54 NEW PRODUCTS: PAGE 233 • 29 PRODUCT REVIEWS: PAGE 184

MACWORLD

The Macintosh® Magazine January 1990 $3.95 Canada $4.95

Data Security

Controlling Access to Your Mac

SPECIAL REPORT

1989 IN REVIEW

Capturing the Year in Icons

IS THE MAC JEOPARDIZING YOUR HEALTH?

See Page 150

MATH PROGRAMS

How They Work & What They Do

OOP!

Object-Oriented Programming

How do you explain the magnitude of Microsoft Works?

Whether you run a small business or your knowledge about computers happens to be less than monumental, Microsoft® Works 2.0 has you covered.

Microsoft Works 2.0 is actually five tools in one: word processing, spreadsheet, database, drawing and communications. But as far as you're concerned, it's one integrated program—so it's easy to move between the different productivity tools and use them together.



You get five programs in one—and incredible efficiency when you combine their talents.

In fact, from the moment you take it out of the box, Microsoft Works 2.0 is easy to use. It comes with an animated training program written in HyperCard® format. As well as on-line help and unlimited phone support to help answer any questions you may have about Works' features.

No matter how varied your projects are, Microsoft Works 2.0 can handle the job. Its newest feature, the drawing module (with page layout), can take an otherwise dull, fact-filled document and turn it into one full of compelling graphics.

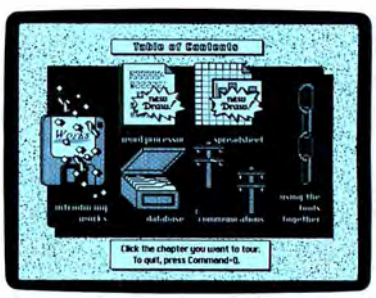
The word processor can create everything from a simple memo to a detailed report—and it even includes a spell-checker aimed at eliminating typos.

Of course, if your document needs to be supported with numbers, you can always jump over to the spreadsheet to compute and analyze data. And then transform it all into easy-to-read, easy-to-understand charts.

As for information that keeps your business going, the database is indispensable for keeping track of clients and orders.

And you can count on the communications module to bring information to your desktop through a modem.

If you'd like to learn more about Microsoft Works 2.0, just call (800) 541-1261, Dept. I76 for the name of your nearest dealer.



To help get you started, we've included an animated training program written in HyperCard format.

No wonder Microsoft Works 2.0 is the best selling application in its class. Aside from being a great value, Microsoft Works 2.0 is one program that can handle a myriad of business needs.

It's that simple.

Microsoft
Making it all make sense

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It's simple.

HOME FRONT

Real Estate News for the Greater Aspen Community - Published by Martin Realty

Lowest Lending Rates Since 1983!

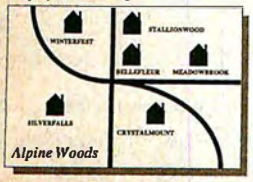
Last week mortgage interest rates reached a five-year all-time low. First Mortgage offered a 30-year, 95 percent new home loan at 8.5 percent with no points. Unheard of in recent years.

Resale of homes has jumped 13 percent over sales recorded during the same period last year.

New Home sales are up 17 percent. Several local lenders have put together special new home financing packages in cooperation with local contractors. Call our Aspen office at (426) 838-2961 for details.

Crown Construction Opens This Year's Alpine Woods Development

The Alpine Woods development will be open for public tours from July 15 until August 21. Each home represents a distinct style from contemporary to French provincial – all homogeneously placed to create a uniquely attractive neighborhood.



Each home has been fully decorated by a local interior design firm and each is singular in its own way. Even if you're just shopping for ideas, we recommend this year's Alpine Woods development.

You can park at the Denny Shopping Center and take a tour bus from there between 9:00 a.m. and 6:00 p.m. daily.

HOME OF THE MONTH

Lakefront Country House: Designed for Entertaining!



This lovely brick and cedar country house can be found just fifteen-minutes from downtown Aspen. Nestled in giant firs, it represents true Colorado style!

The master bedroom suite features a panoramic view of Lake Dinmond. The master suite also has his-and-hers walk-in closets, a separate vanity, and a stunning shower area made of glass bricks.

The living room, study, family room, and bedrooms (2+) feature hand-polished redwood panelling and skylights.

The three-car garage has special wall-mounted ski racks and an extra-sized third stall to accommodate up to a 24-foot boat.

Two additional baths, a stone fireplace, 800 square feet of decking, three wooded acres, and a private dock complete this rural dream home.

MARTIN REALTY

July 28, 1988

Gary and Lisa Elliot
533 4th Street
Denver, CO 54556

Dear Gary and Lisa,

This Saturday, I look forward to showing you a few of the quality homes in the Aspen community.

Per our phone conversations, we will be looking at family homes with a minimum of four bedrooms, two-and-a-half baths, a family room, and a three-car garage. It sounds like you are a pretty active family, so I've also chosen homes with a "mud room" for changing wet boots, etc.

One issue that we haven't really discussed is schools. Before Saturday, you might want to jot down a few priorities. Public, private, parochial? Level needed--from pre-school to college. And any special needs your children may have, like proximity to an indoor pool or gym.

I can also put you in touch with any youth organizations you may be interested in like The Boy Scouts or 4-H. We have it all.

You mentioned wanting a fairly good-sized lot. Does this mean that you will need stables or a barn? I can even put you in touch with a local riding stable if you wish.

Since you plan to be here for the whole weekend, let me know if I can be of any help with hotel reservations or activites. I can arrange for anything from theatre tickets to a riding lesson. Whatever might make your stay more pleasant, and leave a good impression of Aspen.

It's a beautiful place and we're happy that you've decided to make it your home.

Sincerely,

Peter Cohen
Residential Agent

cc:file



MARTIN REALTY

PETER COHEN

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(426) 838-2961

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St. Louis, MO 88990

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6767 Diamond Place
Aspen, CO 54555

The Stefls
14 Lamplighter Lane
Ridgefield, VT 29333

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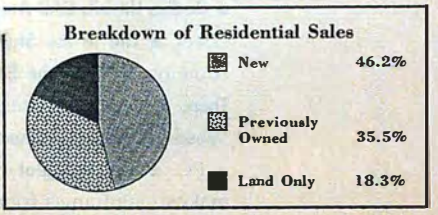
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COMMISSIONED SALES REPORT—JUNE

Sales Person	Type	Rate	Sales YTD	Billings	Check Amt.
Shannon Pitts	Commercial	3.80%	$275,000	$88,000	$3344.00
Lisa Doan	Residential	3.00%	$320,000	$120,000	$3600.00
Peter Cohen	Residential	3.00%	$230,000	$100,000	$3000.00
Robbie Ross	Commercial	4.00%	$500,000	$340,000	$13600.00
Mike Lucero	Residential	4.00%	$150,000	$65,000	$2600.00
Gary Gigot	Residential	7.00%	$700,000	$260,000	$18200.00
Mary Freeman	Residential	3.80%	$450,000	$60,000	$2280.00
Joan McArthur	Residential	2.60%	$250,000	$99,000	$2574.00
Barbara Miller	Commercial	3.00%	$250,000	$130,000	$3900.00
Robyn Komachi	Commercial	2.80%	$780,000	$240,000	$6720.00

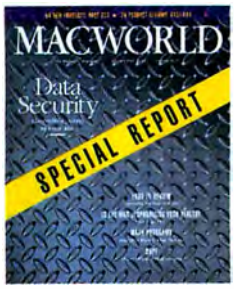
Residential		704,000	
New		325,000	46.16%
Prev. Owned		250,000	35.51%
Land Only		129,000	18.32%
			100.00%



Everything you see above was created using some combination of the five tools within Microsoft Works 2.0: word processing, spreadsheet, database, drawing and communication. As you can see, the real power of Microsoft Works 2.0 comes into play when all the tools are used together.

MACWORLD

The Macintosh® Magazine January 1990



Afraid of prying eyes and sinister viruses? Worried that your Mac and hard disk might not make it through the night? Or maybe you're tired of coming back from lunch to find your desktop mysteriously rearranged? Whatever your security questions, you'll find the answers on page 142. (Photo by David Bishop.)



For details on how this illustration for our cover story was created, see page 43.

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Warning: Computing Can Be Hazardous to Your Health **150**
By Diana Hembree / Is the Mac jeopardizing your health? Here's a survey of computer hazards—and how to avoid them—from the pain of repetitive strain injury to the perils of radiation.

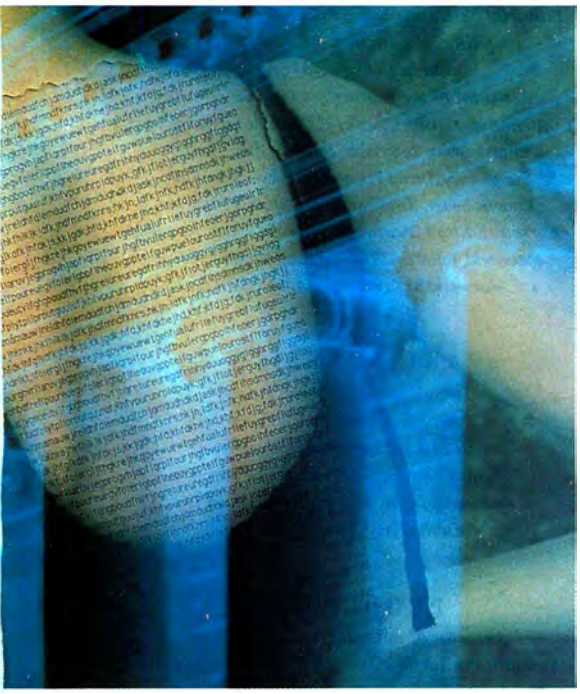
Math without Tears **158**
By Charles Seiter / You no longer have to be a math wizard to do complex calculations. Powerful yet easy-to-use numeric and symbolic math programs have finally come to the Mac.

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Object-Oriented Programming **174**
By Brita Meng / Object-oriented programming will help Mac programmers build better applications. But its simplicity can open up the world of programming to users too.



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Is your Mac exposing you to a slew of occupational hazards? To learn how to stay healthy on the job, see page 150.

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OOD NEWS FOR "SOME" OPTIMIZER OWNERS



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Circle 202 on reader service card.

MACWORLD

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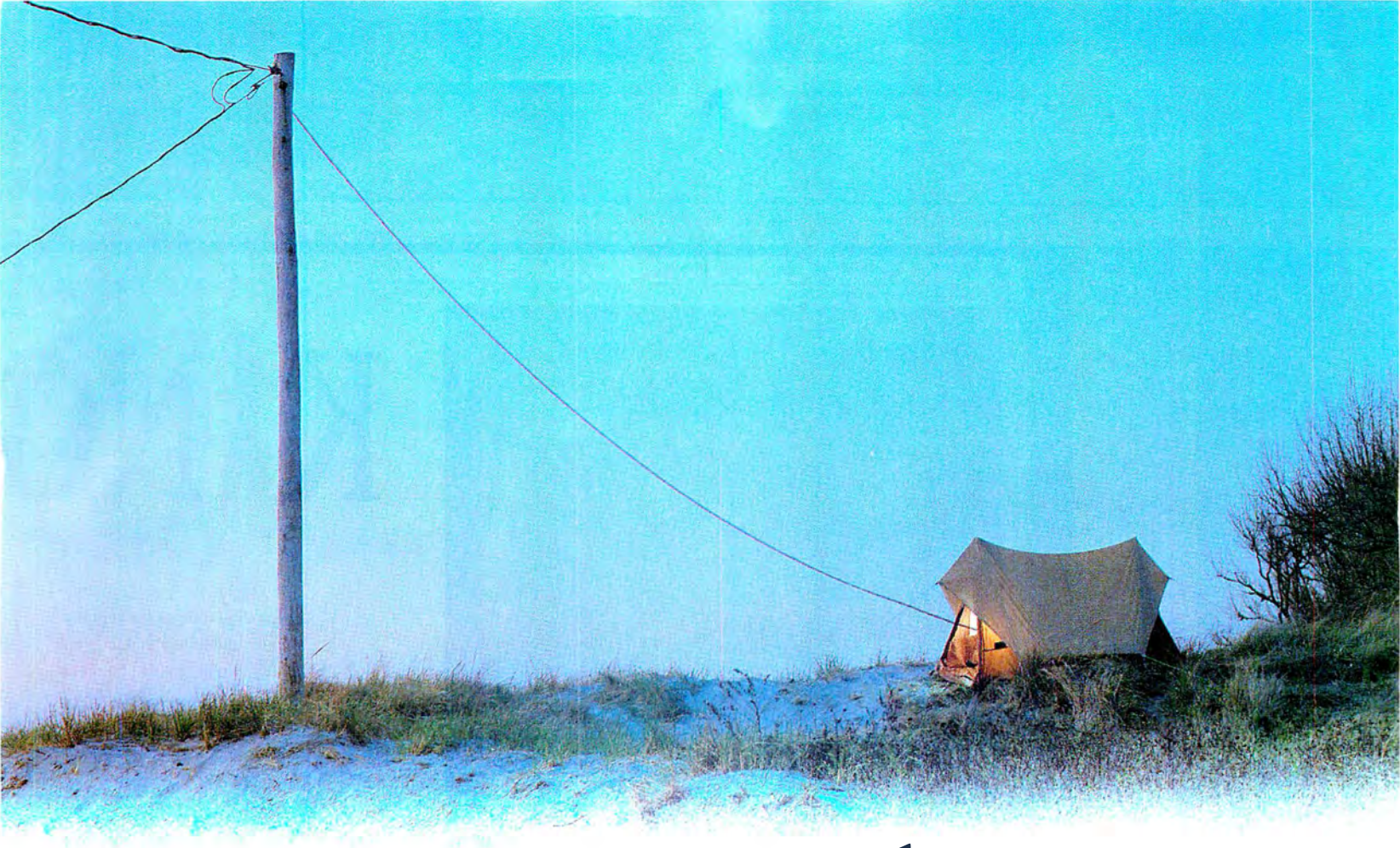
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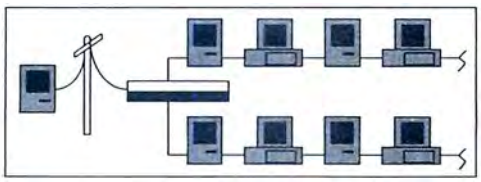
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KING STRATEGY



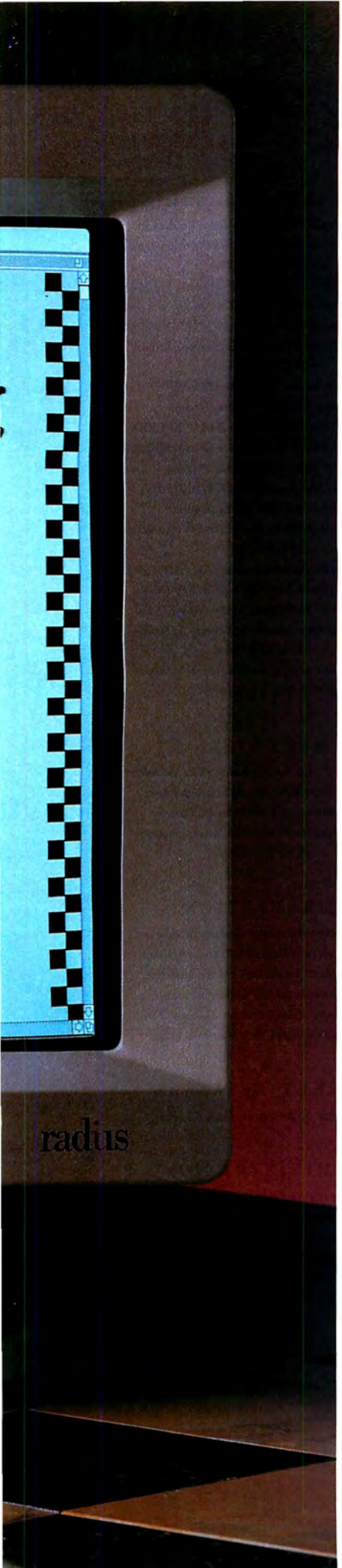
KING

STRATEGY

To some it was just a game. An intricate game composed of subtle moves, sublime suggestions, and intricate defenses. To him, it was a paradigm of life. An ever shifting pattern. Of Victory and Defeat. Each game unique. Each game a bitter-sweet experience. He studied Sun Tzu. He read Clausewitz. He explored Napoleon. He marvelled at the Masters. He never stopped learning. He played his opponent as closely as some would hold a lover. He played the clock as if his life depended on hitting the button five seconds under the allotted time. They called him the King of Strategy. He called himself a Student of Life.



Page 1



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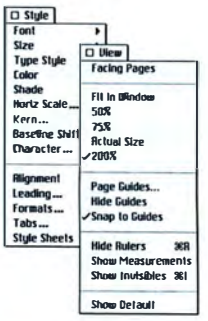
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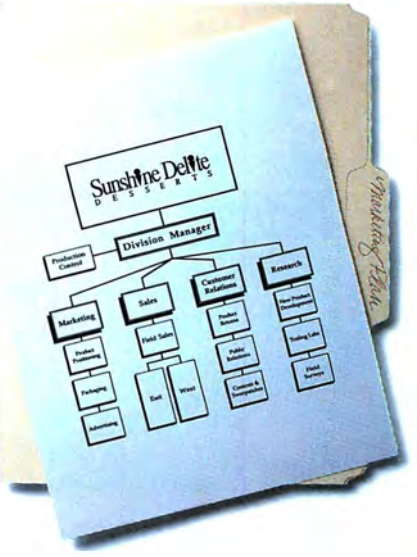
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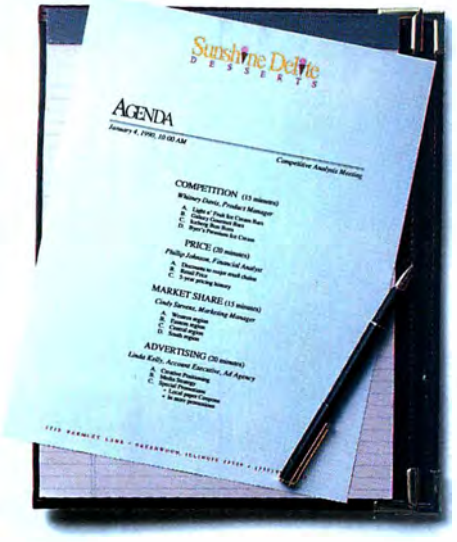
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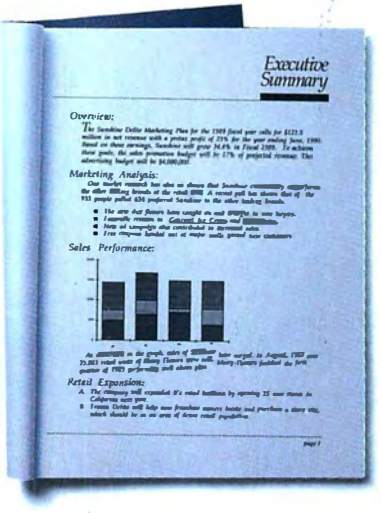






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Usually, the technology available to computer users just plods along—with competing products repeating one another's so-called improvements.

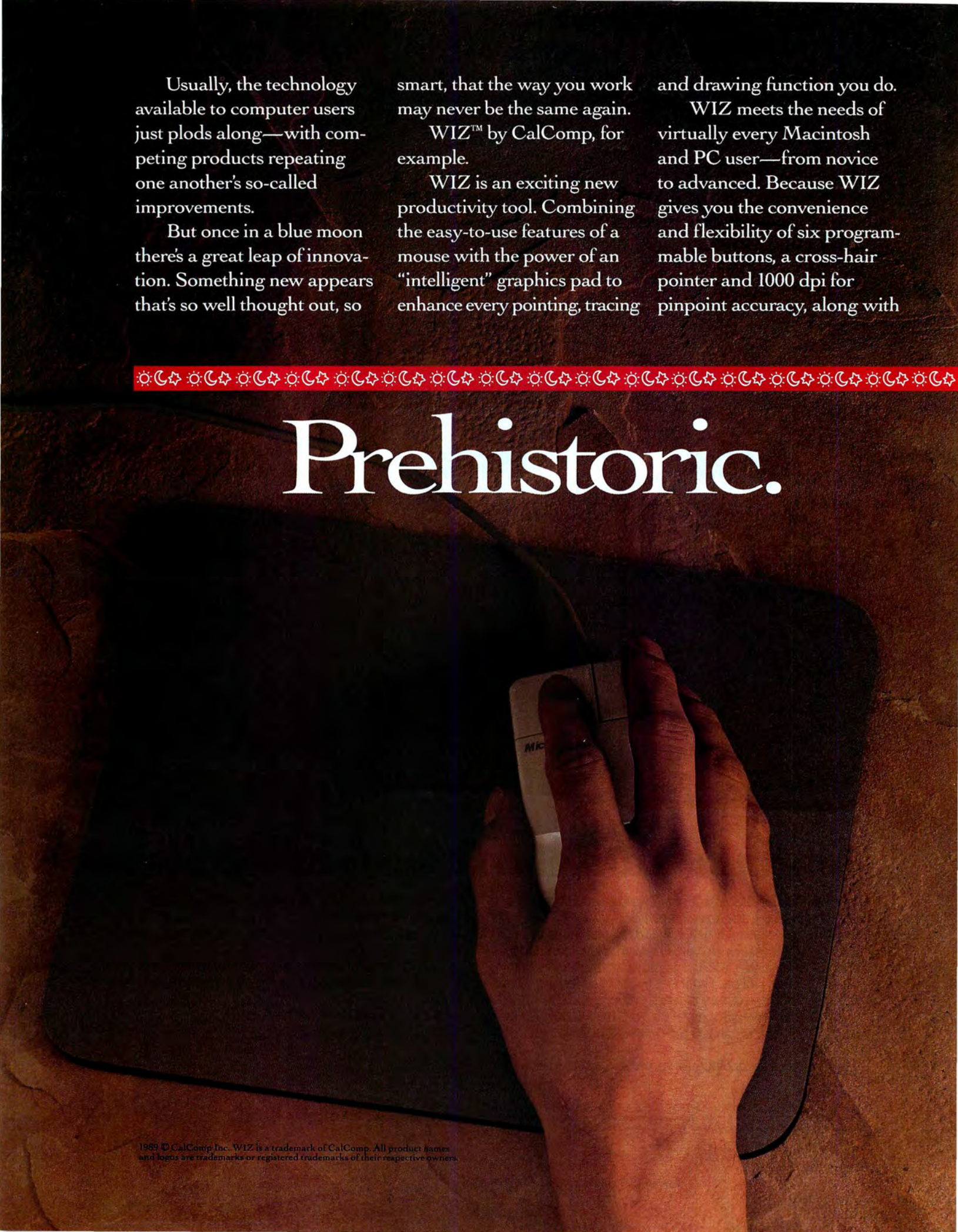
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WIZ is an exciting new productivity tool. Combining the easy-to-use features of a mouse with the power of an "intelligent" graphics pad to enhance every pointing, tracing and drawing function you do.

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MACWORLD

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Questions and Quick Tips Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to: Quick Tips, Lon Poole.

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BPA

IDG COMMUNICATIONS

The Story Of Apple® & Eve.™

In the beginning, there was an Apple. & a lot of software. Great stuff to use. Great stuff for pirates to copy free.

Then came a bigger, more powerful Apple called the Mac. The temptation for free software rose once more. & piracy again had its way.

Then Eve arrived. To quickly end the free-loaders' rule. & the rest is history.

Introducing EVE for the Apple–the software developer's key to a secure return on development investment.

EVE protects Macintosh software from piracy–with a simple but virtually foolproof concept: The software won't run unless the EVE hardware key is plugged in. And only those who purchased the software have a key that works with the program.

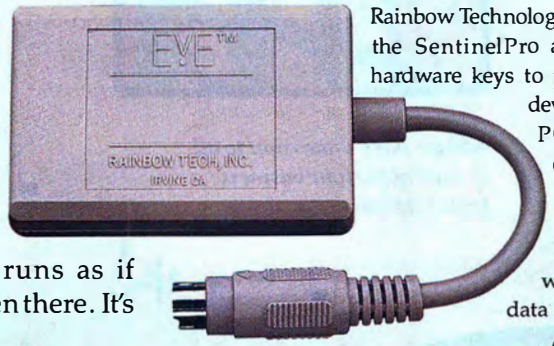
To developers, EVE's implementation is simple. Key codes are imbedded in the software which require a correct response from EVE any time the program is accessed. Without EVE, the software doesn't run.

And to users, EVE is totally transparent. The software runs as if EVE wasn't even there. It's that simple.

KEY FEATURES:

• For the Macintosh SE and II • Developer implemented • Completely transparent to the user • Permits unlimited backup copies • Seven programmable security locks • Up to seven programs per key • Multi-level password-based access • Installs via any Mac ADB connector • Compact and easy to install

EVE. The perfect companion to Mac software. For additional information, call Rainbow Technologies. European inquiries can be conveniently made to Rainbow Technologies Ltd, United Kingdom.



Rainbow Technologies also provides the SentinelPro and Sentinel-C hardware keys to protect software developed for IBM PCs, PS/2s and compatibles, and the Atari ST. And the DataSentry for PC users who want to protect data files.

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Multimedia defined.

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Mul-ti-me-di-a (mul ti-me de-e) *noun*. Involving the use of several media of communication, expression or entertainment. **1.** From the Latin word meaning more than one medium; to combine text, graphics, animation, sound and video for improved communication. **2.** The integration of several media when presenting, instructing or simulating concepts and ideas. **3.** Extremely effective when attempting to keep an audience "awake." **4.** Dangerous when used by competitors. **5.** The complete solution is available now—only from MacroMind—developers of the world's most flexible multimedia presentation and animation software tools.

There's more to this definition than meets the eye. MacroMind *Director*™ really delivers on the promise of communicating important ideas and concepts—going beyond words and pictures to engage all of the senses with exciting sound, animation, even video.



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Add an extra dimension to all of your important business presentations.

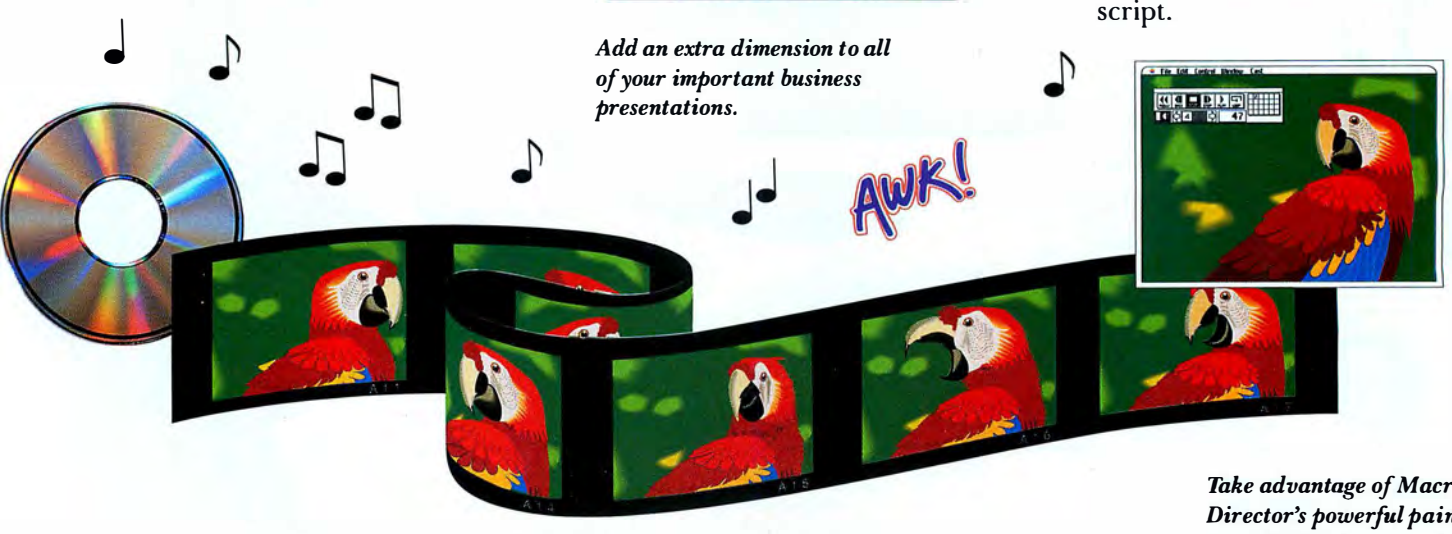
When presenting a case.

MacroMind *Director* can do amazing things for you when it comes to making business presentations—especially when share of mind, ear, body and soul is the main objective.

Create exciting images effortlessly with MacroMind *Director's* built-in tools. Or, import all of your sound and graphics from one of the standard Macintosh software applications. Take advantage of the MacroMind *CD-ROM*™, which offers a wide selection of ready made sounds and animations, to dazzle your audience with a truly caffeinated presentation. One that is sure to be memorable over time.

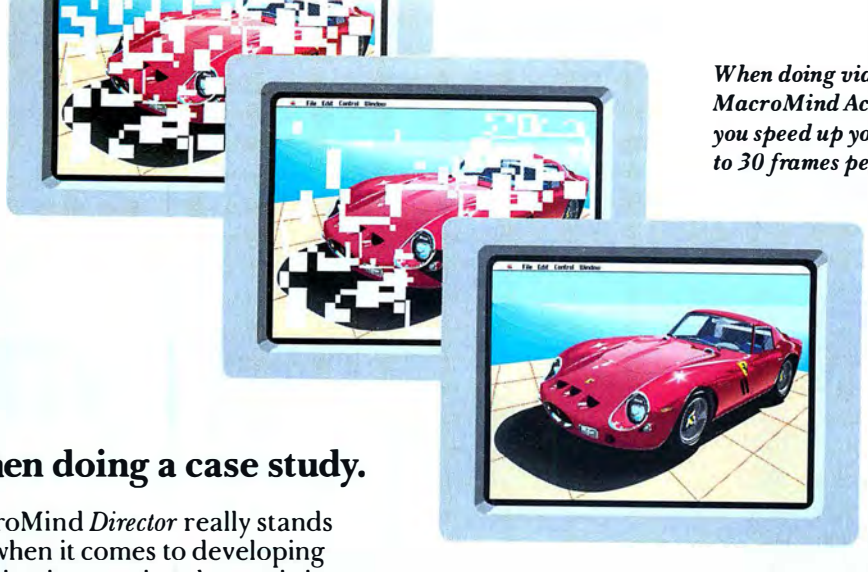
To move a case forward.

Add graphically exciting animation to all of your video work. Make your logo "jump" right off the screen—and orchestrate it to whatever tune you choose. Use graphics to add excitement to all of your video productions and important presentations. MacroMind *Director* can play an important role—whatever the script.



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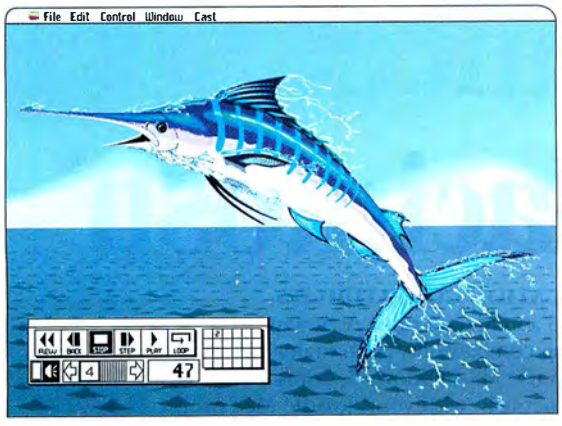


When doing video productions MacroMind Accelerator™ lets you speed up your animation to 30 frames per second.

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MacroMind *Director* really stands out when it comes to developing exciting instructional or training programs. Take the most complex subject—and make it easily understood. There is no content too challenging, or too simple, given MacroMind *Director's* powerful multimedia capabilities.

From the most fundamental corporate training programs, to a simulated moon landing—or moonwalking if you choose—it's the one product that really excels in and out of the training room.



MacroMind Director allows you to import images and sounds from most Macintosh software applications.

In case you need to simulate DNA . . . ASAP.

MacroMind *Director's* powerful capability to *simulate* complex scientific or medical concepts provides yet another powerful application. Import three-dimensional or flat images created using other Macintosh graphics-based software applications. Exciting models can be created—allowing you to *visualize* just about anything—from a DNA molecule to an assembly line at a manufacturing facility.

Let MacroMind *Director* clearly define how multimedia can work for you, whatever the endeavor or application. This is the one product that can do it all. See for yourself why the most creative minds are turning to MacroMind.

Simulate just about anything—even a "knee jerk" response







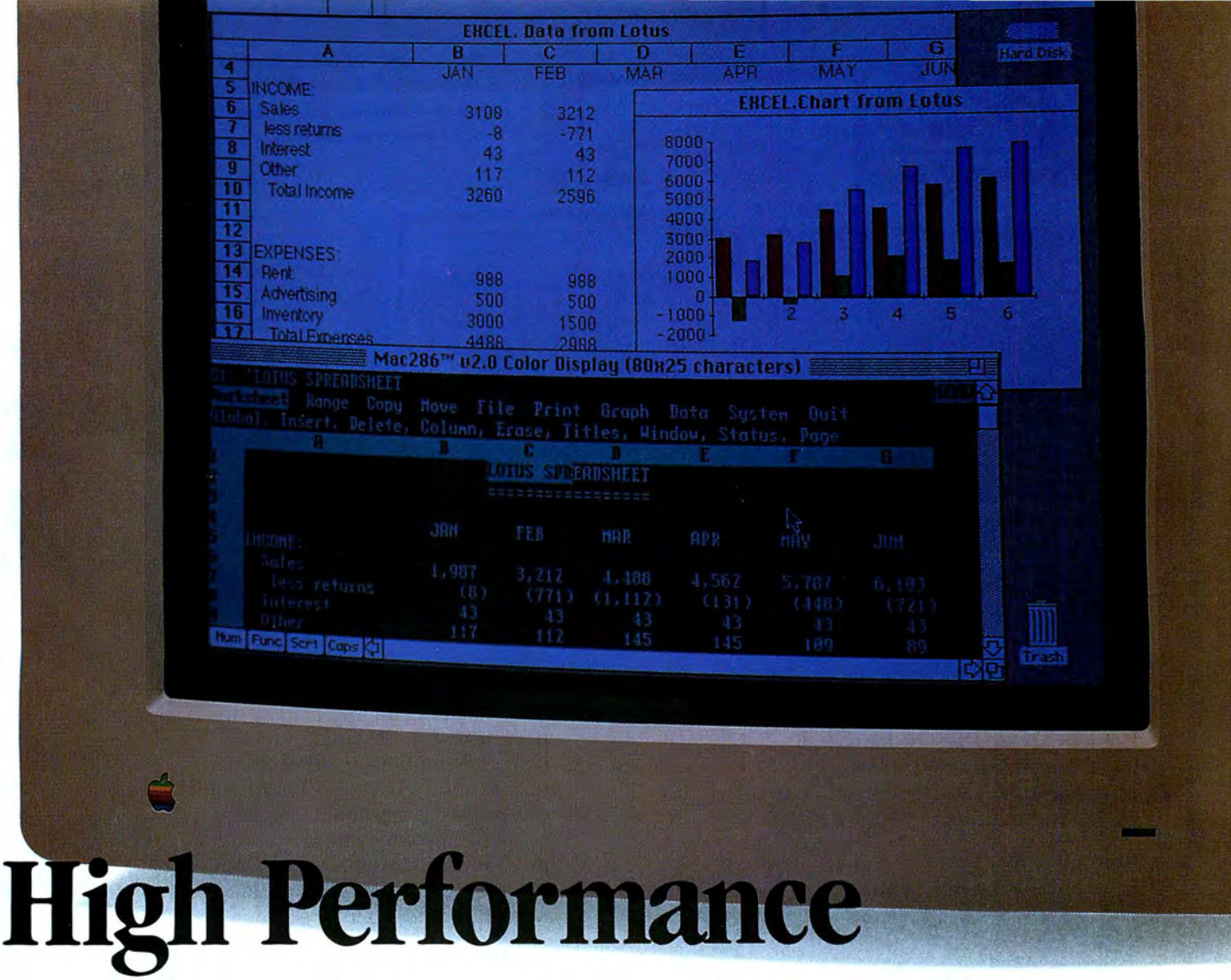
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MAC BULLETIN

INDUSTRY NOTES

Symmetry Merges with Teknon

Symmetry, publisher of Acta, HyperDA, and PictureBase, is merging with Teknon, the company that wrote Layered's atOnce. The new firm is keeping Symmetry's name but moving to Teknon's headquarters in Scottsdale, Arizona, and will continue to market Symmetry's line while developing and marketing new products. For more information, call 602/998-9106 or 602/844-2199.

Mass Microsystems Going Public

On September 22, Mass Microsystems filed with the Securities and Exchange Commission to make a public offering of 1.4 million shares of common stock, which the company expects to sell for between $4.25 and $5 a share. Mass Microsystems develops and markets a line of Macintosh hard disks and boards for video manipulation.

Apple Shuns DRAM Consortium

Apple has declined membership in U.S. Memories, an industry consortium formed to manufacture dynamic random access memory (DRAM) chips. Apple's reasons for not joining were twofold: it wants to spend its money on what it considers more important areas, and it does not see that consortium membership would benefit customers. Current members of U.S. Memories include IBM, Digital Equipment Corporation, and Hewlett-Packard. Apple did say, however, that it would consider purchasing DRAM chips from U.S. Memories.

Kinetics Sells K-Talk to Mt. Xinu

Kinetics announced that it has sold K-Talk, K-Spool, and K-Share to Mt. Xinu. The software provides access to AppleTalk protocols, LaserWriter print spooling, and

Apple Japan and Canon Investigated for Unfair Trade

Apple Computer Japan and its largest Japanese distributor, Canon Sales, are being **investigated by Japan's Fair Trade Commission (FTC) for violating Japanese antimonopoly laws.** The FTC is looking into claims that Apple Japan and Canon Sales pressured four Japanese computer magazines to reject advertisements placed by Step, an unauthorized, or gray-market, Mac importer. Apple Japan is also being investigated on charges that it asked two service firms not to maintain Macs bought from Step. Both Apple Japan president Shigechika Takeuchi and a Canon official denied the allegations.

MacWrite II and Open Architecture Software

Version 1.1 of MacWrite II supports drop-in modules for adding features. Claris plans to implement the new technology, called XTNDs, in all of its applications. The first batch of XTNDs for MacWrite includes about 30 translators for reading and saving in AppleWorks and in Mac and MS-DOS versions of Microsoft Word and WordPerfect, as well as in Acta and other file formats. DataViz, which developed the translators Claris is using, has additional translators for WordStar, XyWrite, the VAX word processor WPS Plus, and others, and is developing a translator to import records from DOS dBASE into MacWrite mail-merge documents. Claris is making the extension format available to developers at no charge. MacWrite II version 1.1 also adds substantially increased speed on the Mac Plus and SE, built-in virus protection, and an improved online help system. Version 1.1 lists for $249 and is available free on request to registered owners of version 1.0. For more information, contact Claris in Santa Clara, California, at 408/987-7000.

Sybase Offers Mac API

Sybase has introduced its first Mac product, **a Mac-based application programming interface (API) for the company's Sybase SQL Server relational database-management system.** The API, called Open Client, comes in two versions and works over networks running TCP/IP and DECnet protocols. DB-Library supports Macintosh Programmer's Workshop (MPW) C; Hyper/DB-Library provides SQL command capabilities within HyperCard. Apple's Strategic Investment Group made a minority investment in Sybase in August 1987.

Quick Look at a New Panorama

Panorama, described by its publisher ProVue as "the database that thinks it's a spreadsheet," is being revised to version 1.2. The upgrade features **the ability to trigger a macro by entering data in a field;** matrices, which will simplify the use of line items; the ability to select records using multiple criteria at once; and a summary capability for Flash Art that will, for example, make it possible to overlay data on a map or a calendar. The new version will also concatenate fields when printing. Panorama's list price remains unchanged at $395, but upgrade pricing had not been decided at press time. ProVue is also publishing a 40-page how-to book for $6.95. For more information, call ProVue at 714/892-8199.

OCR Goes Preppie

Blue Solutions (until recently Orange Solutions) is working on a product, tentatively called OCR Prep, to **clean up TIFF images of scanned text and prepare them for optical character recognition** packages. OCR Prep is designed to isolate letters from extraneous bits in gray-scale or black-and-white scans of dirty originals such as newspapers. It will also correct for skewing and misalignment of the original scan, one of the primary reasons optical character recognition packages misidentify

(continues)

INDUSTRY NOTES

AppleShare file server capabilities to UNIX and computers on networks, respectively. Mt. Xinu will continue to develop and market the three programs.

Good News for NuPaint

NuEquation has turned over distribution of its black-and-white paint package, NuPaint, to Good Software. The list price is unchanged at $139.95. For more information, contact Good Software at 214/239-6085.

Mediagenic Drops Most Mac Products

Mediagenic is stopping development on its TenPoint0-labeled Mac products and plans to sell the division. Affected products include Focal Point II, Reports for HyperCard, Business Class, City to City, and OpenIt. The Manhole and Cosmic Osmo are not affected by the change. For more information, contact Mediagenic at 415/329-0800.

Plus Changes Hands

Olduvai has given up distributing Format Software's HyperCard work-alike, Plus, and Spinnaker Software is planning to take over Plus. For more information, contact Spinnaker at 617/494-1200.

Japan Market Forum

Macworld is hosting a forum for companies interested in the Japanese Macintosh market. The Japanese Market Forum is cosponsored by Apple Pacific and IOG Japan and is scheduled for January 12 at the Hotel Nikko in San Francisco. Speakers from Apple Japan, Apple Pacific, and other companies will cover the current market, future opportunities, establishing business in Japan, and localization issues. For more information contact David Ushijima by phone at 415/978-3239 or by fax at 415/442-0766.

The Empty Table

Table Tools publisher Mansfield Systems has closed its doors. Mansfield Systems president James Duke said it is unlikely another publisher will take over TableTools to provide support or to market version 2.0, which was about to ship. However, TableTools owners can buy the competing Tycho for $99.95, a $50 discount. For information about Tycho, contact MacCreations at 415/359-7649.

letters. OCR Prep is scanner-independent and should work with any standard TIFF file. At press time, no release date or pricing had been set. For more information, contact Blue Solutions at 805/371-4521.

Virus Prevention Built In to New Applications

Virus-prevention recommendations made by the Software Virus Task Force, a committee of the 1500-member Software Development Council, have already been implemented in at least three Macintosh products: Advanced Software's DocuComp, a utility for comparing versions of word processor files; AppleLink 5.0, the software for Apple's proprietary online system; and version 1.1 of Claris's MacWrite II. According to SDC president Michael Odawa, **the recommendations provide a generic description of how to incorporate virus-detection code into an application** so that it "performs a self-integrity check similar to counting your fingers and toes when you wake up in the morning." For more information, contact the Software Development Council at 415/854-7219, or write Odawa at Simple Software, 220 Redwood Hwy., #42, Mill Valley, CA 94941.

MacMoney Invests for the Future

The home-finance package MacMoney is expanding in several directions. Version 3.5, which should be available now, has hooks for add-in modules, and the first module planned is InvoiceIt, which uses MacMoney's categories and figures to generate invoices and prepare reports for sales, cash received, and aging. Version 3.5 also adds the ability to change the opening balance, edit categories after using them, perform quarterly and semiannual loan planning, and create bar and line graphs comparing specific income and expense categories. MacMoney version 3.5 lists for $119.95, and InvoiceIt lists for $99.95. For more information, contact Survivor Software at 213/410-9527.

Online Service Comes Home

Macintosh users can now access Prodigy, **the family-oriented online system developed by Sears and IBM.** The Prodigy system features a simple interface and offers online shopping, clubs, magazines, movie reviews, horoscopes, news, group games, and even a summary of the day's soap operas, as well as electronic mail and conferencing. Each Prodigy account covers up to six members and costs $10 a month for unlimited use; so far only electronic banking carries surcharges. Prodigy takes over the entire Mac screen with attractive but definitely IBM-looking graphics. It does not run under MultiFinder or in a window, preventing users from cutting off the strip of advertising along the bottom of the screen. Prodigy's Macintosh software requires at least a Plus and is available for $49.95 with three months of free time. For more information, in the United States contact Prodigy at 800/822-6922, ext. 205.

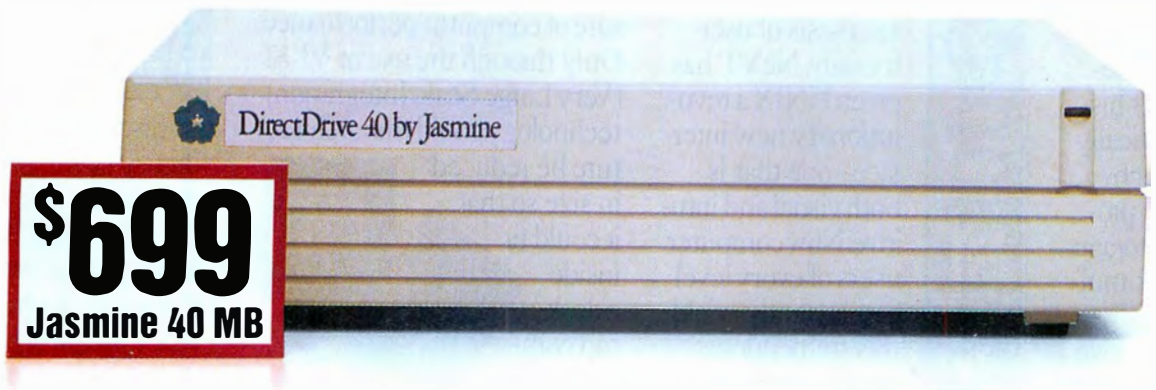
Mac II Gone but Not Forgotten

Apple has admitted that it took the Mac II out of production in March, after introducing the Mac IIcx. The Mac II was the first open-architecture Macintosh, featuring six NuBus add-in slots, and the first Mac with a 32-bit architecture. But the IIx, IIcx, and IIci outshine the Mac II. The newer machines are built around the 68030 processor, which is slightly faster than the Mac II's 68020 processor and features the memory management that will be necessary to take advantage of System 7.0's virtual memory capability. **But don't scrap those 68020-based IIs: they can easily be fitted with an inexpensive memory management chip** for users who do require virtual memory. For $275, Connectix supplies the 68851 PMMU with version 2.0 of Virtual, software that creates up to 14MB of virtual memory under the current System 6.0. For more information, contact Connectix at 415/324-0727.

Claris Public Folder Offers File Exchange

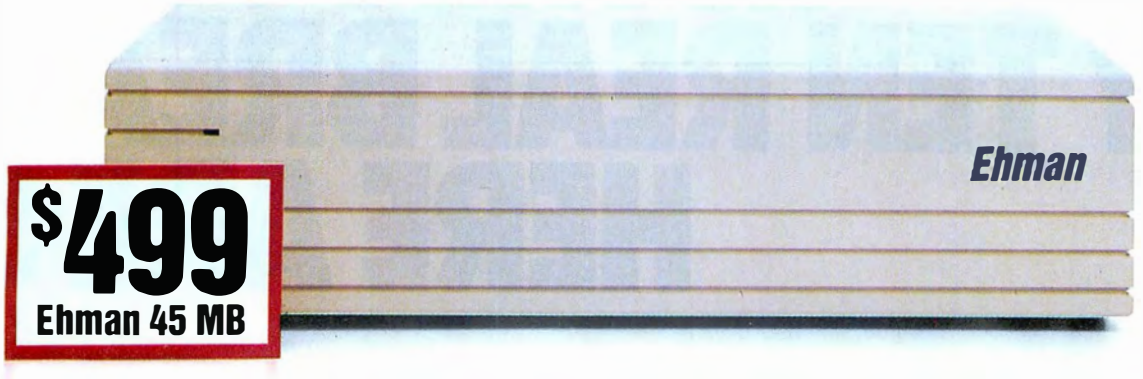
Looking for a way to exchange files on an AppleTalk network—without a file server? Claris programmer Michael Peirce has written a Chooser document called Public Folder that lets you do just that. Using it, **networked users copy files to and from a specific folder on another user's Mac drive.** Public Folder is free to any licensed user of Claris software, and is available on bulletin boards such as CompuServe. M

Users Won't Know The Difference.



$699
Jasmine 40 MB

But Buyers Will.



$499
Ehman 45 MB

According to a recent article in *MacWorld Magazine*, "There is very little to distinguish one hard drive from another, other than speed, software, and price." We agree.

Only a very few milliseconds of access speed separate the Jasmine and the Ehman hard disk drives, and both include utility software programs free. Both come with two year warranties and a 30-day money back guarantee. And both companies enjoy a reputation for manufacturing high-quality products.

That brings us to price.

As you can see, the Ehman 45 MB hard drive is $200 less than the Jasmine 40 MB. That's a difference users may not notice, but buyers certainly will. Ehman's low Rocky Mountain overhead always means lower prices.

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Hard Drive Prices

Size (MB)	Internal	External
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30+	$379	$449
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60+	$499*	$579
80+	$579*	$649
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135	$899	$999
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45 Removable		$799

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*Good only on Macintosh II models. SE drives also available. Utility software not available on 20 MB. All product names mentioned are trademarks of their respective holders. Prices subject to change without notice and may not reflect limited-time pricing. 3% Surcharge on American Express.

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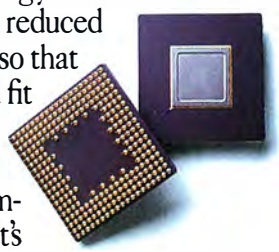
1 The NeXT™ Computer System is the first computer in the world (and so far the only) to use read/write/erasable optical storage. While PCs today are typically equipped with Winchester drives that store 20 to 40 MB, a single optical disk can store 256 MB. Plus, it is removable, for portability and added security. This dramatically new technology provides storage that is simultaneously vast, reliable and cost-effective—a combination unmatched by computers of any size.



2 NeXT has made the power of UNIX® usable by mere mortals. UNIX is the high-performance operating system used by workstations to achieve true multitasking and superior networking. Unfortunately, it has always been the antithesis of user-friendly. NeXT has given UNIX a revolutionary new interface—one that is both visual and intuitive. Now computer users of every level can instantly wield this tremendous power, with no technical knowledge whatsoever.



3 To achieve the power needed for the 90s, NeXT bypassed traditional workstation architecture and went directly to that of a mainframe. This eliminates bottlenecks and attains an extraordinary level of system "throughput"—the true measure of computer performance. Only through the use of VLSI (Very Large Scale Integration) technology could this architecture be reduced in size so that it could fit inside a desktop computer. It's a mainframe on two chips.



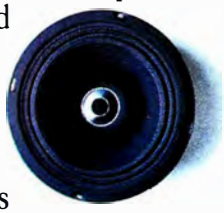
4 While PostScript® has long been the industry standard for printing, NeXT has made it fast enough to also be used on the display. This "unified imaging model" ensures that what you see on the display is precisely what you will get on paper. All your work, in any size type and any degree of rotation or magnification, appears with perfect 92-dots-per-inch clarity on the NeXT MegaPixel Display. And with laser precision at 400 dpi on the NeXT Laser Printer.



IN THE 90s, WE'L
ONLY TEN REAL BREAKTH
HERE ARE SEV



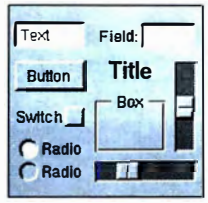
5 The NeXT Computer System is the first to be capable of producing CD-quality sound. Without requiring any additional equipment. This feat is made possible by a chip that has been specifically designed for the task of manipulating sound—the Digital Signal Processor (DSP). Because this processor is standard in every NeXT machine, software developers will be able to call upon its power to enrich programs we use every day. Now computers will not just be seen, but heard.



6 NeXT Mail takes electronic communications beyond anything you've seen on a personal computer before. Now you can send and receive multimedia mail—including text (with varied type fonts, styles and sizes), graphics and voice messages. And despite its high level of sophistication, NeXT Mail is so intuitive, you may not ever need to open the manual. NeXT Mail is built into the system, along with Ethernet and TCP/IP, so the NeXT machine can quickly become a part of existing networks.



7 Programmers can create software on the NeXT Computer up to ten times faster than on any other computer—the result of a breakthrough called NextStep.® It gives software developers the power to create the graphical user interface portion of their applications (often the most time-consuming and difficult part) without any programming at all. This revolutionary environment means we will see more programs, and better ones, in less time than ever possible before.



These seven breakthroughs will change the way we use computers in the 90s. Which is why Businessland, the leading supplier of computers to corporate America, chose the NeXT Computer System as the workstation they will offer. Call us at 800-848-NeXT, and we'll send you a 28-page brochure describing the NeXT Computer. We'll also give you the address of your nearest Businessland Center. There, you can experience for yourself the first seven breakthroughs of the 90s. And get a good idea where the next three will come from.

L PROBABLY SEE ROUGHS IN COMPUTERS. EN OF THEM.



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Multimedia What?

Or, don't you hate it when that happens?

by Jerry Borrell

There I was, working away in PowerPoint, hammering out a last-minute presentation when suddenly the multimedia urge struck me. I realized in that instant that my presentation should be more than just good type—it should have pictures, maybe some animation. After all, as the editor of *Macworld*, my presentation should be state of the art.

So I opened a new slide and began tinkering with PowerPoint's drawing tools. After significant effort, I recognized that I was not going to impress anyone with my artistic abilities. I thought of those glowing advertisements I had seen on television—I should be able to do that on the Mac, right? Inspiration hit. I might not be able to amaze with PowerPoint's graphics, but what about using MacDraw?

I wanted to add an organization chart to my presentation, so I opened a copy of our org chart in MacDraw, did a Select All function, copied, closed MacDraw, and reactivated my PowerPoint window. I positioned my cursor on the slide window and hit Paste. Wham. No problem. Except that I needed to resize the drawing, and I needed to add some color. So I started in, only to realize that I could not edit my original drawing! In fact I couldn't even change the type.



DON'T YOU HATE IT WHEN . . .

The Mac lives down to the expectations of, say, a DOS machine? Here I am with a presentation that has 48-point type for text slides in yellow on a blue background, and then I have an unreadable org chart. Someone explain to me why Apple and Microsoft can't get together and exchange information so that I get an editable document. Jeez. Even spreadsheets, word processors, and databases have common formats for the import and export of data. (Well, some do.) So what about graphics? It was jarring, this image of the little helicar from the Apple ads on television compared with my dippy org chart.

Then more inspiration struck. It occurred to me to borrow some good work. I thought of the illustration by Arne Hurty that explains how laser printers work (it appeared in our October 1989 issue). Arne put a few days into that drawing—that should look great! The illustration was done in FreeHand and took up 314K of storage. I found the file and opened it.

Or tried to. Actually, FreeHand wouldn't open, and a dialog box told me I didn't have sufficient memory. I knew that was incorrect; only two applications and the Finder appeared on the Apple menu. I have 5MB of memory. It occurred to me that since I don't use FreeHand frequently, I probably didn't have sufficient memory allocated to the program. I doubled the memory allocation and tried again. It worked.

Don't you hate it when that happens? Don't you wonder why applications can't figure out for themselves if there's enough memory in the computer? Why doesn't the system software or the application take care of that for me?

TIME FOR A COFFEE BREAK

I wait for the slow (get-a-cup-of-coffee-type slow) screen-drawing process. Finally, the image appears. I do a Select All function on it. I cut the image and close FreeHand. I activate PowerPoint, select an insertion point, select Paste, and voilà—nothing.

Twenty minutes go by. I try copying the image and pasting. Nothing. Each time I try anything in FreeHand, of course, I have to wait for the screen to redraw the image. I try the venerable Scrapbook. No luck. I try asking others. "Try saving it as an EPS file in FreeHand," I'm told. Okay, I do that. I open FreeHand again. I select the drawing and copy. I save in an EPS format. I close FreeHand. I reactivate PowerPoint, which I've kept open in a window. I reopen the document and do the copy-close-paste jig. I note to myself that it's a good thing I have a 19-inch monitor, 5MB of RAM, and a Mac IIcx, or this would be a slow process. It works. The drawing appears in my presentation.

Now we're talking multimedia, right? Well, the picture's too small. PowerPoint

(continues)

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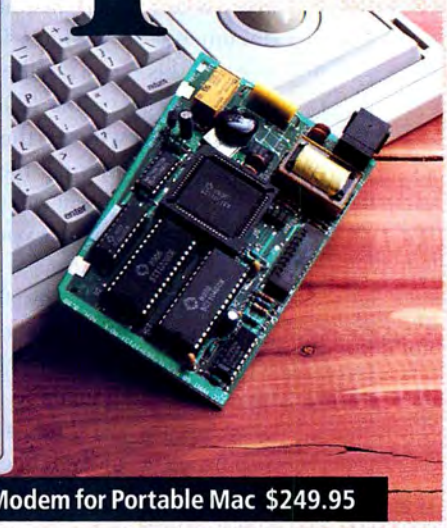
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MacWorld, May 1989.





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has a resize function. I select the drawing and create a box. By dragging on one of the handlebars I make the box bigger. And my drawing? Looks like hell. It breaks apart when scaled, just like the MacDraw document. Yo—what's happening here? After all this, I can't make the drawing big enough to be visible to a small group of viewers who will see this on my 19-inch screen. The internal file format of the FreeHand document can't be manipulated by PowerPoint. Don't you hate it . . . well, you get the idea.

I'm drumming my fingers by now, more than a little impatient. I stare at my screen, subconsciously noting the size of my file. I note that the window I keep open for my documents in the View by Size mode has not changed since I started. I am reminded that I must close the window and reopen it to see how the size of the file has changed. I am reminded that this is a pain in the ass. I am reminded of long-winded speeches about the elegance of the interface.

Still, I'm doing good stuff. Okay, marginally acceptable stuff. But I'm encouraged enough to try some more. I grapple with how to get something really impressive into my presentation. What about ImageStudio? I look at the sample images included. There are some really dramatic 8-bit gray-scale files. I select a big one, 897K. I open it and it is converted to a RIFF file format. Why, I wonder, does the program inform me of this? Never mind. I select and cut the document, close the application, and open a new slide in my presentation. I paste and wait . . . it appears. Wonder of wonders. I select Slide Show in PowerPoint and review my presentation—and the program halts when it reaches the gray-scale file. I quit and start again. This time it opens without a hitch. I add a few more text slides and quit.

WHAT'S IT ALL MEAN?

A lot, but basically this experience tells me that we are about as far away from real multimedia as it is possible to get. If these few applications won't transparently interchange graphics files (and allow me to edit them), the field of multimedia is a figment of our collective imagination. I hesitate to think what would have happened if I wanted to use animation or, god forbid, some video sequences. This also suggests to me that Apple has to play a leadership role in cleaning up the mess that is accumulating in the graphics arena, or we will be as bad off as the IBM community.

Longer term, I wonder what will happen with features in System 7.0 like live copy/paste. Hey, it doesn't work now—what's going to happen when applications start launching other applications, or reaching out over networks to update themselves automatically?

And unfortunately these issues raise a host of problems that have been bothering me for a while. Like the five-minute wait while my computer loads all the INITS. (Why do I see them? Why do I have to wait for them to do something when I start up my Mac?) And what about those silly dialog boxes that tell me to open a document from within an application when again, the system software or application should take care of all of that for me?

But I digress. My point here has to do with the reality, or lack thereof, of multimedia. We do have exciting products that, together with a lot of experience and time, can produce remarkable results. The whole multimedia blitz, however, feels like desktop publishing around the time of the introduction of the LaserWriter in 1985.

THE BIG DAY

So the big day arrived. I had my Mac in the room, with the Kodak slide-show device hooked up so that I could run the presentation away from the computer. When called I rolled the machine forward and started in. (Actually, the batteries of the Datashow were in backwards so it didn't work on the first try.) I had enlarged the type size to 96 points so that from 10 feet away you could read the screen. I grimaced my way through the MacDraw and EPS files. They were too small to be seen. Then I went on to the big finale, my ImageStudio file, which refused to open (until later in the privacy of my office, where it performed flawlessly). Don't you *really* hate it when that happens?

Maybe we should all insist that what we've got works before we go charging off into the future of multimedia. ■

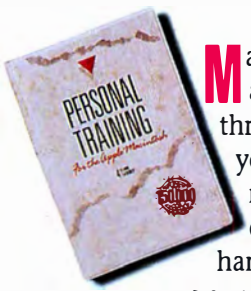
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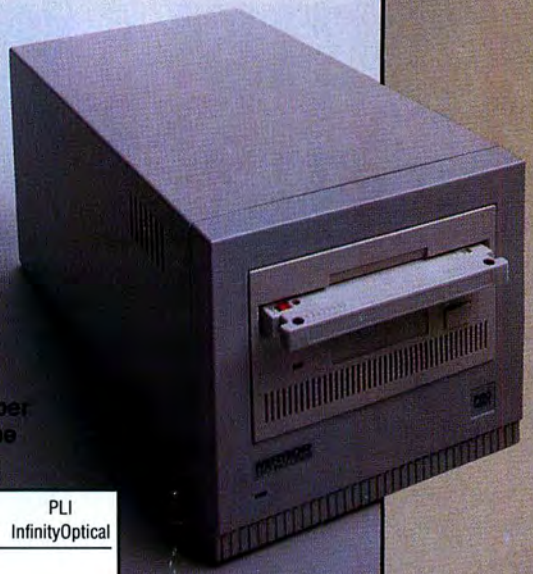
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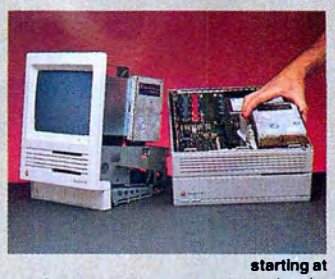


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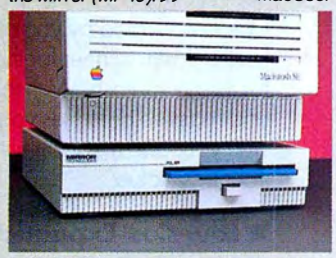


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LETTERS

A forum for Macworld readers



MICK WIGGINS

Practice Makes Perfect

Thom Hogan's "The Show Must Go On" [August 1989] touches on the most basic blind spot in the world of Mac mania—the idea that owning a Mac and the right software can make you an instant pro at anything. The 128K Mac was simple and intuitive, but in the world of 8-megabyte color machines, too many Mac users won't face the reality that more serious training and skills—or at least some practice—are critical to making the best use of the Mac's prowess. This is definitely the case with desktop presentations. We regularly see clients trying to do in a week what artists on our staff have taken years to learn. It's not the fault of desktop presentation software that Hogan is not a skilled graphic artist. But he's not entirely to blame either. Software developers and Apple Computer itself are plenty guilty of promoting the idea that you too can be an instant professional in the discipline of your choice.

Hogan does us all a disservice by scolding developers for producing "inadequate" products when he hasn't taken the time to learn them properly. With a bit more effort he would have found, for instance, that Cricket Presents offers a snap-to guideline that lets you align anything anywhere you want and that Aldus Persuasion's master background tools are quite powerful.

Desktop presentation software is a new and evolving application. In this first-generation lineup are some very good programs, albeit with room to mature. However, users shouldn't expect to produce successful graphics until they've taken the time to learn how to be graphic artists.

Gary Karp
Chartmasters
San Francisco, California

Hogan has been using most of these products regularly since their introduction. One of his gripes is that Cricket Presents is the only presentation program that has an alignment tool—but it's not intuitive and is poorly described. The only program he finds intuitive and easy to use—PowerPoint—lacks most of the features necessary to satisfy a presentation professional, while the feature-laden Persuasion has a clumsy interface and design. If PowerPoint were to acquire Persuasion's feature set or Persuasion PowerPoint's ease-of-use, he swears he would stop complaining.—Ed.

In Praise of FullWrite

I enjoyed reading the *Macintosh Bible* until I came upon advice that at best is ill informed and at worst a vicious hatchet job: Naiman's offhand dismissal of FullWrite Professional.

I have written books on five different computer systems using five different word processors since 1979. My last two books were done on a Mac II using FullWrite, which I've been using exclusively since I first tested the demo disks being given away at the 1988 Macworld Expo.

The working folder for the last book contained nearly 6.3 megabytes. The finished formatted book is 2.4MB, spread over 320 full-size pages and containing 1500 discrete entries in 24 chapters with dozens of sidebars, pictures, and notes. The headers are different on nearly every page and are

(continues)

Corrections

In the table "Searching for the Right Image" on page 155 ("Screen Tests," August 1989), the PCPC II color display should have read 1.5 in the Price-Dependent category, since this monitor was very competitively priced at $5545.

