finish things up by making an appointment with my accountant, setting it several days in advance so I work to that artificial deadline. I take several things to the meeting: a working copy of the forms, last year's forms, any receipts I think necessary, my state forms, and a worksheet for my estimated taxes for the next year.

My accountant is always impressed by how good my forms look, with all the nicely printed worksheets and itemizations. We go over everything, including the state return, line by line, placing special emphasis on the comparison with last year's return. There is no need to check the math, since *MacInTax* has automatically calculated the entire return. We do check, however, to make sure I used the right forms and put the right numbers on the right lines.

We often discuss alternate strategies that might be suitable. Sometimes I even print alternatives and bring them along to save time during the meeting. The meeting takes only an hour or so. I've paid for *MacInTax* many times over in savings on tax-preparation fees alone.

Last year, *MacInTax* offered a state return for California only. At press time SoftView planned to add New York and possibly Illinois this year. The company plans to add more states next year. The federal version of *MacInTax* helps with returns for other states by providing itemizations and worksheets. *MacInTax* even tells you which areas on the state forms it was unable to fill out because of state variances.

MacInTax may be even more valuable to you if you don't get your taxes done on time. You should be able to come up with a fairly good guess of what amount, if any, you must send in with your form 4868, Automatic Extension of Time to File, to avoid penalties for underpayment of taxes. In any case, *MacInTax* will save you time and money on preparation fees and will give you a better handle on your tax situation. □

See *Where to Buy* for product details.

Planning Ahead

SoftView announced a year ago that it is working on a professional version of *MacInTax*. A shipping date has not been announced yet, and most of its features will not be of interest to individual taxpayers. The most interesting features are already included in SoftView's new product, *TaxView Planner* (see "Plan for a Taxing Situation" in this issue).

TaxView Planner, a supplement to *MacInTax*, helps calculate and print estimated taxes (*MacInTax* has estimated tax forms as well) and W-4 forms (employee's withholding). It also has a worksheet that calculates up to five alternate tax strategies for this year. Or it can calculate for the next five years at the appropriate rates instead.

Keep in mind that 1988 is a transition year for the tax laws. They will change again next year and so will the tax tables. *TaxView Planner* allows you to set an inflation rate for each year of a five-year projection.

Using a personal financial management program will

make preparing your tax returns dramatically easier next year because it eliminates fussing with paper records and breaks the chore up into 12 monthly installments. Furthermore, you know where you stand at any time during the entire year.

MacMoney and *Dollars and Sense*, the two most popular financial management programs, both create year-end reports that can be opened in a special window within *MacInTax*. To transfer information between the report window and *MacInTax* simply point and click. Actually, *MacInTax* can import files from other programs in the same way, as long as the files have been saved as text only. By the time you're paying 1988 taxes, the manufacturers of *MacMoney* and *Dollars and Sense* hope to provide a feature that will permit *MacInTax* to import a year-end report and fill in almost your entire tax return automatically.

File Edit Options Alternative: 1 2 3 4 5										
Summary(3)										
Alternative 3 - Summary Invest in Rental Property										
Name	Michael W. & Susan A. Moore	SSN	123 45 6789	5-Year Cost	40,488					
		%	(a) 1987	(b) 1988	(c) 1989	(d) 1990	(e) 1991			
1 Status: Exempts. Elderly/Blind	<input type="checkbox"/>	2	4	1	2	4	1	2	4	1
2 Wages, Salaries			70,000	44,940	48,086	51,452	55,054			
3 Interest, Dividends										
4 Business Income or (Loss)			0	11,000	13,200	15,840	19,008			
5 Capital Gains or (Losses)			10,000							
6 Rents, Royalties, Partnerships			-11,500	-8,700	-6,418	-5,153	-3,904			
7 Other Income or (Loss)			4,900	4,990	5,082	5,176	5,271			
8 Total Income			73,400	52,230	59,950	67,315	75,429			
9 Adjustments to Income			6,000	6,000	6,000	6,000	6,000			
10 Adjusted Gross Income			67,400	46,230	53,950	61,315	69,429			
11 Itemized Deductions			17,152	16,645	15,770	15,144	14,558			
12 Exemptions			7,600	7,800	8,000	8,000	8,000			
13 Taxable Income			42,648	21,785	30,180	38,171	46,871			
14 Tax Computation			8,181	3,268	4,583	6,821	9,257			
15 Credits			700	700	700	700	700			
16 Net Regular Tax			7,481	2,568	3,883	6,121	8,557			
17 Other Taxes*	<input type="checkbox"/>		1,479	2,572	2,723	2,502	2,602			
18 Total Tax Liability			8,960	5,140	6,606	8,623	11,159			
19 Payments			6,100	6,100	6,100	6,100	6,100			
20 Balance Due or (Refund)			2,860	-960	506	2,523	5,059			
21 Tax Bracket (%)			21.0	21.0	21.0	21.0	28.0			
22 Inflation Rate (%)										

TaxView Planner

TaxView Planner gives an in-depth look at alternative tax strategies. At any time during the year you can find out your current tax standing or analyze possible strategies and their impact for up to four years in the future.

Well-Connected

2400-baud modems deliver speed with compatibility

by Nanci Hamilton

If you're shopping for a faster, smarter modem, or even for your first one, you should consider 2400-baud modems. The 2400-baud modems have more functions and they're easier to use. What's more, the technology is proven, the price is right, and there are plenty of models to choose from.

The 2400-baud modems double the file-transfer speed of 1200-baud modems, while avoiding the problems of proprietary protocols that currently beset 9600-baud modems. But don't decide to trade in your 1200-baud modem for a 2400 just yet; if you spend most of your time online conversing from the keyboard rather than downloading, a new modem may not be worthwhile. And you might do well to consider a higher-speed modem, such as a 9600-baud model, if you intend to routinely use the modem for large file transfers or for working online with CAD/CAM graphics-intensive applications.

Which modem should you buy? That depends on what tasks you want to accomplish—and on your budget. Consider the work you'll be doing and whether you'll set the modem up in your office or at home. Check features and prices in "2400-Baud Modems Compared" to find the model most suited to your needs.

A Case for 2400-Baud Modems

The faster the modem, the lower your phone bill. Described by data transmission rates measured in baud (modulations per second), modem speeds vary from 300 to 19,200 baud. The least expensive modems cost as little as \$50 and operate at 300 baud, a pathetically slow rate. More expensive (\$200 to \$900) 1200-baud modems transmit data fast enough for online tasks that require keyboard entry or reading on screen, but are slow when it comes to file transfers. Faster 2400-baud modems cost approximately the same as, or slightly more (\$100 or so extra) than their 1200-baud counterparts. High-speed modems, 9600 baud and up, are pricey (\$1000 to \$3500) but operate at almost triple the data transmission rate of the 2400-baud modems.

Most online information services support 300, 1200, and 2400 baud and provide 2400-baud access at the same price as 1200-baud access. A few services do increase fees as baud rate goes up, in an attempt to keep information access priced roughly the same.

You might conclude that you should buy the fastest, most affordable modem. But there's one other issue—standards. If you want two modems to exchange data, they have to speak the same language. At this point, there is no agreed-upon language, or set of standard protocols, for modems faster than 2400 baud.

Before 1981, modem manufacturers incorporated one of two unrelated sets of data-transmission protocols: AT&T's Bell standards, used primarily in the United States and Canada, and the CCITT (Consultative Committee on International Telegraph and Telephone) standards used throughout Europe. Predictably, the language barrier created problems in exchanging data between America and Europe. In 1981, collaboration between AT&T and CCITT resulted in the first worldwide data communications standard: V.22 bis. Embraced by more than 40 manufacturers, V.22 bis allows modems to exchange data at rates up to 2400 baud.

However, the battle over standards continues for modems over 2400. Proprietary protocols proliferate. If you require 9600-baud or faster communication, equip your computers with modems from the same manufacturer—but realize you may have to replace the equipment later if those modems do not support the protocols that standards organizations ultimately settle on.

Uncertainty about standards has also stalled development of information ser-



A Stack of Modems
Hayes Smartmodem 2400, Microcom, AX/2400c, Prometheus ProModem 2400, and the Everex EV 945.



vices, online databases, and value-added networks that can be accessed at high speeds.

For general-purpose communications, 2400-baud modems are more practical than the technologically sophisticated but incompatible high-speed modems.

Features Guide

If you've decided to get a 2400-baud modem, you have more than 50 models to choose from. Look for features that offer flexibility, such as call-progress monitoring, Hayes and AppleTalk compatibility, and Microcom Network Protocol error correction. You may not need some features—optional data compression or password and call-back protection, for example.

Intelligent Features

Nearly all 2400-baud modems include status indicator LEDs, autodialing, auto-answer, and self-testing. Quite a few allow you to store frequently called phone numbers in memory. Most modems offer sophisticated call-progress monitoring: the modem monitors a call by discriminating between various frequencies (dial tones, busy signals, ringing, human voice) and responds appropriately. Check for this feature if you plan to use your modem for unattended operations, such as file transfers in off-hours when the rates are low.

Unless you plan to install two phone lines, look for voice-to-data switching.

2400-Baud Modems Compared

Manufacturer	Product Name	Bell 103 Protocol	Bell 212/V.22 bis Protocol	XON/XOFF Flow Control	RTS/CTS Flow Control
Adaptive Computer Technologies	ACT Error-Correcting Comparison Modem	•	•	•	
Anchor Automation	Signalman Lightning 24	•	•	•	
Anchor Automation	Signalman Secure 24		•	•	
Anderson Jacobson	AJ 2400-TM	•	•	•	•
Anderson Jacobson	AJ 2412-AD3H	•	•		•
Anderson Jacobson	AJ 2412-STHM	•	•		•
Anderson Jacobson	AJ 2441-1	•	•		•
Anderson Jacobson	AJ 2441-1M	•	•	•	•
Anderson Jacobson	AJ 2441-2	•	•		•
Anderson Jacobson	AJ 2441-2M	•	•	•	•
ARK Electronics	24K	•	•	•	•
AT&T	Dataphone II set	•	•	•	•
Basic Time	2400E	•	•	•	•
Basic Time	2400ES	•	•	•	•
Basic Time	2400ES-MNP	•	•	•	•
Bizcomp	IntelliModem 2400	•	•	•	
Black Box	Dial Modem 24+	•	•	•	•
Bytcom	24/12ADH Contac	•	•	•	
Bytcom	24/12ADH Contac Plus	•	•	•	•
Case Communications	1224 Autodialer with Data Recovery	•	•	•	•
Case Communications	4624	•	•	•	•
Case Communications	4648	•	•	•	•
Cermetek	2400 Standalone	•	•	•	•
Codex	Model 2233	•	•		•
ComData	2424ADH	•	•		
ComData	2424AM	•	•		
Computer Friends	Mercury 2400	•	•	•	•
Concord Data Systems	224	•	•	•	•
CTS Fabri-Tek	2424ADH	•	•	•	
CTS Fabri-Tek	2424AMII	•	•	•	•
Dowty Information Systems	Quattro International V.22 bis Modem	•	•	•	•
Epic Technology	2400 I	•	•	•	•
Epic Technology	2400 II	•	•	•	•
Everex Systems	EV 945	•	•	•	•
Franklin Telecommunications	FM-2400E	•	•	•	•
Gandalf Data	Access Series 24A	•	•		
General DataComm	Acculine 224	•	•		•
GVC-Chenel	SM 24	•	•	•	•
Hayes Microcomputer Products	Smartmodem 2400	•	•		

Voice-to-Data	Phone Directory	Error Correction	Data Compression	Call-Back Security	Password Security	Other	Price
		CRC-16	•	•	•		\$745
•	•	optional MNP class 4					\$499 ¹
•				•	•		\$599
•	•	MNP class 4 or ARQ		•			\$765
•	•			•	•		\$695
•	•	MNP class 4	•	•	•		\$695
•	•	optional upgrade		•	•		\$695
•	•	MNP class 4		•	•		\$895
•	•	optional upgrade					\$495
•	•	MNP class 4					\$695
•	•	MNP class 3					\$595
•	•	MNP class 4	•			software and cables included	\$695
•							\$299
•							\$399
•		MNP class 5				•	\$499
		adaptive echo cancellation					\$599
•	•	MNP class 4					\$549
•	•						\$389.95
•	•	MNP class 4					\$479.95
•	•	MNP class 2					\$649
•	•	MNP class 4					\$695
•	•	MNP class 5	•				\$795
•	•						\$445
•	•				•		\$445
•							\$337
•		MNP class 4					\$427
•	•						\$249
•	•	MNP class 4; optional MNP class 5 and X.PC	•		•		\$425
•	•						\$395
•	•	MNP class 4					\$495
	•	MNP and Surelink		•	•		\$750
•		optional MNP class 4		•	•	internal modem for SE; software optional	\$349
•		optional MNP class 4		•	•	internal modem for Mac II; software optional	\$349
•						modem cable included	\$499
•	•	MNP class 4				cables available	\$349
•	1 number						\$510
•	•	optional MNP class 4 or X.25				command-mode lockout switch	\$595 ²
•							\$399
	•						\$599

Manufacturer	Product Name	Bell 103 Protocol	Bell 212/V.22 bis Protocol	XON/XOFF Flow Control	RTS/CTS Flow Control
Hayes Microcomputer Products	V-series Smartmodem 2400	•	•	•	•
IBM	5842 Modem	•	•		
Incomm	Turbo 2400	•	•	optional	•
Micom	3124EH	•	•	•	•
Microcom	AX/2400	•	•	•	•
Microcom	AX/2400c	•	•	•	•
Multi-Tech Systems	MultiModem 224	•	•	•	•
Multi-Tech Systems	MultiModem 224E	•	•	•	•
Novation	Professional 2400	•	•	•	•
Omnitel	Encore 2400 SD	•	•		
Paradyne	FDX 2400 Plus	•	•	•	•
Penril DataComm	Cadet 2400	•	•	•	•
Penril DataComm	Datalink 2400	•	•	•	•
Prentice	P224 with MNP	•	•	•	•
Prometheus Products	ProModem 2400 Series	•	•	•	
Prometheus Products	ProModem 2400G Series	•	•	•	
Racal-Vadic	2400VP	•	•	•	•
Racal-Vadic	2400PA Model 2	•	•	•	•
Shiva	NetModem 2400	•	•	•	
Telcor Systems	Accelerator 2496DA	•	•	•	•
Telenetics	Express Data 24S	•	•	•	•
Telenetics	Pony Express 24A	•	•		
Tymnet	Model 933		•	•	•
Tymnet	Model 934		•	•	•
Tymnet	Model 972	•	•	•	•
Universal Data Systems	FasTalk 2400	•	•	n/a	n/a
Universal Data Systems	224 A/D	•	•		
Universal Data Systems	EC 224 A/D	•	•		•
Universal Data Systems	224 CG	•	•	•	•
US Robotics	Courier 2400	•	•		
US Robotics	Courier 2400e	•	•	•	•
Ven-Tel	EC2400-32	•	•		
Ven-Tel	EC2400-33	•	•	•	•
Western Datacom	MESA 424		•	•	•
Western Datacom	424 Linebacker	•	•	•	•
Western Datacom	424 Class 5	•	•	•	•
Western Datacom	424 MNP	•	•	•	•
Western Datacom	USA 224A	•	•	•	•

¹ \$599 with MNP.

² \$770 with error correction.

³ \$399 with error correction.

⁴ \$595 with Acculink, \$595 with Relay Silver, \$655 with both.

⁵ \$795 with Acculink.

⁶ Software an additional \$25.

Voice-to-Data	Phone Directory	Error Correction	Data Compression	Call-Back Security	Password Security	Other	Price
	•	LAP-B	•				\$899
•	•				•		\$590
•	•	optional MNP class 4 and X.PC					\$299 ³
•		MNP class 4					\$599
•	•	MNP class 4					\$699
•	•	MNP class 5	•				\$799
•	•						\$599
•	•	MNP class 5	•				\$649
•	•	MNP class 3					\$750
•	•						\$499
•	•	MNP class 3				front-panel lockout	\$595
•		optional MNP class 3			•	software optional	\$535 ⁴
•	•	optional MNP class 3			•	security dialing; software optional	\$695 ⁵
•	•	MNP class 3					\$845
•	•			•	•	software and cables optional	\$325 ⁶
•						software and cables optional	\$249 ⁶
•	•	MNP					\$595
•	•	MNP				memory security	\$795
		•			•		TBA
	•	MNP class 4 and proprietary MNP	•	•	•	DES encryption	\$1095
•						modem cable included	\$595
						modem cable included	\$495
							\$549
							\$1295
	•	MNP classes 1 to 3 and X.PC					\$749
•							\$495
•	•						\$550
•	•	MNP class 4					\$575
•	•	MNP class 4		•	•		\$795
•							\$599
•	•	MNP class 3					\$699
•	•						\$599
•	•	MNP class 5 and X.PC	•				\$749
•					•	DES encryption	\$995
•	•	MNP class 5	•	•	•		\$795
•	•	MNP class 5	•		•		\$695
•	•	MNP class 4			•		\$595
•							\$395

Internal Mac modems. The Epic 2400I plugs into the SE's expansion slot; the 2400II plugs into the Mac II's NuBus.



When difficulties arise in transmission, you and your colleague can avoid redialing by switching to voice to discuss the problem; you change from one mode to another either by invoking a software command, or by pressing a button on the modem that toggles between data and voice.

Hayes Compatibility

If the modem and communications software share the same command set, the communications software can automate routine procedures, such as dialing and connecting to a service, downloading data, and disconnecting. Most communications programs support the Hayes AT command set, the de facto industry standard for modem-level commands. Look for basic Hayes AT compatibility—it gives you a wider choice of communications programs.

Some manufacturers offer their own command set in addition to Hayes, and some have extended the AT command set (usually to operate special features, such as voice/data switching or to control volume). You must type these special commands from within the communications program; you can't choose them from a menu.

Setup Procedures

Typically, you attach a modem to the Mac by connecting an interface cable from the RS-232C port on the modem to the modem port on the Mac.

If you have an SE or a Mac II, you can install a modem card in one of the expansion slots. Installation on the SE requires a

special tool and should be performed by an authorized dealer—if you open the case yourself, you void the warranty. Opening the Mac II is easy, and instructions for installing add-in boards are in the Mac II owner's manual.

To add a network modem to an AppleTalk network, you need an AppleTalk System Connector Kit. Alternatively you can connect a standard modem to the network using products like Solana Electronics' R-Server, Abaton's MultiTalk or Shiva's NetSerial.

After connecting the modem, you may have to configure it before using hardware devices, such as the Hayes InterBridge, or software, such as *AppleLink*. The traditional way to configure a modem for a specific task is to set tiny DIP switches, which are usually inside the modem and awkward to get at. Some modem manufacturers let you change and save settings through the communications software. Typically, you can choose pulse or tone dialing, turn autoanswer off or on, determine how many times the phone will ring before the modem answers, and set the length of time the modem waits for a dial tone—useful if your modem is connected to a private branch exchange (PBX) phone line. Some manufacturers, such as Racal-Vadic and Novation, have simplified the process further, by assigning major functions (for example, voice/data switching, diagnostic testing) to front-panel buttons.

You may run into configuration problems when you need to use the modem for more than one purpose. For example, the Hayes InterBridge and *AppleLink* use different command sets. If you program the modem for InterBridge using the Hayes AT

command set, you won't be able to switch to *AppleLink* unless you alter *AppleLink*'s modem command control (CCL) file.

Flow Control

The modem regulates the flow of information between the Mac and the modem, and between the Mac and a remote computer. The modem receives information into a memory buffer, sends it to the Mac's communications buffer, transfers it to memory (RAM), and finally sends it to the screen or disk. To prevent the buffers from overflowing, the modem uses start and stop signals (sometimes referred to as the handshaking protocol or flow control). If the modem doesn't set the flow control correctly, you may lose data. Both systems must agree on which start and stop signals to use. Most modems recognize the signals XON and XOFF. These signals cannot be used, however, when transferring a file that might contain the binary codes used to represent XON and XOFF—for example, an application file. Some modems don't support XON and XOFF; they use other handshaking schemes, such as RS-232C RTS/CTS hardware lines.

Error Correction

Hissing, popping, and clicking noises common to the standard telephone system can corrupt high-speed data transfers. Errors, especially at speeds above 300 baud, tend to affect groups of bits rather than a single bit. To ensure that data is received

intact, manufacturers usually incorporate error detection and correction into the communication process either in the software or in the modem. But error control lowers the effective throughput, or data transmission rate, by adding bits to the transmission for its own error-checking procedures. Hardware methods of error control are generally faster than software methods.

All error-correction schemes use some sort of mathematical process to generate a code number based on the data bits. The sending and receiving modems independently perform a calculation for each data block and compare answers. If the answers don't match, the computer assumes that a transmission error occurred and resends the offending block. The modems on both ends of the connection must use the same error-correction scheme.

While several protocols exist, Microcom Network Protocol (MNP) stands the best chance of becoming the industry standard for error correction. In some cases MNP uses variable data-block sizes to maximize throughput. If MNP detects only a few errors in transmission, the protocol sends large blocks of data. If it detects multiple errors, it selectively retransmits the offending blocks and reduces the size of the subsequent blocks. When the error rate drops, MNP increases the block size.

Microcom's six classes of MNP vary in efficiency. Class 2, which uses standard

asynchronous framing techniques, actually transmits data at less than 2400 bits per second, because of its error-correction overhead. At class 3, the actual throughput improves to about 2600 bits per second. Class 4, using the adaptive data block sizes, transmits 2900 bits per second at 2400 baud. In addition to error control, MNP classes 5 and 6 include data compression to further enhance throughput. Each class contains the functions of, and is compatible with, all classes below it. Microcom has placed the lower three classes in the public domain, so you will frequently find MNP class 3 incorporated in 2400-baud modem hardware. (Microcom restricts the use of classes 4 to 6 to licensed manufacturers.)

Hayes has also introduced its own hardware-based error-correction protocol (LAP-B) with the V-series modems. So far, however, only Hayes has implemented the Hayes V protocol.

Data Compression

Some manufacturers offer optional data compression, which improves throughput and significantly reduces file-transfer time. Compression schemes are proprietary, and both sender and receiver must use modems from the same manufacturer. Some models automatically check at the beginning of a communication session to see if the remote modem accepts compressed data, and then switch to compressed mode or remain in standard mode.

Security Features

Security systems prevent unauthorized access to sensitive or valuable data stored on the computer. Networks equipped with a Solana R-Server, for example, allow remote access to all network resources. To prevent just anyone from dialing in and browsing through the network files, look for security features that limit connection to authorized users.

Password protection allows only people who know the password to connect to the network. Callback protection adds another level of security by requiring that people with passwords call from a specific phone number. To access a remote system, you call the system and enter your password. The remote modem then disconnects, looks up the phone number associated with the password, and calls back the number.

Communications Decisions

Choose a modem to fit your needs. If you have a home office and want to install a modem on the AppleTalk network that your branch office can access, look for a modem that works with products like InterBridge, R-Server, or Shiva's NetSerial. Make sure the modem provides auto-answer as well as autodial capabilities. You may need a modem simply to download stock quotes and MCI Mail at home. In that case you'll probably want one with voice-to-data switching and call-progress monitoring capabilities. For routine file transfers, evaluate modems with built-in error correction and perhaps data compression. And if you are looking for the easiest way to get online, buy a modem that comes with communications software and a cable.

After analyzing your own requirements, study "2400-Baud Modems Compared" for help in identifying which modem has the features and price that are right for you. □

See *Where to Buy* for product details.



CompuServe's Maury Cox. The company now offers 2400 baud access particularly for users who download software.

Overnight Delivery.



Micro Education (MECA) ... CP
Managing Your Money—Everything for managing and mastering your personal finances: personal budgeting, check writing, tax planning, portfolio management, net worth, and more \$129.

ConcertWare+ (music composition)	39.
ConcertWare+ MIDI	79.
Greene, Inc. ... NCP	
QuickDEX (address book)	24.
Hayden Software ... CP	
MusicWorks (songs for your Mac)	29.
Score Improvement for the SAT or ACT	58.
Ideaform ... NCP	
MacLabeler or DiskQuick	28.
201 Quicklabels	18.
HyperBook Maker (print stacks into book) ..	42.
Imagine ... NCP	
Smart Alarms (DA reminder system)	35.
Multi-user Appointment Diary	89.
Infosphere ... CP	
LaserServe (network software)	64.
ComServe (NCP, modem sharer)	124.
MacServe (network software)	164.
Innovative Data Design ... NCP	
MacDraft 1.2A (requires 512k)	155.
Kensington	
Professional Type Fonts for Text	29.
LaserWare ... CP	
LaserWorks (requires 512k, LaserWriter) ..	195.
LaserPaint (requires Mac Plus)	315.
Layered ... CP	
Notes for...Excel or Microsoft Works	41.
Notes for...PageMaker or Ready,Set,Go!3 ..	41.
Notes for...Microsoft Word	41.
Legissoft/Nolo Press ... NCP	
WillMaker 2.0 (prepare your own will)	30.
Letraset ... NCP	
Image Studio (image processing software) ..	279.
Ready,Set,Go! 4.0 (page layout)	279.

Linguist's Software ... NCP	
Tech (1000 different symbols)	\$59.
FOREIGN LANGUAGE FONTS	
SuperFrench/German/Spanish	39.
MacGreek New or Old Testament	79.
MacHieroglyphics, MacKana/Basic Kanji, MacSemitic/Coptic/Devanagari, MacKorean, MacThai, SuperGreek, MacHebrew, MacCyrillic, MacAkkadian	each 59.
MacHebrew Old Testament	79.
MacChinese	79.
MacGreek/Hebrew/Phonetics	89.
LaserFrench/German/Spanish	79.
LaserGreek or LaserHebrew	79.
Laser Transliterator	79.
Laser Tech	79.
LaserCyrillic	115.
Living Videotext ... NCP	
More 1.1C (outlines, windows, & tree charts)	175.
Lundeen & Associates ... NCP	
WorksPlus Spell 1.1	49.
WorksPlus Command	65.
MacroMind ... NCP	
VideoWorks II (animation tool)	119.
MacroPac International ... NCP	
101 Macros for Excel	45.
Magnum ... CP	
McPic Vol. 1 or Vol. 2	29.
The Slide Show Magician 1.3	35.
Micro Analyst ... NCP	
Mac Zap (recover crashed hard disks)	39.
Micro Education (MECA) ... CP	
Managing Your Money	129.
Microlytics ... NCP	
Word Finder (synonym finder)	39.
Microsoft ... NCP	
Basic Interpreter 3.0	62.
Chart 1.02 (42 chart styles, CP)	72.
Multiplan 1.1 or File 1.05	110.
Microsoft Write	111.
Basic Compiler 1.0	119.
Fortran 2.2 (compiler)	169.
Works 1.1 (integrated tool)	185.
Excel 1.04 (power spreadsheet)	224.
Word 3.01 (word processor)	239.
Migent ... NCP	
In House Accountant (small business)	99.
Miles Computing ... NCP	
Mac the Ripper Vol. 3 (req. Paint program) ..	27.
Orchestra of Fonts Vol. 4 (30 different fonts)	27.
Peoples, Places & Things Vol. 5	27.
Mindscape ... NCP	
The Perfect Score: SAT (CP)	47.
ComicWorks (create your own comics)	47.
GraphicWorks 1.1 (newsletters & posters) ..	87.
Monogram ... NCP	
Forecast (tax planning)	40.

Dollars & Sense (home, small business) ..	\$81.
Business Sense (full-featured)	282.
Nantucket ... NCP	
McMax (dBASE III compatible)	185.
Nashoba Systems ... NCP	
FileMaker Plus (feature-packed database) ..	149.
North Edge Software ... NCP	
Timeslips III (time & expense tracking)	119.
Odesta ... NCP	
Double Helix II (relational, custom menus)	349.
Olduvai Software ... NCP	
DA-Switcher (unlimited desk accessories) ..	26.
Post ART (clip art, 3 disk set)	36.
Icon-It! (create custom icon bars)	41.
Read-It!TS (OCR software for Thunderscan)	99.
Read-It! (300 dpi OCR software)	199.



Olduvai Software ... NCP
Icon-It!—Create an icon bar using your own designs, or choose from 30+ templates .. \$41.
DA-Switcher—Organizes and allows multiple sets of desk accessories .. \$26.

OWL International ... NCP	
Guide (hypertext, free-form info)	77.
Guide Envelope System	99.
Palantir ... NCP	
MathFlash or WordPlay	26.
MacType (typing instruction, NCP)	32.
inTalk (communication to emulation, NCP) ..	99.
Passport Designs ... CP	
Mastertracks Pro	259.
PBI Software ... NCP	
HFS Locator (DA organizer for HFS)	26.
HD Backup (supports MFS, HFS)	28.
Personal Computer Peripherals ... NCP	
HFS Backup	29.
ProVUE Development ... NCP	
OverVUE 2.1 (power-packed database)	149.
Rubicon Publishing ... CP	
Dinner At Eight-Encore Edition Bundle	51.

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\$3 does it all.

SOFTWARE

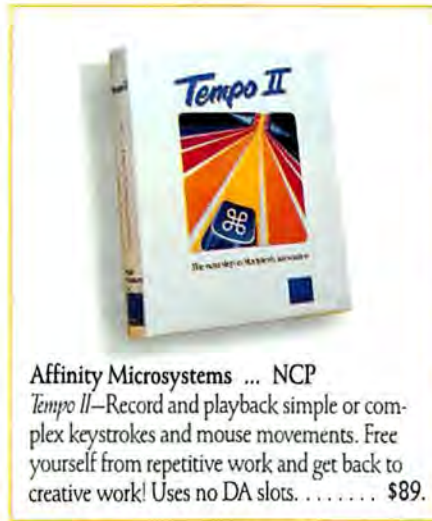
NCP denotes not copy-protected.
CP denotes copy-protected.

Aba Software ... NCP
"Draw it again Sam" (color & layers) . . . \$95.
Activision ... NCP
Postcards (clip-art, card stock) . . . 20.
Business Class (atlas, req. Hypercard) . . . 30.
Focal Point (organizer, req. Hypercard) . . . 64.
Aegis Development ... NCP
Doug Clapp's Word Tools . . . 42.
Affinity Microsystems ... NCP
AffiniFile (DA filer) . . . 49.
Tempo 1.2 (power user's macro utility) . . . 53.
Tempo II (updated, auto installation) . . . 89.
Allan Bonadio Associates ... NCP
Expressionist 1.1 (equation processor) . . . 52.
ALSoft ... NCP
DiskExpress (maximize disk performance) . . . 27.
Font/DA Juggler . . . 27.
Altsys ... NCP
FONTastic Plus (advanced font editor) . . . 48.
Fontographer (LaserWriter font editor) . . . 239.



BrainPower ... NCP
MathView Professional—Superb mathematical and computation program. Handles linear and non-linear equations, 2 and 3 dimensional plotting, stats and series operations, etc. . . . \$149.

Ann Arbor ... NCP
FullPaint (advanced Paint program) . . . 49.
Ashton-Tate ... NCP
dBASE Mac 1.0 (relational, req. MacPlus) . . . 295.
Batteries Included ... NCP
Thunder! 1.1 (spelling checker) . . . 31.
Isgur Portfolio (portfolio management) . . . 129.
Berkeley System Design ... NCP
Stepping Out (requires 512k) . . . 55.
Blyth ... NCP
Omnis 3 Plus/Express (database) . . . call
Omnis 3 Plus/Express (2-5 users) . . . call
Omnis 3 Plus/Express (6-10 users) . . . call
Bogas Productions ... NCP
Studio Session (music creation) . . . 52.
Country or Heavy Metal Rock Disk . . . 15.
Borland International ... NCP
Turbo Pascal Tutor . . . 49.
Numerical Methods Toolbox . . . 65.
Sidekick 2.0 (includes MacPlan) . . . 65.
Turbo Pascal (HFS compatible) . . . 65.
Eureka: The Solver . . . 129.
Reflex Plus (info management tool) . . . 179.



Affinity Microsystems ... NCP
Tempo II—Record and playback simple or complex keystrokes and mouse movements. Free yourself from repetitive work and get back to creative work! Uses no DA slots. . . . \$89.

BrainPower ... NCP
Thinkfast (memory improvement) . . . 23.
StatView (statistics package) . . . 34.
Graphidex (DA graphics organizer) . . . 65.
DesignScope (electronic circuit design) . . . 128.
MathView Professional (num. analysis) . . . 149.
StatView 512+ (req. external drive, 512k) . . . 178.
Bravo Technologies ... NCP
MacCalc (easy to use spreadsheet) . . . 79.
Broderbund ... CP
Jam Session (create your own tunes) . . . 30.
Print Shop (create cards and memos) . . . 36.
Geometry (over 350 problems!) . . . 60.
Physics (over 300 problems!) . . . 60.
CAMDE ... NCP
Nutriscalc (diet & nutrition analysis) . . . 49.
Nutriscalc Plus (full-featured program) . . . 175.
CasadyWare ... NCP
Fluent Fonts (two-disk set) . . . 28.
Fluent Laser Fonts (Vols. 1-15) . . . each 46.
CE Software ... NCP
Calendar Maker (create custom calendars) . . . 32.
Disktop 3.0 (powerful DA Finder) . . . 32.
QuickKeys (reduce mouse movements) . . . 69.
Challenger Software ... NCP
Mac3D (3D graphics, CAD features) . . . 127.
Chang Labs ... NCP
Rags to Riches Ledger . . . 120.
Rags to Riches Payables . . . 120.
Rags to Riches Receivables . . . 120.
Rags to Riches Three Pak . . . 299.
C.A.T. (contacts, activities, time) . . . 239.
Inventory Control or Professional Billing . . . 239.
Professional Three-Pak . . . 389.
Retail Business 3 Pak . . . 389.
Cortland ... CP
TopDesk 2.3 (7 new desk accessories) . . . 33.
Cricket Software ... NCP
Pict-O-Graph (color on the Mac II) . . . 105.
Cricket Graph (multiple windows) . . . 119.
Cricket Draw (advanced draw capabilities) . . . 169.
Data Tailor ... NCP
Trapeze 2.0 (spreadsheet, graphics & more) . . . 205.
DataViz ... NCP
MacLink Plus (transfer Mac/IBM data) . . . 149.
Davidson ... CP
Math Blaster! (grades 1-6) . . . 27.

Deneba Software ... NCP
Merriam-Webster's Thesaurus . . . \$36.
Comment (electronic Post-It notes) . . . 59.
Canvas 1.0 (includes desk accessory) . . . 119.
Dove Computer ... NCP
RAMSnap (RAM Disk/Disk Cache) . . . 21.
Dow Jones ... CP
Market Manager Plus . . . 159.
Dubl-Click Software ... NCP
Calculator Construction Set . . . 37.
World-Class Fonts! (both volumes) . . . 45.
WetPaint Clip Art (both volumes) . . . 45.
Electronic Arts ... CP
Disk Tools Plus (8 DAs plus tools) . . . 33.
Deluxe Music Construction Set 2.0 . . . 62.
Enabling Technologies ... NCP
Easy3D (create solid 3D objects) . . . 79.
Pro 3D (3D shaded modeling) . . . 199.
Enzan-Hoshigumi USA ... NCP
Japanese Clip Art Scroll 1 "Heaven" . . . 59.
Japanese Clip Art Scroll 2 "Earth" . . . 59.
Japanese Clip Art "Borders" Scroll . . . 69.
MacCalligraphy (create unique designs) . . . 115.
Fifth Generation Systems ... NCP
FastBack Mac (powerful backup utility) . . . 59.
1st Byte ... CP
Mad Libs (w/synthesized speech) . . . 14.
First Shapes (all about sizes & shapes) . . . 32.
Kid Talk ("talking notebook") . . . 32.
Math Talk (math learning tool) . . . 32.
Math Talk Fractions (great homework helper) . . . 32.
Smooth Talker (speech synthesis) . . . 32.
Speller Bee (spelling learning tool) . . . 32.
Forethought ... NCP
Factfinder 1.1 (information organizer) . . . 39.
FileMaker 1.0 (custom design reports) . . . 49.
PowerPoint 1.0 (presentations) . . . 189.
Foundation Publishing ... NCP
Comic People (create your own characters) . . . 26.
Comic Strip Factory (create cartoons) . . . 45.
FWB Software ... NCP
Hard Disk Partition . . . 37.
Hard Disk Util (program backup) . . . 55.
Great Wave Software ... NCP
TimeMasters (learn about time, ages 4+) . . . 22.
KidsTime (educational, ages 3-8) . . . 27.
Crystal Paint (graphic symmetries) . . . 32.
American Discovery (U.S. facts & fun) . . . 39.



Chang Labs ... NCP
C.A.T.—Powerful relational database for managing Contacts, Activities, and Time.. Use to organize events, meetings, day-to-day projects, expense reports, personal records, etc. . . \$239.

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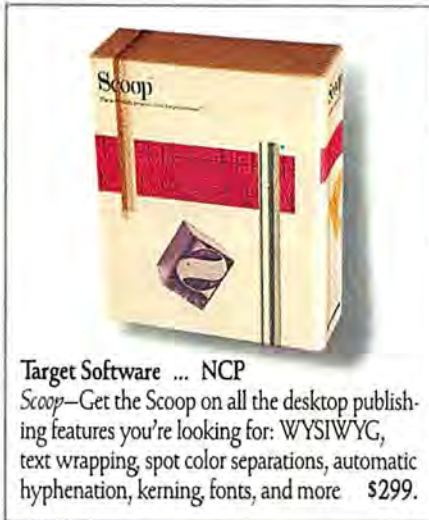
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Latest versions.