The address of Steven B. Halls, developer of Talking Moose (Where to Buy, October 1989), is 3837 Luther Pl., #303, Saskatoon, Saskatchewan, Canada S7H 4B1.

*The SC-7500 Color Scanner (*New Products, *November 1989) is manufactured by Mitsubishi International, 914/997-4999.*

The address for HJC Software ("Start with Utilities," *October 1989), manufacturer of Virex, is P.O. Box 51816, Durham, NC 27717, 919/490-1277.*

*The phone number for Creative Computer Resources, maker of Personal Golf Stats 2.0 (*Updates, *November 1989), is 805/968-7529.*

The cost of upgrading an Apple LaserWriter IISC to a IINT ("Paging All Printers," October 1989) is $2699; the cost of upgrading a IISC to a IINTX is $4699.

*The address for SuperMac, maker of the DataFrame XP 330 hard disk (*Where To Buy, *November 1989), is 485 Potrero Ave., Sunnyvale, CA 94086, 408/245-2202.*

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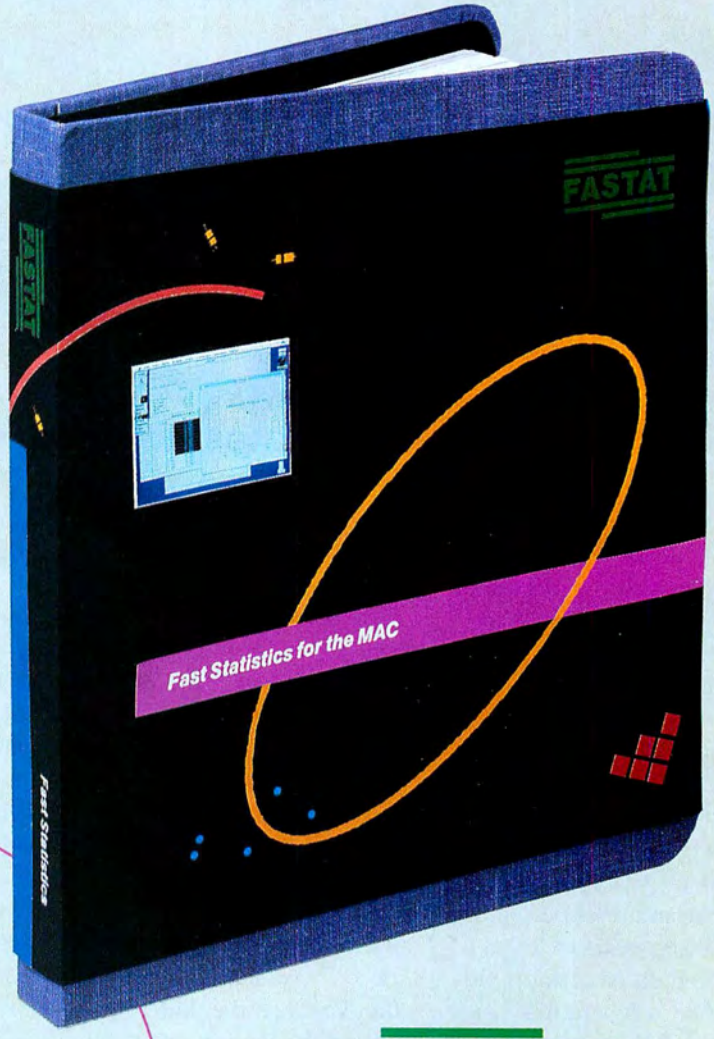
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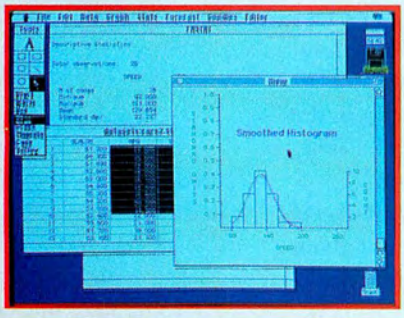
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oriented left and right. FullWrite pictures, tag lines, signatures, and sidebars were stored in MultiClip and integrated perfectly when needed.

FullWrite's most impressive feat was the 18-page, 3100-entry, multilevel index it allowed me to create. It was set in a mix of bold, italic, and plain type. I seriously doubt whether any other word processor (with the possible exception of the outrageously expensive Interleaf) could create an index of this size and sophistication.

Both books were printed on the first model of the Apple LaserWriter without hitch or hesitation, yet Naiman says not to buy it until it "works better" with a LaserWriter. How much better could it work?

FullWrite isn't perfect. I'd like to see a line-count indicator directly on screen. And while setting columns is duck soup, making them all different widths is difficult. There are a few other minor things I'd change, but in this full-time user's opinion, there is no other word processor on the market as versatile or as simple.

Tony Hyman
Claremont, California

In Defense of Snap

As a senior designer who has beta-tested Snap, Intergraph Microstation, MacCad, and CADMover, I feel qualified to respond to your review of Snap [*Reviews,* September 1989].

Snap does not look like a Macintosh draw program because it is a CAD program that is much more accurate and flexible than any draw program. Snap gives you the ability to build your own on-screen button menu or a custom digitizer menu. Snap allows you to create your own menus with the graphics that you choose, not some canned menu setup such as the other programs provide.

You stated that you could not launch Snap with the 256-color setting on a Mac II with 5MB RAM. If you're using MultiFinder, you must allocate 2MB of memory to Snap (rather than the default setting of 1MB). On my 2MB Mac II, with 256 colors and the virtual screens turned on, I have a maximum design file size of 248K. With 4MB, the maximum design file size would be about 2.2MB. With the virtual screen feature turned off, you'd have a maximum design file size of about 920K using only 2MB RAM. Note that this is without using MultiFinder.

It's strange that you found the color control hard to use, because Snap has one of the most flexible color setups of any CAD program. You can select an active color by using the color table or the key-in CO=_. You can also modify the 256-color table by double-clicking on a color and using the Apple color picker to change the color's number.

CAD programs should not be judged by how Mac-like they appear but on their productivity level. Having all your commands in front of you on a digitizing tablet beats anything you can do with a mouse.

Robert Newhall
GulfCoast CAD, Inc.
Largo, Florida

While Snap does allow you to use MultiFinder, it's not easy to figure out how. Though reasonable as set up, the color controls would be easier to use if they were displayed in the palette.

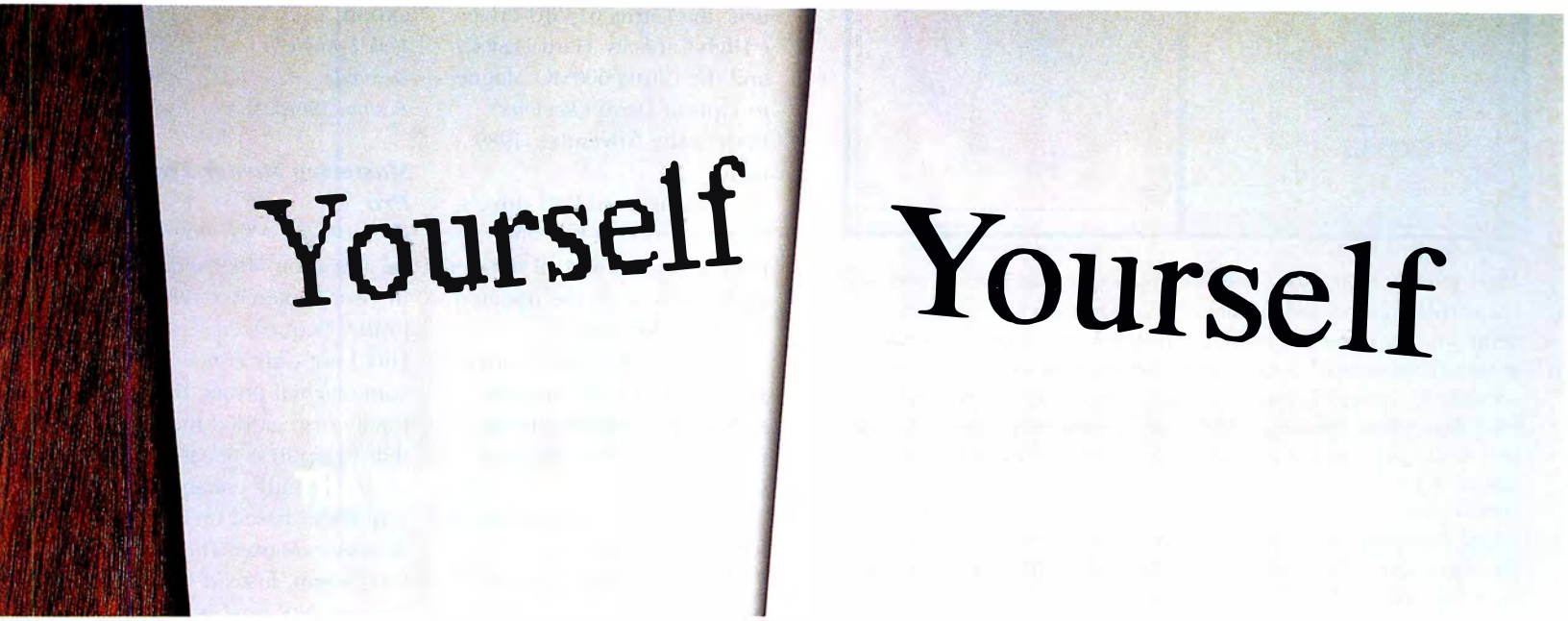
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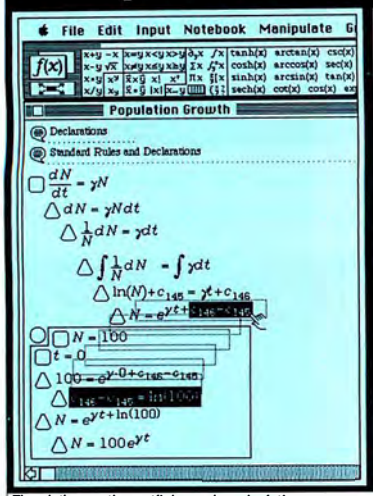
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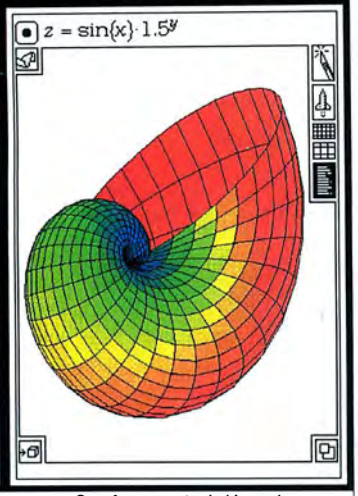
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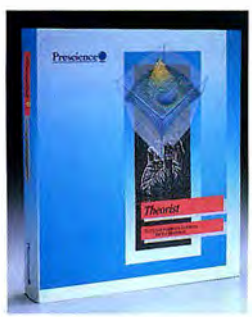


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Although Snop's flexibility can be an advantage, one of the Mac's key attractions as a CAD platform is its standardized interface. Powerful programs that adhere to the standard simply are more useful to more people, even CAD professionals.—Ed.

La Cie Product Updates

We would like to note some changes and clarifications to information published about two of our products: the Cirrus 613MB drive ("High-Capacity Hard Disks") and the Cirrus 600MO Magneto Optical Drive (*Reviews*) both in the November 1989 issue.

The Cirrus 613MB drive's booting problem has since been corrected and all shipped drives now have the updated drive mechanism.

The 600MO optical drive promotion was incorrectly stated. The customer must purchase the drive from La Cie and then La Cie purchases a Mac Plus from Businessland for the customer.

All optical drives come with preformatted cartridges. In addition, La Cie now offers both Ricoh and Sony drive mechanisms for its magneto-optical line.

Toni Abrahamson
La Cie
Tigard, Oregon

Insights on Insight

We were excited to see *Macworld* devote a feature article in the November issue, "A Full Accounting," to Macintosh accounting. Although we feel the subject was covered very thoroughly, there are a couple of points we'd like to clarify.

We sell only a single-user version of our Insight Expert Accounting series, which lists for $695 per module. Each module is fully networkable and can run concurrently with any other Insight Expert module, though the modules themselves are not multiuser. In the second quarter of 1988 we took Insight Multiuser off the market, but we continue to support the product. At that time, we began to concentrate on making Insight the first Macintosh accounting product with flexible data import and export.

Velle J. Kolde
Layered
Boston, Massachusetts

Mastering Master Tracks Pro

Christopher Yavelow's article on MIDI sequencers in your September 1989 issue ["MIDI Sequencers: Greatest Hits"] not only contained some factual errors, but also totally disregarded the fact that Passport is releasing Pro 4 (a significantly enhanced MIDI sequencer based on its predecessor, Master Tracks Pro) this month, instead featuring Portrait. Not only is Portrait still unavailable, it's been announced on the Pan network that Resonate will not release it. The feature-comparison chart is riddled with inaccuracies about Master Tracks Pro. In his conclusion the author steers "anyone who isn't a serious musician, toward Master Tracks Pro." I would consider the likes of such Master Tracks Pro users as The Grateful Dead, Prince, Billy Cobham, and Stevie Wonder's band, among many others, fairly serious musicians. As Yavelow acknowledges, Master Tracks Pro is known for its highly intuitive user interface and ease of use; however, it's misleading to imply that this is at the expense of

(continues)

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Passport Designs
Half Moon Bay, California

Passport provided us with version 3.3 of Master Tracks Pro (the reviewed version) and promised to keep us up-to-date on future releases. Pro 4 did not ship until several weeks after the article was published. (We did print one inaccuracy about version 3.3: that Master Tracks Pro requires a Mac Plus, when actually it will run on a 512K.) Pro 4 does indeed have many of the features missing from 3.3. Finally, rather than steer serious musicians away from Master Tracks Pro, we merely wanted to emphasize that its intuitive interface, ease and speed of use, and learning curve made it suitable for nonprofessionals as well.—Ed.

Stand by Your Product

I find the letters column to be a good source of information about companies and programs that I may or may not want to deal with, based on other users' experiences. Thus, I would like to commend Fox Software for its customer support.

The last time I called, the tech rep told me of a future update to FoxBase+/Mac that would solve the problem I was having. I waited for the update but never heard anything until I read an ad for version 2.0.

So I zipped off a letter asking why I wasn't informed of the update and how I could obtain it. The following week I received a package containing new manuals and the version 2.0 disk—all at no charge.

Even the best companies sometimes let things slip through the cracks, but when the problem is rectified in such a generous and efficient manner it restores all my confidence in the company. I love FoxBase+/Mac, and it's nice to know that such a good program has an equally good company standing behind it.
Christyne Imhoff
Winnetka, California

The Invisible Folder

Gone are the days when System Folder meant a folder with the System, Finder, and four or five small additional files. At the moment, my System Folder holds 92 files and folders, all of which *have* to be there. I always try to keep no more than 10 items in a folder, but there is nothing I can do about this huge System Folder.

Could someone please invent a transparent (not HFS) folder type that would let me place my INITs in one folder, my CDEV files in another, and so on, while making the Mac think that all those files are squatting in one flat System Folder? It should be easy to assign a different folder icon to this new folder type.
Ingemar Öhberg
Skövde, Sweden

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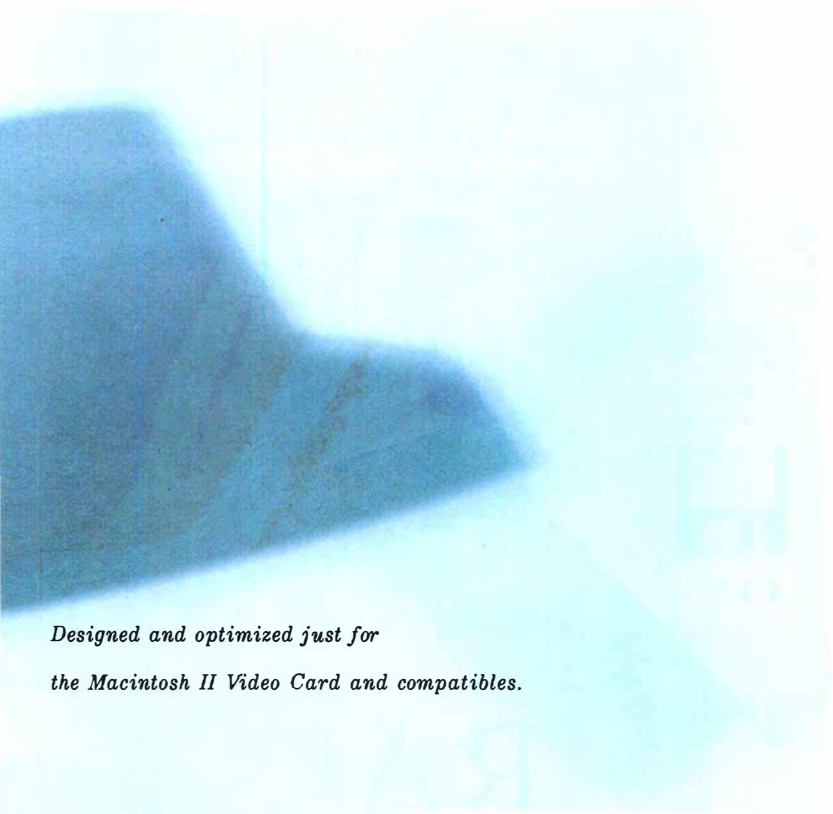
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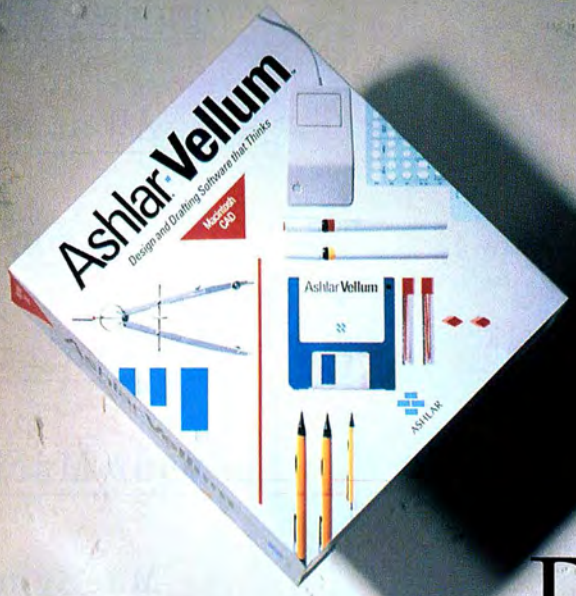
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ART BEAT

by Deborah Branscum

This column examines the tools and the talent behind Macworld's graphics and the techniques that make them possible



Artist: Canadian John Hersey moved to San Francisco in 1983 to concentrate on his art and has succeeded wildly, as awards and assignments for *Esquire, GQ, LA Style,* and the *Washington Post* testify.

Tools: Mac II with 5MB of RAM; Aldus FreeHand 2.0..

How It Was Done: The topic of our cover story suggested skullduggery and dark colors. "Because of the subject matter, I thought the image would have to be fairly monochromatic," says Hersey, explaining the palette of black and blues.

The artist made a preliminary sketch by hand, then created an outline drawing in FreeHand based on the sketch. Once the shapes were finished, Hersey created a library of line widths, which he assigned to different shapes. He also assigned color values and gradations to each shape.

The illustration has the look of an engraving, thanks to a half-tone screening effect. After creating a color gradation for a particular shape, he selected Special under the Element menu to bring up a half-tone screening dialog box. Hersey replaced the default setting with lines instead of dots, an angle, and the number of lines per inch (between 10 and 20 lines).

Adding values shape by shape was a time-consuming process for Hersey, who needed 24 hours to create the illustration. Still, "the great thing about FreeHand is that you can go through at the end and change the lines. If you're using a predetermined line width and you've made 20 different shapes with that line width, you can change it automatically under the Line menu. That's a big advantage over Adobe Illustrator."

Although he's a big fan of FreeHand, Hersey also uses Adobe Illustrator, ImageStudio, PixelPaint, Easy3D, and Swivel 3D. "I really love combining programs because it's like mixed media," he says.

Hersey still does some "analog illustration" but says, "I really don't think that computer illustration should be distinguished from other illustration. I want my illustrations to be judged with watercolor or any other medium." Ⓜ



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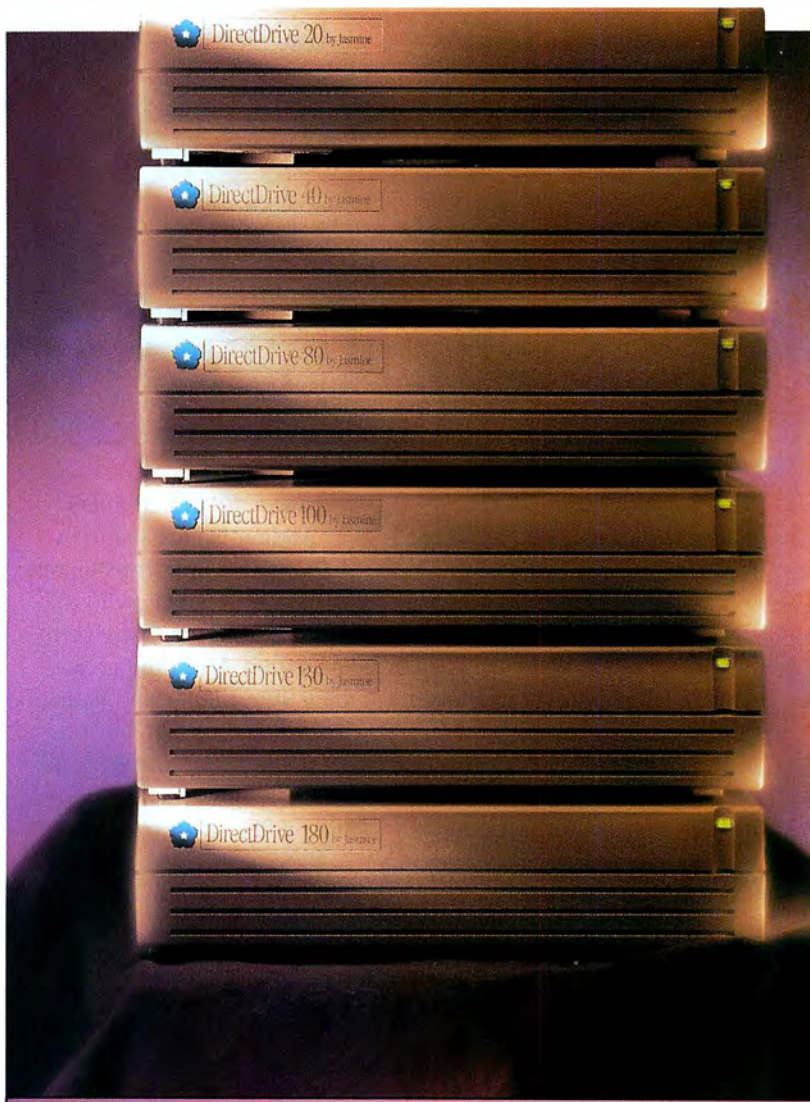
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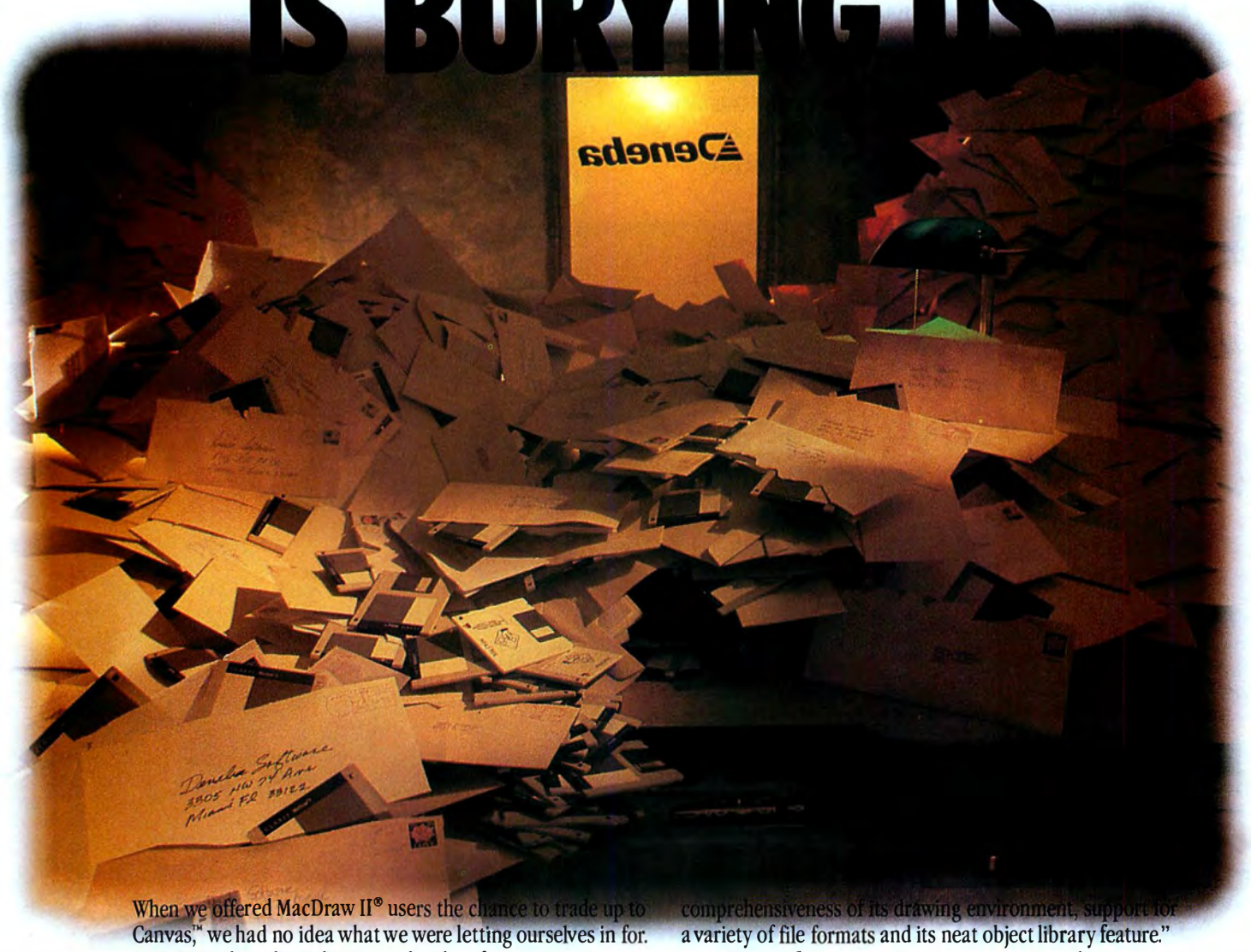
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MacWeek (January, 1989) was no less enthusiastic. "Canvas 2.0 is loaded with drawing tools and tool enhancers that go beyond those of its more expensive object-oriented rival, MacDraw II ... Canvas is superior in color handling, the comprehensiveness of its drawing environment, support for a variety of file formats and its neat object library feature."

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The Root of All Boredom

Finance programs are feasible but not much fun

by Steven Levy

Money is at the heart of everything. Besides giving you the wherewithal to buy printer paper, candy bars, and Volvos, money is a discipline in itself, a topic too hot even for Geraldo. Ultimately, money is the measurement we use to keep score in this country. And keeping score is no problem with a program called Andrew Tobias's Managing Your Money. There's an entire menu item called Net Worth; by selecting it you can immediately grasp whether you are a winner or a loser in late-twentieth-century America.

The ability to know what you are worth, net, in less than a second of computational time, is a sobering experience. It is only one of the shocks that comes with Managing Your Money. But it was something I was compelled to try the minute I booted the program.

Before I get into my new Net Worth obsession, let me explain why I was trying out this program. I had been wondering if the state of technology had yet reached the lofty point where it would be practical to use a personal computer to do one's finances. Previously it was better to stick to pencil and paper, or even cuneiform. The only people who actually used personal computers to do their finances were anal-retentive wireheads who wrote their own programs in BASIC, and hapless chumps who'd paid good cash for the available commercial packages and were too proud to admit they'd wasted their money. All this supposedly changed a few years ago when the writer Andrew Tobias, well known for his scribblings about economic matters, lent his knowledge to the MECA software company, which produced Managing Your Money.





Some people raved about it—*Whole Earth Catalog* founder Stewart Brand called it reason enough to buy a PC.

But not a Mac—Managing Your Money ran on IBM computers and Apple IIs, but not Macintoshes. I once ran into Tobias at a party and asked him why not. He told me he didn't like the Mac and that he didn't think Mac users were a good market for his program. I guess the appearance last year of Managing Your Money on the Mac means he changed his mind. Anyway, I thought I would submit my own increasingly complicated finances to the program and see if it was worth sticking to the Tobias regimen.

TOBIAS'S BIASES

It didn't take long to realize that whatever bias Andrew Tobias had against the Macintosh is subtly reflected in Managing Your Money. All too often things happen that are not Mac-like. The root of the problem, I discovered, is the mind-set underlying the program. It wants you to submit, totally, with no reservations. The enforcement is embedded in the lack of freedom concerning file creation. You don't simply open a file called New when you want to start over; a complicated rigmarole is invoked that, after over an hour of figuring, I still can't comprehend. Eventually you get the idea, perhaps in some misguided paranoia about piracy, that you aren't supposed to have "new" finances. It's as if an auditor is looking over your shoulder, making sure you're not keeping a double set of books.

This quasi-tyranny is distressingly evident at all levels of Managing Your Money. Tobias, whose charming prose helps the manual considerably, explains this in a section called Managing Your Money's Way of Doing It. The program, the author says, "intuitively knows all the signs and rules. The pluses, minuses, debits, credits, and parentheses are all taken care of in the bowels of the program the same way steam gets supplied to the

(continues)

City of New York. I don't know where it comes from or how it works—*no one* knows where it comes from or how it works. It just works."

Let it be noted that during the week I am writing this column, New York City steam lines have exploded in three separate incidents, sending deadly asbestos into the streets. I assume that the bowels of Managing Your Money are sturdier. Still, I wish it had an Undo function.

LET'S GO TO THE CHARTS

That said, Managing Your Money is loaded with fascinating tools for analyzing one's financial situation. Chief among them is the aforementioned Net Worth. It takes a while to input all the components of one's empire, but the experience is enlightening—not only will you list all your stocks, bonds, IRAs, and bank accounts, but you must go through your house room by room, gauging what all your furniture is worth. Then you have to enumerate your various debts, including the mortgage, and voilà! Here's your bottom line. As months pass, and your finances go through various ebbs and flows, you can call up the net worth at any old time. See if it's up or down. Using a program like Tempo, you can even get your Net Worth automatically, every time you turn on the computer.

Granted, this can become a sickness. It gives your finances an almost pornographic appeal. But not everything is as fascinating with Managing Your Money. Once you have entered its portals, you have to leave a certain kind of thinking behind—for instance, the kind of thinking where you can spend $3 for a magazine *without recording it on the ledger*. That kind of behavior is now banned. The least intrusive thing you can do with the $3 purchase is lose it in the Spending Money category. Or—here comes a decision—include it in the Newspapers and Magazines category. Did you make that one deductible? Yes. Well, then definitely in that category. Ahh.

Some might call this world a little too demanding. But it has its virtues. The amazing thing about Managing Your Money is the various things you can do once you get all the details of your finances on the machine. In an instant, you're calling up pie charts and bar graphs, detailing how your cash flow is running or how accurate your budget projections have been.

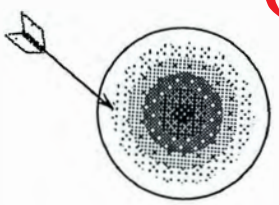
My favorite little component is the quickie tax spreadsheet. By giving off-the-cuff estimates of the various line items on the 1040 forms (and supplemental forms like schedule A or C), the program, using current tax schedules, quickly calculates how much you owe. By switching numbers around, you can get instant feedback on the impact of various tax strategies. For instance, what are the benefits of filing jointly or separately? Of socking $5000 in a Keough account? It's all there.

THE DARK SIDE OF MYM

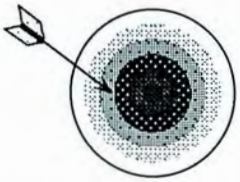
Other features are downright depressing. Like the little chart that calculates how many years you have left to live, and how

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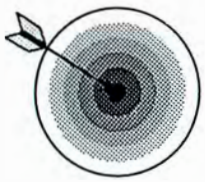
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The weapon

Police were called to break up the scuffle, but Brian Girvins, Manager, declined to press charges: "We didn't know about the Rival ourselves, or we wouldn't have been pushing these expensive brands." He muttered.

"We owe Gordon a debt of thanks for bringing the Rival to our attention. Although we wish he'd just called and told us on the phone."

"These computer users are a feisty bunch," Police Chief Aldo Malmstein said." We've had a few of these cases lately, all stemming from customers overpaying for computer equipment and finding out later how much they could have saved."

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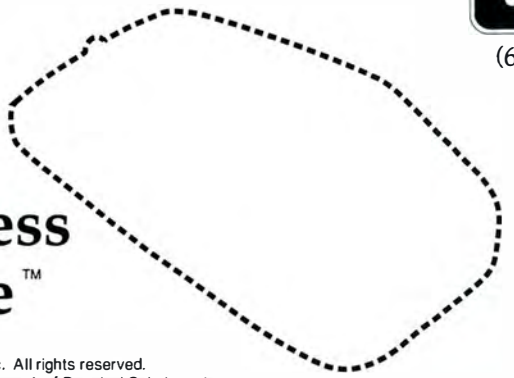
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much insurance to accumulate, and how much you'll have when you retire. (The good news is that I have 41 more years to live. The bad news is that I'll die a pauper.) Or the table that lets you figure out how much you need to save to finance a college education for kids in the next century. Or the menu items that track your stocks and bonds. I don't happen to have any stocks and bonds and judging by this program, Andy Tobias thinks I'm an idiot for not having any.

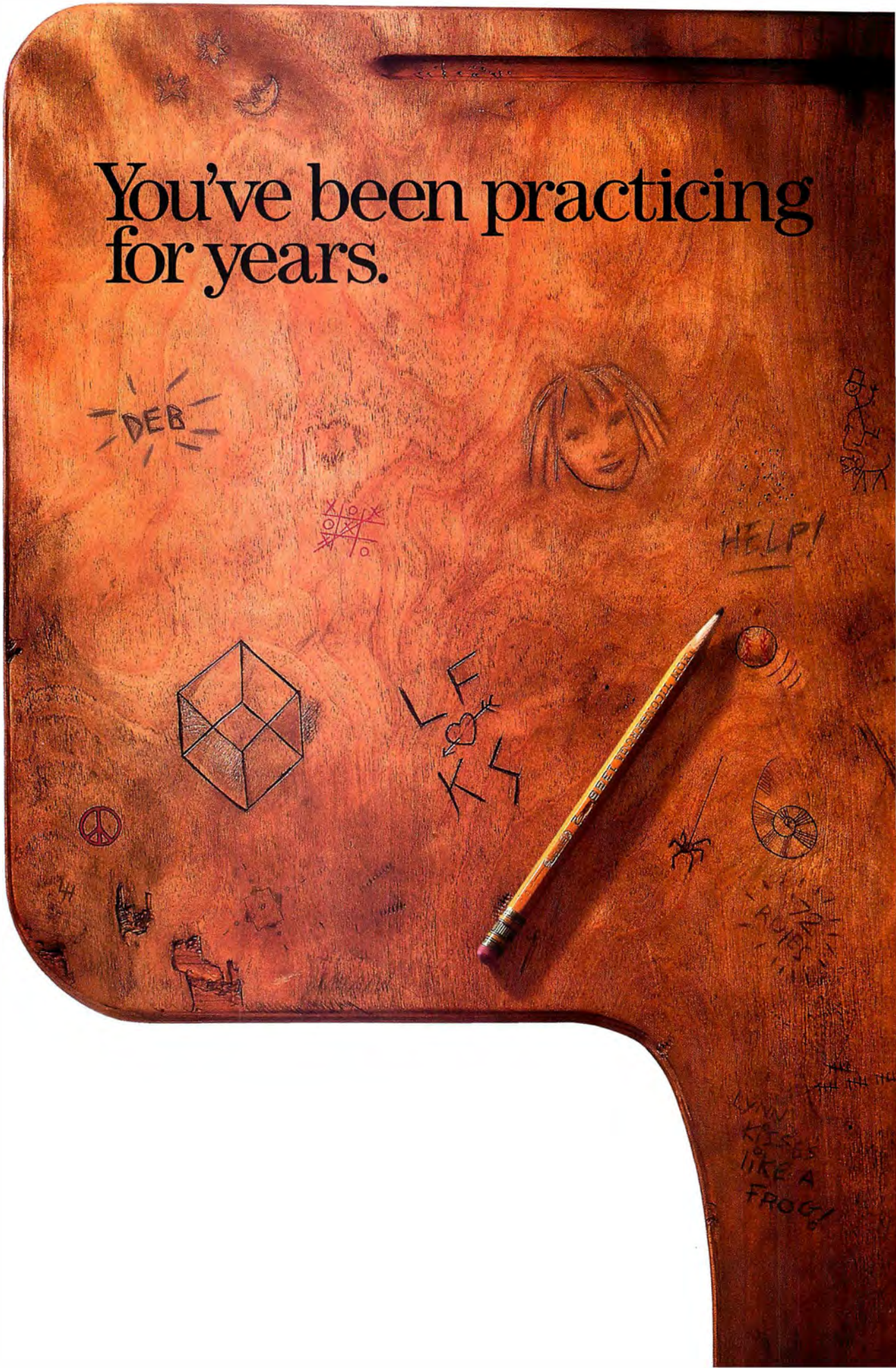
Ultimately, I did not have the intestinal fortitude to go all the way with Managing Your Money. This is not surprising, considering I'm the type of person who feels a checkbook is sufficiently reconciled if my balance figure is within a hundred dollars of what the bank says. My philosophy is that it's more constructive to spend money than figure out where it went. Managing Your Money doesn't even try to hide its disgust with this philosophy. It expects you to lash yourself into your ergonomic Balans chair and suffer for a few minutes each time you have to pay the electric bill, the mortgage, and the HBO fee. And then sit there with a self-satisfied grin as the program prints out your form-fitted checks. (Do creditors really accept those things?)

According to MYM, the good news is that I have 41 more years to live. The bad news is that I'll die a pauper.

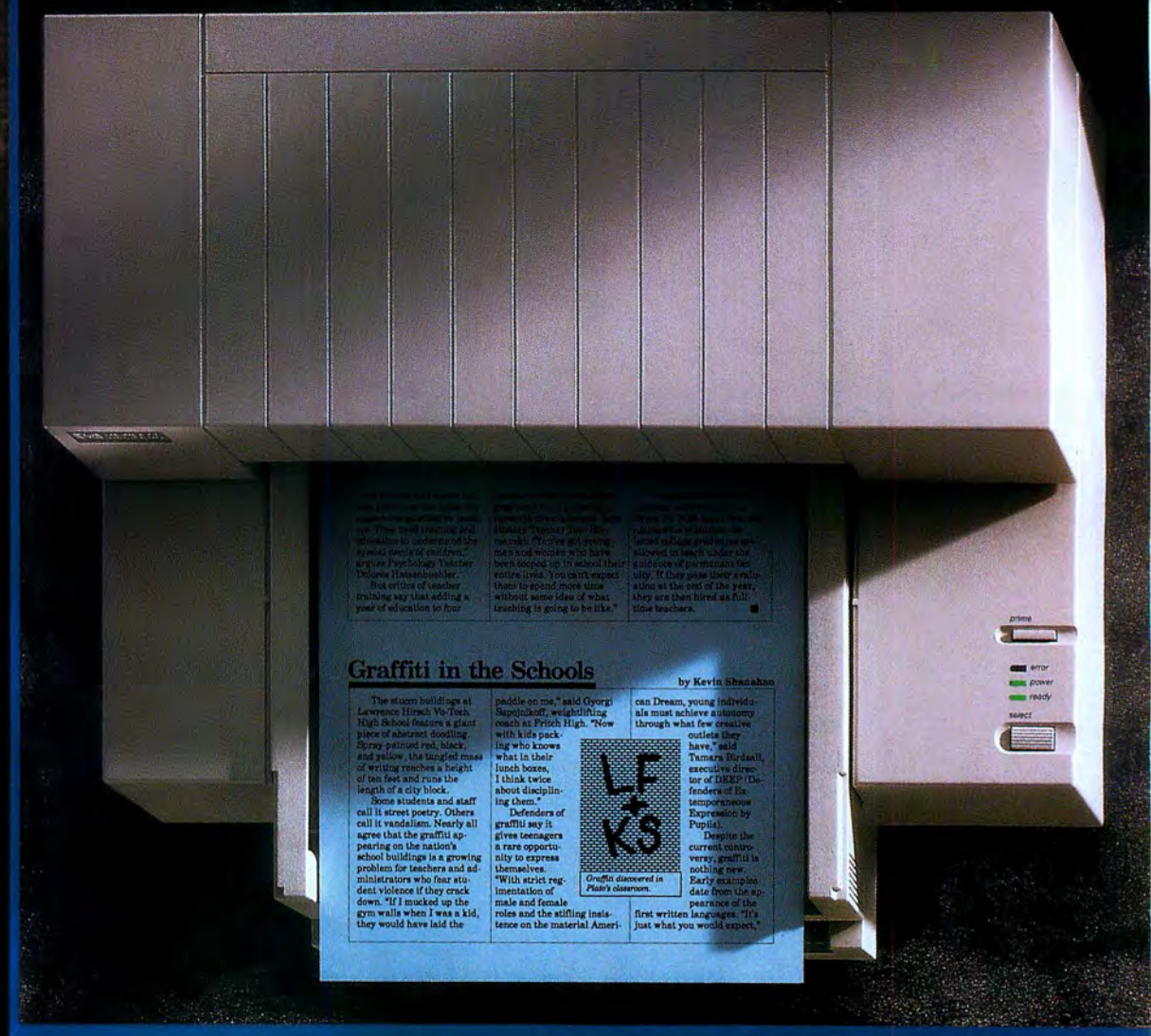
But face it—most of us pay bills not when we are sitting at our Macintoshes, but decked out in front of the couch watching football games. We scrawl checks out quickly, sometimes using creativity in dating them. We visit ATMs and stick the receipts in our wallets. We steal odd moments to do our finances and don't like it when Andy Tobias tells us to go straight. At least I don't.

Maybe it is just me. So let's state it for the record—my personal rejection of the program does not imply that others should reject it. Those who stick with Managing Your Money will have some clear advan-

(continues)


You've been practicing for years.
DEB
HELP!
L F
K L
KISS
LIKE A
FROG!

Now it's time to play.



Graffiti in the Schools

by Kevin Shanahan

The stucco buildings at Lawrence Hirsch Vo-Tech High School feature a giant piece of abstract doodling. Spray-painted red, black, and yellow, the tangled mass of writing reaches a height of ten feet and runs the length of a city block.

Some students and staff call it street poetry. Others call it vandalism. Nearly all agree that the graffiti appearing on the nation's school buildings is a growing problem for teachers and administrators who fear student violence if they crack down. "If I mucked up the gym walls when I was a kid, they would have laid the paddle on me," said Gyorgi Sapojnikoff, weightlifting coach at Fritch High. "Now with kids packing who knows what in their lunch boxes, I think twice about disciplining them."

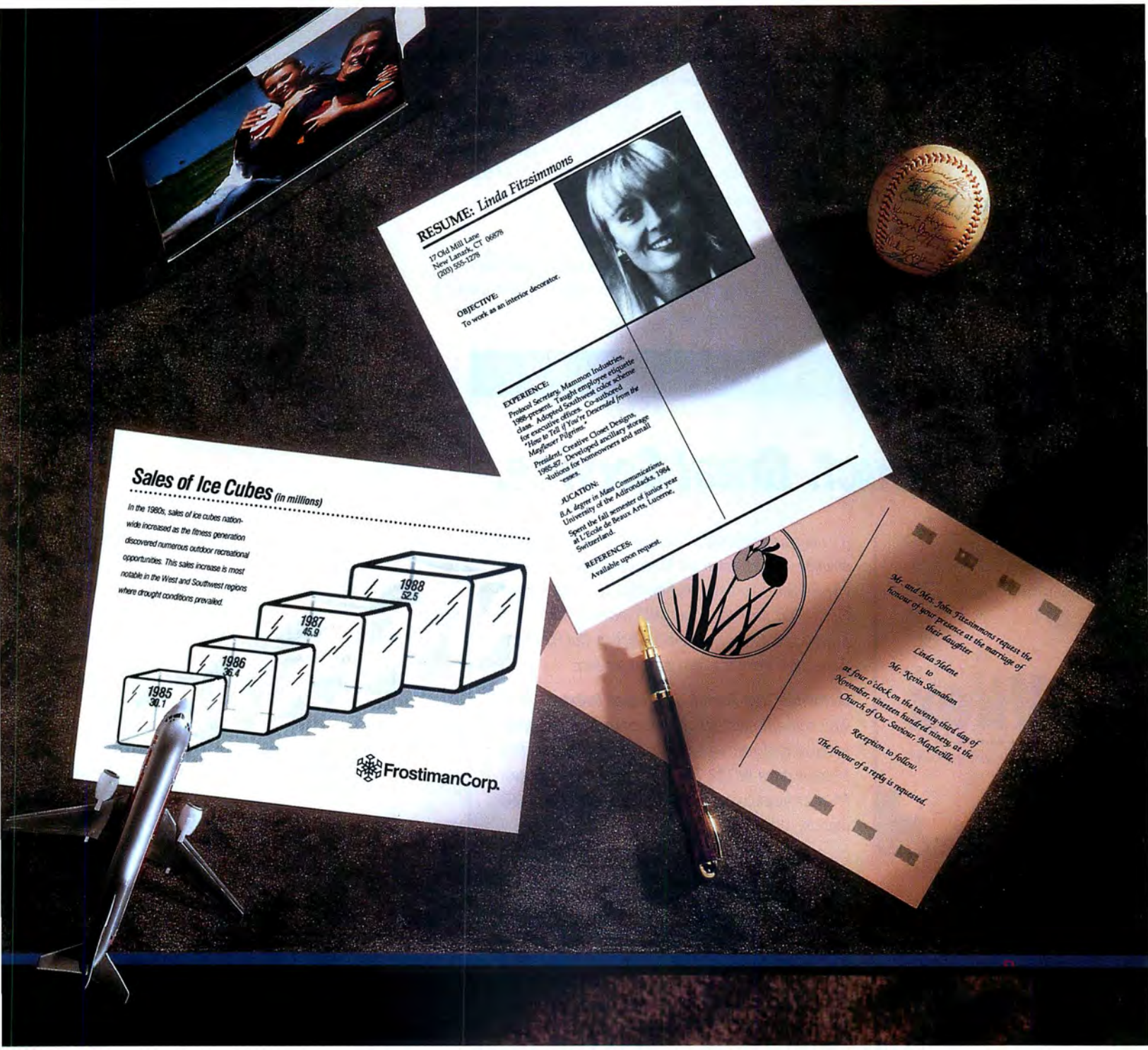
Defenders of graffiti say it gives teenagers a rare opportunity to express themselves. "With strict regimentation of male and female roles and the stifling insistence on the material American Dream, young individuals must achieve autonomy through what few creative outlets they have," said Tamara Birdsall, executive director of DEEP (Defenders of Extemporaneous Expression by Pupils).

Graffiti discovered in Plato's classroom.

Despite the current controversy, graffiti is nothing new. Early examples date from the appearance of the first written languages. "It's just what you would expect,

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tages. The program is a hawk at keeping track of the complex interrelationships between various elements of your total financial picture. I can only drool when I contemplate the scenario of tax preparation after a year's worth of faithfully using Mananging Your Money. Since you've been flagging each item in the proper tax category all along, your income is already totaled, your deductions fully tabulated. Those two or three days of dreary tax work are reduced to about ten seconds. I'm sure that the total commitment to Managing Your Money pays off in those ten seconds alone. So I consider it my failing, rather than that of Andy Tobias, that I will never get the benefit of that ten-second miracle.

QUICKEN DELIGHT

Does this mean that I totally gave up hope that my Macintosh would participate in my finances? Not exactly. I also tried out option B, a program called Quicken. (For a closer look at Quicken, see *Reviews* in this issue. There are other programs I might also have used. "Mac-sumizing Your Money" in the February 1989 issue offers an overview of personal finance packages.) It is strictly the low-budget way to use your computer for finances. It does not print out charts of your stock yields or tell you when you're going to die. But it does operate in a clear and simple fashion. Each file is a bank account and you simply list the checks, deposits, and withdrawals. The only complication is a request to put each transaction in a category, but there's reasonable flexibility in setting the categories. You can easily set up recurring charges, like your rent or auto loan, and the checks will instantly appear. Here too, you can print out the checks if you want to.

The tools for analyzing your transactions in Quicken are limited, but they're the basic ones you need. Let me see the utility bills. List the rent checks. Show me all the money I paid to my bookie. Quicken uses the kind of reports you see in database programs, but it's less complicated than any database you can imagine.

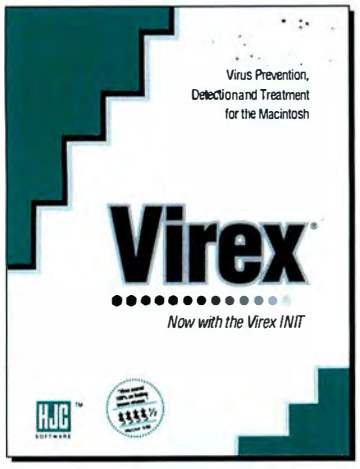
Notice the proliferation of the words *easy* and *simple?* But for such a straightforward program there's a lot of power. Small businesses can use Quicken to calculate things like W-2 statements or profit and loss statements. Those who use MacInTax will certainly appreciate the fact that Quicken communicates with that program like a first cousin. But the bottom line here is no frills. If you just want to keep track of your checkbooks and how the money goes in and out of your life, Quicken is it.

Best of all, it is priced at $59, with a street price of about $35. This is inexpensive enough to junk the program with no guilt at all when you finally decide that even with this elegant, well-designed program, using the computer to handle your finances is still a pain in the ass. M

Steven Levy is a Macworld *columnist and the author of* The Unicorn's Secret: Murder in the Age of Aquarius, *recently released in paperback by NAL.*

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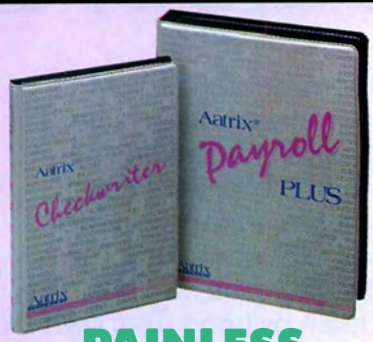


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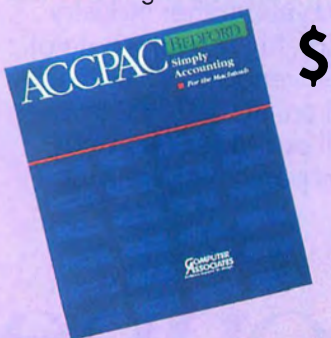
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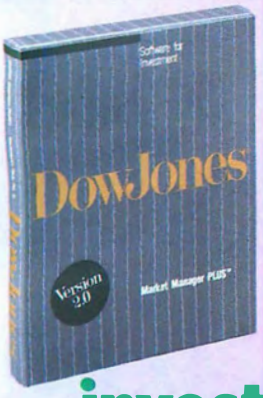
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MAC 3

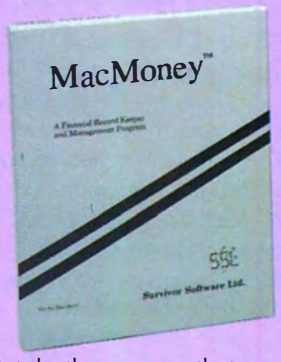
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(4-user pack) . . . . . 229.

The Fox enhances its base.

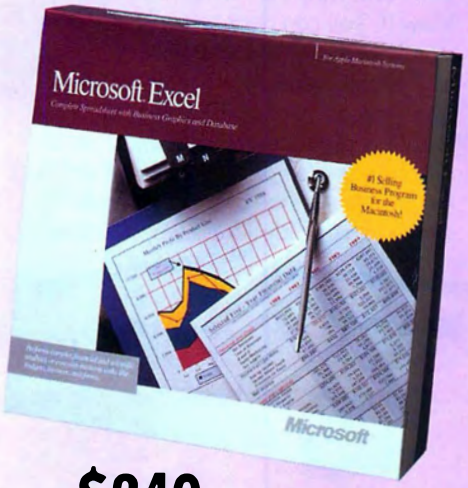


The original **FoxBASE+/Mac** was named *InfoWorld* Product of the Year, *MacUser* Editor's Choice, and was a *MacWEEK* Top 10 product. Version 2.0 is faster than ever, and packed with new features. *FoxReport* creates custom reports and labels in seconds. Place objects representing fields, lines, boxes, text objects, and graphics where you want them—FoxReport does the rest. *Enhanced XCMD/XFCN Support* gives you access to up to 16 XCMDs and XFCNs written in a variety of programming languages. Most HyperCard XCMDs and XFCNs can be used without changes. Plus, you get an automatic application generator, complete dBASE compatibility, integrated graphics, and much, much more. The Network version is compatible with AppleShare, Novell, 3Com, and FoxBASE+/LAN. Multi-User and Runtime versions provide unlimited distribution of single- and multi-user applications.

Fox Software ... 30 day MBG
5572 FoxBASE II/Mac 2.0 . . . . . $295.
4580 FoxBASE+/Mac Runtime 2.0 179.
4844 FoxBASE+/Multi-User 2.0 . . 399.
5579 FoxBASE+/Multi-User
Runtime . . . . . 295.

No Credit Card Charge Til We Ship.

The new way to Excel.



$249

Version 2.2 of **Microsoft Excel** gives you full access to the 8 megabytes in high-powered Macs. That's room enough for remarkably large spreadsheets (and their graphics), documenting your company's financial condition for the past two centuries, and projecting into the next one (which is just around the corner). And, thanks to advanced intelligent recalc, your calculations will be 40% faster. This new Excel is also a visual delight: it lets you select up to 256 fonts per sheet, including up to six styles and eight colors, change row height, add shading, insert notes, and otherwise turn some rather ordinary numbers into some rather extraordinarily compelling visuals. And remember, all these features have been added to what was already the best selling spreadsheet for the Mac. Which could put a smile on the face of the most taciturn number cruncher.

Microsoft ... 30 day MBG
2865 Excel 2.2 . . . . . $249.

The singular solution for any business.

Wait! We take it back! Don't buy *Excel*! Buy **The Microsoft Office**. It's the budget- balancing way to buy all the Microsoft programs your office needs. It includes *Excel*, *Word*, *PowerPoint*, and *Mail* in a bundle that's priced significantly lower than all four combined. You'll be working with four full-powered and totally integrated applications, thereby transforming your very own office into a lean mean productivity machine. Look out!

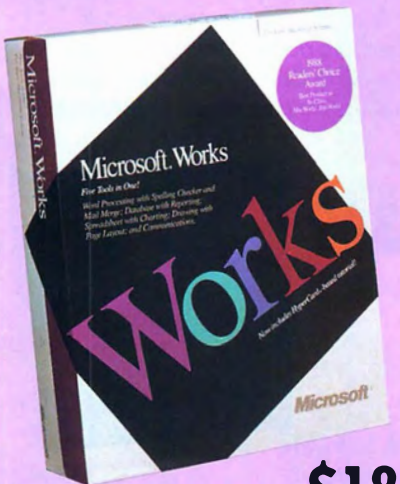


$499

Microsoft ... 30 day MBG
5454 The Microsoft Office (includes Excel, Word, PowerPoint, and Mail) . . . . . *special* $499.

MAC 5

The singular solution for small business.



$185

Okay, so you're sitting there thinking that all this power is impressive, but what you really need is one straightforward way to crunch some numbers, manage some lists, write some presentable proposals, and get on-line once in a while. Sounds like you need **Microsoft Works**—it gives you all the tools you need to run a small business or even a rather complex personal life, by combining word processing, spreadsheet, database, drawing, and communications into one powerfully integrated program. So you can keep track of your clients, create newsletters, do your projections, and log on to on-line services, all by learning just one program. Plus, the new drawing module (with page layout) lets you add pizazz to all of the above. Works also comes with an animated training program written in familiar HyperCard format, and if you ever get confused, you can take advantage of on-line help and unlimited phone support.

Microsoft ... 30 day MBG
2884 Works 2.0. . . . . $185.

Call 1-800/334-4444 to order.

120C

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ACCOUNTING & FINANCE • NUMBERS & DATABASES • GRAPHICS & DESIGN • PUBLISHING & PRESENTATIONS
PROGRAMMING & HYPERMEDIA • UTILITIES • WORD PROCESSING • MUSIC & EDUCATION • ENTERTAINMENT
NETWORKS & COMMUNICATIONS • INPUT/OUTPUT • MEMORY & DRIVES • ACCESSORIES • MACCONNECTION

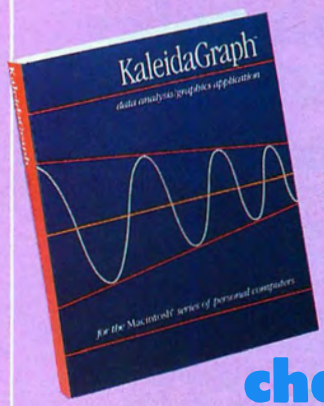
Fast C.A.T.

C.A.T. is the lightning-fast relational database that's perfect for managing all your contacts, facts, figures, events, and projects. Plus, it gives you letter writing and mail merge capabilities you need to stay current with all these Contacts and Activities in a Time-ly manner. Enter and look for information based on a contact person, activity (meeting, letter, phone call, etc.), and/or when it happened. It will constantly update your files, and generate reminders, schedules, memos, etc.



$229

Chang Labs ... 60 day MBG
1611 C.A.T. 2.0 . . . . . $229.



$145

Top of the charts.

This Mac power tool lets you import data, analyze it, and generate scientific and business graphics. **KaleidaGraph** is extremely fast, and features built-in graphing tools, curve-fitting functions, and user-defined macros. It has 14 types of graphical structures, lets you transform data mathematically, and create high resolution output. Pull-down and pop-up menus make selections and modifications fast and straightforward.

Synergy ... 30 day MBG
3129 KaleidaGraph 2.0 . . . . . $145.

Statistical winners.

With **StatView SE+Graphics** or **StatView II**, you can perform sophisticated statistical analyses and present the results—all in one package! In addition to a wide array of statistical functions, StatView produces ten different types of graphs that are easily customized within the program. It's the only statistics software to be awarded 5 Mice by *MacUser*.



Abacus Concepts ... 60 day MBG
4482 StatView SE+Graphics *special* 179.
4481 StatView II 1.03 . . . . *special* 249.



$95

Hot dates.

Throw away those calendars with their crossed-out plans and multiple layers of stick-em notes. **Endeavour Planner** lets you plan and track projects via a very clean, simple, and fully graphical interface. You work directly with a Gantt chart to enter data, set dependencies between tasks, milestones, and task durations. Every time there's a change, the program automatically updates your new schedules and displays them right on screen.

Softstream Int'l. ... 60 day MBG
5439 Endeavour Planner 1.0. . . . $95.

Database omnibus.

Omnis 5 is a comprehensive program for developing business data management applications. This multi-user, multi-platform database for the Mac also features SQL connectivity to a VAX or mainframe. It supports full color graphics for "Mac-like" applications, and its HyperCard access allows stacks to read and write to Omnis 5 data files in both single-user and multi-user installations.

$349



Blyth Software
5492 Omnis 5 . . . . . $349.
5855 Omnis 5
(each additional user) . . . . . 75.

MODEL WINNERS.

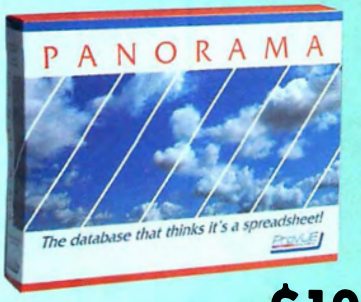
From the developers of award-winning *StatView* statistical software comes **SuperANOVA**, a revolutionary new full-featured general linear modelling program designed specifically for the Macintosh. Ideal for researchers and engineers, SuperANOVA lets you easily perform ANOVA, ANCOVA, MANOVA, MANCOVA, and regression on your data.

$439



Abacus Concepts ... 60 day MBG
5840 SuperANOVA 1.0
(for Mac Plus/SE). *special* $439.
5904 SuperANOVA 1.0
(for Mac II) . . . . . *special* 439.
5906 StatView SE+Graphics/
SuperANOVA bundle . . . . 595.
5907 StatView II/SuperANOVA
bundle . . . . . 695.

30/60 Day Money-Back Guarantee.



POWER IN THE FLATS.

$199

Just because all you need is a flat-file database doesn't mean that all you can do is manage and sort lists. **Panorama** gives you extensive spreadsheet-like, semi-relational analysis features for finding what that data's trying to tell you. Fast? Its *Clairvoyance* feature will complete common entries for you, and you can easily record your own macros. It also features extensive mail merge, outline capabilities, and a full palette of form design tools.

ProVUE ... **60 day MBG**
4582 Panorama 1.1.1 . . . . . $199.

SUPER TOOLS.

SuperCard, a HyperCard-compatible "software toolkit," lets you create simple stacks, full-color multimedia presentations, and standalone applications. It provides color Paint and Draw, animation, custom menus, full-screen windows, and the ability to open multiple stacks. **SuperPaint** combines Paint and Draw capabilities in one program. It features *AutoTrace* to convert Paint graphics into Draw objects, an Airbrush, and a Freehand tool to sketch Bezier curves.



$125

Silicon Beach ... **60 day MBG**
3506 SuperPaint 2.0 . . . . . $125.
5100 SuperCard 1.0. . . . . 125.

$49 3D CLIP ART.



Add another dimension to your favorite desktop publishing, presentation, illustration, painting, and drawing programs with images from these eight great 3D clip-art packages. You can also produce camera-ready art from these high-quality images using laser, thermal, and inkjet printers, film recorders, and a wide variety of dot matrix printers.

Enabling Technologies *Special Prices*
30 day MBG
5019 Clips 3D Accents . . . . . $49.
5026 Clips 3D Business . . . . . 49.
5020 Clips 3D Fonts . . . . . 49.
5022 Clips 3D Geography . . . . . 49.
5027 Clips 3D Lifestyle . . . . . 49.
5023 Clips 3D Messages . . . . . 49.
5024 Clips 3D People . . . . . 49.
5025 Clips 3D Recreation . . . . . 49.

ENTER THE 3RD DIMENSION.

Add another dimension to your product designs, scientific modelling, animation, and illustrations. **Swivel 3D** lets you bring in existing graphics in virtually any format (Encapsulated PostScript, PICT, PICT2, MacPaint, etc.) and change the lighting, add shadows, or create a 3D background. Or you can start from scratch to build models with parts that twist, turn, swivel, and move in other realistic ways. For animation, put your images into *VideoWorks* or HyperCard stacks and watch them come alive.



$299

Paracomp
4597 Swivel 3D 1.1 . . . . . $299.

DREAM IT. DRAW IT.



$249

IDD, creator of *MacDraft*, now also offers a powerful precision drawing program for professional scaled drawings, illustrations, presentations, and graphics. **Dreams** features zoom, rotation, layers, dimensioning, symbol libraries, an array of drawing tools, and many advanced illustration tools. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. If you can dream it, you can draw it.

Innovative Data Design
4707 Dreams 1.0. . . . . *special* $249.

PRECISION DRAWING.



$135

Enter the world of precision drawing and drafting with the two-time *Macworld* World Class award-winning program, **MacDraft**. Its precise, fast, and easy-to-use drawing tools are ideal for creating custom graphics, business charts, forms, illustrations, technical drawings, and schematic designs. You can draw both geometric and freehand shapes, and then rotate, zoom, scale, fill with custom patterns, dimension, or even calculate their area.

Innovative Data Design
2417 MacDraft 1.2B . . *special* $135.

Call 1-800/334-4444 to order.

MacConnection™

Fountain of fonts.