Target Software ... NCP

Scoop—Get the Scoop on all the desktop publishing features you're looking for: WYSIWYG, text wrapping, spot color separations, automatic hyphenation, kerning fonts, and more \$299.

Satori ... NCP

BulkMailer 3.0 (mailing lists) 82.
BulkMailer Plus (up to 90,000 names) 199.
Legal Billing (attorneys to accountants) 379.
Legal Billing II (full trust accounting) 569.
Project Billing (architects to engineers) 439.

Silicon Beach Software ... NCP

Silicon Press (printer utility, 512k) 41.
SuperPaint (advanced graphics program) 79.

Simon & Schuster ... NCP

Typing Tutor IV (typing instruction) 35.

SoftStyle ... NCP

Epstart (Epson printer driver) 27.
Laserstart (Hewlett-Packard Laserjet) 58.
Printworks for the Mac (Daisywheel) 45.
Printworks for the Mac (Dot Matrix) 56.
Printworks for the Mac (LaserWriter) 85.

SoftView ... NCP

MacInUse (time-use manager) 42.

Software Discoveries ... NCP

Merge Write (MacWrite mail merge) 35.
Record Holder Plus (data manager) 45.

Software Supply ... NCP

Suitcase (font and DA utility) 38.
PowerStation (alternative to Finder) 38.

Software Ventures ... NCP

Microphone 1.1 (includes Glue™) 119.

Solutions, Inc. ... NCP

SmartScrap & The Clipper 37.
SuperGlue (total graphic integration) 56.
The Curator (access your artwork) 79.

Springboard ... CP

Art a la Mac Volume 1 or 2 (NCP) 23.
Early Games or Easy as ABC 28.
Certificate Maker (requires 512k) 35.
Certificate Library Vol. 1 19.

SuperMac Software ... NCP

SuperSpool 3.4 42.
SuperLaserSpool 82.
Multi-User SuperLaserSpool 205.
DiskIt (backup & restore utility) 54.
Network DiskIt (automatic back up) 205.
Sentinel (encryption) 155.
Pixel Paint (color Paint program) 265.

Survivor Software ... NCP

MacMoney (financial planner) 40.

Symmetry ... NCP

Acta 2.0 (outline/writing desk accessory) 36.

PictureBase 1.2 (clip art manager, 512k) \$59.

Target ... NCP

Scoop (composition & page layout) 299.

Think Educational ... CP

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

THINK Technologies ... NCP

HFS Navigator (search for buried files) 35.
Laserspeed (LaserWriter utility) 55.
Lightspeed Pascal 65.
Lightspeed C (top-rated C Compiler) 95.
CAPP's for Lightspeed C 49.
CAPP's for Lightspeed Pascal 49.
InBox Starter Kit (CP) 209.
InBox Personal Connection (Mac & PC) call

T/Maker ... NCP

ClickArt Personal Graphics 28.
ClickArt Effects 28.
ClickArt Publications 28.
ClickArt Letters Vol. 1 or 2 28.
ClickArt Holidays 28.
ClickArt Business Images 28.
Christian Images 35.
Bombay, Plymouth, or Seville Laser font 45.



THINK Technologies ... NCP

InBox—End paper clutter. Send messages through your AppleTalk network! Includes message center and 3 personal connections \$209.
InBox Personal Connections (Mac) \$75.

Write Now (word processor) 99.

TML Systems ... NCP

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

TOPS ... CP

TOPS (file-server/LAN software) 119.
TOPS PRINT 125.
TOPS for the PC 299.

True BASIC ... NCP

PROGRAMMING LIBRARIES

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

EDUCATIONAL SOFTWARE

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

Unicorn ... CP

Animal Kingdom (ages 6-12) 27.
Decimal Dungeon (math, ages 9 and up) 27.
Fraction Action (arcade style math game) 27.

Mac Robots (pre-school program) \$27.

Math Wizard (math games, ages 5-10) 27.

Read-A-Rama (reading, ages 5-8) 32.

William & Macias ... NCP

myDiskLabeler (design & print labels) 24.
myDiskLabeler w/Color (req. ImageWriter II) 32.
myDiskLabeler w/LaserWriter option 35.
216 Smart Labels (for ImageWriter) 15.

Working Software ... NCP

Lookup (90,000 word dictionary) 29.
Findswell (locate documents fast) 32.
Spellswell (spelling checker) 42.
Spellswell Legal or Medical Dictionary 57.

GAMES

Accolade ... CP

Hardball (baseball simulation) 23.

Activision ... CP

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

Addison-Wesley ... CP

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

Ann Arbor ... CP

Grid Wars (3D arcade) 22.

Avalon Hill ... CP

MacPro Football (req. 1 Meg) 29.
MacPro Football 85 Team or Season 16.

Baudville ... CP

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

Blue Chip ... CP

Millionaire or Baron 35.

Broderbund Software ... CP

Lode Runner (over 150 levels) 24.
Ultima III (fantasy adventure) 24.
Ancient Art of War (military strategy) 27.
Toy Shop (create working models) 31.

Bullseye ... CP

Ferrari Grand Prix (Formula One racing) 33.
Fokker TriPlane Flight Simulator 33.

Electronic Arts ... CP

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



Software Discoveries ... NCP

MergeWrite—Stop retyping the same information, and merge letters and other documents with MacWrite. Sorts on different fields and allows complex conditions. \$35.

Toll-free support.

Epyx ... CP	
Sub Battle Simulator (NCP)	\$24.
Winter Games (Olympic events)	24.
Greene, Inc. ... NCP	
Crystal Quest (color on Mac II)	24.
Hayden Software ... CP	
Perplexx (scrabble-type game)	24.
Sargon III (9 levels of chess)	29.
Infinity Software ... CP	
Go (4000-year-old strategy game)	22.
Grand Slam (tennis, req. 512k)	27.
Infocom ... CP	
Leather Goddesses, Nord & Bert,	
Bureaucracy, Hollywood Hijinx,	
Lurking Horror, Plundered Hearts,	
Borderzone, Stationfall (standard)	each 24.
Beyond Zork	30.



Bogas Productions ... NCP
Studio Session—MacUser 1986 Music Product of the Year. Includes a wide selection of instruments, Editor, and Player. You won't believe your ears! ... \$52.

Classic Mystery Library: Moonmist,	
Suspect, & Witness	36.
Science Fiction Classics: Hitchhiker's,	
Planetfall, & A Mind Forever Voyaging	36.
Zork Trilogy	44.
Invisicues Hint Booklets (please specify)	6.
MacroMind ... NCP	
Mazewars+ (play via modem or network)	31.
Microsoft ... CP	
Flight Simulator (the Mac takes flight)	32.
Micro Sports ... CP	
MSFL Pro League Football	32.
Miles Computing ... CP	
Harrier Strike Mission II	27.
Quintette (ancient Chinese board game)	27.
Down Hill Racer (3D ski simulation)	27.
Fool's Errand (solve the puzzles)	27.

Fool's Errand Hint Booklet	\$7.
Mindscape ... CP	
Crossword Magic	30.
Balance of Power (world politics)	30.
King of Chicago (req. minimum 512E)	30.
Shadowgate (castle adventure)	30.
Uninvited or Deja Vu	30.
Trust & Betrayal: The Legacy of Siboot	30.
Defender of the Crown (req. 800k drive)	30.
Olduvai Software ... NCP	
Maze Survival (action game)	21.
PBI Software ... CP	
Strategic Conquest (multi-user)	35.
Primera Software ... CP	
Smash Hit Racquetball (top-rated!)	15.
Smash Hit Racquetball II	22.
Psion ... CP	
Psion Chess (3D and multi-lingual)	31.
Rainbird ... CP	
Pawn (text-graphics adventure)	27.
Sierra On-Line ... CP	
Leisure Suit Larry (swinging single life)	24.
King's Quest I, II or III	30.
Space Quest	30.
Silicon Beach Software ... NCP	
Airborne! (CP, the classic!)	20.
Enchanted Scepters (CP, over 200 scenes)	21.
Dark Castle (top-rated arcade action)	27.
Apache Strike (helicopter 3D action)	27.
World Builder (program creator)	41.
Simon & Schuster ... CP	
Star Trek—The Kobayashi Adventure	24.
Sir-Tech ... CP	
Mac Wizardry (high-rated fantasy)	35.
SPHERE, Inc. ... NCP	
Tellstar II (No. & So. hemispheres, req. 512k)	15.
GATO (submarine simulator)	26.
Orbiter (space shuttle simulation)	26.
Falcon (F-16 flight simulation)	27.
XOR ... NCP	
NFL Challenge (be the coach!)	65.


HARDWARE

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

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

Apricorn ... 1 year	
ApriCord Mac (for Mac 512k or Mac Plus)	75.
AST Research ... 6 months	
AST TurboScan (300 dpi scanner)	1385.
AST TurboLaser P/S	2995.

Curtis Manufacturing ... lifetime	
SURGE SUPPRESSORS	
Safestrip (6 outlets)	\$21.
Diamond (6 outlets)	32.
Emerald (6 outlets; 6 ft cord)	36.
Sapphire (3 outlets; EMI/RFI filtered)	47.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord)	59.
Dove Computer ... 90 days	
Toolkit (clamp, torx driver & wrist strap)	15.
SCSI Interface/Port	95.
MacSnap 524 (512k to 1 Meg)	175.
MacSnap 524S (512E to 1 Meg w/SCSI)	219.
MacSnap 548 (512k to 2 Meg)	399.
MacSnap 548S (512E to 2 Meg w/SCSI)	459.
MacSnap 2S (1 Meg to 2.5 Meg)	489.
MacSnap 4S (1 Meg to 4 Meg)	969.
MacSnap 8S (for Mac II, to 8 Meg)	1939.
MacSnap Plus 2 (MacPlus to 2 Meg)	289.
MacSnap Plus 4H (MacPlus to 4 Meg)	969.
Ergotron ... 1 year	
Mouse Cleaner 360°	15.
MacTilt or MacTilt SE	69.
MacTilt (for large monitor)	89.
Farallon Computing ... 1 year	
PhoneNET-AppleTalk 120	9.
PhoneNET PLUS (DB-9 or DIN-8)	45.
TrafficWatch	159.
Hayes ... 2 years	
Smartcom II (communications software)	88.
Smartmodem 1200	299.
Smartmodem 2400	449.
MacPlus 1200 or 2400 Package	call
Kensington ... 1 year	
Appletalk Cable Clips or Connectors	each 1.



Nashoba Systems ... NCP
FileMaker Plus—Outstanding forms and database management program. Performs calculations, sorting, mail merges, summary reports, and more. ... \$149.

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External Drive Cover	\$8.
Mouseway (mouse pad)	8.
Mouse Pocket (for your idle mouse)	8.
Mac Plus/Mac SE Cover	9.
ImageWriter II Dust Cover	9.
Printer Stand	17.
Mouse Cleaning Kit w/Mouse Pocket	17.
Disk Drive Cleaning Kit	20.
Tilt/Swivel	22.
Universal Copy Stand	23.
Polarizing Filter (for MacPlus or SE)	34.
Surge Suppressor	34.
Apple Security Kit	34.
Printer Muffler (80 column)	38.
Printer Muffler (132 column)	51.
Printer Muffler Stand (80 or 132 column)	25.
A-B Box (for the Mac Plus)	64.
System Saver Mac	64.
Control Center	64.
Turbo Mouse (for the MacPlus & SE)	83.
Koala Technologies ... 90 days	
MacVision (digitizer, includes MoreVision)	175.
Kraft Systems ... 1 year	
3-Button QuickStick	39.
Migent ... 1 year	
Pocket Modem (ext. 300/1200 baud)	169.
Mirror Technologies ... 1 year	
Magnum 800 External Drive (platinum)	199.
MagNet 30x (w/cable & print spoolers)	799.
Magnum Tape 40 Backup	999.
MagNet 40/40 (40 Meg, 40 Meg tape)	1995.
MSC Technologies ... lifetime	
A+ Mouse (optical mouse)	79.
A+ Mouse ADB (for Mac SE & II)	89.
Nuvotech ... 1 year	
EasyNet/AppleTalk cable	6.
EasyNet (DIN 8 or DB9 connector)	28.
Orange Micro ... 1 year	
Grappier (universal parallel interface)	69.
Passport Designs ... 90 days	
Passport MIDI Interface	95.
Personal Computer Peripherals ... 2 years	
MacBottom HD 21 Meg (SCSI)	749.
MacBottom HD 32 Meg (SCSI)	899.
MacBottom HD 45 Meg (SCSI)	1159.
Optional built-in 1200 baud modems available for the above MacBottom units	call
MacBottom IHD-144 Meg (for Mac II; 1 yr.)	2195.

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

DISKS

Double-sided diskettes.

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



MSC Technologies ... lifetime

A+ Mouse—An all optical mouse with no moving parts. Lightning fast, exceptionally accurate cursor control. Includes mouse pad.

A+ Mouse	\$79.
A+ Mouse ADB	\$89.

INFORMATION SERVICES

CompuServe	
CompuServe Information Service	24.
Dow Jones	
Dow Jones News/Retrieval Membership Kit	24.

ACCESSORIES

Clean Image Ribbon Co.	
Clean Image Ribbon Kit	12.
Computer Coverup	
External 800k Drive Cover	4.
ImageWriter II Cover	8.
Mac Plus or Mac SE Cover Set	10.
I/O Design	
Available in navy blue.	
Imageware II (ImageWriter II carry case)	45.
Macinware Plus (Mac Plus carry case)	65.
Macinware SE (Mac SE carry case)	75.
Kalmar Designs	
Teakwood Roll-top Case (holds 45 disks)	14.
Teakwood Roll-top Case (holds 90 disks)	20.
Teakwood Roll-top Case (holds 135 disks)	28.



Thunderware ... 90 days

ThunderScan and PowerPort—Replaces your ImageWriter's ribbon cartridge to scan and reproduce high quality digitized images (up to 300 dpi). Saves true gray scales, and line art. \$199.

Magnum

Mouse Mover (let your mouse ride!)	14.
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Moustrak

Moustrak Pad (standard 7" x 9")	8.
Moustrak Pad (large 9" x 11")	9.

Ribbons

ImageWriter Ribbons	5.
Available colors: black, blue, brown, green, orange, purple, red, yellow and silver.	
Rainbow Pack (6 single color ribbons)	25.
Four Color Ribbon (requires ImageWriter II)	11.

Sensible Softworks

Quality "MacAttire" nylon dust covers	7-17.
High Trek ImageWriter II carry case	49.
High Trek Mac SE & ext. kybd. carry case	69.

Smith & Bellows

Mahogany case (holds 90 disks)	28.
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OUR POLICY

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- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 1 week for personal and company checks to clear.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

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



Borland ... NCP

Reflex Plus—High-powered relational database. Features built-in number crunching and extensive sorting \$179.

Reviews

Here's the Scoop

Scoop 1.01

Desktop publishing software with advanced graphics capabilities. **Pros:** Fast operation; complete draw and paint graphics editors, with support for 300-dpi bit maps; extensive special text effects; multiple master pages. **Cons:** Word processor lacks search and replace, has weak spelling checker; typographic precision inadequate for some applications; poorly indexed manual. **List price:** \$495. **Requires:** 512KE, single 800K disk drive. **Copy protection:** None.



Although desktop publishing packages permit text editing and let you add rudimentary graphics, they expect you to import most of your words and pictures from other programs. Target Software's *Scoop*, on the other hand, attempts to supply all the tools you'll ever need to create printed documents, including complete draw and paint graphics capabilities.

While the all-purpose *Scoop* bristles with more features than any other desktop publishing program, it can't yet replace such full-featured tools as *Microsoft Word*, *SuperPaint*, and *MacDraw*. However, the

program is written entirely in assembly, which makes it faster and more responsive (and less of a disk hog) than most of the competition.

Laying Out the Basics

Scoop handles the fundamentals of page layout as neatly as the best of them, with sensible commands for designing pages and for placing and sizing page elements. It lays out text competently—allowing you to create, delete, and resize text boxes as you work, and to link and unlink them for automatic text flow on the fly. *PageMaker* users who struggle to create

layouts that mix column widths within a vertical section of the page will love *Scoop's* ability to automate this procedure.

Like other programs, *Scoop* lets you build right and left master pages; if your design features a repeating graphic such as a vertical rule, you need only place it once. You can lay out and link a framework of text boxes on your masters so that text additions automatically flow, but the program can't create new pages with formats based on existing ones. To make it easy to juggle layout items, there's a scratch page where you can park them temporarily.

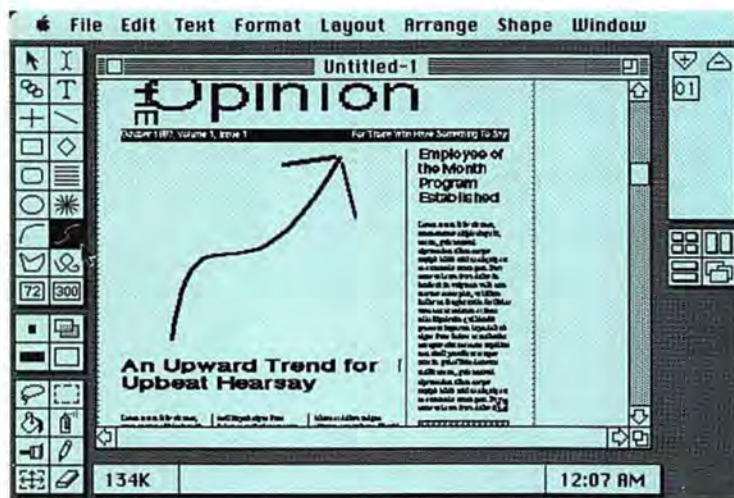
In addition to supporting all popular large-screen displays, *Scoop* does what it can to make the cramped workspace on the Mac's small screen tolerable enough for serious page layout. It allows you to choose from a wide range of preset magnification choices, and you can size the document to fit the current window, display it as two facing pages, or even choose a "thumbnail" mode that can display up to 100 pages at a time as tiny rectangles—ideal for quickly checking layout consistency and for easily dragging elements from one page to another. In addition, a window palette lets you instantly split up the screen vertically, horizontally, or into quarters for simultaneously displaying separate documents (you can have as many files open as memory permits).

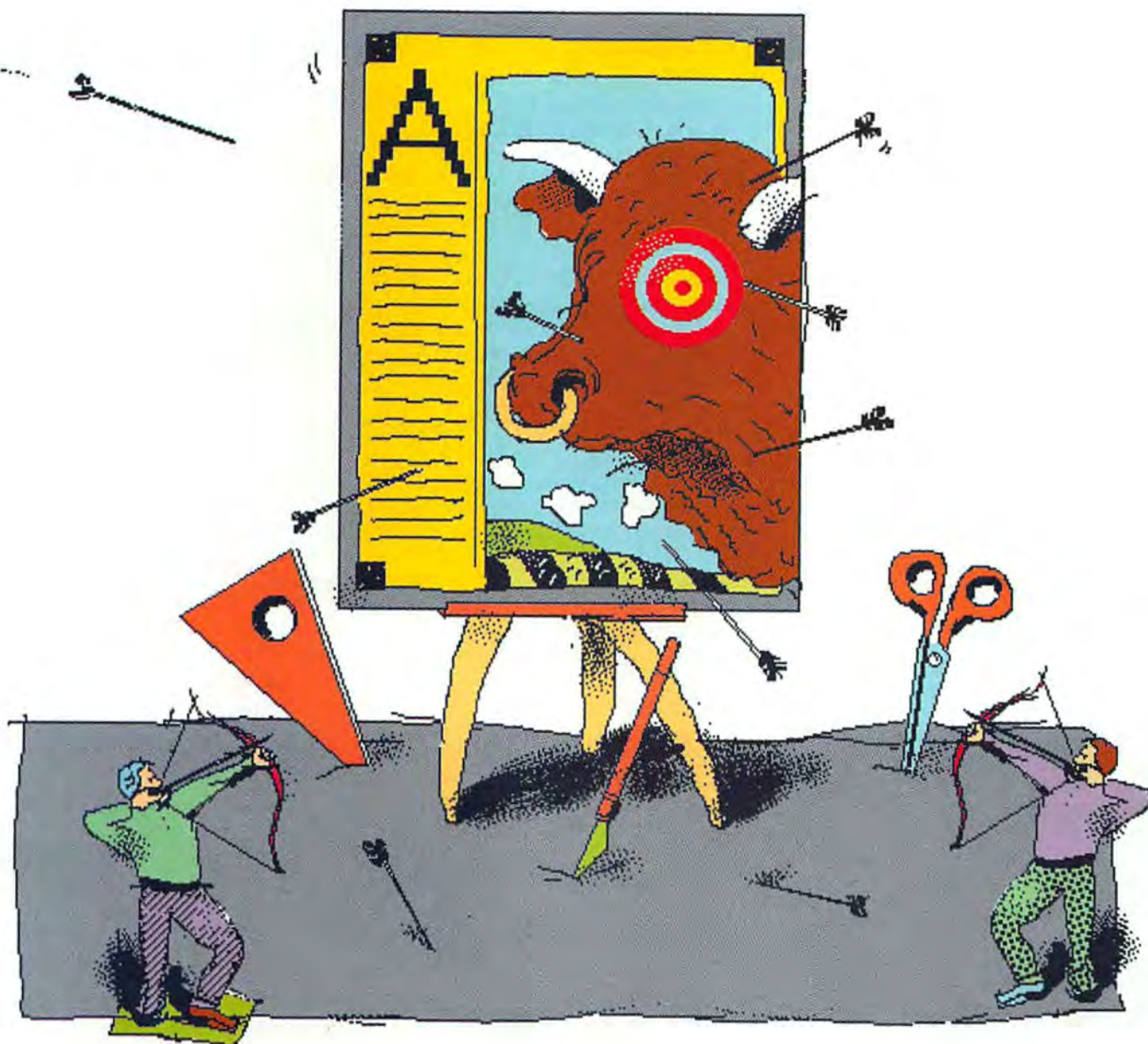
The Test of Text

Although *Scoop* includes an extensive set of text editing functions that are as quick as they come on the Mac, there's no search-and-replace feature. But *Scoop* does offer more text-style choices than any competitor. Strikeout text, white-on-black characters, and text with rectangular or oval boxes are some of the more unusual options. The program permits font sizes of 4 to 127 points; that's nowhere near the range you get from *XPress*, but it's adequate for most jobs. You can stretch text horizontally without changing the point

Rounding the Bend

The meandering arrow in the left column is a bezier curve object, not a bit map, and it will print at the highest resolution available on your output device. Also in evidence are the *Scoop* tool palette (on the left), and controls for turning to other pages and for splitting the screen into multiple windows (on the right).





size. Another nice touch is a series of options for capitalization of selected text.

Scoop's typographical features will satisfy just about anyone, but they may lack the precision demanded for some professional layout applications. There's a multitude of options for letterspacing, leading, manual (in increments as small as .003 point) and automatic kerning, and baseline control. You can also fine-tune the maximum and minimum spacing *Scoop* permits between words and letters in justified text.

With *Scoop* and *ReadySetGo* 4.0, the stylesheet concept has finally arrived for the Mac, letting you instantly apply a predefined format to any paragraph. However,

settings for a host of spacing options included in *Scoop's* stylesheets, such as margins, justification, tab stops, kerning, and leading, don't permit character attributes (font, size, and style) to be specified.

As for special text effects, you can rotate text, print it in gray scale, and even convert it to a bit-mapped or object-oriented graphic (the latter option lets you stretch and scale text for special effects). Now that most desktop publishing programs can flow text around irregular graphics, *Scoop* goes them one better by letting you set diagonal margins. You can even vary the degree of raggedness at the margin by adding space between letters and words, a technique normally used only in fully justified text.

Although many people prefer to concentrate on getting their words out first and worry about spelling corrections later, the program's spelling checker audits your work as you go. But *Scoop's* speller is weak. It simply beeps at you when it catches an error, without identifying the offending word on the screen. You have the option of choosing a replacement word from a Suggestions submenu immediately after typing a mistake, but if you enter even one new letter the suggestions are gone forever. Also, be prepared for some unusual word associations from the dictionary algorithm—if you type “deepz,” it will suggest “topaz,” but not “deep.”

Beyond the One-Liner

Scoop's cornucopia of graphics features gives you most of the tools that come with *MacDraw* and *MacPaint*, and some new ones besides. For draw-type object-oriented graphics, you get tools for creating diamonds, polygons, and curious starburst shapes, and you can even draw curves freehand. Not only do you have the familiar paintbrush, bucket, and spray-can tools, but for paint-type bit maps you can choose between 72- and 300-dpi resolutions. Building the option of LaserWriter resolution into the graphics editor, however, has resulted in a few rough edges. When you're working on a 300-dpi image, *Scoop* automatically enlarges it on the screen so that each pixel represents a corresponding laser dot. This enforced zoom mode permits precision, but your completed pictures may not look the way you'd expect, especially since you can't view the nascent image at normal magnification as you work. In addition, pages that contain high-resolution graphics scroll slowly and unevenly.

Of course, *Scoop* can also import graphics created elsewhere—in *MacPaint* or *MacDraw*, or with the Abaton Scan 300. As in *PageMaker*, imported images open in full-screen boxes, which you must then resize. Graphics extras include the ability to apply gray scales or fill patterns to black areas of existing bit maps, to merge overlapping images, and to convert drawings into bit maps. You can also rotate graphics in 1-degree increments.

Onto the Printed Page

Scoop has an extensive set of handy printing options that should be standard on all desktop publishing programs. You can specify a reverse-printing order, so that output from Canon-engine laser printers will be properly stacked, or you can choose to print pages in the proper order for saddle-stitched books. *Scoop* can also print two facing pages or a whole set of thumbnails on one sheet of paper, and it handles large page sizes by automatically splitting them into single-sheet sections, or tiles. You can create spot color by placing items on any of eight overlapping "color planes," and print color separations on a LaserWriter and color pages on an ImageWriter II. (The version of *Scoop* that we reviewed, however, could not display color

on a Macintosh II.) To match the requirements of some professional printing houses, you can reverse the black and the white areas on a page or print the document in a mirror-image format. Inexplicably missing, however, is a command to convert PostScript output to a disk file, an important facility for those using typesetting services.

Be Here Now

Although *Scoop* has the potential to become the "complete solution," a few crucial pieces are still missing. While no other desktop publishing program can touch its graphics prowess, competitors like *Ready-SetGo* and *Xpress* make better word processors.

However, *Scoop's* version 2.0 enhancements are supposed to include search-and-replace, a batch spelling checker, TIFF-file import capabilities, and automatic indexes and tables of contents.

If these promises become reality, *Scoop* may yet entice some desktop publishers to give up their stand-alone word processors. Until then, though, you won't go wrong if you choose *Scoop* for the strengths it already has: speed, compact size, and an unsurpassed set of graphics features.—*Steve Cummings*

See *Where to Buy* for product details.

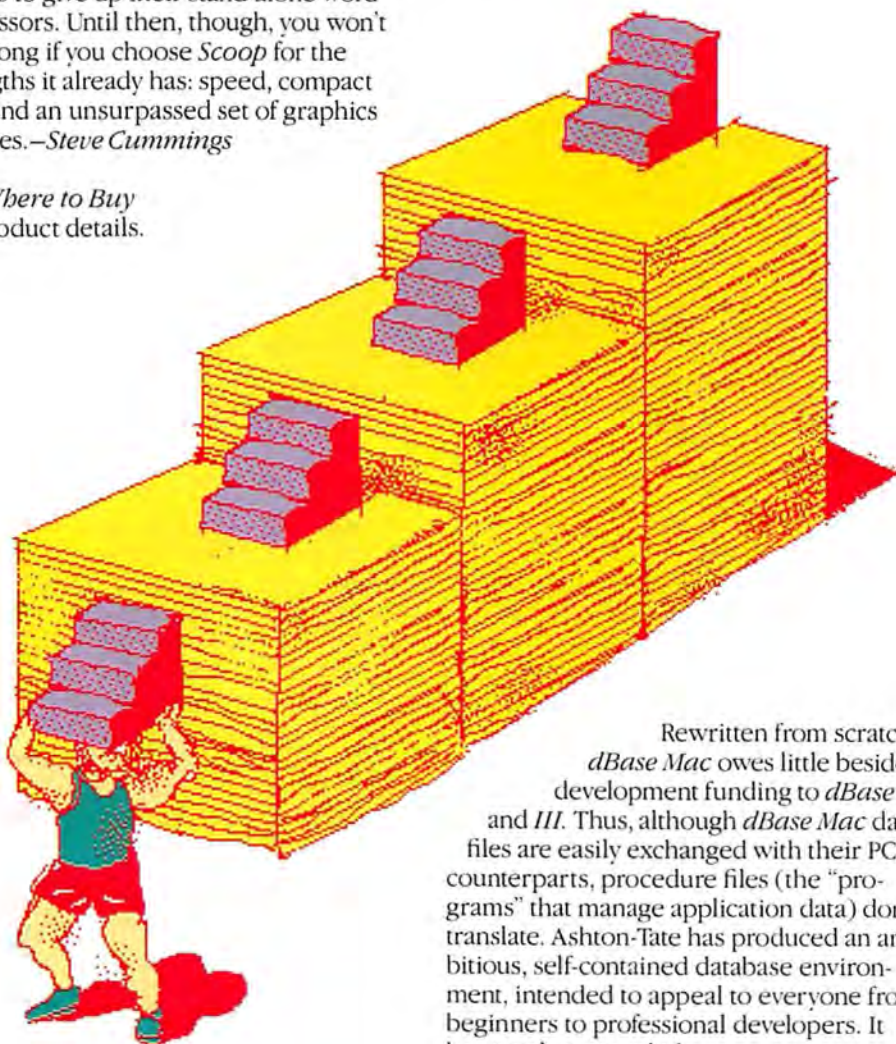
dBase Power Made Easy

dBase Mac 1.0

Relational-database and applications-development system. **Pros:** Easy to create useful projects; command language allows great flexibility. **Cons:** Leisurely performance; skimpy documentation of advanced features. **List price:** \$495. **Requires:** Mac Plus, SE, Mac II, hard disk. **Copy protection:** None.



Ten long years ago at the Jet Propulsion Laboratory, in southern California, a small database program called *Vulcan* was written for the first personal computers. Renamed *dBase*, it became one of the most popular business applications, first for CP/M computers and then for the IBM PC.



Rewritten from scratch, *dBase Mac* owes little besides development funding to *dBase II* and *III*. Thus, although *dBase Mac* data files are easily exchanged with their PC counterparts, procedure files (the "programs" that manage application data) don't translate. Ashton-Tate has produced an ambitious, self-contained database environment, intended to appeal to everyone from beginners to professional developers. It has nearly succeeded.

Beginner's Luck

dBase makes it very easy to get started in database management. A simple, entry-level, disk-based tutorial explains standard concepts (files, records, fields, keys) and explains *dBase*'s approach to database management. A beginner's manual then steps through the creation of a basic *dBase* "project," a set of related files and views (see "Tying It Together").

Many users will never need to progress beyond this level. Adding fields to a record, changing record-to-record links, defining input and output forms, even creating custom menus in a form are all actions requiring only a few choices from *dBase*'s standard Options menu (note the palette in "Views for You"). A generous variety of field types and formats anticipates every standard business situation. Online help contains a good, indexed summary of the material in the main manual. Searching, sorting, and report generation can be performed by a new user on the first day.

Project creation is also simple. A *dBase* project is a file that tells the program how data files and *views* (*dBase* views are like hypertext versions of business forms) are related. This flexible hypertext approach means that the same data files can be used in different applications. Within the data files and views, procedures can be attached to individual fields. These procedures are the heart of application programming in *dBase*—they're used for data manipulation and for creating custom dialog boxes and error messages—and they are "programmed" from pop-up menu choices in a procedure-definition dialog

box. Although the user may not be aware of it, the sophisticated, menu-driven, object-oriented programming language in *dBase Mac* is accomplishing—error-free and in minutes—what can take hours of command-line, text-based agony in *dBase* on a PC. What more could anyone want? Speed, that's what.

A View from the Top

Although the program is not necessarily as slow as suggested in some early review benchmarks, certain operations (translating ASCII files, screen I/O) are annoyingly unhurried. *dBase Mac* is a relational database, and the clever use of relational features (breaking up files into

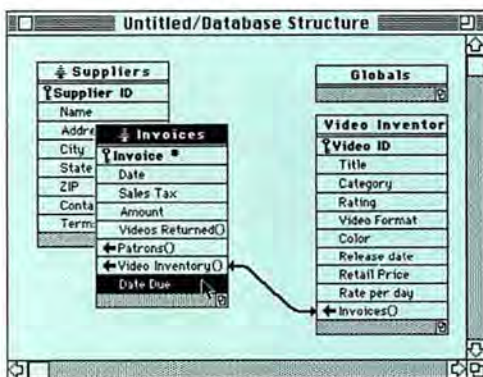
dard types. Application files of procedures may be saved as "protected" for distribution to end-users; a run-time version of *dBase Mac* is promised for this spring.

Upon registration, users are sent a disk of demonstration programs. A nicely done book (*dBase Mac in Business* by *Macworld* contributing editor Jim Heid) is also available from Ashton-Tate. Unfortunately, Ashton-Tate seems to have compensated for the book's cost by skimping on advanced-features documentation, which means that many of the features professional developers could use to their advantage are undocumented. It's a relatively simple matter to access *HyperCard* command files (or for that matter, external



Views for You

Using Quick Create to call up a columnar view of the file designated CHECK enables you to inspect the data entries in individual fields.



Tying It Together

dBase Mac's Database Structure window lets you check the overall design of a data file. When linked files are open the program displays the links visually.

linked smaller files, for example) is a must for optimum performance in any such database. But because *dBase* supports variable-length records, multiple-valued fields, and a large variety of formats, it can't compete in flat file-searching speed with programs that have a more limited record structure. Using the External-Index file option to order a file's records (amounting to a presort of its contents) can improve search speeds by nearly six times, however. *dBase Mac*'s File-Reorganize feature also helps build speedier structures for large databases.

These speed hints are noted on a reference card packed with the manual. Applications developers will find minimal documentation on the complete and flexible command language for procedures in the original package. Preprocessor procedures, which operate on views as they are opened (presenting, for example, attractive data-entry forms) and post-processor procedures (useful in checking data-entry errors) are two of the five stan-

compiled code resources) from within *dBase*, but the manual mentions neither of these topics.

Nice Touches

Despite these problems for the pros, *dBase Mac* abounds in useful features for "the rest of us." One example of the program's power is the Tablet. Called from the View menu's palette, the Tablet lets users design forms modifiable by options on the form itself. An expense report form for data entry, for example, could be toggled by user choices to show panels for travel, entertainment, or materials purchase. This would call for considerable programming ingenuity in most other databases, but requires none in *dBase*.

The printing options, together with limited but useful drawing features, allow an attractive range of output-forms design. Particularly useful is Ashton-Tate's *Picture This...*, a graphics capture/import desk ac-

cessory that appears under the Apple menu when *dBase* is invoked.

Another *dBase* strong point is convenient file interchange, not only with Ashton-Tate's own products but with most other relevant commercial software as well. A separate 50-page manual describes in detail import/export with 15 other databases, spreadsheets, and word processors.

dBase Comparison

dBaseMac will allow nonprogrammers without database experience to rapidly design real relational applications that are sophisticated enough to be useful in business—something they certainly can't do in *dBase* on the PC. *dBase*'s appeal to developers who may be considering *4th Dimension*, *Double Helix*, or *Omnis 3 Plus* for applications is somewhat less overwhelming. Complex applications will require considerable tinkering to show acceptable speed. The documentation makes it necessary for applications developers to join the \$150-per-year Professional Support program, a service with special telephone and online support. Despite these performance and support issues, *dBase Mac* is generally easier to use than development systems of comparable power.

If Ashton-Tate were to produce about 300 pages of advanced documentation, it could give Acius, Odesta, and Blyth serious trouble in the power-user market.

—Charles Seiter

See *Where to Buy* for product details.

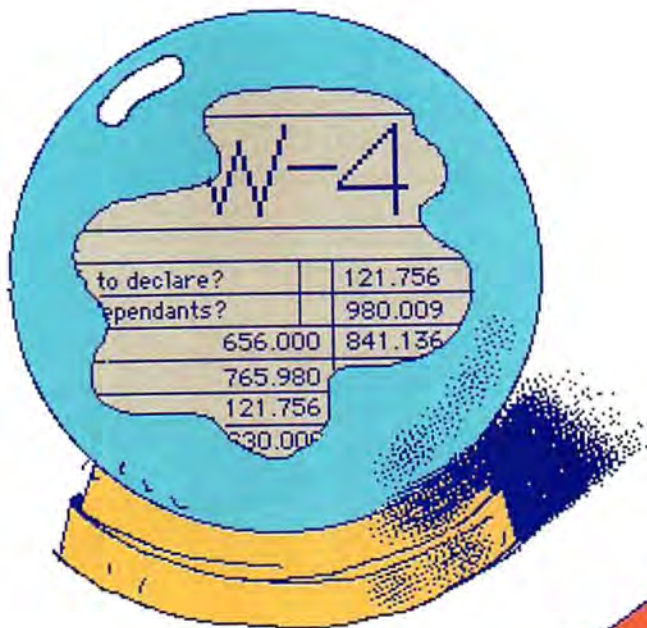
Plan for a Taxing Situation

TaxView Planner 1.0

Federal income tax planner, supplement to MacInTax. **Pros:** Professionally competent; well documented; fairly easy to use. **Cons:** Sacrifices speed to perform complex calculations; relatively high price compared to program it supplements. **List Price:** \$79; MacInTax \$119, updates \$55 per year. **Requires:** 512K, MacInTax. **Copy protection:** None.



As more changes wrought by the 1986 Federal Tax Reform Act take effect, even those who only filled out W-4 forms for the first time last year can use some help in figuring income tax alternatives. *TaxView Planner*, a supplement



ment to SoftView's income tax preparation program *MacInTax*, can help anyone easily perform a five-year tax projection based on the earning and deduction estimates entered on various forms. The planner incorporates the latest tax law information for preparing up to five alternative projections. For example, would it be better to sell your stocks that have gone up (or down) in value and take the profit (or loss) this year, or next? Or, getting to basics, approximately how much will you owe the federal government this year in income tax, and will the deductions withheld from your wages cover the obligation? These are the kinds of questions *TaxView Planner* competently answers.

Using TaxView Planner

Data management in *TaxView*, as in *MacInTax*, is direct and consistent. The



program opens with a Main Summary screen that highlights the federal tax consequences of alternative approaches. After data entry, double-clicking on an alternative number brings up a report on that alternative. When you double-click on a year, *TaxView* reports on all the alternatives for that year. For the more sophisticated user, there is an optional row for entering discount rates, so you can view your taxes in present-value dollars based on depreciation of your money over the entire five-year period.

File Edit Options Alternative: 1 2 3 4 5										
Summary(1)										
Alternative 1 - Summary										
Big Bucks Alternative										
Name Sam & Suzee Schlock		SSN 555 12 1234		5-Year Cost		72,681				
		%	(a) 1987	(b) 1988	(c) 1989	(d) 1990	(e) 1991			
1 Status, Exempts, Elderly/Blind			2 4	2 4	2 4	2 4	2 4			
2 Wages, Salaries			113,000	117,850	122,982	128,409	134,143			
3 Interest, Dividends		5	1,397	1,467	1,540	1,617	1,698			
Summary(1)/Line 3 Instructions										
Line 3 - Interest, Dividends										
<input type="checkbox"/> Summary(1)/Line 3-a Itemization										
The total taxable interest and d										
The Tax Reform Act of 1986 rep										
\$100 qualified dividend exclusi										
married couple filing joint).										
Itemization of: Interest & Dividends										
2 Items										
Description										
Total										
Amount										
a 13th National Bank Account										
212										
b Blue Chip dividends										
1,185										
c										
d										
e										
f										
g										
h										
i										
21 Tax Bracket (%)										
22 Inflation Rate (%)										

Worksheet Levels

TaxView Planner's Summary Worksheet is the highest-level worksheet for each tax alternative. Worksheets, sub-worksheets, and itemization boxes are accessed by double-clicking in the cells. In the Itemization box, the total of the amounts entered is carried to the parent cell when the box is closed.

When you click on a main summary alternative, the program brings up a five-year Summary Worksheet. The summary, modeled on the IRS's 1040 form, is the highest-level spreadsheet for that alternative, and an explanation of what you need to enter is available by clicking on that item. You may enter data directly into the Summary Worksheet or double-click on a cell to bring up the worksheet(s) provided for the separate items. Line-by-line entry instructions for completing the summary, the worksheets, and the sub-worksheets are provided in the program's manual, although in worksheet-level order rather than in entry order.

The lowest-level format is the itemization box, which provides rows of cells for text and amounts. As the worksheets are closed, their totals are carried up to their parent cells, until the summary has all the needed information. Since the whole operation integrates smoothly and interfaces well with the Mac, the program is fairly easy to learn and use despite the application's potential complexity.

In addition to its planning function, *TaxView* provides a worksheet for the federal W-4 withholding form and prints out a form you can turn in to your employer. It also prints out a 1040-ES form for making quarterly tax payments to the IRS.

Some Limits on Performance

To take advantage of all this power, however, you sacrifice calculation speed. When I ran the program, there was a 10- to 15-second lag on my Mac SE, even though a slight ripple on the screen indicated that the program was doing some recalculations while I worked.

The lag is not a problem, however, unless you open an itemization box and immediately close it (say you want to glance at a figure). In this case, it's best just to click the close box and *w-a-i-t*—further clicks will only make things worse as the program catches up with you. (The program does not support a manual calculation option.)

TaxView, at about 80 percent the price of *MacInTax*, is too expensive; *SoftView* should offer a discounted *MacInTax/TaxView* package. Also, cells that do not accept manual entries because they are automatically calculated should be marked or shaded. However, *TaxView Planner* is generally well thought out and does what it says it will do in a competent and professional manner.—Alan L. Slay

See *Where to Buy* for product details.

Learning to Relate

Reflex Plus 1.0

Relational database. **Pros:** Fast; easy to use; good examples library and tutorial. **Cons:** No procedure-language/run-time capability. **List price:** Version 1.01 \$279. **Requires:** 512K, 800K of drive storage. **Copy protection:** None.



While the original *Reflex* was a straightforward file manager, Borland's recently introduced *Reflex Plus*, is a true relational database with an emphasis on convenience. *Reflex Plus* targets typical office database users rather than applications developers, and it competes with products like *OverVue* rather than *Omnis 3 Plus*.

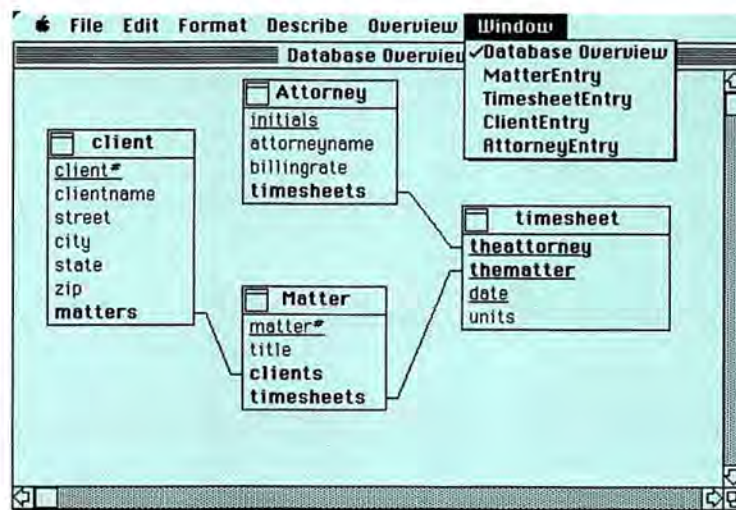
All-Purpose Database

Although relational databases sometimes seem mysterious, they're actually just collections of individual files with links defined between the files. For example, your social security number could be used

Borland has included three features in the *Reflex Plus* package to prove that typical Macintosh users can operate relational databases. First, there's a separate step-by-step tutorial book, which takes the reader through the development of a model set of customer files. Second, there are "preset" entry forms (you define the database, *Reflex Plus* designs the form) and stock report formats. If you resist the urge to customize, you can zip through database creation, data entry, and printing of summaries at warp speed. Third, *Reflex Plus* offers separate example files—these occupy twice the disk space the program does—covering applications ranging from law of office billing to genealogy. These examples give new users database files that they can customize. You simply pick an appropriate file, add or delete a few fields from the records, type in your own data, and you have an instant, working relational database.

Working It Out

Creating a database from scratch is simple. You define a database by entering the fields you want. You can set the field types (text, number, integer, date, logical,



Well-Connected Lawyers

The Database Overview window displays the relational links between different data files. Here the Window menu keeps track of the data entry forms associated with these files.

as a link between your driving record, your employment history, and your income tax statements. In linked files, repeated data, such as a birthdate or address, needs to be kept in only one of the files but can be accessed from any of them. This feature alone, which saves great amounts of storage space in large databases, is one of the main reasons relational databases are required by all but the smallest businesses.

time, or sequence) and tag key fields. *Reflex Plus*'s particularly thorough, context-sensitive Help function spells out the concept of keys and key fields.

To make a linked, two-file database, create a second database, add a field for linking in the first database, and drag a line with the mouse between this link-field and a field in the second database. You can specify whether a record in one database will correspond to a single record in the other, or whether the correspondence will be one-to-several (see "Well-Connected Lawyers").

Searches in a database are just as simple. You set up a query by choosing search options, and you compose complex conditional searches by clicking on the choices rather than typing in criteria (see "Questions, Anyone?"). Likewise, report definition is strictly menu-driven, using a Fields Selection dialog box to select data fields for the report and FormulaBuild to select particular records.

Ready for the Big Time

Although simplicity is its key virtue, *Reflex Plus* has the power to handle large-scale office chores. File size is limited only by disk space, and large records (up to 4K) with many fields (up to 254) are supported. The program's search speeds are comparable to those of the most popular relational systems for applications developers (*Double Helix* and *Omnis 3 Plus*). Output forms can include imported graphics. Calculation on database fields includes all standard arithmetical, statistical, financial, and date/time functions. A variety of functions unique to *Reflex Plus* (Group By, Paste Choice, Repeating Collection) simplify database construction and display. The

Questions, Anyone?

By selecting fields and operators, and filling in Value to Find, you can quickly set up a complex search in *Reflex Plus*. This screen shows the choices available when you select *FormulaBuild* from the main menu.

manual comes with a detailed supplement on file transfer that explains import/export with most popular Mac and PC databases. An Autosave function saves your work every few minutes. Although *Reflex Plus* is intended primarily for single-user mode, several people can read files simultaneously on networks that allow opening of read-only files.

Reflex Plus is a lot of program for the money. Because it's easy to use, it will encourage offices to develop their own databases and will convince many mainstream Mac users that database development is too important to be left to the developers. With a 600-page manual, dozens of carefully designed sample files, and a solid tutorial, this product may just put you in the database business.—Charles Seiter

See *Where to Buy* for product details.

Desktop Painting

DeskPaint 1.0

Desk accessory paint program. **Pros:** Extensive selection of tools and special effects; edits TIFF files; convenience of DA. **Cons:** Slight lag in operation of some tools. **List price:** \$129.95. **Requires:** 512K (paint bucket and lasso don't operate on 512K). **Copy protection:** None.



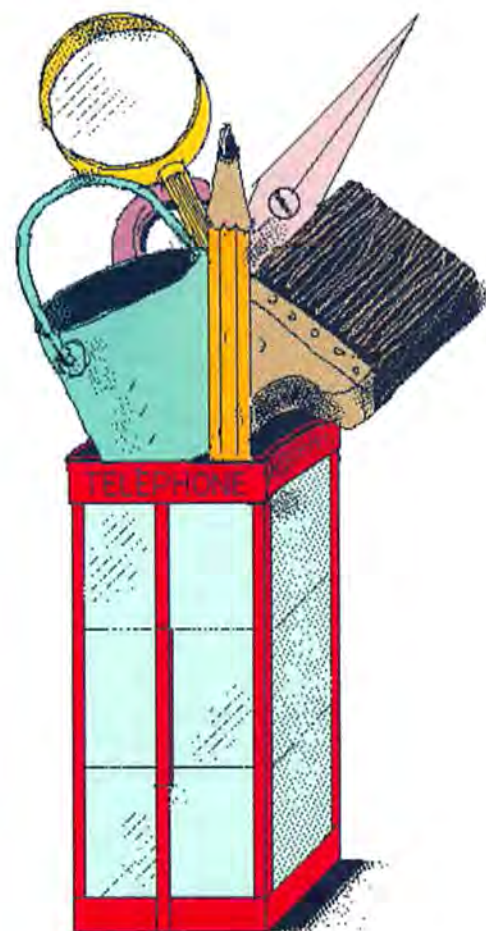
Remember when stuffing as many college students as possible into a phone booth was all the rage?

Well, neither do I. But that's the image that came to mind when I opened Zedcor's *DeskPaint*, a desk accessory that crams dozens of features into a mere 25K. *DeskPaint*, which offers most of the features found in stand-alone paint programs (and many others as well), lets you find, retrieve, and edit graphics from inside an application.

The Tools

DeskPaint's Tool Palette has most of the tools Macintosh paint-program connoisseurs have come to expect: pencil, brush, eraser, paint bucket, shapes, and so on (see "Condensed Paint"). Familiar editing options like flip, rotate, and invert are also present. Notably absent are the spray can and the ability to edit the brush shape, but these aren't serious omissions. The tools and effects operate much like their *MacPaint* or *FullPaint* counterparts; if you're familiar with one of the popular Macintosh paint programs, you should quickly master *DeskPaint*.

DeskPaint improves upon *MacPaint* in many ways. For example, *DeskPaint* includes a scrolling, resizable window; eight zoom levels; a free-rotate option; the ability to have up to three windows open at once; and a Tool Palette that can be hidden to provide more drawing space.



Although it's merely a desk accessory, *DeskPaint* even encroaches upon *FullPaint*'s territory, offering most of the latter's features plus some new ones. Unlike *FullPaint*, *DeskPaint* provides multiple-pattern palettes, several zoom levels, image scaling, automatic scrolling when the edge of the drawing window is reached, and the ability to display image size and amount of free memory. *DeskPaint* falls short of *FullPaint* in some areas, however: the DA offers only square or rectangular brushes, while *FullPaint* offers multiple brush shapes and lets you create your own; *DeskPaint* doesn't offer *FullPaint*'s rulers, skew and slant effects, or 300-dots-per-inch editing; and *FullPaint*'s pencil, brush, paint bucket, and eraser operate more smoothly than *DeskPaint*'s, which lag a bit. In addition, you can't print *DeskPaint* images directly on the LaserWriter (you can, of course, paste them into another application and print them from there).

In fact, *DeskPaint*'s painting tools are more akin to *SuperPaint*'s than to *FullPaint*'s, but *DeskPaint* falls behind *Super-*

Condensed Paint

DeskPaint offers a healthy selection of painting tools and effects, all neatly tucked into a 25K desk accessory.

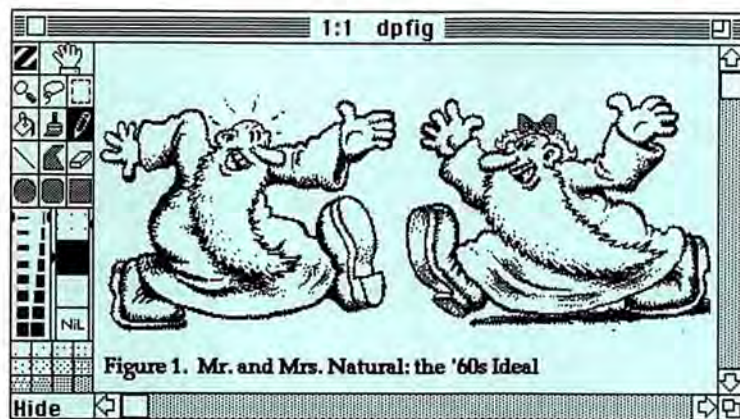


Figure 1. Mr. and Mrs. Natural: the '60s Ideal

Paint in one major respect. The DA lacks SuperPaint's other half, an object-oriented drawing layer. DeskPaint is strictly a bit-mapped painting program; SuperPaint is still your best bet for a full-featured drawing and painting program.

Operation

You can use DeskPaint to draw pictures and paste them into an application on the fly, or you can browse disks, folders, or various Scrapbook files for the MacPaint or TIFF image you need. When you find the image, you can paste it into DeskPaint and modify it before placing it in a document, or you can paste an image straight into a document.

DeskPaint offers several bells and whistles that set it apart from other paint programs, including copy modes such as Opaque and Transparent for overlaying images, an option that prints posters on the ImageWriter, a feature that adds patterns to an image for a halftone effect, and the ability to set scanning speed to produce on-screen slide shows.

DeskPaint is a handy accessory that takes up less than a quarter of the space taken by FullPaint, and it's available from within an application. This DA is easy to learn and performs well for the most part (I encountered an occasional glitch in the polygon tool, and the paint bucket is annoyingly lethargic). The Scan feature provides a quick way to browse collections of graphics without leaving the program you're working in. DeskPaint's \$129.95 price tag seems steep for a desk accessory, but you get a lot of features for your money. I'd recommend DeskPaint if you're in the market for a paint program that pops up at a moment's notice. —Erferit Nielson

See *Where to Buy* for product details.

A Stitch in Time

Fastback 1.01

Backup program. **Pros:** Speedy file copying; hierarchical catalog. **Cons:** Aborts backup when interrupted; loses data during restore. **List price:** Version 1.02 \$129. **Requires:** 512K. **Copy protection:** None.

DiskFit 1.3

Backup program. **Pros:** Backs up to hard disks or floppies; backs up any size disk; restores folder, file, document, and application information; restores a catalog. **Cons:** Limited options for partial backups and restores. **List price:** Version 1.4 \$74.95. **Requires:** 512K. **Copy protection:** None.

HFS Backup 2.02

Backup program. **Pros:** Many options for filtering partial backups and restores; restores file and folder information. **Cons:** Limited catalog size; doesn't restore data that links documents to applications. **List price:** \$49.95. **Requires:** 512K. **Copy protection:** None.



Editor's note: During the time Linda Joan Kaplan was testing Fastback, the developers at Fifth Generation Systems found at least one error in their code that caused disks to be rejected easily. A company representative at first said that no upgrade would be forthcoming that would correct this failing and allow the program to continue after finding an unacceptable disk. But after negative response to their policy of making an upgrade available only to users who complained, the developers decided to send the upgrade to all registered users. Once the upgrade is released, we will re-run the tests and publish our findings.

High Hopes

Backing up a hard disk is a dreary business, so when Fastback was released I hoped it would provide an easier way to perform this tedious chore. I decided to compare Fastback with SuperMac's DiskFit and with HFS Backup from Personal Computer Peripherals, expecting Fastback to be superior. I was disappointed.

In two backups on the Mac Plus with a 20MB hard disk, Fastback copied files 30 percent faster than either of the other two backup programs. In a full backup of an 80MB hard disk on the Mac II, Fastback was more than twice as fast as DiskFit. But unfortunately Fastback loses its speed advantage in the real world—Fastback aborts when it is interrupted for any reason.

When I used the verification option and Fastback encountered a bad disk, the program aborted and I had to start my backup from the beginning. Imagine failing to complete a backup while copying to the 83rd disk, and then failing five more attempts. When I backed up the 80MB hard disk without using the verification option, Fastback rejected disks during the restore. To complete the restore, Fastback had to rebuild its catalog (starting at the point where the disk was rejected) at the very slow rate of 1½ minutes per disk. Even worse, once the disk was restored, 1MB of data was missing. Fastback did not even warn me that files were missing.

Fastback also failed to restore data to my 20MB hard disk after three attempts. I finally used HFS Backup to restore the disk. Likewise, DiskFit backed up and restored both disks without a hitch, both with and without the verification option.

Comparing Features

Fastback does not restore folders, files, or windows to their original positions, so you must reposition them manually. In addition, since some identifying information (APPL resources) is not replaced, you cannot open an application by clicking on its document. You must either drag fresh applications to your disk, leave all your folders open, or rebuild your desktop.

Both DiskFit and HFS Backup restore the file, folder, and window information, although HFS Backup doesn't restore the APPL resources. Both programs continue after finding a bad disk and allow you to substitute a new disk. If you interrupt your backup and quit the program, DiskFit can

resume. Neither program caused me to lose any data.

Fastback adds disks to the set when doing incremental backups. After a few incremental backups, the floppy-disk buildup becomes so unwieldy that a full backup must be performed again. *HFS Backup* also suffers from this problem; only *DiskFit* allows you to replace the original file with a changed version.

Fastback's catalog depicts files hierarchically within their folders so that individual files can easily be selected for backup or restore. *DiskFit* keeps a text-file report for locating individual files for restoration, but it is cumbersome to use. *HFS Backup* also has a hierarchical catalog display, but it cannot be used to back up large disks because the size of the catalog is limited to what will fit on a single 400K floppy (2500 to 3500 files). Too bad, since *HFS Backup* offers more refined options than the others do for supplementary backups, and it is well suited for 20MB disk backups.



DiskFit in Process

DiskFit can back up and restore to a hard disk or floppies, it indicates its progress in copying files, and it tells you how many more disks are needed.

The Point of It All

Any good backup program must be able to back up and restore files reliably. After all, it is because of the fragility of disks that we back up at all. Until Fifth Generation releases an upgrade that can deal with bad media, I'll rely on *DiskFit*, which does the job reliably for both my 20MB and my 80MB hard disks. —Linda Joan Kaplan

See *Where to Buy* for product details.

For Typists Only

Nutmeg/Xerox Full Page Display

Full-page display. **Pros:** Flicker-free, sharp screen; automatic screen dimmer. **Cons:** After-image when you move objects; screen isn't flat; interference occurs when Mac is too close. **List price:** \$1795. **Requires:** Any Mac except the 128K or the Mac II.



For a long time Radius's monochrome monitor was the only one capable of displaying an entire letter-size page on the screen. Now Nutmeg Systems is offering a monitor made by Xerox that looks very much like the Radius unit. The similarities, however, stop there. The Nutmeg/Xerox FPD has potential, but several things need fixing before I can give it an unqualified recommendation.

The Nutmeg display measures 8½ by 11 inches and has a resolution of 90 dots per inch (dpi)—a definite improvement over the Mac's 9-inch diagonal screen with its 72 dpi. There are separate contrast and brightness controls on the front panel, and the screen swivels and tilts in any direction—a definite plus. Nutmeg's display is convex, giving the impression of an old-fashioned TV tube. Even though it did not distort the image noticeably, I still found the curved screen quite annoying. Also, curved screens generally show more reflections in a well-lighted environment than flat screens do. Nonetheless, Nutmeg's flicker-free screen is easy to look at for long periods of time—that is, if you're just typing. Unfortunately, because of a slow refresh rate, there is an afterimage every time you move an object. The Radius monitor does not have this problem.

Almost every Radius monitor I've seen has a blurry upper-left-hand corner; the Nutmeg display is consistent overall. Although the Nutmeg image is less contrasty than that produced by the Radius screen, some users may find the softer image preferable. Some may also prefer the slightly greenish tint of the Nutmeg to the bluish tint of the Radius.

The Setup

To set up the monitor, all you need to do is open up the Mac, install a CPU clip on the 68000, attach an interface board to the clip, and connect some internal cables. That's it. All the parts fit snugly and seem very well made. This procedure seemed



Nutmeg/Xerox Full Page Display

more complicated than necessary at first because the manual isn't illustrated and fails to tell you the direction in which to clip on some of the parts. (Nutmeg says the manual will be completely rewritten and will include pictures.)

To inform your system that the Nutmeg screen exists, you need to run a boot application. (You might want to place the boot application in your start-up file.) Once installed, the main Mac screen blacks out and the Nutmeg comes to life. You choose which screen to use by holding down the \mathbb{H} key while launching an application.

One other thing you need to consider when setting up the Nutmeg monitor is its physical placement. Running your Mac right next to the Nutmeg screen results in an unacceptable level of interference on the screen, so be prepared to give the Nutmeg monitor more space on your desk than its frame requires.

A Tough Decision

I find myself of two minds with this monitor. I like the sharp, easy-to-look-at display. The afterimage problem, however, is unacceptable: it's tiring and gives the impression that graphics are being drawn more slowly than normal, thus giving the monitor a sluggish feel. Also, if you have limited desk space you won't like the Nutmeg, because of the interference problem. For chores other than straight typing, I find that the Nutmeg's problems outweigh its advantages. —Rob Hahn

See *Where to Buy* for product details.

Stuff and Send

StuffIt 1.10

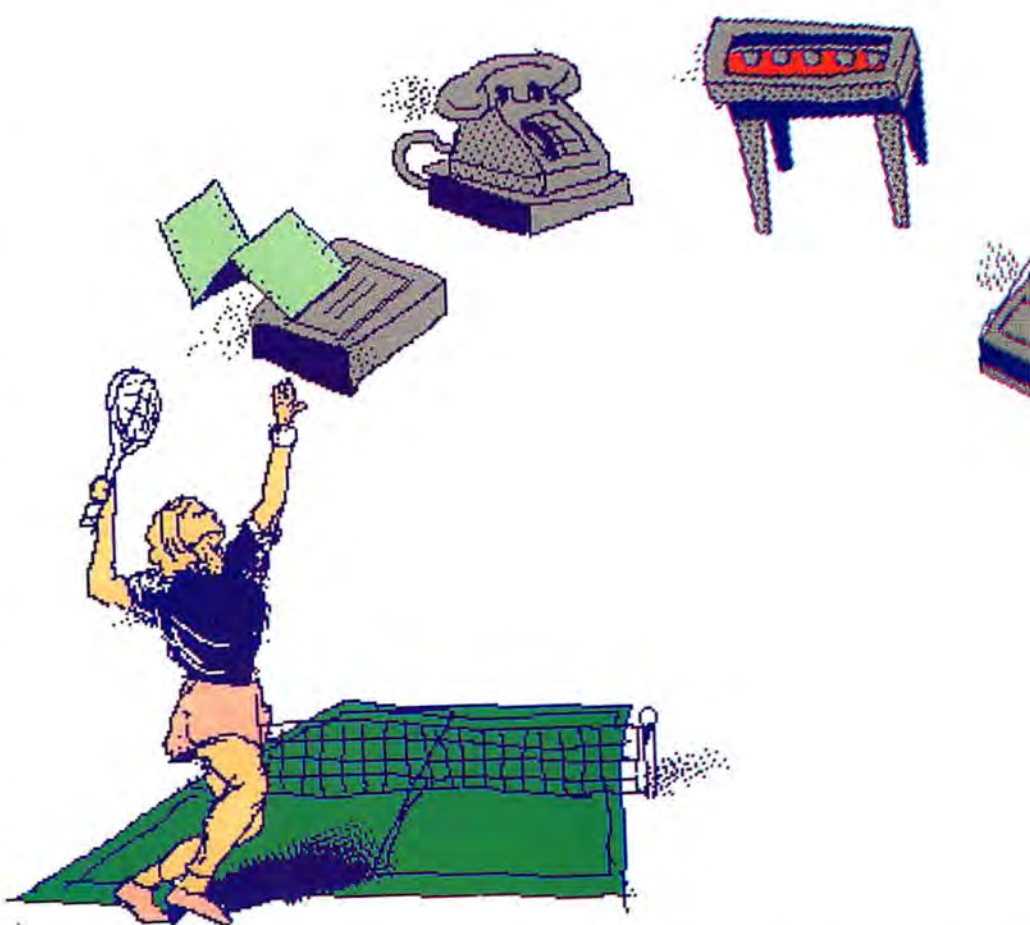
File compression utility. **Pros:** Compacts files tightly; fast; archives files and directories; maintains archive directory. **Cons:** Does not figure out optimal compression method for you; does not archive nested directories. **List price:** \$15. **Requires:** 512KE. **Copy protection:** None.



If you've been using *PackIt* for file compression, then you'll love *StuffIt*, a new shareware utility. With *StuffIt* you can combine and compress files tighter than you can with *PackIt*, before sending them over a modem. When *StuffIt* compressed a 374K file, it came out 61K tighter than *PackIt*'s compressed version. In addition, *StuffIt* offers better performance and new archiving features. It even works on *PackIt* archives faster than *PackIt* does.

StuffIt maintains an archive directory for easy file retrieval; you can also create an archive from a directory and add files to, or delete them from, an existing archive. Unfortunately *StuffIt* does not let you archive nested directories.

For a printed report of archive constraints, simply choose Generate Report from the menu. To convert or add *PackIt* files to a *StuffIt* archive, choose Unpack,



select the Convert button, and *StuffIt* unpacks the files and adds them to the currently opened archive.

StuffIt supports three of the most well known file-compression algorithms: RLE (run length encoding), a variation of which is used by *MacPaint*; Lempel-Zev, which encodes repeated strings; and Huffman, which is similar to Lempel-Zev. For files under 25K, *StuffIt* automatically uses RLE. For all other files, however, you choose one or a combination of the other two techniques. *StuffIt* won't analyze the data and use the technique that is most efficient.

StuffIt is a well-implemented utility that is definitely worth the price. If you use *StuffIt* only to unpack files, don't bother to send in the registration to author Raymond Lau. If, however, you use the program to compress or archive files, then send in your \$15. After all, authors who provide programs that are this useful should be encouraged to continue doing so.

—Dennis Cohen

See *Where to Buy* for product details.



StuffIt in Your Modem

StuffIt allows you to archive and compress files before transferring them over to a modem. The program shows you the size of each original file and the percentage of space saved through compression. In addition *StuffIt* displays file size totals for the archive.

Sharing Expensive Peripherals

ComServe 1.0

Peripheral-sharing software for AppleTalk networks. **Pros:** Allows network users to share serial devices (modems, terminal ports, serial printers, plotters). **Cons:** Incompatible with some devices and applications. **List price:** \$195. **Requires:** 512K; System 3.2, Finder 5.3, and Chooser 2.3 or later (release notes list compatible serial devices and applications). **Copy protection:** None.



Infosphere's *ComServe* allows all members of an AppleTalk network to share devices connected to the modem ports of other Macs—a simple, easy-to-use, and cost-effective way to share expensive peripherals, without additional hardware or cables.

Servers and Workstations

ComServe divides a network into two groups. The Mac to which a shared device is physically connected is the *server*; the other Macs in the network are *worksta-*

tions. With *ComServe* the Mac can simultaneously be a server (being accessed by other Macs) and a workstation (accessing peripheral devices on other servers in the network). So even when your Mac is a server, it's still yours.

The program captures input to and output from the modem port on a workstation and redirects it over the network to the modem port of the appropriate server. Using *ComServe* is very simple. You select the desired server through the Chooser, then run an application as usual. When you must access a modem port, *ComServe* automatically steps in and establishes a connection with the desired server. The only difference you'll notice between using the server and having a direct connection are the dialog boxes.

Installation and Operation

ComServe has two components: a memory-resident background server application, and software that enables each workstation to access a *ComServe* server. Installation is simple. You can install the *ComServe* workstation software on as many Macs as you want, but you may set up only one server. For each additional server, you must purchase another *ComServe* package.



Configuring a ComServe Server

The *Configure Server* command presents a dialog box requesting information about the shared device, including a release string—a command that causes the device to reset when a session ends. Release strings use a macro language.

You perform all *ComServe* management (workstation and server) using Apple's icon-oriented Chooser. When you select the *ComServe* icon, a list of available servers appears in the Chooser window, and a new menu that lists special *ComServe* commands appears in the menu bar. One of the available servers is "My local modem port." Select it when you wish to access a device physically connected to your Mac's modem port.

ComServe user menu commands are self-explanatory. Five additional server-specific commands are available on the Mac whose System Folder contains the *ComServe* server file. Network managers can password-protect access to these special commands to prevent unauthorized tampering with the server.

Compatibility

Timing problems that crop up in serial communications are especially stressful when a network shares serial devices. *ComServe* has been tested to determine the degree of compatibility with various third-party hardware and software.

AppleLink, *MicroPhone*, *Red Ryder 9.4*, *Desktop Express*, *FreeTerm*, and *HyperTerm* are fully compatible; and *VersaTerm*, *MacTerminal*, and *inTalk* are partially compatible. *Smartcom II*, *Jazz*, and *Silicon Press* are not at all compatible. *MacLink Plus* will work but only if renamed *AppleLink*. *Pyro*, a screen-blanking Init resource, is incompatible with *ComServe* for the same reason that it is incompatible with *SuperLaserSpool*: it interprets serial-port monitoring as user input and so never activates *ComServe*. Infosphere's Release Notes provide additional information about *ComServe*'s compatibility with other devices and applications.

Applications that do not close the serial driver after accessing the serial port cause problems because *ComServe* depends on closure of the serial driver to determine when a session has ended. Prominent offenders are old ImageWriter printer drivers (the latest one, released with ImageWriter LQ, does close the port). See "Configuring a ComServe Server" for more information on how *ComServe* gets around this problem.

A *ComServe* server can run on the same computer as a *MacServe* server or an *AppleShare* server. *AppleShare*, however, is stingy about giving time to other programs running with it on the same computer, so when the *AppleShare* server is busy, a *ComServe* workstation user will notice some degradation in response time.

Once installed, *ComServe* is so easy to use that it's almost invisible. Most applications are compatible. So at only \$195, *ComServe* is a great way to share peripherals without investing in additional hardware and cables.—Nanci Hamilton

See *Where to Buy* for product details.



Can We Talk, Big Blue?

MacIrma 1.0

NuBus card and software to emulate IBM 3278/9 terminals. **Pros:** Easy to install; includes file-transfer utilities; features color display for appropriate terminal type; handles various keyboards. **Cons:** Does not include graphics support. **List price:** \$1195. **Requires:** Macintosh II. **Copy protection:** None.



Digital Communications Associates (DCA) has drawn on its long experience in linking PCs and IBM mainframes to produce a link for the Macintosh II. *MacIrma*, a NuBus-style board accessed via *MacIrma* software, turns your Mac II into a faithful emulator of the well-known IBM 3278 and 3279 terminals.



Information, Please

MacIrma's file-transfer options are easy to use (see "Preparing a File Transfer"), and they handle many of the character translations necessary in transferring files from an IBM mainframe (such as EBCDIC-to-ASCII translation or line-feed stripping).

To simplify file transfers, DCA will mail you a copy of *Irmalink* (free for the asking—just specify which IBM operating system you're using). With the *Irmalink* software installed on the IBM mainframe, you handle file transfers via menu selections within the *MacIrma* terminal emulation software. *MacIrma* enables you to transfer both text files and binary files; but in the case of binary files (such as Mac programs), the mainframe serves only as centralized storage for users.

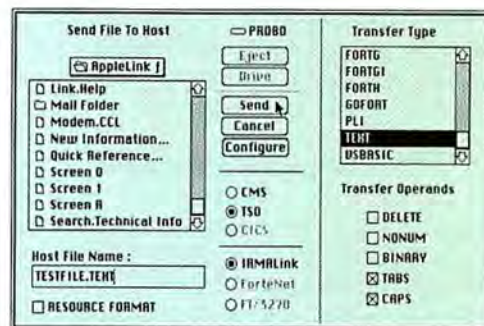
Although *Irmalink* may suffice in most cases, it is a bit slow for some uses. I transferred files at speeds of about 1.7K per second, but transfer speed depends on mainframe usage and varies considerably. For more speed, use one of DCA's file-transfer packages (ForteNet or FT/3270) with the *MacIrma* software.

Keys and Files

One of the problems with connecting to an IBM mainframe is ensuring that your keyboard can be mapped to all the characters that IBM expects. To deal with this, the *MacIrma* software allows you to customize the keyboard configuration as necessary, although I found the default settings for the Apple Extended Keyboard to be fine for typical uses. Reconfiguring the keyboard is more likely to be necessary if you're using the standard Apple keyboard with a Mac II (see "Altering Key Assignments").

MacIrma also contains a QuickPad feature, which allows you to map even the most uncommon 3278/9 keys to a pull-down menu for selection with the mouse. I've used such menus with other products (*MacTerminal*, for instance) and found them to be awkward—*MacIrma*'s QuickPad feature is no exception. DCA has attempted to deal with the awkwardness by providing a ⌘-key equivalent, but you still need to select a key with the mouse.

In addition to the normal line-by-line copy-and-paste mode, you can configure *MacIrma*'s Clipboard to copy text in block or column mode. Switching between the two modes is very simple. You copy a file into the Clipboard and then paste that text into a new file in *MacIrma*. The program doesn't attempt to paste data into protected fields in an IBM file, which is a nice touch.



Preparing a File Transfer

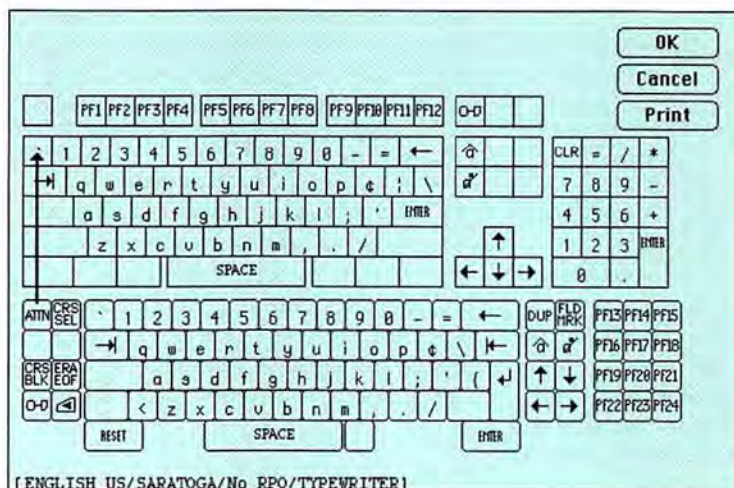
In this case, a Macintosh file will be sent to the mainframe as a text file called *TESTFILE.TEXT* using *Irmalink* software.