$89 EACH

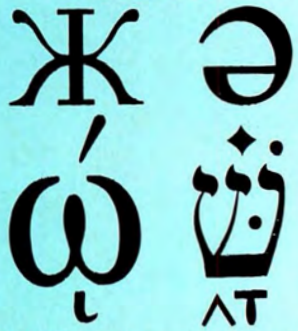


You can answer all your typeface needs with **MacFontware Typeface Packages**, no matter what Mac output device you use, including: *Apple LaserWriter IINT* and *IINTX*, the *LaserWriter IISC*, and any *ImageWriter*. The fonts in each package are scaleable to any size (within application or device limitations) by PostScript PDL devices. They also provide bitmap fonts for QuickDraw printers, *and* true WYSIWYG fonts in 20 sizes from 9 to 96 point on your screen. So it's easy to proof type accurately in bitmap format before outputting to a laser printer or typesetter. The two Headline font packages include four typefaces each, and the text faces come complete with roman, italic, bold, and bold italic. MacFontware fonts are compatible with virtually all Mac applications.

Bitstream

5968 Baskerville . . . . . $89.
5969 Bitstream Charter. . . . . 89.
5970 Futura Medium . . . . . 89.
5973 ITC Galliard . . . . . 89.
5974 ITC Garamond . . . . . 89.
5975 ITC Souvenir . . . . . 89.
5976 Letter Gothic. . . . . 89.
5977 News Gothic . . . . . 89.
5971 Headlines I (Bitstream Cooper Black, Broadway, Cloister Black, University Roman) . . . . . 89.
5972 Headlines II (Brush Script, Blippo Black, Hobo, Windsor) . . . . 89.

MULTILINGUAL FONTS.



春花秋月何時了,何事知多少
拜啓 お客様各位 皆様に御提

Linguist's Software ... 60 day MBG

2636 Kanji, 2631 Hebrew, 2637 Korean,
5759 LaserArabic & Farsi, 2627 Cyrillic,
2630 Greek . . . . . *special* each $49.
2625 Chinese, 2641 LaserHebrew,
2640 LaserGreek, 2639 LaserFrench/German/Spanish . . *special* each 69.
2647 Greek, Hebrew & Phonetics,
2642 LaserKorean. . *special* each 79.
2638 LaserCyrillic (includes Russian, Ukranian, Serbian) . . . . . *special* 99.

INFINITE PAINT POSSIBILITIES.

NuPaint is an innovative paint program that provides over 100 defined patterns plus 32 x 32 fill-pattern capability. Edit and print up to 300 dpi. It features many unique tools. You can use masking tape to protect areas from drips and splatters, restore small edited areas back to the original, create shadows from any direction, repeat images with precision, free rotate, adjust frame height and width up to 16 x 16 dots, halftone, smooth, stir, fade, mix, and more.



$79

Good Software ... 30 day MBG

5428 NuPaint 1.0.4. . . . *special* $79.

$99



GRAPHIC CHARTING SOLUTION.

Now there's a charting package with the flexibility and power to create captivating charts *and* dramatic graphics, all in one program. **DeltaGraph** lets you choose from 22 3D and 2D chart types with full color support, Postscript output, and complete formatting control over each element in the charting window. Drawing Tools include Bezier curves, lines, arcs, arrows, and special fills. You can also import data from all popular file formats and establish direct links to Excel 2.2 files.

DeltaPoint

6095 DeltaGraph . . . . . $99.

SIMPLY BRILLIANT.

With Pantone Color Selection, a built-in color separator, complete range of paint tools, and sophisticated blending of any 256 colors (out of 16.8 million), **PixelPaint** delivers the most sophisticated paint effects possible in an 8-bit program. **PixelPaint Professional** adds support for 8, 16, 24, or 32-bit color depths (including Apple's QuickDraw 32), 0-100% transparency control, and image processing effects. Both are simply brilliant.



SuperMac Software
60 day MBG

3380 PixelPaint 2.0 . . . . . $225.
5625 PixelPaint Professional 1.0 . 395.

No Freight on Backorders.

Very decent exposure.

Give yourself total creative screen control with **Exposure**, the System 6.0- and MultiFinder-compatible CDEV screen graphics utility with screen capture, painting tools and fonts, and the ability to format color and gray scale images. To keep track of all those graphics (and text) try **DAtabase**, the full-featured desk-accessory database that *MacWEEK* called "one of those rare products we can recommend to all regular Mac users."



Preferred Publishers ... 30 day MBG
5751 Exposure 1.1 . . . . . $54.
4780 DAtabase 1.12 . . . . . 69.

GIVE YOUR INTERFACE CHARACTER.



$229

Are your applications long on power but short on personality? Give them their very own talking on-screen character (agent) with **interFACE**. This sophisticated animation toolkit lets you develop full-color talking agents of various sizes and proportions (each with up to 120 total images). These agents are an excellent interface for business presentations, training programs, informational kiosks, and more. And, interFACE allows for the importation of color into HyperCard.

Bright Star Technology
6093 interFACE 1.0 . . . *special* $229.

CLIP-ART MAPS.



Add a new dimension to your proposals, periodicals, and presentations with **MacAtlas**. You get detailed clip-art maps of the entire world, world regions by country, USA by state, and all 50 states by county. MacAtlas maps are ready to customize with fill patterns, drop shadows, text, and more. Available in Paint, Draw (PICT), and Illustrator/Freehand (EPSF) format. *Macworld* gives it five stars.

MicroMaps ... 30 day MBG
5516 MacAtlas (MacPaint) 2.0 . . $45.
5514 MacAtlas EPSF (PostScript) 1.0 . . . . . 105.
5513 MacAtlas Professional (PICT) 1.0 . . . . . 105.



$65

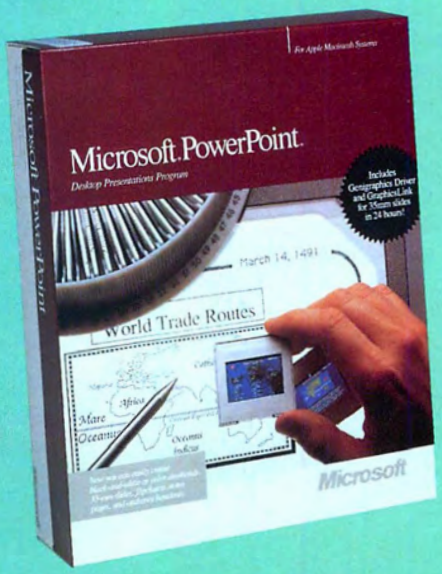
Edit graphics. Anytime. Anywhere.

DeskPaint (with **DeskDraw**) gives you full graphic editing power *from within any application*. It can create, load, edit, or save any TIFF, MacPaint, or PICT image up to 4000 dots per inch. You get a complete set of bitmap graphic tools including AutoTrace, air brush, smoothing, scaling, halftone control, and special effects. Plus there's support for full LaserWriter resolution and huge poster-size printing on an ImageWriter.

Zedcor ... 60 day MBG
3986 DeskPaint & DeskDraw 2.01 $65.

You can be very persuasive.

For flip charts, overhead transparencies, slides, and audience handouts **PowerPoint** gives you the power to be your most persuasive. It makes it easy to develop coherent presentation formats (fonts, borders, titles, etc.) filled with text and graphics imported from a wide range of programs. You can visually



$249

rearrange slides, and create hard copy reproductions for memorable handouts. You also get word processing functions, on-screen slide show rehearsal, support for all 16.8 million colors on the Mac II, and support for many B&W and color printers and 35mm recorders. Plus, PowerPoint offers an easy interface to slide-production service centers—you can even send color presentations to Genigraphics via disk or modem, using the new Genigraphics Driver and GraphicsLink.

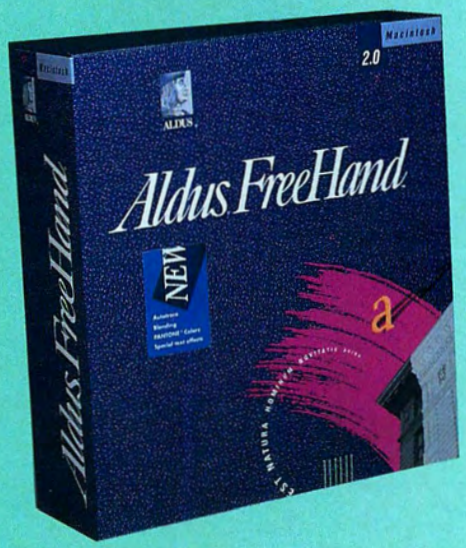
Microsoft ... 30 day MBG
2878 PowerPoint 2.01 . . . . . $249.

Call 1-800/334-4444 to order.

MacConnection™

Give yourself a FreeHand to develop high-impact illustrations and typography.

Combine Aldus' super powerful drawing program with their best-selling desktop publisher. And in one fell swoop you'll transform your Mac into a fully equipped design studio, ready to create sophisticated newsletters, brochures, ads, flyers, package designs, and anything else you can envision. **Aldus FreeHand** gives you the illustration power. You see your changes on the monitor while you work, so it's easy to refine a shape or apply Pantone colors while keeping the big picture in focus. It also gives you total typographic control for curving text



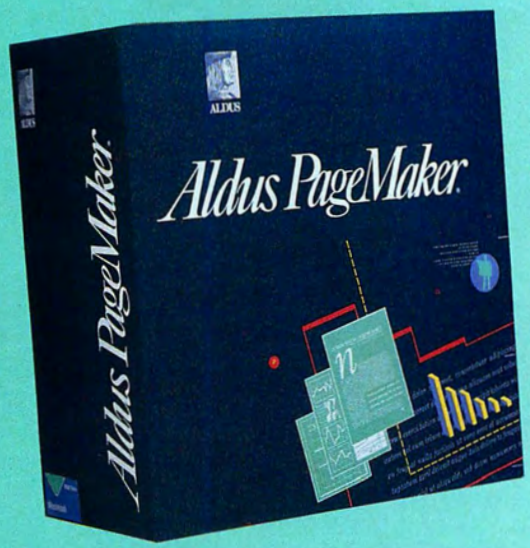
on a path, rotating or stretching type, mixing sizes, fonts, and colors, and, in general, getting words exactly the way you want them *before* outputting to an expensive typesetter.

Aldus ... **30 day MBG**
1330 FreeHand 2.02 . . . . . $345.

$345

Then Make your Pages come alive.

Once you've developed your graphics and display type, just place them into **PageMaker** to put your piece together. The two programs are completely integrated, so you can immediately start fine tuning the letter kerning and word wraps, add rules and spot color, and experiment with a multitude of ways of combining your text and graphics. You'll soon discover why this program has single-handedly enabled thousands of designers to make the transition from drawing board to Mac as natural as the



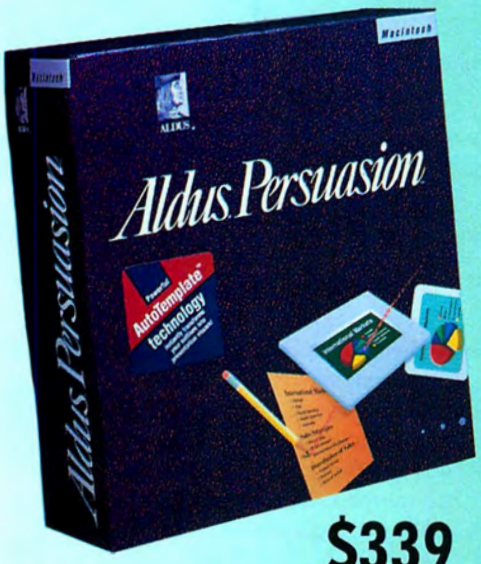
one from waterbed to futon. When you give PageMaker a FreeHand you get a potent combination of advanced illustration, design, typography, and page layout capabilities that will give you a definite creative edge.

Aldus ... **30 day MBG**
1331 PageMaker 3.02 . . . . . $385.
6149 PageMaker Color Extension 149.

$385

30/60 Day Money-Back Guarantee.

And pour on the persuasion.



$339

Whether you have weeks or just minutes to create your next presentation, **Aldus Persuasion** will make it easy to assemble the materials, including totally professional black and white overheads, 35mm slides (either with a desktop film recorder, or via a slide bureau), and audience handouts. Thanks to Persuasion's *AutoTemplate* technology, it's as simple as selecting a design, and typing into the text outliner—your ideas are transformed into a professional-quality presentation automatically. And, for customizing your work further, just use the built in word processing, drawing, and charting tools. When you're done, you can preview, or even show your entire presentation on screen. The new Version 2.0 can import *PowerPoint* and other files saved in Scrapbook format, and features 12 additional AutoTemplate designs (for a total of 36), automatic resizing, context-sensitive Help, and compatibility with Apple's new 32-bit color standard. Plus, you can now type notes directly on your outline and have them appear on your speaker notes next to a thumbnail image of the slide. *InfoWorld* said, "This may be the product that does for desktop presentations what *PageMaker* did for desktop publishing."

Aldus ... 30 day MBG
4751 Persuasion 2.0 . . . . . $339.

$89



Give your words a facelift.

Springboard Publisher II can give any word processing document more pizazz. With this easy desktop publisher you just point and click to add page layout, graphics, and special effects. Six *SmartArt* PostScript effects let you rotate text, add shadow or distance, make text arc or fade, or stretch text to fill the page. Plus, you get a coupon for 500 pieces of clip art or 36 newsletter templates free! Don't settle for ordinary pages. Start desktop publishing today.

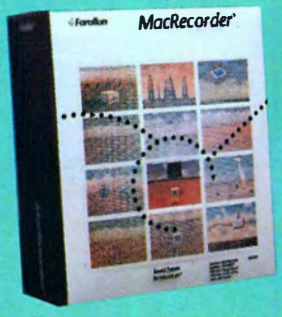
Springboard ... 30 day MBG
4500 Publisher II . . . . . *special* $89.



LOOK GOOD. FAST.

Create a dazzling array of presentations, demos, mini applications, and more, quickly and easily with **HOT-SPOT**, by combining standard graphic and text files. No programming knowledge is necessary. **FLEXFORM Business Templates** is a business form- and data-management system that comes with professionally-designed business forms. Volume I includes A/R and Inventory; Volume II has Administration, Purchasing, and Personnel.

Antic Software ... 30 day MBG
6100 HOT-SPOT . . . . . $42.
5756 FLEXFORM
Business Templates I. . . . . 49.
5760 FLEXFORM
Business Templates II . . . . . 49.



$162

Get into production.

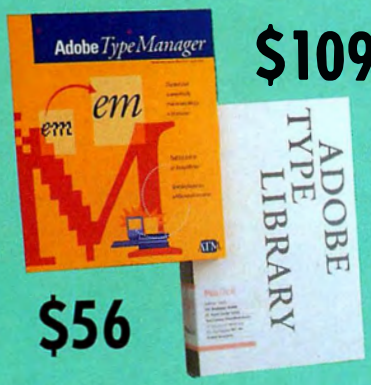
The **MacRecorder** Sound System turns your Mac into a complete audio workshop with a built-in microphone, jacks for external lines, multi-channel mixer, mono or stereo recording options, and special effects. It comes with two applications, *HyperSound* and *SoundEdit*, which let you record directly into a HyperCard stack and make your own stacks that play and record sound.

Farallon Computing ... 60 day MBG
2199 MacRecorder 2.0 . . . . . $162.

Call 1-800/334-4444 to order.

MacConnection™

Smooth those rough edges.

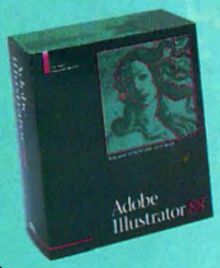


$109

$56

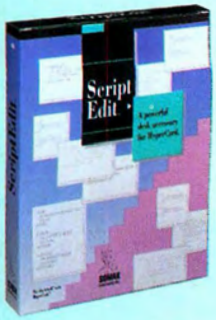
You can dramatically improve the quality of your printed ImageWriter text *and* even make the type on your Mac display smoother and more legible, just by installing **Adobe Type Manager** on any Mac with System 6.0 or later. From then on, it invisibly intercepts QuickDraw font requests and generates smooth PostScript outline fonts in proper screen bitmaps at the correct size. When you print, it will similarly generate the requested printer font bitmap, only, once again, in smooth Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's IINT and IINTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, *Adobe Illustrator 88* comes bundled with a free copy of Adobe Type Manager.

$279



Adobe Systems
5750 Adobe Type Manager . . . . $56.
6053 Adobe Plus Pack . . . . . 109.
6156 Adobe ATM/Plus Pack Bundle . 162.
1137 Illustrator 88 1.9 w/ATM . . 279.

$49



SCRIPT IMPROVEMENTS.

Enhance your HyperCard scripting with the **ScriptEdit** DA. It lets you edit multiple scripts on screen simultaneously, even from different stacks. It also features global search and replace functions, a script compare feature, separate undo commands for each editing window, and pop-up HyperTalk command menus. You can access most HyperCard menus while editing, and customize the way you use the editor with the included XCMD.

Somak Software ... 30 day MBG
5897 ScriptEdit 1.0 . . . . . $49.



GET PRESENTABLE.

With **Cricket Presents** you can develop presentations complete with 35mm slides, color overheads, and handouts. It has a text editor, template libraries, plus graphing and drawing tools. And, you can automatically transform your outline into a professional-quality presentation using the built-in *Auto Presents* function. **Cricket Graph** was given five mice by *MacUser* and gives you 12 graph types in up to 8 colors with up to 16 patterns. Graphing's easy as pie with graphic macros, multiple windows, and overlays.

Cricket Software
1668 Cricket Graph 1.31 . . . . . $115.
1670 Cricket Presents 2.0 . . . . . 285.

ALL-IN-ONE PUBLISHER.

Publish-It! is the fully-integrated, completely self-contained Mac desktop publishing system that gives you the text, graphic, and page-layout power you need to create high-impact documents even if you have no previous graphic experience. Special features include text rotation and patterned text, and the ability to edit scanned images *after they are placed into your documents*. It comes with 70 professional sample layouts so you can get started immediately.



$225

Timeworks ... 30 day MBG
5908 Publish-It! 1.0 . . . . . $225.

$95



Beyond HyperCard.

Develop powerful, full-color, HyperCard applications with **PLUS**. You work in a familiar HyperCard-like environment with direct access to existing stacks. There you can create cards up to 32,000 x 32,000 pixels, with buttons of any shape, a multitude of colors (you can even import color graphics), database fields where you can pre-format data, word processing fields, and more. Buy at a special price through 1/31/90, and get a free upgrade to the next version.

Olduvai
5446 PLUS 1.11 . . . . . *special* $95.

Order by Fax 1-603/446-7791.

HYPER IMPROVEMENTS.

Enhance your HyperCard productivity with these two collections: **HyperTools #1** (16 tools for stack design) and **HyperTools #2** (16 tools for stack enhancements). They let you perform many new functions, from modifying buttons to adding field validation, and they create their own scripts automatically. Also, try **StackCleaner**—a collection of stack management utilities for HyperCard.

Trendware

5202 HyperTools #1 1.02 *special* $47.
5199 HyperTools #2 1.04 . *special* 47.
5203 Stack Cleaner . . . . . 29.



$129



Develop yourself!

Packing 32-bit architecture, **Smalltalk/V Mac** has the memory and capacity to let you create full-blown applications at affordable prices. And its object-oriented development environment is ideal for letting the creative juices flow. It works under MultiFinder and gives you complete access to the Mac Toolbox, integration with other languages, a push-button source-level debugger, and portability to 8088, 80286, and 80386 computers.

Digitalk ... **60 day MBG**
5166 SmallTalk/V Mac 1.1 . . . . $129.

DATABASE POWER. HYPERCARD EASE.

Using **HyperHIT's** 40 XFCN's you can finally create your own "keyed" database from within HyperCard. A serious database engine, HyperHIT lets you design simple and sophisticated databases (multiple indexes) while cutting search time to as little as half a second. And you still get the freedom of HyperCard (SuperCard or PLUS) on the front-end. It supports the creation of text, *PICT*, and *snd* records, and can run on any Mac that runs HyperCard.

Softstream Int'l. ... **60 day MBG**
5440 HyperHIT 1.0 . . . . . $125.

$125

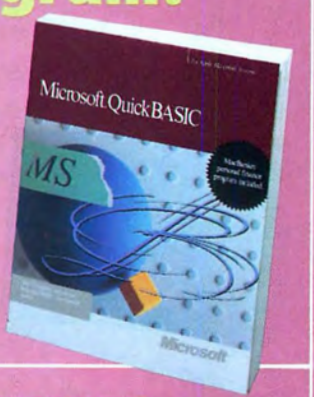


Get with the program.

Here's the fast direct route to your own programs. With **Microsoft QuickBASIC** you can write as super serious (or super-silly-ous) a program as you like, complete with music and graphics. The compiler and interpreter are all in one program so you can compile and execute at any time with a simple double click.

Microsoft ... **30 day MBG**
4471 QuickBASIC 1.0 . . . . . $65.

$65



DEBUGGING MADE SIMPLE.

Reduce debugging time and increase productivity with these two debuggers. **TMON** is a multi-window monitor/debugger that will set breakpoints, display labels, intercept system errors, and more. Perfect for the novice as well as the experienced programmer, it was given five mice by *MacUser*. Exclusively for HyperCard, **HyperTMON** brings interactive debugging to HyperTalk. It can help anyone write more advanced scripts and solve the mysteries of existing scripts.



ICOM Simulations

5681 HyperTMON 1.0 . . . . . $59.
4085 TMON 2.8.2 . . . . . 89.



$47

FOR HYPERCARD HYPERNEED.

HyperDA is the DA that gives you access to HyperCard stacks anytime (complete with buttons and fields) from within any application or the Finder. It lets you print and phone dial, search stacks, and copy to the clipboard. Plus you can change your stack screen to an expandable, scrollable window for easy access to your background application. New Version 1.2 lets you add or modify text in existing text fields, and save to the original stacks independently of HyperCard. It works on any Mac from the 512K up.

Symmetry ... **30 day MBG**
3318 HyperDA 1.2 . . . . *special* $47.

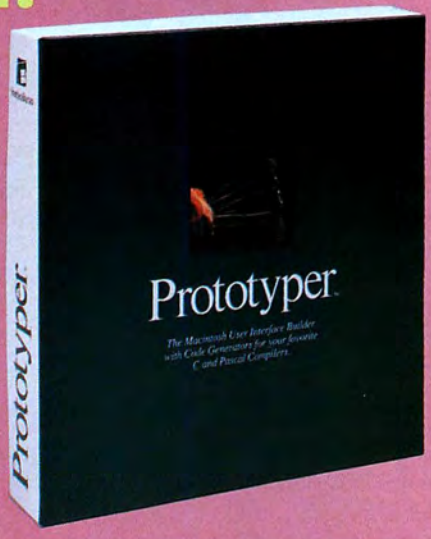
Call 1-800/334-4444 to order.

MacConnection™

The ultimate prototyper, simulator, and code generator.

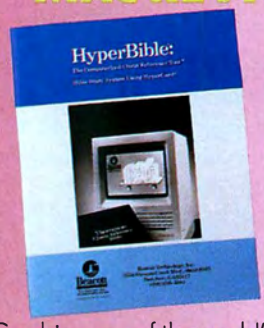
$169

With **Prototyper** you can program your interface as fast as you can draw it. As Dan Shafer, author of *HyperTalk Programming*, put it, this completely integrated interface builder and code generator "makes the process of building a Mac application as easy as it's likely to get." Just click and drag items from a palette to give your program all the buttons, icons, pictures, text areas, check boxes, lists, rectangles, pop-menus, bells and whistles you want. You can run simulations anytime during the process. Then, once you're satisfied, Prototyper will *generate all the C or Pascal source code and resources automatically*. Your interface is complete. It literally couldn't be easier.



SmethersBarnes ... 30 day MBG
1478 Prototyper 2.1 . . . *special* $169.

MAC REVIVAL.



$145

Combine one of the world's oldest books with some of the world's newest technology and you get **HyperBible**. This computerized version of the *Thompson Chain Reference Bible* includes all its features and provides an easy link to any word processor. Use it to find verses, trace topical themes, study different characters, view an electronic atlas, study archaeological findings of Biblical sites, and more. It's 15 megabytes of timeless information.

Beacon Technology ... 30 day MBG
4967 HyperBible (King James) 1.1 $145.
4968 HyperBible (New Intl.) 1.1 . . . 175.

THINKING SPEED? THINK C.

$149

Why is **THINK C** used to create heavy-duty programs like *FoxBASE+/Mac*, *PageMaker*, and *Illustrator*? Speed. And more speed. This ultra-fast development system includes a multi-window text editor, compiler, linker, Mac-style source level debugger, and more. It's a programming powerhouse designed for the pros.



Symantec ... 30 day MBG
3420 THINK C 4.0. . . . . $149.

$65



GENERIC BRAIN. JUST ADD INTELLIGENCE.

HyperX is the HyperCard Expert System that you can teach to troubleshoot problems or provide advice when you're not around. So you can distribute your expertise anywhere there's a Mac. Applications include intelligent database interfaces, data analysis, computer-assisted instruction, troubleshooting, automation of complex procedures, and executive information systems. It includes powerful features for developing and delivering these intelligent applications. Written entirely in HyperTalk, it also provides an excellent hands-on way to learn expert systems.

Millenium ... 30 day MBG
6105 HyperX . . . . . $65.

It figures.



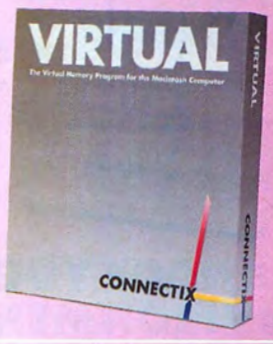
Prepare for exams with learning programs from the inventors of *True BASIC*. Let Mac do the calculations and graphing while you master the concepts. **Algebra**, **Pre-Calculus**, and **Calculus** are each available with a valuable workbook. **Algebraic Proposer** handles word problems in math, the sciences, economics, even real life!

True BASIC, Inc.
3571 Algebra plus workbook . . . $39.
3580 Pre-Calculus plus workbook . 39.
3575 Calculus plus workbook . . . . 39.
6110 Algebraic Proposer . . . . . 45.

No Credit Card Charge Til We Ship.

MEGABYTES. NOT MEGABUCKS.

$195



Blast through the eight megabyte barrier with **Virtual 2.0** from Connectix. Now you can afford more memory than you thought your Mac could have. This simple software package turns your hard disk into as much as 14 megabytes of internal memory. The Mac II version *includes* a PMMU chip—to make your Mac II System-7-ready today.

Connectix

6123 Virtual 2.0 (for SE/30, IIcx, IIx, and IIci) . . . . . $125.
6122 Virtual 2.0 (for Mac II, includes PMMU) . . . . . 195.

To your Mac's health.

SUM II is your hard drive magician: it recovers files and crashed hard disks, and even improves disk performance. Its Volume and File Recovery programs use three superior algorithms for triple file recovery power. SUM's friend **SAM** protects your system from viruses, even monitoring peculiar activities that may indicate a virus; and scanning floppies to prevent a virus from infecting your system.



Symantec ... 30 day MBG

5176 Symantec AntiVirus for Mac 1.1 (SAM) . . . . . $63.
5724 Symantec Utilities for Mac II (SUM II) . . . . . 95.

Make it big. Play it safe.



Get big screen vision on a small screen with **Stepping Out II.** It lets you scroll across pages in a mouse click, zooming in to work on details, or zooming out for the big picture, via 16 levels of magnification and three levels of reduction. And to prevent screen burn-out, use **After Dark.** Choose from 12 wild images, including flashing lightning bolts, streaking meteors, and crawling worms, or create your own.

Berkeley Systems ... 30 day MBG

5737 After Dark 1.0 . . . . *special* $22.
1541 Stepping Out II 2.01 *special* 45.

Look ma, no program!

$65



Want to check a file but don't have the application? Need to get some info out of a partially damaged file? Then get **CanOpener!** This clever utility will let you search for and open virtually any file (on a disk, hard drive or network) to check out its text, pictures, even sounds. *Without the application that created it.* Plus, it lets you copy material into your current application, or archive it for future use.

Abbott Systems ... 30 day MBG

5236 CanOpener 1.1 . . . . . $65.

HOLISTIC MEDICINE FOR MAC.

$55



The new version of **Virex** goes beyond the mere file repair that earned it 4½ mice from *MacUser*. Now, it actually monitors your system continuously and repairs infected files *before* they have the chance to spread their evil corruption through your helpless bits and bytes. There's also a new diagnostic tool for detecting previously unknown viruses. And the annual update service lets registered users get protection for new viruses within days of the first reports.

HJC Software ... 30 day MBG

4803 Virex 2.1 . . . . . $55.
5885 Virex 2.1 (10 Pak) . . . . . 349.

WHAT'S APP, DOC?

$29



HandOff eliminates the dreaded "Application Not Found!" message. No more searching for applications to open the documents that you borrow from your friends and co-workers. HandOff will let you assign *their* documents to *your* applications so you can open their files directly from the Finder. HandOff also lets you redirect files to any application based on the filename extension. Jean-Louis Gassee calls it "a nice, unobtrusive and very much needed extension to Macintosh."

Software Innovations ... 30 day MBG

5869 HandOff . . . . . *special* $29.

Call 1-800/334-4444 to order.

MacConnection™



POWER TWINS.

MacCalc is the easy-to-learn, easy-to-use, super-fast spreadsheet that's earned a *MacUser* Editor's Choice Award, and been called a "must have" by *MACazine*. It features extensive formatting, and support for .WKS files, for compatibility with *1-2-3* and *Excel*. And, through 1/31/90, we're bundling it at a special price with Bravo's **SPAMM**, the automatic INIT utility that can double the speed of calculations for your graphics, CAD/CAM, statistics, database work, and virtually all arithmetic operations on your Mac Plus or SE.

Bravo ... 30 day MBG

5404 SPAMM 1.1 . . . . . $48.
1539 MacCalc 1.2D . . . . . 79.
6084 MacCalc/SPAMM . *special* 115.



BACKUP AND SPOOL.

DiskFit automates your backup chores intelligently, backing up just those files that have changed. There's a network version available, and it's MultiFinder compatible, so you can keep on working while backing up. With **SuperSpool** you can even print while you work. The original is just for ImageWriters. The Laser version works with all Apple printers and is also available in an economical 5-Pack.

SuperMac Software ... 60 day MBG

3377 DiskFit 1.5. . . . . $58.
3379 Network DiskFit 1.5 . . . . . 225.
3383 SuperSpool 5.0 . . . . . 58.
3382 SuperLaserSpool 2.0 . . . . . 88.
3378 SuperLaserSpool 5-Pack 2.0 295.



$52

MANAGE YOUR ENVIRONMENT.

XTreeMac integrates disk management with file undelete and security protection. Its unique interface gives you a clear Directory Tree on the left and a DeskPad working environment on the right. There you can gather, rearrange, or delete files and folders from multiple disks, launch applications, lock files, and even recover accidentally deleted files. All on one screen, not multiple layers of windows.

Xtree ... 30 day MBG

5177 Xtree Mac 1.02. . . . . $52.

HOLY MACRO! FREE TEMPLATE!

Tempo II makes simply powerful macros, either from existing text and graphics or by recording unlimited keystrokes and clicks. An amazing time-saver, it can automate any routine, with pauses, conditional branch and repeats, "smart" features like window- or screen-relative recording, and "play-by-name" simplicity. Plus, through 1/31/90, you'll receive a free keyboard template ($9.95 retail) to keep track of your macros.

$75



Affinity Microsystems ... 60 day MBG

1016 Tempo II 1.02 . . . . . $75.

TRUE ARCHIVING.



$152

With **Retrospect**, you can put inactive but still useful files where they belong: in an archive. Free valuable hard disk space by *moving* files into the archive—you can access them later via a catalog on your hard disk. Or copy files into the archive for backup. It supports disks, tapes, optical cartridges, file server volumes, etc.—if it can hold data, Retrospect can archive or backup to it. And it includes file compression and a calendar for unattended operation.

Dantz Development ... 30 day MBG

5255 Retrospect 1.1 . . . . . $152.

THIS BEEP'S FOR YOU.



Wake up, Mac users! **Smart Alarms** will beep you at any appointed time, remind you what to do, and can even generate printed schedules. **Appointment Diary** is a daily calendar that can send reminders directly to Smart Alarms. The multi-user versions lets everyone on AppleShare or TOPS have identical or individual diaries.

JAM Software ... 30 day MBG

6089 Smart Alarms w/Single-User Appointment Diary . . . . . $49.
6088 Multi-User Appointment Diaries w/Smart Alarms (1-4 users) . . 99.
6087 Appointment Diaries (5-8) . . 149.
6086 Appointment Diaries (9-15). . 199.
6085 Appointment Diaries (16-25) 299.

No Surcharge on Credit Card.



$79

LABEL TEMPLATES. AT LAST.

Formatting a document for label printing can make anyone yearn for a nice old-fashioned typewriter—unless, of course you have **StickyBusiness**, the program that gives you *preformatted templates* for labels, cards, and tags from Avery, MOORE, Rolodex, Inmac, NEBS, UPS, Dennison, and Williams & Macias. It includes tools for creating your own imaginative designs, and you can import graphics from other files. Plus, it's compatible with text files from all leading applications.

Williams & Macias ... **30 day MBG**
4976 StickyBusiness 1.0.7 *special* $79.

3 ways to play it safe.



$87

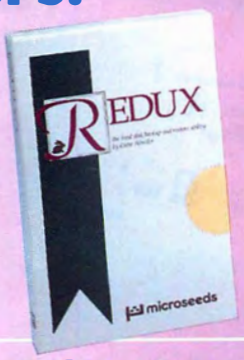
$107

$57

MacSafe II lets you secure your documents and applications inside password-protected folder-like safes on a hard disk, diskette, or network. The latest version features exclusive LightningCrypt encryption, Control Panel access, and the ability to put multiple files into a safe at once. For nighttime protection put **The NightWatch** on duty. Your hard disk will be locked up until you turn it back on with the correct password. And only you have access to the override function (in case of forgotten passwords). When you leave your desk and want to keep anyone else from seeing your work or accessing your network connections, **QuickLock** darkens your screen, displaying only a moving image that protects your screen from burn-in, while allowing background processing. To regain access to your screen, simply type in the access password. Three simple, elegant, and secure solutions.

KentMarsh Ltd. ... **30 day MBG**
5457 QuickLock 1.0 . . . . . $57.
2591 The NightWatch 1.03 . . . . . 87.
6134 MacSafe II . . . . . 107.

NO MORE ACHING BACKUPS.

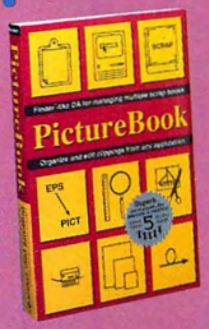


$46

Anyone can trash a file or a disk. Which means that everyone needs a backup program that anyone can use. With **Redux**, two clicks back you up. For custom backups, just tell Redux what to do in simple English(!) commands. Need to perform a complex backup regularly (e.g. all spreadsheets in certain folders over 20K)? Redux will reduce it to two clicks so even a novice can do it.

Microseeds Publishing **60 day MBG**
2913 Redux 1.5. . . . . *special* $46.

CLIPPING SERVICE.



$39

PictureBook is a powerful Finder-like DA that organizes your clippings into multiple scrapbooks. You can name and annotate each clipping, track creator name and date, move clippings between multiple windows by simply clicking and dragging, and print scrapbook catalogs. Plus, the integrated editor lets you precisely crop or re-size. PictureBook can directly read PICT, MacPaint, and EPS files, converting all EPS to PICT. Rated five mice by *MacUser*.

Loop Software ... **30 day MBG**
5442 PictureBook. . . . . $39.

LAUNCH ON CUE.

On Cue whisks you quickly and smoothly from program to program without accessing the Finder! It lets you travel between documents and applications in record-breaking speed. No more waiting for files to open and close, or getting lost in the desktop maze. When running MultiFinder, On Cue allows you to switch applications simply by pressing the command-option combination. Compatible with all Macs from 512KE on up.



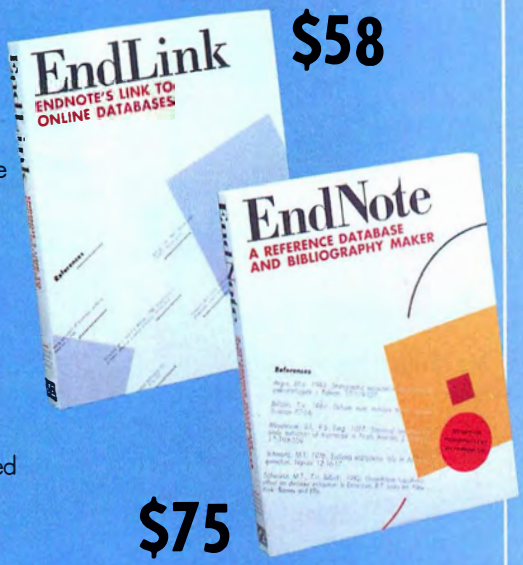
$35

ICOM Simulations
4084 On Cue 1.3 . . . . . $35.

Call 1-800/334-4444 to order.

MacConnection™

Ultimate reference tool.



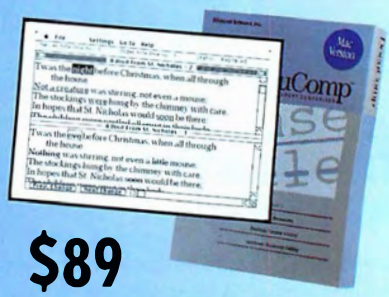
$58

$75

How much time do you spend tracking down references you've used before? How about re-typing the same bibliographic entries? **EndNote** lets you create and update a personal database of up to 32,000 references which you can access anytime, searching by author, year, or any word in the text. (Full logic searches are also supported.) The data from those references can be pasted directly into your word processing document as citations, just the way you need them. Then, the program will *generate your bibliography automatically,* formatted in any style. EndNote works either as a DA or as an application and is compatible with *Word, MacWrite, WriteNow,* and *WordPerfect.* Its companion program **EndLink** lets you import references directly from on-line services into your EndNote database. It works with MEDLINE, BIOSIS, Chem Abstracts, and other databases available on DIALOG and BRS Colleague. *MacUser* (2/89) gave EndNote 4½ mice and said, "almost like magic, the bibliographic chores of your writing task are finished."

Niles & Associates ... 30 day MBG
5048 EndLink 1.0 . . . . . $58.
4602 EndNote 1.2.1 . . . . . 75.

Compare and save.



$89

DocuComp is the fast and accurate way to show differences between two versions of anything from a contract to a book to source code. Even documents from different word processors can be displayed simultaneously, revealing insertions, deletions, replacements, and moves. The comparisons can be saved or printed as needed. A great time saver for technical writers, editors, lawyers, programmers, educators, and others.

Advanced Software ... 30 day MBG
5608 DocuComp 1.11 . . . . . $89.

$35



QUICK AND EASY RÉSUMÉS.

RésumExpert comes in four extraordinary editions that will let your all-important career-related documents dress for success on Microsoft Word or Works—whether you're a student or a CEO. The templates in "original" RésumExpert will produce expertly tailored resumes for almost any career. The other editions are for cover letters, sales and marketing, and management careers. The manuals even include valuable writing tips.

A Lasting Impression
5465 RésumExpert . . . . *special* $35.
5853 Sales & Marketing . . *special* 35.
5852 Management Edition *special* 35.
5749 Cover Letters . . . . . *special* 35.

$225

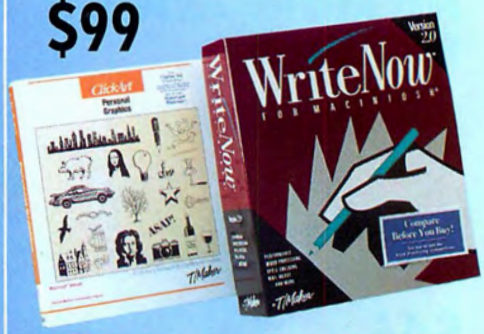


Word processing heaven.

Nisus has enough word processing power for even the most serious textpert. It boasts ten clipboards; extensive editing features like unlimited undos; and a lightning-fast search and replace facility that's font- and style- (including color) sensitive, can search by matching patterns, and can even look through unopened files. You also get a spell checker and thesaurus, integrated graphics, versatile formatting, an editable page preview, 50 useful macros (or write your own), and much more.

Paragon Concepts ... 30 day MBG
5683 Nisus 2.03 . . . . . *special* $225.

$99



BUY RIGHT NOW. GET ART FREE.

Though 1/31/90, you'll get a free copy of *ClickArt Personal Graphics* ($49.95 retail value) when you buy the word processor that's been called "Best New Word Processor" (*MacUser* 5/89) and "Readers' Choice" (*MACazine* 1/89). **WriteNow** is an elegant combination of simplicity and power, featuring WYSIWYG editing, 100,000 word spell checker, multiple columns, mail merge, and many other claims to fame.

T/Maker ... 30 day MBG
3639 WriteNow 2.0 (with ClickArt Personal Graphics) *special* $99.

Overnight Shipping $3.

One Word says it all.

Whether you're a salesperson, scientist, secretary, or just writer of the occasional love letter, **Microsoft Word** has all the formatting, editing, and printing power you need. Integrated outlining lets you get your thoughts in order before writing a single word and reorganize whole documents with a few clicks. Store and summon your favorite formats with Style Sheets. Avoid nasty gaffes and faux pas with the 80,000-word spell checker. The QuickSwitch feature lets you go to other programs in a single keystroke and bring back graphics just as fast. The new and powerful Table feature lets you create columns, charts, lists, and forms without tabs. And simple to use? The menus are flexible and customizable to meet the needs of everyone from novice to expert.



$249

Microsoft ... **30 day MBG**
4969 Microsoft Word 4.0 . . . . . $249.



$64

Complete outline tool.

Acta Advantage combines the convenience of a DA outliner for putting down rough notes anytime, with the full features of an application for developing polished outlines. The latest version of the DA lets you mix faces, styles, and sizes at will, and specify page breaks for printing. The application adds a full menu bar plus your choice of Harvard, Roman, or bullet outline labels, page preview, printing options, and more.

Symmetry ... **30 day MBG**
4504 Acta Advantage 1.0 *special* $64.

GRAMMAR & BIBLIO FILES.

Catch grammatical errors in any text file before your colleagues or clients do. **Sensible Grammar** flags awkward writing, jargon, inappropriate contractions, etc., and suggests corrections. To manage references for your newly improved writing, try **Bookends**, a sophisticated HyperCard database that stores all your reference data and then generates bibliographies in whatever format you need.



Sensible Software ... **30 day MBG**
3375 Grammar 1.5.4. . . *special* $51.
4692 Bookends 1.1.7. . . . *special* 51.

INCREDIBLE QUICKIES.

QuickLetter makes writing letters and printing envelopes a snap. You don't even have to use pre-printed stationery—QuickLetter lets you print your own picture letterhead. Just write your letter, view it in Page Preview, and let QuickLetter address your envelopes automatically, even while you're working in another program. This DA word processor also has full font and style control, and a built-in address book. *MacUser* 10/89 gave it 4½ Mice and said that it's "quickly earned a place on my most-used DAs list."



$73

Working Software ... **30 day MBG**
4699 QuickLetter 1.01 . . . . . $73.

LISTEN AND LEARN.

$39

Become a power user at your own pace on your own Mac by listening to an expert talk you through the program step by step while you try each new skill. Each 90-minute tutorial includes an audio cassette, example files on disk, and quick reference card.



Personal Training Systems
60 day MBG
(Note: Each series is available in beginning, intermediate, and advanced levels; see our complete product list for details.)
Personal Training for: Excel 2.2, Word 4.0, Persuasion 2.0, HyperCard, PageMaker 3.0, Works 2.0, Illustrator 88, FileMaker II, and the Macintosh ea.$39.

Call 1-800/334-4444 to order.

MacConnection™



PARLEZ POWER.

Now you can use your Mac along with the top-selling audio language program to master a foreign tongue. **VocabuLearn/ce** interactive HyperCard Stacks are available in two levels for French, German, Italian, Spanish, and Japanese. Each program includes two 90-minute audio cassettes, a complete word list, and a free copy of HyperCard V. 1.2.

Penton Overseas ... 30 day MBG

Level 1	Level 2		
5864	5887	French	ea. $30.
5865	5889	Italian	ea. 30.
5867	5891	Spanish	ea. 30.
5868	5888	German . . .	ea. 30.
5866	5890	Japanese . .	ea. 36.

$27



Who dunnit?

Who put the fun into math equations, word problems, and logical thinking? No, the butler didn't do it, Davidson did. With **Math Blaster Mystery**. For ages 10 and up, Math Blaster Mystery is the exciting and entertaining way for children to master a variety of math and problem solving skills. It runs on a Mac Plus, SE, SE/30, IIcx, or II, and can be installed on your hard disk.

Davidson & Associates
1734 Math Blaster! 1.0 *(CP)* . . . . $27.
6128 Math Blaster Mystery *(CP)* . . 27.

YOUR PERSONAL MUSIC TUTOR.

$72



Learn to read and write music, develop your ear for intervals, chords, melody, and rhythm, and have fun while doing it with **Practica Musica**. Just point and click on the screen, keyboard or use a MIDI instrument. Called "a sensational learning program" by *MacUser* (11/87), it features high-quality sound, interactive notation, and a coordinated textbook. For both beginners and advanced students.

Ars Nova ... 60 day MBG
1215 Practica Musica 2.1 . . . . . $72.

STARS IN YOUR EYES.

$89
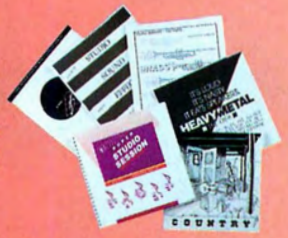


Launch **Voyager** and explore the vastness of space. This planetarium program entertains and educates with a 14,000-object database of deep-sky objects, stars, planets, comets, and asteroids. View from anywhere in the Solar System at any date from 1000 B.C. to A.D. 4000. You can even enter custom orbits and print out charts. *MacUser* gave it five mice and said, "Voyager will not only assist the current generation of astronomers, but may also inspire the next."

Carina Software
5726 Voyager 1.2 . . . . . $89.

COMPOSE YOURSELF.

Your Mac can make music magic with **Super Studio Session**. You can compose using many instruments, tempos, and key signatures, and play it all back on your Mac or home audio system. No synthesizer is needed. Write and play back on eight tracks using over 90 instruments. The complete library offers over 320 different instruments and sound effects. Supports AppleTalk links.

$65



Bogas Productions ... 60 day MBG
4255 Super Studio Session 2.0 . . . $65.
6135 Super Studio Session Bundle Pack (incl. Rock, String Quartet, Country, Brass, & Sound Effects) *special* 99.

HYPER-ANIMATED LEARNING.



$45

Learning letters and their sounds is far more enjoyable thanks to HyperAnimation, which combines real speech sounds, synchronized with correct facial motions. Children can improve their letter recognition by following the Talking Elf in **Alphabet Blocks**. To transform learning phonics into play use **Talking Tiles** whose on-screen tutor spells and pronounces words. Get both of Bright Star's two learning programs together at a special price through 1/31/90.

Bright Star Technology
6096 Talking Tiles 1.0 & Alphabet Blocks 1.0 *special, both for* $45.

No Hidden Charges.

MANIC HUMOR. LURID GRAPHICS.



$29

Guess what? It's 2004 and San Francisco is ruled by aliens. Your job is to work undercover "with" the aliens, in order to penetrate the hideout of a band of renegade Ninjas and defy the Pig-Monkey mutants to win freedom for all humankind. But it's hard when creatures out of your worst nightmares stalk the familiar streets and sights of the City by the Bay.

Sierra On-Line
5694 Manhunter: San Francisco . $29.

$39



DEAL YOURSELF IN.

Ready for a little two-handed, four-handed, or five-card Cribbage? How about some good old standard Gin or Oklahoma Gin? With **Cribbage King-Gin King**, you can play against seven computer personalities, ask their advice, then improve your game and beat them. Modern play techniques and sophisticated probability analysis make for hours of serious good times. *The New York Times*- (10/10/89—you can look it up) claims it manages to "imitate that elusive quality, card sense, in a box of transistors."

Software Toolworks ... 30 day MBG
6111 Cribbage King-Gin King . . $39.

PURSUE GLOBALLY.



$32

Wondered what the Trilateral Commission's been up to lately? **Moriarty's Revenge** lets you join the Scotland Yard Irregulars in relentless pursuit of the world's most diabolical criminals, who belong to the ten secret societies that rule the world of crime and threaten the very fabric of civilization (what's left of it). You can travel the globe, unraveling the evil deeds of these nogoodnicks, visiting exotic locales, meeting bizarre new people, and save the world to boot...again.

Bull City Software ... 30 day MBG
5841 Moriarty's Revenge . . . . . $32.

ARE YOU GAME?

The **TaskMaker** takes you through ten challenging tasks in which you fight off some truly nasty creatures in order to restore prosperity to the depressed, devastated world. **NFL Challenge** can make any Sunday super by pitting all 28 NFL teams against each other at varying levels of difficulty, taking into account different players' special talents. Or head for the links with **MacGolf Classic**. You get to use all 14 clubs on 108 different holes complete with awesome graphics and sound effects.



XOR
6152 TaskMaker (CP) . . . . . $27.
4320 MacGolf Classic (CP) . . . . . 53.
3815 NFL Challenge (CP) . . . . . 57.

ENTERTAINMENT GROUPWARE.

These two games transform your computer network into an action-packed battle field. **Strategic Conquest** is the realistic war game that dares you to explore and conquer an unknown, enemy-infested world. And, for adventures of another class, launch **NetTrek** and attempt galactic colonization in this real-time space battle simulator. Both allow you to challenge your Mac or other network users for hours of full color, networkable entertainment.

$35 EACH





Premier Technology
5773 Strategic Conquest Plus 2.0 $35.
5774 NetTrek—The Real Version . . 35.

GET JET. QUICK.

Take the controls of a carrier-based F-18 or a land- combat F-16 and pit yourself against your friends or your Mac. You can even fly with others (like in *Top Gun*). **Jet** lets you choose from a breathtaking array of Scenery Disks. And, to help you take off faster, we're bundling Jet with the **Kraft QuickStick** at a special price. The QuickStick plugs right into your mouse port, and features both auto-centering or free-floating operating modes. Offer good through 1/31/90.

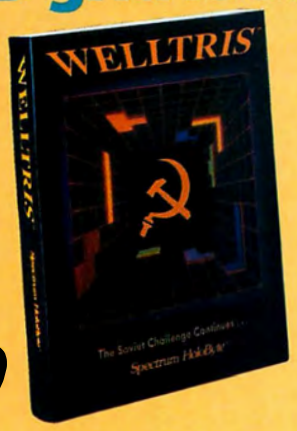


SubLogic & Kraft ... 60 day MBG
4698 Jet . . . . . $32.
2600 3-Button QuickStick . . . . . 39.
4082 3-Button QuickStick ADB . . . 49.
6113 Jet & QuickStick . . . . special 59.
6138 Jet & QuickStick ADB special 69.

Call 1-800/334-4444 to order.

MacConnection™

3-D grid lock?



$19

Alexey Pajitnov's *Tetris* could challenge parts of your brain you didn't even know you had. Well, his sequel, **Welltris** will send you into another dimension altogether, where you'll spend many challenging hours staring deep into a four-sided well with grid-like walls while you try to position falling pieces quickly and accurately on the bottom grid.

Spectrum HoloByte ... **30 day MBG**
6112 Welltris . . . . . $19.

Have your Mac and PC it, too.

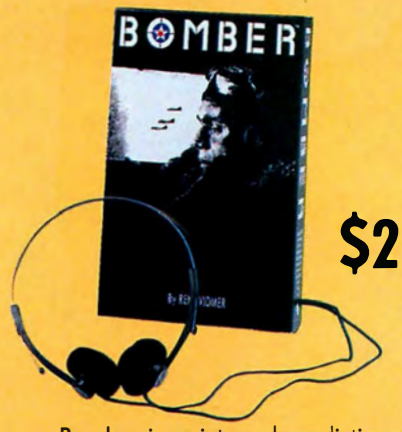
$245



Are you still doing part of your computing on a DOS machine and part on a Mac? Well, now you can put an end to such silicon schizophrenia. Because **SoftPC** gives your Mac II, IIx, IIci, IIcx, SE/30 or 68020-accelerated SE true MS-DOS compatibility. So you can run any PC application, from best sellers to in-house programs, right on your Mac. Plus you can run PC and Mac programs at the same time, and even cut and paste between Mac and PC applications via MultiFinder. There's no hardware. No hassle. Just install SoftPC on your Mac, double click, and get the best of both worlds.

Insignia Solutions
4089 SoftPC 1.3 . . . . . $245.

Bombs away!



$26

Bomber is an intensely realistic action/adventure game recreating the sights, sounds, and split-second decisions of the young B-17 crews in the skies over Nazi Germany. You get digitized sound, animation, and a ten-man crew to talk you through the tough ones. It runs on everything from a Mac Plus to a IIci. HyperCard required.

Inline Design ... **30 day MBG**
5870 Bomber (incl. headphones) $26.

MAC CRUISE CONTROL.

Reduce your CompuServe on-line time and costs with **CompuServe Navigator**. It can automatically log on, take care of your Forum business, check stock quotes and pending electronic mail, download files, and then log back off. And it can do all this unattended, or in background. Winner of the 1989 SPA Telecommunications Award, it's available at a special price through 1/31/90 *and* you'll receive an upgrade to Version 3.0 directly from CompuServe.



$39

CompuServe ... **60 day MBG**
1673 Navigator 2.1 . . . *special* $39.

$249



Special delivery.

Your workgroup's productivity will soar when you start sending messages, files, even graphics created with other Microsoft programs via **Microsoft Mail**. This electronic mail system lets everyone on your AppleTalk network communicate easily with each other (even PC and VAX users), and provides a gateway to AppleLink and MCI Mail.

Microsoft ... **30 day MBG**
5856 Microsoft Mail 2.0 Server . $249.
5858 Microsoft Mail 2.0 Workstation . . . . . 84.
5857 Microsoft Mail 2.0 (20 Pack) 969.

No Sales Tax.



$24

Dial the Dow.

The **Dow Jones News/Retrieval Membership Package** brings current business and investment facts, figures, and full-text articles from over 50 Dow Jones Services directly to your Mac. It comes with the *E-Z Online* communications disk for easy access to those services and a *User's Guide* for finding the facts you want fast. Plus, you get five hours of usage time and your first year's annual service fee free!

Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package .... $24.

Take a look or take over.

The key to successful network training, troubleshooting, and file/peripheral sharing is the ability to actually observe and/or control another Mac. And that's the power **Timbuktu** gives an AppleTalk network. Not only can two colleagues share files, compare notes and help each other out, but even multiple users can share screens for mass Mac meetings or training sessions. All you need is





a copy of Timbuktu at each Mac. With a copy of **Timbuktu/Remote** and a modem at each location, you get the same power over dial-up lines, serial links, or ISDN services. Timbuktu/Remote also includes a chat window and file transfer for the ultimate in file management between two remote sites.

Farallon Computing ... 30 day MBG

5707 Timbuktu 3.0 ..... $95.
4866 Timbuktu/Remote 1.0.1 ... 129.
4867 Timbuktu 30-Pack 3.0. ... 1325.
5893 Portable Pack (incl. two copies each of Timbuktu & Timbuktu/Remote, two StarConnectors, and accessories) ..... 375.

GO OVER THE TOPS.

TOPS transforms any Mac into a TOPS network station, able to share files, printers, and multi-user applications. As you add workstations, maintain your network performance by virtually tripling network capacity with the **TOPS FlashBox**. It installs in minutes. And, for communications software there's **TOPS InBox**. Use it to send messages and memos just by pressing a few buttons, and to receive your messages whether you're Mac is on or off.



TOPS ... 30 day MBG

4598 TOPS FlashBox ..... $123.
3723 TOPS Mac 2.1..... 137.
4714 InBox Starter Kit 2.2 ..... 149.
4715 InBox Connection Mac 2.2 . 45.

THE INCREDIBLE EXPANDING NETWORK.



First, Shiva introduced **NetBridge** which let *AppleTalk* networks expand to hundreds of Macs, LaserWriters, and other network devices. Now two *AppleTalk* or *PhoneNet* networks can be connected over any distance, with a **TeleBridge** and modem at each end. You even get dial-in network access so a single Mac and modem can access any TeleBridge network resource from any phone.

Shiva ... 30 day MBG

4347 NetBridge ..... $339.
4942 TeleBridge ..... 339.

COMMUNICATION REVELATION.

The new version of best-selling telecom software **MicroPhone II** lets you build front ends to information services and corporate mainframes. It also supports ZMODEM, XCMDs and XFCNs, European languages, icons, color, and sound. Using built-in modem drives, it works with any modem to transfer documents for you anywhere in the world... with super reliability at a super low price.



$219

Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 ..... $219.

Call 1-800/334-4444 to order.

Transfer data. Codes and all.



With **MacLink Plus**, you don't just transfer data between Macs and PCs (at up to 57,600 bps), you retain *all the correct styles and formats*. And now it lets you do the same with Sun and NeXT systems too. The **MacLink Plus/Translator** library now includes over 100 translators. So, for example, you can send a *MacWrite* or *Word* document to your PC to appear correctly in *WordPerfect*, *WordStar*, *MultiMate*, *XYWrite*, etc. Or, you can send your PC's *dBASE*, *1-2-3*, *Multiplan*, *Symphony*, or *DIF* file, with all formulas and formats intact, to your *Excel*, *Multiplan*, or other Mac application. All it takes is a couple of points and clicks between two familiar Mac file windows. MacLink Plus comes complete with a direct connect cable to your PC's serial port (or you can use a Hayes-compatible modem) and software for both the Mac and the PC. If your Macs and PCs already share a network or server, then you can buy the Translators separately. Welcome to the world of real file exchange.

DataViz ... 60 day MBG
1823 MacLink Plus/PC 4.1 (includes Translators) . . . . $125.
4842 MacLink Plus/Translators 4.1 . 99.



$325

FAST, CONVENIENT SCANNING.

The **ScanMan** hand-held scanner from Logitech offers a fast, easy way to add the dazzle of non-computer images to your Mac documents. It comes with convenient editing software that can be used as a standalone application or DA to resize, rotate, flip, or crop scanned images. Scanned images are displayed in 32 shades of gray, and you can set the resolution from 100-400 dpi, choose from three settings for photo scanning, and adjust contrast.

Logitech ... 30 day MBG
5082 ScanMan Mac . . . . . $325.

THIS PACK SAYS IT ALL.



$199

Get on line quickly, easily, and cost-effectively with the **Mac Communications Pack**. It includes the external *PM 2400SA* modem (platinum color to match your Mac), installation cable, and *Microphone 1.5*, the popular communications software. This superior, standalone, USA-made modem is Hayes compatible, accepts pulse or touch-tone dialing, full- or half-duplex operation, and features automatic adaptive equalization for error-free operation.

Practical Peripherals
30 day MBG
3089 Mac Communications Pack 1.5 . . . . . *special* $199.

COMMUNICATION ART.



White Knight 11 takes over where its popular predecessor *Red Ryder* left off. It supports four XMODEMs, three YMODEMs, three Kermits, ZMODEM, and Flash protocols, emulates TTY, VT52, VT100, and VT102 terminals, and supports Color QuickDraw and large monitors. The interface can be customized and its improved Host Mode and 200+ command Procedure Language let you fully automate any session. And, for a limited time, it comes bundled with a *free copy of Okyto 1.0*—the revolutionary Mac-to-Mac file transfer program, and a *free supscription to GEnie*.

Freesoft ... 60 day MBG
6115 White Knight 11 . . . . . $89.

SIMPLIFY YOUR PRINT LIFE.



LabelWriter is the first printer designed just for labels. It's whisper quiet, maintenance free, and produces letter-quality 1" x 1½" labels (even machine- scannable bar codes) on 130-label rolls. Bundled software lets you use existing lists, create new ones, and format in any style. **The Organizer** from CoStar raises your LaserWriter II to desktop height and has storage for extra paper, paper trays, toner cartridge, and even a Hard Disk 20. And it comes on casters so it's easy to roll over to a colleague's desk.



CoStar ... 30 day MBG
6090 LabelWriter . . . . . $189.
6067 LabelWriter Labels . . . . . 11.
6091 The Organizer . . . . . 239.

Overnight Shipping $3.



$369

SCAN BY HAND.

Now one quick pass of your hand brings images and text up to 4.2'' wide into your Mac. **LightningScan** is the hand scanner that *saves and edits in true gray scale.* The built-in memory makes it extraordinarily fast, and its new DA software can resize, calibrate, rotate, and flip in a flash. In fact, it was rated the top Macintosh hand scanner by both *Publish!* and *MacWEEK.*

Thunderware ... 30 day MBG

4994 LightningScan . . . . . $369.
3648 ThunderScan 5.0 with PowerPort . . . . . 187.
3645 Mac II Power Accesssory . . . 45.

KEYBOARD CONTROL.

Work as fast as a mouse without leaving the keyboard. The Datadesk **Mac-101** is a full-size DOS-style keyboard that comes with 15 very functional function keys and the software for assigning them program commands, menu selections, and mouse movements. *MacWEEK,* called it ''the most important accelerator you can buy for a Macintosh.''



$139

Datadesk ... 30 day MBG

1819 MAC-101 Keyboard (beige) . . . . . $139.
1820 MAC-101 Keyboard (platinum) . . . . . 139.
1821 MAC-101 Keyboard (ADB). 139.
Foreign keyboards available in French, German, Spanish, and the U.K. . . . . call



THE BIG PICTURE.

The full-page (15'') and two-page (19'') B&W **Nutmeg Monitors** deliver ultra-high resolution, flicker-free viewing for hours of desktop publishing, CAD/CAM, etc. Both feature 72 dpi resolution and come with a built-in tilt and swivel stand. And, through 1/31/90, we're offering special prices on the entire 19'' line.

Nutmeg Systems ... 30 day MBG

2993 15'' for Mac II . . . . . $799.
2992 15'' for Mac Plus . . . . . 999.
2994 15'' for Mac SE . . . . . 999.
4002 19'' for Mac Plus . . *special* 1195.
4096 19'' for Mac SE . . . *special* 1195.
5680 19'' for Mac SE/30 *special* 1195.
4097 19'' for Mac II . . . . *special* 1195.

COMPLETE SCANNING.

Here are two versatile personal scanners, ideal for desktop publishing. Both come with *SmartScan* software to resize, scale, rotate, crop, and edit any image. Three dithering patterns give you a 16-level gray scale. **TheComplete Page Scanner** lets you scan any page of text, drawings, photos, etc. up to 8½'' x 14'' at either 200 or 300 dpi. **TheComplete Half-Page Scanner/400** can handle image sizes up to 4.1'' x 14'' at 200, 300 or 400 dpi.



TheComplete PC

6104 TheComplete Half-Page Scanner/400 . . . . . $315.
6103 TheComplete Page Scanner 759.

GET ON A ROLL.

The **Kraft ADB Trackball** doesn't use up valuable real estate on your desk, because it stays put while your cursor takes off. Three switchable cursor speeds let you choose the response range that's most comfortable for your applications. It plugs right into the mouse port, runs all mouse software, and delivers ultra-sensitive and accurate response. Plus, Kraft's opto-mechanical design and quality construction is backed by a five year warranty. Complete with foot pedal!

$79



Kraft ... 60 day MBG

6099 Kraft ADB Trackball (with foot pedal) . . . . . $79.

SCAN WORDS AS WORDS.

$549



It's no fun trying to edit text with drawing tools. **OmniPage** text recognition software can read virtually any font in sizes from 8 pt. to 72 pt. as scanned by any popular scanner, into any popular word processing format. Besides regular text, it can read spreadsheets and other financial documents, 11 of your favorite Indo-european languages, and even decipher pages with both text and graphics.

Caere

4476 OmniPage 2.0 . . . . . $549.

Call 1-800/334-4444 to order.

MacConnection™



Speed demons.

$879

The awesome productivity benefits of Mac software can be lost while you're waiting for that spreadsheet to calculate, database to sort, or CAD image to arrange itself. An accelerator card from Dove can improve your performance by 55%. The **Marathon 020** series gives 1 or 4 Megs of additional memory to your SE, along with a 32-bit microprocessor operating at 16 MHz (faster than a Mac II!). And you can double the speed of calculations with the optional math co-processor. The **Marathon 030** series enhances your Mac SE/30, II, or IIx's performance with a 256K internal data cache, 256K instruction cache, and full 32-bit microprocessor operating at 32 MHz. And, new from Dove, is the **Marathon Racer**, the cost-effective way to take advantage of Dove's cache technology to make your Mac II perform an average of 20% faster.