Should you want to select only part of a screen for pasting into a Mac file, *MacIrma* provides a handy feature for pasting tabular data from an IBM to a Mac by letting you first determine how many consecutive spaces should be converted to a tab—eliminating the need for any extra processing.

Missing Pieces

It's disappointing that *MacIrma* supports no mainframe graphics displays (for example, IBM 3278/9G or 3179G terminals). Look for an upgraded distribution disk to provide such capabilities in the near future.

Although *MacIrma* provides its own font for displaying IBM screens in a variety of sizes, and the window automatically adjusts to accommodate a full mainframe screen, with font sizes larger than 12 point you must scroll to the bottom of the window to see the IBM status line and then scroll back up to continue data entry—an annoying drawback. I also found the contrast between IBM's colored text and the



Altering Key Assignments

MacIrma's keyboard layout shows both the Mac (top) and IBM (bottom) key configurations. In this display the user assigns the IBM Attn key to the Mac's tilde (~) key by dragging the IBM key's image (as indicated by the long arrow on the left of the screen) onto the Mac key.

"white" background of Apple's color monitor to be a bit indistinct. Fortunately, DCA plans to include a dark-screen background option in the next version.

The Complete Connection

If you want to replace your IBM 3278/9 terminal with a local workstation and a link to an IBM mainframe, the Mac II/MacIra combination is a good choice—one that should enable you to keep up with any IBM terminal enhancements for years to come. The little extras that DCA has put into its software make the task of sharing information much easier and less intimidating. On the other hand, if you're interested in using mainframe graphics on your Mac II, you'll have to wait a little while longer.

—Dave Kosiur

See *Where to Buy* for product details.

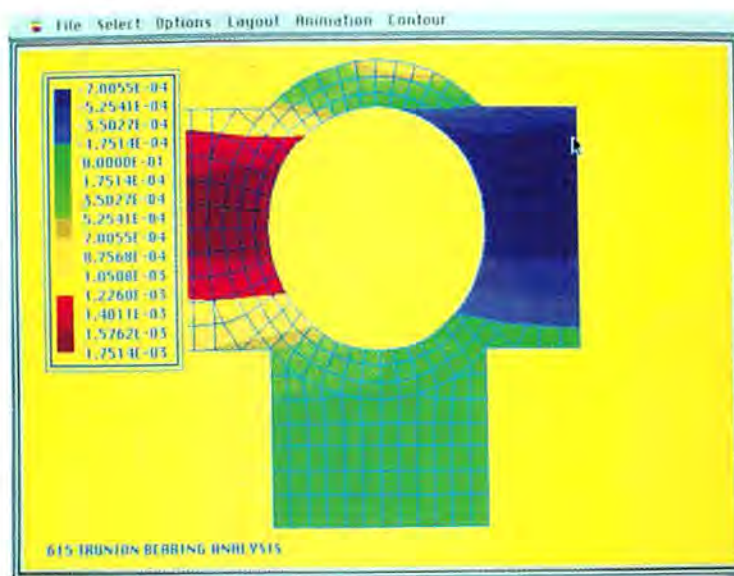
From the Moon to the Mac

MSC/pal 1.95

Finite-element analysis program for stress and vibration analysis. **Pros:** Performs complex calculations with text or imported graphics; interfaces with numerous Mac and MS-DOS CAD and graphics packages. **Cons:** Input for models more easily prepared in other graphics and CAD programs; no heat-transfer analysis; present version does not yet take advantage of more than 1MB on Mac II. **List price:** 1MB version \$1495; demo/introductory version \$45; special pricing available for educational institutions. **Requires:** 1MB and external drive; hard disk recommended. **Copy protection:** None.



Twenty years ago, during the race to put men on the moon, NASA established a standardized approach to structural analysis: NASTRAN (NASA STRuctural Analysis). As one of the contractors on that project, The MacNeal-Schwendler Corporation helped pioneer finite-element analysis (FEA) on mainframes. Subsequently, the company's software has become available for supercomputers, mainframes, minicomputers, workstations, IBM PCs—and now for the Macintosh, in the form of *MSC/pal*. The program is used largely by mechanical and structural designers, as well as by civil and



Two Views

MSC/pal allows you to display models in undeformed (top) and/or deformed (bottom) states. Shown here are the deformation contours within a two-dimensional representation of a trunion bearing. The scale defines the magnitude of the deformations. You can vary the number of values, the increments between them, and the maximum or minimum value.

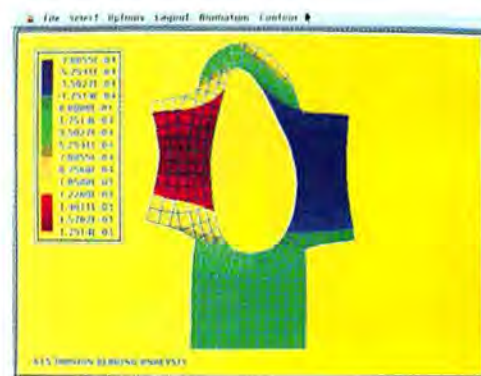
aerospace engineers, to prepare structural designs (beams, trusses, towers, dams) and mechanical designs (brackets, arms, bearing blocks, automobile bumpers, and even fishing rods).

FEA and the Model

FEA works by first creating a model that breaks down complex objects and structures into a number of node points connected with beam elements, quadrilateral or triangular plate elements, or a combination. By knowing the structural properties of each element, the program can determine how the entire model will behave.

MSC/pal simulates a 2-D or 3-D object, structure, or mechanical component before it's built, to determine whether it will be overstressed under static loads (static analysis) and how it will behave under transient conditions like earthquakes—phenomena that produce loads varying in magnitude, direction, and point of application as a function of time (dynamic analysis). *MSC/pal* can thus determine a structure's dynamic characteristics, such as mode shapes and frequencies, as well as its resonant frequency.

Although creating the initial description of the model (a long, detailed list in text form) can require a lot of careful typing, you can take advantage of *MSC/pal*'s ability to import graphic model descriptions directly from other Mac 3-D programs, such as *Dimensions* or *Mac3D*. By using a package from Kandu Software



called *CADMover*, you can create *MSC/pal* models from drawings made on *MiniCad* or even *MacDraw*. The drawings can even be imported from other PC CAD packages, such as *AutoCAD* (via DXF files with *Dimensions* or via IGES files with *CADMover*).

View and Plot

MSC/pal lets you perform static, natural-frequencies, transient-response, and frequency-response analysis on your model. The program does not include heat-transfer analysis. You can view the results of each analysis by selecting View or Plot from the Graphics menu. The following Plot/View choices for Static Solutions demonstrate *MSC/pal*'s versatility.

View provides you with two additional menu choices: Animation and Contour. Animation allows you to see on the screen how the model deforms and behaves under load. You can actually watch a car bumper bend and twist when it hits an object or see how a dam behaves in an earthquake.

Contour gives you pictorial representations with choices of shaded, line, or hidden-line contour annotation of the object presented in the undeformed state, deformed state, or both. You have a choice of contouring: Von Mises Stress; Maximum Shear Stress; Major or Minor Principal Stress; X, Y, or Z Translational Displacement; X, Y, or Z Rotational Displacement. On a Mac II, these contour graphics can be in full color and you can choose background and line colors as well as the number and increments of the contour levels. You can also modify the appearance of the graphic: select either full-size or shrunk elements; show or hide hidden lines. Additionally, you can rotate (on three axes), center and scale the graphic, and scale the deformations.

Plot produces a wide choice of x - y plots that contain data about either static or dynamic solutions. Choices for Plot are at least as extensive as those already described for Contour.

For the Pro

MSC/pal documentation, which presents FEA theory, is highly detailed, easy to follow, and well written by leading experts in the FEA field. Included are a number of tutorials that show you how to use this professional tool's many facilities.

However, don't expect answers in a flash, even on a Mac II. FEA is a highly complex mathematical process that uses complex algorithms to solve simultaneous equations. Typical run-times for static analysis are from 5 to 20 minutes; dynamic analysis can take three to five times as long. How big a problem the program can handle depends on the type of object being modeled and its physical complexity. Check with MacNeal-Schwendler to ensure that the problem you want to solve falls



GCC's Personal LaserPrinter

within the scope of its product's hardware and software capabilities.

Once mastered, *MSC/pal* will save you time and money in product design and development. The program's ability to simulate accurately the behavior of complex objects and structures will interest professionals in engineering and architectural disciplines. Even though *MSC/pal* is not inexpensive, it is certainly well worth its price to anyone who analyzes structures or objects. The program helps establish the Macintosh as a viable corporate engineering tool, it fully exercises the Mac's computational capability, and it provides a means of bridging the chasm between MS-DOS and the Mac.—David L. Peltz

See *Where to Buy* for product details.

Quality on the Cheap

General Computer Personal LaserPrinter 1.0

Laser printer. **Pros:** Prints crisp, high-contrast text and graphics; scales text and graphics to any size; spools output from multiple applications for batch printing; inexpensive. **Cons:** Can't reproduce all PostScript special effects; can't print directly from some applications; compatibility problems with some applications; no background printing; doesn't connect to AppleTalk network. **List price:** \$1999; **Fonts Plus** (additional font library) \$299. **Requires:** IMB, SCSI port, hard disk.

Calculation Times for Contour Plots

Object	Build Model	Static Solution	Calculate and Display Contours	Total Calculation Time
Trunnion	2:57.5	2:13.3	1:16.2	6:27.0
Gear	3:10.0	1:00.2	0:43.6	4:53.8
Bumper	1:19.2	2:13.8	0:38.9	4:11.9

The table shows calculation times (in minutes and seconds) required to produce the contour plots. First a model was read and created from

a stored disk file, then static analysis was performed, and finally the contours were calculated and displayed.



Like a PostScript laser printer, General Computer's Personal LaserPrinter (PLP) delivers high-quality 300-dots-per-inch (dpi) text and graphics. But the PLP doesn't use PostScript, so it costs less. Unlike other non-PostScript laser printers, the PLP has outline fonts, which can be scaled and rotated like PostScript fonts. On the downside, the PLP can't be networked, prints PostScript graphics poorly, and prints more slowly than other laser printers. Many users, however, will gladly accept these limitations in exchange for moderately priced, high-quality graphics and scalable text.

Looks

Compared with first-generation 300-dpi laser engines such as the Canon CX in the LaserWriter Plus, the PLP's Ricoh 1060 engine prints slightly smaller dots, with less toner splatter. It also prints much darker blacks. The result is crisper text and graphics with an excellent degree of contrast. Lines are also a hair finer. Although this refinement can result in tiny breaks in the curved lines of very small text and graphics, it generally enhances detail and text readability.

What you see on the screen is what you get on the PLP, provided the application you use to create the image reads the Mac's QuickDraw commands, which most do. PLP driver software takes the QuickDraw commands and substitutes high-quality fonts and special effects where appropriate. Together the PLP driver and QuickDraw prepare a bit-mapped image, which the PLP software sends to the printer.

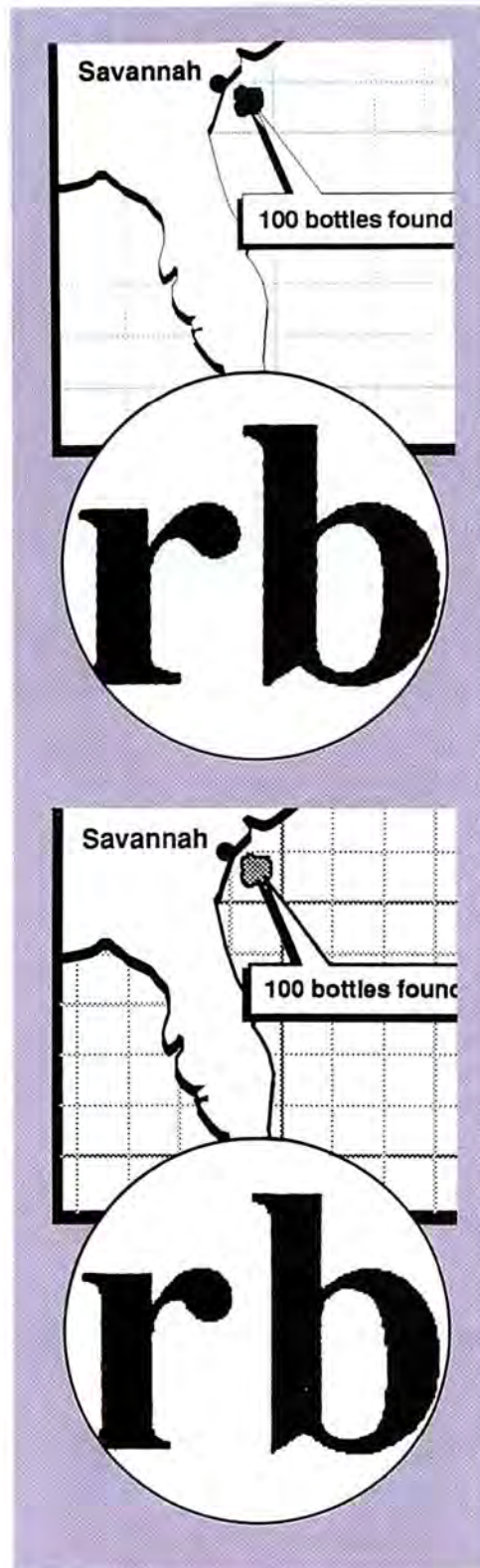
Text printed on the PLP actually looks better than text you see on the screen, particularly if you use odd-sized fonts. The PLP has its own geometrically defined outline fonts, which are very similar in appearance to PostScript fonts. All outline fonts can be scaled up or down with no loss of quality.

Standard PLP outline fonts include Helvetica, Times, Courier, Symbol, Swiss Narrow (like Helvetica Narrow), and Zapf Calligraphic (like Palatino). Seven additional fonts are available: five that resemble the LaserWriter Plus fonts, Avant Garde, Bookman, Century Schoolbook, Zapf Chancery, and Zapf Dingbats; and two bold fonts, Futura Extra Black and Cooper Black. The six standard fonts have bold and italic variations, and occupy 1.1 megabytes of disk space. The optional fonts take up another 1.2 MB.

The PLP Helvetica, Times, Courier, and Symbol fonts closely match their equivalents on Apple LaserWriters. All other PLP fonts have different spacing. These discrepancies can be rectified by installing LaserWriter screen fonts in place of the PLP screen fonts and renaming the PLP outline fonts to match. (You can get the LaserWriter fonts from anyone who rents time on a LaserWriter.)

Talent

Because all page preparation for the PLP takes place on the Macintosh, this printer doesn't need its own memory and processor. This keeps the printer cost



Which One Used PostScript?

Although the PLP will print PostScript graphics (top), the images may not appear exactly as they would from a PostScript printer like the LaserWriter Plus (bottom). In this case, the PLP produced fewer, less detailed grid lines and weaker outlines than the LaserWriter did. The text, however, appears almost identical (see blowups).

down, but means the Mac isn't free for other tasks until printing is completed. It's doubtful that background printing on a standard PLP will ever be possible, because the PLP's lack of native intelligence precludes suspending printing in midpage.

Preparing 300-dpi pages on a Mac takes time. A standard 1MB Macintosh Plus and the PLP software printed text and graphics considerably more slowly than did a LaserWriter Plus with the version 3.0 ROM. However, the PLP can quickly print a draft for proofreading at 75 dpi.

There's not always enough Macintosh memory available to print a document directly from an application at 300 dpi, especially when using MultiFinder. It's hard to predict whether there will be enough memory for a particular document. If there isn't, you must either spool the document to disk and print later using the PLP's Print Manager application, or print a draft.

People who want instant gratification will growl about printing in batches. To alleviate the aggravation, they'll have to add memory to their Macs.

Manners

Few applications refused to print anything on a PLP. Even *Adobe Illustrator*, an unabashedly PostScript application, printed (crudely) on the PLP. If an application uses the appropriate QuickDraw picture comments, PLP can simulate PostScript effects such as rotated text. If not, the PLP prints the lower-resolution screen image instead—at about the same quality as an ImageWriter II.

Many applications had minor glitches when coupled with the PLP. For example, *Microsoft Word 3.01* required fiddling with margins and choosing Page Setup and Print twice, once with the Shift key down and once without. *MacDraw*'s smoothed objects weren't very smooth. A number of applications couldn't right-align text correctly. General Computer expects most of these problems to clear up as developers revise their applications. The release notes included with the PLP list its compatibility status with specific applications. Be sure to check these notes before buying.

The PLP is easy to set up. It chains to the Mac through two 50-pin SCSI connectors. It has an external switch for setting the SCSI priority number and uses an external terminator. The PLP can't be connected to an AppleTalk network, so it can't be shared. However, it may be possible in the future to add AppleTalk compatibility at extra cost.

Merit

The PLP won't replace PostScript printers, but it does provide similar print quality at a much lower cost. Its outline fonts are particularly valuable. Despite the limitations that can make the PLP somewhat awkward to use, most one-Mac users will find it a solid performer and a good value. —Lon Poole

See *Where to Buy* for product details.

War of the Words

Computer Scrabble

Crossword strategy game. **Pros:** Easy-to-read board; lets you juggle your tiles to find playable words. **Cons:** Works poorly with older keyboards; sometimes won't accept valid tiles. **List price:** \$39.95. **Requires:** 512KE, Plus, or SE. **Copy protection:** Key disk.

Finally I had it in hand—the Mac version of my favorite game, Scrabble. After watching the familiar-looking board draw itself, I typed in my name and my opponent's: "Mac." Skill level? No problem. Selecting the highest, I readied myself for the kill. Twenty minutes later I emerged the stunned loser by over 100 points.

Leisure Genius's *Computer Scrabble* is pretty faithful to the original board game while giving you the flexibility of playing alone, against other people, or with a combination of computer and human opponents. On the other hand, three or four

people taking turns at one Mac won't feel quite as cozy as they would sprawled around a coffee table with a board and wooden tiles.

Computer Scrabble uses a vocabulary of over 20,000 words from *The Official Scrabble Players Dictionary*. Skill levels 1 through 4 use a subset of the game's dictionary, while levels 5 through 8 access the whole thing. Expert players shouldn't have much trouble beating the lower levels, but they'd better watch out for the top one.

Watch the Clock

If you like to search leisurely for the perfect word—preferably one that uses all your tiles so you can collect those 50 bonus points—you'll appreciate *Computer Scrabble*'s default setting of limitless time. For a faster-moving game, you can set the Clock for playing times from Lightning (30 seconds) to a 5-minute maximum. At any time during the game, you can reset the clock or turn it off.

If you're stuck for a word, you can try the Hint option for a suggestion, but the ones I got weren't point-heavy. My favorite feature is Juggle Rack, which rearranges your tiles—quite helpful for puzzling out higher-scoring words. Other options let you see what words the computer is considering or see other players' tiles—a decided advantage for planning strategies. Choosing Force during the computer's

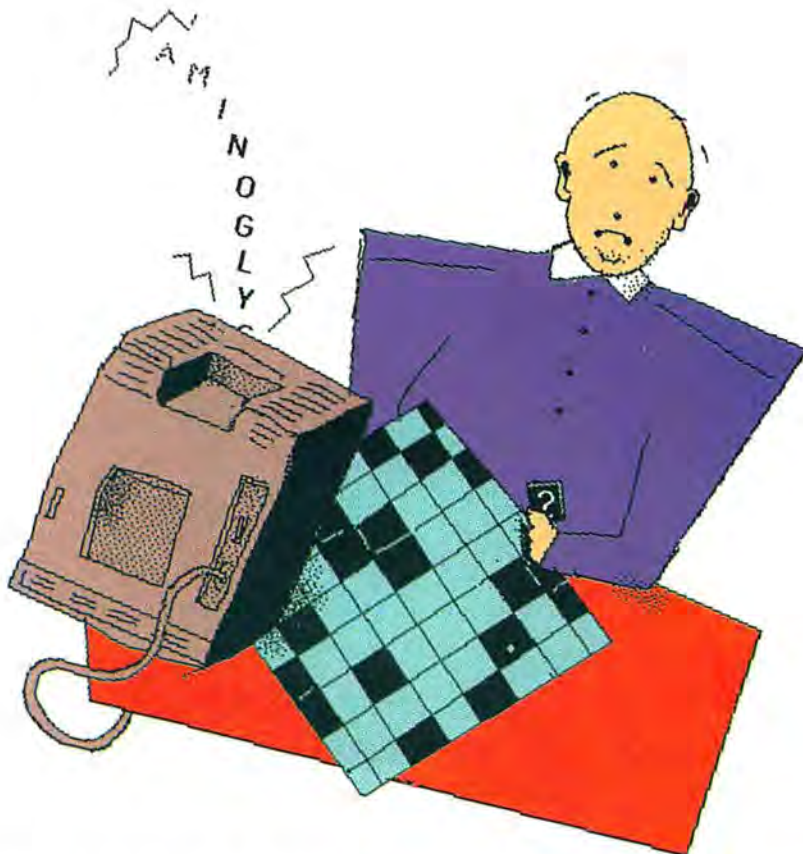
turn makes it play whatever word it's contemplating; if it hasn't yet found one, it will either pass or exchange tiles.

What Was that Word?

Although *Computer Scrabble* is fun, it has some serious quirks and minor irritations. Because it was designed for the Mac Plus, it doesn't work correctly on the older (short) keyboard—pressing any key on the bottom row produces the letter to its left. The Return key doesn't work either; you must use the backslash key just above it. And although the box says it works on a 512K, it actually requires the 128K ROM and an 800K drive, so you'll need at least a 512KE.

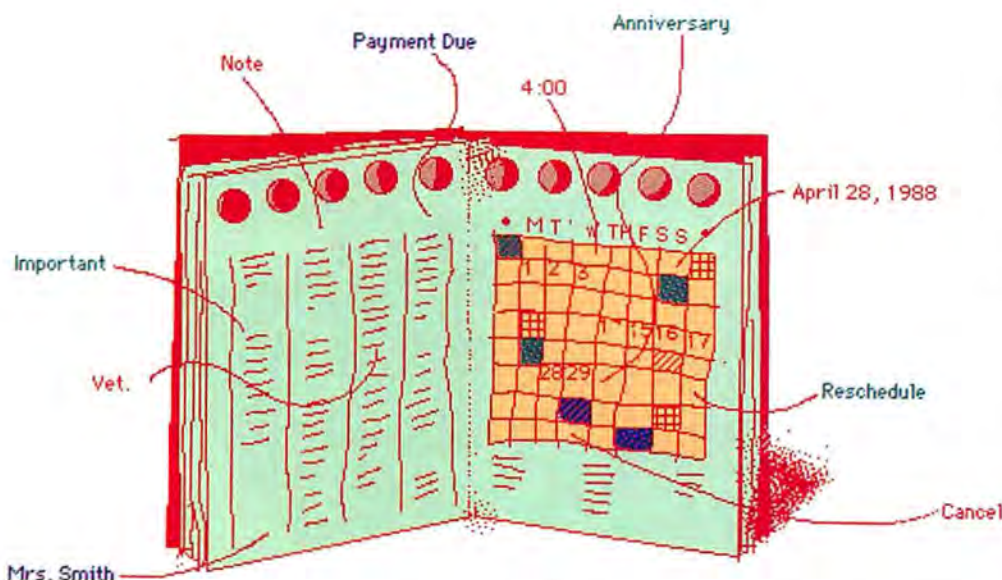
I ran into an even more frustrating problem: sometimes the computer refused to accept any words I typed, giving me an "Invalid Tiles" message. Sometimes I managed to solve this problem by rebooting one or more times; other times by toggling the Caps Lock key.

Whenever you construct a word *Computer Scrabble* doesn't recognize, it displays the word and asks, "Are you sure?" Choose Yes and it accepts the word; select No and you lose your turn. Although the computer often played rather exotic words, it sometimes challenged common ones I used, such as *pale* and *tide*.



Word-Crossed Board

Computer Scrabble's game board is well designed, with premium-word and -letter squares that are easy to distinguish. The tiles sit in nicely drawn racks that mimic the original wooden ones.



I also found a few other minor annoyances. If the computer runs out of time, it always gets to play the word it's currently pondering, while you must type your word and press Return before the last second ticks by. And you'd better be ready to jot down final scores if you like to keep track of them, since they disappear as soon as the game ends.

Despite its flaws, Scrabble lovers who have trouble lining up human opponents will probably enjoy this game; for playing with friends, though, a network version would be far preferable, since taking turns at one Mac gets tiresome. I found *Computer Scrabble* fun and challenging, but it definitely needs some fine-tuning before it can beat the original.—Cathy Abes

See *Where to Buy* for product details.

Keeping on Schedule

Rendezvous 1.3

Appointment-diary system. **Pros:** Full featured; easy to customize. **Cons:** Expensive; system works best if you are constantly near your computer. **List price:** \$200. **Requires:** 128K. **Copy protection:** Key disk; installs on hard disk.



If you use an appointment book or diary, you've probably developed your own system for making it work. Whether that system involves cross-

referencing activities and projects, keeping multiple calendars, or simply listing appointments, you can probably computerize it with PMC Telesystem's *Rendezvous*. But you may not find this electronic appointment-diary system as handy as your paper-based method.

Kinds of Calendars

Rendezvous's yearly, weekly, and daily calendars track the date and time on the Mac's clock. Since you can select any year from A.D. 1 to A.D. 3757, you won't need an update for about a millenium and a half. When the frontmost calendar on your screen is the one for the current year, the current day will blink. When the Mac clock passes midnight, the blinking moves to the next day. And if you have absolutely nothing to do on midnight next December 31, you can watch the This Year windows change to Last Year, the Next Year windows change to This Year, and the Last Year windows close.

When you start up the program, the Year Calendar appears. Days that are referenced in the weekly or daily calendars are highlighted. Next, you select the daily and weekly calendars you want to work with, or you can create new ones. You might create sets of calendar pages—say, one for birthdays, one for social events, and one for business appointments.

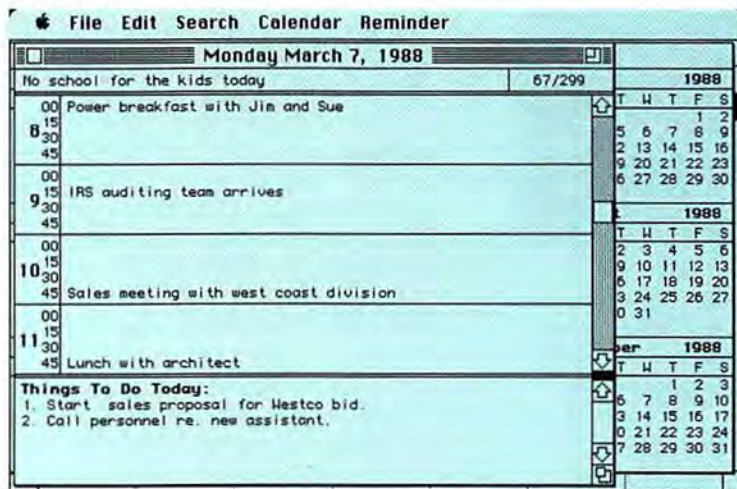
The weekly Planner is formatted like a spreadsheet, with 52 rows of weeks and seven columns of days. Each cell in the Planner shows the date and has room for two 15-character message lines. The most powerful features of *Rendezvous*, however, are in its daily pages, or Diary.

Diary pages are divided into three sections. On the top you can write a one-line special-event message, such as "Election Day." If you set the alarm, on that day the message will flash across the top of the Finder screen when you start up. The middle of a Diary page contains 24 hourly sections subdivided into quarter hours (you can further subdivide these into minutes). You can specify that messages in this section flash across your screen at the appropriate times, even if you will be using another application. Finally, there is a Things To Do window for tasks that are not time related.

Rendezvous also performs forward and backward searches within a single Diary page or through an entire year. In seconds you can find the last time you called your mother or the next time you're scheduled to go to the dentist.

How Handy Is It, Really?

What can you say about a product that is comprehensive and easy to work with, and for which there is no exact alternative?



A Day in the Life

Rendezvous's daily calendar allows you to do in-depth planning, set up special alarms, and enter reminders that are not time dependent. Although it comes subdivided into quarter-hour segments, you can opt for increments as small as one minute.

If you can use it, and the price seems right, buy it. For my money, however, this program is a bit too thin to support its \$200 price tag, especially when a high-end program like *Microsoft Excel* carries a discount dealer price of \$230.

My second problem is one of convenience. I can shove a paper diary into my pocket and take it to meetings. Even when I'm in my office, my computer isn't always on. To take full advantage of *Rendezvous*, you need to be working at computer. *Rendezvous* does provide a plush binder for storing hard copies of calendar pages, but printing out a new copy every time I make changes, or conversely, entering data into the computer every time I change the hard copy, is too cumbersome.

For those who always have a powered-up computer sitting next to them, or who are willing to make the necessary paper/computer transfers, *Rendezvous* is an imaginative program with just about all the features you need. —*Lawrence Stevens*

See *Where to Buy* for product details.

Projecting an Image

Macnifier

Macintosh projector and interface. Pros:

Compact; works with any overhead projector.

Cons: *Inability to show rapidly moving objects.*

List price: Macnifier and interface for Macintosh 128K through SE, \$1695. **Requires:** 128K.

The Comtrex Macnifier offers a novel solution to the old problem of showing the small Macintosh screen to a large audience. Instead of the bulky tubes used in conventional projectors, the Macnifier forms an image by means of a compact liquid-crystal display that fits over the lighted area of a standard overhead projector.

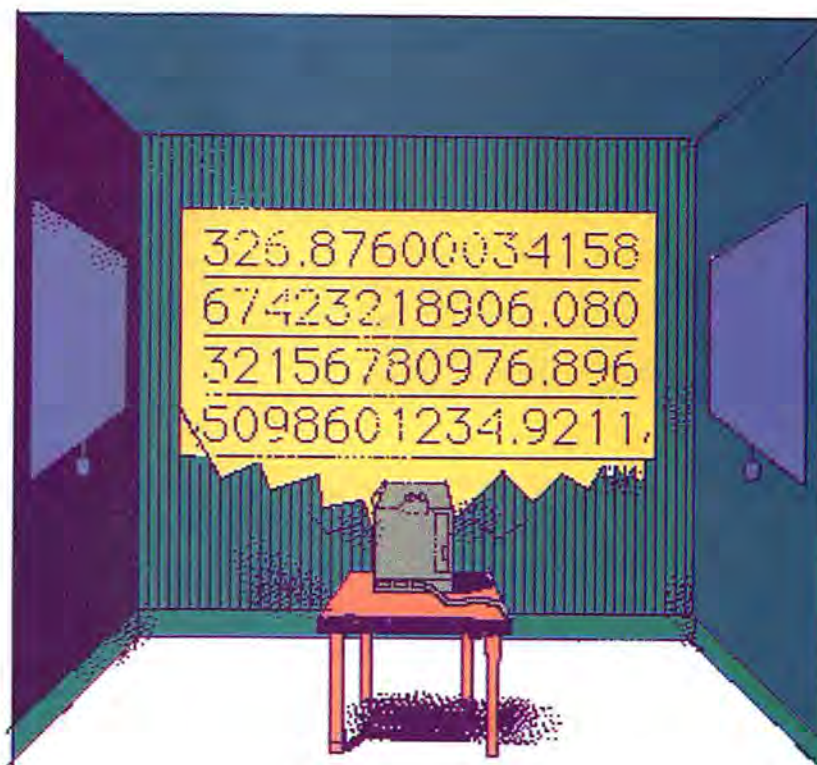
Making Connections

The Macnifier and the Mac connect through a custom interface that works with any Macintosh model, 128K through SE (a Mac II interface is available for an extra

\$100). Comtrex provides detailed installation instructions but recommends that the work be done by an authorized Apple dealer. Still, the 20-minute procedure should be simple enough for the average do-it-yourselfer. (However, you'll need a long-shaft Torx screwdriver to remove the screws in the Macintosh case.)

The interface's circuit board plugs into a connector on the Mac's analog board without soldering. The output panel, which fits neatly over the security slot or into the accessory port on the SE, contains the interface's two outputs: a mini DIN connec-

isn't any less natural than the green hue cast by some projectors. Sharpness is more than adequate, in fact Comtrex claims that the larger the picture gets, the clearer (and dimmer) it becomes, a statement my tests confirm. Overall, the Macnifier is easier to set up and adjust than any standard video projector I've tried. My only gripe is that the Macnifier cannot keep up with fast-moving objects on the screen. If you move the mouse too quickly, for example, the cursor disappears. This might be an important consideration if your Mac presentations contain a lot of animation.



tor for the Macnifier, and a composite video jack for standard video projectors and CRTs.

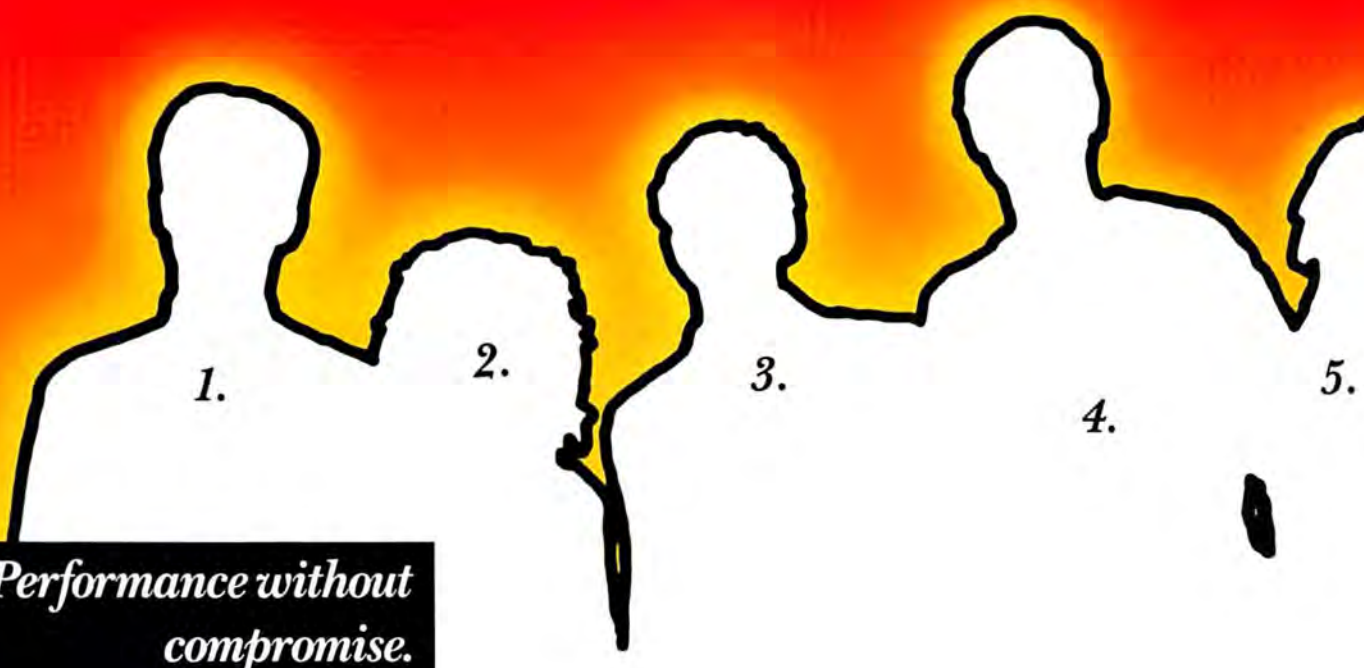
Mac on the Silver Screen

Using the Macnifier is almost as easy as showing a transparency on an overhead projector. There are only two controls: one reverses black and white, another adjusts contrast. The 2000-lumen projector I worked with was able to throw an image bright enough to read in a dimly lighted room; of course, the result with other projectors will depend on the luminosity of the bulb used.

Shown against a white screen or wall, the Macnifier image has a distinctly violet hue. It takes some getting used to, but it

Anyone thinking about buying a Macintosh video projector ought to look at the Macnifier. The interface is easy to install and doesn't void the Apple warranty if installed by an authorized dealer. Overhead projectors are common enough that finding one to use shouldn't be much of a problem. Even with the cost of a projector thrown in, you could save well over \$1000 compared to the cost of a conventional video system. —*Franklin Tessler*

See *Where to Buy* for product details.



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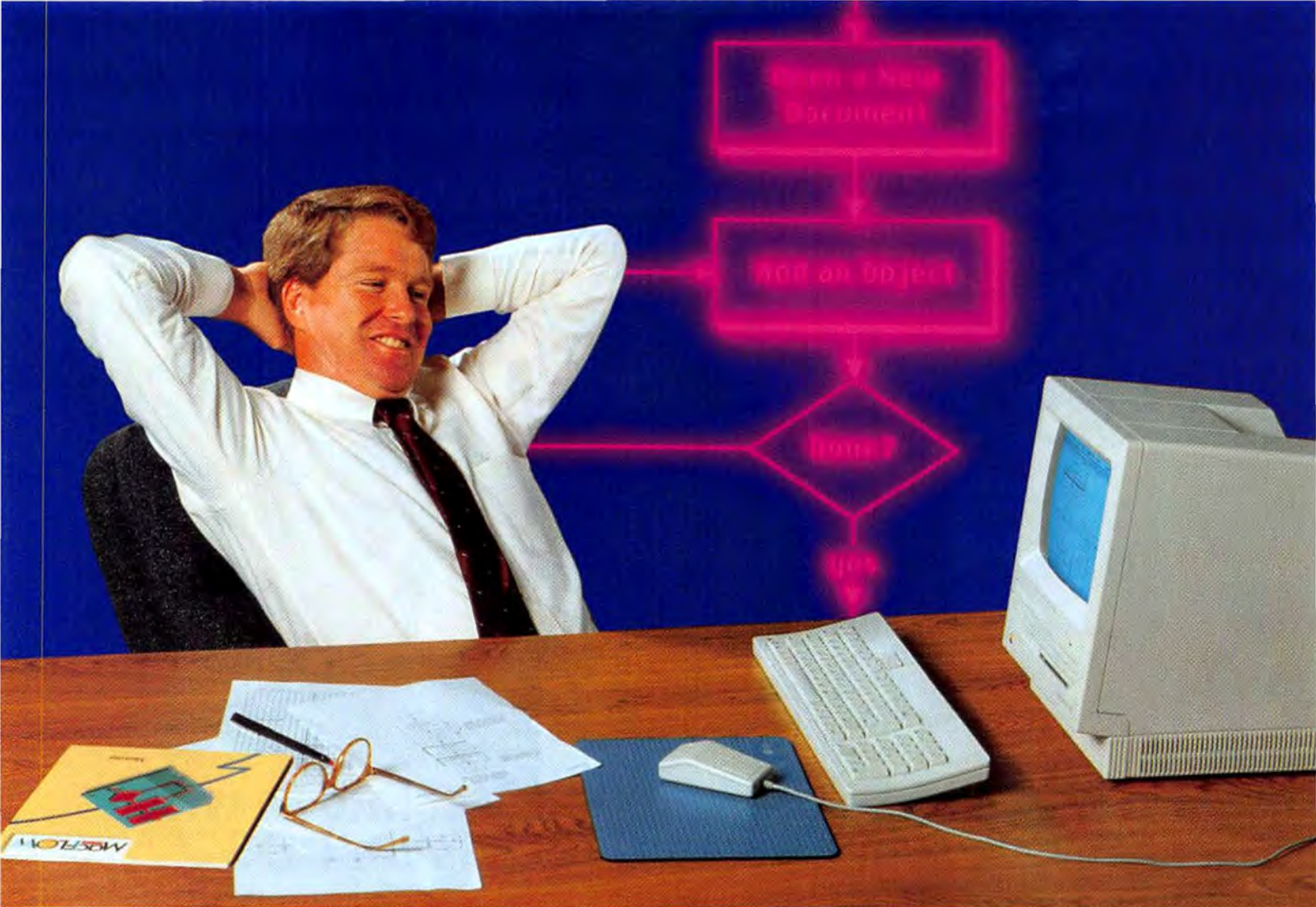
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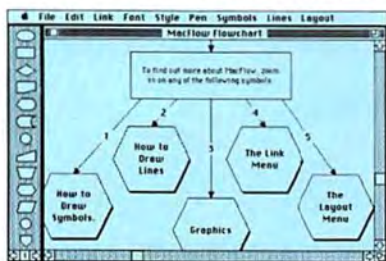
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Circle 94 on reader service card

New Products

*Information on the Mac's latest software,
hardware, and accessories*

Edited by Eileen Drapiza

This section covers Macintosh products formally announced but not yet evaluated by *Macworld*. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

Alternate Reality: The City First in a series of futuristic, fantasy role-playing games, in which you explore the city of Xebec. 512K min. memory. \$39.95. Electronic Arts, 415/571-7171.

Animation Workshop Series of modules allowing real-time, 3-D animations and graphics on the Mac II. 1MB min. memory. Price to be announced. Aegis Development, Inc., 213/392-9972.

Automated Management System Integrated business-management system allowing multiuser implementation of invoicing, sales and commission management, marketing, credit management and enforcement, inventory, purchasing and receivables management, and electronic mail, all of which may be customized for the user. 1MB min. memory; requires LAN and hard disk. Call for quotes. Julian Systems, Inc., 415/686-4400.

Best Answer Linear optimization for *Microsoft Excel* and *Microsoft Works*. 512K min. memory. \$99. Heizer Software, 415/943-7667.

Border Zone Interactive fiction from Infocom. 512K min. memory. \$39.95. Infocom, Inc., 617/492-6000.

Bytes of Fright, Classic Science Fiction, Dinosaur Bytes, Fantasy Realms, and Sky Bytes Horror, science fiction, fantasy, and aerospace clip art collections. \$29.95 each. A.A.H. Computer Graphic Productions, 408/980-7363.

ClickArt EPS Illustrations Portfolio of more than 175 drawn images for use with PostScript-compatible printers and applications that read encapsulated PostScript. \$129.95. T/Maker Company, 415/962-0195.

CLR StatCalc *HyperCard* stack that simulates a statistical calculator with 7 standard functions, 12 statistical functions, and 3 memories. 1MB min. memory; requires *HyperCard*. \$22.50; site licenses for educational institutions \$125 per year. Clear Lake Research, 713/523-7842.

The Curator Art management application integrates artwork from TIFF, PostScript, encapsulated PostScript, PICT, *Glue*, and *MacPaint* formats. Locates stored artwork using names, keywords, or thumbnails in a scrollable table of contents. Available as an application and as a full-featured desk accessory. 512K min. memory. \$139.95. Solutions, Inc., 802/229-9146.

Design Your Own Train: MacInooga Choo Choo Create model train layouts using track pieces that can be flipped and rotated. 512K min. memory. \$49.95. Abracadata, 503/342-3030.

Disktools Plus Collection of seven desk accessories provides a calendar, phone pad, background spooler for text files, scientific and RPN calculator, windowing utility, and Disktools II for Finder-level management. \$49.95. Electronic Arts, 415/571-7171.

Eureka: The Solver Mathematical analysis program. Solves equations, then allows users to verify, plot, or list a function and

generate a report summarizing the solution. Takes advantage of the Mac II's 68881 math coprocessor and color. 512KE min. memory. \$195. Borland International, 408/438-8400.

Finale and MacDrums *Finale* features built-in transcription and notation intelligence that enables users to manipulate music data flexibly. Prints music entered from a MIDI keyboard. *MacDrums* is a programmable, four-voice polyphonic drum synthesizer and sequencer with professional studio instrument features. Use preprogrammed instrument sets or custom-design new sets by choosing from 35 instrument sounds. 1MB min. memory for *Finale*; 512K min. memory for *MacDrums*. *Finale* \$795, *MacDrums* \$49.95. Coda Music Software, 612/854-9554.

FoxBase +/Mac Combines *dBase III Plus* compatibility with a Mac interface. 1MB min. memory. \$395. Fox Software, Inc., 419/874-0162.

Heraldry Basic clip art guide to the medieval art of heraldry: the divisions of coats of arms and the traditional devices and colors that appear on them. \$39.95. Pleasant Graphic Ware, 503/726-8178.

LaserPerfect Fonts New foreign-language fonts for Devanagari and Greek: LaserPerfect Benares and Athina. New specialized fonts: LaserPerfect OCR-A, LCD, and Phonetique. New fine typography fonts: LaserPerfect Ambo, Norfolk, and Garajon. LaserPerfect Benares \$125; Athina, Phonetique, Ambo, and Garajon \$75; OCR-A, LCD, and Norfolk \$55. NeoScribe International, 203/467-9880.

(continues)

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Circle 113 on reader service card

New Products

Mac2200 Terminal emulator for Wang CS/2200 system provides full emulation of Wang DE and DW series terminals and integration of Wang BASIC-2 programs into Mac environment. Supports the 32 function keys and the complete set of programmer support keys of the Wang terminal as both on-screen buttons and keyboard selections. 512KE min. memory; requires Wang 2200/MVP, LVP, SVP, Micro VP, or CS system with either a 2236 MXD or MXE terminal controller. \$225. The Vermont Software Company, 802/333-4020.

MacAtlas HyperCard Version Clip art collection of world maps organized in *HyperCard* format. \$99. MicroMaps, 800/334-4291, 609/397-1611 in New Jersey.

MacCarols Enables the Mac to play and sing popular Christmas carols. 512K min. memory. \$19.95. Park Row Software, 619/581-6778.

Mac Gallery Collection of drawn clip art images ranging from holiday designs to teddy bears. Its reference manual has a visual index. *MacPaint* file format. \$49.95 plus \$2 s/h. Dream Maker Software, 213/221-6436.

MacGridzo, Steareo, Fin-AI, Rosy, Ternary Plot, Terra Mobilis, Zoeppritz5, Mineral Data Base Periodic Chart, Mac Mohr, Strain Graph, and A.V.O. Geological software for such tasks as gridding and contouring, 3-D orientation analysis, oil and gas accounting, rose diagram and ternary plotting, 3-D plate tectonics, and seismic modeling. 512K min. memory. \$50 to \$225. Rockware, 303/238-9113.

MacThai Thai language font includes many combinations of tone markers, vowels, and consonants. \$79.95. Linguists' Software, 617/468-3037.

Membership List, Music Librarian, ShuBox Filing *Membership List* tracks organizational memberships. Search and retrieval with up to 28 simultaneous criteria. Includes mail merge, labeling, and financial assessment tracking. *Music Librarian* is a classification, inventory, and search and retrieval program. *ShuBox Filing* is a small-business accounting system that includes

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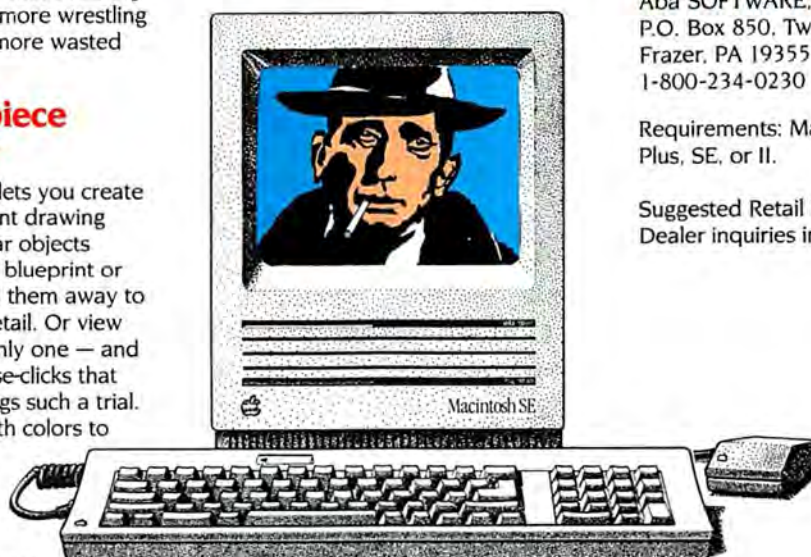
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Dealer inquiries invited.



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Circle 212 on reader service card

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New Products

payroll and a mailing list with merge capability. 512KE min. memory; 1MB for *ShuBox Filing. Membership List* and *Music Librarian* \$20 each, *ShuBox Filing* \$59.95. ShuBox Filing, 904/372-0066.

Monte Carlo Simulations Three-part integrated statistical package consisting of statistical analysis module, simulation module, and long-term projection module. 512K min. memory; requires numeric keypad. \$595. Actuarial Micro Software, 919/773-1313.

OverLays A.M.S. OverVue templates for architectural accounting. \$199. The Firstside Studios, 412/642-4445.

PacerShare Enables any VAX/VMS system to function as an AppleShare-compatible file server. Five concurrent sessions on a MicroVAX \$400. Pacer Software, Inc., 619/454-0565.

Reader Rabbit Teaches reading skills to children ages four to seven. 512K min. memory. \$59.95. The Learning Company, 800/852-2255, 415/792-2101 in California.

SBT Database Accounting Library Programs operate independently or as integrated system. Includes general ledger, billing, inventory control, accounts receivable, accounts payable, sales order processing, purchase order processing, payroll and labor accounting, fixed assets management, job cost accounting, material requirements/manufacturing planning, time and billing, property management, service/equipment maintenance, and main menu and file backup. \$65 to \$395 depending on module. 1MB min. memory; requires McMax. SBT Corp., 415/331-9900.

SuperExpert Development tool for creating and using example-based expert systems. 512KE min. memory. \$199.95. Softsync, Inc., 212/685-2080.

Teach Yourself Essentials of Accounting Self-paced program teaches fundamental accounting concepts. 512K min. memory. \$49.95. Addison-Wesley Publishing Co., 617/944-3700.

Timbuktu Desk accessory lets users connected by AppleTalk view and operate one another's Macs. Optional password protection. \$179. WOS Data Systems, Inc., 800/843-8101, 913/843-8101 in Kansas.

(continues)

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RULES

All artwork must be produced with a registered copy of "Draw It Again, Sam" software. Entries are limited to one per person, per category. All artwork becomes the sole property of Aba Software, Inc. and contestants give up all rights and claims in connection with its unlimited use. All finished artwork must be received by May 7, 1988. Entries will be reviewed by a panel of judges made up of industry leaders and artists. A complete list of winners' names will be available from Aba Software, Inc. Winners will be notified in writing by June 15, 1988. Employees and Associates of Aba Software, Inc. and their families are not eligible for this contest. Entries must be submitted on disk and in hard copy form.

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New Products

Turbo Math Facts Educational math program for kids. Part of the MacKids software line. 512K min. memory. \$39.95. Nordic Software, 402/466-6502.

HARDWARE

Conrac's Model 7250, 7351 Model 7250 is a multiscanning monitor that supports the standard Mac II 640-by-480-pixel resolution. Model 7351 accommodates ultrahigh-resolution modes offered by third-party display boards. Scan rates of 48 to 64 KHz with 110-MHz video bandwidth combined with 1280-by-1024-pixel resolution. Mac II interface cable available. Model 7250 \$2995, Model 7351 \$2995 to \$3450 depending on options. Conrac, 818/966-3511.

Flatbed TurboScan Flatbed optical scanner accepts documents in sizes up to 8½ by 14 in. Includes *SuperScan*, 300-dpi graphics editing software. \$1899. AST Research Inc., 714/553-0340.

InnerDrive 40/SE 40MB internal hard disk installs without displacing the SE's upper floppy-disk drive. Includes mounting bracket and cables. \$999. Jasmine Technologies Inc., 415/621-4339.

NTSC Converter Allows Mac II with an Apple color card to be easily connected to standard video recorder or television monitor. \$599. Julian Systems, 415/686-4400.

Power2 Expand 3½-in. Winchester SCSI drives in 20MB to 100MB, expandable to 200MB. Has two AC outlets with three-way surge protection, external fuse, and SCSI select switches. From \$489 depending on configuration. Mass Micro Systems, 408/988-1200.

QuickShare Connectivity system provides text or graphics file transfer between the IBM PC/XT/AT or IBM-compatibles and the Mac, and lets Macs share PC hard disk or PC LAN drives. Includes a SCSI add-in card that is installed in the PC, and cable to link the card to the Mac. 512KE min. memory. \$465. Compatible Systems Corp., 303/444-9532.

ShapeScan SS-300 Scanner with SCSI interface and image-editing software. Under \$1000. Shape, 800/247-1724, 207/883-2931 in Maine.

Viking 10, 2400, Analog Viking 10 has 19-in. color monitor for Mac II, 1024-by-768-pixel resolution, and 256 colors. Includes plug-in controller card, installation software, manual, and six-foot cable. Viking 2400 monochrome monitor for Mac SE and II has 18-by-13-in. screen and can display two full legal-size pages; 1280-by-960-pixel resolution. Noninterlaced with paper-white phosphor. Viking Analog gray-scale monochrome monitor for the Mac II has 1024-by-768-pixel resolution and offers 256 shades of gray. Comes with controller card. Viking 10 \$4795, Viking 2400 \$2995, Viking Analog \$2695. Monitorm Corp., 612/935-4151.

ACCESSORIES

MacClean Mouse cleaning device removes trapped dirt and dust. It has no moving parts and requires no fluids. \$12.95. Absolute Inc., 617/482-0286.

McWedge A ¼-inch high, cast acrylic base reclines the Mac 512K, Plus, and SE at an 11-degree angle, elevating the screen by 2 inches. \$19.95. Tap Fabrication, 415/351-0422.

Wipe-Free Dry, lint-free, untreated cloth, woven with carbonized threads, removes dust and static electricity from computer monitors; 9-by-9 in. \$1.95. Argraph Corp., 201/939-7722. □

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.

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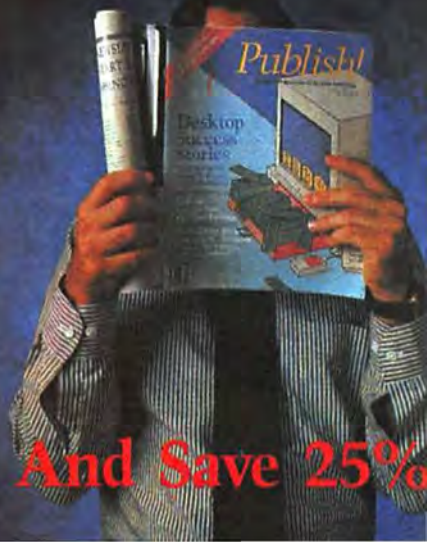
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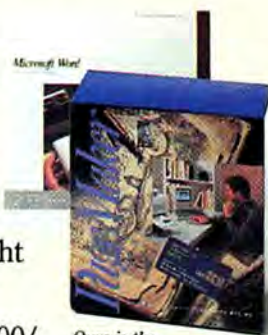
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Quick Tips

Answers to your questions

by **Lon Poole**

The ImageWriter gives good stencil. So say several readers who responded to the question about mimeographs in October's *Quick Tips*. Dwight W. Allen in Gaborone, Botswana, and his son and daughter-in-law in Zimbabwe have made more than a thousand mimeo stencils on their ImageWriter II printers. They avoid gumming up the print-head pins with stencil wax by printing with an old, lightweight ribbon, which acts as a barrier to keep wax out of the pins.

Donna Haglin of Howard Lake, Minnesota, has been cutting mimeo stencils on an ImageWriter I for over a year. She recommends dotted lines in place of solid lines to minimize tearing when the stencil is being run. Also, illustrations should be filled with a light pattern rather than a solid one. Heavy black areas cause ink build-up that keeps copies from ejecting freely from the mimeo machine.

While teaching English in China, D. M. Urquidi of Austin, Texas, printed stencils on an ImageWriter I. Artwork and text turn out much better this way than they do with stencils made by typewriter and hand-held stencil pen. Print-head pins do not become clogged with stencil fibers as typewriter keys do.

Ron Melzer of Atlanta, Illinois, prints newsletter stencils for two churches on an ImageWriter II. He's gotten good results with a special mimeograph stencil made for computer printers, A.B. Dick #2060 (24 stencils cost about \$8.50). He gets 200 to 300 pages per stencil without any problem.

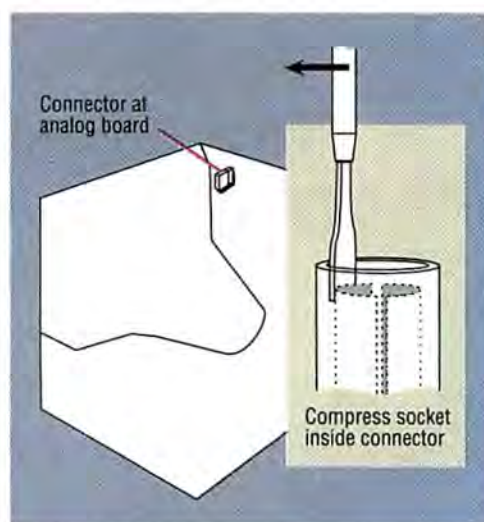
Dancing Screen

Last month I described how to cure a mysterious squeal with some delicate surgery inside the Mac. (The Mac's video board and power supply components include high-voltage areas; so unless you're familiar with this type of equipment, you should not attempt repairs yourself.) An-

other annoying condition that the Mac often falls prey to is what I call the video screen two-step. Here's how it goes: the picture suddenly shrinks a bit and then returns to normal, repeating those steps a few times. This common problem is usually caused by imperfect contact of the picture tube signal cable connector at the analog board. "Dance Is Over" shows the connector's location.

To fix it you must unplug the cable and carefully compress the C-shaped metal sockets inside the cable connector with a jeweler's screwdriver so that they make solid contact with the pins of the matching connector on the analog board. However, if the connector has become brittle, contact with a screwdriver may break it. In that case, you can console yourself with the knowledge that it needed to be replaced anyway.

It's also a good idea to touch up the solder joints that connect the matching connector to the analog board. (Don't for-



Dance Is Over

Cure a sporadically shrinking screen by tightening the metal sockets inside the cable connector and by resoldering the matching connector on the circuit board.

get, though, that opening up the Mac voids Apple's warranty.)

Stubborn Icons

I'm trying to replace icons on the desktop using *Icon Switcher*. But after I switch them and go back to the Finder, the old icon is still on the desktop. Also, when I use *ResEdit* to change the wording of Finder menus, the changes don't seem to stick. Am I doing something wrong?

*Mal E. Maloney
Indio, California*

After changing the icon in an application, you must still update the invisible Desktop file that holds the images the Finder displays on the screen. Using *Icon Switcher*, you do that by making sure the Update Desktop command is checked in the File Icons menu.

(You can also make the Finder rebuild its Desktop file, but you lose Get Info comments in the process. And any documents created by applications not on the currently inserted disk will get blank icons. To rebuild the Desktop file, simply press ⌘-Option when inserting the disk. For a hard disk, press ⌘-Option when starting your Macintosh.)

You can use *ResEdit* to change wording and text style of menus in the Finder and other applications. Menu text and styles are specified in MENU resources. Sometimes an application has more than one MENU resource for a single menu. For example, Finder 6.0 has two resources for the File menu—one for a regular File menu and one for an *AppleShare* File menu. If you change the correct MENU resource, you should see the results the next time you use the application. *ResEdit* is available from many user groups; call 800/538-9696 ext. 500 for the name of one near you.

(continues)

Q Many Openings

After I choose Open from the File menu in *Microsoft Word 3.01*, I can select only one document to open. Is there any way to open more than one document at a time?

I use my 512K Mac with 800K external disk drive only for writing long research documents. Would it be better to upgrade to a Mac Plus or get a hard disk?

David J. English
Bensenville, Illinois

A Your description of the Open command applies to all applications I've ever used except the Finder. You can open several documents at once from the Finder, provided they're all in the same folder. Just Shift-click the ones you want, or drag a selection net around them. Then choose Open from the Finder's File menu. No need to include the application in the selection; the Finder opens the appropriate application automatically.

In *Word 3.01*, you can list your documents in the Work menu, from which you

can select and open them just as you would choose any other menu item. To add a document to the Work menu, press ⌘-Option-+. The pointer then becomes a large plus sign. Use it to go through the motions of opening a document. To remove an item from the Work menu, press ⌘-Shift-hyphen (-) and choose the item you want removed from the Work menu. The current version of the Work menu is saved when you quit *Word*.

If all you do is write, you'll probably find a hard disk more useful than a Mac Plus upgrade. However, adding a hard disk will probably preclude future upgrades, as explained in the answer to the next question.

Q Hard Disk for 512K Mac

I have a 512K Mac. I hope to purchase a hard disk for it, and I wonder what I'll need in addition to the drive. Is a SCSI adapter sufficient, or should I also upgrade to a Mac Plus? Is there any disadvantage in not having a Plus?

Frederick J. Ullrich
Birmingham, Alabama

A To connect a SCSI hard disk to a 512K Mac, you need only install the SCSI adapter of your choice. But to use the SCSI hard disk, you'll have to start up with a single-sided floppy disk whose System Folder contains the System 3.2, Finder 5.3, and Hard Disk 20 1.1 files. After start-up, you can make the SCSI disk the current start-up disk (providing its System Folder contains those same files) by opening an application on that disk.

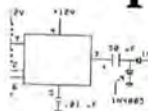
The Hard Disk 20 file allows a Mac 512K to use the Hierarchical File System (HFS), which is not included in its 64K ROM. HFS is what makes folders for 800K disks and hard disks appear in Open and Save dialog boxes, not just in Finder windows.

Upgrading to a 512K Enhanced or a Mac Plus has several advantages. You get an 800K internal disk drive. More important for SCSI disk use, you also get the 128K ROM, which can start a Mac directly from a SCSI hard disk or from another HFS disk.

(continues)

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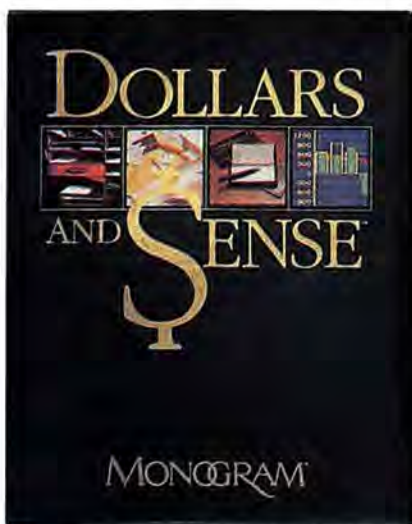
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Accounts	1986 Budgets	1987 Actual	1986 Balances
CASH AT START			
1001 Liquid Assets	1,200.00	3,415.00	2,345.00
1100 Personal Checking	50.00	90.00	43.00
1110 Cash	5,813.00	90.00	10.00
1120 Credit Union	20,515.00	0.00	23,897.00
1130 Stock Savings Plan	93,735.00	28,145.00	12,541.00
1140 Stocks & Bonds		90,735.00	
Total Liquid Assets	129,433.00	120,385.00	39,826.00
1200 Fixed Assets			
1210 Home	204,900.00	200,000.00	196,000.00
1220 Rental A	157,000.00	150,000.00	145,000.00
1230 Rental B	140,000.00	140,000.00	132,500.00
Total Fixed Assets	501,900.00	490,000.00	473,500.00
Total Cash At Start	631,333.00	610,385.00	473,500.00

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How To/Quick Tips

The 128K ROM contains HFS, so you don't need the Hard Disk 20 file.

However, if you've got a 512K or a 512KE with a simple SCSI adapter, your Mac is really frozen in time. Most simple SCSI adapters don't leave space inside the Mac for adding more memory. That may be fine if you use only one or two applications and are sure you'll never want to use new software such as MultiFinder, HyperCard, or Illustrator. They, like more and more of today's software, demand minimum memory of 1 megabyte.

I strongly recommend upgrading to at least a Mac Plus. Get Apple's disk drive upgrade, which includes a new ROM. Then get either Apple's Mac Plus logic board swap or a third-party equivalent such as SuperMac's Enhance. If you're considering upgrading your system, you must be planning to keep it a while longer. Give yourself room to grow.

Q Keyboard Mouse

Many typists complain about having to move from keyboard to mouse. Responses to their complaints seem to revolve around the arrow keys and ⌘-key combinations, which don't work or aren't available in all applications.

As a slow, two-finger typist who usually creates material through an even slower thought process, I don't find mouse problems in word processing. What I do need is a mouse button on the keyboard. For example, in Excel I'd like to be able to leave the pointer parked on the formula bar and activate it at the same place in a formula that appears in a multitude of cells.

*Kevin Bickerstaff
 West Seneca, New York*

A Since April 1987, Macintosh system software has included a file named Easy Access that provides a feature called Mouse Keys. This feature lets you use the ten-key numeric pad in place of the mouse. You can move the pointer, click, drag, and so forth—all from the keyboard.

To install Easy Access, drag its icon into the System Folder on your start-up disk. You must use it with System version 4.1 or higher.

To turn on the Mouse Keys feature, press ⌘-Shift-Clear. The 5 key then acts just like the mouse button. Press it once to click and twice quickly to double-click, or

(continues)

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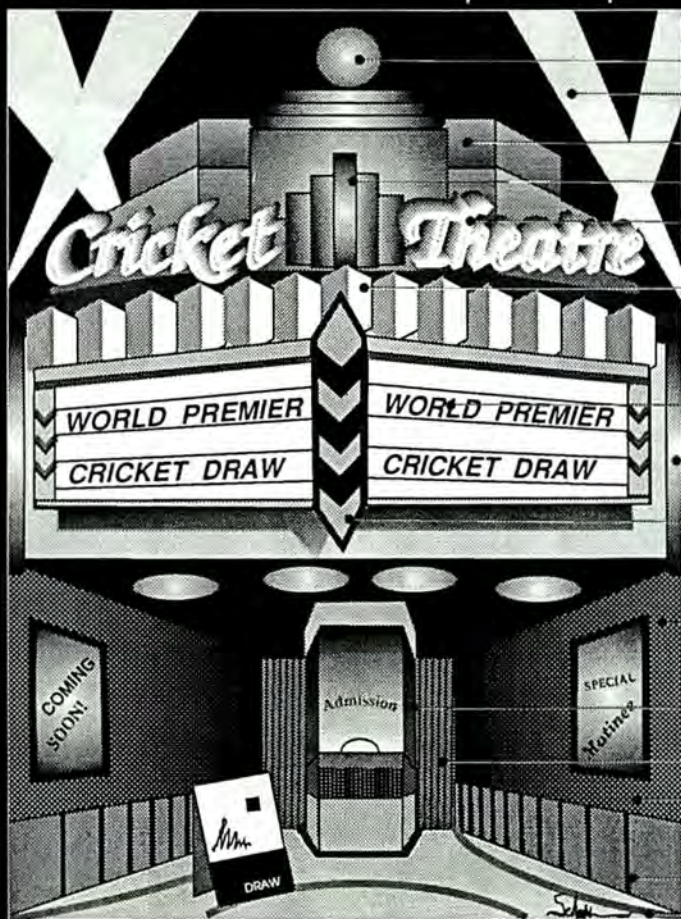
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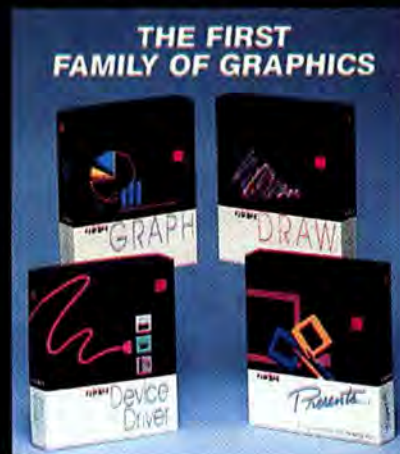
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How To/Quick Tips



Mouse Keys

To make the numeric keypad double as a mouse, press **⌘-Shift-Clear**. Then press keys on the keypad to simulate mouse movement and clicking. The 5 key acts as the mouse button. Press it once to click and twice to double-click, or hold it down to drag. The number keys around the 5 key move the pointer in the directions shown here by bold arrows. The 0 key locks down the mouse button, and the period key unlocks it. Press Clear once to deactivate Mouse Keys.

press and hold for dragging. Pressing the 0 key once locks down the mouse button for pulling down menus, dragging, and so on. To unlock the mouse button, press the period (.) key on the keypad. Shift-click by pressing Shift-5. See "Mouse Keys" for a diagram of keypad uses.

You move the pointer up, down, sideways, or diagonally using the number keys around the 5. For very fine pointer movements, tap the appropriate number key for the direction you want to go. To cover distance rapidly, press and hold the key. The longer you press, the faster the pointer moves. You can adjust its speed with the Mouse Tracking feature in the Control Panel.

To turn off Mouse Keys, press the Clear key once.

Easy Access has another feature, called Sticky Keys. It lets you type key-stroke combinations that include modifier keys—Option, Shift, **⌘**, and Control (if present)—without having to press them all at once. Instead, you press the keys sequentially, which makes it easier to type with only one hand.

(continues)

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Tools

Untitled Data #1

1	2	3	4	5
MONTHS	SALES	Column 3	Column 4	Column 5
1 January	\$83570			
2 February	\$85054			
3 March	\$50509			
4 April	\$40034			
5 May	\$92877			
6 June	\$40154			
7 July	\$100124			
8 August	\$220987			
9 September	\$1033101			
10 October	\$1501198			

Familiar spreadsheet-style data entry

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Colors

Black

White

Red

Green

Blue

Cyan

Magenta

Yellow

1	2	3	4	5	6
Signal #1	Signal				
1 0.300	35				
2 1.804	76				
3 4.345	36				
4 9.406	56				
5 17.032	33				
6 26.079	51				
7 43.204	22				
8 63.075	51				
9 88.360	45				
10 119.705	86				

Scatter Line Area

Bar Column Pie

Stacked Bar Stacked Column Polar

QC Doublet ABC Text

5	6
Freq. Value	Error
01 0.227	309.202
04 0.820	728.354
45 2.066	320.084
06 4.275	521.890
32 7.742	288.321
79 12.763	469.000
04 19.638	176.200
75 28.670	470.266
60 40.164	413.230
25 54.411	817.100

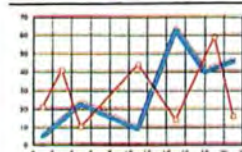
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


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Icon Meaning

-  Sticky Keys is on, and you are ready to begin a keystroke combination by pressing a modifier key: Shift, Option, , or Control.
-  You have begun a combination by pressing one or more modifier keys. Press another modifier key to continue the keystroke combination, or press a character key to complete it.
-  You have pressed the same modifier key twice in a row, effectively locking it down. To unlock it, press it again.

Sticky Keys

The right end of the menu bar displays Sticky Keys' status icons, though occasionally no icon appears there. Sticky Keys lets you execute a keystroke combination by pressing keys sequentially rather than simultaneously.

To turn on Sticky Keys, press the Shift key five times. Don't move or bump the mouse, or you'll have to start over. When Sticky Keys is on, an icon at the right edge of the menu bar should display the current status, but occasionally an icon fails to appear (see "Sticky Keys"). To turn off Sticky Keys, press Shift five times again, or press any two modifier keys simultaneously.

Cross-Tabs with Excel

Tip: Here's a tip for helping you track customer complaints from each of your field offices. Suppose you want to break down the complaints into various categories and determine how many of each type have been lodged against each office.

You can construct a cross-tabulation to perform this kind of analysis by combining a database and a table in an Excel worksheet (see "Counting Incidents").

Under the headings City and Complaint, list for each complaint the office from which it originated in column A and the type of complaint in column B (designating complaint types as A, B, C, and so on). Then select the entire list complete with headings (A6 through B19) and choose Set Database from the Data menu. This defines the selection as an Excel database named *Database*.

To count the number of complaints in the database, you put the formula **=DCOUNT(Database,,Criteria)** in an unused cell (C3); then choose the Define Name command from the Formula menu and name the cell *count*. Enter the criteria headings (City and Complaint) above the database, select the criteria range (cells A2 through B3), and use the Set Criteria command from the Data menu to define that range. The DCOUNT formula in cell C3 can then calculate all occurrences of criteria pairs

(continues)

	A	B	C	D	E	F	G	H	I
1	Criteria:								
2	City	Complaint							
3			13						
4									
5	Database:								
6	City	Complaint							
7	Atlanta	A							
8	Boston	B							
9	Atlanta	C							
10	Los Angeles	A							
11	Atlanta	C							
12	Boston	B							
13	Atlanta	B							
14	New York	C							
15	New York	A							
16	Atlanta	B							
17	New York	C							
18	Boston	C							
19	Boston	A							
20									

Cross-tab table:				
13	A	B	C	D
Atlanta	1	2	2	5
Boston	1	2	1	4
Chicago				
Los Angeles	1			1
New York	1		2	3
	4	4	5	13

(Numbers outside the inner box are totals)

Counting Incidents

This Excel worksheet combines a database and a table to cross-tabulate the values of two variables, in this case, types of complaints and field offices against which they were made. Range

A6:B19 is defined as Database, range A2:B3 as Criteria, and range D6:I12 as a cross-tab table, with row input taken from cell A3 and column input from cell B3.

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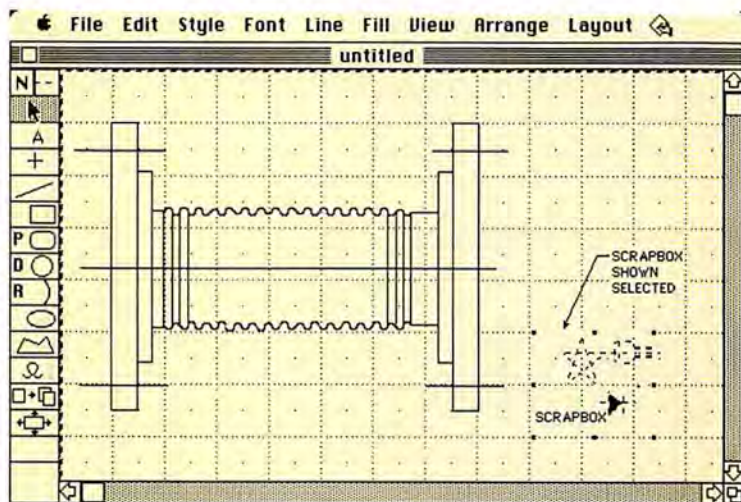
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How To/Quick Tips

Scrapbox Revealed

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specified in the criteria range. (Since the cells beneath City and Complaint are empty, all criteria pairs are specified, and therefore, counted.)