Dove Computer ... 60 day MBG

1793 MaraThon 020 MSE1 . . . $429.
1794 MaraThon 020 MSE2 (1 Meg) . . . . . 699.
1795 MaraThon 020 MSE3 (math chip) . . . . . 589.
1796 MaraThon 020 MSE4 (1 Meg/chip) . . . . . 879.
5192 MaraThon 020 MSE5 (4 Meg) . . . . . 879.
5193 MaraThon 020 MSE6 (4 Meg/chip) . . . . . 1099.

Note: Each Marathon 020 is also available in a *FastNet LAN* version which adds Ethernet connectivity to other Macs or networks.

4663 Mara Thon 030 Accelerator 32 MHz . . . . . 969.
5878 MaraThon 030x Accelerator 32 MHz . . . . . 969.
5880 MaraThon 030 SE/30 Accelerator . . . . . 969.
5623 MaraThon Racer . . . . . 149.

We also carry the complete line of Dove *MacSnap* memory enhancements and *FastNet* networking products. Call for details.

The cutting edge of storage.

Cutting Edge Hard Drives arrive at your door pre-formatted and ready to boot automatically. They feature automatic head parking and dual SCSI ports for daisy chaining. You get access times as low as 23 milliseconds, and a mean-time-between-failure rate of up to 100,000 hours. All at a great price.

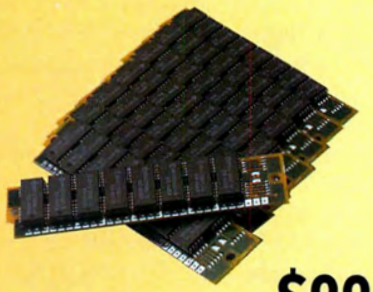


Now, if your storage needs are unlimited but your budget isn't, you'll want to check out the new **45MB Removable Hard Drive**. You get all the benefits of the popular *SyQuest* mechanism without the high price. And whenever you need more storage, all you have to do is buy extra cartridges. It features automatic head parking, super fast 25 millisecond access time, and it can transfer data at up to 1.2 meg per second. Cutting Edge also solves your disk swapping dilemmas with this **800K External Disk Drive**. It formats at 400K or 800K HFS, and is light enough to take home or across the hall. Plus, it's so quiet you need to check the LED indicator to see if it's working.

Cutting Edge ... 30 day MBG

3989 800K External Disk Drive (platinum) . . . . . $149.
5133 20 Meg Hard Drive . . . . . 439.
3990 30+ Meg Hard Drive . . . . 499.
3991 45+ Meg Hard Drive . . . . 549.
5275 65+ Meg Hard Drive . . . . 629.
5276 80+ Meg Hard Drive . . . . 739.
5456 45 Meg Removable *special* 889.
5736 44 Meg Removable Cartridge . . . . . 115.

BITS O'POWER!



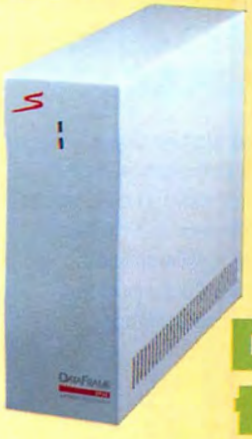
$99

Crank your system memory to the max with MacConnection's very own, very reliable **80ns SIMMs**. These surface-mount 1 Meg SIMMs plug in easily, and are completely compatible with your Mac. Add 2 Meg at a time to your Plus or SE to a maximum of 4 Meg. For your SE/30 on up, add 4 Meg at a time to a max of 8 Meg. Every MacConnection SIMM carries a two-year warranty.

MacConnection ... 60 day MBG

1107 1 Meg, 80ns SIMM . . . . . $99.

Unlimited Toll-Free Technical Support.



$589

Drive time.

From the folks who introduced the first SCSI hard drives for the Mac come four superior external drives, pre-formatted and ready to boot your Mac and store multiple Megs of data. All support the full SCSI command set including Apple's UNIX system and LaserWriter NTX printer. There's even a built-in second SCSI connector for daisy-chaining.

SuperMac Tech. ... 30 day MBG

5452 Dataframe 20 . . . . . $589.
5447 Dataframe XP 30 . . . . . 699.
5448 Dataframe XP 60 . . . . . 959.
5449 Dataframe XP 100 . . . . . 1279.

A BETTER MOUSE PAD.



The world has been beating a path to Moustrak's door since the early days of the Mac. Their smooth, high-tech mouse pads provide sensitive mice with a surface suitable for slipping and sliding across your screen with the utmost precision. This elegant accessory suits the most discriminating Mac palate (or palette) and makes a wonderful gift for anyone who's been bitten by the Mac.

Moustrak ... 60 day MBG

Available in blue or gray.
2694 Moustrak Pad (standard 7" x 9") . . . . . $8.
2692 Moustrak Pad (large 9" x 11") . 9.
2693 Moustrak Pad L/F (9" x 11") . . 10.

MAY WE SLIP YOU SOME DISKS?



One of the first things that many of our customers say to themselves after placing an order is, "Oh my gosh, I forgot to order disks again. Well there's always next time." Sure, but what if you run out before next time? Hey, don't get caught short. We've got the **Sony 3½" Disks** you need—and they could be in your hands tomorrow.

Sony ... 60 day MBG

3297 3½" DS/DD Disks (10). . . . . $14.
6148 3½" DS/DD Disks-3 Pak (30) . 35.
3298 3½" HD Disks-1.44 Meg (10) 25.

ULTIMATE DRIVING.



$329

Upgrade any Mac *and* give it MS/DOS drive compatibility. Plug **Rapport** into your 512e, Plus, SE, or II's drive port to read 720K MS/DOS on your *internal* drive, or read/write MS/DOS on your *external* Apple 800K drive. With **Drive 2.4** plugged into Rapport, you can read and write all IBM and Mac 3.5 standards, plus 1.2 Meg or 2.4 Meg on HD disks. (SE/30, IIcx, IIci, and IIx users can use Drive 2.4 without Rapport.)

Kennect Technology ... 30 day MBG

5631 Rapport (incl. Fastback II) . $199.
5632 Drive 2.4 . . . . . 329.
6150 Drive Port Cable (for Mac II and IIx) . . . . . 47.

GET SOME RELIEF.

Make you and your SE more comfortable. First, lift your papers out of the clutter and onto the **Universal Copy Stand**. Then, protect your eyes from glare, wear, and tear with the **Anti-Glare Filter**. Now, keep your SE, two peripherals, and modem calm with the **System Saver SE**. You get surge suppression, EMI/RFI noise filtering and front-mounted control switches. Get all three at this special price through 1/31/90.



$95

Kensington ... 30 day MBG

6101 SE Bundle (Universal Copy Stand; System Saver SE; Anti-Glare Filter) *special, all 3 for only* $95.

PROTECT YOUR INTERESTS.

$75



Always keep your SE safely under wraps with the **Protection Pak**. On the road, use the *High Trek Travel Case*, featuring ¾" high-density closed-cell foam, lined pockets, and a durable waterproof Cordura plus nylon skin. Keep up to 20 disks safely in the *Gallery Disk Easel*—designed to fold flat and fit into a pocket in the travel case. And, back home, cover your SE and keyboard with *MacAttire Dust Covers*, made from attractive, water-resistant, anti-static, washable rip-stop nylon.

Sopris Softworks ... 60 day MBG

4862 SE Protection Pak (ext. keyboard) . . . *special* $75.

Call 1-800/334-4444 to order.

MacConnection™

TRAVELLING SE OFFICE.

$79



The Ultimate SE Carrying Case boasts two sturdy outside pockets for books, umbrellas, disks, pens, even 8 1/2" x 11" notebooks. Inside there's a padded compartment for your extended keyboard and a 9" x 9" padded pocket for mouse, cords, etc. The super-sturdy construction features a water-resistant Cordura shell, nickel-plated chromium steel hardware, and ultra high-density foam.

I/O Design ... 30 day MBG

6129 Ultimate SE Case . . *special* $79.
2379 MacLuggage Imageware II . . 49.
2376 MacLuggage Macinware Plus 64.
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LABELS FOR ALL.

Avery Labels deliver guaranteed performance in Apple LaserWriter Plus and ImageWriter printers. They feed automatically from the paper tray and are available in address, shipping, file folder, and round sizes. New *Laser Diskette Labels* for 3 1/2" diskettes feature a special adhesive designed to stay on your disk and not peel off in your disk drive. Avery *List&Mail Labels* feature a special adhesive to prevent them from peeling off in your ImageWriter. They are available in individual use and bulk pack sizes.



Avery ... 60 day MBG

4865 Address (3 1/2" x 15/16" Qty. 3750) $15.
4807 Laser (1" x 2 5/8", Qty. 3000) . . 24.
5392 Disk—Laser (3 1/2", Qty. 630) . . 29.
Call for other sizes.

PROTECT CLOTHES AND MAC.

Targus Carry Cases feature closed-cell foam and a special static-proof, water-resistant material that's strong as Cordura but softer so it won't wear out clothes. You also get 100 lb. tensile-strength shoulder straps and a sturdy padded bottom to cushion crash landings. .



Targus ... 60 day MBG

3618 ImageWriter II Carry Case. $45.
3617 Mac Plus/SE Carry Case . . . 55.
4015 Mac SE & Extended Keyboard Carry Case. . . . . 69.
6116 Mac IIcx Carry Case . . . . . 85.

POWER THAT JUST WON'T QUIT.

$269



Don't let spikes, sags, and surges smash your productivity. The **110SE UPS** maintains continuous power for any Mac, including file-server units, protecting your data from both undervoltage and overvoltage. In an extended power outage, it can signal **PowerChute**, APC's software monitoring program, to automatically shut down your AppleShare (2.0 and up) networks. PowerChute comes free with the 110SE through 1/31/90.

American Power ... 30 day MBG

5895 110SE UPS 90 watts, 8 lbs., with free PowerChute . *special* $269.
6102 PowerChute (free with 110SE UPS through 1/31/90). . . . . 65.

FINE FLOPPY FURNITURE.

$29



Part of our Mac mail order business is located in the old mill in Marlow, NH (pop. 561). So, it's not really any surprise that some of the old-timers around these parts still think that chips come from trees. In fact, to prove it, they've designed and hand-made the **MacConnection Solid Oak Disk Case**. It sports some solid New England craftsmanship and just-as-solid oak, and will hold 90 disks safely, securely, and in high style. Accept no substitutes.

MacConnection ... 60 day MBG

4623 Solid Oak Disk Case . . . . . $29.

BE COOL. BE CORDLESS.



FannyMac QT can greatly extend your Mac's life. Its ultra-quiet fan reduces operating temperature, and it has a built-in surge protector to foil those spiteful spikes. Plus, it sits in your Mac's handle, so your Mac can still sit in its carrying case. The **Mobius Mouse** delivers super-fast and precise *cordless* cursor control. It's 100% compatible with all Mac hardware and software and doesn't require a special pad.

Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT . . . *special* $55.
6126 Cordless Mouse . . . *special* 95.

No Sales Tax.

MacConnection™

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1614 Rags to Riches Payables 3.1 ..... 118.
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5862 Payroll 4.02 ..... 179.
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Satori
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5907 StatView II/SuperANOVA bundle ... 695.

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4024 4th Dimension Runtime 2.0. ..... 229.

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5855 Omnis 5 *(Additional 1 user)* ..... 75.

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6084 MacCalc/SPAMM Bundle ..... 115.

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6107 Mind Write Express ..... 79.
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1767 Comment 2.0 ..... 59.
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3788 Findswell 2.0 ..... 36.
3792 Spellswell 2.0G ..... 45.
4699 QuickLetter 1.01 ..... 73.

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1402 Alphabet Blocks 1.0 ..... 30.
6096 Talking Tiles/Alph. Blocks Bundle ... 45.
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4314 Type! 1.0 ..... 19.
1423 Jam Session 1.1 *(CP)* ..... 29.
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4067 Calculus 1.2 *(CP)* ..... 58.
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5726 Voyager 1.2 ..... 89.
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4367 MacDrums 1.01 *(CP)* ..... 31.
4483 Perceive 1.0 ..... 49.
5854 MusicProse 1.0 ..... 169.
5604 Finale 1.2.6 ..... 399.
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4978 Speed Reader II 1.0 *(CP)* ..... 27.
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★First Byte ... 30 day MBG
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5293 Dinosaur Discovery Kit 1.0 *(ages 3-8)* 27.
3941 SmoothTalker 2.1 ..... 32.
3936 KidTalk 2.0 *(ages 5-15)* ..... 32.
3940 First Shape 2.0 *(ages 3-8)* ..... 32.
3935 Speller Bee 2.0 *(ages 5-12)* ..... 32.
★Great Wave ... 30 day MBG
2276 KidsTime 1.2 *(ages 3-8)* ..... 26.
5642 KidsMath 1.1 *(ages 3-8)* ..... 26.
4334 NumberMaze 1.1 *(ages 5-12)* ..... 26.
2271 ConcertWare+ MIDI 5.0 ..... 99.
★Learning Company ... 30 day MBG
2670 Reader Rabbit 2.1 *(CP)(ages 4-7)* ... 31.
5453 Talking Math Rabbit 1.0 *(ages 4-7)* ... 31.
★Paragon Concepts ... 30 day MBG
6094 Mac Tag ..... 42.
★Penton Overseas ... 30 day MBG
5864 VocabuLearn/ce French *(level 1)* ..... 30.
5887 VocabuLearn/ce French *(level 2)* ..... 30.
5865 VocabuLearn/ce Italian *(level 1)* ..... 30.
5889 VocabuLearn/ce Italian *(level 2)* ..... 30.
5867 VocabuLearn/ce Spanish *(level 1)* ..... 30.
5891 VocabuLearn/ce Spanish *(level 2)* ..... 30.
5868 VocabuLearn/ce German *(level 1)* ..... 30.
5888 VocabuLearn/ce German *(level 2)* ..... 30.
5866 VocabuLearn/ce Japanese *(level 1)* ..... 36.
5890 VocabuLearn/ce Japanese *(level 2)* ..... 36.
★Personal Training Sys. ... 60 day MBG
Excellerate 2.2 Training Series
5573 XL1 Beginning Spreadsheets ..... 39.
5574 XL2 Intermediate Spreadsheets ..... 39.
5575 XL3 Advanced Spreadsheets ..... 39.
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6021 XL5 Building Databases ..... 39.
6020 XL6 Beginning Micros ..... 39.
MacTeach Training Series
5263 B1 The Basics *(for 2 floppy drives)* ... 39.
5264 B2 The Basics *(for Plus or SE w/HD)* 39.
5265 B3 The Basics *(for Mac II w/HD)* ... 39.
5266 B4 Beyond the Basics ..... 39.
LearnWord Training Series
4947 W1 Beginning Level ..... 39.
4854 W2 Intermediate Level ..... 39.
5098 W3 Advanced Level ..... 39.
5418 W4 Additional Features ..... 39.
LearnPersuasion Training Series
5269 LP1 Beginning Persuasion ..... 39.
5270 LP2 Intermediate Persuasion ..... $39.
5271 LP3 Creating AutoTemplates ..... 39.
5272 LP4 Creating Artwork ..... 39.
HyperEasy Training Series
5194 H1 Using HyperCard ..... 39.
5195 H2 Creating Cards & Stacks ..... 39.
5267 H3 Basic Scripting ..... 39.
5268 H4 Advanced Scripting ..... 39.
PageTutor Traing Series
4852 P1 Beginning PageMaker ..... 39.
4853 P2 Intermediate PageMaker ..... 39.
5096 P3 Tips & Techniques ..... 39.
5097 P4 Advanced Features ..... 39.
MasterWorks Training Series
5196 M1 Database & Form Letters ..... 39.
5197 M2 Advanced Databases ..... 39.
5273 M3 Spreadsheets ..... 39.
5274 M4 Word Processing ..... 39.
Learn88 Training Series
5259 A1 Beginning Illustrator ..... 39.
5260 A2 Intermediate Illustrator ..... 39.
5261 A3 Creating Special Effects ..... 39.
5262 A4 Precision Drawing Techniques ... 39.
Learn FileMaker Training Series
5278 FM1 Beginning FileMaker ..... 39.
5279 FM2 Intermediate FileMaker ..... 39.
5280 FM3 Advanced FileMaker ..... 39.
5281 FM4 Tips & Techniques ..... 39.
★Spinnaker ... 30 day MBG
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True BASIC, Inc.
3571 Algebra *(with workbook)* ..... 39.
3580 Pre-Calculus *(with workbook)* ..... 39.
3575 Calculus *(with workbook)* ..... 39.
6110 Algebraic Proposer ..... 45.
★Unicorn ... 30 day MBG
3751 Animal Kingdom *(CP)(ages 6-12)* ... 27.
3756 Math Wizard *(CP)(ages 5-10)* ..... 27.
3755 MacRobots *(CP)(ages up to 6)* ..... 27.
3754 Read-A-Rama *(CP)(ages 5-8)* ..... 32.

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Access Software
4655 World Class Leader Board Golf ..... 26.
Activision
4475 Quarterstaff *(CP)* ..... 29.
4486 Manhole ..... 30.
5127 Manhole *(CD ROM)* ..... 35.
5517 Cosmic Osmo ..... 42.
Broderbund Software
5886 Star Wars *(CP)* ..... 24.
4099 Shufflepuck Cafe *(CP)* ..... 24.
1421 Ancient Art of War *(CP)* ..... 26.
4540 Ancient Art of War at Sea *(CP)* ..... 26.
4229 Where/World Carmen Sandiego? *(CP)* 27.
5755 Where/Europe Carmen Sandiego? *(CP)* 29.
5233 Where/USA Carmen Sandiego? *(CP)* 29.
4966 SimCity 1.1 *(CP)* ..... 29.
5871 SimCity Supreme *(CP)* ..... 48.
★Bull City Software ... 30 day MBG
5841 Moriarty's Revenge ..... 32.
Bullseye
1545 Fokker Triplane 2.02 *(CP)* ..... 24.
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4074 P51 Mustang Flight Simulator *(CP)* ... 32.
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2268 Crystal Quest 2.2T ..... 25.
4119 Crystal Quest w/Critter Editor 2.2T ... 41.
★Discovery Software ... 30 day MBG
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★Electronic Arts ... 30 day MBG
1850 Reach for the Stars ..... 26.
5554 Bard's Tale ..... 32.
4064 Chuck Yeager Flight Simulator ..... 32.
4588 Life & Death *(CP)* ..... 32.

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4945 The Hunt for Red October. . . . . $32.
4981 Starfleet 1 . . . . . 36.

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5814 Journey . . . . . 29.
5816 Shogun . . . . . 35.
4592 Zork Zero *(CP)* . . . . . 35.
5815 Zork Zero *(for the Mac II)*. . . . . 35.

★Inline Design ... 30 day MBG

5870 Bomber *(includes headphones)* . . . 26.

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4697 Pirates! *(CP)* . . . . . 35.

★Microsoft ... 30 day MBG

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5253 The Puzzle Gallery . . . . . 27.
2765 Fool's Errand . . . . . 32.
2767 Harrier Strike Mission II *(CP)* . . . . . 32.

Mindscape

4083 Balance of Power 1990 *(CP)* . . . . . 29.
3987 Colony *(CP)* . . . . . 29.
4596 Deja Vu II *(CP)* . . . . . 29.
2743 Crossword Magic *(CP)* . . . . . 29.
2749 Shadowgate *(CP)* . . . . . 29.
5252 Gauntlet *(CP)* . . . . . 29.
2751 Uninvited *(CP)* . . . . . 29.

Premier Technology

5773 Strategic Conquest Plus 2.0 . . . . . 34.
5774 NetTrek-The Real Version . . . . . 34.

Sierra On-Line

4161 Mother Goose *(CP)* . . . . . 19.
3397 Leisure Suit Larry *(CP)* . . . . . 23.
5694 Manhunter: San Francisco *(CP)* . . . 29.
3394 King's Quest *(CP)* . . . . . 29.
3395 King's Quest II *(CP)*. . . . . 29.
3396 King's Quest III *(CP)* . . . . . 29.
3398 Police Quest *(CP)* . . . . . 29.
3399 Space Quest *(CP)*. . . . . 29.
3400 Space Quest II *(CP)* . . . . . 29.

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3501 Apache Strike . . . . . *special* 24.
3503 Dark Castle . . . . . *special* 24.

★Softstream Int'l., Inc. ... 60 day MBG

4071 Mac•Man. . . . . 23.
4072 The Solitaire DA . . . . . 23.
4995 Cribbage Tutor . . . . . 26.
4073 Colour Billiards . . . . . 38.

★Software Toolworks ... 30 day MBG

1842 Chessmaster 2100 *(CP)* . . . . . 32.
6111 Cribbage King-Gin King . . . . . 39.

★Spectrum Holobyte ... 30 day MBG

4175 Solitaire Royale *(for Mac SE)* . . . . . 19.
4001 Solitaire Royale *(for Mac II)* . . . . . 19.
3464 Tetris. . . . . 19.
6112 Welltris . . . . . 19.
4472 Tetris *(color version)* . . . . . 24.
3462 PT-109 . . . . . 26.
3460 GATO . . . . . 26.
3459 Falcon 2.0. . . . . 31.

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4988 Hidden Agenda . . . . . 36.

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6113 Jet & QuickStick. . . . . *special* 59.
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XOR

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4321 Lunar Rescue *(CP)* . . . . . 34.
4517 Road Racer *(CP)*. . . . . 39.
4320 MacGolf Classic *(CP)* . . . . . 53.
3815 NFL Challenge *(CP)* . . . . . 57.

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4589 InterFAX Modem . . . . . 269.

★CE Software ... 60 day MBG

5817 QuickMail Remote . . . . . $33.
5174 QuickMail *(5 user Pak)* . . . . . 169.
5173 QuickMail *(10 user Pak)*. . . . . 249.
5636 In/Out *(5 user Pak)* . . . . . 129.
5638 In/Out *(10 user Pak)*. . . . . 189.

★CompuServe ... 60 day MBG

1676 CompuServe Information Service. . . 24.
1673 CompuServe Navigator 2.1. *special* 39.
1674 Standard Service/Navigator Bundle 59.

Connect, Inc.

5834 Connect 1.5 for the Macintosh . . . . 95.

★DataViz ... 60 day MBG

1823 MacLink Plus/PC 4.1 . . . . . 125.
4842 MacLink Plus/Translators 4.1 . . . . . 99.

★Dove Computer ... 60 day MBG

4939 FastNet III. . . . . 375.
4938 FastNet SE . . . . . 375.
5624 FastNet SE/30. . . . . 375.
4937 FastNet SCSI . . . . . 749.

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5295 News/Retrieval Membership Package 24.
1785 Desktop Express 1.03 . . . . . 95.

★Farallon Computing ... 30 day MBG

5707 Timbuktu 3.0 . . . . . 95.
4866 Timbuktu Remote 1.0.1. . . . . 129.
4867 Timbuktu 30-Pack 3.0. . . . . 1325.
2201 TrafficWatch 1.08. . . . . 129.
5664 PhoneNET StarConnector . . . . . 21.
2203 PhoneNET PLUS *(DIN-8)* . . . . . 33.
2204 PhoneNET PLUS *(DB-9)*. . . . . 33.
5251 PhoneNET CheckNET . . . . . 65.
4869 PhoneNET Connector 10-Pack . . . 215.
4868 PhoneNET Repeater. . . . . 319.
2206 PhoneNET StarController . . . . . 829.
5893 Portable Pack *(incl. two copies each of Timbuktu & Timbuktu Remote, two StarConnectors, and accessories)*. 375.

★Freesoft ... 60 day MBG

6115 White Knight II. . . . . 89.

Hayes

2300 Smartcom II 3.1A . . . . . 87.
2307 Smartmodem 2400. . . . . 429.
5991 V9600 Baud Modem . . . . . 759.

Insignia Solutions

4089 SoftPC 1.3 . . . . . 245.

Intel Corporation

5119 2400 Baud External Modem . . . . 179.

★Microsoft ... 30 day MBG

5858 Microsoft Mail 2.0 Workstation. . . . 84.
5856 Microsoft Mail 2.0 Server. . . . . 249.
5857 Microsoft Mail 2.0 *(20 Pack)* . . . . 969.

★Nuvotech ... 60 day MBG

3000 TurboNet ST *(DIN-8)* . . . . . 30.
3001 TurboNet ST *(DB-9)*. . . . . 30.
5277 TurboBridge . . . . . 319.

★Practical Peripherals ... 30 day MBG

3100 1200 Baud External Modem . . . . . 77.
3102 2400 Baud External Modem . . . . . 179.
3089 Mac Communications Pack 1.5. . . 199.
5285 PM 2400SA MNP Modem . . . . . 209.

★Shiva ... 30 day MBG

3444 NetSerial X232 . . . . . 279.
4347 NetBridge. . . . . 339.
4942 TeleBridge . . . . . 339.
3443 NetModem V2400 . . . . . 439.

★Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 . . . . . 219.

★Solutions Int'l. ... 60 day MBG

4308 BackFAX *(reqs. Apple FAX modem)*. 124.

★Synergy ... 30 day MBG

3130 VersaTerm 4.0. . . . . 89.
3131 VersaTerm-PRO 3.0. . . . . 175.

★TOPS ... 30 day MBG

4188 TOPS Teleconnector *(DIN-8)* . . . . . 29.
4189 TOPS Teleconnector *(DB-9)*. . . . . 29.
3726 TOPS for DOS 2.1 . . . . . 114.
4598 TOPS FlashBox. . . . . 123.
3725 TOPS Repeater . . . . . $125.
3723 TOPS Mac 2.1. . . . . 137.
3720 TOPS Flashcard . . . . . 159.
3724 NetPrint 2.0. . . . . 115.
4714 InBox Starter Kit 2.2 . . . . . 149.
4715 InBox Connection Mac 2.2 . . . . . 45.

★Traveling Software ... 60 day MBG

3729 LAP-LINK Mac 2.0 . . . . . 81.

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★American Power ... 30 day MBG

5895 110SE UPS *(w/free PowerChute)*. . 269.

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4476 OmniPage 2.0 . . . . . 549.

★CoStar ... 30 day MBG

6067 LabelWriter Labels . . . . . 11.
6090 LabelWriter . . . . . 189.
6091 The Organizer . . . . . 239.

★Cutting Edge ... 30 day MBG

3988 CE 105ADB Keyboard w/QuicKeys . 135.

★Datadesk ... 30 day MBG

1818 HyperDialer . . . . . 29.
1819 MAC-101 Keyboard *(beige)*. . . . . 139.
1820 MAC-101 Keyboard *(platinum)* . . . 139.
1821 MAC-101 Keyboard *(ADB)*. . . . . 139.
Foreign keyboards available in French, German, Spanish, and the U.K. . . . call

★GDT Softworks ... 30 day MBG

6151 JetLink Express . . . . . 89.

★Kensington ... 30 day MBG

2576 Turbo Mouse for Mac Plus 3.0. . . . 109.
2547 Turbo Mouse ADB 3.0. . . . . 109.

Koala

2593 MacVision 2.0 . . . . . 219.

★Kraft Systems ... 60 day MBG

2600 3-Button QuickStick . . . . . 39.
4082 3-Button QuickStick ADB . . . . . 49.
6099 ADB Trackball *(with foot pedal)* . . . 79.

★Logitech ... 30 day MBG

5082 ScanMan Mac . . . . . 325.

★LYNX Computer ... 30 day MBG

1211 LYNX Trackball . . . . . 59.
1212 LYNX Trackball ADB . . . . . 59.

★Microseeds Pub. ... 60 day MBG

4843 WristMac 1.0. . . . . 145.
5018 WristMac Executive 1.0. . . . . 189.

★Mobius Technologies ... 60 day MBG

6126 Cordless Mouse. . . . . *special* 99.
4846 MultiScreen. . . . . 315.

★Mouse Systems ... 30 day MBG

2808 A+ Mouse . . . . . 59.
2809 A+ Mouse ADB . . . . . 79.

★Nutmeg Systems ... 30 day MBG

2993 15″ Monitor for Mac II . . . . . 799.
2992 15″ Monitor for Mac Plus. . . . . 999.
2994 15″ Monitor for Mac SE. . . . . 999.
4002 19″ Monitor for Mac Plus. . *special* 1195.
4096 19″ Monitor for Mac SE. . . *special* 1195.
5680 19″ Monitor for Mac SE/30 *special* 1195.
4097 19″ Monitor for Mac II . . . *special* 1195.

Olduvai Software

5138 Read-It! OCR Personal 2.1 . . . . . 125.
3034 Read-It! OCR 2.1 . . . . . 245.

★Orange Micro ... 30 day MBG

4488 Grappler Spooler . . . . . 38.
3036 Grappler C/Mac/GS 2.0 . . . . . 78.
4487 Grappler LS 1.0 . . . . . 103.

★PTI/DataShield ... 30 day MBG

5254 MacDirector . . . . . 109.

Summagraphics

4298 BitPad Plus ADB . . . . . 319.

TheComplete PC

6104 TheComplete Half-Page Scanner/400 . . . . . 315.
6103 TheComplete Page Scanner. . . . . 759.

★Thunderware ... 30 day MBG

3648 ThunderScan 5.0 with PowerPort . 187.

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4994 LightningScan . . . . . $369.
3645 Mac II Power Accessory . . . . . 45.

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1107 *Low profile 80 nanoseconds SIMMs at the best prices. 2 year warranty* . . . 99.

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5133 20 Meg Hard Drive . . . . . 439.
3990 30+ Meg Hard Drive . . . . . 499.
3991 45+ Meg Hard Drive . . . . . 549.
5275 65+ Meg Hard Drive . . . . . 629.
5276 80+ Meg Hard Drive . . . . . 739.
5456 44 Meg Removable Drive . . . . . 889.
5736 44 Meg Removable Cartridge . . . . 115.

★Dove Computer ... 60 day MBG

1802 Dove Tool Kit . . . . . 15.
1801 SCSI Interface/Port . . . . . 109.
5879 MaraThon Serial/Parallel . . . . . 195.
1807 MacSnap 524E . . . . . 185.
1809 MacSnap 524S . . . . . 239.
1811 MacSnap 548E . . . . . 419.
1812 MacSnap 548S . . . . . 479.
1800 MacSnap 2SE . . . . . 319.
1797 MacSnap Plus 2 . . . . . 319.
1804 MacSnap 2S . . . . . 209.
1805 MacSnap 4S . . . . . 409.

ACCELERATOR BOARDS

1793 MaraThon 020 MSE1 . . . . . 429.
1794 MaraThon 020 MSE2 *(1 Meg)* . . . . . 699.
1795 MaraThon 020 MSE3 *(math chip)* . . 589.
1796 MaraThon 020 MSE4 *(1 Meg/chip)* . 879.
5192 MaraThon 020 MSE5 *(4 Meg)* . . . . . 879.
5193 MaraThon 020 MSE6 *(4 Meg/chip)* 1099.
4663 MaraThon 030 Accelerator 32 MHz . 969.
5878 MaraThon 030x Accelerator . . . . . 969.
5880 MaraThon 030 SE/30 Accelerator . . 969.
5623 MaraThon Racer . . . . . 149.

ACCELERATORS (020) W/ETHERNET

5391 FastNet LAN 1 . . . . . 1125.
5390 FastNet LAN 2 *(1 Meg)* . . . . . 1499.
5389 FastNet LAN 3 *(math chip)* . . . . . 1349.
5388 FastNet LAN 4 *(1 Meg/chip)* . . . . 1724.
5387 FastNet LAN 5 *(4 Meg)* . . . . . 1499.
5386 FastNet LAN 6 *(4 Meg/chip)* . . . . 1729.

Epson

5132 40 Meg Raw Drive *(25ms)* . . . . . 399.
5204 70 Meg Raw Drive *(25ms)* . . . . . 499.

IOMEGA

5552 44M Ext. Single Bernoulli II Drive. 1399.
5553 44M Ext. Dual Bernoulli II Drive . . 2199.

★Kennect Tech. ... 30 day MBG

5631 Rapport *(includes FastBack II)* . . . . 199.
5632 Drive 2.4 . . . . . 329.

★SuperMac Tech. ... 30 day MBG

SuperMac drives include SuperSpool, SuperLaserSpool, Diskfit and Manager

5452 Dataframe 20 . . . . . 589.
5447 Dataframe XP 30 . . . . . 699.
5448 Dataframe XP 60 . . . . . 959.
5449 Dataframe XP 100 . . . . . 1279.

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★Verbatim ... 60 day MBG

3772 3½" DS/DD Disks *(10)* . . . . . 15.
3773 3½" HD Disks 1.44 Meg *(10)* . . . . . 29.

★Sony ... 60 day MBG

3297 3½" DS/DD Disks *(10)* . . . . . 14.
6148 3½" DS/DD Disks 3 Pak *(30)* . . . . . 35.
3298 3½" HD Disks 1.44 Meg *(10)* . . . . . 25.

★MAXELL ... 60 day MBG

2792 3½" DS/DD Disks *(10)* . . . . . 15.
2793 3½" HD Disks 1.44 Meg *(10)* . . . . . 29.

★3M ... 60 day MBG

3943 DC2000 Tape Cartridge . . . . . 21.

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Apple Computer

1113 Black ImageWriter Ribbon . . . . . $10.
1114 LaserWriter Plus Toner Cartridge . . 111.
1115 LaserWriter II Toner Cartridge . . . . 115.

★Avery ... 60 day MBG

4864 Disk Labels 3½" *(Qty. 250)* . . . . . 13.
5392 Disk Labels—Laser 3½" *(Qty. 630)* . 29.
5403 Address Labels 1 7/16" x 4" *(Qty. 1000)* . . . 9.
4865 Address Labels 3½" x 15/16" *(Qty. 3750)* 15.
4811 Transparencies 8½" x 11" *(Qty. 50)* 22.
4813 Round Labels 3⅓" *(Qty. 150)* . . . . . 7.
4812 Laser Labels ½" x 1¾" *(Qty. 2000)* . 7.
4807 Laser Labels 1" x 2⅝" *(Qty. 3000)* . 24.
4808 Laser Labels 1½" x 4" *(Qty. 1400)* . 24.
4809 Laser Labels 2" x 4" *(Qty. 1000)* . . . 24.
4810 Laser Labels 8½" x 11" *(Qty. 100)* . 24.

★Basic Needs ... 60 day MBG

5635 Keyboard Flip . . . . . 6.
5633 LaserWriter Printer Stand . . . . . 28.
5634 Large Screen Monitor Stand . . . . . 38.

★Computer Coverup ... 60 day MBG

1722 ImageWriter LQ Cover . . . . . 8.
1723 ImageWriter II Cover . . . . . 8.
1720 Mac Plus Cover . . . . . 10.
1724 Mac SE Cover . . . . . 10.
1725 Mac SE Ext. Keyboard Cover Set . . 10.
4657 LaserWriter II Cover . . . . . 10.

★Goldstein & Blair ... 30 day MBG

2267 *The Macintosh Bible* (2nd Edition) . . 19.

★I/O Design ... 30 day MBG

2379 MacLuggage Imageware II . . . . . 49.
2376 MacLuggage Macinware Plus . . . . 64.
2381 MacLuggage Macinware SE . . . . . 75.
6129 The Ultimate SE Carrying Case . . . 79.

★Kensington ... 30 day MBG

MacConnection carries the entire line of Kensington's accessories. Partial listing below.

2577 Mouseway Pad . . . . . 7.
2563 Mouse Pocket ADB . . . . . 8.
2569 Mac Plus/SE w/System Saver Cover . 9.
2558 ImageWriter II Dust Cover . . . . . 9.
2589 Universal Printer Stand . . . . . 15.
4970 Modem/FAX Protector 10 . . . . . 15.
6066 Custom Control Panel . . . . . 15.
4971 Modem/FAX Protector 20 . . . . . 25.
4126 LaserWriter II Dust Cover . . . . . 17.
2580 Mac II Stand . . . . . 20.
2545 Universal Copy Stand . . . . . 22.
2573 Tilt/Swivel *(platinum)* . . . . . 22.
2578 Extra Long ADB Keyboard Cable . . 25.
2579 Mac II Monitor Cable Extension Kit . 33.
4972 Power Tree 10 . . . . . 19.
4973 Power Tree 20 . . . . . 27.
4974 Power Tree 50 . . . . . 54.
2559 Apple Security Kit . . . . . 34.
2568 Maccessories SuperBase . . . . . 34.
2585 Printer Muffler 80 . . . . . 43.
2586 Printer Muffler 80 Stand . . . . . 24.
4070 System Saver SE . . . . . 52.
2566 System Saver Mac *(platinum)* . . . . . 63.
2567 System Saver Mac *(beige)* . . . . . 63.
2546 A-B Box *(DIN-8)* . . . . . 63.
2556 Maccessories Anti-Glare Filter SE . . 33.
5064 Apple Color Monitor Polarizing Filter 63.
5065 Full Page Display Polarizing Filter . . 63.
5066 Two Page Display Polarizing Filter . 135.
4941 Mac II Monitor Stand . . . . . 64.
4643 Mac II Stand and Cable Kit . . . . . 64.
6101 SE Bundle *(incl. Copy Stand, System Saver, & Anti-Glare Filter)* . . *special* 95.
2561 MasterPiece Mac II . . . . . 105.
5894 PowerBacker 360 . . . . . 269.
5577 PowerBacker 450 . . . . . 339.
5578 PowerBacker 520 . . . . . 399.
5230 PowerBacker 800 . . . . . $749.
5228 PowerBacker 1200 . . . . . 949.

★MacConnection ... 60 day MBG

4623 Solid Oak Disk Case, made by New England craftsmen *(holds 90 disks)* . . 29.

★Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT . . . . . *special* 55.

★Moustrak ... 60 day MBG

Available in blue or gray.

2694 Moustrak Pad *(standard 7" x 9")* . . . 8.
2692 Moustrak Pad *(large 9" x 11")* . . . . . 9.
2693 Moustrak Pad L/F *(9" x 11")* . . . . . 10.

★NoRad ... 30 day MBG

5620 Shield for Mac Plus or SE *(*2524)* . . 99.
5622 Shield for Mac II *(*2523F)* . . . . . 99.

Ribbons

Available in black, blue, brown, yellow, green, orange, purple, red, silver & gold.

3255 ImageWriter II Ribbon . . . . . 4.
3261 ImageWriter II 4-Color Ribbon . . . . 9.
3270 ImageWriter II Rainbow Six Pack . . 20.
3260 ImageWriter LQ Black Ribbon . . . . 17.
4011 ImageWriter LQ 4-Color Ribbon . . . 20.

★Sopris Softworks ... 60 day MBG

4171 Mac SE Std. Keyboard Cover *(navy)* . . 15.
4019 Mac SE & Ext. Keyboard Cover *(navy)* . 15.
4017 ImageWriter II Cover *(navy)* . . . . . 11.
4018 LaserWriter II Series Cover *(navy)* . . 17.
4012 High Trek ImageWriter II Carry Case . 49.
4013 High Trek Mac Plus Carry Case . . . . 59.
4014 High Trek Mac SE & Ext. Kybd. Case . 69.
5877 Mac II Monitor Carry Case . . . . . 59.
5839 Mac IIcx CPU & Kybd. Carry Case . 69.
4861 SE Protection Pak *(std. keyboard)* . . 65.
4862 SE Protection Pak *(ext. keyboard)* . . 75.

★Targus ... 60 day MBG

3618 ImageWriter II Carry Case . . . . . 45.
3617 Mac Plus/SE Carry Case . . . . . 55.
4015 Mac SE & Ext. Kybd. Carry Case . . 69.
6116 Mac IIcx Carry Case . . . . . 85.

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Circle 225 on reader service card

Service Central

A phone guide to 48 companies

by Deborah Branscum

When you're having problems with a company, you need to know how to complain and whom to complain to. "A Phone Guide to Customer Service" lists 48 companies drawn from our Best-Sellers section over the past two years. It includes a main telephone number, customer service and tech support numbers (if they differ), the hours the phones are answered, and sources of online support.

How to get results depends on the problem and the company involved. But it never hurts to be persistent yet polite. Sounds obvious, but many callers vent their frustration by yelling at people answering the phone. "When customers call up and they're angry, it's a lot harder to deal with them than if they understand that we're on their side," says a customer service rep at Apple. It's hard to keep your cool with a company that doesn't offer technical support, charges a lot, and has a miserable warranty. But alienating customer service reps is not a good idea.

Consumer expert John Dorfman outlines a 10-step "escalation ladder" for consumer action in his book *A Consumer's Arsenal* (Praeger Publishers, 1976). The steps are (1) telephone complaints; (2) written complaints to the retailer; (3) complaints to the manufacturer; (4) complaints to a trade association, the Better Business Bureau, or the Chamber of Commerce; (5) complaints to local or state agencies; (6) complaints to federal agencies; (7) legal action, starting with small-claims court; (8) enlisting the help of voluntary consumer organizations; (9) enlisting the help of the media; (10) unconventional tactics, such as picketing.



Unconventional tactics has an interesting ring to it, but often you can get satisfaction simply by calling and asking for it. Some general tips for complaining with clout:

- If the customer service department can't help you, ask to speak to someone with authority who can. (According to Dorfman, asking questions such as "Do you have the power to authorize a refund?" and "Do you have the authority to offer me a replacement?" can save time and irritation.) As always, keep a written record of whom you spoke to, what was said, and the nature of the transaction. And give the company time to respond. (Calling five people on the same day for the same help can dilute goodwill.)
- Keep complaint letters short and civil. List what you want and why you are making this request—a refund on your ImageWriter, for example, because it fails to operate properly despite an upgrade. Include details of earlier contacts with the company (and copies of any additional correspondence) and a reasonable deadline by which you expect a response. Customer service departments won't be happy to read this, but my experience suggests that a letter addressed to an individual gets a better response than one directed simply to the company or a department. (Some companies won't give out the full names of people working in customer service. Try calling the main switchboard, explaining that you need to send a letter, and asking for the name of someone you can write to—it usually works for me.) Finally, make it easy for the company to reach you.

According to Tony Lucich, president of Applied Ideas, customers often fail to include in their letters a phone number and a time they will be available. "They also don't say what they want," he adds. In the case of Applied Ideas, letters from people wanting refunds go to the marketing department; letters from those who want the problem fixed stay with customer service. Whatever the problem, it takes longer to resolve if the company has to guess what you want and track you down to find out.

- Follow the steps of the complaint ladder. (Local consumer agencies can usually offer more immediate help than federal groups, for example.) And weigh the time and energy needed to pursue a complaint against the possible return.

Companies benefit from good cus-

(continues)

A PHONE GUIDE TO CUSTOMER SERVICE

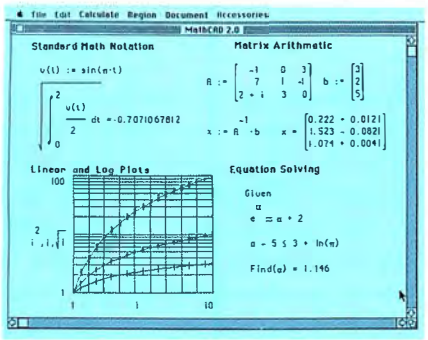
Company	Main Number	Customer Service	Tech Support	Hours	Online Access
Accolade	408/985-1700	408/296-8400	408/296-8400	8–5 PT	
Adobe Systems	415/961-4400	800/344-8335	415/961-0911	CS 7–5 MWF; 8–4 TTh PT	
				TS 8–5 MWF; 8–4 TTh	
Aldus	206/622-5500	206/628–2320	206/628–2320*		
Apple Computer	408/996-1010	408/252-2775	no tech support	7–5 PT	AppleLink
Ashton-Tate	408/927–5157	213/329-9989	213/329-0086	CS 7–5 MTThF; closes at 3 W PT	CompuServe
		product info 800/437-4329		TS 6–4:30, closes at 4 Th	
AST Research	714/863-1333	714/261-5006	714/863-9991	7–5 PT	BBS: 714/852-1872
Brøderbund	415/492-3200	800/521-6263	415/492-3500	8–5 PT	
Bullseye Software	702/265-2298	main number	main number	8–5 PT	CompuServe
Casady & Greene	408/624-8716	408/624-8716	408/624-8716	9–5 PT	Connect: Kunysz
Cloris	408/987-7000	408/727-8227	408/727-9054	8–5 M–Th; 8–2 F PT	AppleLink
		upgrades 800/544-8554			CompuServe
CMS Enhancements	714/259-9555	714/259-5932, 5934, 5937	714/259-4373, 4374	CS 7:30–4; TS 7–5 PT	BBS: 714/259-0933
Cricket Software	215/251-9890	800/531-5236	408/432-1764	CS 8:30–5:30 M–F ET	
DotoViz	203/268-0030	main number	main number	9–6 ET	
Davidson & Associates	213/534-4070	800/556-6141;	800/556-6141;	8–5 PT	
		213/534-2250 local	213/534-2250 local		
Denebo Software	305/594-6965	305/594-6965	305/594-6965	9–5 ET	
Dove Computer	919/763-7918	800/622-7627	800/622-7627	8:30–5:30 ET	
		outside NC	outside NC		
Everex	415/498-1111	415/683-2230	415/498-1115	8–5 PT	BBS: 415/683-2924
Forollon Computing	415/849-2331	main number	main number	8–5 PT	CompuServe, Connect,
					AppleLink, GEnie
First Byte	714/432-1740	800/523-8070 in CA;	800/523-8070 in CA;	8:30–12, 1–5 PT	AppleLink
		main number	main number		
GCC Technologies	617/890-0880	800/422-7777	800/422-7777	9–6 ET	
Great Wove Software	408/438-1990	main number	main number	8–5 PT	
Informix	913/599-7100	913/492-9922	913/492-9922	8:30–5 CT	
Infosphere	503/226-3620	503/226-1407	503/226-1407	8–5 PT	
The Learning Company	415/792-2101	800/852-2255	800/852-2255	7–6 PT	
Letroset	201/845-6100	800/634-3463	800/634-3463	CS 9–5; TS 9–6 ET	
MocProducts USA	512/343-9441	main number	main number	9–6 ET	
Microlytics	716/248-9150	800/828-6293	800/828-6293	8:30–5:30 ET	
Microsoft	206/882-8080	800/882-8088	206/454-2030	8–5 PT	
Microtech Internotionol	203/468-6223	800/626-4276	800/626-4276	9–5 ET	
Mindscope	312/480-7667	312/480-1948	312/480-8715	9–4 CT	
Nordic Software	402/466-6502	800/228-0417	main number	9–5:30 CT	
Novell	415/969-1999	408/729–6700	800/221-6402	8–5 PT	CompuServe
QED Information Sciences	800/343-4848	617/237–5656	617/237–5656	9–5 ET	
Quark	303/934-2211	800/543-7711	303/934-0784	7:30–5 MT	
Radius	408/434-1010	408/434-1012	408/434-1012	8–5 PT	AppleLink
					CompuServe, Connect
Rodime	407/994-5585	main number	407/997-0774	CS: 8:30–5:30; TS: 8–5 ET	
Silicon Beach Software	619/695-6956	main number	main number	8–5 PT	
Simon & Schuster Computer Software	800/624-0023	800/624-0024	212/373-7770	8:45–4:30 ET	
SoftView	805/385-5000	800/622-6829	main number**	9–6 PT	

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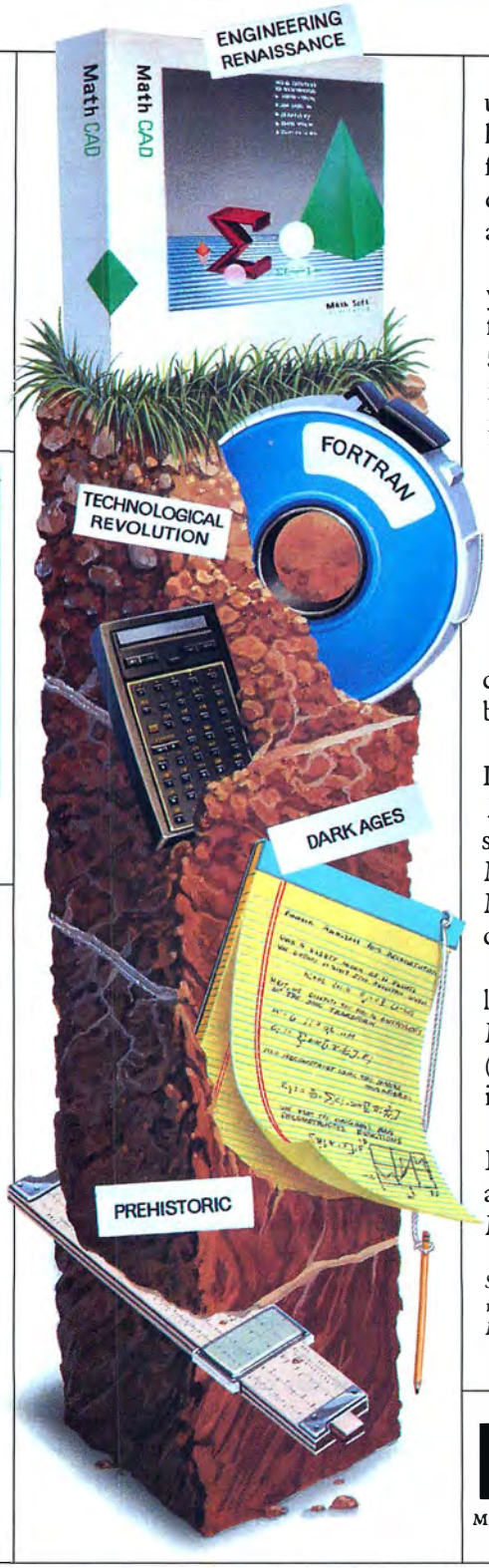


MathCAD takes full advantage of the Macintosh® interface, with features that make it simple to enter operators and Greek letters into equations.

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Circle 34 on reader service card

A PHONE GUIDE TO CUSTOMER SERVICE (continued)

Company	Main Number	Customer Service	Tech Support	Hours	Online Access
Spectrum HoloByte	415/522-3584	415/522-1164	415/522-1164	9–5 PT	
Spinnaker-Hoyden	617/494-1200	617/494-9384	617/494-9384	11–5pm ET	
Springboard Software	612/944-3915	612/944-3912	612/944-3912	8:30–5 M–Th, CT	
SuperMac Technology	408/245-2202	main number	408/245-0640	8–5 PT	BBS: 408/773-4500
					CompuServe
Survivor Software	213/410-9527	213/338-0155	213/338-0155	CS 9–5; TS 1–5:30 PT	
T/Maker	415/962-0195	main number	main number	9–5 PT	
TOPS	415/769-9669	415/769-2304	415/769-8711	7–5 PT	Applelink, BIX, CompuServe,
					BBS: 415/769-8774
WordPerfect	801/225-5000	800/222-9409; 800/321-4566	800/321-3348	6–7 MT	BBS: 801/225-4414
XOR/PCAI	612/831-0444	800/635-2425	800/635-2425	8:30–5 CT	

**800 number for tech support available for $100.*

***800 number available to professional tax preparers.*

PT = Pacific time; MT = Mountain time; CT = Central time; ET = Eastern time; CS = customer service; TS = technical support.

tomer service. Honest. A 1986 study by the Technical Assistance Research Programs Institute and the U.S. Office of Consumer Affairs says so. I couldn't find the study itself, but according to an abstract, "proper handling of consumer complaints promotes brand, product, and product line loyalty and can translate to returns on investment of 15 to 400 percent." But wait, there's more: "The study reports that consumer service departments are most successful when they have set up 800 assistance numbers, have trained their personnel in defusing customer anger, have established detailed monitoring systems to follow up complaints, and do not begin complaint-handling procedures with a list of questions identifying account numbers, serial numbers, or consumer data." Mac companies, are you listening?

It was interesting to note, while researching the table, the number of companies that do not allow their customer service and tech support people to fully identify themselves. It's a pretty silly system, designed to keep customers and company reps on an unequal footing right off the bat. The companies who admitted to this practice include Ashton-Tate (which refused to tell me even confidentially who heads its customer service and tech support departments), Broderbund, and Microsoft. Many companies let their employees decide whether they want to give out their names. Radius, Novell, and CMS Enhancements say their customer service people will give you their full names. It's a small point but, like 800 numbers, it tells you which companies really think about their customers.

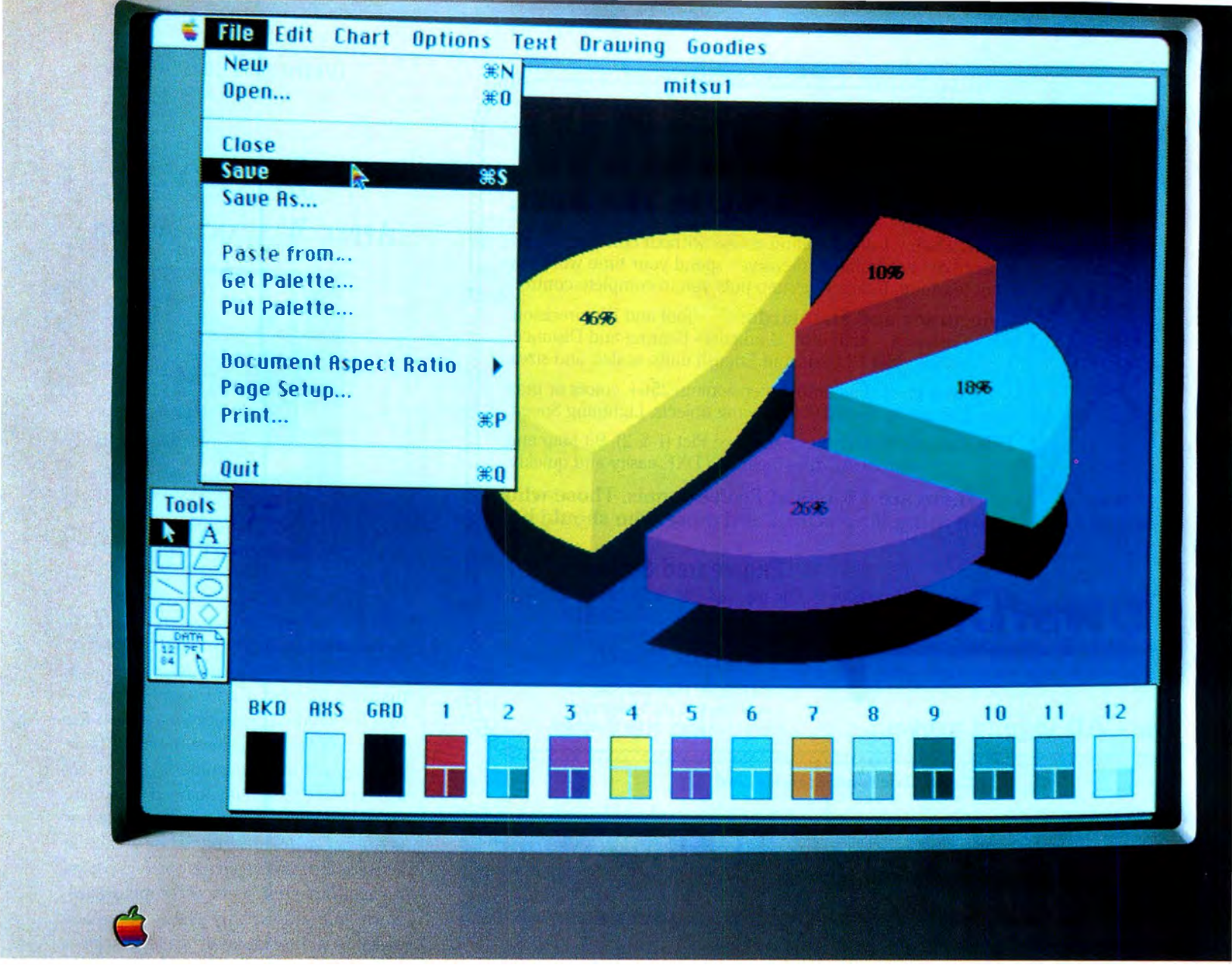
I didn't find many recent consumer handbooks in the bookstores, but you may be luckier. My library finds include *The Consumer Protection Manual*, from Facts on File Publications, and the *Consumer Sourcebook: 1990–91*, published by Gale Research. *The Consumer Protection Manual* is fairly legalistic, but it offers sound advice on protecting your rights

(continues)

SERVICE HEROES

One evening Wayne Vucenic of Cupertino, California, took a break after working with his Mac II and E-Machines 21-inch monochrome monitor all day in 85-degree heat. "When I returned, the screen on the monitor was black and I could hear a *zzzt, zzzt* sound from the upper back of the monitor. I turned the system off and let it cool down for several hours. When I turned it back on, it worked fine, with no sound." It was working fine the next day as well, but Vucenic was concerned, so he called E-Machines tech support. "The technical person said, 'That just doesn't sound right. I'm going to ship you a replacement monitor by second-day air.' Sure enough, I got the new monitor and returned my old one." Our reader is impressed with E-Machines' willingness to provide extraordinary service, since he would have settled for much less.

Reader Dick Barton of the Northrop Macintosh User Group writes that it's particularly nice when one of the big companies does a good job. He recently requested a binder from Microsoft for some updated documentation and received it within a week. "Yeah, I know a binder is a pretty simple thing, but the promptness and no-questions-asked aspect make this a nice gesture on the part of a giant from which you would expect sluggishness."



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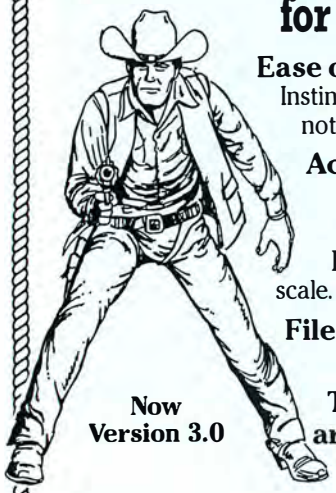
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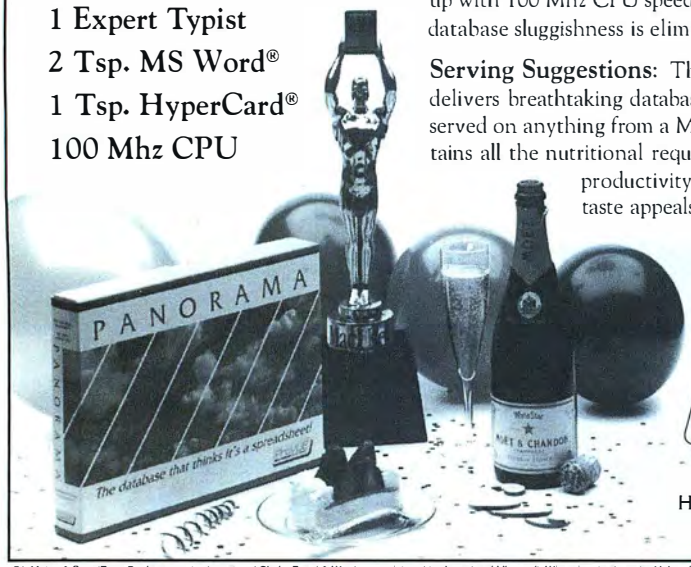
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Circle 451 on reader service card.

JANUARY

APPLE WARRANTY WATCH



73 Months of Inadequate Warranty

with mail-order companies, returning rejected goods that you've paid for, and so forth. The *Sourcebook* is a terrific resource that lists addresses and telephone numbers for national organizations such as the Council of Better Business Bureaus, trade groups, and state consumer agencies. It's a great place to start if you need to escalate your complaint. Another book of interest is *Credit Card Secrets*, edited by California attorney Howard Strong. Strong says paying for mail-order purchases of computer hardware and software by check or money order is a big mistake; "buying with a credit card is like having a black belt in consumer karate, if you know your rights and how to get them." His paperback is a handbook on credit card law and tactics; you can order it for $33.94 (includes shipping) from the Boswell Corporation, P.O. Box 7100, Beverly Hills, CA 90212.

MEA CULPA

In November I made a mistake when referring to GCC Technologies' HyperDrive upgrade program. Upgrades through the program will net you substantial savings over retail, but they no longer represent a 40 percent discount. ■

Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or Connect (Branscum). Conversely, drop Conspicuous Consumer a line if a company is ignoring you. I will help solve your problem, if I can.

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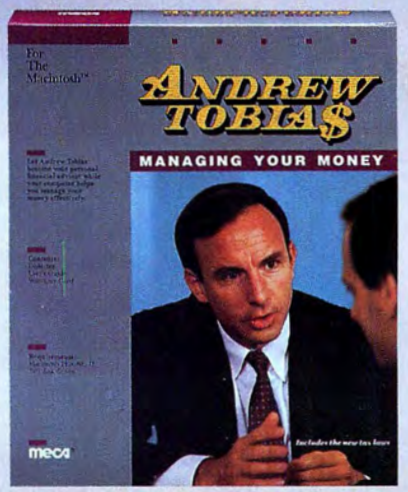
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— Macweek, 9/13/88

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Circle 37 on reader service card

Who says SuperPaint 2.0 is so great?

"...for plain old drawing and painting, you can't beat SuperPaint."
Erfert Fenton, **Macworld**, August 1989.

"SuperPaint 2.0 is, without a doubt, the best upgrade I've ever paid for."
Dan Gookin, **ComputorEdge Magazine**, March 10, 1989.

"SuperPaint remains the best black and white graphics program around."
Laurie Wigham, **Publish!**, August 1989.

"I've decided it's a better overall product than Canvas... SuperPaint has more to offer."
Robert Art Morgan, **ComputorEdge Magazine**, June 30, 1989.

"...one of the most intuitive implementations of Beziers I have seen."
Carlos Martinez, **MacUser,** July 1989.

"SuperPaint offers quantity, quality, and depth in each of its options."

"It's a godsend for simple art."
Tom Thompson, **BYTE**, June 1989



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Macworld World Class Award - Best Graphics Program

1988
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Circle 266 on reader service card.

Toward a 24-Bit Color Standard

Is it worth the high price it commands?

By Thom Hogan



MICK WIGGINS

Last May I wrote about how the various Macintosh models handle the display. You may have wondered why I spent so little time describing 24-bit color boards. Well, at the time, 24-bit color was still an experimental (and expensive) proposition. And like the old chicken and egg problem, the software didn't really exist because the hardware wasn't there yet, and vice versa. The 24-bit color options available early last year tended to be kludgy, unique, and not particularly useful.

The situation is different now. In recent weeks, I've sat through dozens of demonstrations of the advanced color capabilities available to Mac II users. My current everyday monitor is a 19-inch Radius display with a speeded-up 24-bit color board. On the shelf behind my desk are a half-dozen soon-to-be-released software programs that understand how to talk to 24-bit color hardware. Obviously, it's time to get up-to-date on the advances in the display world.

IT STARTS WITH THE SYSTEM

You can't do anything in the 24-bit world without the System 6.0.3 QuickDraw INIT or a Macintosh IIci. I felt like a dummy after wasting the better part of an hour trying to get a 24-bit color board to work on my older Mac II, only to discover I had booted from a drive with System 6.0.2. (This reminds me of the universal law of hardware repair: Always check to see that the machine is plugged in before deciding that you need to replace the power supply.)

Before Apple released the new 24-bit color QuickDraw routines, 24-bit color boards essentially tricked the System in order to render images. Older RasterOps 24-bit boards, for example, patched all the traps in the System that call QuickDraw. This method was fraught with hidden problems, but to the credit of RasterOps (and other companies), these boards worked quite well, albeit slowly. The slow speed was due to the huge number of pixels being updated by the Mac's processor, not to any deficiency in the boards themselves.

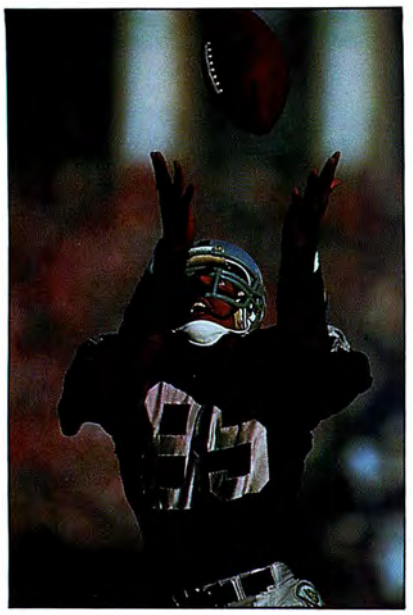


Apple finally released its own 24-bit color scheme last April, the QuickDraw INIT released with System 6.0.3. Most 24-bit boards use the INIT—it's in ROM on the Mac IIci. Though it's actually a 32-bit color protocol, I, like others, still refer to the high-end color solution as 24-bit color because that's how many bits are used to keep track of color information. By comparison, the standard monochrome Mac monitors use 1 bit, the standard Mac II display uses 8 bits for gray scale or color (if you purchase the full 256K complement of memory), and the new 32-bit QuickDraw protocol uses 24 bits.

The leftover 8 bits in color QuickDraw—called the alpha channel—are reserved for vendor use, meaning that Apple is not going to standardize on a use for them but suggests that they might be used to control video overlays. Overlays are used, for example, during televised football games, to superimpose a player's name at the bottom of the TV screen. Typically, most of the screen (the background layer) is handled by a signal coming directly from one of the cameras covering the event, while the name (the foreground layer) is created by a character generator located in the TV studio or in a remote truck at the event.

Usually a character generator outputs colored letters on a black (no video) background. Roughly speaking, the black areas in the output are ignored and the colored areas are superimposed onto the background picture. This is a neat trick you might want to duplicate with your Mac in these days of multimedia hype. And that's where the alpha channel checks in: with the right software, those extra 8 bits per pixel can be used to store information about which layer the pixel is in (foreground or background), whether the background should overwrite the foreground, and other details (other options include the ability to "etch" the background into the foreground, for example).

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The problem is, Apple tells the developers exactly what the lower 24 bits of the new QuickDraw pixel format mean, but it doesn't tell anyone what to do about the other 8 bits. I find this remarkable given Apple's intense interest in spawning a desktop multimedia market. Already some companies are using all 8 bits of the alpha channel in their products. The Truevision board, for example, uses these bits for overlays, animation control, and a host of other things. So developers who want their software to be compatible with the Truevision board will adopt that company's definition of the alpha channel.

But what about other hardware vendors? The problem most hardware companies have is making their products distinct from those of other companies. Most hardware companies hate to design their product to someone else's standards. So I've already seen incompatible alpha-channel assignments from several key vendors (Mass Microsystems and Truevision are examples). Quite frankly, if Apple wants multimedia to succeed—but that's another column—it needs to step in and show some real leadership. Hedging on the alpha-channel definition is the type of leadership you'd expect from Charlie Brown, not from a high-tech company.

BUT WHAT ABOUT SPEED?

I'm straying a bit. The issue is whether or not 24-bit QuickDraw is useful or necessary. Key to the protocol's acceptance will be its responsiveness and its usefulness in everyday software products. If every time you try to scroll a 24-bit color image it takes several seconds to update the screen, you're going to get frustrated and look for an alternative. If your software doesn't understand 24-bit color, there's no reason to buy the hardware needed to display it.

As for speed, fortunately Apple built a speedy alternative to 24-bit color into the new QuickDraw: dithering. If the slow updates of 24-bit images really bother you, simply switch (via the Monitors Control Panel device) to 8-bit color. The new QuickDraw will automatically dither the image for you. The result is closer to the real thing than 8-bit color alone, though not nearly as subtle or detailed as 24-bit color. The dithered image provides an idea of what the image (and any changes you're making to it) will look like in its full-color state, but without the speed penalty that 24-bit color usually adds.

Solutions beyond dithering are available as well. Radius, for example, now offers an accelerator board for its 24-bit displays. If you already have a Radius 24-bit display, you need only add the $795 QuickColor accelerator board for a speed boost (the accelerator can be added to any Radius 24-bit system at any time). The typical Mac II averages about 1 million instructions per second (MIPS). The QuickColor board consists of a 6-MIPS RISC processor that talks to the Radius DirectColor display boards through the NuBus block-transfer mode. A supplied INIT captures QuickDraw calls and routes many of them to the QuickColor's RISC coprocessor, which in turn quickly writes new information directly into the regular 24-bit display board. Radius claims that the typical Mac II writes to the display memory through the NuBus at the rate of about 3.8MB a second (that might seem fast, but remember that a 24-bit color image can be 7MB or more on the standard monitor). Radius further claims that QuickColor's use of the NuBus block-transfer mode speeds up writes to display RAM to as high as 27MB per second. Thus, even if the RISC coprocessor handling QuickDraw calls was merely the same speed as the Mac II's CPU (it's actually faster), the display should redraw at a much faster clip.

Unfortunately, Radius's approach has its drawbacks. First, not all QuickDraw operations are accelerated. Fills, patterns, and horizontal and vertical lines are sped up, as are copies of rectangular on-screen regions, but nonrectangular regions, angled lines, changes of one pixel at a time, and many other QuickDraw routines are left to be handled by the Mac II's sluggish CPU. Moreover, there appears to be some overhead associated with trapping the QuickDraw calls, which lowers all those potential speed increases somewhat.

Nevertheless, the QuickColor board does make a substantial difference in the usability of 24-bit color. Curiously, much of the improvement in speed comes with monochrome applications like word pro-

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cessing, since these applications frequently use large rectangular region copies (during scrolling, for example). As Radius product manager Stephen Becker puts it, "Using 24-bit color with the QuickColor card is almost as responsive as using an unaccelerated 8-bit color card; I tend to leave 24-bit color on all the time now that I have this product." I agree. Graphic artists tired of bouncing back and forth between 8-bit and 24-bit mode will be happy to discover this board. The QuickColor board is the first option I've seen that would tempt me to use my Mac in 24-bit mode all the time.

Apple, too, has a tempting offering if you're into detailed color images: the Mac IIci. The faster processor (25MHz instead of 16MHz) makes a lot of difference in screen updates, no matter how many color bits per pixel you're working with. Eight-bit color on a IIci runs every bit as fast as monochrome on the IIx or IIcx. And 24-bit color on a standard-size monitor is *very* usable (more on that in a moment).

What Apple isn't telling everyone is that the 32-bit QuickDraw code in the Mac IIci's ROM *is not* the same as the QuickDraw that is installed as an INIT in System 6.0.3. This new IIci iteration of QuickDraw has been optimized and is measurably faster (how much, I can't tell you, since I haven't had a Mac IIci in my hands for more than a few minutes, and I can't really afford to buy a new one). Not only that, but software in ROM runs slightly faster than the same software in RAM in the Mac II lineup. Here's the real kick: take the ROM chips out of a Mac IIci and put them into an SE/30 or IIcx and you'll speed up the display of that machine. Apple has mumbled privately about "perhaps" offering a ROM upgrade. If you own an SE/30 or IIcx, you should demand the upgrade (expect to pay something for it, of course).

But let's get back to 24-bit color on a Mac IIci. With an unaccelerated Mac II, IIx, IIcx, or SE/30, I would recommend that you avoid 24-bit color. If you absolutely have to have it, Radius's QuickColor is a viable short-term solution. But with the availability of the Mac IIci and RasterOps's new $995 24-bit color board (the 264), I foresee a new standard for the state-of-the-Mac desktop. The RasterOps board is a nifty bit of engineering in its own right, what with its reduced-power draw (it uses less than 1 amp in my machine) and ability to display images in 24-bit color on the standard Apple 13-inch color display. (It also offers NTSC output.) And the RasterOps 264 installed in a Mac IIci is a dream system for many of us—super performance in all color modes, with truly astonishing display speeds in monochrome. For the past few months I've been recommending Apple's standard IIcx configuration as the high-end choice: Apple display, 4MB of RAM, and an Apple-supplied 80MB hard disk. Not any more. My new recommendation is a Mac IIci with 8MB of RAM (memory has gotten cheaper), the RasterOps 264 video board with the standard Apple 13-inch color monitor, and a 150MB drive (preferably one of the Wren models). You'll need the extra memory and drive capacity when you start dealing with 24-bit images, and the IIci's new ROM coupled with the RasterOps board provide high-quality, fast color display.

BUT WHERE'S THE SOFTWARE?

All this new nifty hardware leaves us with only one problem—an age-old one at that—where's the software?

Well, the software scene is slowly shifting. (Ooh, that conjures up images, doesn't it?) As I write this, SuperMac's PixelPaint Professional uses 24-bit color, and beta copies of updates for software abound here in my abode. Besides the image processing programs (like Letraset's ColorStudio), there's a wealth of paint and drawing programs about to break the software logjam. Desktop publishing programs like Aldus PageMaker and QuarkXPress seem finally to be addressing 24-bit color well (I'm taking that on the word of others who've tried them—my newsletter still uses the good ol' black-and-white press). All this is well and good for desktop publishers: 24-bit color is actually becoming affordable and usable. ◘

Thom Hogan is president of Macreations, a Macintosh software developer; publisher of The Macintosh II Report; *and author of* Programmer's Macintosh Sourcebook *(Microsoft Press, 1989).*

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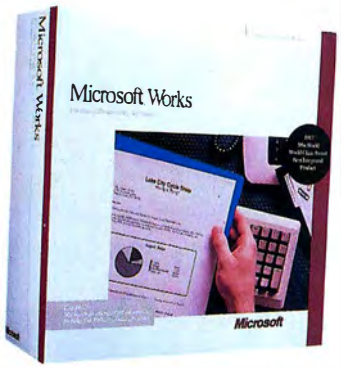
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BUSINESS SOFTWARE

Fast, powerful, easy to learn word processor



Puts it all together in one package

Works 2.0

Works 2.0 integrates the most-needed office applications: spreadsheet, database, word processor and terminal software. Works provides a significant degree of convenience for anyone who needs to share data among several applications, but hasn't the RAM necessary to run Multi-Finder.

The spreadsheet, with 230 columns and 9,999 rows, behaves like Multiplan or Excel. The word processor looks and acts like Word with Short Menus selected. The new version now includes the Spellswell spelling checker. The word processor has a MacPaint-like Draw command.

The database manager offers a solid selection of standard "flat file" manager functions. You can select and sort records in a variety of ways, and the module supports a useful set of mathematical functions for computed fields.

The simple, easy to use terminal module supports MacBinary transfers for error-free data transmission and reception. Winner of the 1988 *Macworld* World Class Award.

BUS 0014 NCP
Publisher: Microsoft
Suggested Retail: ~~$295~~

$185

Handy tool for technical writers

Formulator

Use Formulator to create mathematical equations and scientific formulas — then paste them into a word processor or DTP document. Special symbols, from Greek characters to integrals and radicals are all built into Formulator. It makes the distinctions among super and subscripts, and normal characters at different levels, and selects the appropriate point size.

WRD0027 NCP
Publisher: ICOM Simulation
Suggested Retail: $149.95

$89

Bigger, better, and more powerful than ever

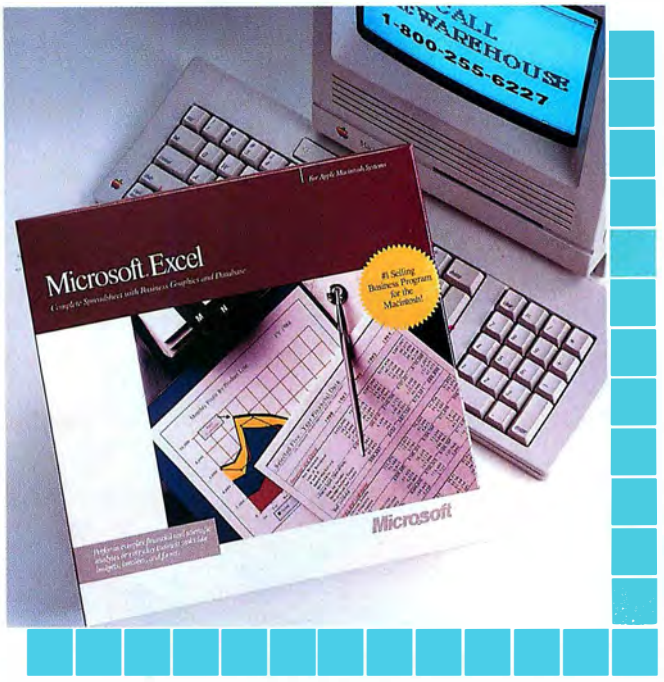
Excel 2.2

Excel 2.2 delivers a host of improvements and new features. Excel can now use the full memory of your Mac — up to 8 Megabytes. It recalculates up to 40% faster and empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references.

The new Search and Replace function makes global changes. Charting is improved — just double-click anywhere on a chart to see the dialog box for all the chart formatting commands. Charts are now dynamically linked to the original worksheet, so the chart automatically reflects any changes in the spreadsheet. Excel 2.2 also supports "warm links" to Word 4.0, so changes to your spreadsheet data automatically appear in your Word documents.

BUS 0003 NCP
Publisher: Microsoft
Suggested Retail: ~~$395~~

$249



Brimming over with new capabilities

MacWrite II

MacWrite II now offers multiple columns, mail merge, foot notes and end notes, multiple documents, font sizes from two to 500 points, direct import/export of files (for MS Word, MS Write, MS Works, and WriteNow), plus the ability to search and replace by font, size and style.

WRD 0026 NCP
Publisher: Claris
Suggested Retail: ~~$249~~

$185

Microsoft's basic, "no-frills" word processor

Write 1.0

Microsoft Write is great for people who like Word but don't need all its fancy functions. Microsoft calls it "a streamlined subset of Word." Write is fast, and full of useful functions, such as a spelling checker with an expandable 80,000 word dictionary, footnoting, the ability to embed graphics in text, multiple columns, page preview mode, and suppression of headers and footers on title pages. If you don't need mail merge, outlining, glossaries, or style sheets Microsoft Write is right for you.

WRD 0014 NCP
Publisher: Microsoft
Suggested Retail: ~~$175~~

$79



An old favorite gets better

Word 4.0

Word 4.0 adds new page design capabilities to the feature-laden previous versions. Create newsletters with multiple columns, or even movie script-style documents. Design pages with different numbers of columns on the same page. Place sidebars exactly where you want them. Word automatically wraps text around graphics. For creating graphics, Word 4.0 includes SuperPaint at no extra charge. Tables are a breeze. Just tell Word how many rows and columns you need, and it generates your table, with automatic text wraps within cells. Word even has facilities for creating mathematical formulas.

Word 4.0 has a spelling checker, hyphenation, Style Sheets, a glossary, automatic indexing, mail merge, and an integrated outliner. It is compatible with the MS-DOS version of Word, and with PageMaker (both Mac and PC versions), so you can exchange files among all four formats. Version 3.0 won the 1988 *MacUser*/Europe Victor, and the *Macworld* World Class Awards.

WRD 0022 NCP
Publisher: Microsoft
Suggested Retail: ~~$395~~

$249





HARDWARE
HARD DISK DRIVES

Quality, performance and dependability at a low price

Cutting Edge Hard Disk Drives

The Cutting Edge series of hard disk drives (both internal and external versions) plug directly into your Mac's SCSI port and are pre-formatted, so they're ready to use, right out of the box. They're fast, compact, virtually noiseless, and use components from Seagate Technology (the world's leading manufacturer of hard disk drive mechanisms).

The design is not only attractive, but also functional, because it creates a convection cooling current, just as the Mac does. The steel alloy case also helps to radiate heat. All of that means Cutting Edge drives can use a smaller, quieter fan to assist the natural cooling process. A back panel SCSI address switch, plus a second SCSI plug, make daisy-chaining simple and convenient. You can connect up to seven SCSI devices (including scanners and printers) to the Mac, and the address switch tells the Mac where to look for your hard disk on the loop. For greater convenience, the back panel has an extra AC plug.

The internal drives work on the Mac SE, II, IIx, and IIcx. An LED for the front panel indicates disk access. The drives connect directly to the internal SCSI port, so they do not need an address switch. They do not have fans, because the Mac SE and II already have fans. Their rear mount bracket means that you can keep your double internal floppy disk drives.

All Cutting Edge drives carry the manufacturer's one-year warranty, plus a lifetime warranty on the cables and switches. Also, they come with a generous amount of public domain software, the current Apple System and freeware hard disk drive utilities, HD Backup, and a personalized copy of the TCE Manager (formatting and diagnostic software), and an anti-viral package.

20 Meg Under the Mac Drive

DRI 0157
Manufacturer: Cutting Edge
Suggested Retail: ~~$649~~
$439

30+ Meg Under the Mac Drive

DRI 0158
Manufacturer: Cutting Edge
Suggested Retail: ~~$749~~
$499

45+ Meg Under the Mac Drive

DRI 0159
Manufacturer: Cutting Edge
Suggested Retail: ~~$829~~
$549

65+ Meg Under the Mac Drive

DRI 0160
Manufacturer: Cutting Edge
Suggested Retail: ~~$899~~
$629

80+ Meg Under the Mac Drive

DRI 0161
Manufacturer: Cutting Edge
Suggested Retail: ~~$1099~~
$739

XL 30 Internal

DRI 0110
Manufacturer: Cutting Edge
Suggested Retail: ~~$593~~
$469

XL 45 Internal

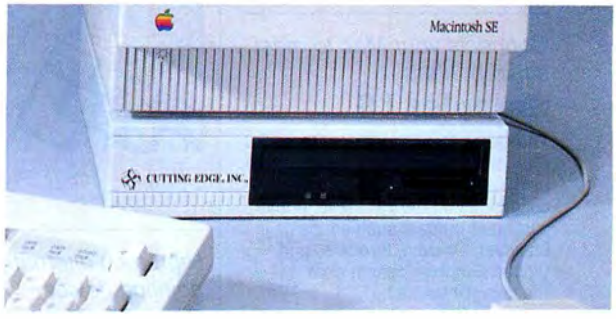
DRI 0111
Manufacturer: Cutting Edge
Suggested Retail: ~~$799~~
$645

Removable cartridges for extra security and protection

Cutting Edge 45MB Removable Hard Drive

The Cutting Edge 45 megabyte removable hard drive provides incredible flexibility. It features a SyQuest™ mechanism, excellent driver software and an average access speed of 25 milliseconds. This high performance drive is actually faster then many fixed drives and provides low cost expandability.

Just replace the 45 megabyte cartridge with a new one whenever you need more storage. Since the cartridges are removable you can take them with you or lock them up for security. The Cutting Edge removable hard drive is easy to use, the cartridge just inserts into the receptacle like a tape player cartridge. Ejection is automatic, just use the eject command or drag the icon into the trash can. Cutting Edge removable cartridge drives make backing up and archiving files simple and easy to retrieve. You can share data with any Macintosh computer that is equipped with a Cutting Edge 45 Megabyte Removable Hard Drive. Now transferring large volumes of data between systems is as easy as passing a cartridge around.



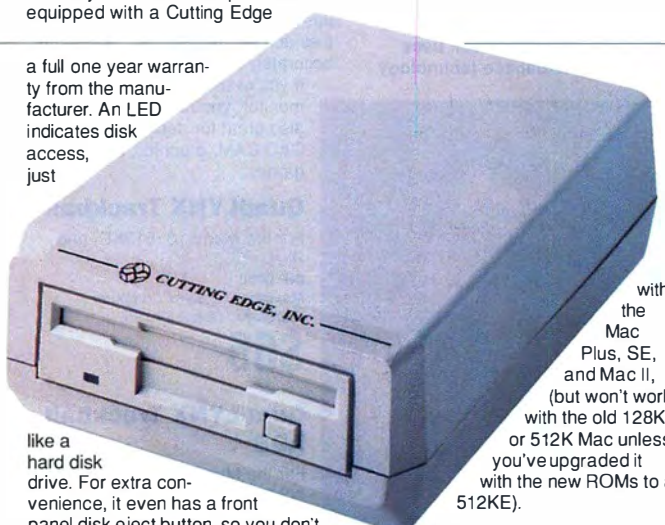
DRI 0162
Manufacturer: Cutting Edge
Suggested Retail: ~~$1599~~
$899

Inexpensive, dependable external disk drive

800K Disk Drive

The Cutting Edge 800K External Disk Drive makes any Mac easier to use, even if you have a hard disk. It reads and writes both single and double sided floppy disks with equal ease. If you find yourself jumping through hoops every time you need to copy a floppy, you'll appreciate the convenience of having a second floppy disk drive. Just drag the first disk's icon over to the second disk, and let the Mac copy the contents. If you've suffered through the nuisance of trying to boot up a crashed system with a dysfunctional hard disk when you have only a single floppy disk drive, you'll appreciate the extra disk drive. At this price, why put it off?

The Cutting Edge disk drive is quiet, sturdy and reliable, and carries a full one year warranty from the manufacturer. An LED indicates disk access, just like a hard disk drive. For extra convenience, it even has a front panel disk eject button, so you don't have to fool around sticking paper clips through that little hole to retrieve a stuck floppy disk. It's compatible with the Mac Plus, SE, and Mac II, (but won't work with the old 128K or 512K Mac unless you've upgraded it with the new ROMs to a 512KE).



DRI 0042
Manufacturer: Cutting Edge
Suggested Retail: ~~$185~~
$149



HARDWARE PRINTER INTERFACES

Need to hook up a parallel printer to your Mac?

Grappler Interface

The Orange Micro Grappler interface card connects your Mac to most parallel printers. Just plug the Grappler into the serial port, and it converts the output to the Centronics parallel format. If you have an old daisy wheel or dot matrix printer sitting around the office unused, put it to work and alleviate the traffic jam on your LaserWriter.

ACC 0227
Manufacturer: Orange Micro
Suggested Retail: ~~$119~~
$79

Highly intelligent printer interface

Grappler Interface L/Q

The Grappler LQ connects your Mac to any 24-pin dot matrix printer, or HP-compatible laser or ink jet printer — as if they were ImageWriter LQs. Just set the switch for the printer you want to use. For dot matrix printers, you can use any Mac, but for laser and ink jet printers, you'll need a Mac Plus, SE, or II, and a hard disk. Grappler does not recognize PostScript commands

ACC 0237
Manufacturer: Orange Micro
Suggested Retail: ~~$149~~
$103

Connects your Mac to most serial printers

Grappler LS

The Grappler LS works with serial Hewlett-Packard (and compatible) printers. Now you can print Mac documents on the HP ink jet printer, plus laser printers such as the LaserJet, Okidata, Kyocera, and Blaser. Grappler cannot print PostScript files.

ACC 0284
Manufacturer: Orange Micro
Suggested Retail: ~~$129~~
$103


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HARDWARE INPUT DEVICES

The more keys the better

Mac-101 Keyboard

The only extended keyboard available for the Mac 512, 512KE, and Plus. Includes macro software.

INP 0043
Manufacturer: DataDesk
Suggested Retail: ~~$194.95~~
$139



Mac-101 Keyboard ADB

For the Mac SE.
INP 0047
Manufacturer: DataDesk
Suggested Retail: ~~$194.95~~
$139

Mac-101 Keyboard MacII

For the Mac II.
INP 0048
Manufacturer: DataDesk
Suggested Retail: ~~$194.95~~
$139

Retire your mouse

New Turbo Mouse

Kensington's New Turbo Mouse speeds up Mac use, and saves desk space. The Turbo Mouse is like an upside-down mouse, or a track ball, so you only need to move the ball in its socket, not the whole assembly. Nudge it for tiny adjustments, or give it a good spin to dash across the screen. The automatic acceleration sensor is like a two-speed automatic transmission. It speeds up cursor movement when you move faster, and slows it down for precise positioning. A second button is a click lock, and you can assign one of seven common functions (Close, Save, Print, etc.) for both buttons at once. This well-designed mouse alternative won the 1988 *Macworld* World Class Award.

New Turbo Mouse 512, Plus

For the Mac 512, 512KE, and Plus.
INP 0059
Manufacturer: Kensington
Suggested Retail: ~~$169.95~~
$109

New Turbo Mouse ADB

For the Mac SE or II.
INP 0060
Manufacturer: Kensington
Suggested Retail: ~~$169.95~~
$109



Enter the world of optical mousing

A+ Mouse

The A+ Mouse has no moving parts, except for the mouse itself. It uses an infrared LED and a reflective plastic mouse pad to determine its position. The mouse glides over the glassy smooth surface of the pad. Anyone who works with graphics or CAE/CAD applications will appreciate the convenience and precision of an optical mouse. Comes with manufacturer's lifetime warranty.

INP 0044
Manufacturer: Mouse Systems
Suggested Retail: ~~$99~~
$63

A+ Mouse ADB

For the Mac SE and II, connects to the Apple Desktop Bus.
INP 0045
Manufacturer: Mouse Systems
Suggested Retail: ~~$129~~
$79

High-tech alternative pointing device

QuadLYNX Trackball

The QuadLYNX Trackball uses Honeywell aerospace technology to give you precise fingertip control over cursor movement. This device offers much greater precision in cursor placement than the standard-issue Apple mouse. Just spin the trackball and the cursor flies across the screen, quickly and accurately landing where you want it.

If you're using a large screen monitor, you need a trackball. It's also great for desktop publishing, CAD/CAM, graphics, and arcade games.



QuadLYNX Trackball

For the Mac 512, 512KE, and Plus.
INP 0050
Manufacturer: Lynx Computer
Suggested Retail: ~~$99.95~~
$65

QuadLYNX Trackball ADB

For the Mac SE or II.
INP 0051
Manufacturer: Lynx Computer
Suggested Retail: ~~$99.95~~
$65



Combo joystick and mouse for precise cursor ontrol

Kraft QuickStick

The button placement ensures fast action and comfortable use, whether you're playing an arcade game or working on a complex page layout. Precision gimbals and dual-axis fine-tuners give you complete control over its operation. Comes with manufacturer's five-year warranty.

ACC 0015
Manufacturer: Kraft
Suggested Retail: ~~$59.95~~

Kraft Premium III Joystick

The Kraft Premium III Joystick is the same as the QuickStick, but it connects to the ADB port of the Mac SE or Mac II. It also works with the Apple IIgs.
INP 0064
Manufacturer: Kraft
Suggested Retail: ~~$79.95~~
$49

HARDWARE MEMORY UPGRADES

Run your SE up to four times faster with an accelerator

MaraThon 020 Accelerator Boards

MaraThon 020 Accelerators are equipped with a 68020 chip running at 16 MHz. They rival the Mac II's performance, for a fraction of the cost. Because MaraThon 020 Accelerators use a programmable Logic Cell Array controller, you can re-configure them to accommodate future hardware upgrades or to optimize them for specific tasks. The on-board expansion slot gives you back the expansion slot you gave up to install the accelerator.

MaraThon 020 Accelerator MSE1
DRI 0098
Manufacturer: Dove
Suggested Retail: ~~$899~~
$429

MaraThon 020 Accelerator MSE2
Includes one megabyte on-board memory.
DRI 0125
Manufacturer: Dove
Suggested Retail: ~~$1199~~
$719



MaraThon 020 Accelerator MSE3
Includes 68881 Math Co-processor, no memory.
DRI 0126
Manufacturer: Dove
Suggested Retail: ~~$999~~
$599

MaraThon 020 Accelerator MSE4
Includes one megabyte on-board memory and 68881 Math Co-processor.
DRI 0127
Manufacturer: Dove
Suggested Retail: ~~$1499~~
$899

Enjoy maximum speed with an accelerated 68030 chip

MaraThon 030 Accelerator Boards

The MaraThon 030 Accelerator Boards make your Mac II, IIx, or SE/30 sing. They employ a 68030 chip running at 32 MHz, which has its own 256K data and instruction caches on the chip itself (selectable through the Control Panel). Just remove your old 68020 and plug the compact 030 Accelerator card into its socket. The Logic Cell Array controller is programmable for future upgrades or to optimize operations for a specific task.

MaraThon 030 Accelerator Board
For the Mac II. Plugs directly into the 68020 chip socket to provide you with a 69030 chip running at 32 MHz. A 68882 math co-processor is available as an option.
DRI 0130
Manufacturer: Dove
Suggested Retail: ~~$1599~~
$969

MaraThon 030/SE Accelerator Board
For the SE/30. Available options include up to four Megabytes of on-board memory, and the 68881 Math Co-processor or the 68882 Floating Point Unit.
DRI 0151
Manufacturer: Dove
Suggested Retail: ~~$1599~~
$1250

MaraThon 030/X Accelerator Board
For the Mac IIx.
DRI 0152
Manufacturer: Dove
Suggested Retail: ~~$1599~~
$999

MaraThon Racer

A high-speed cache card with accelerator-like performance designed for the Mac II, plugs into the existing 68020 socket on the Motherboard.
DRI 0181
Manufacturer: Dove
Suggested Retail: ~~$259~~
$159

Open your Mac in a snap

MacSnap Tool Kit

The essential tools for opening up your Mac 512, Plus, or SE to install memory upgrades, adaptor cards and fans. Includes the required hex screw driver, case spreader, and a static strap.
DRI 0040
Manufacturer: Dove
Suggested Retail: ~~$21~~
$15

Bring your Mac up to date - inexpensively

MacSnap Memory for Older Macs

MacSnap memory expansion kits give your old Mac (512, Plus, or SE) the power to run the new generation of software. Using MultiFinder, keep several applications open, and switch from one to another without quitting and launching. Or, explore the exciting world of HyperCard. You'll need at least two Megabytes to run System 7.0 when it arrives. So modernize your old Mac with more memory. It's cheaper than buying a new computer.



MacSnap 524E
Expands enhanced Mac 512KE to one Mb.
DRI 0120
Manufacturer: Dove
Suggested Retail: ~~$299~~
$187

MacSnap 524S
Expands enhanced Mac 512KE to one Mb. Includes SCSI interface and external SCSI connector.
DRI 0065
Manufacturer: Dove
Suggested Retail: ~~$399~~
$239

MacSnap 548E
Expands enhanced 512KE Mac to two Mb.
DRI 0121
Manufacturer: Dove
Suggested Retail: ~~$699~~
$439

MacSnap 548S
Expands enhanced 512KE Mac to two Mb. Includes SCSI interface and external SCSI connector.
DRI 0068
Manufacturer: Dove
Suggested Retail: ~~$799~~
$499

Unleash your Mac - and save money

MacSnap CMOS Memory

MacSnap CMOS memory expansion kits require less power, so they run cooler than standard RAM chips. Don't settle for that one Megabyte Mac you bought because you couldn't afford the deluxe model. Upgrade it to full power with inexpensive, high-performance MacSnap memory.

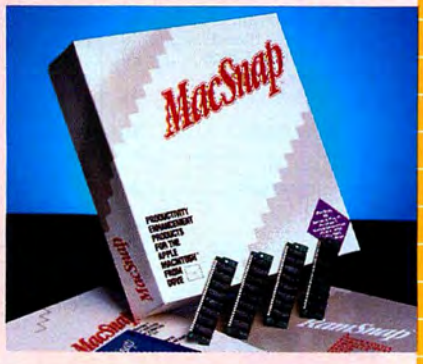
MacSnap 2S CMOS
Expands Mac Plus or SE to two Mb. using one Mb. surface mount CMOS chips: expandable to four Mb.
DRI 0122
Manufacturer: Dove
Suggested Retail: ~~$476~~
$249

MacSnap 4S CMOS
Expands Mac Plus, SE or II from one Mb. to four Mb., with one Mb. surface mount CMSO chips.
DRI 0123
Manufacturer: Dove
Suggested Retail: ~~$952~~
$498

MacSnap 8S CMOS
Expands Mac II from one Mb. to eight Mb. using one Mb. surface mount CMOS chips.
DRI 0124
Manufacturer: Dove
Suggested Retail: ~~$1904~~
$1029

MacSnap Plus 2
Expands Macintosh Plus from 1024K to 2048K using 256K DRAM. Not expandable.
DRI 0036
Manufacturer: Dove
Suggested Retail: ~~$499~~
$312

MacSnap 2 SE
Expands Macintosh SE from 1024K to 2048K using 256K DRAM. Not expandable but fully compatible with internal expansion cards.
DRI 0099
Manufacturer: Dove
Suggested Retail: ~~$499~~
$319



Affordable Ethernet connections for the Mac

FastNet Ethernet Adaptors

FastNet connects your Macs to Ethernet LANs. It supports TCP/IP, EtherTalk, DECnet, and other protocols, so you can talk to mainframes and minis at Ethernet speeds. The FastNet SCSI and FastNet II are intelligent controllers, with their own 68000 chips and RAM buffers to take the processing load off your Mac.

FastNet SCSI
FastNet SCSI is an external Ethernet adaptor that works with any Mac with a SCSI port. It is an intelligent controller with its own 68000 chip and 512K buffer RAM, but is not as fast as the FastNet NuBus cards.
DRI 0142
Manufacturer: Dove
Suggested Retail: ~~$1249~~
$749

FastNet II
FastNet is an intelligent NuBus card for the Mac II, with 512K RAM, 64K ROM, and a 68000 chip.
DRI 0143
Manufacturer: Dove
Suggested Retail: ~~$899~~
$565

FastNet III
FastNet is a NuBus card for Mac II, but without on-board intelligence and buffering.
DRI 0144
Manufacturer: Dove
Suggested Retail: ~~$599~~
$375



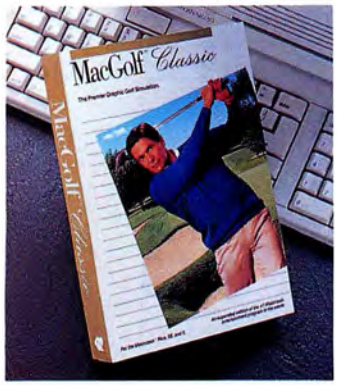
FastNet SE
Plugs directly into the SE's slot, and has 64K RAM and 64K PROM.
DRI 0145
Manufacturer: Dove
Suggested Retail: ~~$599~~
$375

FastNet SE/30
Plugs directly into the SE/30's slot, and has 64K RAM and 64K PROM.
DRI 0146
Manufacturer: Dove
Suggested Retail: ~~$599~~
$375



GUARANTEE

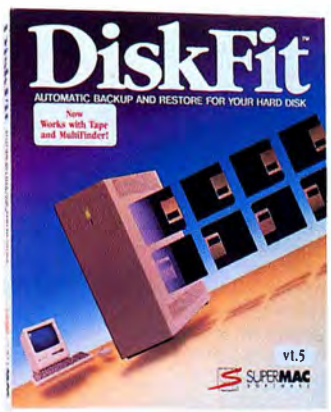
Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



MacGolfClassic (XOR Corp.)
You won't be in the rough when you play MacGolf. This is the premium edition of MacGolf, featuring vivid full-screen color graphics with unsurpassed screen image detail. Contains the original 2 MacGolf courses and 4 additional MacCourses, for a total of 108 holes to play. New features include 5 enlargement options for close-up viewing, 9 practice greens, a driving range, installability on hard disks and much more. Plus, SE, and II. (entertainment) **$53.**

ACCESSORIES

Apple
Toner Cartridges LaserWriter ..... 109.
Avery Labels (full line available)
Color Coded 3.5 Diskette ..... 4.
Laser 3.5 Diskettes ..... 29.
Laser File Folders ..... 6.
Laser Transparencies ..... 22.
Basic Needs, Inc.
HardTop Keyboard Covers ..... 15.
HardTop ImageWriter Covers ..... 17.
Keyboard Flip ..... 6.
Dust Covers - Grey Nylon Ripstop
ImageWriter or LaserWriter ..... 12.
Mac Plus and keyboard ..... 11.
Mac SE and extd. or reg. keyboard 11.
Mac II and extd. keyboard ..... 12.
Large Screen Monitor Stand ..... 39.
Universal Laser Printer Stand ..... 28.
Computer Friends, Inc.
MacInker (IW & IW II) ..... 41.
Curtis
Computer Tool Kit (52 pc.) ..... 49.
Curtis Clip ..... 6.
Disk Holder (holds 40) ..... 9.
Jewel Surge Suppressors ..... Call.
Ergotron
MacTilt-SE ..... 68.
MacTilt II-RGB ..... 75.
Goldstein & Blair
The Macintosh Bible ..... 20.
I/O Designs
Imageware II Carrying Case ..... 49.
Macinware IIcx Carrying Case ..... 89.
Macinware Mac II Carrying Case ..... 99.
Macinware Plus Carrying Case ..... 64.
Macinware SE Carrying Case ..... 75.
Monitorware Apple RGB Case ..... 79.
Ribbons black ..... 4.
Kalmar
Rolltop Teak disk holder 45 ..... 14.
Rolltop Teak disk holder 90 ..... 21.
Kensington
Anti-Glare Filter ..... 33.
Apple Security Kit ..... 34.
Mac II Stand w/Cable Kit ..... 64.
MasterPiece Mac II ..... 105.
PowerBacker 360 UPS Line ..... 269.
PowerBacker 800 UPS Line ..... 749.
PowerBacker 1200 UPS Line ..... 949.
System Saver ..... 63.
Mobius Products
Cordless Mouse ..... 99.
Fanny Mac QT ..... 59.
SE Silencer ..... 39.

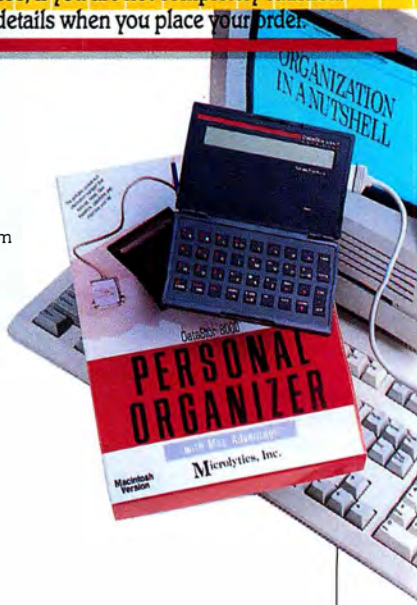


DiskFit 1.5 (SuperMac)
A handy utility for backing up your hard disk on a series of floppies. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. DiskFit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge tape drives, including the Apple tape backup system. (utilities) **$59.**

Polaroid
Circular Polarizing Filter ..... 35.
Read-Write
CompuDuster ..... 29.
Kleen & Dry CRT Pads ..... 5.
Computer Care Kit ..... 45.



Macinware Carrying Cases (I/O Designs)
The I/O family of carrying cases protects your Mac and it's peripherals against damage whenever you need to take your Mac on the road. The outer covering is made of luggage quality lightweight woven nylon with web strap reinforcement. The SE Extended Case has an inside padded compartment that can accommodate the extended keyboard. The interior is padded to protect the equipment. Comes in Black or Navy. (accessories) **SE Extended Case $69.**



DataStor 8000-Personal Organizer (Microlytics)
Organization in a nutshell! DataStor 8000 Personal Organizer is a portable, pocket-size information manager that reminds, notes, files, transfers, calculates and organizes your life. Carry important information with you by down loading it from your computer to the Personal Organizer. When you return, any information you entered can be easily uploaded to your computer. It's all you need to get on top of things...and stay there.(hardware) **$65.**

Smack-a-Mac
Smack-a-Mac ..... 9.
SoundSight
FastKeys 2.0 ..... 35.
Targus, Ltd.
Deluxe Plus/SE-XKB Case (black)...69.
ImageWriter II Case (black) ..... 49.
Mac Plus/SE Case (black)..... 55.

ACCOUNTING AND PERSONAL FINANCES

Aatrix
Checkwriter ..... 37.
Payroll 3.5 ..... 109.
Payroll PLUS or TimeMinder .... ea. 149.
Bedford (Computer Associates)
Simply Accounting ..... 209.
Brown-Wagh Publishing
MacLedgers ..... 159.
Service Industry Accounting ..... 209.
DAC
Dac-Easy Light ..... 42.
Intuit
Quicken 1.5 ..... 36.
Layered, Inc.
at Once! ..... 289.
MECA
Managing Your Money ..... 124.
Monogram
Business Sense ..... 269.
Dollars and Sense ..... 81.
Nolo Press
For The Record ..... 29.
WillMaker ..... 32.
Reality Technologies
WealthBuilder ..... 165.
ShopKeeper Software
Bill-It 2.0 ..... 99.
Softview
MacInTax 89 ..... 69.
Taxview 1040 ..... 309.
Survivor
MacMoney 3.5 ..... 60.

BLANK MEDIA

B.A.S.F. made in U.S.A
DS/DD (box of 10) ..... 15.
DS/High Density (1.44 Meg) ..... 29.
Peripheral Land, Inc.
Turbo 40 Cartridge ..... 115.
Sony
DS/DD (box of 10) ..... 14.



Casino Master (Centron)
Become a Master of Casino Gambling! Five separate casino games include **Blackjack Ace, Crapsmaster, Roulette Master, Pokermaster, and Baccarat Master.** Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included. Now available in dazzling color in the Mac II version!! Recommended and used by professional gamblers! (entertainment) Buy individual games for **$27.** each or get the 5 game Casino Master Package for **$49.** or the Deluxe Mac II color version for **$55.**

MIDNIGHT EXPRESS

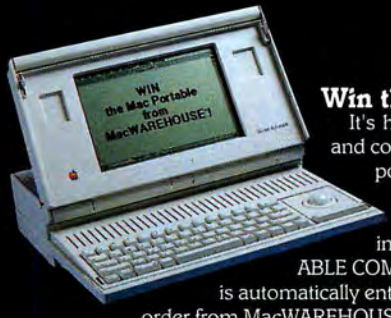
Order until midnight — for overnight delivery!

Believe it or not, between now and December 22nd, you can place your order with MacWarehouse anytime up to 12:00 midnight (E), and still have your package delivered not long after the morning paper!* All for our amazingly low $3 overnight delivery charge!

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And to make your holiday shopping even easier, we've opened up our phone lines twenty-four hours a day, seven days a week. No parking problems, no sore feet, no crushing crowds or heavy packages. Now there's no excuse for not ordering that hard drive for young Johnny or the much needed memory upgrade for yourself! Nobody gets it to you faster — not even Santa's little helpers!



Win the *NEW* Mac Portable! It's here at last! It has all the power and convenience of your Mac in a 15.7 pound portable package.

And you can win the new Macintosh Portable by entering the MacWAREHOUSE PORTABLE COMPUTER GIVEAWAY. Your name is automatically entered into the drawing when you order from MacWAREHOUSE, or when you fill out and send in the Official Entry Coupon below.

MacInTax (Softview) MacInTax '89 guides you through the process of preparing your Federal Taxes (eight state tax modules also available). Just type in the requested numbers, and MacInTax does the rest. When finished, print the completed return on the LaserWriter or the ImageWriter. It reads last year's MacInTax files and brings forward relevant items.(finance) **$69.**





SuperCard (Silicon Beach) Your HyperCard compatible "software toolkit" for creating anything from productivity stacks to color multi-media presentations. Provides color Paint and Draw, animation creation, custom menus and windows, full screen support, and the ability to open multiple stacks. (hyperware) **$128.**

Super 3D Convert 2D drawings into 3D models easily with automatic commands in this powerful graphics program. Shade with multiple light sources and thousands of colors, then animate automatically. (graphics) **$319.**



Dreams (Innovative Data Design) A powerful precision drawing tool for professionally scaled drawings and general purpose graphics. Dreams offers zoom, rotation, layers, dimensioning, symbol libraries and a vast array of drawing tools, as well as many advanced illustration features. You can merge shapes together, cut edges of objects using other objects as templates... even glue lines and curves together to form unique shapes to be filled with colors or patterns. (graphics) **$269.**

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FROM MacWAREHOUSE™



The Puzzle Storybook
Zug the Megasaurus is back with The Puzzle Storybook for children ages 3-8. Children create pictures, solve puzzles and write stories to combine language arts activities with geometric shapes to build early reading and writing skills. (education) **$27.**



Managing Your Money
A fully integrated software program addressing every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) **$124.**



Dow Jones News/Retrieval
Dow Jones News/Retrieval membership package comes with E-Z Online communications software, provides the new user with 5 hours of free online time. Connects with more than 50 databases, up-to-the-minute news and financial data, plus extensive reference library. (communications) **$24.**



MacKNOWLEDGE
MacKNOWLEDGE is the latest communications software available for your Macintosh. Icon based scripts provide instant access to all major online services with just the click of your mouse. TheTAL scripting language provides all the capabilities for customizing and automating your own online sessions or the record function will watch your session and create an icon based script automatically. Also provides support of 9600 bps and MNP modems. (communications) **$149.**

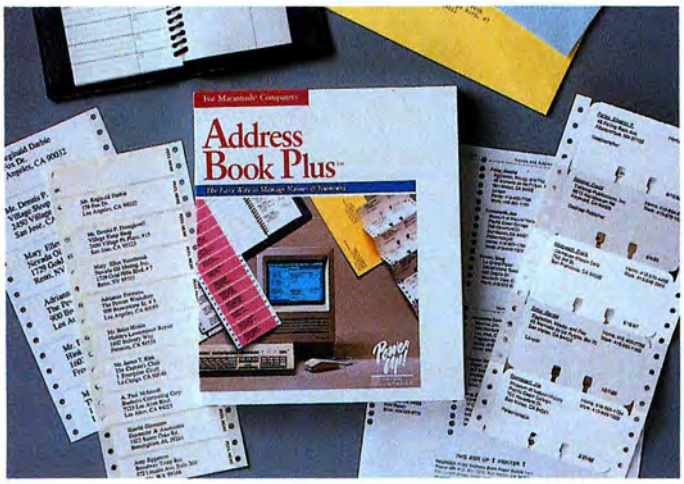
DESKTOP PUBLISHING

Aapps
MicroTV ..... 289.
Aldus
PageMaker 3.02 ..... 385.
PageMaker Color Extension ..... 179.
Broderbund
DTP Advisor ..... 47.
Data Translation
PhotoMac ..... 609.
Emerald City Software
Smart Art I, II, or III ..... ea. 85.
Icom Simulations
MacKern ..... 119.
Letraset
ColorStudio or FontStudio ..... Call.
ImageStudio ..... 275.
Ready,Set,Go! ..... 275.
Olduvai
Plus 1.1 ..... 115.
Read-It! 2.1 (OCR) ..... 249.
Read-It! Personal ..... 99.
Read-It! TS (Thunderscan) ..... 79.

Exposure (Preferred Publishers)
Integrated CDEV screen graphics utility for screen capture, painting and formatting of color and gray scale images. Unique format includes built in painting tools and fonts.(utilities) **$54.**

Direct Mail
Complete correspondence solution for labels, envelopes, addresses, form letters and telephone dialing. Easily searches, sorts, and mails address files for select mailing, merging or exporting. Available as DA or application. (business) **$54.**





Address Book Plus / Address Book Plus with Binder (Power Up!)
Address Book Plus is the most complete and ready-to-use solution for managing names, addresses, phone numbers and other vital information. Users can input, edit and view business and personal contact information, and print it out in a variety of readily-usable forms including address book pages, rotary-file or index cards, phone list, mailing labels, and envelopes. It also provides searching and automatic dialing capability in a separate Desk Accessory. (business) **Address Book Plus $53 or Address Book Plus w/ Binder $99.**

Quark
QuarkStyle ..... 175.
Xpress ..... 479.
Springboard
Springboard Publisher II ..... 109.
TimeWorks
Publish-It! ..... 239.

DISK DRIVES/BOARDS

Aristotle Industries, Inc.
HardPac Mac 20 Meg ..... 479.
HardPac Mac 40 Meg ..... 755.
HardPac Mac 80 Meg ..... 1099.
HardPac Mac 105 Meg ..... 1235.
CMS
MacStack 20 Meg ..... 529.
MacStack 30 Meg ..... 545.
MacStack 45 Meg ..... 625.
MacStack 60 Meg ..... 699.
MacStack 80 Meg ..... 799.
Cutting Edge
800K External Floppy Drive ..... 149.
SyQuest Removable 45 Meg ..... 899.
Under the Mac 20 Meg ..... 439.
Under the Mac 30+ Meg ..... 499.
Under the Mac 45+ Meg ..... 549.
Under the Mac 65+ Meg ..... 629.
Under the Mac 80+ Meg ..... 739.
Dayna Communications
Dayna File Single 360K (5 1/4") ..... 529.
Dayna File Dual 360K & 1.44M ..... 729.
Dolphin Systems Tech
Integra 20 Meg ..... 499.
Integra 30 Meg ..... 595.
Integra 40 Meg ..... 719.
Integra 60 Meg ..... 778.
Integra 80 Meg ..... 995.
Flipper 150 Meg Tape Backup ..... 1439.
Kennect Technology
Drive 2.4 ..... 359.
Rapport ..... 219.
PCPC
MacBottom Hard Drives ..... Call.
Peripheral Land, Inc.
Infinity Turbo 40 Meg ..... 1119.
Turbo Floppy 1.4 ..... 359.
Quantum
Quantum 40 MB Raw Drive ..... 525.
Quantum 80 MB Raw Drive ..... 869.
RasterOps
RasterOps Colorboard 264 ..... 760.

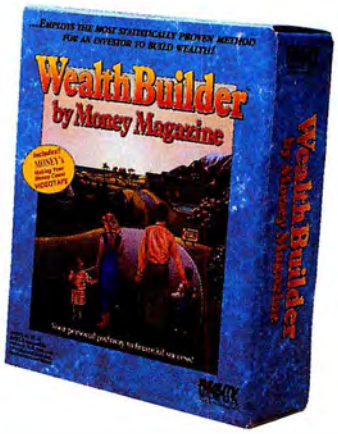
WealthBuilder (Reality Technologies)
Turn your Mac into your own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risk that you are willing to assume, WealthBuilder searches for the best investments available to fulfill your objectives. The program also allows you to change any information or assumption and immediately view its impact on your overall financial picture. Wealthbuilder is your personal tool to a brighter financial future. (finance) **$165.**

EDUCATIONAL/ PERSONAL

Bootware Software
ResumeWriter Pro ..... 58.
BrightStar
Alphabet Blocks 3.01 ..... 30.
Talking Tiles ..... 27.
Davidson
Math Blaster ..... 27.
Speed Reader II ..... 27.
First Byte
The Dinosaur Discovery Kit ..... 27.
The Puzzle Storybook ..... 27.
The Rhyming Notebook ..... 27.
Fair Tide Technologies
Navigate! mono ..... 199.
Help Software, Inc.
Desktop Help for Excel ..... 50.
Learning Company
Reader Rabbit or Math Rabbit ..... 31.
MicroTech
Elementary Signer ..... 49.
Finger Speller ..... 29.
The Software Toolworks
Mavis Beacon Teaches Typing ..... 32.
Visionary Software
Synchronicity ..... 39.
Voice & Video Instruction Videos
HyperCard or Pagemaker 3.0 .... ea. 35.
Word 4.0 Video Tape ..... 35.

ENTERTAINMENT

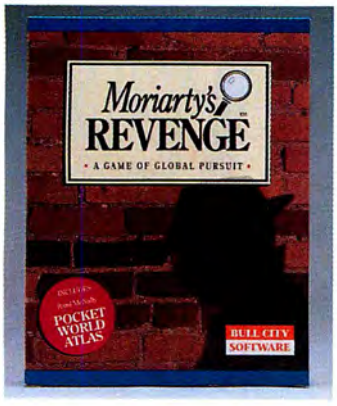
Access Software, Inc.
World Class Leader Board ..... 27.
Artworx
Bridge 6.0 ..... 24.
Daily Double Horse Racing ..... 19.
GrailQuest ..... 19.
Broderbund
Ancient Art of War At Sea ..... 27.
Shufflepuck Cafe ..... 24.
Where in the World is Carmen ..... 27.



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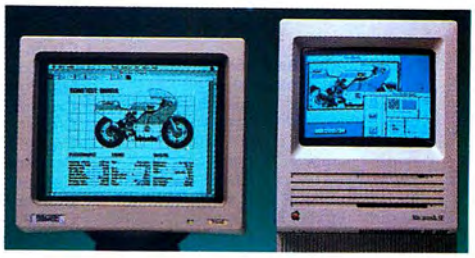
A Lasting Impression
ResumExpert (word vers.) ..... 39.
Adobe Systems, Inc.
TrueForm SetUp ..... 225.
AEC Management Systems
FastTrack Schedule ..... 115.
Aldus
Persuasion 1.0 ..... 369.
Antic Software
FlexForm Bus.Temp Vol 1 or 2 ... ea. 49.
Aperture Technologies
Aperture Visual Information Mgr. ... 729.
Ashton-Tate
Full Impact ..... 249.
Avery
List & Mail ..... 79.
Claris
MacProject II ..... 379.
SmartForm Designer w/Assistant ... 299.
Cognition Technology
MacSMARTS PRO ..... 249.
Cricket (Computer Associates)
Cricket Graph 1.3 ..... 115.
Cricket Presents ..... 285.
HyperPress Publishing
Intelligent Developer ..... 219.
Informix
WingZ ..... 259.
Microsoft
Excel 2.2 or PowerPoint 2.1 ..... ea.249.
The Microsoft Office ..... 529.
Works 2.0 ..... 185.



Moriarty's Revenge (Bull City Software)
An intriguing detective game. Track a suspect around the world using clues you uncover in each city. Solve a case correctly linking the suspect to one of ten diabolical worldwide gangs. Cases increase in difficulty as a player rises in rank. A "Master Sleuth" must track down gang leaders, including the famous Moriarty. (entertainment) **$36.**

Portfolio Systems
Dynodex-Instant Address Book ..... 89.
Power Up
Address Book Plus ..... 53.
Address Book Plus w/Binder ..... 99.
Calendar Creator ..... 38.
FastForms! ..... 89.
Preferred Publishers
Direct Mail ..... 54.
ProPlus
Wall Street Investor ..... 449.
Satori
Bulk Mailer 3.2.3 ..... 78.
Softstream International
Endeavor Planner ..... 99.
Symantec
More II 2.01 ..... 249.
Symmetry
KeyPlan ..... 339.
Synex
MacEnvelope 4.1 ..... 65.
MacEnvelope Plus ..... 149.
Vertical Solutions
FastLabel ..... 49.

Multi-Screen Full Size Display (Mobius)
Expand your vision with a 14 inch monitor. The Display combines a Princeton Graphics 14-inch monitor with the MultiScreen Video Card. Just slide the interface card into your Mac SE and connect it to the Princeton monitor. Enjoy the benefits of a larger screen that can display the full width of a letter-sized page, and over half its length. The software allows you to use your present SE screen in conjunction with your new larger one. You can optimize the display for either 72 or 85 dpi resolution. (hardware) **$529.**



CAD/CAE

Claris
ClarisCAD ..... 599.
Generic Software
Generic CADD Level 1 ..... 85.
Graphsoft
Blueprint ..... 349.
MiniCad+2.0 ..... 519.
Innovative Data Design
MacDraft ..... 144.
Dreams ..... 269.
I.S.I.
Precision ..... 199.
Strata
StrataVision 3D ..... 375.

COMMUNICATIONS

CE Software
In/Out (1 to 5 Users) ..... 129.
QuickMail 2.0 (1-10 Users) ..... 249.
CompuServe
CompuServe Navigator 3.0 ..... 45.
CompuServe Subscription Kit 9.95
DataVIZ
MacLink Plus w/Cable 4.1 ..... 125.
MacLink Plus/Translators 4.1 ..... 99.
Dow Jones
News/Retrieval Membership ..... 24.
FreeSoft
Red Ryder 10.3 ..... 52.
Hayes
Smartcom II 3.1 ..... 87.
Infosphere
Liaison ..... 175.
InSignia Solutions
Soft PC (Mac II) ..... 245.
MetaComet
AccuWeather Forecaster ..... 58.
Prodigy
Mac Starter Kit ..... 30.
Prometheus
Acknowledge ..... 289.
MacKNOWLEDGE ..... 149.
Software Ventures
Microphone II v.3.0 ..... 219.
Traveling Software
Lap-Link ..... 81.

DATABASE SOFTWARE

Acius
4th Dimension 2.0 ..... 469.
AEC Management Systems
AEC Information Manager ..... 409.
Blyth
Omnis 5 ..... 369.
Claris
FileMaker II ..... 225.
Fox Software
FoxBASE+/Mac ..... 295.
Microsoft
File 2.0 ..... 125.
Odesta
Double Helix III ..... 349.
GeoQuery ..... 199.
ProVUE
Panorama ..... 205.

DESK ACCESSORIES

Casady & Greene
QuickDEX ..... 31.
JAM Software
Smart Alarms & Appt. Diary ..... 49.
Smart Alarms (1 - 4 users) ..... 99.
Smart Alarms (5 - 8 users) ..... 149.
Smart Alarms (9 - 16 users) ..... 199.
Preferred Publishers
DAtabase ..... 72.
Vantage ..... 55.
Solutions
SmartScrap & The Clipper 2.0 ..... 45.

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- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $6 including shipping.
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*Defective software replaced immediately. Hardware replaced or repaired at our discretion.

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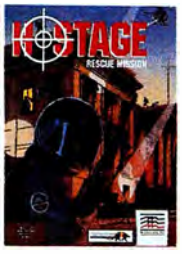
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Cribbage and Gin King
With Cribbage King, you can play against seven personalities, each with unique playing styles, in two-, four-, or five-handed games. Gin King's sophisticated algorithms also challenge your skill with seven AI opponents. Full-color, high resolution graphics, and the traditional Bicycle design add realism to both. (entertainment) **$39.**



Hostage
Special Alert: Terrorists have invaded your Embassy and seized an undetermined number of hostages. Lives hang in the balance as high-ranking diplomats are held at gunpoint. Their safety requires immediate action. Prepare to infiltrate the Embassy, neutralize the terrorists, and rescue the hostages. (entertainment) **$30.**



P51 Mustang Flight Simulator
Fly the P51-Cadillac of the sky. An incredible adventure in the skies over England and France in WWII. You'll dogfight ME109's, strike ground targets - even buzz the Eiffel Tower. Just like the movies. Fly against another Mac via modem. View action replay from 13 different angles. (entertainment) **$32.**



Gauntlet
One of the most successful arcade games of all time has come home. It brings with it all the characters, dungeons, traps, treasures, and excitement you love in the arcades! Thor, Thyra, Questor, and Merlin are together again. Action, sound and animation on your home screen. (entertainment) **$30.**

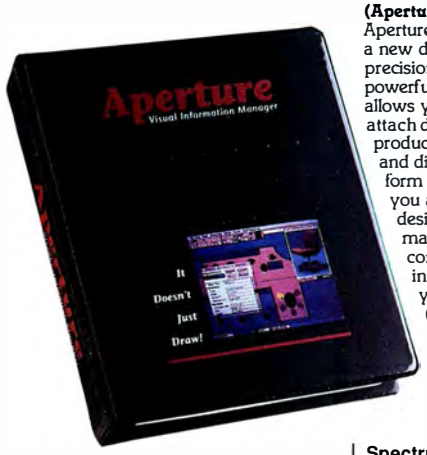


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GUARANTEE

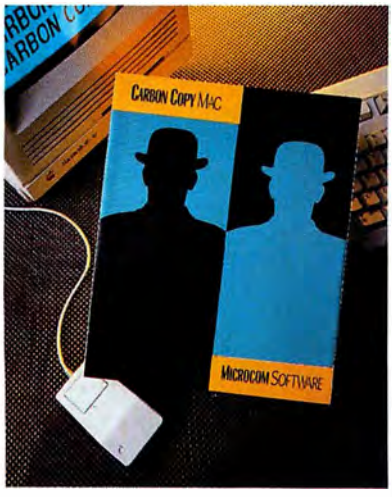
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Visual Information Manager (Aperture Technologies)
Aperture moves Macintosh graphics into a new dimension by integrating a precision drawing system with a powerful database manager. Aperture allows you to create detailed drawings, attach data to objects in your drawings, produce reports, link drawings together, and display data on your drawings to form complete applications. Whether you are an architect, engineer, designer, space planner, facilities manager, or someone who needs to communicate complex ideas and information, Aperture will become your program of choice. (business) **$729.**

Bull City Software
Moriarity's Revenge ..... 36.
Bullseye
Ferrari Grand Prix or P51 ..... ea 32.
Fokker Tri-plane ..... 24.
Centron Software, Inc.
BlackJack or CrapsMaster ..... ea 27.
CasinoMaster (5 pack) ..... 49.
Discovery Software
Arkanoid ..... 26.
Electronic Arts
Chuck Yeager Adv. Flight Trainer .... 32.
Miles Computing
Fool's Errand ..... 32.
Puzzle Gallery ..... 27.
Mindscape
Balance of Power, Deja Vu ..... ea. 30.
Hostage ..... 30.
The Colony or Gauntlet ..... 30.
Nemesis
Go Master ..... 49.
Joseki Tutor ..... 30.
PCAI/XOR
Lunar Rescue or MacGolf 2.0 ..... 34.
MacGolf Classic ..... 53.
Road Racer ..... 39.
NFL Challenge ..... 54.



Carbon Copy Mac (Microcom)
Carbon Copy Mac is a remote control software package for the Macintosh. It allows one Mac to remotely access and operate another Mac's peripherals, screen, keyboard and mouse. Carbon Copy Mac can be used for training, collaborating, file transfer, troubleshooting and updating software. It is the ideal Macintosh network management tool. Carbon Copy Mac can run locally over an Appletalk network or remotely with modems on both machines. (networking) **$119.**

Spectrum HoloByte
Falcon 2.0 ..... 31.
Tetris color version ..... 24.
Springboard
Hidden Agenda ..... 36.



The Software Toolworks
ChessMaster 2100 ..... 32.
Cribbage & Gin King ..... 39.
Life & Death ..... 32.
The Hunt for Red October ..... 32.

FONTS

Adobe
Adobe Type Manager ..... 57.
ATM Plus Pack ..... 113.
Fonts (full line avail.) ..... Call.
Forms and Schedules ..... 279.
Newsletters ..... 229.
Presentations ..... 279.
Textures, Fills, and Patterns ..... 129.
Altsys
Fontastic Plus 2.02 ..... 52.
The Art Importer 2.0 ..... 92.
Letraset
LetraStudio ..... 275.
LetraFonts (various) ..... ea. 69.
Orange Micro
Alphabits ..... 69.
Tactic Software
ArtFonts Vol.I or 2 ..... 55.

GRAPHICS AND DESIGN

3G Graphics
Images w/Impact
Graphics & Symbols 1 ..... 52.
Business 1 ..... 65.
Adobe
Illustrator 88 1.8 ..... 279.
Streamline ..... 229.
Aegis Development, Inc.
Showcase F/X ..... 199.
Aldus
Freehand 2.0 ..... 345.
Broderbund
Drawing Table ..... 75.
TypeStyler ..... 129.

Casady & Greene
Vivid Impressions Vol. 1 ..... 67.
Claris
MacDraw II ..... 295.
MacPaint 2.0 ..... 99.
Cricket (Computer Associates)
Cricket Color Paint ..... 179.
Cricket Draw ..... 139.
Deneba
Canvas 2.0 ..... 169.
Dream Maker
Cliptures, Business Images ..... 69.
MacGallery ..... 27.
Electronic Arts
Studio/1 ..... 97.
Studio/8 ..... 299.
Innovative Data Design
Dreams ..... 269.
MacroMind
MacroMind Accelerator ..... 149.
MacroMind Director ..... 449.
VideoWorks II ..... 175.
Metro ImageBase (Full Line Available)
Art Deco or ReportMaker ..... ea. 76.
Newsletter Maker or Business ... ea. 76.
Mindscape
ZING ..... 139.

ThunderScan (Thunderware)
ThunderScan turns any printed image into a detailed, high resolution Macintosh graphic that you can change and enhance with ThunderScan's powerful set of software tools. Print out your finished work on your ImageWriter or use ThunderScan's special PostScript printing effects on your LaserWriter. Rotation, framing, captioning, shaping, and other special effects let ThunderScan tap the full resolution of the LaserWriter, producing exquisite true gray scale graphics with up to 300 dots per inch and 32 shades of gray. For use with Mac 512KE, Plus and SE. (A separate power accessory must be purchased for the Mac II) (hardware) **$187.**

Multi Ad Services
ProArt: Bus., Sports or Holidays ..ea.95.
Paracomp
ModelShop ..... 399.
Swivel 3D ..... 325.
Select Micro Systems
MapMaker 4.0 ..... 245.
Silicon Beach
Digital Darkroom ..... 249.
Super 3D 2.0 ..... 319.
SuperPaint 2.0 ..... 128.
SuperMac
PixelPaint 2.0 ..... 229.
PixelPaint Professional ..... 399.
Tactic Software
Art Clips ..... 51.
SoundClips ..... 49.
Zedcor
Deskpaint 2.0 ..... 65.

HARDWARE AND PERIPHERALS

Cutting Edge
Two Page Monochrome Monitor .... 999.
DEST
Dest PC Scan Plus ..... SPECIAL 699.
General Computing Company
WriteMove Ink Jet Printer ..... 585.
Magnavox
Color Monitor 14" ..... 535.
Microlytics
DataStor-8000 Personal Organizer . 65.
Microtek
Microtek MSF-300GS Scanner .... 1589.
Mobius
Multiscreen Video Card w/Princeton 15" monitor ..... 529.
Qume
Crystal Print Publisher ..... 3445.
Seikosha America
Seikosha Printer (dot-matrix) ..... 235.