To complete the cross-tab system, create a table in an unused area of the worksheet. The leftmost column of the table should contain all possible values for the office location, plus one blank line for totals. The top row of the table should contain all possible values for the type of complaint, plus a blank column for totals. In the upper-left corner of the table (cell D6), put the formula `=IF(count=0,"",count)`; `count` refers back to the cell containing the DCOUNT function. Then highlight the entire table (D6 through I12) and select the Table command from the Data menu to define the selection as a table. In the dialog box that appears, set the Column Input Cell to the first criterion (A3, the blank cell under City) and set the Row Input Cell to the second criterion (B3, the blank cell under Complaint).

Excel calculates the formula in cell D6 (in the corner of the table) using all combinations of the two variables—office location and type of complaint—and then puts the result for each combination in the appropriate cell of the table. When the process is finished, the table contains cross-tabulations and totals of all complaints in the database.

I've successfully used this system with 500 data records and a 10-by-80-cell table. When I tried the same procedure with Lotus 1-2-3 on an IBM PC, it choked with a much smaller data set.

Barry L. Parr

San Francisco, California

Scrapbox

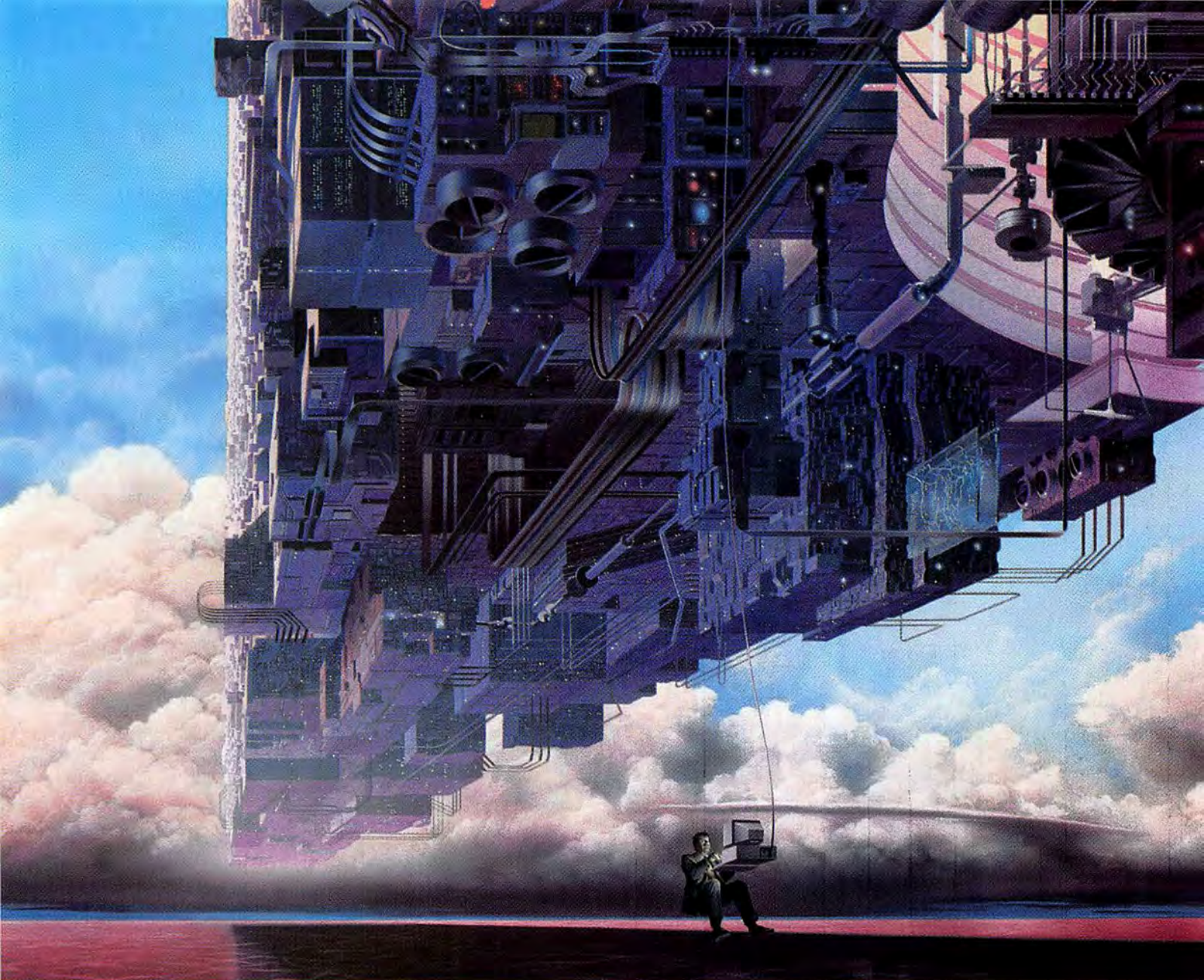
Tip: When using MacDraft, I keep a "scrapbox" of goodies (unique shapes, bolt heads, circuit components, and so on) right on my drawing (see "Scrapbox Revealed"). I drag all the objects to an unused area on the drawing and draw a white, borderless box over them. I type a name on the invisible box so that it doesn't get lost. When I need an object, I drag the white cover away, copy the object, and drag the cover back. Just before printing, I cut the typed name from the box. After printing, I paste the name back. My scrapbox saves trips to the Scrapbook. It might also work on other applications.

Jim Zimmerman

Santa Clara, California

This tip should work with any object-oriented graphics application, such as MacDraw and SuperPaint (drawing layer). It won't work with MacPaint, HyperCard, and other bit-mapped graphics applications. □

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Getting Started with Mac-VAX Connections

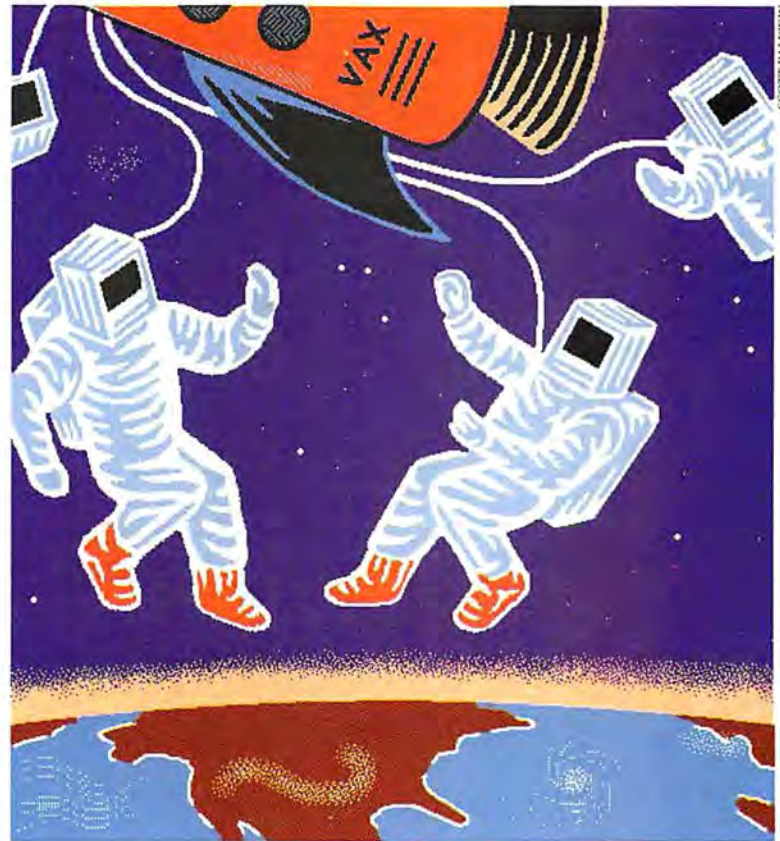
An introduction to the worlds of institutional computing and VAX minicomputers, and how the Mac fits in with both

by Jim Heid

Revolutions seldom occur all at once. They begin slowly, building momentum as they grow. Small groups join forces and gain strength until the powers they seek to change take notice.

That's certainly been the case in the world of Big Computing. Microcomputers like the Mac have had a profound impact on the way institutions—corporations, universities, government agencies—use computers. While they used to rely solely on room-size *mainframes* or refrigerator-size *minicomputers*, many of these institutions are now linking their big machines to networks of micros—whose responsiveness and portability complement the vast storage capacity and processing power of the mammoth computers.

For most microcomputer manufacturers, linking their wares to mainframes or minis usually means connecting them to large *IBM* computers. While Apple isn't ignoring that market, it's concentrating more on the VAX series of minicomputers from Digital Equipment Corporation (DEC). Why DEC? According to Joanne Correia, DEC's PC interconnect marketing manager, it's because the firms' "cultures of computing blend well." From a business perspective, that's true: both Apple and DEC, though corporate giants in their own right, are like ants nipping at IBM's heels. (And Apple doesn't really compete with DEC, whose Rainbow microcomputer never did lead to a pot of gold.) The cultural blending notion also holds true from a technical



perspective. Both firms have a hardware design philosophy involving "intelligent" microprocessor-bearing peripherals that lighten the load on the machines they serve, and both have benefited from their machines' ability to connect to each other and to other computers.

But perhaps the main reason DEC and Apple are joining forces is because both

companies want some control over a bandwagon that got started without their help. Apple CEO John Sculley has estimated that 46 percent of all VAX installations also use Macs, and most of the Mac-VAX products they use were developed not by DEC or Apple but by independent firms.

(continues)

Whatever the reason, the Mac and the VAX do pair up nicely. This month, we tour the world of Big Computing, with a special focus on how Macs and VAXs are working together. For an introduction to the terminology of the VAX world, see "VAX Words." For detailed information about specific Mac-VAX products, see "The Invisible VAX" in this issue.

Central Services

Institutional computing is a centralized affair. An organization's big computers live in the data processing department, in fluorescent-lit, climate-controlled rooms, where they are tended by data processing specialists. Users access this central "brain" through *terminals*; initially these were clattering, typewriterlike devices, which have now been replaced by video-screen-and-keyboard packages that look much like microcomputers. But terminals lack disk storage and have little memory and processing power; their primary function is to serve as windows to the central machine. By dividing its processing time among active terminals, the computer gives the illusion that each user is the only one on the system.

Collectively, the computer, the terminals, and the software they run form a *management information system*, or *MIS*. (Incidentally, MIS is not an acronym: it's *M-I-S*, not *miss*.) The system's overseer is the MIS manager, a powerful force who, by influencing the ways an institution uses its computer equipment, can have a significant impact on the organization itself.

For years, this basic scheme of terminals tied to a central computer has formed the backbone of Big Computing. It has worked, but not without drawbacks. There never seemed to be enough terminals to go around, so access to computing power was reserved for a select few, who often had to wait hours just to get online. Moreover, when many terminals were in use, the system's response time slowed as the computer struggled to serve each one, thus shattering the illusion that each user had exclusive access to the "brain."

When microcomputers permeated the workplace, they began a bittersweet relationship with MIS managers. On the bitter side, data got scattered throughout the organization on floppy and hard disks, instead of being stored in a central location. Sharing information became difficult.

Backups were rare, and security rarer still. These developments weakened the MIS department's stronghold on the organization's computing practices.

On the sweet side, MIS managers realized that microcomputers' strengths—their low cost, vast software selection, and ability to lighten the load on the central system—could make them a vital part of an organ-

ization. Designed to promote compatibility between networks, the OSI model divides a network into seven layers, each directing one part of the network's operation (see "Network Layers"). AppleTalk conforms to the OSI model but not to the protocols; many companies, including DEC, are evolving their products to conform to both the model and the protocols.

ReGIS Remote Graphics Instruction Set, a set of graphics commands that VAXs use to create images on graphics terminals.

RMS Record Management Services, the VAX file system that's the VAX equivalent to the Mac's Hierarchical File System (HFS). It provides hierarchical directories for organizing files, as well as the system routines that applications use to read and write files.

UNIX Multiuser, multitasking operating system developed by Bell Laboratories, popular in universities and research labs. DEC's version for VAXs is called *Ulrix*. See *VMS*.

VMS Virtual Memory System, the multiuser, multitasking operating system used by most corporate VAX installations. See *UNIX*.

VAX Words

Bridge Hardware-software system that unites separate networks. *Gateways* are bridges that link networks of different types, such as an AppleTalk to a DECnet, by translating one network's protocols into the other's.

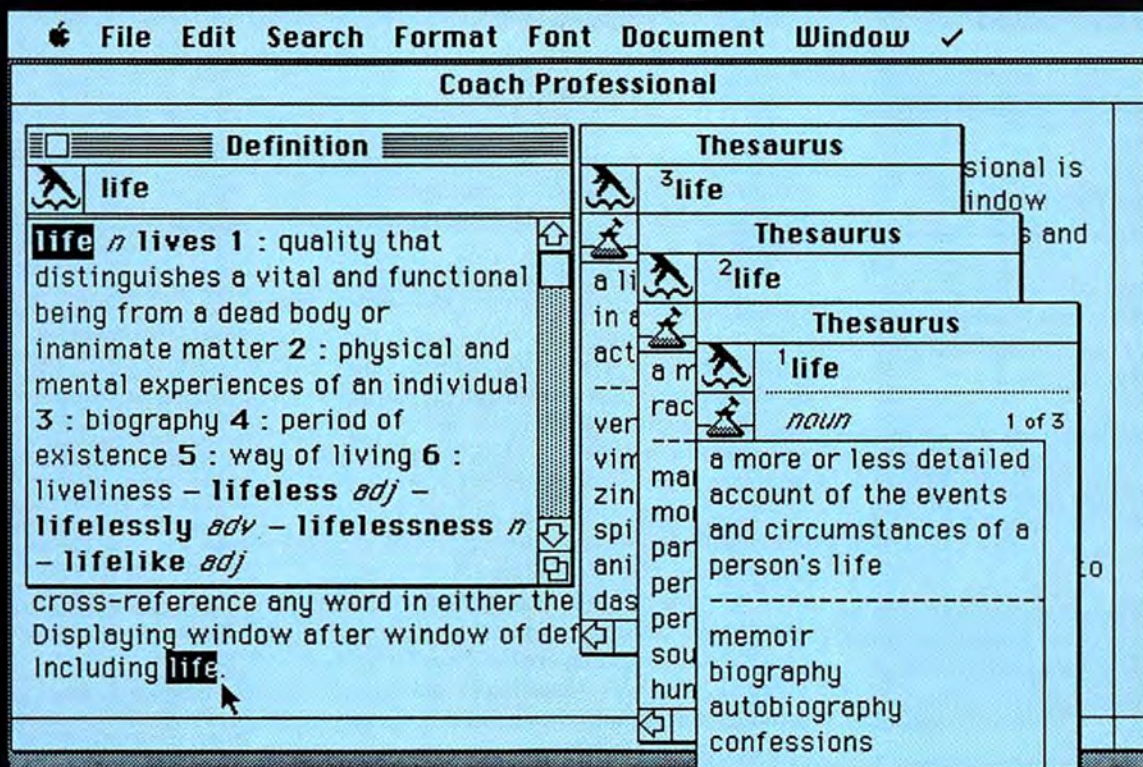
DECnet DEC's network-system equivalent to AppleTalk: the hardware and software around which VAX networks are built. Based on the OSI-like Digital Network Architecture (DNA), DECnet adds to Ethernet a set of protocols that determine how applications communicate with each other and how they access files on a VAX. See *OSI*, *Ethernet*.

Ethernet A data-link protocol—developed by Xerox, Intel, and DEC—that specifies how to encode information into chunks called *packets* and how the packets travel on the network's transmission medium. That medium can be fiber-optic cable, coaxial cable like that of a cable TV system, *twisted-pair* (telephone-like) cabling such as AppleTalk's, or even radio signals beamed between buildings or from satellites. See *DECnet*, *OSI*.

OSI Open Systems Interconnect, a structure for computer networks developed by the International Standards Organi-

zation's computing structure, especially when connected to the central system. Out of the desire to combine the ease of use and flexibility of personal computers with the power and central storage capabilities of mainframes and minis, a buzzword was born: connectivity.

(continues)



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Network Layers

Layer	Description
Application	Specifies how application programs (such as multiuser databases) access files created by other programs.
Presentation	Sets out the format in which data is sent from one device to another (a Mac printing to a LaserWriter uses AppleTalk's presentation level).
Session	States how specific devices on the network work together (such as a Mac accessing files on an AppleShare server).
Transport	Determines how a receiving device acknowledges receipt of data from a transmitting device.
Network	Specifies how devices on the network establish communications.
Data link	States how a device accesses the physical layer and encodes the network's data into packets and transmits it to its destination.
Physical	Sets out the type of interface and transmission medium used by the network (AppleTalk uses the Mac's RS-422A printer port and twisted-pair cabling).

Network Layers

The OSI model for network organization specifies seven layers, each governing a different aspect of the network's operation.

Yes, but What's a VAX?

Many of the big machines welcoming micro into their networks are members of DEC's VAX family. DEC has built its success around a family of computers that share the same operating system and the same architecture—the internal methods a computer uses to load and run programs, manage memory, serve users, and connect to other devices. The VAX family comprises over a dozen computers at prices ranging from roughly \$20,000 for a MicroVAX to over \$1 million for a cluster of VAX 8800s. The members of this family provide varying amounts of memory, processing

speed, and expandability, but because they share the VAX architecture and the same operating system, they can run the same software. That's a big plus in the minicomputer world, where application programs can cost \$10,000 or more.

All VAXs are 32-bit computers—their central processing units (CPUs) process data in 32-bit chunks. The more bits a computer can access at once, the faster it can manipulate data. (In the Macintosh family, only the Mac II is a 32-bit computer; the rest are 16-bit machines.) VAXs use a memory-management technique called *virtual memory* to swap programs and data between disk and memory, turning a disk into an extension of the computer's memory. (Most microcomputer word processors use a similar technique to enable you to create documents that are too large to fit in memory.) The VAX operating system that provides this capability is named *VMS*, for virtual memory system.

But VMS isn't the only VAX environment—many operations run under the UNIX operating system that Bell Laboratories developed in the early seventies. Corporate VAX installations usually run VMS, which can run a large library of business software including spreadsheets, database managers, and office automation packages—the minicomputer world's version of all-in-one programs like *Microsoft Works*. (Indeed, DEC's offering in this class is named *All-in-One*.)

Universities and scientific research labs generally run their VAXs under UNIX, for which a large selection of engineering and number-crunching applications is available. Although UNIX offers an extensive library of commands and is extremely powerful, its power has historically come at the price of user friendliness. Today, programs are being developed that hide UNIX's complexity under windowing facades that make it look much like the Mac (see "What's in a Window?" *Macworld*, November 1987).

Both VMS and UNIX are multiuser, multitasking operating systems. *Multiuser* means the computer can simultaneously service numerous users, each on a separate terminal. The operating system divides the computer's time between each user, like a department store clerk trying to mollify a crowd of Christmas shoppers. *Multitask-*

(continues)

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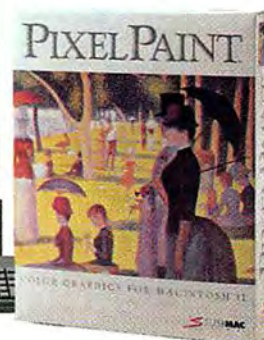
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ing, also called *multiprocessing*, means the computer can run more than one program, or perform more than one task, at a time. The operating system has the necessary smarts to keep each task separate, but it also provides for *interprocess communication*—the ability of programs to directly exchange data.

The Mac Goes Digital

After realizing how powerful a VAX is, you might think that hooking a Mac to a VAX would be like giving Pee-Wee Herman a starting spot on the Chicago Bears lineup. Not so. Microcomputers, especially graphically talented ones like the Mac, can play several positions in the world of team computing.

The simplest form of connectivity is the sincerest form of flattery: *terminal emulation*. By tapping into a VAX—through either a telephone modem or a direct cable connection—and running terminal emulation software, you can make a Mac imitate one of those terminals I mentioned earlier, allowing you to access VAX applications from a Mac. The programs are still running on the VAX; you're just using the Mac to send them commands and view their responses. Usually, you forgo the Mac's user interface and type commands as if you were using a DEC terminal. However, a clever product from Apple called *Mac-Workstation* lets developers create Macintosh front ends for VAX applications, adding pull-down menus and dialog boxes, then translating your selections into the typed responses the VAX application expects.

Because terminal emulation is a variant of telecommunications, you'll find terminal emulation features in most communications programs, including *MacTerminal*, *MicroPhone*, *inTalk*, *SmartCom II*, *VersaTerm*, and *Telescope*. But the packages' emulation talents vary. Some emulate only DEC's older VT100 series (text terminals). Other programs can emulate the newer VT200 series, including the VT240 graphics terminal, which can display graphics sent from the VAX using DEC's REGIS commands. Many terminal emulators that imitate DEC graphics terminals also mimic graphics terminals from Tektronix (see "VAX Graphics").

Using a Mac as a terminal has several advantages. Virtually all Mac terminal-emulation programs support the Clipboard, allowing you to cut or copy text and graphics from the VAX and paste them into other Mac applications. You can also paste text from the Clipboard to the VAX. Combine that with the Mac's Scrapbook, and you have an easy way to store and send VAX commands that are hard to type and harder to remember. Terminal emulators also let you squirrel away incoming data on disk, or commit it to paper. Finally, a Mac costs less than most DEC graphics terminals. And it can run *Flight Simulator* when you aren't online.

Net at Work

Terminal emulation is a good way to unite Macs and VAXs, but a more sophisticated method is to link up Macs with a VAX network. As you'll recall from last September's column, a network is an excellent way

for an office full of Macs to share expensive peripherals like hard disks. Not only does a network provide a central repository for shared documents, it also opens the door to improved coworker communication through electronic-mail packages.

These same pluses apply to Mac-and-VAX networks—in spades. A VAX makes a formidable *file server* that can house not only its own documents and applications, but those of a roomful of Macs, too. (Even one of the smallest VAXs, the \$74,800 MicroVAX 3500, provides 280 megabytes of hard disk storage.)

In fact, a major factor behind DEC's success has been its strong emphasis on networks. With over 8000 customer sites serving over one million users, DEC claims to be the world's largest network supplier. Next time you're talking VAX networks at a party, the names to drop are *Ethernet* and *DECnet*. Ethernet is the most common network system used in *local area* VAX networks—ones contained within a relatively small geographical area such as a building or a section of a building.

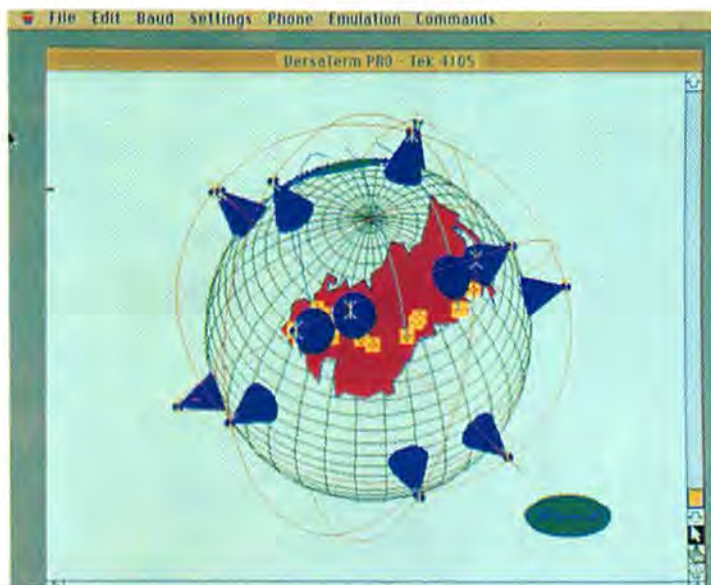
DECnet, which runs only under VMS, allows applications to communicate with each other and to access files on a VAX, and its *terminal-to-terminal* communication enables users to exchange messages. In addition, with DECnet's powerful communications capabilities, you can set up *wide area* VAX networks to span buildings, cities, or even countries (see "Power Sharing"). When communicating with remote systems in a wide area network, DECnet uses a telecommunications protocol called X.25 (pronounced *x-dot-twenty-five*.)

Understanding what Ethernet, X.25, and DECnet do might be easier if we dust off one of my favorite metaphors: the network as a roadway. The network's transmission medium compares to the blacktop: it's what the data rides on. DECnet, Ethernet, and X.25 compare to a system of traffic signs and signals: they determine the pattern of traffic flow. DECnet operates at a higher level as well; it ties all the other network components together to form a roadway system on which data can travel safely between the proper points.

Joining Club VAX

Because Macs and VAXs store their files in different formats, Mac-VAX networking products must work behind the scenes to unite the two disparate systems.

(continues)



VAX Graphics

This three-dimensional color graphic was generated on a VAX for display on a Mac II in Tektronix emulation mode. It was saved as a PICT file in VersaTerm-Pro, a terminal emulation package. Such images saved in MacPaint or PICT format can be used and modified in other Mac applications.

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Back to Basics assumes you're an expert in only one business—your own.

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Back to Basics Accounting System became a best seller priced at \$525. Now, as a result of reduced expenses, we are able to offer all three modules — General Ledger, Accounts Receivable and Accounts Payable — in a complete set for just \$199.

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Peachtree has long been the first name in accounting software and the powerful features we've included in Back to Basics prove we understand what you're looking for.

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Back to Basics was a featured accounting system in Apple's initial ads for the Macintosh and is backed by Peachtree's outstanding support, labeled by *InfoWorld* as "the finest in the industry". Support is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

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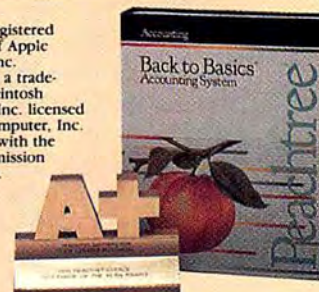
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- Calculates finance charges.

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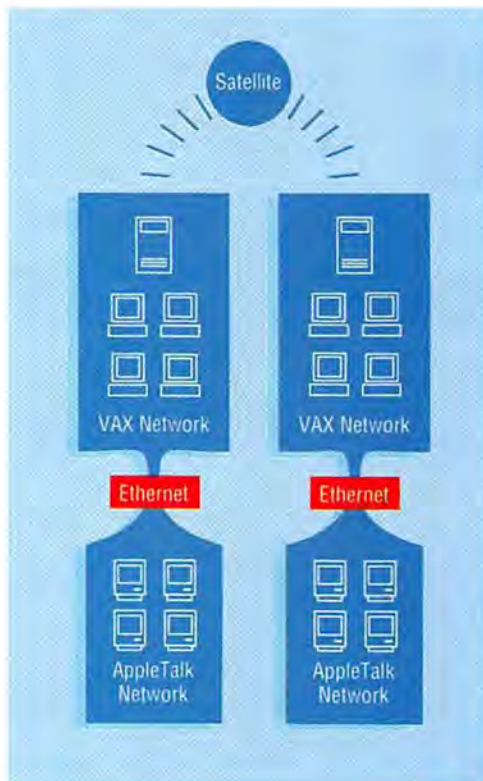


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Some products let you create *virtual disks*, which appear on the Mac's desktop like any other disk but actually reside on the VAX disk as VAX files. A virtual disk can hold Mac documents and even applications, although Networking Rule One still applies: Running applications from a server over a network will almost always be slower than running them from a local hard disk (one attached directly to a Mac).



Power Sharing

Through a series of network connections, even remote Macs and VAXs can easily communicate with one another. Here an AppleTalk network is bridged via an Ethernet gateway to a VAX network, which is then linked by satellite to a remote VAX network. The second VAX is also connected through Ethernet to an AppleTalk network.

Coercing a VAX into storing Mac files is one thing; allowing VAX applications to access them is another. Many products bridge the gap between the two machines' operating systems by providing *file trans-*

lation features that allow Mac users to work with files created by VAX applications, and vice versa.

Another classic strength of a network—the ability to share and administer access to a printer—also applies to the Mac-VAX connection. Many of the same firms that make Mac-VAX disk-sharing products also offer software that allows Mac users to access printers on the VAX and VAX users to access PostScript printers attached to Macs. Some products also turn the VAX into a *print spooler* that intercepts Mac documents en route to the printer, stores them on the VAX disk, then sends them to the printer. (For details on Mac print spooling, see "Getting Started with Spooling," *Macworld*, March 1987.)

You Say 10011, I Say 11100

All this happy sharing doesn't come without complications. The Mac and the VAX use different network *protocols*—those rules of the road that determine how chunks of data called *packets* travel on the network's wires. Macs use the AppleTalk protocols developed by Apple, while VAXs use the Ethernet and X.25 protocols to determine how to encode and transmit packets, and DECnet protocols to determine how applications use those packets. The technicalities behind each protocol are complex enough to bring on migraines, but the bottom line is easy to grasp: the systems speak different languages.

The solution? Teach one system to speak the other's language. Several products exist that teach DECnet protocols to the Mac, allowing Macs to join a VAX network (in network parlance, to become a *node*). Macs that belong to a VAX network can run VAX applications and access the VAX's disk storage, printer, and electronic-mail system.

Another approach is to add AppleTalk protocols to a VAX. A VAX that speaks AppleTalk appears in the Chooser desk accessory as though it were a LaserWriter or an *AppleShare* server. Products that let you create virtual disks on a VAX generally use this second approach. Two examples are Pacer Software's *PacerShare* and Alisa Systems' *AlisaShare*. Both add the Apple Filing Protocol to a VAX, allowing it to be used as an *AppleShare* file server.

The most ambitious way to join Macs and VAXs is to link an AppleTalk network to a DECnet network using a hardware device called a *gateway*. On the Mac end, the gateway plugs into an AppleTalk connector, a SCSI connector, or—if it's a Mac II expansion board—into a NuBus slot. On the VAX end, the gateway plugs into an Ethernet connector. The gateway translates the protocols of one network into those of the other.

The Best of Both Worlds

The most promising dividend of a Mac-VAX merger is *distributed processing*, which combines each system's strengths to create powerful applications that neither system could handle by itself. Odesta's *Helix/VMX* is currently the only example of Mac-VAX distributed processing. It combines the what-you-see-is-what-you-get approach of the *Helix* database manager with the file-serving prowess of a VAX. You design and access the database on the Mac using *Helix*'s icons, tiles, and form-design features. The VAX handles the data-management dirty work—storing records and administering database access to numerous Mac users.

It's long been rumored that Apple and DEC will announce a "strategic alliance," a kind of digital *détente* wherein companies exchange information and work together to produce complementary products. If that happens, the Mac-VAX link could give those nipping ants enough strength to make IBM's heels ache.

So Apple finds that its key to Big Computing is engraved with three letters, but not the three letters you'd expect. And DEC, the world's second-largest computer company, may enter into a strategic alliance with a company whose machines smile when you turn them on.

It just goes to show what a little revolution can do. □

See *Where to Buy* for product details.

Thanks to David R. Kosiur, publisher of the Macintosh networking newsletter Connections, for his technical assistance.

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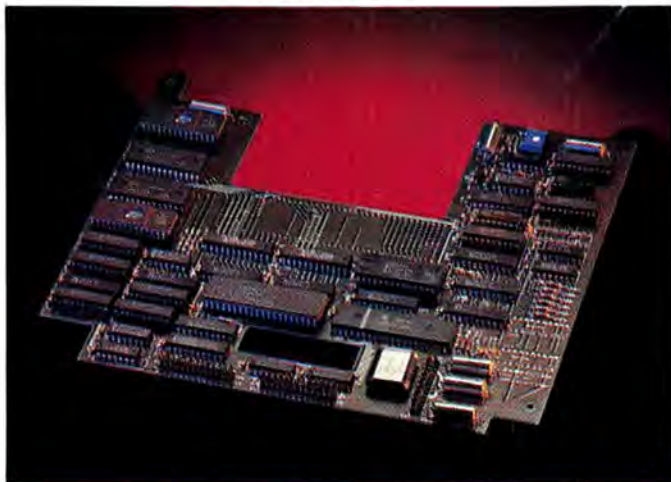
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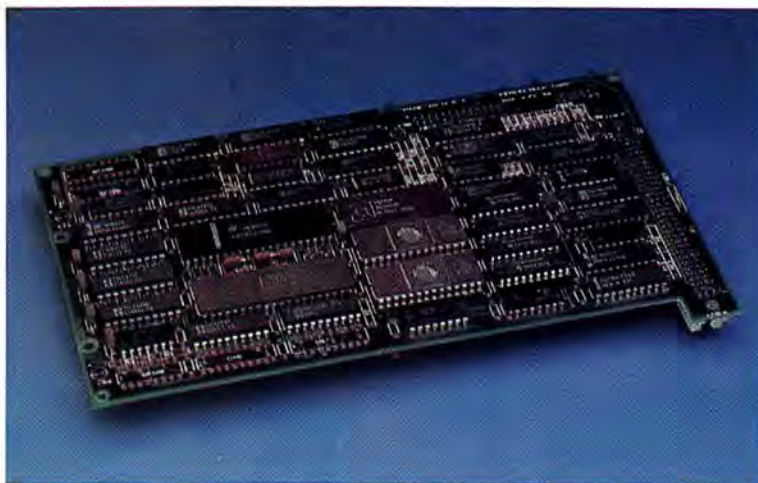
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Insights on TOPS

Tips for trouble-free operation of a TOPS network

by Joel McNamara

A local area network, or LAN, is a system that links two or more computers together so that users can share data and/or devices such as printers and hard disks. One way to set up a LAN for the Mac is to install *TOPS* software, short for Transcendental Operating System, from TOPS (formerly Centram). *TOPS* is a desk accessory that uses AppleTalk to communicate with other computers in a network. These can be Macs, IBM PCs or compatibles, or Sun workstations, in just about any combination. Included with *TOPS* for the Macintosh is TOPS Spool, a print-spooling desk accessory; and TOPS Translators, a conversion program that translates many popular Mac and PC spreadsheet, word processing, and database files.

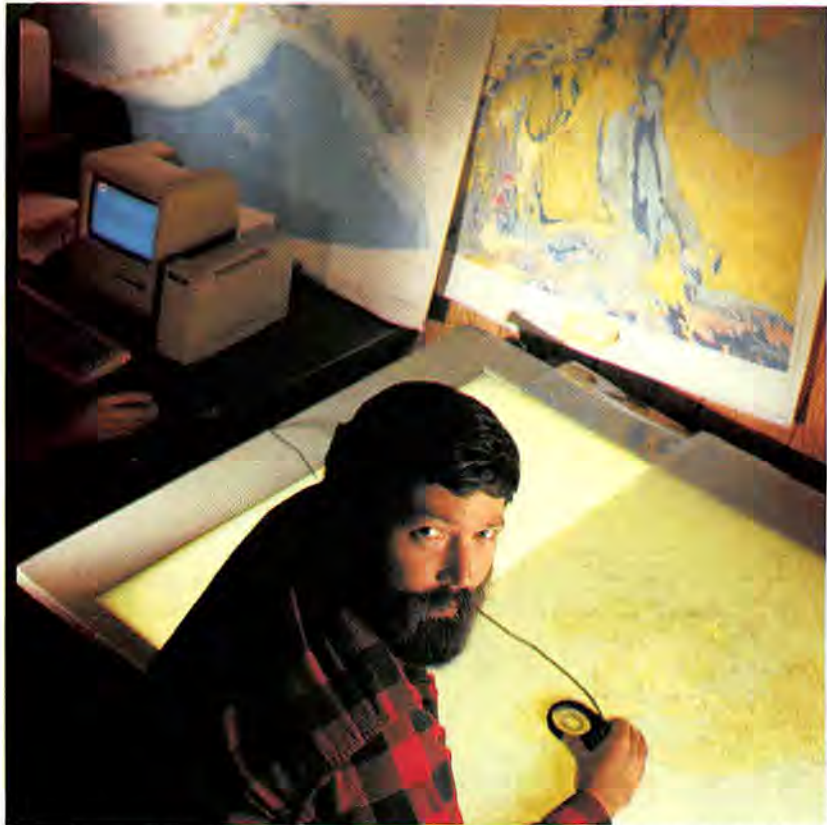
Unlike other networking systems such as *AppleShare*, *TOPS* doesn't need a Macintosh dedicated as a server to run the network. Instead of a single hard disk with a server acting as the network traffic cop, *TOPS* is *distributed*. This means that any computer in the network can act either as a server, to distribute information, or as a station, to receive information. The versatility that results increases the speed and efficiency of the network and saves the expense of a dedicated server and hard disk.

TOPS has enjoyed great popularity in the Mac community, with over 80,000 copies shipped, according to the publisher. This month's "Insights" delves into how the software operates and how users can put it to work efficiently and effectively.

I'd like to thank Sue Fenstermaker and Mike Rogers at TOPS and the following users for their valuable suggestions: Dave Bloom, Kristi Branch, Carl Carlson, Don Clifton, Reese T. Jones, and Doug Wieringa.

What TOPS Is

Although *TOPS* supports up to 32 stations in a single network, it is best suited to groups of 15 or fewer. Larger networks can



At the U.S. Geological Survey office in Menlo Park, California, geologist Michael L. Zientek digitizes a map into the Mac. His office runs a TOPS network that lets multiple authors prepare documents jointly.

be set up using hardware devices called *bridges*, which link smaller parts of the network, called *zones*, into the larger main network.

A *TOPS* network can incorporate PCs fitted with an AppleTalk card and memory-resident software. As bizarre as it seems, you could double-click a copy of *MacPaint* stored on a PC's hard disk, and it would run on your networked Mac. File copying and

access are accomplished simply by dragging and clicking on the Mac or by issuing standard MS-DOS commands on the PC.