ResumExpert
Quick and easy resume composition. Effective for students to CEO's. 42 MS Word or Works fully-formatted resume templates. Highlight text and replace with your information. Manual identifies 30 special career situations; provides useful resume-writing tips. Four Mice Rating. Cover letter editions available. (business) **$39.**



Publish-It!
Complete self-contained Desktop Publishing program. Allows both professional & non-professional business communicators to write, design, and produce dynamic, sophisticated documents. Fromsimplein-house newsletters & business forms to full-length magazines and distinctive annual reports; do it faster and easier than before! (desktop publishing) **$239.**



Fanny Mac QT
Keep your Mac running cool. If you've upgraded your Mac with extra memory, an internal hard disk drive, a board for a large screen monitor, or an accelerator card, Fanny Mac QT is a required accessory. Pulls 21 cubic feet of air per minute through the computer, includes surge suppressor. (accessories) **$59.**



Desktop Help for Excel
For both novices and experts. Puts everything you need to know about Excel in one place — and makes it all available on screen whenever you need it. Just open the Desk Accessory and leave its window open while you work. Upgraded to cover Excel 2.2. (education) **$50.**





Mac-101 Keyboards (DataDesk Intl.)
Features 101 keys including a numeric keypad, a separate T-shaped cursor keypad, Cancel Key, Option and Command keys at both ends, definable function keys, plus scrolling, page control, and zooming keys. Manufacturer's two year warranty. (input/output) **$139.** International versions also available.

Power Backer 360 (Kensington)
Takes over when the power goes off. The Power Backer 360 uses a rechargeable battery to provide continuous electrical power – plus surge suppression and noise filtering. Have you ever lost data or damaged a System File when the lights flickered? Now, for less than the cost of a hard disk, you can keep your Mac humming. (accessories) Provides 360 VA. **$269**, Power Backer 800, : **$749**, Power Backer 1200 **$949.**





HyperHit 1.0
Extends the power of HyperCard by giving it the ability to search for cards at lightning speeds. HyperHit creates structured HyperCard files with indexed sort keys, so that your Mac doesn't have to read every card in every stack to find the right one. It checks the index, which tells it which card has the information, and displays it on your screen. (hyperware) **$125.**



CanOpener
Information retrieval utility for the Mac. CanOpener will search anywhere, and lets you retrieve just about anything; including text, pictures and sounds. Locates text inside pictures, and gives you the whole picture! Anything you retrieve with CanOpener can be stored in it's library, so the next time you need it, its just a click away. (utilities) **$65.**



HandOff
HandOff lets you open any document from the finder, even if it's application is missing. You can specify a compatible substitute based on the document's creator or file-name extension, even across networks. Jean-Louis Gassee calls it "a nice, unobtrusive and very much needed extention to my Macintosh".(utilities) **$35.**

Sharp
The Wizard ..... 249.
ThunderWare
LightningScan ..... 369.
ThunderScan 5.0 ..... 187.

HYPERWARE

Activision
Focal Point II ..... 117.
Reports for HyperCard ..... 69.
Bantam
Complete HyperCard Handbook ..... 22.
Beacon Technologies
HyperBible International Version ..... 175.
HyperBible King James Version ..... 145.

ZING (Mindscape)
Create 2D images and extrude them into 3D, or use Enabling Technology's 3D clip art libraries. You can even scan the image in. Rotate, bend, stretch, compress, or shade them. Change the ambient and direct lighting. Make it easy to give your presentations or documents depth, dimension, and added impact. The program supports 16.7 million colors, and is compatible with some of the most popular and advanced page layout, word processing, presentation and graphics packages. (graphics) **$139.**



BrainPower
ArchiText ..... 199.
Bright Star Technology
HyperAnimator 1.5.1 ..... 99.
interFACE ..... 250.
DataDesk International
HyperDialer ..... 29.
ICOM Simulations
HyperTMON ..... 59.
MicroMaps
HyperAtlas ..... 59.
Power Up
HyperTutor ..... 29.
Silicon Beach
SuperCard ..... 128.
Softstream International
HyperHit ..... 125.
Springboard
Family Matters ..... 28.
Symmetry
HyperDA 1.2 ..... 49.
TimeWorks
HyperWorks Organizer ..... 60.

INPUT/OUTPUT

Cutting Edge
CE-105 ADB Keyboard ..... 125.
DataDesk Intl.
Mac 101 Keyboards ..... 139.
Kensington
New Turbo Mouse ..... 109.
Koala
MacVision 2.0 ..... 219.
Kraft
ADB Joystick Premium III (SE&II) ..... 49.
QuickStick ..... 39.
Kurta
IS/ADB Tablet 8 1/2 x 11 ..... 255.
Mouse Systems
A+ Mouse (SE/II) ..... 79.
A+ Mouse (512/Plus) ..... 63.
Practical Solutions
The Cordless Mouse ..... 99.
Mouse Master ..... 57.
Summagraphics
Bit Pad Plus ..... 325.

LANGUAGES

Digitalk, Inc.
Smalltalk/V MAC ..... 129.
Microsoft.
QuickBasic ..... 65.
Shana Corporation
Inside Out ..... 369.
SmethersBarnes
Prototyper ..... 189.
Symantec
THINK'S C 4.0 ..... 159.
THINK'S Lightspeed Pascal ..... 85.
Zedcor
ZBasic 5.0 ..... 89.

MEMORY UPGRADES/ ACCELERATORS

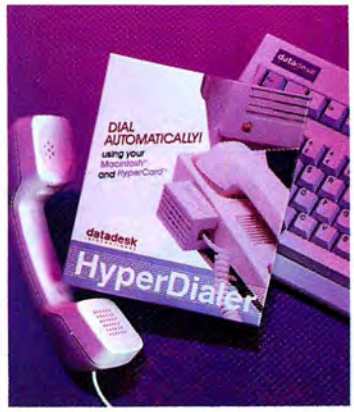
1 MEG SIMMS
Low Profile, 100ns High Quality Single In-Line Memory Modules for MacPlus, SE, II, IIx. 2 yr. Warranty. **New low price $119.**

Dove (full line available)
MaraThon 030 Accelerator ..... 969.
MaraThon 030X ..... 999.
MaraThon Racer ..... 159.
MacSnap 2S ..... 249.
MacSnap 4S ..... 498.
MacSnap 8S ..... 1029.
MacSnap 524E ..... 187.
MacSnap 524S ..... 239.
MacSnap 548S ..... 499.

MODEMS/FAX

Abaton
InterFax12/48 ..... 269.
Best Data Products
SmartOne 2400/1200 ..... 145.
Hayes
Smartmodem 1200 ..... 295.
Smartmodem 2400 ..... 429.
Smartmodem 9600 (V series) ..... 799.
Prometheus
ProModem 2400 SE Int. ..... 209.
ProModem 2400M ..... 199.

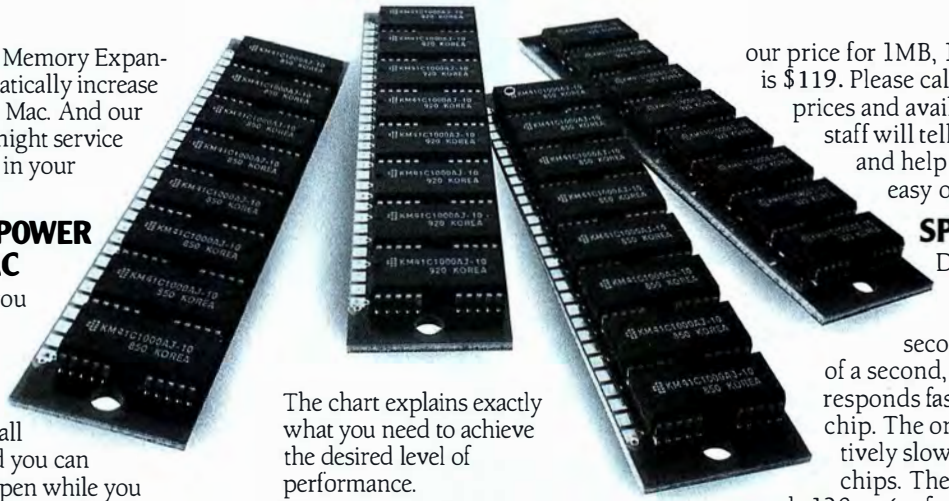
HyperDialer (DataDesk International)
Now you can connect your Macintosh to your existing business or home telephone for automatic dialing with Apple's HyperCard. DataDesk's HyperDialer is designed specifically for HyperCard's touch-tone dialing capabilities and works with-line business phones without requiring a modem or dedicated phone line for automatic dialing. Automatically dials HyperCard, SideKick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. It connects to Mac speaker port - not a precious serial port. (hyperware) **$29.**



Circle 78 on reader service card

4 MB CAPACITY NOW AVAILABLE!

Tomorrow's Upgrade For Your Mac Is Only $119.*



A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.



WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@ $119ea.)

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE30 to this amount of memory	**Do this: (install in multiples of four only)**
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
8 MB	Remove all four 256K SIMMs install eight 1M SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just $15.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

*Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns Samsung kits is $119. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 80, 90 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by **12:00 a.m.** (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

MacWAREHOUSE™

1-800-255-6227

ORDER TOLL-FREE
24 HOURS A DAY
Inquiries: 1-201-367-0440
Fax: 1-201-905-9279

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MACWAREHOUSE 30 DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

MWAØP



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Symantec
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THINK'S Lightspeed Pascal ..... 85.
Zedcor
ZBasic 5.0 ..... 89.

MEMORY UPGRADES/ ACCELERATORS

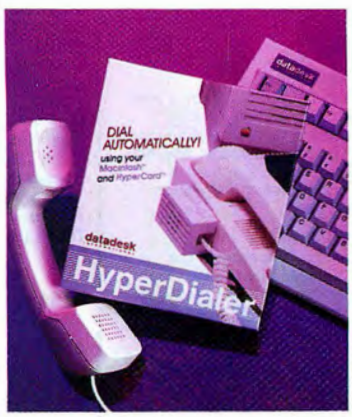
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MacSnap 524S ..... 239.
MacSnap 548S ..... 499.

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Hayes
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Smartmodem 2400 ..... 429.
Smartmodem 9600 (V series) ..... 799.
Prometheus
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GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



SmartOne 2400 Modem (Best Data Products)
For beginners and experienced modem users. If you need a 2400 baud modem, the Smart One 2400 Modem provides an economical alternative. For less than the cost of some 1200bps units, you get a Hayes compatible modem with an auto answer/originate, 300, 1200 and 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes software and cable. (modems) **$145.**

Supra
Supra Modem 2400 ..... 139.
US Robotics
Courier 9600 Modem ..... 689.

MUSIC AND SOUND

Altech
MIDI Interface ..... 59.
Bogas Productions
Super Studio Session 2.0 ..... 69.
Coda
Finale ..... 479.
MacDrums ..... 31.
Perceive ..... 50.
Electronic Arts
Deluxe Music Construction 2.5 ..... 85.
Deluxe Recorder ..... 99.
Esthetic Engineering
Music Mouse ..... 49.
Farallon Computing
MacRecorder (records sound) ..... 164.
Screen Recorder ..... 129.
First Byte
SmoothTalker ..... 33.
Great Wave
Concertware+MIDI 4.0 ..... 78.
HIP Software
Harmony Grid ..... 59.



MaraThon 030 (Dove)
Put a fast running 68030 chip into your Mac II with this MaraThon board. Features a 256K byte internal data cache, 256 bytes of instruction cache, and full 32 bit microprocessor operating at 32MHZ. Quick and easy installation. (accelerators) **$969.**

MaraThon 030X
Designed specifically for use in the Macintosh IIX, plugs into the existing 68030 socket and features a Motorola MC68030 microprocessor, operating at 32 MHZ, has a built-in Paged Memory Management Unit available for A/UX systems. Improves intensive applications, and other processor-demanding operations. (accelerators) **$999.**

Intelligent Music
OvalTune ..... 95.
Passport Designs
Master Tracks Pro 3.0 ..... 259.
NoteWriter ..... 325.
Passport MIDI Interface ..... 89.
Primera Software
Different Drummer ..... 59.
Repertoire
Music Publisher ..... 375.
Resonate
Listen 2.0 ..... 62.

NETWORKING PRODUCTS

Connect Inc.
MacNet ..... 47.
Dove
FastNet SCSI ..... 749.
FastNet III ..... 375.
FastNet SE or SE/30 ..... ea. 375.



Drive 2.4 (Kennect Technology)
Drive 2.4 finishes the job Rapports starts. On a Mac 512E, Plus, SE, or II (needs a special cable), the Drive 2.4 reads, writes, and formats HFS, ProDOS, MS-DOS formats in the related 400K, 800K, 720K, 1.2 MB,1.44 MB, and 2.44 MB sizes. Rapport is not necessary for the Mac SE/30, IIcx, IIci, and IIx (needs a special cable). Just plug in the Drive 2.4 and install the software. Includes FastBackII, which can put an average of 4 MB on a single diskette. (drives) **$359.**

Rapport (Kennect Technology)
Just plug Rapport into the External Disk Drive port on your Mac. Suddenly, your Mac can read MS-DOS disks on its Internal Floppy Disk Drive. With an 800K External Disk Drive, you can read, write, and format MS-DOS disks. As an added bonus, Rapport can increase the capacity of Mac disks to 1.2 Megabytes on the External Drive. It adds the functionality of Apple's new FDHD drive - at a lower cost.(drives) **$219.**



Farallon
Timbuktu 3.0 ..... 95.
Timbuktu Remote 1.0.1 ..... 129.
TrafficWatch ..... 132.
PhoneNET PLUS ..... 33.
PhoneNET Repeater ..... 319.
PhoneNET Star Controller ..... 1095.
Microcom Software
Carbon Copy Mac ..... 119.
Shiva
NetBridge ..... 339.
NetSerial X232 ..... 279.
TOPS
NetPrint ..... 119.
FlashBox ..... 123.
FlashCard ..... 159.
Repeater ..... 129.
Teleconnectors ..... 29.
TOPS ..... 145.
TOPS DOS ..... 115.

SECURITY AND VIRUS PROTECTION

ASD Software, Inc.
FileGuard 2.0 ..... 125.
FileGuard Extend (office 5-pak) ..... 309.
TWINS ..... 109.

HJC Software, Inc.
Virex 2.1 ..... 55.
Kent Marsh
MacSafe or NightWatch ..... ea. 87.
QuickLock ..... 57.
Mainstay
AntiToxin ..... 59.
Symantec Corporation
S. A. M. ..... 63.

SPELLING/DICTIONARY THESAURUS CHECKERS

Deneba Software
BigThesaurus ..... 59.
Spelling Coach Pro ..... 115.

Deluxe Recorder (Electronic Arts)
Deluxe Recorder transforms your Mac and MIDI compatible instrument into a home recording studio and helps you create and perform musical compositions. Use it alone or use it with Deluxe Music Construction Set and your other music software programs. It provides all the power of a multi-track tape recorder with all the vital controls for recording and playing, including fast forward, rewind, overdub, mute solo, punch in/out and more! (music) **$99.**



Electronic Arts
Thunder II ..... 52.
Lexpertise
MacProof 3.2.1 ..... 115.
Microlytics
Electronic Word Finder ..... 75.
Word Finder 2.0 ..... 36.
Sensible Software
BookEnds or Sensible Grammar ..... 53.

STATISTICAL ANALYSIS

Abacus Concepts
StatView II ..... 295.
StatView SE+Graphics ..... 225.
BrainPower
StatView 512+ (requires 512k) ..... 149.
D2 Software
MacSpin 2.0 ..... 189.
Odesta
Data Desk Professional ..... 289.
Paracomp
Milo ..... 159.
Select Micro Systems, Inc.
Exstatix ..... 219.
Wolfram Research
Mathematica (SE) ..... 450.

UTILITIES

Abbott Systems
CanOpener ..... 65.
Affinity
Tempo II ..... 79.
Aladdin Systems Inc.
Programmer's Assistants ..... 75.
Shortcut ..... 59.

CompuServe®

You can now contact MacWAREHOUSE or place orders with us in the **Electronic Mall** on CompuServe. The **MacWAREHOUSE GO code** is **GO MW**. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.

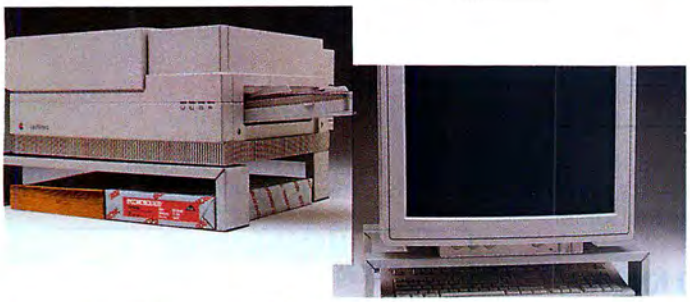
LightningScan (Thunderware)
LightningScan is Thunderware's newest, fastest and most versatile personal scanner for the Mac. All you need is one fast pass to transfer any image up to 4.1 inches wide into your favorite Mac program. Change and enhance your image with LightningScan's powerful software tools. LightningScan supports TIFF, encapsulated PostScript, PICT and Paint files and is compatible with PageMaker, Illustrator, FreeHand, Digital Darkroom, ImageStudio, XPress and ReadySetGo!, among other applications. Compatible with Mac Plus, SE and II family. (hardware) **$369.**



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Laser Printer Stand (Basic Needs)
Free up space on your desktop by raising your printer four inches. Store extra toner cartridges or supplies conveniently underneath. Attractive 2-piece steel construction fits any size printer. **$28.**
Large Screen Monitor Stand raises your monitor four inches for easier viewing, allows you to store your keyboard and other supplies underneath. **$39.**
The Keyboard Flip allows you to "flip" your keyboard on its side for storage when not in use. Fits any size keyboard. (accessories) **$6.**

STOP PRESS

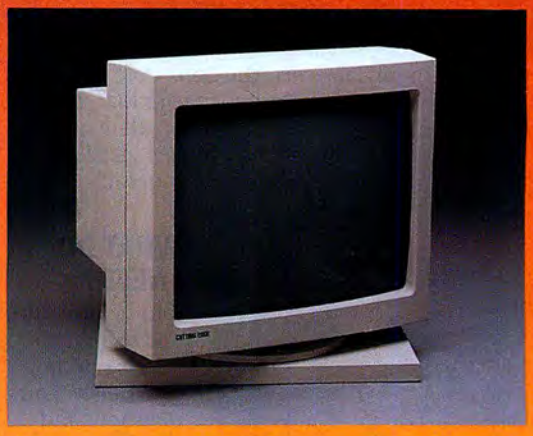


NEW!
Price breakthrough!
Under the Mac Drives (Cutting Edge)
The Cutting Edge Under the Mac Drive hard disk drives are quiet and reliable with access times down to 20 milliseconds making it almost three times faster than most. Push button external SCSI address switch and removable SCSI terminators allow easy daisy chaining up to 7 SCSI devices. Sizes available 20 meg to 80 meg (disk drives)
20 meg only $439.
30+ meg only $499.
45+ meg only $549.
65+ meg only $629.
80+ meg only $739.



800K Drive
The Cutting Edge 800K drive's attractive styling, quiet performance, and high-tech reliability make it our most popular floppy drive. Features an LED light to indicate disk access and a hinged door over the disk insertion slot to keep the mechanism clean. One year manufacturer's warranty. (disk drives) **$149.**

Two Page Monochrome Monitor (Cutting Edge)
Every Mac SE and II user can now justify the expense of a big screen with the new Cutting Edge 19" Two Page Monochrome Display System. The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 herz and a high resolution of 72 DPI. Like all Cutting Edge products it comes with a one year warranty and a 30 day money back guarantee. (hardware) **$999.**



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ORDER TOLL-FREE 24 HOURS A DAY.

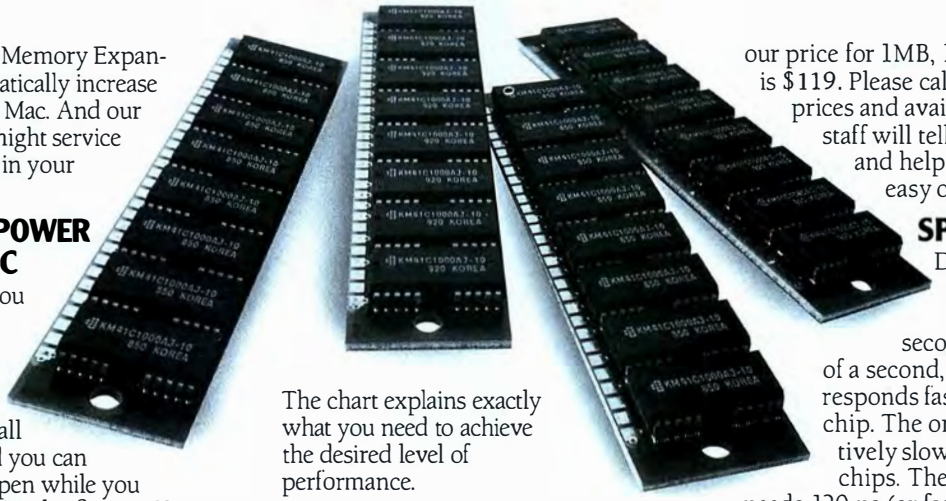


Circle 78 on reader service card

4 MB CAPACITY NOW AVAILABLE!

Tomorrow's Upgrade For Your Mac Is Only $119.*

A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!



MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.



WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@ $119ea.)

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE30 to this amount of memory	**Do this: (install in multiples of four only)**
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
8 MB	Remove all four 256K SIMMs install eight 1M SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just $15.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

*Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns Samsung kits is $119. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 80, 90 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by **12:00 a.m.** (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

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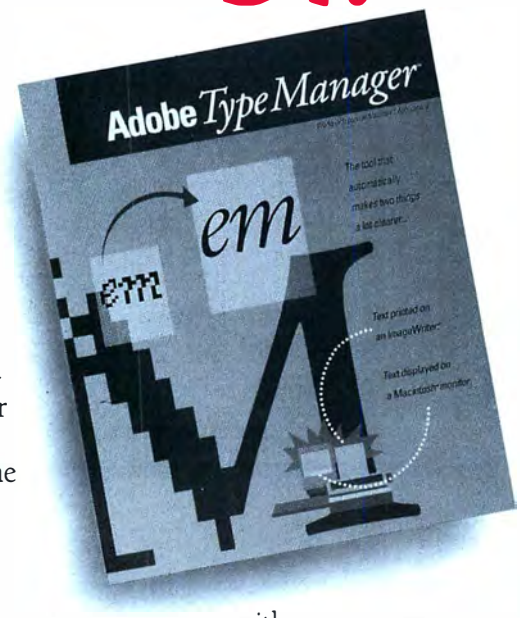
MACWAREHOUSE 30 DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

MWAØP

Introducing Adobe Type Manager From MacWarehouse $57.



NO MORE JAGGED EDGES! Now you can make the output of your ImageWriter or Hewlett-Packard DeskWriter look just like a laser printer, thanks to this sensational new program. But don't stand in line to pay $99 at your local software store. Pick up the phone now, and for just $57 (plus $3 s&h), we'll rush your copy by overnight delivery!

Believe it or not, Adobe Type Manager solves the problem of jagged edges on screen fonts, too. Now, what you see on your screen will more closely resemble what you get from any PostScript printer — no more 24-point headlines that look like brick piles on screen. It's almost like having Display PostScript on your Mac — for only $57.

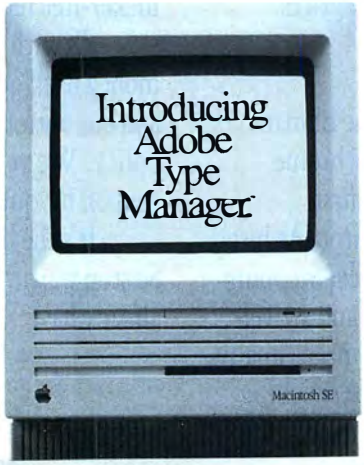


Adobe Type Manager is compatible with virtually every major application, and it's easy to install on any Mac (running System 6 or later) from a Plus to a IIci. Just a few clicks with your mouse — install it and forget it. Because you'll only need one size of a screen font installed in your System, you can also save megabytes of space on your hard disk. You won't need any additional memory, either.

If you have a non-PostScript laser printer, like Apple's LaserWriter IISC, Adobe Type Manager will give you PostScript — quality type, without the PostScript expense.

And Type Manager includes high-quality outline versions of 13 popular fonts, so it's easy to produce the kind of text you thought only came from a PostScript laser printer.

Our friendly MacWarehouse staff of Mac fanatics is standing by to help with any questions you may have. Remember, nobody beats our fast, dependable, overnight service for Adobe Type Manager or any of the other fine Adobe products.



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Special Offer

Adobe Type Manager Plus: Available for a limited time only. Contains 22 additional typefaces—Adobe Typeface Packages 1-5 and HelveticaNarrow. (These are not included with Type Manager.) Retail value if purchased separately — $885. MacWarehouse price **$113.**

Circle 78 on reader service card

MWAØS

A Big Screen Monitor Now Makes Big Sense.



Up to now most Macintosh users considered a big screen monitor a luxury purchase. Something desirable, but a purchase which could be put off until prices came down.

Surprise! They just did.



Introducing the Ehman 19" Two-Page Monochrome Display System, the first affordable big screen monitor. At just $899, including card, cable, Stepping Out II software, and a tilt and swivel base, the Ehman monitor means finally doing away with scrolling, squinting and scrunching.

The Ehman monitor matches all the major features of other big screen monitors costing twice as much, including a high resolution of 76 DPI, and a flicker-free refresh rate of 70 herz.

As with all Ehman products, you get a 30-day money back guarantee, a minimum one-year warranty, and our optional 24-hour express service replacement policy. We've even thrown in a $25 dealer installation coupon for quick and easy set-up.

It's the big-screen monitor you've been hoping for. So stop waiting for prices to come down. At Ehman they already have.

Ehman

1-800-257-1666

All product names mentioned are trademarks of their respective holders. Prices subject to change without notice.

Circle 154 on reader service card

MACWORLD NEWS

by Dan Littman and Tom Moran

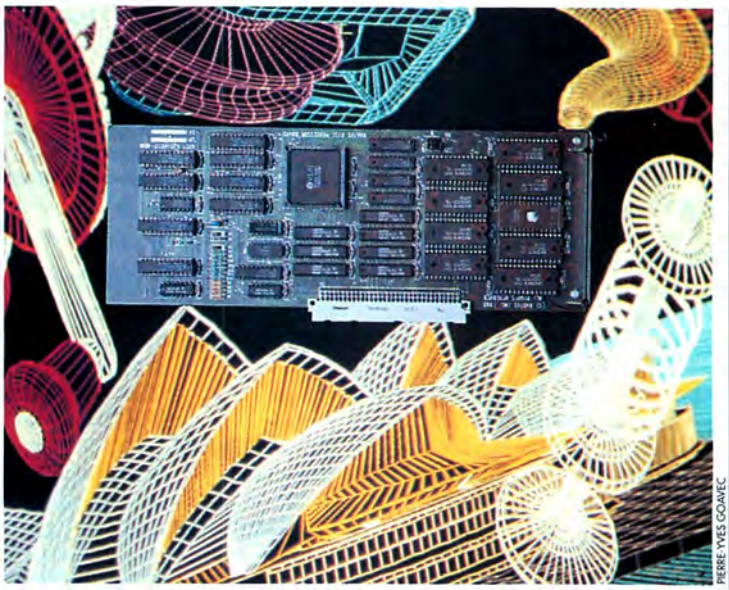
Radius Unveils CAD Accelerator

Radius recently introduced its Radius QuickCAD Graphics Engine, an accelerator board that makes CAD operations up to 30 times faster. The accelerator uses a 6 MIPS Acorn RISC processor for the display-list processing necessary to speed up the vector graphics used in CAD applications.

The board's hardware is very similar to Radius's existing QuickColor accelerator for QuickDraw, but the software supports display-list processing (for vector graphics) in conjunction with CAD applications such as AutoCAD, VersaCAD, MacBravo, and Pegasys. The software also handles the difficult translation between vector graphics and QuickDraw without any incompatibilities, Radius said.

The QuickCAD board works with the 19-inch Radius Color Display, the Radius 8-bit GSC Color Display Card, and Apple's 13-inch color display. It can drive the larger Radius display because both the accelerator and the Radius display adapter implement the faster block-transfer mode of the NuBus.

At press time, Radius expected the Radius QuickCAD Graphics Engine to have a list price of $1495. The accelerator was slated to begin shipping in early November. The Radius Color Display and the GSC Color Display Card list for a total of $6190. For more information, call Radius at 800/227-2795. —*Tom Moran*



The QuickCAD Graphics Engine from Radius is designed to make CAD software run up to 30 times faster.

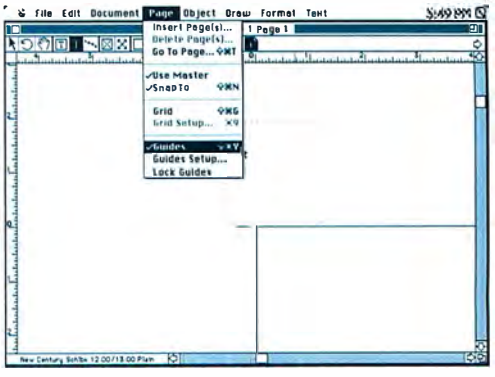
Life in the Studio Line

The flagship piece of Letraset's new Studio Line series of products is DesignStudio, a $795 feature-packed page-layout application that imports and converts ReadySetGo files and addresses some of that earlier product's shortcomings.

DesignStudio looks like ReadySetGo but adds a PageMaker-like pasteboard interface to RSG's rigid grid, letting you combine both ways of working on the same page. The much-improved text handling offers kerning and tracking from the keyboard to 1/500 em, and tracking operates at three different levels depending on font size. DesignStudio can rotate text and wrap it inside polygons or wrap it nonsymmetrically around graphics, and the program provides an unusual masking capability that lets you place a graphic into a triangular, circular, or other odd-shaped hole and run text around it. DesignStudio also provides an aesthetic rag command that prevents ragged type from lining up. You can save files in Crosfield format to simplify moving them to a Crosfield prepress system, and Letraset plans to provide special printer drivers for improved printer compatibility. The company will implement four-color support in stages, with the eventual goal of providing prepress quality output with CIE-LUV color model-based technology licensed from Optronics.

A few nice touches include the ability to automatically show numbers as properly formatted fractions; horizontal and vertical rulers that you can set to different units; expanded preferences,

(continues)



DesignStudio's interface is a lot like ReadySetGo's, but among DesignStudio's new features is the addition of a pasteboard-and-guidelines metaphor to ReadySetGo's grid.

Image Club Graphics PostScript Typeface Library

Announcing the improved Image Club Typeface Library and LetterPress CD ROM

new VERSION 1.5

new contours

HINTS

now both MAC and PC compatible

PC fonts are compatible with Ventura, PageMaker and CorelDraw. Also includes .OFL files for use with non PostScript printers such as the HP LaserJet. OFL files require Publishers Type Foundry.

image club typeface library

599 Ways To Avoid Helvetica™

GOUDY
Goudy
Goudy ITALIC
Goudy BOLD
Goudy BOLD ITALIC

Goudy Sans
GoudySans BOOK ITALIC
GoudySans BOLD
GoudySans BOLD ITALIC

America
America ITALIC
America BOLD

Badloc
Badloc Compression

Bak r Signet

BALLOON (ATF)
BALLOON BOLD
BALLOON EXTRABOLD

BAMBOO (ATF)
Bamboo

BANCO
BANCO

ITC BARCELONA®
Barcelona BOOK
Barcelona BOOK ITALIC
Barcelona BOLD
Barcelona BOLD ITALIC

BASILEA™ (VGC)
Basilea

ITC BAUHAUS®
Bauhaus LIGHT
Bauhaus MEDIUM
Bauhaus BOLD
Bauhaus HEAVY
Bauhaus HEAVYOUTLINE

BEEBOPP™ (IC)
BEEBOPP

ITC BENGUIAT®
Benguiat BOOK
Benguiat BOLD

ITC BENGUIAT GOTHIC®
Benguiat GOTHIC BOOK

GOTHIC BOOK ITALIC
GOTHIC BOLD
GOTHIC BOLD ITALIC
STYLE BOOK
STYLE BOLD
OLD STYLE BOLD ITALIC

ITC BERNASE ROMAN®
Bernase ROMAN

BERNHARD TANGO™ (VGC)
Bernhard Tango W/SWASH INIT

BISQUE™ (VGC)
Bisque

BODONI
Bodoni Poster

Balt BOLD

Book Jacket ITALIC

Century BOOK COND.
Century BOOK COND. ITALIC
Century BOLDCOND.
Century BOLDCOND. ITALIC

CENTURY OLDSTYLE
Century OLDSTYLE
Century OLDSTYLEITALIC
Century OLDSTYLE BOLD

CENTURY SCHOOLBOOK (ATF)
Century SCHOOLBOOK
Century SCHOOLBOOKITALIC
Century SCHOOLBOOK BOLD
Century SCHOOLBOOK BOLD ITALIC

CHAMPAGNE (IC)
Champagne

ITC CHELTENHAM®
Cheltenham BOOK
Cheltenham BOOK ITALIC
Cheltenham BOLD
Cheltenham BOLD ITAL
Cheltenham OUTLINE
Cheltenham OUTLINE SHAD.
Cheltenham CONTOUR

ITC CHELTENHAM® CONDENSED
Cheltenham BOOK COND.
Cheltenham BOOK COND. ITALIC
Cheltenham BOLD COND.
Cheltenham BOLD COND. ITALIC

CHROME BUMPER™ (IC)
CHROME BUMPER

CITI (IC)
Citi LIGHT
Citi BOLD

CLAREDON (IC)
Claredon
Claredon BOOK

ITC CLEARFACE®
Clearface REGULAR
Clearface ITALIC
Clearface BOLD
Clearface BOLDITALIC
Clearface OUTLINE
Clearface OUTLINE SHAD.
Clearface CONTOUR

COMIC BOOK™ (IC)

Novarese BOOK ITALIC
Novarese

Italia
Italia MEDIUM
Italia BOLD

COPPERPLATE GOTHIC™ (VGC)
ABCDE COPPERPLATE GOTHIC LIGHT
ABCDE COPPERPLATE GOTHIC

ITC KABEL®
Kabel BOOK
Kabel MEDIUM
Kabel DEMI
Kabel BOLD
Kabel ULTRA
Kabel OUTLINE
Kabel CONTOUR

KAUFMAN SCRIPT (IC)
Kaufman Script
Kaufman Script

Eurostil EXT.
Eurostil BOLD EXT.
Eurostil EXT. OUTLINE
Eurostil BOLD EXT. OUTLINE

ITC NEWTEXT®
Newtext LIGHT
Newtext LIGHTITALIC
Newtext BOOK
Newtext BOOKITALIC
Newtext REGULAR
Newtext REGULAR ITALIC
Newtext DEMI
Newtext DEMIITALIC

AASE™ (VGC)

Ronda LIGHT
Ronda
Ronda BOLD

Franklin GOTHIC HEAVY ITALIC
Franklin GOTHIC OUTLINE
Franklin GOTHIC OUTLINE SHAD.
Franklin GOTHICCONTOUR

FRIZ QUADRATA™ (VGC)
Friz QUADRATA
Friz QUADRATA BOLD

FUTURA® (FTN)
Futura LIGHT
Futura LIGHT OBLIQUE
Futura BOOK
Futura BOOK OBLIQUE
Futura MEDIUM
Futura MEDIUM OBLIQUE
Futura DEMI BOLD
Futura DEMI BOLD OBLIQUE
Futura BOLD
Futura BOLDOBLIQUE
Futura EXTRABOLD
Futura EXTRA BOLD OBLIQUE

FUTURA® CONDENSED (FTN)
Futura MEDIUMCOND.
Futura MEDIUMCOND. OBLIQUE
Futura DEMI BOLDCOND.
Futura DEMI BOLD COND. OBLIQUE
Futura BOLDCOND.
Futura BOLD COND. OBLIQUE
Futura EXTRA BOLD COND.
Futura EXTRA BOLD COND. OBLIQUE

GRAPHIK SHADOW

ITC GRIZZ

Grotesque

Mezzo ITALIC
Mezzo BOLD

Franklin

hairpin
hairpin HAIRLINE

HARRY™ (VGC)
Harry THIN
Harry PLAIN
Harry FAT

HEADLINER
HEADLINER OUTLINE

HALLMARK (IC)
Hallmarke LIGHT
Hallmarke LIGHT ITALIC
Hallmarke BLACK
Hallmarke BLACK ITALIC

HALLMARKE CONDENSED™ (IC)
Hallmarke LIGHT COND.
Hallmarke LIGHT COND. ITALIC
Hallmarke REGULAR COND.
Hallmarke REGULAR ITALIC
Hallmarke BOLDCOND.
Hallmarke BOLD COND. ITALIC
Hallmarke BLACK COND.
Hallmarke BLACK COND. ITALIC

ITC FAT FACE®
FatFace

ITC FENICE®
Fenice REGULAR
Fenice REGULAR ITALIC
Fenice BOLD
Fenice BOLD ITALIC

INDUSTRIAL PRESS™ (IC)
INDUSTRIAL

ITC ISBELL®
Isbell BOOK
Isbell BOOK ITALIC
Isbell BOLD
Isbell BOLD ITALIC

LYNX
LYNX GREY

L&C Hairline

ITC MACHINE®
MACHINE
MACHINE BOLD

MAXIMUS™ (VGC)

MICR™ (IC)
EXT

ABCDE MICROGRAM NORMAL
ABCDE MICROGRAM BOLD
ABCDE MICROGRAM OUTLINE
ABCDE MICROGRAM BOLD OUTLINE

MICROGRAM EXT & COND (IC)
MICROGRAM COND.
ABCD MICROGRAM EXT.
ABCD MICRO GRAM BOLD EXT.
MICROGRAM COND. OUTLINE
ABCD MICROGRAM EXT. OUTLINE
ABCD MICROGRAM B OLD EXT

ITC MILANO ROMAN®
Milano Roman

MINI PICS™ (IC)
MINI-PICS

MISTRAL
Mistral

ITC MIXAGE®
Mixage BOOK
Mixage BOOK ITALIC
Mixage BOLD
Mixage BOLD ITALIC
Mixage BLACK
Mixage BLACKITALIC

Modern NO. 216 LIGHT
Modern NO. 216 LIGHT ITALIC
Modern NO. 216 BOLD
Modern NO. 216 BOLD ITALIC

Modern NO. 216 HEAVY
Modern NO. 216 ITALIC

MURRAY (IC)
Murray
Murray BOLD

NEON™ (IC)
NEON

ITC NEON®
ITC NEON

NEULAND
NEULAND

PALLADIA (IC)
Palladia
Palladia ITALIC
Palladia BOLD
Palla BOLD ITA

Panache BOLD ITALIC

PAPER CLIP™ (VGC)
PAPER CLIP
PAPER CLIPOUTLINE
PAPER CLIPSOLID

PARK AVENUE (ATF)
Park Avenue

PEIGNO (IC)
Peigno LIGHT
Peigno BOLD

ITC PIONEER®
PIONEER

PLAYBILL
Playbill

POINTILLE™ (VGC)
POINTILLE

IVY LEAGUE
IVY LEAGUE OPEN

COMMERCIAL SCRIPT (ATF)
Commercial Script

COMPACT (IC)
Compact LIGHT
Compact
Compact BOLD

COOPER BLACK (ATF)
Cooper BLACK
Cooper BLACKITALIC

Folio LIGHT
Folio MEDIUM
Folio BOLD
Folio EXTRABOLD

FRAKTUR
Fraktur

SALTO
Salto

SAVAGE™ (IC)
Savage

SCANNING
SCANNING

SCOTFORD UNCIAL™ (VGC)
SCOTFORD UNCIAL

Serif Gothic REGULAR
Serif Gothic BOLD
Serif Gothic BLACK
Serif Gothic BOLOOUTLINE

TH ALPHABET SOUP™ (VGC)
T.H.ALPHABET SOUP

THOR™ (VGC)
THOR

THUNDERBIRD
ABC THUNDERBIRD

ITC TIEPOLO™
Tiepolo BOOK
Tiepolo BOOK ITALIC
Tiepolo BOLD
Tiepolo BOLDITALIC
Tiepolo BLACK
Tiepolo BLACKITALIC

Tiffany LIGHT
Tiffany LIGHT ITALIC
Tiffany MEDIUM
Tiffany MEDIUMITALIC
Tiffany DEMI
Tiffany DEMIITALIC
Tiffany HEAVY
Tiffany HEAVY ITALIC

Toon's Roman

TOO MUCH OPAQUE
TOO MUCH CLEAR
TOO MUCH SHADOW

TRIUMPH (IC)
Triumph
Triumph ITALIC
Triumph BOLD
Triumph BOLD ITALIC

Uniform 47
Uniform 48
Uniform 57
Uniform 58
Uniform 67
Uniform 68
Uniform 39
Uniform 49

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This ad was created on a Mac II using Aldus PageMaker 3.02, Adobe Illustrator 1.83, Silicon Beach Digital Darkroom. the text was set with the Futura & Futura Condensed families from the ImageClub Typeface Library and output as negatives on a Linotronic L300 PostScript imagesetter.

600 Typefaces

They just won't fit onto one page. This is the Image Club PostScript Typeface Library. 600 licensed "brand name" typefaces compatable with your Mac or PC and any PostScript printer. The typefaces are available on floppy diskettes in separate families as illustrated here or the entire library of 600 faces on our new LetterpressCD ROM (available for the Mac only).

Desktop Typestore

The Letterpress CD ROM features a special program developed by Image Club that unlocks typefaces as they are required on the CD ROM. The Letterpress CD can be obtained for as little as $199 including 10 fonts. Purchasing additional fonts from your Letterpress is as easy as making a phone call. We will provide a key number that is used to unlock the new typefaces from the disc.

PostScript Art Files

Also included with every font is a PostScript artwork file that you can use with Adobe Illustrator or Aldus FreeHand. Modify, rotate, stretch, customize and create your own headlines, logos and type based artwork.

Prices & Discounts

Whether you buy fonts on diskette or from the Letterpress CD ROM, our pricing and discount schedule will make it even easier.

Each font $25. Minimum purchase $50.

Please note that typeface families cannot be split up.

Discount schedule:

10-30 fonts 20% off	131-210 fonts 35% off
31-70 fonts 25% off	211-300 fonts 40% off
71-130 fonts 30% off	

Letterpress CD ROM

Letterpress CD ROM full disc (all 600 fonts)	$4999
Letterpress full disc with NEC CD ROM drive	$5599
Letterpress TypeVendor	$199

(includes 20 fonts with 600 more ready to unlock)

Ordering

To view the entire library of 600 fonts (a single page just can't do it), call for your free catalog or order without toll free line. Image Club accepts VISA, MasterCard and American Express.

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for example the choice of whether the grid-drawing tool immediately becomes a text cursor or remains ready to draw another box.

A number of add-on modules, which Letraset is calling annexes, are under development. For example, one annex attaches a custom kerning table to a specific document so that kerning is preserved when you send that document to other machines; another annex, to be called Design Script, provides a scripting language for automating document production. When all the parts are completed, the new Studio Line will include DesignStudio; FontStudio ($595) for creating typefaces and symbols; LetraStudio ($495) for manipulating type; and ImageStudio ($495) and ColorStudio ($1995) for working with photographic images. Letraset says it plans to continue to support ReadySetGo and will incorporate it and StandOut in an entry-level line to be called Business Line. For more information, contact Letraset in Paramus, New Jersey, at 201/845-6100.

—*Dan Littman*

When the Earth Shook, the Mac Was There

Tuesday, October 17: The earthquake struck shortly before sundown, cutting electrical power to most of San Francisco. Crowds gathered in the smoke-filled, pitch black streets to stare at an occasional battery-operated portable television, but most San Franciscans knew little about the quake's impact around the Bay Area.



SF EXAMINER/CRAIG LEE

When the San Francisco *Examiner's* mainframe went down, reporters wrote on laptops, and artists laid out pages on generator-powered Macs.

Without power to the System Integrator Incorporated (SII) System 55 publishing system they share, the morning *Chronicle* and afternoon *Examiner* had to improvise fast. Using generators and their art departments' Macs, each paper put out a special edition the next day full of half-page photos showing the buckled freeways, flaming houses, and collapsed buildings, with maps of the destruction sketched out in Adobe Illustrator.

To save time, said John Melendez, who runs the *Examiner*'s computers, "people were doing stories on paper, on typewriters, [and then entering them] into MacWrite. Most of the people had to learn MacWrite on the fly. It was a problem, with reporters putting in tabs and returns."

The MacWrite documents were imported into QuarkXPress, printed as running columns on a laser printer, and then cut out and pasted up by hand. The edition was printed at plants that had power, and Wednesday's 16-page *Examiner*, with a healthy variety of fonts and formatting, hit the streets as a classic piece of early desktop publishing. News-hungry San Franciscans didn't seem to mind: According to *Examiner* managing editor Frank McCulloch, the paper's circulation more than doubled, to 300,000.

The *Chronicle* sold about 600,000 copies of the 8-pager it whipped up on the art department's six Mac IIs, two IIcx machines, and Varityper VT600 and 11-by-17-inch VT600W laser printers. Steve Outing, who runs the Macs, said the paper used its normal display fonts, which were already rendered in Fontographer. For half-toning photos, "We used our Canon Laser Copier."

The *Examiner*'s Melendez is perfecting his Quark templates now and creating detailed plans for deploying people on the Macs, "just in case it happens again."—*D.L.*

Miramar Speeds Up MacLan Connect

Miramar Systems, one of only two companies that can turn an MS-DOS–based PC into an AppleShare (AFP) server, has just added speed and new remote-administration features to its Miramar MacLan Connect. Introduced at the recent Networld show in Dallas, MacLan Connect 1.1 offers a five-fold increase in performance during file, folder, and directory operations, Miramar said.

Even better, AppleShare administrators can now configure the PC-based server from any Macintosh on the network (before, the administrator often had to walk over to the PC-based server to add, change, or delete users, groups, or volumes). And it is no longer necessary to shut down the server during these operations.

One of the most striking features of MacLan Connect is File Extension Mapping, which allows PC files to appear on the Macintosh desktop with their own unique desktop application icons. PC and Macintosh applications that share the same file format, for instance FoxBase+, can also support common file attributes and record locking from both PC and Macintosh workstations.

New security features include password protection for system setup and administration, and a new user level called Supervisor, which lets an AppleShare administrator examine, delete, or modify any file on the server.

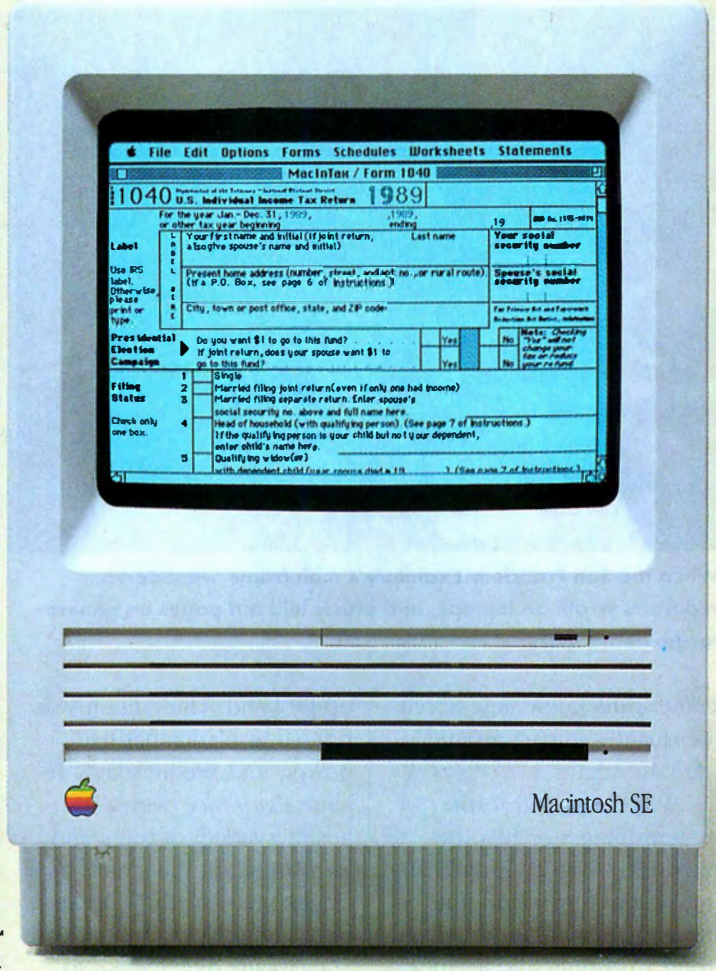
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Are you one of those people who considers tax preparation only slightly less painful than childbirth?

Do you wait until the point of no return before doing yours? Or pay a lot of money to an accountant and evade the whole thing?

Has form 4868* become an annual ritual?

Then you may be startled to learn that there are thousands of people out there—Macintosh®users just like you—who actually *enjoy* preparing their taxes.



MACINTAX

Excellence in Software '89, '87 *Software Publishers' Association*

▲

World Class Award '89, '88, '87 *MacWorld*

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#1 Tax Product Rating '89, '88 *InfoWorld*

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Award of Distinction '88 *BYTE*

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Golden Gavel Award '88 *MacGuide*

No kidding. We've got letters.

From happy users of MacInTax,™ the runaway best-selling tax program for the Mac.

How did MacInTax become so popular? Because it's so easy.

As easy as filling in the blanks on your choice of over 75 forms, schedules, worksheets and statements that pop up on your screen in the exact IRS format.

Don't know which forms you need? Don't worry. MacInTax helps you decide.

Aren't sure what belongs on which line? MacInTax fills you in: IRS instructions are on-line for every line. And Softview is always on the end of your telephone line.

Can't tell when a form is complete? MacInTax tells you what's done, what isn't and what's left.

Afraid of making a mistake? Don't be. MacInTax checks your input, helps prevent illogical, inconsistent or incomplete entries and performs all tax calculations—and recalculations—for you.

When an entry you make on one form, schedule, statement or worksheet affects the entries you've already made on others, MacInTax makes all the necessary changes.

Automatically.

When you're finished—which shouldn't take long, even if it's your first time—your laser *or* dot matrix printer spits out your return as exact replicas of official IRS forms.

> *"Rating: 10 of a possible 10... simply the best microcomputer program on the market for personal tax preparation. Easier to learn, to use and to print forms than any other tax program [we've] ever tested."*
> —Chicago Sun Times

> *"MacInTax is so good that it has literally driven the competition from the market."*
> —MacUser

Of course, you do have to sign, date, stamp and mail the return yourself. But you have to do that even when you use a professional.

Speaking of professionals, hundreds of them secretly use MacInTax to prepare the returns of people just like you.

No kidding. We've got letters.

Call us at 1-800-622-6829 and we'll read you a few.

S O F T V I E W

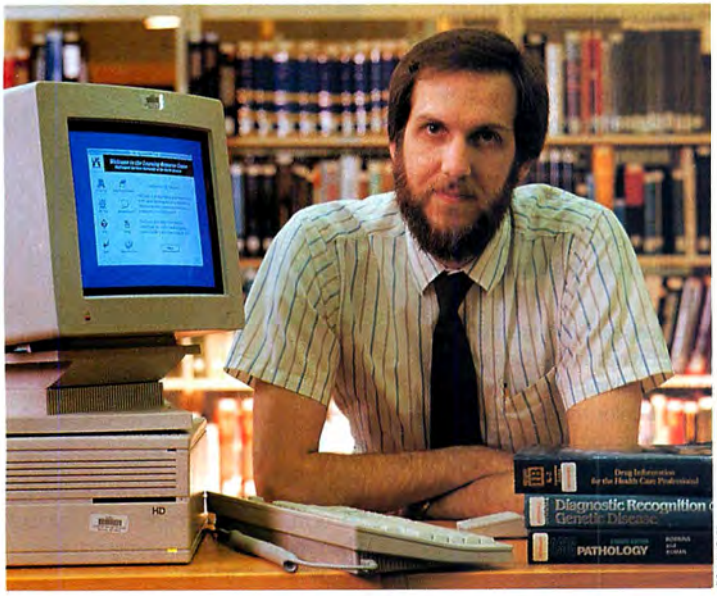
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Compatibility with AppleTalk Phase 2, which supports Ethernet and TokenTalk, has also been added to MacLan Connect with release 1.1. MacLan Connect also doubles as a gateway between dissimilar PC-based LANs such as Novell's NetWare, Banyan's Vines, 3Com's 3+, and Ungermann-Bass's Net-1.

MacLan Connect 1.1 remains priced at $995 for a license that permits unlimited users on an AppleTalk network. Registered users can upgrade for $95. For more information, call Miramar Systems in Santa Barbara, California, at 805/965-5161. —*Scott Mace*



TOM WOLFF

Steve Brown used MitemView to build a HyperCard front end for the Convergent minicomputer-based catalog at a medical library.

The Polyglot HyperCard

Every kind of computer speaks a different language and has its own way of sending and receiving data—isolating machines in the digital equivalent of the Tower of Babel. When Macintosh users want to communicate with minicomputers or mainframes, they must use a common terminal, and they must know and use the other machine's command syntax.

A new package called MitemView helps developers distill their mainframe knowledge into HyperCard stacks called Application Interface Modules (AIM). Inside the MitemView stacks are XCMDs that provide a pattern-recognition capability labeled WHOOP (Watch Host Operating Patterns), which monitors and records commands as they come down from the mainframe. An AIM developer can then map the mainframe commands into HyperCard scripts, where they can be translated into English and displayed on a card. The end-user can reverse the process by clicking on a button, executing a HyperCard script that sends commands to the mainframe—all without the user even knowing that another computer is online. MitemView also manages lower-level functions such as screen buffering and terminal protocols.

At Uniformed Services University in Bethesda, Maryland, where doctors train for the military, microcomputer manager Steve Brown is using a beta of MitemView to build a unified Macintosh front end to the medical library's computers. The library's primary machine is a Convergent Technologies CG 5000A minicomputer running a turnkey library-maintenance package that holds the library's central catalog, maintains the library's database, tracks acquisitions, and performs other functions. The library also has three CD ROM drives daisy-chained on an AppleShare server running Aries MedLine. Presenting the catalog under HyperCard, Brown said, has made it possible to "index the call number and provide a map, a floor plan, on the Mac screen showing where [each] book is located." Brown didn't think that Acknowledge, Prometheus's telecommunications application generator (the closest comparable product), would work as well as MitemView: "Acknowledge [has] a very rich and intelligent telecom procedural language . . . but we wouldn't have as much flexibility to manipulate the info coming from the mainframe; we couldn't move the data from Acknowledge to HyperCard."

MitemView should be available now. The developer toolkit lists for $995 and requires 2MB of memory; and the run-time version, whose price is based on quantity, requires 1MB of memory. For more information, contact Mitem in San Jose, California, at 408/559-8801.—*D.L.*

Third Parties Line Up behind the Portable

Perhaps the most remarkable thing about the recent introduction of the Macintosh Portable in Los Angeles was the number of third-party hardware products announced for it at the same time. The announcements ranged from high-speed communications devices to tiny hard disks and a new category of Mac add-in: the Static RAM (SRAM) module.

Abaton announced its InterFax Portable 24/96, a fax modem for the Portable. The device is a combination 2400-bps MNP Class 5 modem and 9600-bps CCITT Class 3 fax modem that fits into the Portable's modem slot. The Hayes-compatible InterFax Portable 24/96 is sheduled to ship in the first quarter of 1990. For more information, call Abaton in Fremont, California, at 415/683-2226.

Two 2400-bps modems for the Portable were introduced by Megahertz Corporation. The EasyTalk A124 is a Hayes-compatible modem that lists for $399. The EasyTalk A124M, also Hayes compatible, adds MNP Class 5 data compression and lists for $499. Both are slated to be available now. For more information, call Megahertz in Salt Lake City, Utah, at 800/527-8677.

Traveling Software showed LapLink Mac III, which supports Mac-to-Mac file transfers via cable, modem, AppleTalk, and a direct SCSI connection to the Portable. LapLink Mac III includes a custom serial cable

(continues)

RasterOps 24-bit color for MacII & SE/30.

How we broke technology barriers, to deliver the worlds most advanced 24-bit color board.

$995.

The new RasterOps ColorBoard 264 rewrites the price book for 24-bit color.

Combine it with Apple's® 13" color monitor, or any Mac-compatible 640 x 480 monitor. You get advanced, third-generation 24-bit color, allowing you to display over 300,000 colors simultaneously.

If you have an Apple 13" color monitor, then you are ready for 24-bit color.

If you are going to buy a 13" color monitor, this is the only board you should consider.

Why? For the quality design and features described in this ad.

And for real, 24-bit color.

24-bit systems let you work with over 16 million colors simultaneously. This is the most accurate way to produce true-to-life colors. With 24-bit color, you can display and manipulate photographic quality images, to create stunning presentations and documents.

24-bit color unlocks the potential of desktop publishing, presentations, and video.

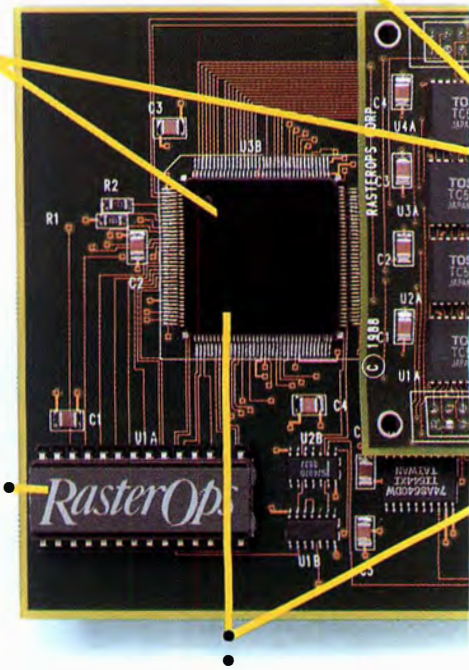
Apple's 32-bit QuickDraw™ is the standard.

Now, we have made it affordable.

300 nanosecond Bus Cycle

Barrier: 24-bit color takes a lot of memory. One screen image can take up to 900,000 bytes. Slow memory slows your screen draw time.

Breakthrough: These 1 Megabit Video RAMs provide more memory in less space, and operate at 100 nanosecond speeds, providing the fastest possible read-write cycles available on the Macintosh, at 300 nanoseconds.



RasterOps 264 Chip Set

Barrier: Providing professional color capability to Macintosh® users at a price everyone can afford.

Breakthrough: Resulting from many man-years of engineering development time, RasterOps has reduced the large number of components needed (sometimes as many as thirty) to produce 24-bit color video display cards, to a set of two proprietary custom chips utilizing the most advanced VLSI chip design and manufacturing technology. Selecting the most advanced high density CMOS chips throughout, this board has the lowest chip count of any 24-bit card in the industry. The fewer the chips, the less the heat, and the more reliable the product.

SetGamma and DirectSetEntries

Barrier: To see the effects of color corrections in real time, as you make adjustments to gamma, brightness and contrast.

Breakthrough: Your ColorBoard 264 directly supports Apple's DirectSetEntries and SetGamma QuickDraw instructions in hardware. Instantly see the effect of changes to your color image. You can watch the color tones change as you move the mouse. Without this dynamic support, you have to guess at the color correction, enter the new value, and wait for the new screen to repaint. No waiting with the 264.

Color Modes

Barrier: The colormode of the display (2,4, 16, 256, or millions) affects the speed of your work. When you are word processing you want documents to scroll fast.

Breakthrough: With RasterOps' custom Very Large Scale Integration CMOS chips, all color modes are available including 2, 4, 16, 256, or millions of colors. You decide what color level you need and when you need it.

"Millions of Colors For Millions of People!"™



Both the Mac II family and SE/30 version of the RasterOps ColorBoard 264 are fully compatible with Apple's 32-bit Color QuickDraw. RasterOps is an Apple licensed supplier of the Apple 6.0.3 System Software, including 32-bit color QuickDraw. A copy is shipped with each ColorBoard 264.

ColorBoard 264/II For Any Mac II: **$995.**

ColorBoard 264/SE30: **$1295.**

All registered and unregistered trademarks are the sole property of their respective companies.

Dual Oscillators

Barrier: With the onrush of multimedia and video applications, our customers don't want to invest in a board that locks them out of video.

Breakthrough: Two separate oscillators. The left to support Apple's 13" color monitor at a resolution of 640 by 480, and the right oscillator to output 8-bit gray scale video directly to VCRs or TV monitors. It will also output RGB NTSC video for external encoding in 24-bit True Color. When you need video, (and it's coming fast), you're ready.

DAC 473

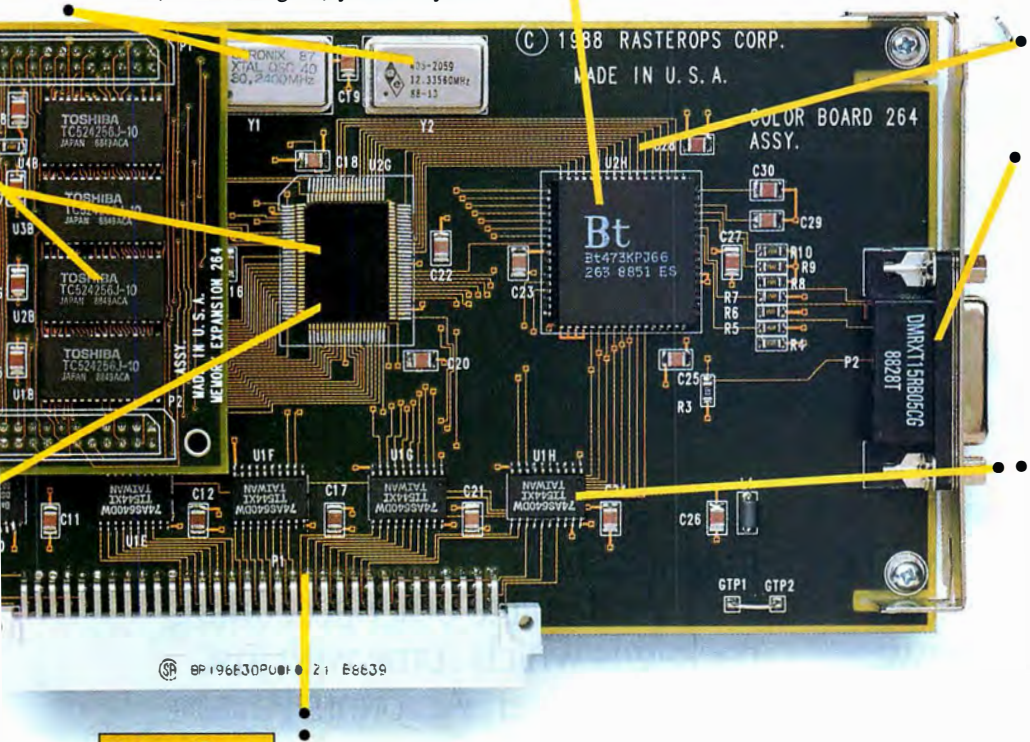
Barrier: Convert a 24-bit image from digital values in memory to analog signals of Red, Green, and Blue, using the least amount of power and board space.

Breakthrough: We are the first to use this advanced, DAC (Digital to Analog Converter) 473. The single, low power chip does a better, faster job, and replaces 3 chips. If you want the best, ask for the DAC 473.

SMOBC Fabrication

Barrier: The accepted, easy way to manufacture a board is wave soldering. But this doesn't allow efficient use of robots, and doesn't create a "Clean" board.

Breakthrough: We use an advanced, Solder Mask Over Bare Copper board fabrication technology and surface mounting of components through efficient, dependable robotics. Note the clean, simple appearence of this board. When you turn the board over, you will see a smooth golden surface, the trademark of a SMOBC board. It costs more and requires a greater design effort, but the benefit to you is a more reliable board.



Auto Sensoring

Barrier: Allow user to change monitors and frequency without setting a switch, changing an oscillator, or making a selection from the control panel.

Breakthrough: Circuitry that automatically senses which monitor you are using and switches automatically from 66.7 Hz to 30 Hz. You just plug in your Apple-compatible monitors, the board will take care of the necessary adjustments.

Bus Buffering

Barrier: The NuBus transmits power spikes and bus noise. These can destroy data as well as circuitry on the display card. Spikes can also cause pixels to trip, causing spots on the screen.

Breakthrough: We designed sophisticated bus buffering circuitry to isolate the hostile NuBus environment from critical components on the board, protecting your video investment, and your data.

Power Draw

Barrier: Power and heat. Your board draws its power through the NuBus. Apple specifies a maximum of 2.1 Amps per slot. Many boards require over 4.0 Amps. Amps mean heat, which is deleterious to your Macintosh, and a drain on the power supply.

Breakthrough: Through the extensive use of CMOS circuits, VLSI parts that replace multiple parts, low chip count, and 5 mil copper traces, the RasterOps ColorBoard 264 needs less than 1.0 Amp. Your system runs cooler. You can use other slots without fear of overloading your power supply.