The TOPS Translators utility converts many popular word processing, spreadsheet, and database files into a format that can be read by a similar program on another computer. For example, Translators could change a *WordStar* file into a *MacWrite* file with all formatting information intact. The advent of Mac and PC versions

(continues)

Effortless Sharing

"Smart" programs that come in both PC and Mac versions and that can share information directly, via *TOPS*, include *PageMaker*, *Microplanner*, *Microsoft Word*, *Microsoft Excel*, *WordPerfect*, *dBase III/dBase Mac*, *Omnis Quartz/Omnis 3*, and *Ready/More*. In addition, Lotus 1-2-3 and *Excel* can eas-

ily share files over *TOPS*.

Because parallel versions give developers more mileage for effort expended in designing an application, we can expect to see more programs that work on PCs and Macs and exchange files without the aid of additional translation software.

of the same program has led to "smart" applications that can read a file regardless of which computer produced it (see "Effortless Sharing").

How about what *TOPS* isn't? It isn't an electronic mail (E-mail) service. You can't send messages to other users on the network with it. *TOPS* isn't an emulator. You can't run PC programs on a Mac, or Mac

programs on a PC, with it. And although *TOPS* lets PCs communicate with Macs, it doesn't support PC use of the LaserWriter or other networked printers. To get these capabilities, you need other hardware or software packages.

The Current Version

TOPS 2.0, the latest version, contains some significant enhancements to previous versions. *TOPS* now includes automatic

publishing and mounting features; compatibility with AppleTalk zones; improved password protection; and full compatibility with multiuser applications such as *4th Dimension*, *Omnis 3*, *Helix*, or any other product that makes use of the Apple File Protocol standard. The updated software works almost exactly like older versions, according to *TOPS*. The only exception is a new Remember option: when Remember is selected, the Mac repeats a saved publish or mount instruction each time the computer is started up.

When a new *TOPS* version comes out, don't just upgrade one or two of the stations in your network. Problems can arise if some computers on the network, whether Macs or PCs, run different versions of the software simultaneously. For upgrade information, call *TOPS* at 415/549-5995.

Installing TOPS

TOPS is a snap to install on the Mac, but there are a few points to remember. Each *TOPS* disk has a serial number that allows only one station at a time to use it.

(continues)

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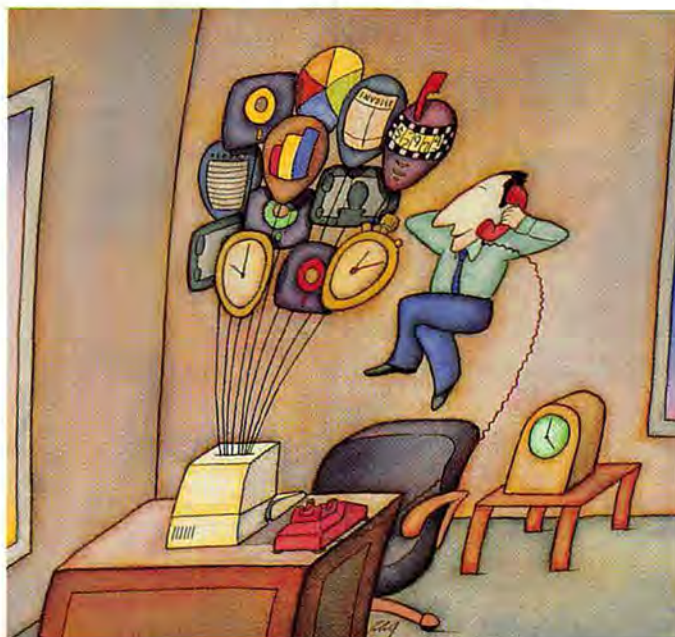
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When you sign on, *TOPS* verifies that no other station on the network has the same number. If one does, you'll be denied network access until you supply a uniquely numbered disk. If you have several Macs in your network without hard disks, consider writing the serial number or the user's name on each startup disk to avoid confusion.

One common installation problem lies with the hardware portion of a network. If the network doesn't operate smoothly, make sure all AppleTalk cables are connected securely and the right number of terminators are in place. If you're using PhoneNet, from Farallon Computing, and you experience problems, be sure you have the right number of resistors. (Installing *TOPS* on the PC is just as simple as on the Mac, but it takes a bit more time to install the AppleTalk card on the PC.)

Memory and Disk Space

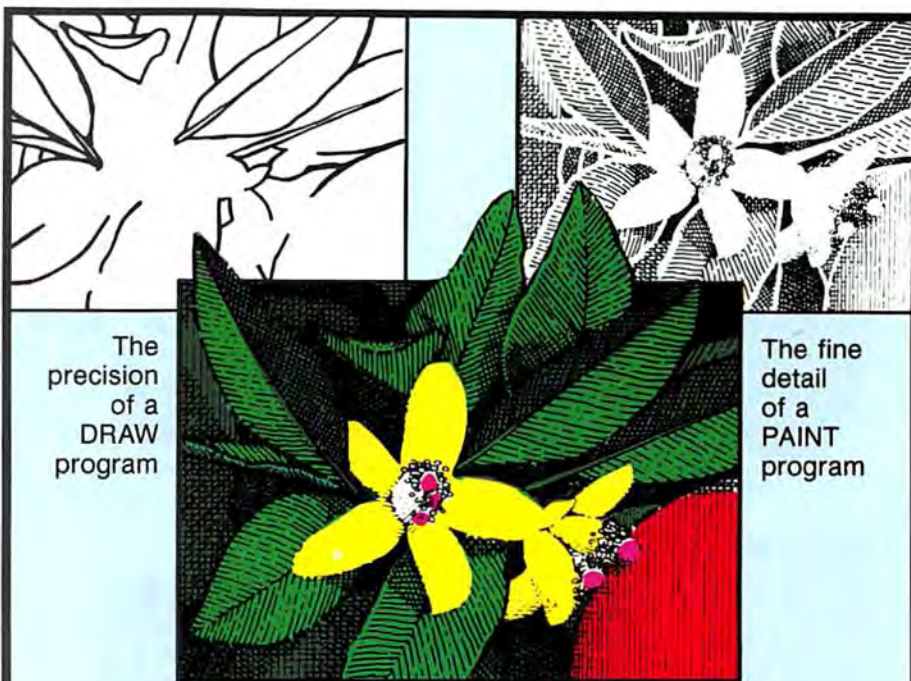
The minimum memory configuration for *TOPS* on both PCs and Macs is 512K, but *TOPS* recommends 640K for the PC. The *TOPS* desk accessory for the Mac uses between 76K and 98K of RAM; the PC version uses 180K to 220K. The *TOPS* Spool desk accessory requires 32K of memory on a 512K, and 64K on a 1MB or larger Mac. Needless to say, the more memory you have, the better off you'll be. If out-of-memory messages keep popping up, try closing files or desk accessories, or unmounting volumes; if you're on an all-Mac network, try removing the InterBase file from the System Folder and restarting. If you're running off a floppy-disk-based system, you can also remove the *TOPS* Help file to free up disk space.

Who Am I?

When you initially sign on to *TOPS*, the desk accessory prompts you to enter a user name for your station. You may enter up to 31 characters. Choose a name that readily identifies your computer to others on the network. "Les's Mac" or "Personnel 1" is much clearer than "My Mac" or "Captain Midnight."

Your Options Are...

TOPS has several extended commands that rely on the Option key. Holding down Option while clicking Publish gives the volume a password or restricts access. Similarly, Option Mount sets access for the mounted volume. Option Copy copies only



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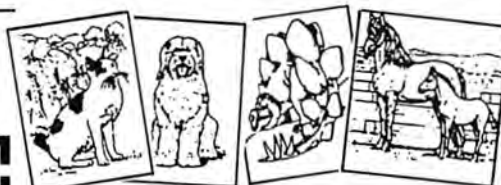
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the ASCII text of a file. Holding down Option while the Mac boots brings up a dialog box that asks if you want to install TOPS and InterBase. And holding the key down while opening a volume displays all files, including invisible files.

Sharing Applications

Although TOPS allows file sharing, at this point most Mac software doesn't support simultaneous multiuser file operations. The default for published volumes is One Writer Only. This option queues up users so that the first to access the volume may write to it, while others may only read it. A padlock icon in the upper-left corner of the Finder desktop window indicates that a volume is "occupied." Once the user logs off the volume, the padlock disappears, and that volume becomes available to the next person in the queue.

If you have newer software that supports multiuser access, you can select the Many Writers mode, which places no restrictions on the number of people who can read or write to a volume (see "One Writer by Default").

The Name Game

In any network, keep file names simple and understandable. Shared files shouldn't have strange, cryptic names meaningful only to you. Make sure, too, that the file name explains itself in 14 characters or fewer; when the TOPS desk accessory displays a file, directory, or volume, only the first 14 characters of the name appear.

(continues)

windowmaker

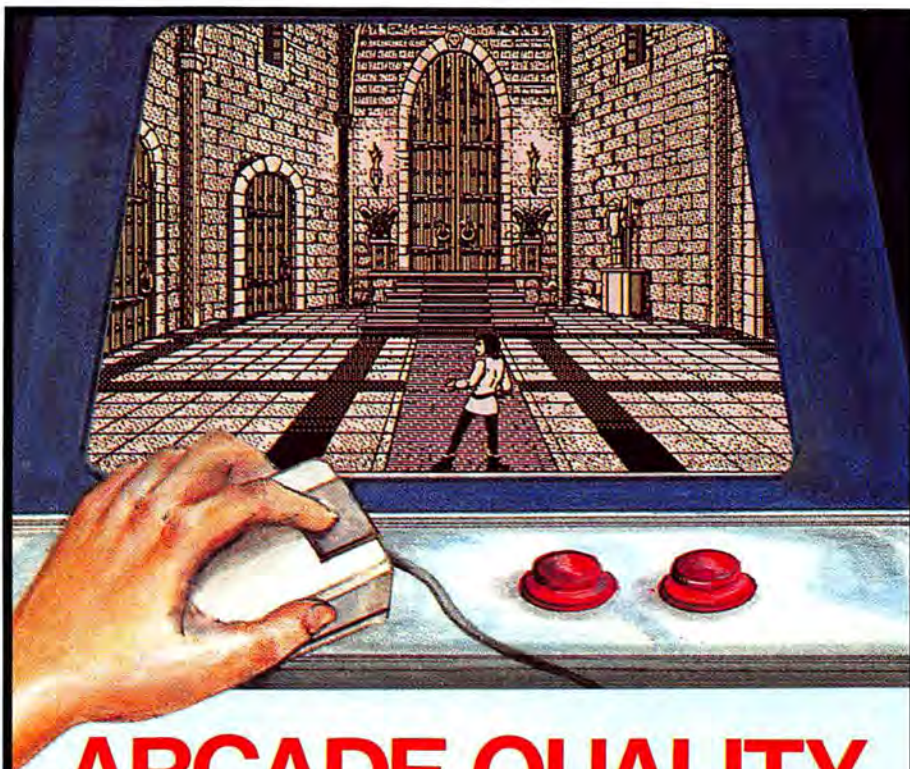
Password

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☒ One writer only
☐ Many writers

☐ Remember

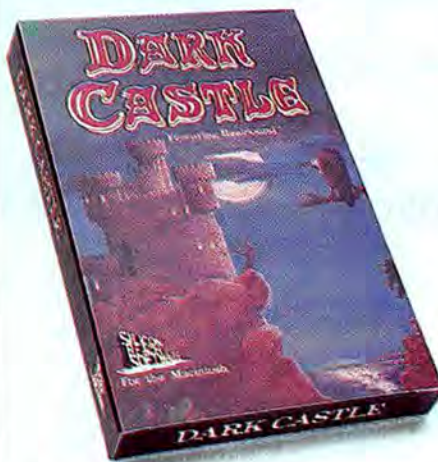
One Writer by Default

Since most Mac programs today have not been designed as multiuser applications, TOPS makes One Writer Only the default for any program you publish on the network. If you are adding a multiuser application such as 4th Dimension, hold down the Option key when you select the Publish command to reach the dialog box where you can choose Many Writers.



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File Name Conventions

PC Names (displayed as uppercase)

File/Directory	Application	Volume
up to 8 characters	up to 8 characters	up to 11 characters
optional 3-character extension	.COM or .EXE extension	no extension
no blank spaces	no blank spaces	blank spaces OK

Mac Names (displayed as upper- and lowercase)

File/Folder	Application	Volume
up to 31 characters	up to 31 characters	up to 27 characters
blank spaces OK	blank spaces OK	blank spaces OK
no colons	no colons	no colons

Naming conventions for MS-DOS and Macintosh computers differ. This table compares the two naming systems.

If there are PCs on the network, you need to be aware of different operating systems' conventions for naming files, directories, and volumes. Unlike the Mac's operating system, which has few rules for names, the PC environment is quite strict. Its rules have a direct impact on how you can display and access files (see "File Name Conventions" and "Display Variations"). For example, since the PC shortens names to eight characters, if you name several Mac files "Sales Reports:" followed by the appropriate month, you'll have great difficulty in locating the correct file on the PC. They'll all appear as SALESREP.

Life in the Fast Lane

Although you can directly access a file or run a program from a mounted volume,

it's quite a bit faster to copy the file or application over to your own computer. When you're continually accessing a file through the network, the communications traffic slows down the entire *TOPS* system. Instead, copy the file onto your disk; while at the Finder level, just drag a file's icon to copy it. Remember to return a copied and changed file to its originating server, and make some reference to the fact that it has been altered.

System Compatibility

According to the developer, version 2.0 of *TOPS* works with Finder 6.0, System 4.2, and MultiFinder. *TOPS* has also tested the software successfully with *DiskTop*, *Suitcase*, and *PowerStation*. *TOPS* suggests that when using MultiFinder, you run

TOPS as an application instead of a desk accessory. The PC version of *TOPS* works with version 2.1 or higher of DOS, with the 3.1 version recommended.

Resource Warning

TOPS works with just about any Mac software. The exceptions are programs that modify resources (Font/DA Mover, *ResEdit*, and so on). Such applications may have unpredictable and sometimes disastrous effects on your network. If you need to run a resource-modifying program, be sure to do it after signing off the *TOPS* network.

Disconnecting

Once *TOPS* is running, you may notice a tiny, 1-pixel light flashing on and off in the upper-right corner of the Mac screen. This light indicates that *TOPS* is engaged in network activity. If your Mac seems hung up and doesn't respond while this light is flashing, you're probably connected to a server that can't communicate. When a server has crashed or been turned off, your Mac will try for about 30 seconds to communicate before giving up. If there is some other problem, your Mac may stubbornly keep trying. In such cases, you can break communication with a server by pressing the ⌘ and period (.) keys. Answer yes when you're asked if you want to disconnect from the server to bring the Mac back to normal. But try not to break communications with a server during a file save or application launch; your System may crash or you may lose data at those times.

Where Is Everyone?

If certain parts of your network seem inaccessible, try double-clicking on File Servers in the *TOPS* window. This forces the server to display all other servers currently on the network. If some servers still don't appear, a likely culprit is a dislodged AppleTalk cable. It's fairly common for users to accidentally kick cables under their desk, breaking off AppleTalk communications from that station on. Trace through your cabling to make sure all connectors are in place. Kensington Micro-ware's AppleTalk connector clips inex-

(continues)

Display Variations

Originating on the PC:	PC Display	TOPS Display	Mac Display
File/Directory	INCOME.TXT	INCOME.TXT	INCOME.TXT
Applications	WORD.COM	WORD.COM	WORD.COM
Volume	MY DISK	MY DISK	MY DISK
Originating on the Mac:	Mac Display	TOPS Display	PC Display
File/Folder	Profits for '87	Profits for '8	PROFITS
Applications	Microsoft Word	Microsoft Word	MICROSOFT
Volume	Runtime Projects	Runtime Projec	RUNTIMEP

Taking the naming rules into consideration, here's what you can expect to see in the various environments.

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Palantir Software Intalk	105
Hayes Smartcom II	88

Database

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Borland Reflex Plus	159
Forethought Filemaker Plus	159
Microsoft File	Call
Nantucket McMax	169
Odesta Double Helix	275
Double Helix II	340
Multi User Helix	425
Provue Overvue 2.1	149

Desktop Publisher

Aldus Pagemaker	399
Letraset Ready Set Go 3	289
Microsoft Power Point	Call
Orange Micro Ragtime	216

Educational

Davidson Math Blaster	28
First Byte First Letters & Words	32
First Shapes	32
Kid Talk	32
Math Talk	32
Speller Bee	32
Mindscape	
New Improved Mastertype	32
Perfect Score SAT	49
Simon & Schuster	
Typing Tutor IV	39
Springboard	
Early Games	30
Easy As ABC	30

Entertainment

Avalon Hill MacPro Football	31
Electronic Arts	
Chessmaster 2000	31
Deluxe Music Cont	63
One On One	16
Patton vs. Rommel	28
Scrabble	39
Seven Cities of Gold	16
Holobyte Falcon	32
Infocom Beyond Zork	32
Lurking Horror	28
Mindscape Balance of Power	32
Deja Vu	32
King of Chicago	32
Sierra On Line	
Championship Boxing	28
Silicon Beach	
Beyond Dark Castle	28
Dark Castle	28
Enchanted Scepters	22

Graphics

Ann Arbor Full Paint	55
Borderbund Printshop	35
Videoworks 2	115
Cricket-Cricket Draw	168
Cricket Graph	112
Microsoft Chart	Call
Mindscape Graphic Works 1.1	59
Silicon Beach Super Paint	78
Soft Style Bluestart	29
Colormate 2.1	49
Epstart	29
Jetstart	29
Springboard Certificate Maker	25
Super Mac Pixel Paint	252
T-Maker	
Click Art Business Image	29
Click Art Effects	29
Click Art Personal Graphics	29
Click Art Publications	29

Integrated

Microsoft Excel 1.04	Call
Works 1.0	Call

Languages

Borland Turbo Pascal	59
Microsoft Basic Compiler 1.0	Call
Basic Interpreter 3.0	Call
Fortran Compiler 2.2	Call
Think Technologies	
Lightspeed C	90
Lightspeed Pascal	65

Statistical Analysis

Borland Eureka	119
Brainpower Statview 512+	179
Cricket Statworks	77

Utilities

Central Point Copy II Mac	21
FGS Fastback	55
Silicon Beach Silicon Press	45
Word Builder	45
Supermac Diskfit	49
Superspool	49
Superspool Laser	85
Superspool Multiuser	210

Word Processors/Spellers

Aegis Development	
Doug Clapps Word Tools	49
Ann Arbor Fullwrite	154
Batteries Included	
Thunder	32
Living Videotext More 1.1C	179
Microsoft Word 3.01	Call
T-Maker Writenow	100
Working Software	
Spellswell	42

Worksheets

Batteries Included	
Timelink	42
Microsoft Chart 1.0	Call
Multiplan 1.11	Call
Softview Mac In Use	35

Accessories

Curtis Ruby SPF-2	59
Kensington A-B Box	65
Appletalk Clips	10
Appletalk Clip Cables	18
Appletalk Connectors	18
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Polarizing Filters	35
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Softstyle Mac Enhancer	169

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HyperDrive F1/40	909
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40MB SCSI tape drive	

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LaserView 19"	1715
for the MAC SE	
LaserView 15"	1419
for the MAC II	
LaserView 19"	1780
for the MAC II	
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Migent Migent MAC Modem	165

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MAC286 MS DOS	
co-processor for MAC II	1079
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Dove MacSnap 548	425
MacSnap 548S	475
MacSnap Plus 2	305
MacSnap Toolkit	16
MacSnap 2S	507
MacSnap 4S	1009
MacSnap 524	182
MacSnap 524E	162
MacSnap 524S	229
General Computer Corp.	
Hypercharger 020	719
no ram or 68881	
Hypercharger 020 no 68881	929
Hypercharger 020 w/68881	1219

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pensively solve this problem by securely attaching the cables.

The maximum length of a network using AppleTalk cabling is 1000 feet. If your network needs to be longer than 1000 feet, increase its range with signal boosters or alternate cabling systems such as PhoneNet.

Keeping Order

When people in a work group start sharing information, things can become a bit disorganized. Some files seem to mysteriously disappear and then reappear elsewhere, while others just vanish altogether. Don't blame the network. With all of the document shuffling by users, chaos may sometimes prevail. To avoid this situation on your network, establish file-management and housekeeping procedures. File-checkout logs, central volumes for certain types of files, and regular backups can make the network run more smoothly. For example, the problem of misplaced documents could be easily solved by placing a log file (in any word processor) in a designated folder. Each time users alter or move

a common file, they record in the log the name of the document, who made what changes, when they were made, and where the document is currently located.

Spooling Around

The TOPS Spool desk accessory shipped with TOPS version 2.0 and earlier is not compatible with the LaserWriter driver version 5.0 in the latest System software release. TOPS is aware of the problem and is working on an updated version of the spooler. For reliable network spooling, use the previous LaserWriter driver, version 4.0, in conjunction with the new System and Finder. According to TOPS, that solution should not pose any other problems as a side effect.

Help

If the online help doesn't help and re-reading the documentation still doesn't answer your question, don't despair. Answers are as near as the phone or your modem. The list here suggests a few places to turn for aid in troubleshooting an unusual problem. When you call or log on to discuss your problem, be sure to have handy some details about your TOPS installation: which

version is installed; what types of computers, how many of each there are, and how they are laid out in the network; which versions of System and Finder (or DOS) are being run; and what network connectors are being used.

• TOPS Technical Support Hotline 415/549-8737. This free service for registered users operates from 8 a.m. to 5 p.m. Pacific Time. Voice messages are taken after hours.

• TOPS Talk 415/549-5955. TOPS supports its own bulletin board system. Parameters are 300/1200/2400 baud, 8 data bits, 1 stop bit, no parity.

• AppleLink. The technical support team can be reached via AppleLink at D0098.

• TOPS BBS, Sweden, 46-830-8356. For European users who don't relish transatlantic phone calls, a bulletin board has been set up in Sweden. The contact is Peter Freund from Software Plus. □

See *Where to Buy* for product details.

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Mac Communications Tools

Navigating CompuServe for public exchange software by wire

by Lon Poole

You turn on your Mac, hearing the ping of its start-up tone. It's a familiar sound—comforting even—but it doesn't begin your work session with style the way a few notes of the "Twilight Zone" theme would. A friend says you just need to hook up to an online service and download Fractal Software's public domain utility *Sound Init* and the start-up sounds of your choice, but how to begin? You've avoided going online in search of shareware because it seems like a job for a cryptologist.

Read on to learn how you can legally copy public exchange software over the phone lines and try it out on your Macintosh. (Even if you're a seasoned denizen of online services, take a look at the *MicroPhone* scripts in "Eight Scripts" for some shortcuts.) Much of the software is free—all you pay is the cost of acquiring it. Some authors ask you to pay a small fee, usually \$5 to \$20, if you decide to use their software. Try out the software at your convenience. If you like it, pay the person who created it the modest fee he or she requests. If you don't use it, pay nothing.

All the major commercial information services have software libraries, including The Source, GENie, Delphi, and CompuServe. The MAUG (Micronetworked Apple Users Group) on CompuServe is generally acknowledged to have the largest collection of Macintosh software.

Commercial information services keep their software libraries on large, centrally located computer systems. To access one of these software libraries, your Macintosh must be equipped for telecommunications with a remote computer. For that, you need a telephone line, a modem, and a communications program (see "Getting Started with Communications Gear," *Mac-*



world, May 1987). You also need a subscription to the information service you want to use (see *Where to Buy* in this issue). If you'd like a travel guide to public exchange software, get a copy of *Free (and Almost Free) Software for the Macintosh* by Robert C. Eckhardt (Crown Publishers, 1987).

This article describes how to use Software Ventures' *MicroPhone* communications program to get software from the MAUG libraries on CompuServe. The process is similar for other communications programs and other commercial information services.

Navigating

CompuServe has two methods of navigating among its many services. The primary method is a hierarchical system of menus; you move from one menu to the next by typing a number or word. The other navigation method uses direct commands. Because the menu system is less efficient than the direct commands, many users eventually turn off the menus.

Whether you use menus or not, you can use the GO command to go directly to

one of the MAUG forums, where the Macintosh software libraries are located. The forums, also called special interest groups (SIGs), are electronic clubs where people with common interests get together to exchange information. MAUG has three Macintosh forums: the Macintosh Arts and Entertainment forum (abbreviated as MACFUN), the Macintosh Business forum (MACBIZ), and the Macintosh Personal Productivity forum (MACPRO).

To go to one of the Macintosh forums, type the command **GO**, a blank space, the forum's abbreviation, and press the Return key. You can use the GO command any time CompuServe ends a prompt message with an exclamation point. For example, whenever CompuServe prompts "Enter Choice !," you can go to the Macintosh Users forum by typing GO MACUS. You may type this and any other CompuServe command in uppercase or lowercase letters.

(continues)

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MacScheme version 1.5 contains the native code compiler (distributed with *MacScheme+Toolsmith*) and faster I/O. Semantic Microsystems, Inc., 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539. \$35; \$15 for complete manual; \$125 new.

MegaScreen version 2.0 software allows simultaneous use of the MegaScreen and the Mac screen and fixes third-party software incompatibilities. MegaGraphics, Inc., 20954 Osborne St., Canoga Park, CA 91304, 818/407-0571. Free from MegaScreen dealers with letter from MegaGraphics and original disk, or return letter plus \$20.

MiniCad version 3.15 lets you cancel redraws with ⌘-period. It fixes some bugs in rotated text and works with *MacPlot* 3.0 in non-72-dpi mode. Users may adjust current dimensions in the interactive drawing mode by typing in coordinates. Diehl Graphsoft, Inc., 8370 Court Ave. #202, Ellicott City, MD 21043, 301/461-9488. \$10 with SASE and blank disk; \$495 new.

Quark XPress version 1.1 supports TIFF and displays in continuous tone. Prints negative, high-contrast, or posterized images. Includes special effects. Menu additions include Find/Change to the Edit menu, Font Usage and Edit Auxiliary to the Utilities menu, and Lock/Unlock to the Item menu. Quark, Inc., 300 S. Jackson St. #100, Denver, CO 80209, 303/934-2211. Free; \$695 new.

Sonar version 4.5 supports *Trapeze*. Automatically creates indexes, which may be printed or saved, of all documents and page numbers where any of the search phrases were found. Gives the option of

saving or printing paragraphs containing key phrases. Alphabetically sorted indexes may be created by word-selection criteria or by word frequency. Includes a notes-analysis subsystem. Virginia Systems Software Services, Inc., 5509 W. Bay Ct., Midlothian, VA 23113, 804/739-3200. \$30; \$195 new.

TOPS/Macintosh version 2.0 introduces a Remember function that allows users to make files available to the network automatically and to access remote files. It is fully compatible with all AFP applications, supports AppleTalk zones, and offers improved password protection. \$29 per node; \$189 per node new. *TOPS Net-Print* version 2.0 includes a dynamic menu listing that enables users to choose from available networked printers, and a new PostScript translator that supports all LaserWriter Plus fonts. Also includes a downloadable, IBM-style character set that includes block graphics and shorthand configuration commands. TOPS, 2560 Ninth St. #220, Berkeley, CA 94710, 415/549-5995. Free; \$189 new.

Turbo Pascal version 1.1 supports Mac II and includes libraries needed to call the Mac II ROM Toolbox and new System facilities. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400. Free; \$99.95 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

Then make sure you are in the right data library. Use the DL command from CompuServe's Functions menu or another data library menu to choose a library.

You can download a file by finding it with the **BRO** command and typing **DOW** when CompuServe pauses after displaying the file's description. You can also download a file by typing **DOW** when a data library menu is displayed. CompuServe then asks for the name of the file you want. As a shortcut, you can type the file name on the same line as the DOW command, leaving a blank space between them. At the From Apple data library (DL8) menu of the Macintosh Developers forum, for example, typing **DOW FINDER.FND** gets you the Finder (which, incidentally, takes about a half hour to download).

After you specify the file name, CompuServe displays a short menu that lists downloading methods, or *protocols*. The XMODEM protocol, choice number 1, works for all files in the data libraries of the Macintosh forums. You only have to specify the protocol for the first file you download during a session in a particular forum. If you download additional files, CompuServe uses the protocol you chose for the first file. You can bypass the protocol menu by adding the suffix **/PROTO:XMODEM** to the **DOW** command, as in this example: **DOW PIANO.PIT /PROTO:XMODEM**.

If CompuServe finds the file you want, it asks you to initiate Xmodem transfer and to press <CR> when the transfer is complete. You initiate transfer in *MicroPhone* by selecting the Receive MacBinary Xmodem command from the File Transfer menu.

File-transfer time depends on the size of the file you download. Short files take a minute or so, average-size files take 10 minutes, and very large files may take 45 minutes. During the file transfer, *MicroPhone* displays status information in a dialog box. For most files, this includes the file size, the amount transferred so far, and the estimated time remaining.

When the transfer is complete, *MicroPhone*'s status box goes away. Press the Return key to inform CompuServe that the transfer has been completed.

Decoding and Unpacking

Files that contain formatted text, graphics, applications, and other nontext files are encoded in plain text; plain-text files are kept in CompuServe data libraries.

(continues)

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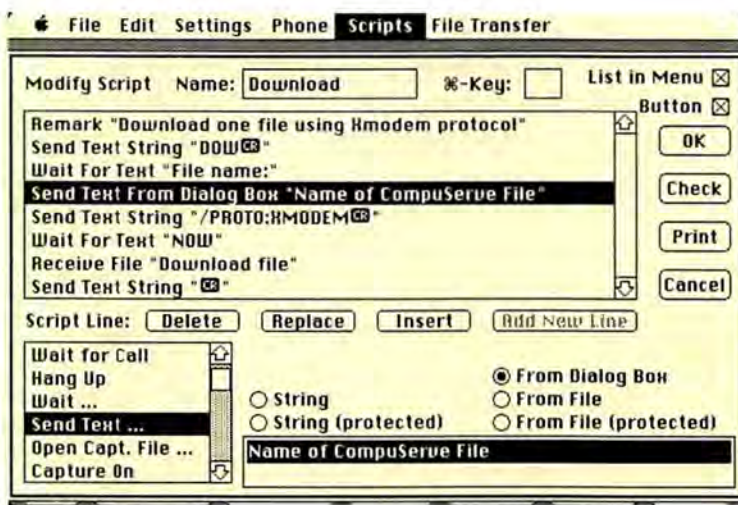
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Script Editing

You can create a MicroPhone script by using a point-and-click editor that requires very little typing.



Names of encoded files usually have the suffixes .HEX, .HCX, .HQX, .BIN, .SIT, and .PIT. Before you can use an encoded file, it must be decoded. *MicroPhone* automatically decodes files with .BIN suffixes as it downloads them, so you get ready-to-open applications and documents, complete with icons.

A file that ends with the suffix .PIT contains several Macintosh files, compressed and packed together. For example, a desk accessory may be packed together with its instruction manual. After downloading such a file and disconnecting from CompuServe, you must unpack the Macintosh files in it. Use the *PackIt III* application; it's file PACKIT.BIN in MacPro DL8. If the file ends in .SIT, unpack it with *StuffIt*, (STUFF1.BIN or STUFF1.SIT/binary in MacPro's DL8).

However, you must decode files with the suffix .HEX, .HCX, or .HQX in a separate step after downloading. Do this with the application BinHex. Using *MicroPhone*, you can download a copy of BinHex from the MacPro DL8; its filename is BINHEX.BIN. That's a .BIN file, so *MicroPhone* automatically decodes it during downloading.

BinHex can also decode .BIN files if your communications program doesn't automatically do it. You can download a *Microsoft BASIC* or *Macintosh Pascal* program that will create BinHex. For BASIC, download file BINHEX.BAS from MacPro's DL8. For Pascal, download file BINHEX.PAS. Both of those files are plain text and require no decoding. If you have a 128K Mac or just want more information about BinHex, download file BINHEX.HLP. It's a plain-text file that you can read with any word processor.

Scripts

You can interact with an information service entirely by typing responses to messages it displays on your screen. This method works, but gets tedious for several reasons. For one, it demands you focus your attention on the screen at all times or else risk paying for wasted time. Also, you must remember exactly how to phrase each response and you must type accurately.

With *MicroPhone*, you can create scripts that automate all or part of a com-

munications session. Each script contains commands that watch for messages and respond appropriately. You create and modify scripts in a script-editing dialog box (see "Script Editing"). The *MicroPhone* manual does a good job of explaining how to edit scripts, so there's no point in covering that here.

The scripts shown in "Eight Scripts" create buttons and menu commands that simplify choosing a forum, searching a data library, downloading a file, disconnecting from CompuServe, and even using the Return key. Many of the scripts include the symbol ^M at least once. Where you see ^M in a listed script, just press the Return key as you recreate the script. Don't type the two characters themselves.

When you create each of these scripts, be sure to check the Button option in the script-editing dialog box, so that *MicroPhone* displays a button with the script name at the bottom of the screen. Clicking the button invokes the script. You can also set the List in Menu option if you want to be able to choose the script from the Scripts menu.

Ordinarily, *MicroPhone* arranges buttons along the bottom of the screen alpha-

Eight Scripts

Set Up Buttons

Remove All Buttons
Install Buttons
Install Button "MacBiz"
Install Button "MacFun"
Install Button "MacPro"
Install Button "Search"
Install Button "Download"
Install Button "Disconnect"
Install Button "<CR>"

Search

Remark "Scan file descriptions by keyword"
Send Text String "SCA/DES/KEY:"
Send Text From Dialog Box "Keyword to find"
Send Text String ^M

MacPro

Remark "Go directly to the Mac Personal Productivity forum"
Send Text String "GO MACPRO^M"

MacFun

Remark "Go directly to the Mac Arts & Ent. forum"
Send Text String "GO MACFUN^M"

MacBiz

Remark "Go directly to the Mac Business forum"
Send Text String "GO MACBIZ^M"

Download

Remark "Download one file using Xmodem protocol"
Send Text String "Dow^M"
Wait For Text "File Name"
Send Text From Dialog Box "Name of CompuServe File"
Send Text String "/PROTO:XMODEM^M"
Wait For Text "NOW"
Receive File "Download File"
Send Text String ^M
<CR>

Remark "Simulate pressing the Return key"
Send Text String ^M

Disconnect

Remark "Disconnect from CompuServe"
Send Text String "Bye^M"
Wait For Text "USING COMPUERVE!"
Wait Seconds "3"
Hang Up
Remove All Buttons

These MicroPhone scripts are useful when finding and downloading files from Macintosh data libraries on CompuServe.

betically by script name. If you want them in a different order, write a start-up script that installs them your way (see the listing for Set Up Buttons in "Eight Scripts"). Then select Startup Action from the Settings menu, click Do Script, and select the name of your button-installing script. When you quit, answer Yes to save the settings; the next time you open that *MicroPhone* document the buttons will line up in order.

The script named <CR> simulates pressing the Return key. It comes in handy all those times CompuServe pauses after displaying a screenful of information and asks you to press <CR>. Instead of pressing the Return key, you can click the <CR> button.

The MACBIZ, MACFUN, and MACPRO scripts are almost identical. Each one sends a GO command that takes you directly to one of the MAUG forums.

The Disconnect script enables you to disconnect from CompuServe by clicking a button or choosing from the Scripts menu. You can use it any time CompuServe ends a prompt message with an exclamation point. It sends the command BYE and waits for CompuServe to send its sign-off message, which ends "...using CompuServe!" Then it waits three seconds for

CompuServe to disconnect before hanging up the phone and removing all buttons.

The Search script saves you some trouble when searching a data library for a keyword. When you use the script, it sends the SCA/DES/KEY: command along with the keyword you want to find. It asks you to enter the keyword in a dialog box. When the script finishes, CompuServe starts looking for the keyword you entered. It may occasionally ask you to press <CR>, which you may do by pressing the Return key or by clicking the <CR> button (assuming you have created the <CR> script).

The Download script makes the downloading process easier. When you choose it from the Scripts menu or click its button, it asks you for the name of the file you want to download. It sends the DOW command, the file name you entered, and the protocol specification for Xmodem to CompuServe. The script does not initiate file transfer or inform CompuServe when transfer is complete. *MicroPhone* has script commands to do those tasks, but they do not work with CompuServe files. You must manually initiate file transfer by

choosing the Receive MacBinary Xmodem command from *MicroPhone*'s File Transfer menu. When the transfer is complete, press Return or click the <CR> button.

Costs

CompuServe and other commercial information services are not the cheapest sources of public exchange software. For an average file, you'll probably pay \$.50 to \$2.00 in hourly charges. You may be able to find the software you want on a local electronic bulletin board system (BBS). Most bulletin boards are privately operated and levy no hourly charge. (The phone company will still charge you for toll calls, of course.) There's a list of several hundred bulletin boards in *Free (and Almost Free) Software for the Macintosh*.

Downloading software is not as easy as copying disk to disk with the Finder. When you go online, you say good-bye to most of the Macintosh user interface and hello to archaic menus and command lines. But once you get used to the environment, and with a few scripts to help, you should have little trouble finding and acquiring useful software at very low cost. □

See *Where to Buy* for product details.

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Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Canvas version 1.02m adds Multi-Finder compatibility and minor enhancements. Deneba Software, 7855 N.W. 12th St. #202, Miami, FL 33126, 305/594-6965. Free; \$195 new.

Cricket Draw version 1.1 includes a Windows menu and improved text handling. You may view the printable area border and the edge of the paper; the Show Specs command gives detailed info on location, angle, and size of objects in the drawing area. Imports MacPaint and EPS files; lets you use artwork from PictureBase. Various improvements make it easier to select and modify attributes of objects behind other objects. Extent and direction of fountains and shadows can now be specified numerically. Supports logarithmic radial grates. Cricket Software, Great Valley Corporate Center, 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890. Free if purchased after September 1, 1987; \$20 if purchased previously; \$30 for new manual; \$295 new.

MacGene version 2.7 runs as a stand-alone application. Copy protection has been removed, and the new software comes with a start-up System Folder, a help file, and a demo family. Applied Ideas, Inc., P.O. Box 3225, Manhattan Beach,

CA 90266, 213/545-2996. Free if purchased within six months of purchase date; \$25 after six months; \$145 new.

Mac Pro Football version 2.0 is faster and includes new features such as a Same button, which allows remaining strategy categories to stay the same as in the last play called. Avalon Hill Game Company, 4517 Harford Rd., Baltimore, MD 21214, 301/254-9200. Return game and team disks plus \$11; \$49.95 new.

MacProof version 3.0 works as a desk accessory. It proofs interactively and checks phrases and words. The usage dictionary has been expanded, and it offers possible correct spellings. Includes a new Select Text feature that allows selection of a single word, sentence, or paragraph. Editable dialog comments. Automated Language Processing Systems, 295 Chipeta Way, P.O. Box 8719, Salt Lake City, UT 84108, 801/584-3000. Free if purchased after August 11, 1987; \$25 if purchased previously; \$195 new.

Mac.Transfer version 1.3 is Apple IIGS compatible and includes a utility for paragraph formatting. Southeastern Software, 7743 Briarwood Dr., New Orleans, LA 70128, 504/246-8438. Return original disks plus \$12; \$60 new.

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Quark XPress version 1.1 supports TIFF and displays in continuous tone. Prints negative, high-contrast, or posterized images. Includes special effects. Menu additions include Find/Change to the Edit menu, Font Usage and Edit Auxiliary to the Utilities menu, and Lock/Unlock to the Item menu. Quark, Inc., 300 S. Jackson St. #100, Denver, CO 80209, 303/934-2211. Free; \$695 new.

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saving or printing paragraphs containing key phrases. Alphabetically sorted indexes may be created by word-selection criteria or by word frequency. Includes a notes-analysis subsystem. Virginia Systems Software Services, Inc., 5509 W. Bay Ct., Midlothian, VA 23113, 804/739-3200. \$30; \$195 new.

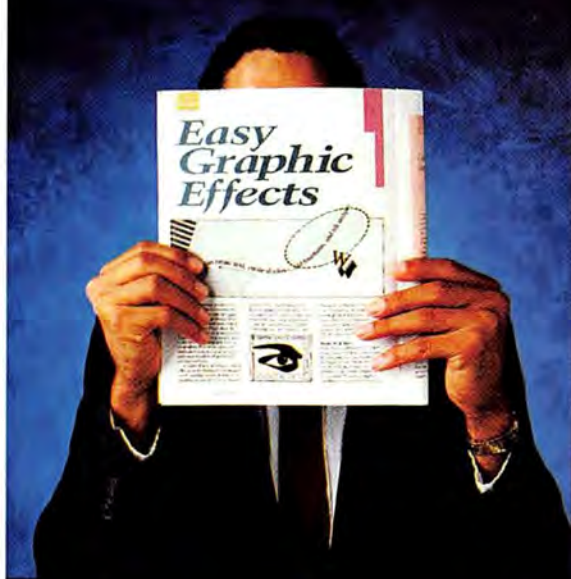
TOPS/Macintosh version 2.0 introduces a Remember function that allows users to make files available to the network automatically and to access remote files. It is fully compatible with all AFP applications, supports AppleTalk zones, and offers improved password protection. \$29 per node; \$189 per node new. *TOPS Net-Print* version 2.0 includes a dynamic menu listing that enables users to choose from available networked printers, and a new PostScript translator that supports all LaserWriter Plus fonts. Also includes a downloadable, IBM-style character set that includes block graphics and shorthand configuration commands. TOPS, 2560 Ninth St. #220, Berkeley, CA 94710, 415/549-5995. Free; \$189 new.

Turbo Pascal version 1.1 supports Mac II and includes libraries needed to call the Mac II ROM Toolbox and new System facilities. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400. Free; \$99.95 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

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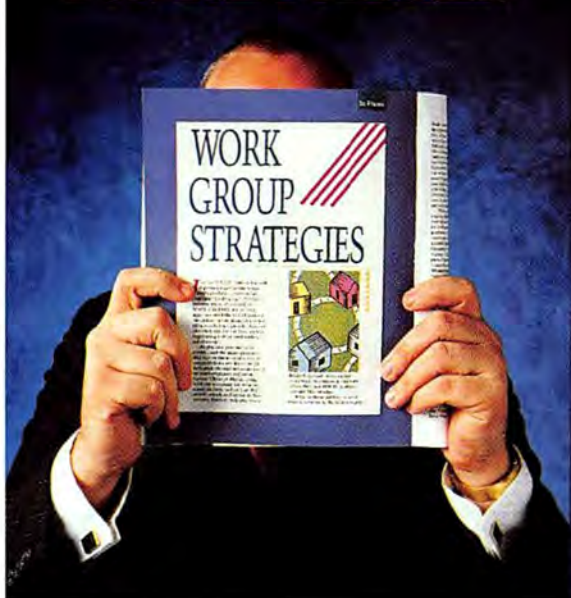
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Public domain software and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Educomp, 742 Genevieve, Ste. D, Solana Beach, CA 92075, 619/259-0255, 800/843-9497, 800/654-5181 in California, or The Public Domain Exchange, 2074C Walsb Ave., Dept. 609, Santa Clara, CA 95050, 408/496-0624, 800/331-8125.

Pages 126 to 135 *The LaserWriter Lines Up*

Fonts Plus

General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737, 800/854-9737 in Illinois. 1MB min. memory; requires General Computer Personal LaserPrinter and hard disk. \$299.

General Computer Personal LaserPrinter

General Computer Corp. For address see *Fonts Plus*. 1MB min. memory; requires hard disk. \$1999.

LaserWriter IISC, IINT, IINTX

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. Prices and product specifications to be announced.

Pages 136 to 139 *Room to Grow*

Apple 1MB Memory Expansion Kit

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. Compatible with Mac Plus, SE, and II. \$249.

Apple 2MB Memory Expansion Kit

Apple Computer, Inc. For address see Apple 1MB Memory Expansion Kit. Compatible with Mac Plus, SE, and II. \$599.

MacSnap 1024

Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405, 919/763-7918, 800/622-7627. Compatible with Mac II. \$299.

MacSnap 4S

Dove Computer Corp. For address see MacSnap 1024. Compatible with Mac Plus, SE, and II. \$1495.

Mass Pak

Mass Micro Systems, 3250 Jay St., Santa Clara, CA 95054, 408/988-1200, 800/253-8900. Compatible with Mac Plus, SE, and II. \$479.

MultisIMMs

MacMemory, Inc., 2480 N. First St., San Jose, CA 95131, 408/922-0140, 800/862-2636. Compatible with Mac Plus, SE, and II. 2MB version \$899, 4MB version \$1799.

Ram I

Open Mac Enterprises, 2280 Bates Ave., Ste. J, Concord, CA 94520, 415/682-0440. Compatible with Mac Plus, SE, and II. \$199.

Ram II+II

Open Mac Enterprises. For address see Ram I. Compatible with Mac Plus, SE, and II. \$999.

Pages 140 to 146 *The Invisible VAX*

Alisa Connection

Version 4.2. Alisa Systems, 221 E. Walnut St., #230, Pasadena, CA 91101, 818/792-9474. Key-disk copy protection; installs on hard disk. Requires DEC VAX/VMS systems and Hayes-compatible modem. \$2750.

AlisaTalk

Version 2.0. Alisa Systems. For address see *Alisa Connection*. Requires DEC VAX/VMS systems, AppleTalk network, Ethernet, and Kinetics' FastPath. \$3750 to \$11,500.

Alisa TSSnet

Version 1.2. Alisa Systems. For address see *Alisa Connection*. 512KE min. memory. \$495.

Beam Mac

Version 1.11. Compuneeering Inc., 113 McCabe Crescent, Thornhill, Ont., Canada L4J 2S6, 416/738-4601. 512K min. memory; 800K drive storage recommended. \$145.

Beam Mac II

Version 2.11. Compuneeering Inc. For address see *Beam Mac*. 512K min. memory; 800K drive storage recommended. \$345.

CADMover

Version 2.07. Kandu Software Corp., P.O. Box 10102, Arlington, VA 22210-1102, 703/532-0213. Key-disk copy protection; 512K min. memory; hard disk recommended. \$495.

CommUnity-Mac

Version 1.0. Technology Concepts Inc., 40 Tall Pine Dr., Sudbury, MA 01776, 617/443-7311, 800/777-2323. 1MB min. memory; requires FastNet Box and access to Ethernet; hard disk recommended. \$350 for single-user licenses, \$200 for documentation and media.

EtherPort SE

Kinetics, Inc., 2500 Camino Diablo, Walnut Creek, CA 94596, 415/947-0998. Requires Mac SE. \$795.

EtherSC

Kinetics, Inc. For address see EtherPort SE. 512K min. memory. \$1250.

FastNet CCU

Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405, 919/763-7918, 800/622-7627. 512KE min. memory; requires SCSI port for 512KE. \$899.

(continues)

Where to Buy

Page 168

Here's the Scoop

Scoop

Version 1.01. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512KE min. memory; latest System from Apple recommended. \$495.*

Page 170

dBase Power Made Easy

dBase Mac

Version 1.0. Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502-1319, 213/329-8000. 1MB min. memory; requires hard disk. \$495.*

Page 172

Plan for a Taxing Situation

TaxView Planner

Version 1.0. SoftView, Inc., 4820 Adohr Ln., Ste. F, Camarillo, CA 93010, 805/388-2626, 800/622-6829 (orders only). 512K min. memory; requires MacInTax. \$79.*

Page 173

Learning to Relate

Reflex Plus

Version 1.01. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400, 800/255-8008, 800/237-1136 in California. 512K min. memory; requires 800K drive storage; hard disk recommended. \$279.*

Page 174

Desktop Painting

DeskPaint

Version 1.0. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712-4567, 602/881-8101, 800/482-4567. 512K min. memory; more RAM memory recommended for TIFF. \$129.95, \$59.95 before March 1, 1988.*

FullPaint

Version 1.0SE. Ann Arbor Softworks, Inc., 2393 Teller Rd., #106, Newbury Park, CA 91320, 805/375-1467. 512K min. memory. \$99.95.

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K min. memory. \$149.95.

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A Stitch in Time

DiskFit

Version 1.4. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-9694. 512K min. memory; requires hard disk. \$74.95.*

Fastback for the Macintosh

Version 1.02. Fifth Generation Systems, Inc., 1322 Bell Ave., #1-A, Tustin, CA 92680, 714/259-0541, 800/225-2775. 512K min. memory; requires hard disk. \$129.*

HFS Backup

Version 2.02. Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, FL 33634, 813/884-3092, 800/622-2888. 512K min. memory; requires hard disk. \$49.95.*

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For Typists Only

Nutmeg/Xerox Full Page Display

Nutmeg Systems, Inc., 25 South Ave., New Canaan, CT 06840, 203/966-3226. 512K min. memory. \$1795.*

Radius Full Page Display

Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134, 408/434-1010. 512KE min. memory. \$1995.

Page 177

Stuff and Send

StuffIt

Version 1.10. Shareware from Raymond Lau, 100-04 70th Ave., Forest Hills, NY 11375. 512K min. memory; requires System 3.0 or later; hard disk recommended. \$15.*

Page 177

Sharing Expensive Peripherals

ComServe

Version 1.0. Infosphere, Inc., 4730 S.W. Macadam Ave., Portland, OR 97201, 503/226-3620, 800/445-7085. 512K min. memory; requires Apple-Talk, and System 3.2 or later. \$195.*

Page 178

Can We Talk, Big Blue?

MacIRMA

Version 1.0. Digital Communications Associates, Inc., 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000. 1MB min. memory; requires coaxial cable, and Mac SE for SE version, or Mac II for Mac II version. \$1195.*

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From the Moon to the Mac

MSC/pal

Version 1.95. The MacNeal-Schwendler Corp., 815 Colorado Blvd., Los Angeles, CA 90041, 213/259-3888, 800/336-4858. 1MB min. memory; requires external drive; hard disk recommended. \$1495.*

Page 181

Quality on the Cheap

General Computer Personal LaserPrinter

Version 2.0. General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737, 800/854-9737 in Illinois. 1MB min. memory; requires hard disk. \$1999.*

Page 183

War of the Words

Computer Scrabble

Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403, 415/571-7171, 800/562-1112, 800/245-4525 in California. Developed by Leisure Genius, a

subsidiary of Virgin Games, Ltd. Key-disk copy protection; 512KE min. memory. \$39.95.*

Page 184

Keeping on Schedule

Rendezvous

Version 1.3. PMC Telesystems, Inc., P.O. Box 5127, Vancouver, B.C., Canada V6B 4A9, 604/255-9949. Key-disk copy protection; installs on hard disk. 128K min. memory. \$200.*

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Projecting an Image

Macnifier

Comtrex Ltd., P.O. Box 1450, El Toro, CA 92630, 714/855-6600. 128K min. memory. From \$1695.*

Pages 213 to 220

Getting Started with Mac-VAX Connections

AlisaShare

Alisa Systems, 221 E. Walnut St., #230, Pasadena, CA 91101, 818/792-9474. 512K min. memory; requires DEC VAX with *AlisaTalk*, *AppleShare Workstation Installer*, and communications hardware; 1MB recommended. Price to be announced.

inTalk

Version 3.0. Palantir Software, 12777 Jones Rd., #100, Houston, TX 77070, 713/955-8880, 800/368-3797. 512K min. memory; requires modem. \$195.

MacTerminal

Version 2.2. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 512K min. memory; requires Apple- or Hayes-compatible modem. \$125.

MicroPhone

Version 2.0. Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232, 800/336-6477, 800/336-6478 in California. 128K min. memory; requires modem. Price to be announced.

Epic Technology, Inc., 46735 Fremont Blvd., Fremont, CA 94538, 415/683-0932, 800/634-9992.

Everex Systems, Inc., 48431 Milmont Dr., Fremont, CA 94538, 415/683-2222.

Franklin Telecommunications Corp., 733 Lakefield Rd., Westlake Village, CA 91361, 805/373-8688.

Gandalf Data, Inc., 1020 S. Noel Ave., Wheeling, IL 60090, 312/541-6060.

General DataComm, Inc., Rt. 63, Middlebury, CT 06762-1299, 203/574-1118.

GVC-Chenel Corp., 41 Bergenline Ave., Westwood, NJ 07675, 201/666-1443.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617.

IBM, Old Orchard Rd., Armonk, NY 10504, 914/765-1900.

Incomm Data Systems, Inc., 652 S. Wheeling Rd., Wheeling, IL 60090, 312/459-8881.

Micom Systems, Inc., 4100 Los Angeles Ave., Simi Valley, CA 93063-3397, 805/583-8600, 800/642-6687.

Microcom, Inc., 1400-A Providence Hwy., Norwood, MA 02062, 617/762-9310, 800/322-3722.

Multi-Tech Systems, Inc., 82 Second Ave. SE, New Brighton, MN 55112, 612/631-3550, 800/328-9717.

Novation, Inc., 21345 Lassen Ave., Chatsworth, CA 91311, 818/998-5060, 800/423-5419.

Omnitel, Inc., 5415 Randall Place, Fremont, CA 94538, 415/490-2202, 800/654-2785, 800/233-2202 in California.

Paradyne Corp., 8550 Ulmerton Rd., P.O. Box 2826, Largo, FL 34641-3893, 813/530-2000.

Penril DataComm, 207 Perry Pkwy., Gaithersburg, MD 20877, 301/921-8600.

Prentice Corp., 266 Caspian Dr., P.O. Box 3544, Sunnyvale, CA 94088-3549, 408/432-1515.

Prometheus Products, Inc., 4545 Cushing Pkwy., Fremont, CA 94538, 415/490-2370.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, CA 95053, 408/432-8008, 800/482-3427.

Shiva Corp., 222 Third St., #1200, Cambridge, MA 02142, 617/661-2026, 800/458-3550.

Telcor Systems, Inc., 12 Michigan Dr., Natick, MA 01760, 617/653-3995.

Telenetics Corp., 895 E. Yorba Linda Blvd., Placentia, CA 92670, 714/524-5770, 800/826-6336, 800/822-4267 in California.

Tymnet, McDonnell Douglas Network Systems Co., 2560 N. First St., P.O. Box 49019, San Jose, CA 95161-9019, 408/922-0250.

Universal Data Systems, Inc., 5000 Bradford Dr., Huntsville, AL 35805, 205/721-8000, 800/663-2252.

US Robotics, Inc., 8100 N. McCormick Blvd., Skokie, IL 60076, 312/982-5001, 800/342-5877.

Ven-Tel, Inc., 2121 Zanker Rd., San Jose, CA 95131, 408/436-7400, 800/538-5121.

Western Datacom, 5083 Market St., Youngstown, OH 44512, 216/788-6583.

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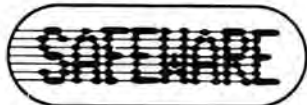
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Here's the Scoop

Scoop

Version 1.01. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512KE min. memory; latest System from Apple recommended. \$495.*

Page 170

dBase Power Made Easy

dBase Mac

Version 1.0. Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502-1319, 213/329-8000. 1MB min. memory; requires hard disk. \$495.*

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Plan for a Taxing Situation

TaxView Planner

Version 1.0. SoftView, Inc., 4820 Adohr Ln., Ste. F, Camarillo, CA 93010, 805/388-2626, 800/622-6829 (orders only). 512K min. memory; requires *MacInTax*. \$79.*

Page 173

Learning to Relate

Reflex Plus

Version 1.01. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400, 800/255-8008, 800/237-1136 in California. 512K min. memory; requires 800K drive storage; hard disk recommended. \$279.*

Page 174

Desktop Painting

DeskPaint

Version 1.0. Zedcor, 4500 E. Speedway, #22, Tucson, AZ 85712-4567, 602/881-8101, 800/482-4567. 512K min. memory; more RAM memory recommended for TIFF. \$129.95, \$59.95 before March 1, 1988.*

FullPaint

Version 1.0SE. Ann Arbor Softworks, Inc., 2393 Teller Rd., #106, Newbury Park, CA 91320, 805/375-1467. 512K min. memory. \$99.95.

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K min. memory. \$149.95.

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A Stitch in Time

DiskFit

Version 1.4. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-9694. 512K min. memory; requires hard disk. \$74.95.*

Fastback for the Macintosh

Version 1.02. Fifth Generation Systems, Inc., 1322 Bell Ave., #1-A, Tustin, CA 92680, 714/259-0541, 800/225-2775. 512K min. memory; requires hard disk. \$129.*

HFS Backup

Version 2.02. Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, FL 33634, 813/884-3092, 800/622-2888. 512K min. memory; requires hard disk. \$49.95.*

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For Typists Only

Nutmeg/Xerox Full Page Display

Nutmeg Systems, Inc., 25 South Ave., New Canaan, CT 06840, 203/966-3226. 512K min. memory. \$1795.*

Radius Full Page Display

Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134, 408/434-1010. 512KE min. memory. \$1995.

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Stuff and Send

StuffIt

Version 1.10. Shareware from Raymond Lau, 100-04 70th Ave., Forest Hills, NY 11375. 512K min. memory; requires System 3.0 or later; hard disk recommended. \$15.*

Page 177

Sharing Expensive Peripherals

ComServe

Version 1.0. Infosphere, Inc., 4730 S.W. Macadam Ave., Portland, OR 97201, 503/226-3620, 800/445-7085. 512K min. memory; requires AppleTalk, and System 3.2 or later. \$195.*

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Can We Talk, Big Blue?

MacIRMA

Version 1.0. Digital Communications Associates, Inc., 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000. 1MB min. memory; requires coaxial cable, and Mac SE for SE version, or Mac II for Mac II version. \$1195.*

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From the Moon to the Mac

MSC/pal

Version 1.95. The MacNeal-Schwendler Corp., 815 Colorado Blvd., Los Angeles, CA 90041, 213/259-3888, 800/336-4858. 1MB min. memory; requires external drive; hard disk recommended. \$1495.*

Page 181

Quality on the Cheap

General Computer Personal LaserPrinter

Version 2.0. General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737, 800/854-9737 in Illinois. 1MB min. memory; requires hard disk. \$1999.*

Page 183

War of the Words

Computer Scrabble

Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403, 415/571-7171, 800/562-1112, 800/245-4525 in California. Developed by Leisure Genius, a

subsidiary of Virgin Games, Ltd. Key-disk copy protection; 512KE min. memory. \$39.95.*

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Keeping on Schedule

Rendezvous

Version 1.3. PMC Telesystems, Inc., P.O. Box 5127, Vancouver, B.C., Canada V6B 4A9, 604/255-9949. Key-disk copy protection; installs on hard disk. 128K min. memory. \$200.*

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Projecting an Image

Macnifier

Comtrex Ltd., P.O. Box 1450, El Toro, CA 92630, 714/855-6600. 128K min. memory. From \$1695.*

Pages 213 to 220

Getting Started with Mac-VAX Connections

AlisaShare

Alisa Systems, 221 E. Walnut St., #230, Pasadena, CA 91101, 818/792-9474. 512K min. memory; requires DEC VAX with *AlisaTalk*, *AppleShare Workstation Installer*; and communications hardware; 1MB recommended. Price to be announced.

inTalk

Version 3.0. Palantir Software, 12777 Jones Rd., #100, Houston, TX 77070, 713/955-8880, 800/368-3797. 512K min. memory; requires modem. \$195.

MacTerminal

Version 2.2. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 512K min. memory; requires Apple- or Hayes-compatible modem. \$125.

MicroPhone

Version 2.0. Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232, 800/336-6477, 800/336-6478 in California. 128K min. memory; requires modem. Price to be announced.

PacerShare

Version 5.1. Pacer Software, Inc., 7911 Herschel Ave., #402, La Jolla, CA 92037, 619/454-0565 512K min. memory for the Mac; requires *PacerLink*, DEC VAX/VMS, and communications hardware from Mac to VAX. For 5 users \$400, 20 users \$1000, 50 users \$2000, 100 users \$3000, 250 users \$5000, 500 users \$7500.

Telescope

Version 1.0. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301, 818/991-6540. 128K min. memory; requires communications hardware or modem. \$125.

VersaTerm

Version 3.1. Peripherals, Computers & Supplies, Inc., 2457 Perkiomen Ave., Mt. Penn, PA 19606, 215/779-0522. 512K min. memory; requires communications hardware or modem. \$99.

Pages 223 to 232 Insights on TOPS

TOPS/DOS

Version 2.0. TOPS, A Sun Microsystems Company, 2560 Ninth St., #220, Berkeley, CA 94710, 415/549-5900. Works with 256K IBM PC or compatible; requires TOPS Flash-Card or AppleTalk PC Card; hard disk recommended. \$189.

TOPS/Macintosh

Version 2.0. For address see *TOPS/DOS*. 512K min. memory; requires AppleTalk; hard disk recommended. \$189.

Pages 235 to 242 Mac Communications Tools

CompuServe

CompuServe, Inc., 5000 Arlington Center Blvd., P.O. Box 20212, Columbus, OH 43220, 614/457-0802, 800/848-8199. Requires modem. Subscription kit \$39.95. Rates: 110 to 450 baud \$6 per hour, 1200 to 2400 baud

\$12.50 per hour, plus 25-cents-per-hour surcharge when dialing CompuServe network; other network surcharges start at \$2 per hour.

Delphi

General Videotex Corp., 3 Blackstone St., Cambridge, MA 02139, 617/491-3393, 800/544-4005. Requires modem. One-time fee \$49.95 (includes two free hours). Rates through TimeNet or TeleNet: 7 a.m. to 6 p.m. (M-F) \$17.40 per hour, 6 p.m. to 7 a.m. M-F, weekends, and holidays \$7.20 per hour. Direct-dial rates: 7 a.m. to 6 p.m. (M-F) \$9.60 per hour, 6 p.m. to 7 a.m. M-F, weekends, and holidays \$6.60 per hour.

GENie

General Electric Information Services, 401 N. Washington St., Rockville, MD 20850, 800/638-9636. Requires modem. One-time fee \$18.

Rates: 8 a.m. to 6 p.m. (M-F) 300 to 1200 baud \$35 per hour, 2400 baud \$45; 6 p.m. to 8 a.m. M-F, weekends, and holidays 300 to 1200 baud \$5 per hour, 2400 baud \$15 per hour.

MicroPhone

Version 2.0. Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232, 800/336-6477, 800/336-6478 in California. 128K min. memory; requires modem. List price to be announced.

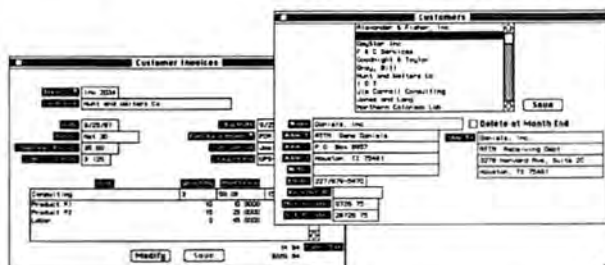
The Source

Source Telecomputing Corp., 1616 Anderson Rd., McLean, VA 22102, 703/734-7500, 800/336-3330. Requires modem. One-time fee \$49.95. Rates: 7 a.m. to 6 p.m. (M-F) 300 baud 36 cents per minute, 1200 baud 43 cents per minute, 2400 baud 46 cents per minute; 6 p.m. to 7 a.m. M-F, weekends, and holidays 300 baud 14 cents per minute, 1200 baud 18 cents per minute, 2400 baud 20 cents per minute. \$10 monthly minimum. □

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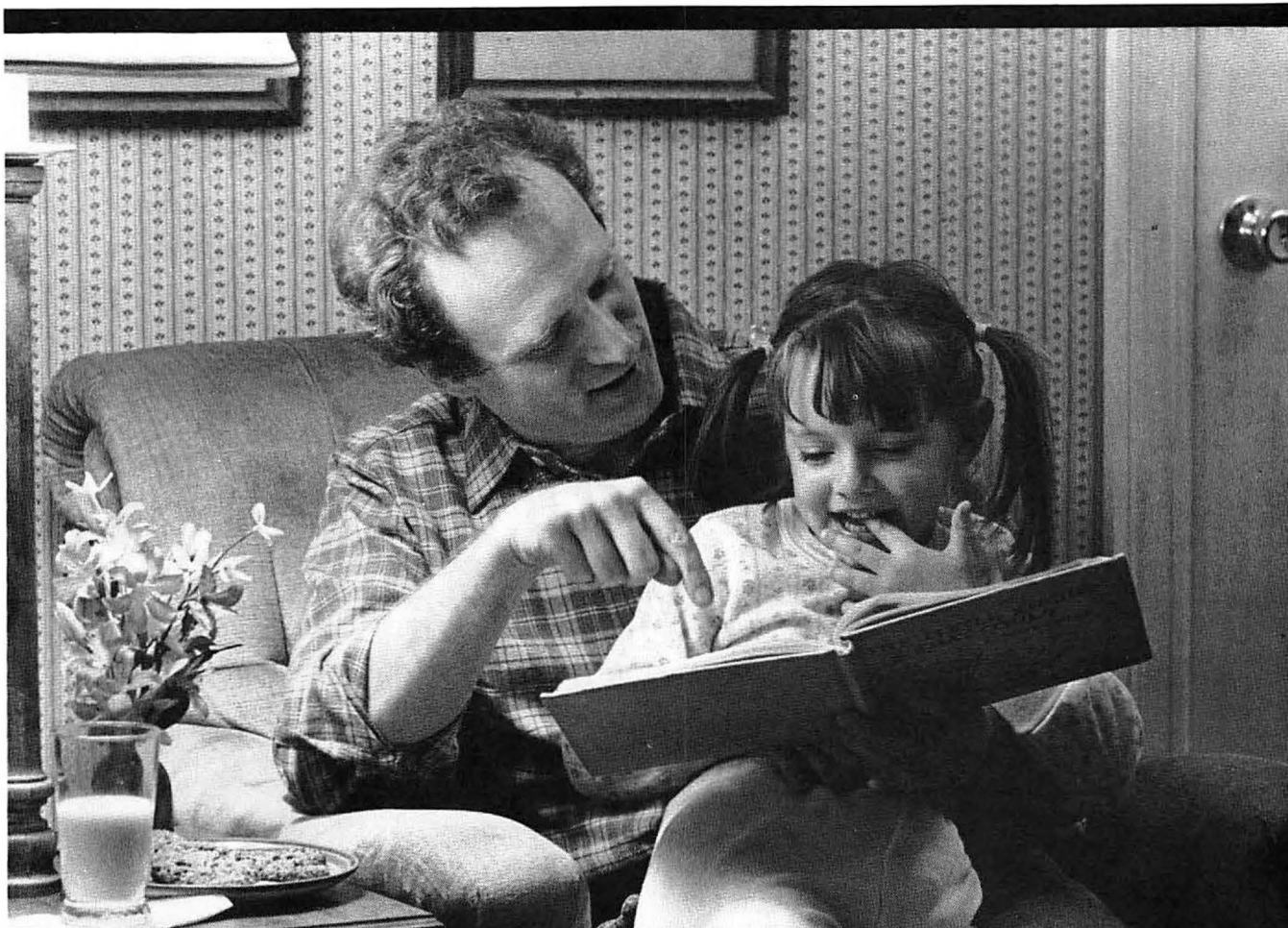
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Macworld Best-Sellers

Months on chart	Last month	This month	
25	3	1	Microsoft Excel <i>Microsoft</i>
33	1	2	Microsoft Word <i>Microsoft</i>
13	2	3	Microsoft Works <i>Microsoft</i>
1	—	4	Printshop <i>Brøderbund Software</i>
11	6	5	SuperPaint <i>Silicon Beach Software</i>
21	4	6	PageMaker <i>Aldus</i>
28	—	7	MacDraw <i>Apple Computer</i>
13	—	8	MacPaint <i>Apple Computer</i>
6	9	9	WriteNow for Macintosh <i>T/Maker</i>
6	7	10	MacMoney <i>Survivor Software</i>

Education Software

17	1	1	Math Blaster <i>Davidson & Associates</i>
1	—	2	Reader Rabbit <i>The Learning Company</i>
15	2	3	Typing Tutor III <i>Simon & Schuster Computer Software</i>
17	3	4	KidsTime <i>Great Wave Software</i>
7	4	5	Early Games <i>Springboard Software</i>

Entertainment Software

17	3	1	Flight Simulator <i>Microsoft</i>
13	1	2	Dark Castle <i>Silicon Beach Software</i>
17	2	3	MacGolf <i>Practical Computer Applications</i>
3	—	4	Sargon III <i>Spinnaker Software</i>
2	—	5	Smash Hit Racquetball <i>Primera Software</i>

Networking/Data Communications

13	2	1	TOPS <i>TOPS</i>
17	1	2	AppleTalk <i>Apple Computer</i>
9	3	3	AppleShare <i>Apple Computer</i>
1	—	4	PhoneNet <i>Farallon Computing</i>
16	4	5	MacServe <i>Infosphere</i>

Months on chart	Last month	This month	
13	1	1	Apple Hard Disk 20/20SC <i>Apple Computer</i>
6	2	2	Macintosh Internal 20SC Hard Disk <i>Apple Computer</i>
7	4	3	Rodime 20 Plus <i>Rodime Peripheral Systems Division</i>
2	3	4	Apple 40SC Hard Disk <i>Apple Computer</i>
1	—	5	Apple Internal 40SC Hard Disk <i>Apple Computer</i>

Add-in Boards

2	4	1	Video Board/Large Screen <i>Ryad</i>
1	—	2	2MB Expansion Board <i>MacProducts USA</i>
4	1	3	Apple 2MB Memory Expansion Kit <i>Apple Computer</i>
4	2	4	Apple 1MB Memory Expansion Kit <i>Apple Computer</i>
4	3	5	Radius Accelerator <i>Radius</i>

Product Watch

Editors' choice:

Other recent products of particular interest.

Film Printer *Mirus* lightweight, high-resolution film recorder

LaserWriter II printer family
Apple Computer LaserWriter IINT, high-performance LaserWriter IINTX, entry-level QuickDraw LaserWriter IISC

MacRecorder *Farallon Computing*
low-cost sound input device

Source: Exclusive InfoCorp survey of more than one hundred twenty-five Macintosh retailers and selected mail-order suppliers. Covers sales during November 1987.

*Does not include hard disks installed at the factory.

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Robert Forras,
MacTimes

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John Dvorak,
San Francisco Examiner

“Right now, WriteNow comes the closest to delivering on the promise of future word processing.”

Michael Miller,
InfoWorld

“This is the word processor that we designed and built Macintosh for.”

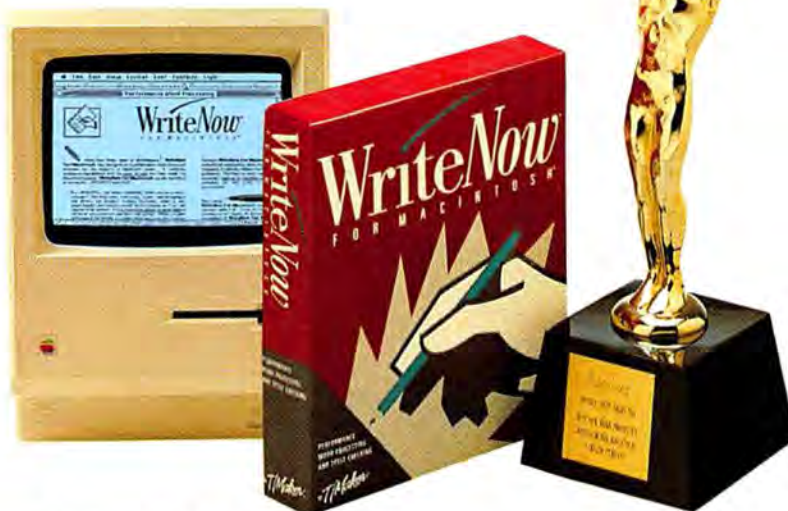
Steve Jobs,
NeXT Inc.

“T/Maker's WriteNow For Macintosh is a polished word processor that retains the elegance of MacWrite but adds features like multiple windows, footnotes, multiple columns, and a spell checker.”

Dan Farber,
MacWorld Magazine

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Vicky Jo Varner,
The MACazine



Best New Word Processor
MacUser Magazine 1986

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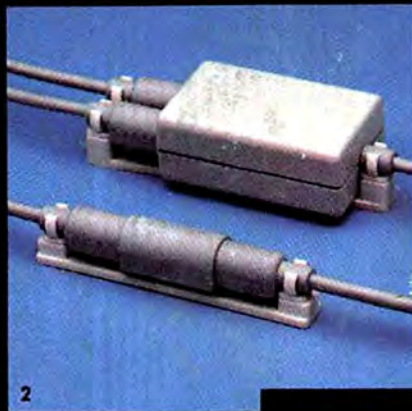
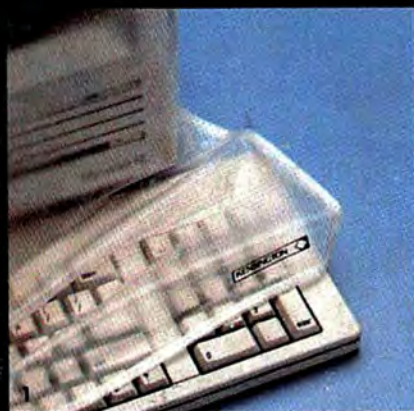
Suggested retail price of WriteNow For Macintosh is \$175. Runs on any Macintosh.

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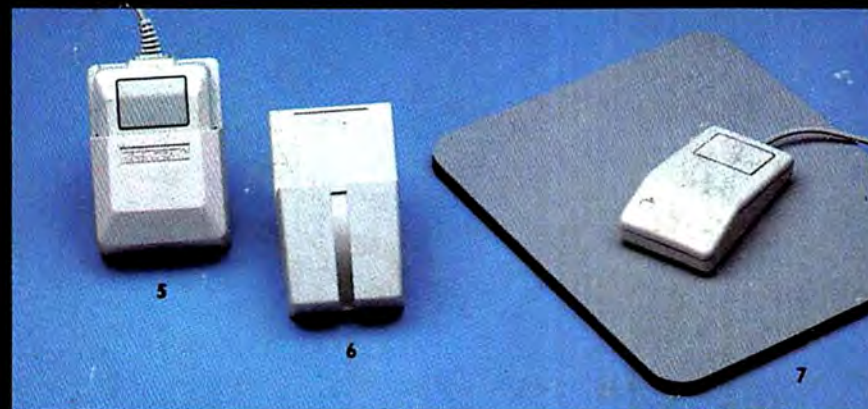
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