RasterOps Literature Package

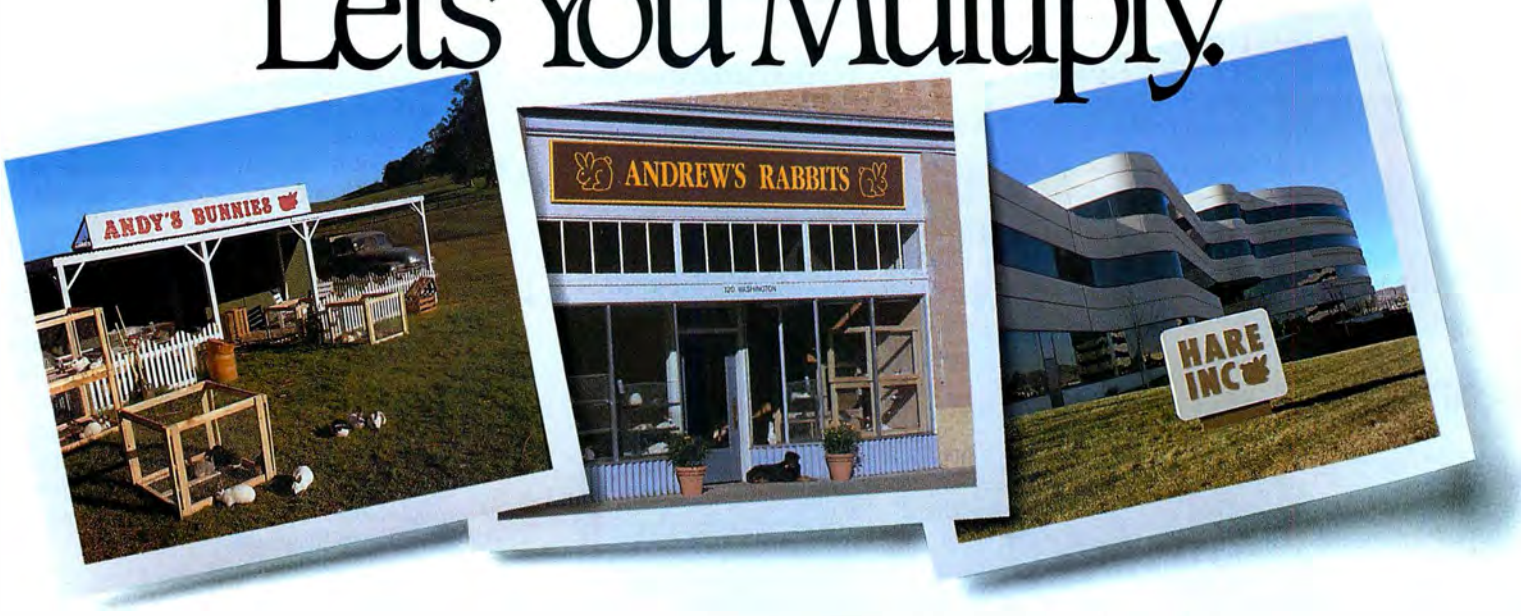
For your nearest dealer and literature on the most advanced Macintosh graphics products, call: **Information Hotline:** 1-800-952-6300. Dept.X24

RasterOps

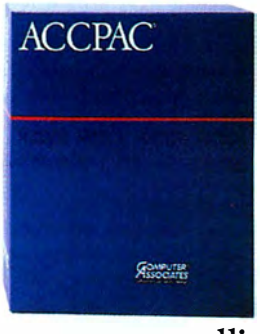
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Which is the most compelling reason to consider ACCPAC® Simply Accounting® for your Macintosh.

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It all adds up to the best all-in-one accounting software you can buy. And it's backed by the world's leading independent software company.

To find out more, call 1-800-531-5236. In Canada, call 1-800-663-6904.

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Circle 10 on reader service card

that can connect a Mac Plus, SE, SE/30, Mac II, IIx, or IIcx to each other or to IBM's PC and PS/2 series and compatibles. The new version transfers up to 750 kilobits per second between Macs. Slated to ship in November for $189.95, LapLink Mac III includes the cable, a 3½-inch Mac disk, and both a 3½-inch and a 5¼-inch disk for the IBM machines. For more information, call Traveling Software in Bothell, Washington, at 206/483-8088.

Adaptec demonstrated its Nodem LAN interface unit, which connects the Mac Portable to Ethernet networks through the SCSI port. The Nodem, intended for use in the office only, can also link a desktop Mac to Ethernet. It will retail at $545 for Thick Ethernet, $595 for Thin Ethernet, and $645 for Ethernet that runs over twisted-pair wires. For more information call Adaptec in Milpitas, California, at 408/945-8600.

MicroNet Technology will offer the Low-Power Micro-Pak, an internal one-third–height, 40MB hard disk for the Portable. The unit will use the same Conner drive that Apple is currently using and will have all the same power-saving features, according to MicroNet. Slated to ship in October, the drive will retail for $729. For more information, call MicroNet in Irvine, California, at 714/837-6033.

Iomega Corporation announced a Bernoulli Portable 44 for the Macintosh, a battery-powered version of the company's removable storage device. Slated to ship in December of 1989, the Portable 44 measures 10.5 inches by 10 inches by 2.75 inches and is rated to withstand 1000g of shock. It will retail for $2199 including carrying case, utility software, battery charger, and power-saver software. For more information, call Iomega in Roy, Utah, at 801/778-1000.

KMW Systems Corporation said that its TwinAxcess series of protocol converters will now allow the Mac Portable and other Macs to communicate locally or via modem to IBM midrange systems including the AS/400, System 34, System 36, and System 38. The protocol converters let the Macintosh emulate an IBM 5251 or 5291 terminal. File transfers are possible using KMW's TwinAxcess Link software on the Portable and equivalent file-transfer software on the IBM system. The one-port TwinAxcess Series III is available now for $1295. The TwinAxcess Series II, also shipping, ranges from $1695 for a two-port model to $3595 for a seven-port model. For more information, call KMW Systems in Austin, Texas, at 512/338-3000.



JOHN GREENLEIGH

Adaptec's Nodem LAN interface device and Traveling Software's LapLink Mac III are both intended to work with The Portable.

MicroTouch Systems introduced a touch tablet that replaces the Portable's trackball and a touch screen that fits over the Portable's LCD display. Currently shipping, the first version of the $235 UnMouse touch-sensitive tablet will sit beside the Portable. A version designed to fit in the space taken up by the Portable's trackball is scheduled to ship in January. The UnMouse and the Mac 'n Touch touch screen both offer 1000-by-1000-point resolution. The $695 touch screen lets you give mouse-click commands either by tapping on the screen or by lifting your finger off the surface. It is available now. For more information, call MicroTouch Systems in Wilmington, Massachusetts, at 508/694-9900.

CD Technology introduced its Porta-Drive, a CD ROM player for the Portable and for IBM-compatible computers. Based on a Toshiba drive, the Porta-Drive can operate from an optional battery pack. It retails for $895. For more information, call CD Technology in San Jose, California, at 408/432-8689.

Pinnacle Sales International showed its LXPi plus 2, a 2MB SRAM add-in module for the Portable. To achieve the 2MB capacity on one module, PSI used 1-megabit SRAM chips, which are currently in scarce supply. The 2MB modules have sockets for attaching more than one module at a time, allowing for configurations with 3MB, 5MB, or 7MB of SRAM. Now shipping, the LXPi plus 2 was expected at press time to retail for about $1500. For more information, call PSI in San Jose, California, at 408/559-8544.

Lind Electronic Design Corporation has announced two products for the Portable, a 12V DC power adapter that connects to a car's cigarette lighter, and a battery charger that works only with spare Mac Portable batteries. The 12V DC power adapter has a suggested retail price of $69.95, while the battery charger retails for $99.95. Both were slated to be shipping now. For more information, call Lind Electronic Design in Saint Louis Park, Minnesota, at 612/927-6303.

Apple peripherals currently shipping for the Mac Portable include the $449 Macintosh Portable Data Modem 2400, the $649 1MB Memory Expansion Kit, the $49 Rechargeable Battery, the $129 Battery Recharger, the $69 Numeric Keypad Module, the $499 SuperDrive Upgrade, and the $1199 Internal 40SC Hard Disk. Apple also said that in the future it intends to introduce its Portable Video Adapter, which will support

(continues)

Corporate Training Solution

How to Learn As *Much* As You Can, As *Fast* As You Can on the Macintosh Computer

An interview with Randall D. Smith, corporate CEO who has supervised the training of over 20,000 Macintosh users.

Q. *Are corporations wasting money buying Macs?*

Only if they spend thousands of dollars on computers and then don't spend any money on training. You can save *milliseconds* by upgrading your computer or *days* by upgrading the skills of the operator.

Q. *Why is Macintosh training so critical today?*

If you look at the Macintosh today and the Macintosh of two years ago there is no comparison. Then if you look at the size and features of leading programs such as Excel, Word, FileMaker, & PageMaker you'll hardly recognize them compared to a few years ago. The bottom line is that we now have more features, more speed, more capabilities,... which is great! But, we've also made training a necessity instead of a luxury.

Q. *How can an investment in training pay off in real dollars?*

Our company is a great example of training which dramatically contributes to our bottom line. Using industry standards, based on our volume, we should have 65 employees. We have 15. The only reason we can do so much business with so few people is that every employee is trained on the Mac. Each employee has a broad knowledge of Excel, Word, FileMaker, PageMaker, etc.

Q. *Realistically what training alternatives does a company have?*

Basically only three: You can leave the training to the individual , start your own in-house training, or hire an outside firm.

Q. *What are the pro's and con's of each option?*

1. There are some great training aids for the individual. There are video tapes, audio tapes, and step-by-step manuals. The problem is that many individuals lack the motivation to really commit to learning on their own.

2. An in-house training program is good except that many times you have the blind leading the blind. If a company relies totally on inside training, creativity suffers becauses ideas are inbred. Mistakes are perpetuated and new, innovative techniques aren't always introduced.

3. Outside training companies are great except they tend to be extremely expensive and very slow in their training techniques. A company with 3,000 Mac users will have a difficult time finding an outside training company that can fill their needs. A recent MACWEEK article suggested that classroom training is really the best alternative, yet at $500 per day too expensive.



Q. *So what's the solution?*

Up until 2 years ago I didn't think there was a good solution. I was running a company with five Mac's and couldn't find adequate training anywhere. That's why I started MacAcademy.

Q. *How was MacAcademy a solution?*

MacAcademy has become an excellent corporate training tool because of a unique combination of format and price. We first made MacAcademy a *workshop* format so that people could ask questions to a real live human being. We secondly offered the program in 65 cities so that large companies could be assured of the same quality for all of their employees.

The next step was to hire instructors that not only knew the programs but used them daily in business. Of over 200 applicants we choose only 5 to be MacAcademy instructors.

Our final step was to charge only $249 for an entire 2 day workshop featuring the Mac, Excel, FileMaker, PageMaker, Works, Word, and HyperCard.

Q. *So what has been the response?*

Over the past 18 months over 22,000 people have attended MacAcademy. Every Fortune 500 company but two has sent someone to MacAcademy.

On a scale of 1 to 5 they have given our program an average rating of 4.5 which is *excellent* on the rating form. Our biggest indication of satisfaction has been that companies will send one person the first time we come to town and twenty or thirty the next time MacAcademy is in their area. In fact many companies like General Electric, NASA, Mobil Oil and Motorola have hired our instructors to do on-site training. The bottom line is that MacAcademy has provided a real jumpstart to thousands of Mac users at a very reasonable price.

Q. *Has the success of your program attracted any competitors?*

I don't mind competition...fair competition that is. But sad to say, over the past few months a few companies have tried to trick companies into sending people to a MacAcademy look-a-like program. They copied our format, our price, our schedule, our locations, and even did a duplicate of our brochure. If you don't look real close you will think that you're signing up for MacAcademy when it's really a cheap imitation. We've had irate calls from people who got burned going to a workshop that looked just like us but wasn't.

Q. *How does a company get information on the original MacAcademy?*

For a complete schedule call 904-677-1918, FAX 6717 or write: MacAcademy 477 S. Nova Rd. Ormond Beach, FL 32174.

MacAcademy™

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Circle 406 on reader service card

8-bit gray-scale and color displays.

And for the IIci

For the Macintosh IIci and the IIcx, CMS Enhancements announced a 200MB 3½-inch internal hard disk. Scheduled to ship at the beginning of October 1989, the unit has a suggested retail price of $2595. For more information, call CMS in Tustin, California, at 714/259-9555.

DayStar Digital has begun shipping the first cache RAM board designed for the Cache Connector in the IIci. The DayStar Fast Cache IIci Board retails for $995. For more information, call DayStar Digital in Flowery Branch, Georgia, at 404/967-2077.—*T.M.*

The Future of Music

When the opera *VALIS* premiered at the Massachusetts Institute of Technology's Cube performance hall, the Mac II was a star even though it didn't take a bow. *VALIS,* based on a science fiction book of the same name by Philip K. Dick (VALIS stands for vast active living intelligence system), was composed by MIT professor Tod Machover. Machover developed a futuristic sound—a quality reflected in the production's haunting set, which resembles a giant circuit board and piles of monitors forming towers and cliffs.

To "use computers as live performance instruments," Machover said, he came up with something he calls hyperinstruments. A hyperinstrument uses MIDI to link a computer to an instrument being played by a person,



Science fiction becomes art: *VALIS* actress Anne Azema's face is haunting as it appears on a stack of computer monitors.

and then the computer alters the music in ways such as delaying notes a few microseconds or sensing the tempo of the rest of the orchestra and changing the hyperinstrument's sound to match in real time. In *VALIS,* a Mac II controlled a grand piano hyperinstrument.

According to Joe Chung, an MIT graduate student and the programmer who wrote the software to drive the hyperpiano, "The bottom line was balancing function with speed. Allegro LISP is not a super-fast language, but it is flexible." Chung said that whenever he had to redesign a hyperinstrument, LISP made it easy to rewrite its software. Machover and Chung also used minicomputers to create some unique musical effects. For example, at one point the vowel sounds of the word *VALIS* are played as eerie musical notes until they gradually become recognizable.

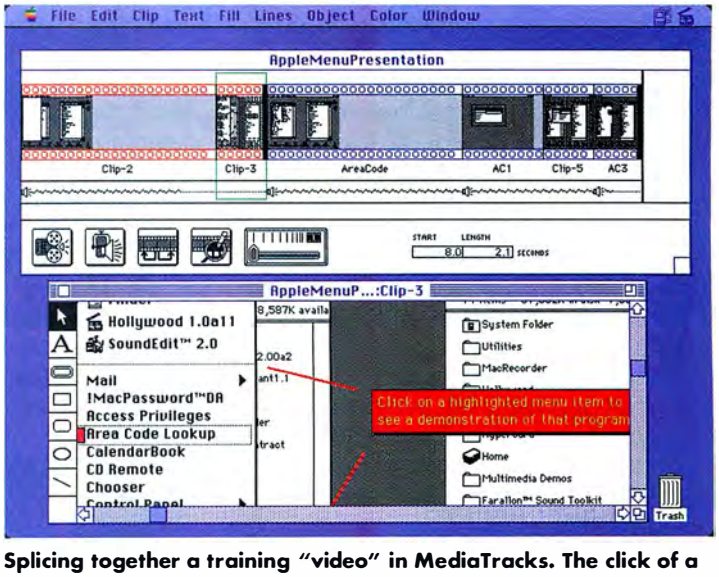
Machover thinks that computers like the Mac II will make it possible for people working on home systems to create special effects like the ones he developed for the professional performance of *VALIS.* "Imagine: Instead of buying a record of a Beethoven symphony, you buy a disk, and you become a conductor. You could bring up the horns. You could hush the strings." Until then, the rest of us will depend on programming wizards like Machover and Chung to expand our musical horizons.

The *VALIS* opera is available on CD or cassette for $19.95 from Bridge Records in Great Neck, New York, at 516/487-1662.
—*Neil Shapiro*

Lights, Camera, MediaTracks

For people who want to do multimedia without megabuck multihardware, Farallon is almost ready to ship MediaTracks, a vast enhancement to ScreenRecorder. The original ScreenRecorder's ability to record and play back events on the Macintosh screen was practical for knocking out self-running demos and simple tutorials, but its lack of editing tools frustrated many would-be Bergmans. MediaTracks is a complete time-domain editing system; it allows you to record "tapes" of what passes across the Mac's screen, cut them into "clips," and modify them in many ways.

After separating your clips, you can rearrange them and synchronize sounds to them. You can also import and superimpose color graphics (MediaTracks only records in black and white, even from a color screen) or *(continues)*



Splicing together a training "video" in MediaTracks. The click of a button can initiate display of a series of Mac screens.

For All Those Who Think That Programming One Of These,



Requires One Of These...



8-bit gray-scale and color displays.

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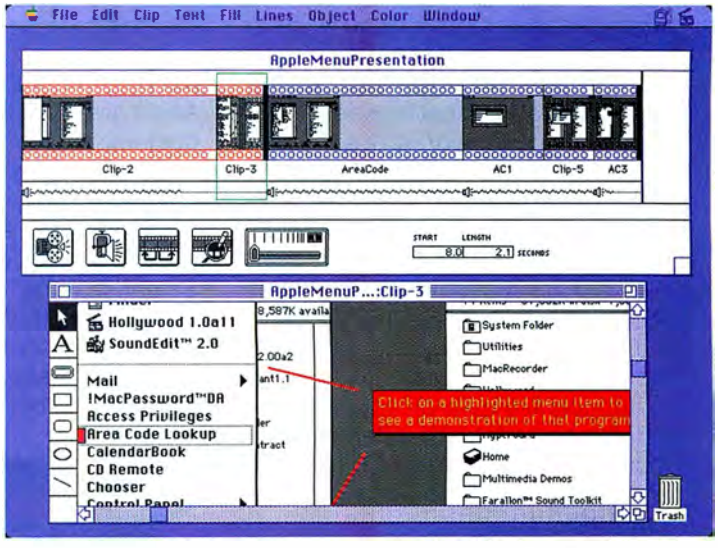
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(continues)



Splicing together a training "video" in MediaTracks. The click of a button can initiate display of a series of Mac screens.

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Circle 196 on reader service card

use MediaTracks' MacDraw-like graphics tools to draw or write on top of a clip. You can also "sew" buttons on to perform many useful tasks. For example, you can add a button that lets you insert a pause or jump to another clip. You might even use buttons to build interactive tutorials or demos, in which clicking on one of these buttons takes the user to a more detailed description of something. You can also call MediaTracks tapes from HyperCard, and Farallon plans to make MediaTracks compatible with MacroMind Director, SuperCard, 4th Dimension, Omnis 5, and many other applications that can launch other applications.

What's missing? Demanding users will clamor for MIDI, real video, and frame-grabber support; color tapes; and the kinds of special effects common in video postproduction. Farallon is already considering adding most (though not all) of these capabilities.

MediaTracks should be available sometime in the first quarter of 1990. At press time, pricing was set for less than $300, and Farallon planned to provide an inexpensive upgrade path for ScreenRecorder owners; MediaTracks will also be available bundled with MacRecorder (a hardware/software combination for recording and editing sounds) and sold as Multimedia MediaTracks; pricing for the set had not been decided at press time. Utilities for playing tapes directly or from inside HyperCard can be distributed royalty free. For more information contact Farallon in Berkeley, California, at 415/849-2331.—*D.L.*

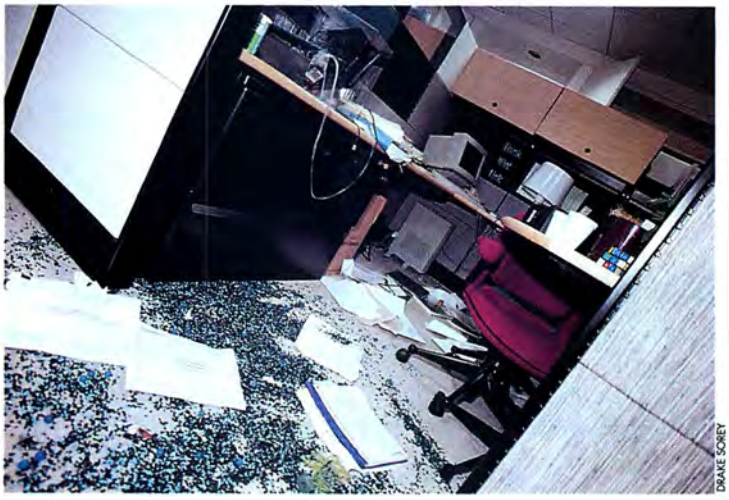
Apple Bobs Back after Great Quake

In the aftermath of the devastating earthquake centered only a few miles from its headquarters in Cupertino, California, Apple moved quickly to resume its normal operations. The company shut down all of its 50 Bay Area buildings the day after the quake to allow engineers to inspect for structural damage. By the third day Apple had reopened about 80 percent of the closed facilities and expected all but one building to be in full operation at the one-week mark. That building, De Anza III, suffered water damage and structural problems and will be remodeled earlier and more extensively than was already planned.

Apple's Fremont manufacturing plant, perhaps the most crucial of its Bay Area operations, was back in operation only two days after the quake. By the same time its distribution sites and shipping department were both functioning as usual. The company temporarily shifted technical-support functions to support centers in other parts of the country. There was no loss of information on Apple's file servers, and its minicomputers, mainframes, and two Cray supercomputers suffered no damage.

Several Apple representatives credited the company's rapid recovery to its emergency planning and to a good communications network, made up of employees who exchanged information from their homes via phone, online bulletin boards, and electronic mail. A general broadcast message on the company's voice-mail system gave the employees a number to call for information on the condition of the buildings.

On Friday, three days after the quake, a tour of several Apple buildings in Cupertino revealed mostly cosmetic damage, although a number of windows and glass doors had popped out of their frames during the temblor. The floors of most cubicles were covered with scattered books and papers, with the odd monitor or aquarium fallen here and there. The only confirmed Apple casualty of the quake, an employee who suffered a broken leg, was in good condition. Morale was high as employees at one group of buildings attended a picnic breakfast set up under a tent in a nearby parking lot. Inside, as employees in the closed cafeteria began their cleanup, the jukebox played "Rock Steady."—*T.M.*



After the Great Quake of '89, many workers at Apple faced cubicle cleanups of their own.



Apple's De Anza III building will require extensive repairs.

Automating Connectivity

Third Wave Systems is using a version of CL/1, the language under development at Apple for letting Macs access data in SQL databases, to show how applications based on standard Mac software can grow into Mac-to-mainframe solutions. Third Wave's Automated Publishing System (APS) Report Generator uses Fairfield Software's CL/1-based Clear Access for Full Impact to create an interface between mainframe databases and Ashton-Tate's graphical spreadsheet, Full Impact.

For many years the state of Maine has produced an annual report comparing performance and expendi-

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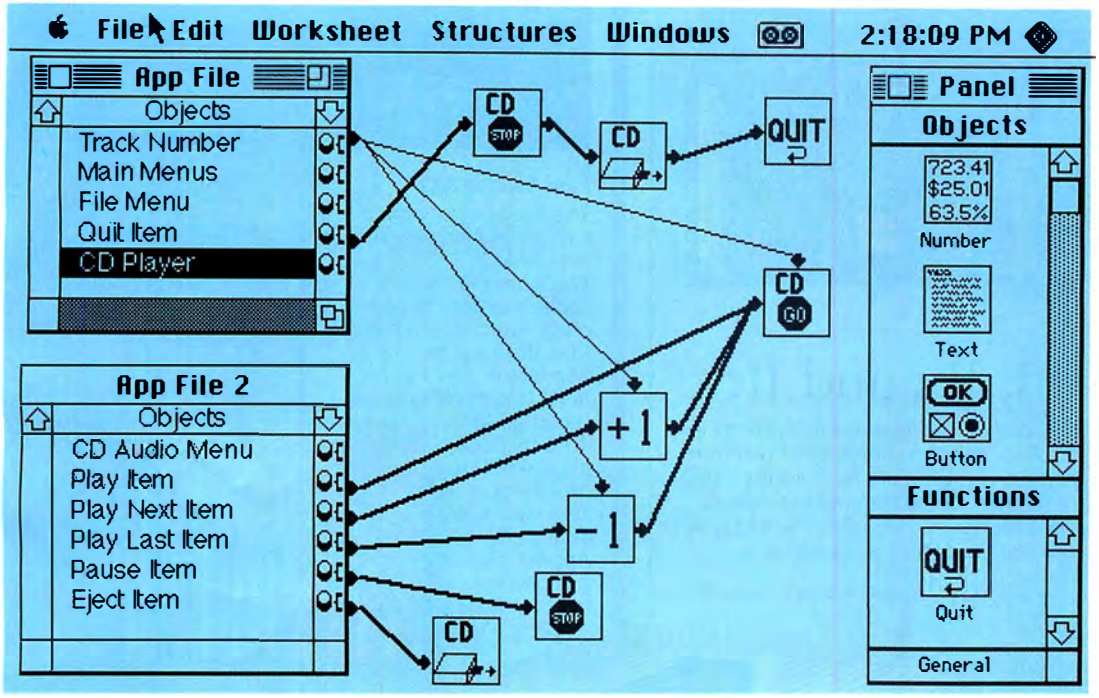
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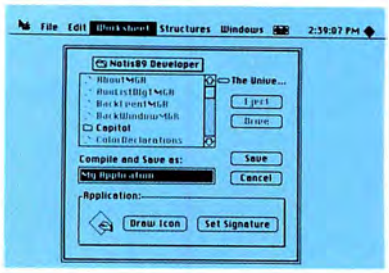


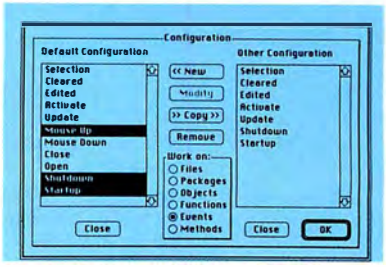
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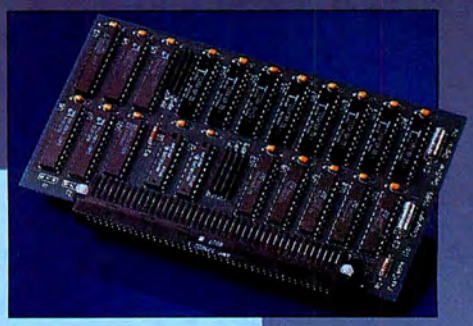
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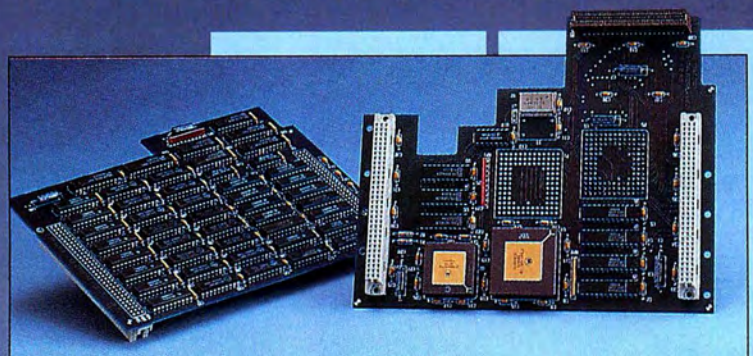
Circle 423 on reader service card

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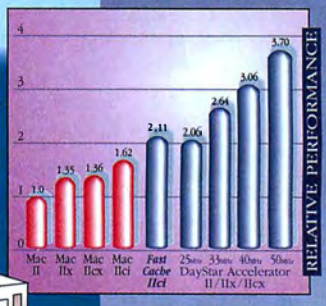
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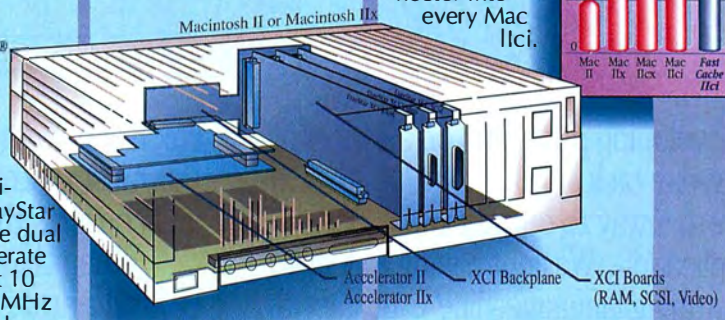
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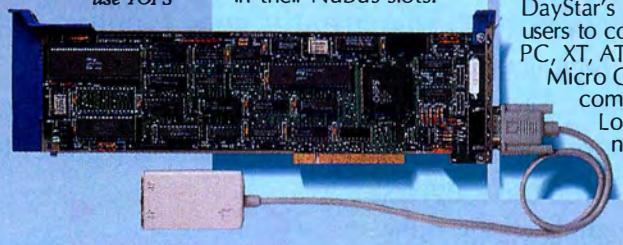
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Dealers circle 404 on reader service card

End users circle 477 on reader service card


BRIAN PETERSON

Maine Governor John McKernen and Third Wave's Greg Melick look over a volume of reports that graphically describe Maine's education budget. Third Wave Systems developed macros to automate generating the reports in Full Impact from data on a Unisys mainframe.

tures for each school district with state averages. Last year Third Wave took on this job, devising a system to download ASCII data from the state's Unisys b900 mainframe into Full Impact spreadsheets. Full Impact macros then created graphs, automatically produced customized text blocks, and took care of other page-layout details. Including data collection, this first draft of Third Wave's publishing system produced 14-page reports for 283 school districts in 8 working days, compared to estimates of 18 to 25 weeks from other vendors bidding for the job who planned to use standard desktop publishing tools. The report's graphics format communicated information so much more effectively than the tables of statistics in earlier reports that it not only assisted local school boards in making budget decisions but also—by being widely reprinted in local newspapers—influenced Maine voters.

The national attention this project shone on Third Wave forced it to make some strategic decisions. First, the company expanded efforts to produce its APS Report Generator, a general-purpose report generator. Second, the firm decided to use the Fairfield Software product because it can handle low-level communications protocols, avoiding the need to construct a different communications interface for every type of mainframe and minicomputer. The APS system can now take data from any mainframe or mini SQL database, move it into Full Impact, and construct graphics-based reports from fields selected by users through a simple arrangement of buttons and menus.

The APS Report Generator is one of the first completed applications using CL/1 to give the Mac a window on organization-wide data stored on larger computers. For details on APS and its applications, contact Third Wave Systems in Brunswick, Maine, at 207/725-6188, or Ashton-Tate at 800/437-4329, ext. 3601. For details on Clear Access contact Fairfield Software in Fairfield, Iowa, at 515/472-7077.

—Charles Seiter

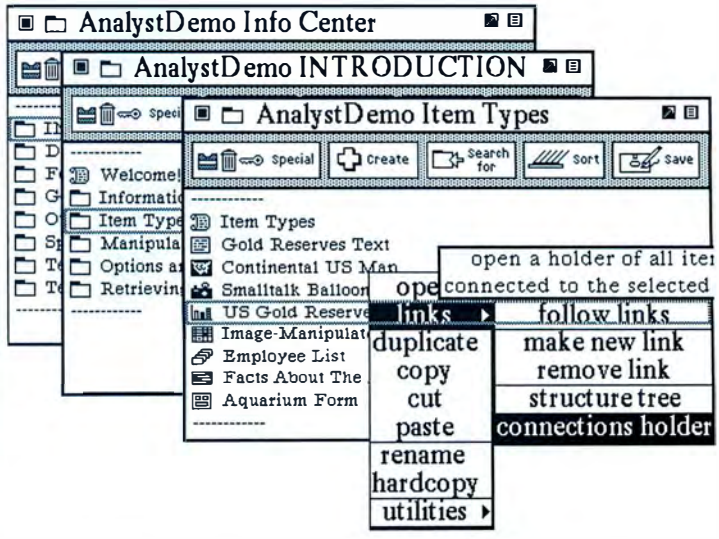
Data Analysis, Xerox Style

The graphic-oriented minds at Xerox have not been idle since the 1970s, when Xerox research laid the foundation for what evolved into the Mac. The Analyst, which Xerox refers to as an "integrated hypermedia system," provides a desktoplike Information Center, a coherent home where people who analyze information can access tools and link and keep track of related information in almost any format. An enhanced version of The Analyst and a second-generation product called HyperFormance are now in development.

The Analyst provides a spreadsheet, a database, page-layout capabilities, forms design, mapping, image processing, graphics, outlining, word processing, and text searching, all of which can share data in some unusual ways—for instance, scanned images can be dumped into spreadsheet cells and manipulated with functions—because data and applications alike are objects in Smalltalk 80, the object-oriented programming environment underlying The Analyst.

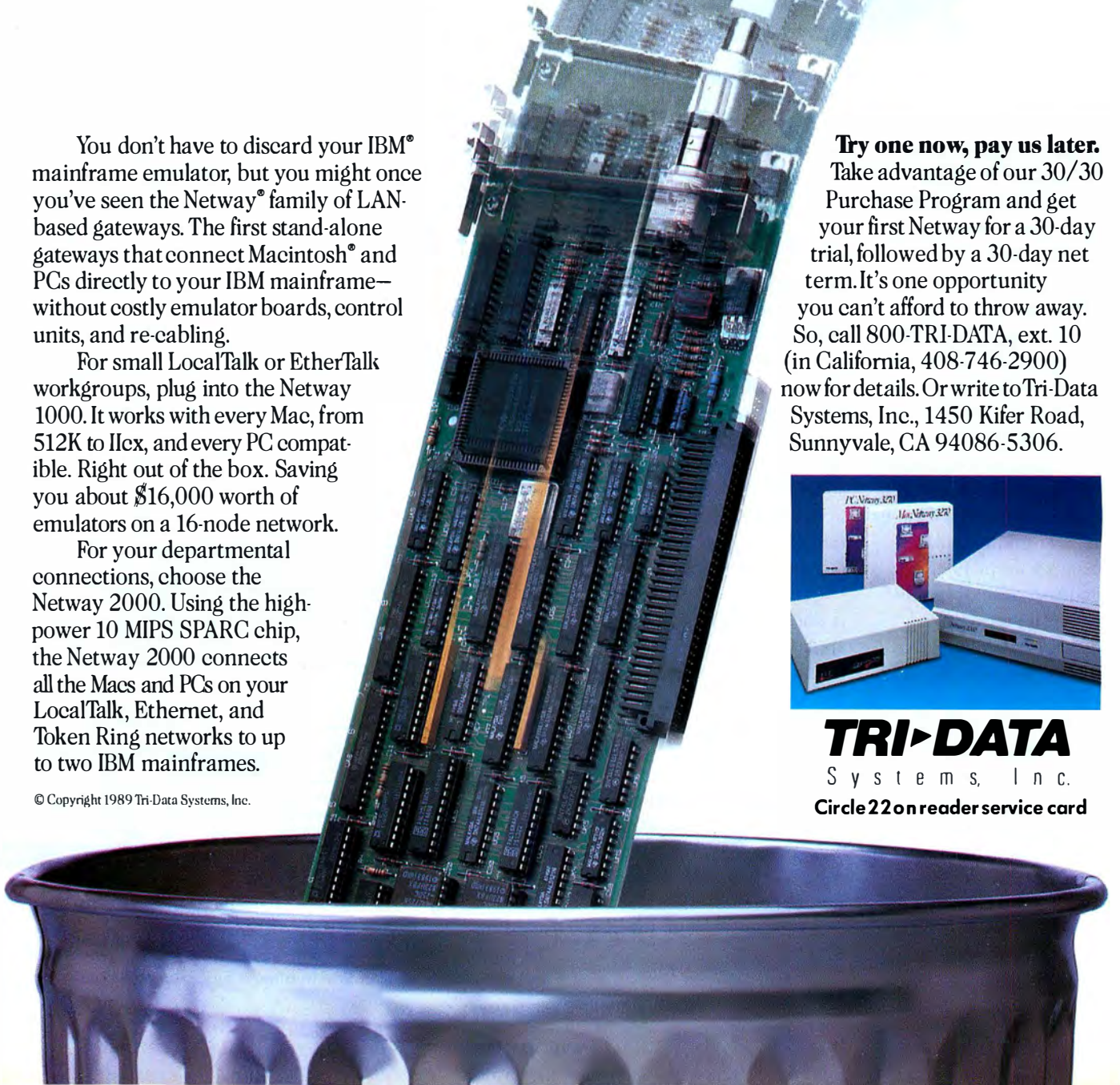
Version 4.0 of The Analyst (loosely scheduled for early 1990) will add many multiuser capabilities, such as letting users share Information Centers across a network, SQL support for transparent access to widely distributed databases, record locking and password protection, and electronic mail. The Analyst will be able to launch non-Smalltalk applications and use their files; and color support may also make its way into the product. Also scheduled for 1990 is HyperFormance, an Analyst-like product that will run under the less expensive (and less power-hungry) Smalltalk/V. HyperFormance will start out as a bare-bones Information Center and a forms-design module and add other modules later. (Bear in mind that forms in Smalltalk have little in common with graphic design: a form is a user-definable window, a data receptacle

(continues)



The Analyst, from Xerox, is designed for tracking, manipulating, and connecting information in almost any kind of format.

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You don't have to discard your IBM® mainframe emulator, but you might once you've seen the Netway® family of LAN-based gateways. The first stand-alone gateways that connect Macintosh® and PCs directly to your IBM mainframe—without costly emulator boards, control units, and re-cabling.

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Take advantage of our 30/30 Purchase Program and get your first Netway for a 30-day trial, followed by a 30-day net term. It's one opportunity you can't afford to throw away. So, call 800-TRI-DATA, ext. 10 (in California, 408-746-2900) now for details. Or write to Tri-Data Systems, Inc., 1450 Kifer Road, Sunnyvale, CA 94086-5306.

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Systems, Inc.

Circle 22 on reader service card



Texas Instruments' basic microLaser printer lets users upgrade to PostScript, up to 35 fonts, and as much as 4.5MB of RAM.

that can contain any Smalltalk object, whether an outline, an image, a set of Information Center links, or even an entire database.)

The Analyst requires at least a Mac II and a large monitor. The program runs under MultiFinder but demands 5MB of memory for itself; it also fills 11MB of disk space (not counting Smalltalk 80). The Analyst lists for $1425 and requires a copy of Smalltalk 80 ($775). Two add-on packages are available as well: Humble, an environment for developing rules-based expert systems ($515), and The Assistant, an intelligent information-retrieval system ($645).—*D.L.*

TI Printer Can Upgrade to PostScript

The microLaser, a low-end laser printer from Texas Instruments, lets users upgrade to PostScript, AppleTalk, and more memory. The microLaser uses a new Sharp print engine with a rated speed of 6 pages per minute at 300-by-300-dpi resolution. The basic model has a suggested list price of $1999, comes with 512K of RAM, and is compatible with Hewlett-Packard's LaserJet Series II printers.

TI will also offer the microLaser PS113, which adds Adobe PostScript, 13 PostScript fonts, and another 1MB of RAM. A third version, the microLaser PS35, includes PostScript, 35 PostScript typefaces, and 1.5MB of RAM. It lists for $3499. Buyers of the basic microLaser can upgrade to the PS113 with a $499 add-in board, or to the PS35 for $995. RAM on any of the microLasers can be expanded up to 4.5MB at a suggested retail price of $495 per MB.

The printer weighs 33.5 pounds and measures only 14.2 inches deep by 13.4 inches wide by 10.5 inches high. The microLaser also offers two font cartridge slots, a 250-sheet paper input tray, and front-panel control. The front-panel control includes the capability to store up to four preset configurations for quick setup of frequent jobs.

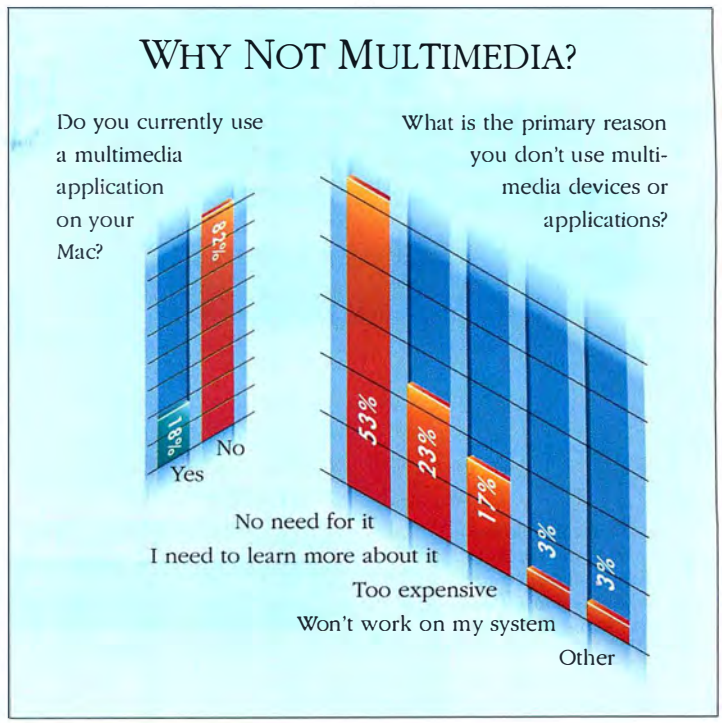
The microLasers all include a Centronics-compatible parallel interface. TI will also provide optional RS232, RS422, and AppleTalk interfaces. Prices for the interfaces had not been set at press time. The company expected to begin shipping the microLaser models late in the fourth quarter of 1989. For more information, call Texas Instruments in Austin, Texas, at 800/527-3500.—*T.M.*

Survey: Multimedia

Our survey this month deals with multimedia—how many use it, how many don't, and why. Despite all the deserved attention multimedia is getting, only 18 percent of responding readers said they use one or more multimedia applications on their Mac.

Among those who do run a multimedia application, 78 percent said they use it for presentations, 47 percent said they use it for education, 42 percent said they run multimedia databases, 38 percent reported putting their documentation in multimedia, and 36 percent said they use multimedia techniques for training. Ninety-one percent of current multimedia users said they set up their own application, 5 percent said an outside consultant or developer set it up, and 5 percent said an in-house expert developed it (results add up to more than 100 percent due to rounding).

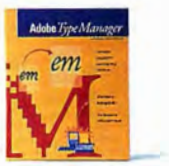
Among responding subscribers who don't use multimedia, 53 percent said they had no current need for it, 23 percent said they needed to learn more about it, 17 percent said it's too expensive, and 3 percent said their current system is insufficient for the task.—*T.M.*



Eighty-two percent of responding readers do not currently use any multimedia application.

Easier Done.

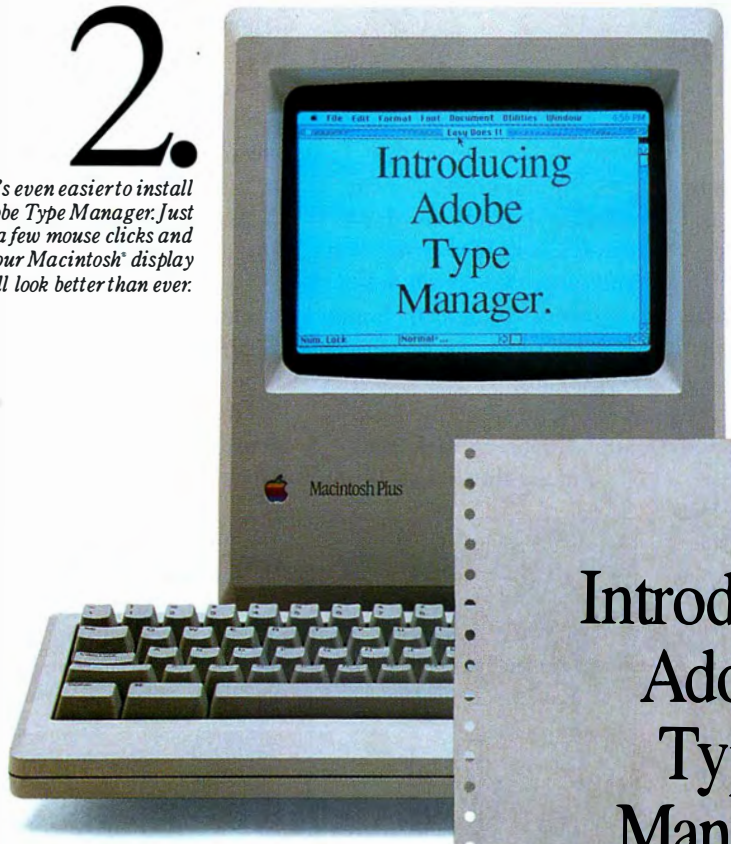
1.



It's easy to get your hands on Adobe Type Manager™ at your nearest Adobe Authorized Dealer. And at $99, it's hard to pass up.

2.

It's even easier to install Adobe Type Manager. Just a few mouse clicks and your Macintosh® display will look better than ever.



3.

But the easiest part of all is seeing how Adobe Type Manager improves your ImageWriter® text. Just command it to print and watch what happens.



These unretouched photographs make it easy to see what a difference Adobe Type Manager makes.

Than Said.

IF YOU HAVEN'T read the page on the left, please do.

We'll wait.

Welcome back. You now know everything you need to know to use Adobe Type Manager.

But if you still need to know more, allow us to elaborate; although it's not going to be as easy as one, two, three.

Because to understand how and why Adobe Type Manager was created, you'll have to understand what came before it.

Prior to 1984, most people thought of computers as excessively complicated, overly technical and, in most cases, far too intimidating.

But that all changed with the computer called Macintosh.

The introduction of the Macintosh was followed a year later by the arrival of the LaserWriter,® the first laser printer to rely on a completely new "page description language." The PostScript® language from Adobe Systems.



Adobe Type Manager puts Adobe's industry-standard PostScript language technology right on your display—where it's easy to see there really is no comparison.

Suddenly, the desktop publishing revolution was born.

Simply stated, PostScript stores descriptions of font characters as smooth outlines comprised of mathematical formulas, rather than the more typical bitmaps. So, no matter how jagged the type might look on a Macintosh screen, it comes out crisp and clean on a PostScript-equipped laser printer.

To say this new technology changed the face of computing would be a monumental understatement. Yet, the initial excitement about desktop publishing has now given way to higher expectations from Macintosh users everywhere.

Users just like you.

No longer is it simply enough to generate different type styles and sizes on your Macintosh display and printed pages.

You now want the text on your displays to be clear, smooth and legible. You want what you see on your display to correspond as closely as possible to what the printed page will look like. And, most importantly, you want to be able to print high-quality text on your low-cost printers.

Adobe Type Manager satisfies all those demands.

When added to your system software (System 6.0 or later), it builds individual characters at any size from PostScript outline fonts—



(Far Left) *Currently, the majority of personal computers, including Macintosh, store text characters as a pattern of dots (known as a bitmap).* (Middle Left) *But outline fonts—which were pioneered by Adobe—store the shapes of each character as easily-modified mathematical formulas.*

(Middle Right) *Scaling a bitmapped font is a less precise process, making the character less accurate and more difficult to read.* (Far Right) *When an outline font is used, the computer scales the outline to the precise size and shape, and fills it with dots. This results in a smoother, more accurate character.*



Before Adobe Type Manager, if you had a low-cost printer, you had to settle for low-quality output. But now this is just a page from the past.

the same fonts used by PostScript printers.

Adobe Type Manager is actually based on the PostScript language's capability to create and scale fonts to different sizes. So it's very fast and very compact.

And, at just $99, it's very affordable. In fact, at that price, Adobe Type Manager probably offers more value than any other Macintosh software.

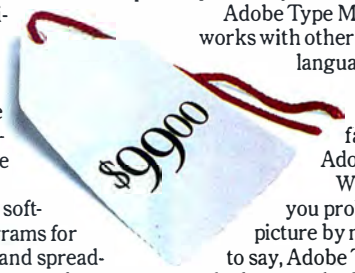
It's also very easy to install and operate.

You see, Adobe Type Manager is completely transparent to both you and your software applications.

So all you'll see is a better image.

Once it's installed in your System Folder, Adobe Type Manager intercepts QuickDraw™ font requests and generates the screen bitmaps (at the requested size) from a PostScript outline font. So, whether your text is regular, bold or italic, it looks smooth and readable from the largest point sizes to the smallest.

Then, when you print to your Apple ImageWriter or Hewlett-Packard DeskWriter, Adobe Type Manager automatically generates the requested printer font bitmap to produce beautiful, letter-quality text from any application.



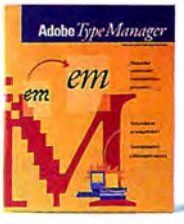
That's because Adobe Type Manager is compatible with virtually all major Macintosh software—from programs for word processing and spreadsheets to page layout and presentations.

Which means it won't change the way you work.

Just the way you look.

And every Macintosh user can look better, because Adobe Type Manager requires just one megabyte of memory. That way, every Macintosh from a Plus to a IIcx can take advantage of its unique outline font technology.

Speaking of fonts, every copy of Adobe Type Manager includes high-quality outline versions of the 13 most popular fonts. They'll enable you to produce the kind of high-quality text from your ImageWriter or DeskWriter you thought only came out of a laser printer.



If you want to add more fonts, you can pick up the ATM™ Plus Pack, giving you the 22 additional outline fonts from Apple's LaserWriter IINT and IINTX laser printers.

Times*
Roman, *Italic*, **Bold** & ***Bold Italic***

Helvetica*
Regular, *Oblique*, **Bold** & ***Bold Oblique***

Courier
Medium, *Oblique*, **Bold** & ***Bold Oblique***

Symbol
ΑΒΧΔΕΦΓΗΙϑΚΛΜ ΝΟΠΘΡΣΤΥςΩΞΨΖ

Adobe Type Manager includes high-quality outline versions of these 13 most popular Macintosh fonts. You can also add any PostScript outline fonts, including those from the Adobe Type Library.

And, ATM Plus Pack is specially-priced at just $198.

Adobe Type Manager also works with other Adobe PostScript language fonts, including the more than 500 typefaces from the Adobe® Type Library.

We could go on, but you probably have the picture by now. Suffice it to say, Adobe Type Manager is a lot better to look at than it is to read about.

Because, quite frankly, words don't do it justice.

So call us at 1-800-344-8335 (outside the U.S.A. and Canada, call your local distributor) for the name of your nearest Adobe Authorized Dealer.

When it comes to improving your image, it doesn't get any easier than this.

ADOBE®
Adobe Systems Incorporated

Look for this symbol on computers, printers and other products that include PostScript software from Adobe Systems. It's your guarantee of quality and compatibility.

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When you need

Now that Adobe Type Manager software has cleaned up your text, give it a change of face with new TypeAlign.

Because while ATM™ gives you great-looking text, TypeAlign allows you to print any number of different ways—up and down, at any angle, even along arcs and complex curves. And you can do it using inexpensive printers like Apple® ImageWriters® and HP DeskWriters® and PaintJets®. So now you don't need a laser printer to get professional-looking results.

You don't need to be a professional designer to use TypeAlign, either. Since it's a desk accessory, you install TypeAlign once in your Macintosh® computer, and then use it in just about any application. You'll find it incredibly easy to create even complicated-looking effects—no special drawing programs or skills needed. So go ahead, put a new face on your reports, slide presentations, charts, whatever.

How does TypeAlign work? First, use a tool to draw an arc, straight line or freehand curve. The freehand

Introducing TypeAlign™—a new desk accessory exclusively

TypeAlign is a trademark and Emerald City Software is a registered trademark of Emerald City Software. Adobe and PostScript are registered trademarks and Adobe Type Manager and ATM are trademarks of Adobe Systems Incorporated.

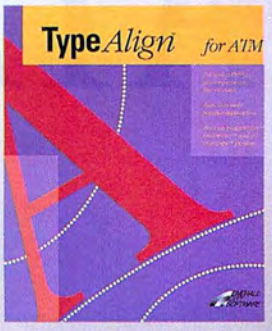


a change of face.

tool is especially handy for wrapping type around any object or shape. Then, type a word or phrase—it appears automatically on the line you just drew. You can even adjust the spacing between the letters and words until it's just the way you like it. Will a shadow or outline look even better? Give it a try—you'll see the effect instantly on screen.

When you're satisfied, paste your creation into a document, then print it out on any ATM-supported printer or other device, including ImageWriters, LaserWriters® and DeskWriters. Of course, TypeAlign works with any Adobe® PostScript® font, too.

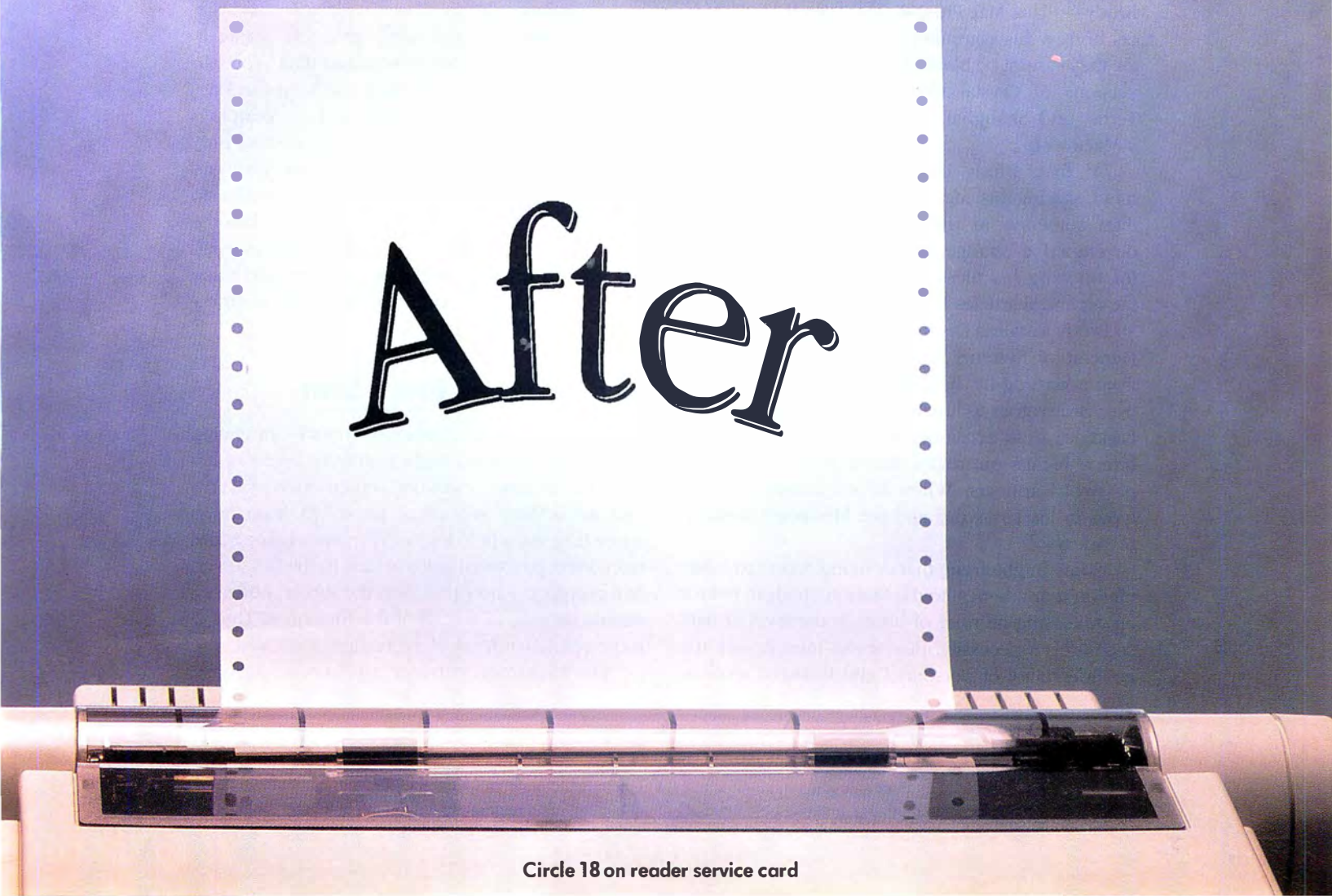
Let's face it. If you have ATM, you need new TypeAlign. Especially with a suggested retail price of only $99.95. To find out where you can buy it, call Emerald City Software at 1-800-223-0417, in CA 415-324-8080.



for Adobe Type Manager™ owners.

EMERALD CITY SOFTWARE

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Circle 18 on reader service card

special report

DATA SAFETY

BY CHERYL ENGLAND SPENCER

David Brody, a marketing engineer at Western Digital, has one of the few Macintosh IIs in a largely IBM company. Think about what that means for Brody—all the Mac Plus, SE, and even IBM PC owners borrow his computer on a regular basis. After all, they cannot be blamed for wanting to play color versions of Crystal Quest, Tetris, and Shanghai on a Macintosh.

At first, Brody didn't mind sharing his Mac. But then someone in the office developed a strange penchant for opening his files and editing the technical articles he had written. So Brody installed DiskLock from Fifth Generation Systems to prevent people from accessing his hard disk. Now whenever Brody goes to lunch, he pulls down the DiskLock desk accessory to lock his disk; the screen blanks out and a dialog box requesting a password appears. When Brody comes back he types in his password and the Macintosh desktop reappears.

Some might argue that denying access to information is antithetical to the Macintosh ideal, but for an increasing number of users, some level of data security is a necessity. Businesses must ensure the confidentiality of personnel and financial records. Networks must be protected against prying eyes and viral threats. And as Brody's case illustrates, a large number of people just haven't learned computer etiquette.

Fortunately, a great many products are available for protecting your system and data. You can physically lock up the Macintosh and its peripherals, you can protect only crucial files, or you can control who has access to your hard disk. I'll explain the various types of protection available, their pros and cons, and make some recommendations for a variety of situations.

DON'T let your confidential data fall into the wrong hands.

Levels of Safety

Any good security scheme works by providing a hierarchy of increasingly restrictive levels of access. For instance, network servers such as TOPS and AppleShare request a password from users when they attempt to log on. Anyone who provides the correct password gains access to the file server. Not everyone who can access the server, however, should be able to see all of the files on it. Thus, a more restrictive level of protection is needed.

The interaction between a relational database,

JOHN HERSEY



such as 4th Dimension or Double Helix II, and a network provides a good example of how levels of access might be restricted. A database allows you to lock your records in such a way that only specified users can access the information. This feature is only active, however, when the database application is running—a sophisticated snoop can use a file editor such as Fedit to browse through the database file without opening the application.

A network-resident database, on the other hand, takes on the network software's security features—thus, even when the application is not running, it is protected. Under AppleShare, for example, a database administrator can give each user read or write privileges for each file or folder. More sophisticated servers, such as Dayna Communications' Novell implementation, give the administrator even more flexibility. Using a Novell server, for instance, the administrator can protect specific parts of a file (say, a certain field in database records) or assign write-only privileges to data-entry clerks who must be able to enter data, but who should not be able to change data.

MAKING A PASSWORD EFFECTIVE

1. Make your password at least eight characters long. The fewer characters a password contains, the easier it is to guess.
2. Don't use an obvious set of characters—such as your name, birthdate, or the name of the program—as a password. An obscure quote or phrase is better.
3. Use at least one space, nonalphabetic character, or capital letter if the program lets you.
4. Don't tell anyone your password. Don't write it down. If you must violate these rules, lock the piece of paper up in a file drawer and keep the number of people you've told to a minimum.
5. Change your password often.
6. Don't embed your password in a script or a macro. Caution: Automatic log-on sequences recorded as macros often leave the password you type in readable form, sometimes with quotation marks around it, making it even more obvious.

Encryption

Many people, however, are more concerned about keeping the data on their hard disk secure than they are about protecting their portion of data on a corporate, networked database. Fortunately, for these folks, lots of programs are available for individual users. These programs tend to be less expensive and easier to use than the network security solutions.

To protect the files on an unguarded hard disk, many security programs provide an encryption feature that transposes information so that it can't be read. Only someone who knows the proper password can decrypt the information. Otherwise, encrypted files and folders can be treated like any other files; they can be moved, duplicated, backed up, or sent over a modem.

One of the most secure encryption schemes is the Data Encryption Standard (DES), a scheme certified by the National Bureau of Standards in 1978 and again in 1988. The difficulty in breaking an encryption scheme depends on the number of possible passwords. DES offers a maximum of 72 quadrillion possible passwords. If you were to write a program that allowed your Mac II to cycle through the DES passwords, it would take thousands of years to try every password combination. To decrypt files efficiently, you would need to build a special computer with one million specialized chips, each one testing one million passwords per second. After ten hours you would have a 50 percent chance of finding the correct password. And you would have spent close to $20 million.

You don't have to use DES, however, to secure data. Many programs offer proprietary encryption schemes that only a highly trained cryptologist could break.



FRED STIMSON

Tight Security and a Great Warranty
FMJ's Mac II FSS secures the Macintosh CPU, prevents access to the keyboard, and attaches the whole bundle to a desk. And FMJ is serious about the three-year warranty—if a protected Mac is stolen, the company will cover it, up to $5000 per machine.

Problems with Encryption

For all of the security it provides, encryption also has many problems. Several times while writing this article, I heard stories of files irreparably damaged by encryption programs. No single program was to blame; instead, encryption keys sometimes just "go bad."

If you encrypt files, you are well-advised to keep a backup copy of the original, unencrypted data (safely locked away, of course). Not only can keys go bad, but if you forget the password for the only copy of an encrypted file, you can never recover that information. Some programs encrypt the original file and others encrypt a copy; the best programs give you a choice (see "Access-Control Programs" and "Encryption Products").

The programs also offer a wide range of other easy-to-use features. Some programs, such as Sentinel, MacSafe, and Camouflage, let you create groups of files and folders (and subfolders) to encrypt. This feature not only cuts down the number of passwords you have to remember (one for each group, instead of one for each file), but it also provides an easier way to

ACCESS-CONTROL PROGRAMS

	BulletProof	DiskLock	Empower	FileGuard Extended Edition	Ft.Knox	MacLock	MacSafe	NightWotch	QuickLock
Company	Spectra Micro Development	Fifth Generation Systems	Magna	ASD Software	Transfinite Systems	Verge Technologies	Kent Marsh	Kent Marsh	Kent Marsh
Cost	$99.95	$189	$395	$249	$195	$75	$149.95	$149.95	$99.95
Encryption Features									
Compression		n/a				n/a		n/a	n/a
DES		n/a			•	n/a	•	n/a	n/a
Proprietary encryption methods		n/a	•	•	•	n/a	•	n/a	n/a
Encrypts subfolders		n/a	optional			n/a	•	n/a	n/a
Encrypts files		n/a	•	•	•	n/a	•	n/a	n/a
Encrypts folders		n/a	•	•		n/a	•	n/a	n/a
Encrypts applications		n/a	•	•	•	n/a	[1]	n/a	n/a
Overwrites source file		n/a		•	•	n/a	optional	n/a	n/a
Supports groups of files		n/a	•			n/a	•	n/a	n/a
Can open one member of group		n/a	•	n/a	n/a	n/a	•	n/a	n/a
Reencrypts files at shut down		n/a	•	•		n/a		n/a	n/a
Passwords									
Maximum number of characters	n/a	26	255	unlimited	31	28	200	200	255
Case sensitive	n/a	•	•	•	•	•	•	optional	
Must type twice for verification	n/a	•		•		•	optional	optional	
Access Control									
Prevents access to									
hard disk		•	•	•		•		•	•
individual partitions			•	•	•				
individual files		•	•	•	•		•		
folders		•	•	•			•		
floppy disks			•	•	•[2]		•		
removable media			•		•[2]	•		•	
Offers group-access privileges			•						
Protects files from modification	•	•[3]		•	•[3]	•[3]	•	•[3]	•[3]
Protects folders from modification		•[3]		•	•[3]	•[3]	•	•[3]	•[3]
Prevents applications from being copied	•	•[3]		•	•[3]	•[3]	•		
Protects files from deletion	•	•[3]		•	•[3]	•[3]	•	•[3]	•[3]
Protects folders from deletion		•[3]		•	•[3]	•[3]	•[4]	•[3]	•[3]
Blanks screen after user-specified time		•	•	•	•				•
Provides audit trail		•		•		•		•	•

[1] *Password protects.*

[2] *Write access only.*

[3] *Only when the hard disk or files are locked.*

[4] *With Finder 6.0 only.*

work. For instance, you can decrypt a group of files that you want to work with all at once, and then when you shut down the Mac the files will automatically be re-encrypted. Since these programs require you to manually move the files to a special folder, however, people who work on lots of different files every day will still find this method cumbersome.

Advanced Security, from Advanced Gravis, offers a sign-in feature whereby you enter your password once and then you can encrypt or decrypt files in any folder. That's a step in the right direction, since you don't have to create special sets of files, nor do you have to remember numerous passwords. But the catch is remembering to sign out—otherwise, anyone can open your encrypted files.

The biggest problem with encryption, however, is the amount of time it takes to encrypt and decrypt files or folders. Because of the complex computations involved, encryption is slow. For instance, Symantec Utilities for Macintosh II (SUM II) took 28 seconds to encrypt a 91K WriteNow document using a proprietary algorithm. The fastest encryption program, Camouflage, from usrEZ Software, took almost 8 seconds to encrypt the same file using the more complex DES algorithm. Although that's a big improvement over SUM II, it's still about the same amount of time as it would take to copy the file.

If you have a large body of confidential data that you need to access on a regular basis, encryption will be too cumbersome to use. But if you need to send data out-of-house safely, either over a modem, a dedicated data line, or on a floppy disk in the mail, encryption is an ideal solution. Packer, from Bobbing Software, was originally created as a compression utility during the days when 400K floppies were the norm. The company threw in the encryption capability as an afterthought. Now, however, this simple, inexpensive program provides a good alternative for users who want to safeguard data as it is sent over telephone lines. Likewise, the latest versions of the popular shareware utilities, StuffIt and PackIt, also offer encryption.

Unless you use Camouflage or Advanced Security, however, the person receiving your encrypted file must have a copy of the program you used for encrypting in order to decrypt it. Camouflage and Advanced Security both let you encrypt files in such a way that people who don't have their own copy of the application can still decrypt the file using the correct password.

The only other way to encrypt data as it is sent over phone lines is by a scrambler such as the TeleScrambler I from Metme. You install one Tele-Scrambler into each modem being used. The Tele-Scrambler scrambles the data being sent so that it can't be intercepted and understood. Tele-Scramblers cost $995 a pair.

Hardware Devices

Encryption programs offer a sure, if awkward, way to protect specific files, and an excellent way to transmit data over telephone lines, but they can't keep others from deleting files, using potentially virus-infected files, or stealing the hardware itself. (Although, if a thief steals your Mac and the data is encrypted, you can at least rest assured that confidential information can't be read.) And, since most programs don't let you encrypt your System Folder, there's no way to stop people from modifying its contents. Worse, someone could use Fedit to extract information from temporary files that programs such as Microsoft Word store in the System Folder.

The most obvious way to keep someone from performing any of these nasty tricks is to make sure no one has physical access to the Macintosh—for example, by keeping the Macintosh behind locked doors. Alternatively, you can use hardware devices like Ergotron's The Muzzle; locks and cables such as Mac Lock from MacProducts and MacKablit from Secure-It; Checkmate's MacSaver board; or Viking Tech's (KeyLock) floppy drive covers, to prevent people from starting up the Macintosh, inserting floppy disks, or stealing the Mac itself. Or, users on a budget can lock up power cords, cables, and the keyboard at night.



FRED STIMSON

Muzzle for the Mac
Ergotron's The Muzzle for the SE blocks the floppy drives and locks down the Mac's case to protect internal components from being stolen. The back of the device has a special cover that lets you lock the power receptacle.

If you aren't particularly worried about someone walking off with the hardware, you can use a Bernoulli Box from Iomega or a Syquest-based removable cartridge drive to store sensitive data. It's a heck of a lot easier to lock up a data cartridge than it is to lock up a whole system. These drives are especially suited to an environment where several people share one Macintosh. Users have their own cartridges, which they take away with them when they are finished using the Mac.

Software Access Control

While you pay a high price for many of the hardware devices, several software programs offer sufficient access-control features at much lower cost. Programs such as DiskLock, NightWatch, and MacLock (Verge Technologies) are designed specifically to lock your hard disk when you shut down the Macintosh. There's no way anyone can mount the hard disk without

BEWARE THE TRASH CAN

You've probably heard stories about scavengers uncovering secrets by rummaging through trash cans in back alleys. (In fact, that's how the world came to know the details on Apple's Macintosh Portable, months before the product was formally introduced.) But you may not realize that the Trash Can on the Mac is just as vulnerable. When you drag a file to the Trash icon, you merely erase the file's directory information, not the data stored on the hard disk. Subsequent files may be written to those portions of the disk, but until they are, any modestly sophisticated user can easily use a utility such as Symantec's SUM II to recover the data.

Several programs erase all traces of a file by writing random information over the hard disk area where the file was stored. Programs such as Sentinel, from SuperMac Technology, and P/C Privacy, from MCTel, let you set options so that the program erases the original file after an encrypted copy is made. P/C Privacy's option, however, is not automatic. After you encrypt a file, you must go back to the program's menu to access the option for erasing the original file.

knowing the proper password, even if they boot from a floppy.

These programs also offer schemes for overriding the password in case you forget it. The NightWatch scheme works much like a bank's automated teller card. Some trusted person, say a network administrator, uses the NightWatch Administrator disk to create a User disk for each person who needs access to the hard disk. Whenever you want to start up the hard disk, you insert your User disk and enter your name and password. The User disk unlocks the hard disk and then restarts the Macintosh from the start-up disk. If someone forgets his or her password or is absent, the NightWatch Administrator disk can be used to override the User disk.

DiskLock lets you install a master password that can override any other password. Both of these methods are secure, but I prefer DiskLock's scheme since no extra disks are required to start up. In addition, DiskLock can lock files and folders.

Other programs, such as Empower, can lock individual hard disk partitions. Don't confuse locking a partition with simply password-protecting it, however. Some partitioning programs, such as ALsoft's MultiDisk utility, offer password protection, but you can still look at data in the partition with one of those handy resource-editing utilities.

Any program that prevents access to a hard disk is an excellent choice for people who need to protect data when they aren't around—say at night or during lunch breaks. But because they don't encrypt files, programs that lock your hard disk do no good if you forget to shut down the Mac. For the forgetful, many of these programs provide timed lock-out features. You specify how long the Mac remains idle before the program locks the hard disk and displays a dark screen with the password dialog box.

But be wary of programs such as Kent Marsh's QuickLock or Berkeley Systems' After Dark, which dim the screen and display a dialog box into which you must type a password before the screen reappears. Since the programs do not actually lock the hard disk, they can be bypassed by booting from a floppy. With QuickLock, you can quickly darken the Mac's screen by moving your cursor to a specified area and clicking, thus instantly covering sensitive data when someone comes into the room. To make these programs truly effective security aids, however, you'll need to use them in conjunction with a program that locks your hard disk or folders or encrypts data.



FRED STIMSON

Removable Security

For ultimate security, you might consider using removable storage such as that offered by an Iomega Bernoulli Box. Data is stored on a cartridge, which can be locked up or carried with you.

Multiuser Considerations

In situations where many people must share a Macintosh (at a university, for instance) locking the entire hard disk is not feasible. To fit individual schedules, the Mac must be left on most of the time or the password must be given to so many people that leaks easily occur. One solution might be to use a product like Empower that grants privileges to groups of users for various files and folders on the disk. Empower, which is based on the AppleShare privilege system, lets a system administrator designate groups of users

TOP SECRET SECURITY

We're not a typical office," says a manager at a government research laboratory. "We have chain-link fences with barbed wire around our building and guards patrolling the grounds." As you might expect, the manager has some special needs for securing the labs' Macs.

Although the Macs are in locked rooms and some of them are also tied down with cables, that's not quite good enough for government work. "If classified information is stored on a personal computer, then that personal computer is also considered classified," says the manager. "If the computer is to be used elsewhere later or by someone without proper clearance, then the data must be destroyed. Otherwise someone could tear apart the hard disk in a clean room and recover the data."

Since destroying every hard disk that ever contained classified information would be absurdly expensive, the manager uses a specialized product called Ft.Knox, from Transfinite Systems, to meet government regulations for destroying data. Most programs that overwrite a file with random, nonsensical information do so only once. While that's secure enough for most people, an electronics expert could still find traces of the original file because the information written the second time might float a bit higher or lower than the original data. Ft. Knox overwrites the original file as many as six times using a random 16-bit pattern. The program can also overwrite entire volumes or hard disks.

Ft.Knox also has numerous other high-security features for clearing data remnants from places you would never imagine could impose a security risk. For instance, the program lets you clear the parameter RAM, the main memory and processor registers, and the nonvolatile storage in the Apple LaserWriters. All of these areas could potentially contain fragments of data. In addition, Ft.Knox can overwrite the space at the end of a file that has been edited, so that any data that is no longer needed in the file, but that is still physically present on the disk, cannot be recovered.

Obviously Ft. Knox is not for every user. But if you have highly classified data, the program helps you clear every possible nook where sensitive information can hide.

who are assigned read and write privileges. Any user who creates a file, however, can become the owner of that file and can set access privileges for it.

Controlling application copying or file deletion and System modification is a bit trickier. BulletProof, from Spectra Micro Development, lets you make files invisible and protect files and folders from modification or deletion. Although that sounds ideal, the program works by simply changing three bits (one for each feature) in a file's Finder attributes. Anyone handy with a file editor like ResEdit, Fedit, or SUM II can easily change the bits back again so that the file is no longer invisible or protected. Files made invisible on the desktop can still appear in the Open dialog box of the program that created them. Many invisible files can also be displayed by a program such as Central Point Software's PC Tools Deluxe. If your goal is just to protect files from being inadvertently deleted, you can always lock the file using the System's Get Info box.

Two programs that I saw in prerelease form, A.M.E. from Casady & Greene and FileGuard Extended Edition from ASD Software, offer elegant solutions for multiuser situations. (FileGuard Extended Edition shipped just as this article went to press.) Both let you set various levels of file, folder, and disk access for individual users, and both let you protect applications from being copied or deleted using a much more complex scheme than BulletProof. A.M.E. even lets you restrict access to desk accessories, printers, and modems and prevent unauthorized applications from being installed.

Network Considerations

Networks present the biggest security problems. The more people sharing hardware, the greater the potential for security leaks. Some products, such as Solana's R-Server, Infosphere's software bridge Liaison, and Shiva's NetModem, let you divide a network into zones. You can then restrict a user's access to certain zones and therefore to the Macs and peripherals in those zones.

In-house users don't provide the only threat, or even the biggest threat, to network security. Dial-in access opens up networks to tampering from outsiders. Products such as Tri-Data's Oz Guardian modem, LeeMah's TraqNet Controller/InfoKey, and Liaison address the problem with call-back capability. People calling into the system enter a password; the modem hangs up and automatically calls the telephone number associated with the password. If the user is authentic and is calling from the proper telephone, then access is granted. If not, then the person is cut off. This setup is highly secure—only glitches in the telephone system could cause a break in security.

One of the biggest holes in any network is the electronic mail system. For instance, QuickMail stores messages as files on the mail server's hard disk. Anyone who can access that machine can read these messages. If you delete your messages, but have the mail log feature enabled, copies of the messages will remain on the mail server until its hard disk is erased or until your mail log is cleared. (This is the type of scheme that tripped up

ENCRYPTION PRODUCTS

	Comouflage	Hord Disk DeodBolt	Advanced Security*	Packer	P/C Privacy	Pockit III	Deluxe
Company	usrEZ Software	FWB	Advanced Gravis	Bobbing Software	MCTel	Horry Chesley	Central Point Software
Cost	$349	$89.95	$149.95	$29	$95	$20	$79
Encryption Features							
Compression				•		•	•
DES	•	•	•			•	•
Proprietary encryption methods	•	•	•	•	•	•	
Encrypts subfolders	optional		•				•
Encrypts files	•	•	•	•	•	•	•
Encrypts folders	•	•	•				•
Encrypts applications	•	•	•		•	•	•
Overwrites source file	optional	•	•	•	optional		optional
Supports groups of files	•	•	•			•	
Con open one member of group	•		•	n/o	n/o	•	n/o
Reencrypts files at shut down			•			n/o	
Passwords							
Maximum number of characters	16,384	32	20	20	20	8	32
Cose sensitive	•	•	•	•	•		•
Must type twice for verification	•	•	•				•

* *A new version of Advanced Security was released at press time. The product now has many more features, including several for controlling access to a hard disk.*

Oliver North.) Even if you delete your messages and the mail log is disabled, copies remain on the server for at least several hours. The only way to ensure that your messages are safe is to delete all copies immediately from your hard disk and from the server. To ensure privacy for all QuickMail users, you should lock the mail server in a closet.

The Virus Panic

Electronic mail provides a notoriously easy—and fast—way for villains to distribute a virus. Dr. Harold Highland, editor-in-chief of *Computers & Security*, tracked the rapid spread of nVIR when it first hit. Early one morning he got a call from Princeton University, saying its Macs had been hit; by that evening, he was receiving calls from Stanford University reporting the same virus. A week later, nVIR showed up at a Finnish university and ten days later reports of nVIR were coming in from Singapore and Australia. "That virus travelled around the world in about two weeks," says Highland. "Unfortunately, the Mac is very susceptible to viruses."

To protect yourself from a virus, you shouldn't put any untested software on your Mac's hard disk. You can use a virus-detection program such as Virex, from HJC Software, or SAM, from Symantec. These two are the best of their kind. HJC offers an excellent upgrade path and SAM has a lot of configuration options. Both products automatically check floppies as they are inserted for known viruses.

A Solution for Every Situation

With all the products and possible combinations, it's easy to get confused. My personal favorite program is DiskLock. I can easily lock my disk or folders with a single menu command, and without having to shut down my Mac. That's quite handy when I get called into an emergency meeting or get dragged away from my desk to answer a question.

If you need to send confidential files via modem or electronic mail, then you'll want an encryption package. If you send files to only two or three people, then you could opt for one of the general utilities packages such as SUM II or PC Tools Deluxe, or for StuffIt or Packer, which are inexpensive and provide compression. If you send files to a lot of different people, however, you'll be better off with Advanced Security; at $149.95 the program costs more but lets you encrypt files so that the recipient can decrypt them without owning a copy of Advanced Security. Camouflage offers the same capability and has a smoother interface and more features, but at $349 it's overpriced.

For environments where several people use a single Mac, my first choice is a combination hardware and software solution. Any Mac left out is subject to theft, so I recommend purchasing The Cavalier security plate from FMJ or Padolock from Doss Industries to attach the Mac and any peripherals to a desk. You should also get a Bernoulli Box or a Syquest drive so that users can take their data with them. To protect the System Folder and the applications on the hard disk, I'd use Empower to set read-only privileges for everyone except the system administrator.



FRED STIMSON

Safety on a Plate
Doss Industries offers security plates that attach any piece of hardware (a Mac or a laser printer, for example) to a desk or other strong surface. The plates can be removed without harming the desk. FMJ offers a similar product.

If the hardware is too pricey for your budget, you should look at A.M.E. or FileGuard. Both products offer numerous features that you can mix and match based on the experience level and trustworthiness of the users. Keep in mind, however, that these products are very complex and require a designated person to set up and reconfigure them.

Network administrators can solve many problems by locking the network server in a closet. They can then use AppleShare to control access privileges. If further restrictions are needed, such as the ability to control application copying, I'd consider A.M.E. or FileGuard. And any network that allows remote dial-in should include a modem with call-back capability. No matter what your situation, however, you'll need a good virus-detection program. And though you've heard this a million times, you should always keep a current backup copy of your hard disk.

Remember, these products are designed to keep important information from going out. It doesn't take much—a forgotten password, a corrupted encrypted file, or a telephone glitch—to keep you out as well.

See *Where to Buy* for contact information.

PC Tools Sentinel	StuffIt	SUM II
SuperMac Technology	Aladdin Systems	Symantec
$149.95	$25	$149.95
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•		•
•	•	•
•	•	•
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•	optional	•
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•	•	•
optional	n/a	
20	255	20
•	•	•
•	optional	•

WARNING: COMPUTING CAN BE HAZARDOUS TO YOUR HEALTH

A growing number of studies link intensive computer use to a host of painful and even debilitating maladies. Meanwhile, scientists argue the possible long-term effects of computer radiation. What steps can you take to make your workstation safer?

BY DIANA HEMBREE

Rick Pearsall of Denver, Colorado, had no idea what was happening to his hands. He used to enjoy playing the guitar after getting home from his job as a Mountain Bell directory assistance operator. But in 1985, the pain and tingling that started in the little finger of his left hand soon spread up his arm, making guitar-playing—and keying in data on the computer—excruciating.

An orthopedist diagnosed Pearsall's ailment as carpal tunnel syndrome, a painful and debilitating disease of the median nerve in the wrist, and linked the condition to Pearsall's constant, repetitive hand movements at the computer keyboard. Today, even after expensive surgery to ease pressure on the nerve, the 31-year-old says that chronic pain makes it difficult to drive long distances, to haul firewood, or sometimes, even to hold a paperback novel.

"It's frightening," he says, "especially because doctors can't really tell you when you'll get well. My savings are about to run out, but it's tough to find a job when you can't use your hands."

Pearsall's injury is hardly an isolated case. More than half of all video-display terminal (VDT) users responding to various surveys in the United States have complained of musculoskeletal disorders, eyestrain, chronic headaches, and other ailments, according to a report from the National Academy of Sciences. At Pearsall's former workplace, Mountain Bell of Denver (now US West), 187 out of 500 directory assistance operators who work with computers have filed disability claims for VDT-related hand, arm, and neck injuries in the past four years.

Macintosh users are not immune to these disorders. A *Macworld* survey sent to 1000 subscribers found that almost a third of the 470 readers who responded had experienced health problems they believed were related to computer use. Of the subscribers with health complaints, 64 percent reported back or neck pain, 56 percent had had eye problems, and another 12 percent had developed strain injuries from repetitive motion. Significantly, a full 80 percent of *Macworld* subscribers using computers at work reported that their employers had failed to inform them of possible dangers.

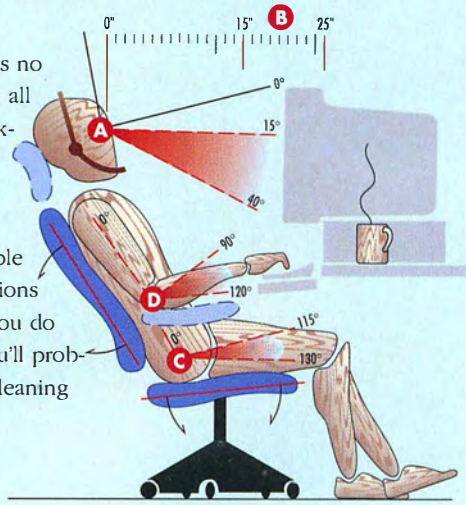
Employers, however, are beginning to find out how devastating it can be to overlook the issue of ergonomics. At the *Fresno Bee,* in Fresno, California, one-third of the editorial staff using computers suffers from musculoskeletal disorders, according to the Northern California Newspaper Guild, which lodged a complaint with the state's Occupational Safety and Health Agency. OSHA recently sided with the Guild, ordering the *Bee* to provide adjustable furniture, hourly breaks, and ergonomic training (the *Bee* is appealing this decision, because, according to the paper, it is already "in voluntary compliance"). At the *Los Angeles Times,* 200 out of 1100 reporters and editors have sought medical attention for repetitive strain injuries (RSI) since 1985, resulting in hundreds of thousands of dollars in disability claims and lost work time and a newsroom "that

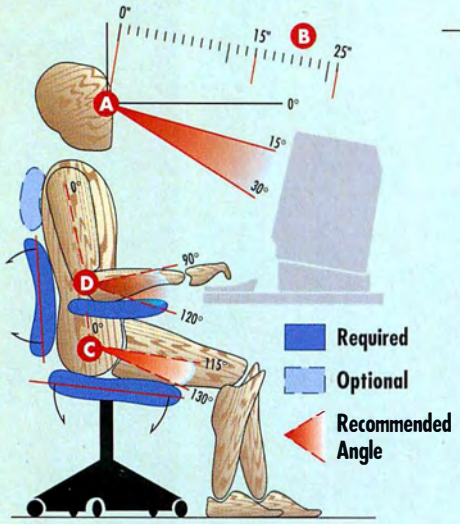
ELISABET ZELON


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26
delete
return
esc
tab
control
shift
caps lock
option

A Workstation That Works

Today's ergonomists recognize that there is no perfect position that workers can maintain all day. For most people, a comfortable workstation is one that can accommodate two or more positions, enabling you to adjust your chair, monitor, and keyboard to fit your current task or inclination. Most people find the upright and slightly reclined positions portrayed here best for computer use. If you do a fair amount of traditional desk work, you'll probably want a chair that supports a forward-leaning position as well.





Screen Posture always follows the eyes; screens placed too low or angled improperly are a major source of slouching **(A)**. The distance from the screen to your eyes should be only slightly greater than the distance you normally maintain between reading material and your eyes **(B)**. (Bifocal wearers may require a steeper screen angle than the ones portrayed.)

Chair Seat contours should follow the contours of your back. Adjust chair height so that you don't feel pressure on your tailbone (seat too low) or lower thighs (seat too high). Ergonomists used to recommend 90 degrees as a good angle between thighs and spine, but recent research shows that more people favor a more open posture **(C)**.

Keyboard Your arms should be relaxed at your side, with elbows a few inches from your body **(D)**. Position your chair and keyboard to minimize reaches. When you change position, from upright to reclined for example, be sure to reposition your keyboard (and screen). An adjustable keyboard stand, which enables you to use the mouse without a stretch, is useful for this purpose, but you can also place the keyboard in your lap.

Desk A comfortable desk height is particularly important if you keep the keyboard on your desk. If you don't have a keyboard stand and you work at a nonadjustable surface that's too high, try raising your chair and putting a platform or box beneath your feet. If your desk is too low, try fastening blocks to the ends of the legs.

Copy Stand If you often look at paper documents when you work, use a copy stand, mounted so that it puts your work in the same plane and at the same height as the screen. If you look at the hard copy more than the screen, orient your chair or screen such that the copy stand, rather than the Mac, is directly in front of you.

You Keep moving—motion makes the blood flow. And remember to take a break from computer work every hour.

Prepared with the assistance of Eileen Vollowitz, PT, of Back Designs, in Oakland, California.—Joe Matazzoni

looks like a therapy ward," according to one observer.

"We had absolutely no warning [about RSI]," recalls *Los Angeles Times* managing editor Noel Greenwood. "We thought the computers were just spiffy electronic typewriters. We learned the hard way that if you don't treat your computer right, it can bite you."

More and more computer users, it seems, are finding that their terminal has indeed bitten them—and not only on the hand. Several surveys by government and private health researchers have shown a connection between computer use and increased rates of eyestrain; back and neck pain; wrist injury; angina, or chest pain; and stress (in fact, an early survey of a large insurance office by the National Institute of Occupational Safety and Health (NIOSH) found that VDT operators in clerical jobs showed the highest levels of stress of any occupational group ever studied by the agency, including air traffic controllers). Other complaints that turn up in health surveys include blurred vision, facial rashes, chronic headaches, nausea, dizziness, irritability and moodiness, fatigue early in the day, shortened attention span, reduced productivity, and sleep disturbances.

Compounding the worry over these complaints is the controversy over computer radiation. In Oakland, California, a recent case-control study by Kaiser Permanente Medical Center of 1583 women concluded that women who work at computer terminals for more than 20 hours a week have an 80 percent higher risk of early and late miscarriages than women who do similar work without using VDTs. Kaiser researchers caution that their study didn't isolate the cause for the higher rate of miscarriages, but stress the need for further investigation into pregnancy and VDT use.

Disturbing as some of these reports and statistics may be, many hazards associated with computer use are entirely preventable. By learning the common causes of computer distress and making some basic changes to their workstation and work habits, most people can avoid joining the growing ranks of casualties of the computer revolution.

On-the-Job Straining

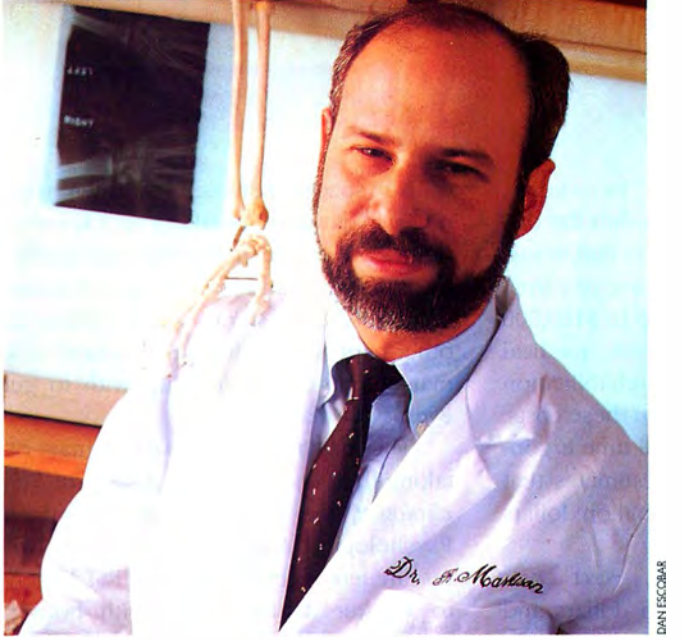
Perhaps the most talked-about computer hazard these days is the host of painful and often disabling hand, back, arm, and neck disorders linked to keyboard work. Like Rick Pearsall, some Macintosh users who spend long hours at the keyboard have been stunned to find themselves suffering from the same numb or swollen fingers, aching wrists, wrenched necks, and nerve damage most of us associate with factory work.

These conditions, which include tendinitis, are known collectively as repetitive strain injuries. Discussing RSI in *Improving VDT Work* (Department of Preventive Medicine, University of Wisconsin, 1986), ergonomist Steven Sauter, now with NIOSH, explains that computer users often repeat nearly identical keystrokes at a high rate of speed, tens of thousands of times a day. Since each keystroke requires muscles to contract and tendons to move, the tendons can become irritated as they slide over bone and against tissue, causing painful inflammation.

In a busy medical office 22 stories above downtown San Francisco, orthopedic surgeon Robert Markison explains how the form of RSI known as carpal tunnel syndrome can develop during VDT work. Tapping the underside of his wrist next to the palm he says, "You've got a regular superhighway of tendons here—nine in company with the median nerve, each wrapped in its own lubricating envelope. They're all in an unyielding fiber bone tunnel that won't open up for anybody—not a chiropractor, not anybody. If, with repetitive motion, one of the envelopes swells even minimally, then the nerve can get mashed."



Dr. Markison, the former chief of hand surgery for San Francisco General Hospital, estimates that he has treated several thousand cases of computer-linked hand disorders. Of those occurring during the past five years, he identifies "two hundred" as Macintosh-related injuries, he says, with a few dozen requiring surgery.



DAN ESCOBAR

"I celebrate the diversity of the human body, but industry doesn't," says orthopedic surgeon Robert Markison. The conventional, flat keyboard, according to Markison, "requires physiological contortions that almost guarantee muscular strain and pain, eventual injury, and possibly disability."

There is no evidence that Macintosh users develop more cases of RSI than other computer users. Some Mac users, however, may develop injuries in their mouse hand and shoulder if their workstation requires long, high reaches to the mouse that strain the muscle origins near the elbow, according to Dr. Markison.

But hands and arms are not the only trouble areas. Another ingredient of RSI is the prolonged sitting involved in VDT work, which puts particular stress on the back and legs. In one NIOSH survey, 71 percent of the operators reported lower back discomfort occurring from a few times a week to every day.

Not surprisingly, many computer devotees find it hard to understand why they are being injured on their sleek, high-tech machines rather than, as one injured reporter put it, "on a clunky, old, mechanical typewriter." Occupational health experts reply that although some typists do develop RSI, computer users are at greater risk because they simply make more keystrokes. Researchers also point out that the typewriter encourages a greater variety of movements, such as those needed to insert paper, while a computer screen can be so mesmerizing that many of us work for hours in the same position without a break.

"The computer is so seductive, so inviting and insidious," says *L.A. Times* editor Noel Greenwood. "It says, 'Keep using me, don't get up, you can change that sentence right now, with a flick of your finger.'

"One day I sat here working furiously, all hunched over the keyboard for five hours," continues Greenwood. "The next morning I couldn't lift my head out of bed. My neck hurt so bad that I couldn't even turn my head. So any time I'm tempted to doubt [RSI sufferers], I remember that."

What Greenwood likely experienced were the aftereffects of static muscle loading, which occurs when the muscles of the shoulders, legs, neck, and hands remain in a prolonged state of contraction. Because the muscles are not periodically relaxed, circulation is decreased. Nutrients carried in the blood are not supplied rapidly enough, while waste products like lactic acid build up in the muscle tissues, causing soreness and pain.

Dr. Markison thinks that some static loading problems and injuries result from what he views as poor keyboard design. The effort required to hold hands flat above a keyboard while typing, he explains, puts a continual strain on the muscles and tendons. Much RSI could be prevented, in his opinion, by adopting the "pup tent" or split keyboard, promoted by California inventor Tony Hodges, which allows users to type with the palms facing each other—a design that several German studies say causes far less strain on the upper body than flat keyboards do.

Although no American computer manufacturers have yet implemented Hodges's split keyboard design, RSI's cost to business may encourage innovation. Workers' compensation claims for RSI

have doubled in the last two years, prompting *Business Week* to dub the disorder "the fastest-growing occupational disease of the 1990s." One case of carpal tunnel syndrome can cost up to $100,000 when workers' compensation, medical expenses, sick leave, and rehabilitation are taken into account. Given these costs, Roger Stephens, the only full-time ergonomist with federal OSHA, estimates that RSI costs employers several billion dollars a year.

The injuries, moreover, exact costs that cannot be measured in dollars and cents. "I've watched my skilled desk editors go on disability and struggle back to work part-time, dulled by pain medication," writes RSI victim John Taylor, then news editor of the *Fresno Bee,* in the May/June 1989 bulletin of the American Society of Newspaper Editors. "I've seen marriages in danger of breaking up. I know of homes put on the market because disability pay is bread-and-butter wages. It makes me bridle over stories about editors at other papers who view RSI as a new trick malcontents have come up with to get even with management."

The unsympathetic editors may be taking their lead from *The American Psychologist,* the journal of the American Psychological Association, in which two researchers recently ascribed RSI largely to worker dissatisfaction with boring, stultifying computer jobs. Although few of us would dispute the notion that mind-numbing work can cause job dissatisfaction and tension, new scientific research supports orthopedists' contention that RSI is a physical disease.

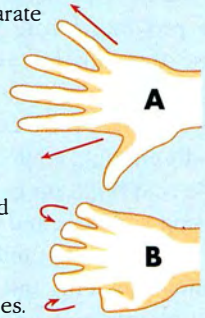
In a study published in the April 23, 1988, issue of the respected medical journal *Lancet,* Australian medical researchers describe a case-control study in which they took muscle biopsies of 29 women with RSI, and observed striking abnormalities in both muscle tissue and cells. These biological changes, they concluded, "cannot be accounted for by any known psychological mechanisms."

Thousands of miles from Australia, Catherine Burke, 32, of Vallejo, California, recently underwent surgery on both hands for carpal tunnel syndrome, which she developed during months of intensive work on an IBM computer, and later a Macintosh, whose keyboard she recalls setting on a table so high she had to arch her wrists to type—an ergonomic no-no. "I don't think the computer companies

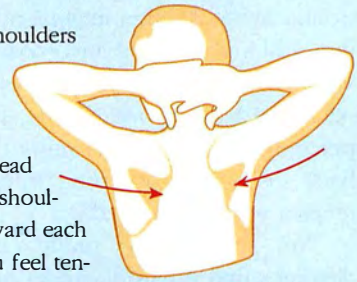
STAY LOOSE

Taking a break every hour to do a few stretches can reduce the muscular tension that builds up during prolonged bouts at the computer. These stretches were selected with the needs of computer users in mind; feel free to add any favorites of your own to your routine.

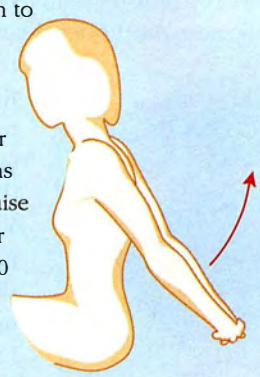
Extend and separate the fingers until you feel the stretch **(A)**; hold for 5 seconds. Relax, then gently bend your fingers for 5 seconds **(B)**. Repeat 5–10 times.



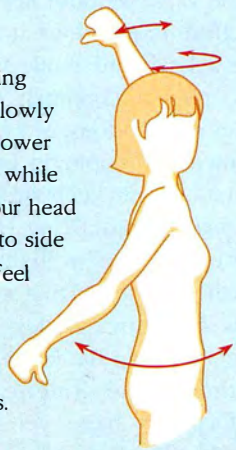
To relax the shoulders and upper back, lace your fingers behind your head and pull your shoulder blades toward each other until you feel tension through the upper back. Hold for 5–10 seconds, then relax. Repeat 5–10 times.



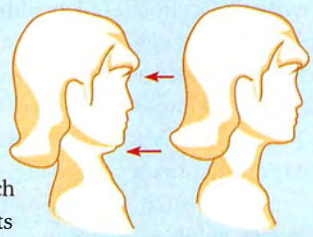
An excellent stretch to do when you find yourself slumping forward. Lace your fingers behind your back with the palms facing in. Slowly raise and straighten your arms. Hold for 5–10 seconds. Repeat 5–10 times.



In a standing position, slowly raise and lower your arms while turning your head from side to side until you feel a gentle stretch. Repeat 5–10 times.

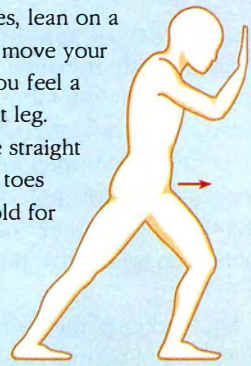


This stretch counteracts the effects of leaning forward to stare at the screen. Slowly tuck in your chin, hold for 2 seconds, and then release. Repeat 10 times.



To stretch your calves, lean on a support, and slowly move your hips forward until you feel a stretch in the straight leg. Keep the heel of the straight leg on the floor and toes pointed forward. Hold for 30 seconds without bouncing, then switch legs.

—Joe Matazzoni



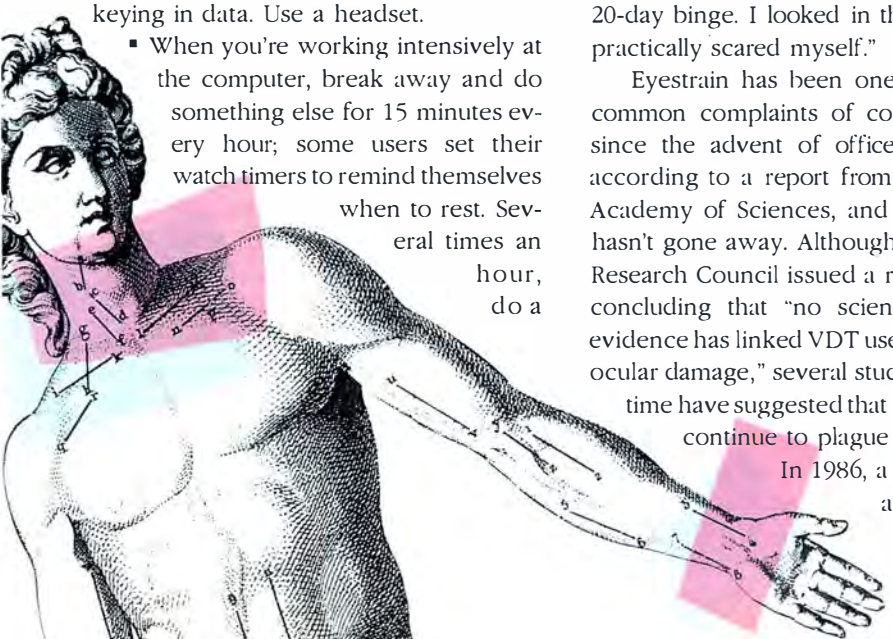
Prepared with the assistance of the Spine Center of the East Bay, in Oakland. Some excercises adapted from "Computer and Desk Stretches," by Bob and Jean Anderson. Mild discomfort is natural when stretching; if any of these stretches cause pain, discontinue.

had a responsibility to warn me [about RSI]," she says, "but it would have helped a lot if they had."

Asked if Apple Computer has developed a package insert cautioning users about RSI and how to avoid it, Apple corporate public relations spokesperson Stacey Byrnes said no, "but we'd definitely consider doing something like that if there was a real need for it." When asked whether Apple was doing any research on RSI, she said it wasn't. "Apple is not aware of any problem among Macintosh users," she said, noting that the company hasn't received any complaints.

Industry groups often say that it is not the computers themselves that are to blame for health problems, but how the devices are used. "There is no demonstrable link between the use [of computers] and adverse health effects," says Linden Heck, of the Center for Office Technology (COT), an information clearinghouse funded by computer manufacturers and large business users. While not everyone would concur with Heck's statement, virtually everyone, including the COT, agrees with the growing number of studies that show that frequent rest breaks and ergonomic improvements can significantly reduce pain and discomfort among computer users. Here are some ways you can help protect yourself.

- Set up your workstation to eliminate poor or uncomfortable posture and long reaches (see "A Workstation That Works").
- Avoid cradling a telephone between your neck and shoulder when talking and keying in data. Use a headset.
- When you're working intensively at the computer, break away and do something else for 15 minutes every hour; some users set their watch timers to remind themselves when to rest. Several times an hour, do a series of gentle exercises (see "Stay Loose").
- Don't exceed 10,000 to 12,000 keystrokes (roughly 1700 words) an hour.
- Preventing problems is much easier than curing them. Seek medical treatment from a specialist at the first sign of RSI. Warning signals include muscle tenderness; pain; aching and tiredness of the wrists, arms, shoulders, or neck; muscle spasms; and numbness and tingling.
- If you smoke, quit—particularly if you are undergoing surgery for a repetitive strain injury. Nicotine shuts off small-vessel circulation and will make recovery more difficult.





DAN ESCOBAR

Inventor Tony Hodges designed his split keyboard partly to relieve the intense shoulder pain he developed during hours of keyboard work at a legal firm. Hodges feels one reason there has been little innovation in keyboard design is that "it's men who design these things and women who use them eight to ten hours a day."

Of Sight and Sore Eyes

"After one all-day stint on a VDT, I woke up the next day with my eyes solid red, I mean blood red," recalls an editor at the *L.A. Times*. "I looked like I'd gone on a 20-day binge. I looked in the mirror and practically scared myself."

Eyestrain has been one of the most common complaints of computer users since the advent of office automation, according to a report from the National Academy of Sciences, and the problem hasn't gone away. Although the National Research Council issued a report in 1983 concluding that "no scientifically valid evidence has linked VDT use to long-term ocular damage," several studies since that time have suggested that eye problems continue to plague VDT users.

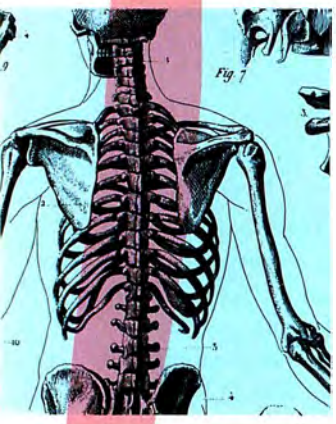
In 1986, a research unit at the State University of New York College of Optometry found that "eyestrain, blurred near vision, eye irritation, headaches, and double vision all had an independent, statistically significant association with increased VDT use." And in Massachusetts, a recent health study found that clerical workers who used computer terminals for seven or more hours a day experienced 72 percent more eyestrain or sore eyes than clerical workers who worked on VDTs fewer hours a day.

The jury may still be out on computers and long-term ocular damage, according to some experts. No surveys, including an Italian study of 29,000 people, have linked VDTs to permanent eye damage, but at the University of California at Berkeley Optometry School's Video Display Terminal Clinic, Dr. James Sheedy and colleagues found an unusually large number of the clinic's patients, all VDT users, had trouble focusing their eyes. Out of 150 patients who had worked on VDTs an average of six hours a day for four years, two-thirds—including 41 patients in their twenties and thirties—had focusing problems. Sheedy, who called the findings "surprising," had estimated that only 5 percent of an average group of young people would have focusing problems.

Sheedy stresses that the study did not prove the problems were caused by computer use, but told one reporter, "We have to seriously consider whether the VDT might be causing some breakdown in the eye-focusing mechanisms."

One problem, Sheedy and other ex-

perts point out, is that like the general population, VDT users tend to have uncorrected visual defects, such as farsightedness, of which they are unaware. Under the strain of intensive VDT work, these weaknesses can lead to eyestrain and other problems. Many of these vision problems can be corrected through proper lenses or special glasses, while other problems stem from poor workstation design and glare.



Among the ways computer users can protect their eyes:

- Get a full eye checkup before buying a computer or doing computer work, even if you are already wearing glasses or have twenty-twenty vision, and schedule a follow-up visit at least once a year.
- Avoid facing windows at your terminal, because, in the words of one ergonomics manual, intense light in the field of view "may flood the eye and wash out the image of the character cast upon the retina." If you have to sit next to a window, sit at a right angle to it, with the display screen perpendicular to the pane to cut down on the glare.
- In general, the American Optometric Association recommends that lighting for computer users should be about half the level of normal office lighting (20 to 50 footcandles is the recommended range). At the office, you can achieve this by simply unscrewing half the bulbs in your area. Since some people notice a flicker with the traditional, 60Hz fluorescent lights, several experts suggest eliminating them entirely or replacing the 60Hz ballasts (transformers) with high-frequency, solid-state ballasts.
- Cut down on glare by using window coverings such as curtains, blinds, and awnings to control light entering the windows. To avoid reflections that can reduce legibility, don't place the workstation directly underneath overhead lighting.
- The wall or other surface behind your computer should be about the same level of brightness as your screen. Watch out for very light or glossy paint finishes in VDT workplaces: these can cause bothersome reflections.
- If you can't control glare in your area, get a filter screen. Mac users should avoid most conventional filters, however, because they will reduce contrast on the reverse-display Macintosh screen rather than enhancing it. Ask for a "high light transmission" filter.

The Radiation Question

No issue in the computer safety debate is as thorny, emotional, or complex as that which revolves around the electromagnetic emissions produced by display monitors. A three-part series by Paul Brodeur published in the *New Yorker* under the title "Annals of Radiation: The Hazards of Electromagnetic Fields," recently brought this little-publicized topic to the national stage (June 12, 19, 26, 1989). Although some scientists and computer trade groups maintain that VDT emissions are harmless, more and more scientists, including some officials from NIOSH, reluctantly concede that we simply do not know enough to say with certainty that VDT emissions are safe.

The emissions produced by computer monitors include X rays, ultraviolet radiation, infrared light, and a range of electromagnetic fields. The earliest controversy over VDT radiation focused on X rays, a hazard experts now agree is negligible since these rays are blocked by the glass screen. Instead, researchers are investigating the health effects of emissions that, until recently, were considered perfectly safe: low-frequency electromagnetic fields.

Over the past ten years, most business groups and government health agencies, including the Food and Drug Administration, have maintained that low-frequency fields and other VDT radiation pose no hazard. Some computer manufacturers laughingly pointed out that the low-frequency fields emitted by VDTs were weaker than those emitted by toasters and electric blankets. Unlike *ionizing radiation,* such as X rays, low-frequency electromagnetic fields cannot break apart, or ionize, atoms—a feat that scientists link to cancer and other health problems. For decades, many physicists have argued that nonionizing radiation could not affect the body unless it was strong enough to produce heat or an electric shock.

Beginning in the sixties, however, and mushrooming in the seventies and eighties, hundreds of laboratory experiments have suggested something different. A number of experiments have indicated that pulsed, 60Hz electromagnetic fields —a type created by power lines, video-display terminals, and even indoor home wiring and home appliances—can induce biological changes, including changes in DNA synthesis, in animal cells exposed to them. Epidemiological research, such as the Kaiser study, which linked heavy VDT use to miscarriages, and other studies that have found an association between exposure to high power lines and childhood cancer, have fueled the growing concern.

Particularly startling to researchers were signs that, unlike exposure to doses of x-radiation, less exposure to electromagnetic fields is not necessarily better; some low-frequency fields appear to affect cells only at lower doses or only at certain frequencies, or "power windows."

Such findings, and others, have led to a profound shift in thinking about the electromagnetic fields that are part of our everyday life. While a number of studies have failed to find a link between VDT use and increased rate of miscarriages or fetal abnormalities, and other studies show no affect from exposure to 60Hz fields, this year a comprehensive background paper from the Office of Technology Assessment (OTA) declared that the growing mass of evidence shows that low-frequency electrical fields too weak to heat a living organism can still affect it. According to the OTA, human beings may be at risk from exposure to even very weak electromagnetic fields from VDTs, high voltage wires, and other ordinary power sources—such as electric blankets.

To what extent we should be concerned about these possible risks remains a topic for debate. Experts such as OTA study coauthor M. Granger Morgan, head of the Department of Engineering and Public Policy at Carnegie Mellon Univer-

sity, stress the need for more research. "There are clear effects on living systems that have been documented, but one can't say that these translate to health risks given the incomplete nature of the knowledge available," Granger said. "It's like trying to guess what picture is on a puzzle when you have only some of the pieces."

Meanwhile, manufacturers are adopting a cautious attitude. "Of course we're concerned, and we're following all the studies closely," says Apple spokesperson Stacey Byrnes. "The safety and well-being of the customer is our highest goal, and we use the same equipment." She says that Apple complies with all governmental standards for VDT radiation.

The government, which has no regulations governing low-frequency radiation emitted by VDTs, does not suggest extra precautions for pregnant VDT users, nor do computer manufacturers. Commenting on the Kaiser study on pregnancy and VDT use, Linden Heck of the Center for Office Technology notes that among the women with high VDT use who showed an elevated risk, the risk was statistically significant only among administrative support and clerical workers—not management—leading some researchers to suspect stress or other factors.

Nonetheless, given the evidence that dangers may exist, some health experts advise erring on the side of caution. The New York Occupational Safety and Health Committee (NYOSHC) urges women to ask to be transferred to non-VDT work during pregnancy or while seeking to get pregnant. Louis Slesin of *VDT News,* a newsletter devoted to computers and health issues, suggests that women who must work with computers during pregnancy use a liquid crystal display. The Safe Computing Company, of Needham, Massachusetts, makes a 10-inch, 8-bit gray-scale LCD monitor for the Mac that the company says emits no electric or magnetic fields (800/222-3003, $1395). (Wearing a lead apron is not a solution for pregnant women, as the weight could be harmful to a fetus.)

In the absence of governmental policies governing low-frequency fields, computer users can take some steps to cut down on potentially harmful VDT emissions. Since the computer's high voltage power source, the flyback transformer, is located in the back or the side of a VDT, the emissions are higher at the back of a terminal, and wall dividers are no protection. Computer users should sit at least 4 feet away from the back and side of any other terminal. Some experts recommend sitting 28 inches from your screen—but check with your optometrist to see whether this poses a vision problem.

In addition, groups such as NYOSHC recommend installing radiation filters over the monitor screen. Although filters do not block the entire magnetic field (they miss the pulsed, 60Hz field of greatest concern to some researchers), they do screen out part of it, as well as the electric and static fields. Filters should always be grounded—that is, come with a wire to attach to the screen ("an ungrounded filter isn't worth a tinker's damn," groused one radiation specialist). Research in Sweden and the United States has shown that static fields in front of a monitor cause ions and floating pollutants to assume a positive charge and head for the nearest negative ground—usually the user's face. This can lead to persistent rashes, but a good filter will cut the static fields down to almost zero. The NoRad Corporation of Santa Monica, California, says it is developing a filter to block the entire magnetic field, and hopes to have a product on the market by the end of 1989.

For the long term, Macintosh and other computer users may want to urge the government to do more comprehensive studies of VDT emissions and other low-frequency electromagnetic fields. As Paul Brodeur concludes in the *New Yorker,* "The de facto policy that power lines, electric blankets, and video display terminals are innocent until proven guilty should be rejected by sensible people everywhere. To do otherwise is to accept a situation in which millions of human beings continue to be test animals in a long-term biological experiment whose consequences remain unknown."

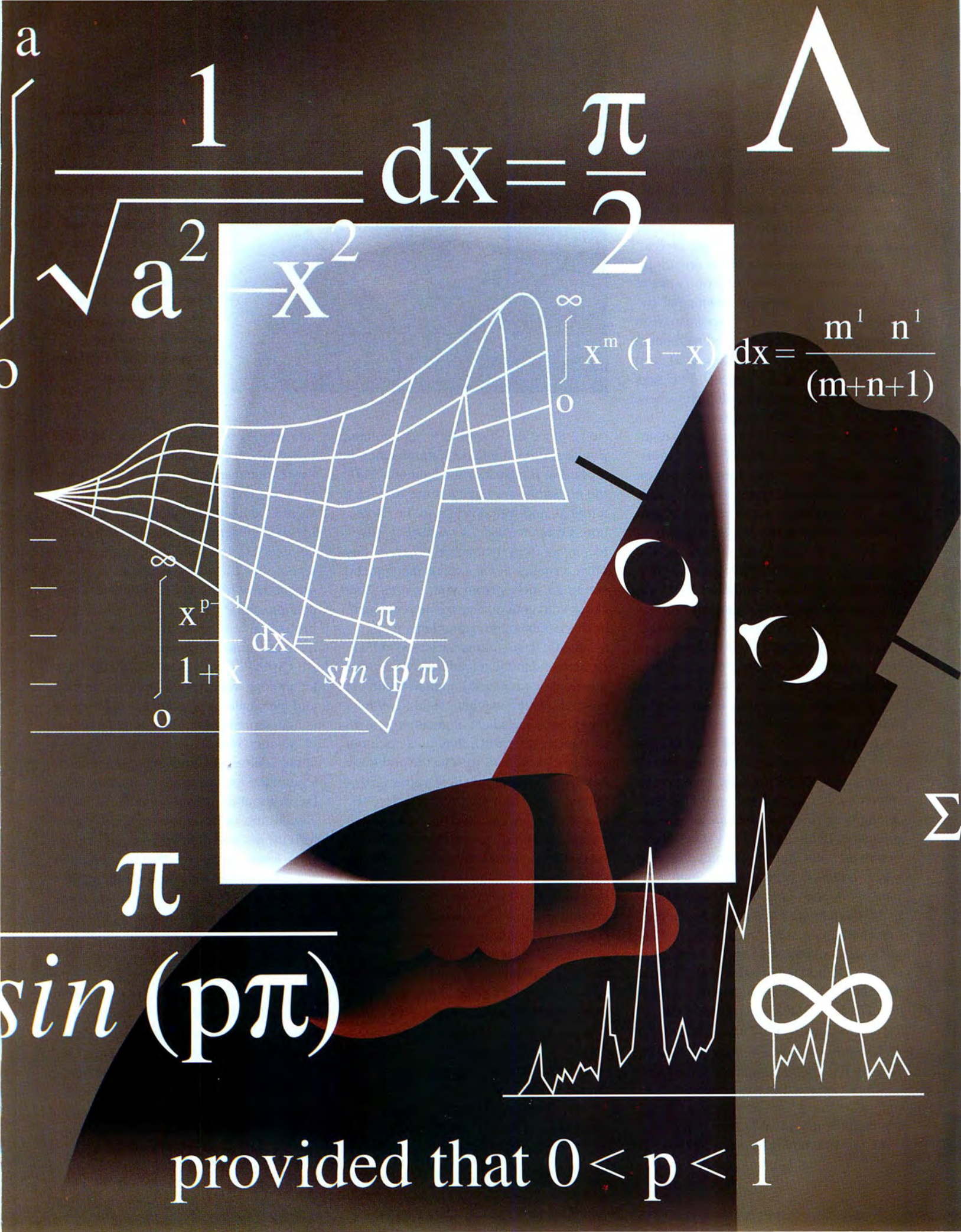
Given the speed at which the new technology was rushed onto the market and into millions of homes and offices, it is not surprising that the computerization of America should be attended by a host of unpredicted and unwanted side effects. In addition to maintaining a healthy skepticism about premature assurances that all is well, the most important thing Macintosh users—and their employers—can do is to learn to take on-the-job computer safety issues seriously. As RSI sufferer Rick Pearsall of US West says, "Take some precautions or you'll regret it. Unlike a computer, our bodies have parts that can't be replaced." ■



DAN ESCOBAR

"I may need to look for a new career," says journalist and Mac user Denise Caruso. When this was written, Caruso, who experiences "excruciating" pain in her hands, forearms, and fingers when she types, had been advised by her doctor to halt keyboard work for a month and to wear wrist braces at all times. She urges users to "start putting pressure on vendors" to design ergonomically sound keyboards and other equipment.

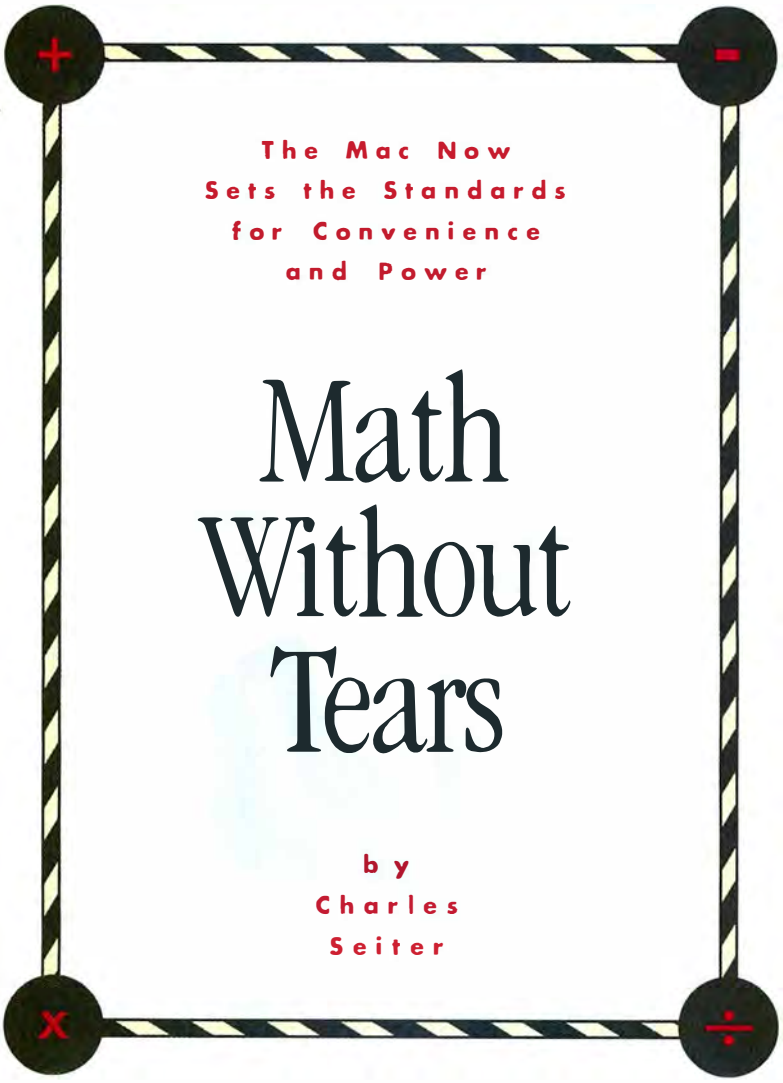
Diana Hembree, *a contributing editor at* Parenting *magazine, is currently on leave from the Center for Investigative Reporting, where she works as news editor. In 1987 she and a coauthor, writing for the* Columbia Journalism Review, *broke the story of widespread RSI among computer users in the United States. CIR associate Katherine Webster helped research this article.*


a
$\int_0$
$\frac{1}{\sqrt{a^2 - x^2}} dx = \frac{\pi}{2}$
Λ
$\int_0^\infty x^m (1-x)^n dx = \frac{m^1 \; n^1}{(m+n+1)}$
$\int_0^\infty \frac{x^{p-1}}{1+x} dx = \frac{\pi}{\sin(p\pi)}$
Σ
$\frac{\pi}{\sin(p\pi)}$
provided that $0 < p < 1$

STARING AT A PAGE scattered with math symbols is enough to drive most of us over the brink. Suppose you had a friend who could solve even the most labyrinthine differential equations with ease? What if that friend was willing to solve all your math problems? The friend might even tutor you—initiating you into the secrets of math arcana, correcting you when you err, and all with infinite patience. A fantasy? Not if you plug the newest math applications into your Macintosh.

Computers have long excelled at number crunching, but few realize that they now have the ability to crunch symbols, as well. Symbolic computer mathematics was developed in the 1970s for mainframes and minicomputers. Today the most powerful, easiest-to-use of these symbolic math programs are found on the Macintosh.

Educators and students are obvious beneficiaries of the emerging math technology, but an increasing number of professional mathematicians, physicists, and engineers are taking advantage of the new tools. From high school students to professors of astrophysics, there's something for everyone in the world of Mac mathematics. Read on for a guided tour of this surprising software universe.



Symbol Processors

Mathematica 1.2 has inspired a great deal of excitement in the math software market. Created by the celebrated Stephen Wolfram, the well-publicized product performs both symbolic and numeric computation, and it defines the standards for utility and accuracy in both areas. In addition, it is available in versions tailored to 386-based PCs as well as to Next, Sun, and many other workstations.

One of Mathematica's chief strengths lies in the fact that the American university community has developed add-on packages for the program. Covering topics that are not contained in Mathematica itself, these packages include such topics as general relativity and fluid dynamics.

Another feature that sets Mathematica apart from its competitors is its graphics capabilities. Mathematica produces publication-quality 2-D and 3-D graphs with detailed control of color, shading, and information content (see "MegaMath").

And Mathematica is comprehensive. It includes most of the facilities necessary for completing Ph.D.-level thesis work, as well as a careful interface to and from the programming base already existing in C and FORTRAN. (You can use C routines in Mathematica and Mathematica routines in C, for example.)

Finally, Mathematica comes with a 750-page book by Wolfram that is the best manual yet produced in this market. If you are working with symbolic math programs, this is not a trivial consideration. The quality of the manual is particularly important in this case because Mathematica's Help system deals only with the details of the Macintosh implementation—not with the intricacies of the program itself.

JON CHAN

Despite all these pluses, Mathematica may not be your automatic first choice for all math computing needs. If you simply need a little help with your freshman calculus homework, or you want to tally some figures to help you select electronic power-supply components, using Mathematica could be roughly equivalent to steering a 747 to your corner grocery.

Also, Mathematica 1.2 for the Mac II demands 4MB of RAM. (For convenient use with an SE or a Plus, you'll also need 4MB of RAM and, as with most math programs, a 68881 accelerator/coprocessor board.) And not much of this space is used for interface beautification; Mathematica operates on plain text commands, requiring that you pay attention to capitalization, spacing, and punctuation.

If you want nice-looking pages of math symbols, the manual suggests that you use its TeX (a popular academic typesetting program) export feature or other external printing support. The program can handle nearly any mathematical task, including beautiful printing of symbols and graphics, but mastering the program requires serious commitment. (For an in-depth review of Mathematica, see *Macworld,* December 1988.)

Maple 4.2, recently developed at Canada's University of Waterloo (the source of an amazing number of high-quality commercial software products, including leading Pascal and C compilers for IBM PCs), is Mathematica's strongest competitor. Notwithstanding its discouragingly austere interface—it is adapted to work on a large spectrum of workstations and minicomputers—Maple's amazing range of computation facilities is comparable to, and in several areas beyond, that of Mathematica.

Users with a programming background will recognize that Maple is rather like an interpreted version of C that includes the world's largest set of math libraries. The range of functions that comes with Maple is impressive (see "Symbolic Differentials"). There are special packages for differential forms, group theory, number theory, and routines for symbolic solution of ordinary differential equations. In addition, there is even a package offering calculus for students.

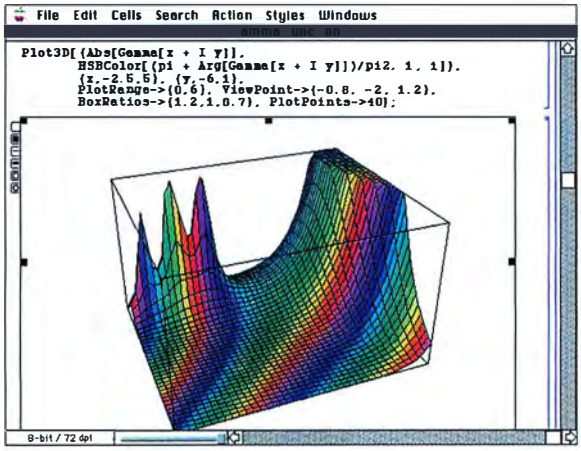
Like Mathematica, Maple employs text commands and offers you the option of formatting Maple files for symbol output using a variant of the ubiquitous TeX format. Similarly, graphics files can be saved or plotted as PostScript files using a variation on the usual plotting commands. As an alternative to TeX output, users of text-based programs may want to invest in one of the symbol processors designed for desktop publishing. These programs let you write out equations in symbols for inclusion in ordinary word processing and page-layout documents. (Three of these—Formulator, Expressionist, and MathType—were reviewed in *Macworld,* November 1989.)

The Mac version of Maple includes a cheery Mac-specific manual accompanied by a 400-page system-independent manual that barely has room to include a terse listing of all program functions. The online Help feature is equally concise, but it does offer a few useful examples of function use at each call.

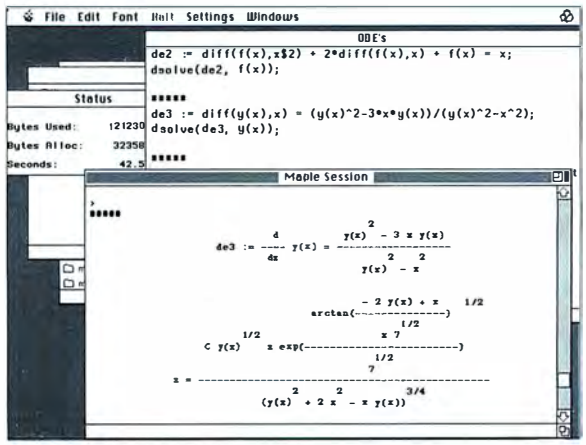
Maple does require nearly 8MB of hard disk space to operate properly, and it contains so many files that you will probably have to increase the space you normally allocate to the Finder. But it runs with 1MB of RAM, a distinct advantage for students or others with budget and memory constraints.

On a low-end system, Maple is much easier to use than Mathematica for many types of problems, and both symbolic and numerical calculations proceed with acceptable speed on a plain SE. If you don't require advanced graphics (Maple offers only a modest set of 2-D plots), but you do want to explore the full range of modern symbolic/numeric computation, Maple deserves serious consideration.

Theorist is an ambitious attempt to combine a real Mac WYSIWYG math-symbol interface with Mathematica-quality graphics and professional-level symbolic computation abilities (see "Coming Soon"). Developed by Prescience, the creators of Expressionist, the first release



MegaMath
Mathematica combines a huge repertoire of symbolic/numeric computational techniques with the finest graphics capabilities offered by any program. The command-driven interface is sometimes awkward, and the program demands 4MB of RAM, but for many advanced tasks it's the only choice.



Symbolic Differentials
Maple's plain-text interface is deceptive; it is a sophisticated program that rivals Mathematica in computational power. This screen shows Maple solving an ordinary differential equation (de3) symbolically.

of Theorist may be available by the time you read this. It is not as comprehensive in functionality as Maple or Mathematica, but the early versions tested by *Macworld* were significantly easier to use than Theorist's text-based competitors.

Student Symbol Processors

Milo was the first product to perform symbolic computation in real Macintosh style, using traditional math notation on screen (see "Critical Math"). This laudable convenience is somewhat offset by the program's limitations. In Mathematica or Maple, for example, you can simply type in an expression and count on the program's rule libraries and artificial-intelligence/pattern-recognition capabilities to direct manipulations. Milo, on the other hand, often expects you to select or formulate applicable transformation rules yourself. For repetitive problems in a well-defined area, this is acceptable and even efficient, and there are clear pedagogical advantages.

Milo does require more planning and labor than the high-end systems, but the solution to your calculus problem *will* look like the one in the book, and you may have a better understanding of how the problem was solved than you would with a totally automated system.

Besides owning Milo, Paracomp also owns the rights to a high-quality C-language mathematical library, and the company is currently working out an interface to use this library to boost Milo's modest rule base with these tools. (For more on Milo, see *Reviews*, *Macworld*, July 1989.)

PowerMath II 2.5 weighs in at a sleek 132K and has the distinction of providing a reasonable number of symbolic computation operations within the memory constraints of nearly all Mac owners. It performs symbolic differentiation and integration, does matrix manipulation, and solves sets of linear and nonlinear equations. Professional users with large tasks will probably find it too slow for convenient use, and engineers interested in numerical results will likely prefer one of the programs described below, but

MATH VISIONS

Visualizing often helps us to understand a complex math problem. While comprehensive programs like Mathematica can include most of the familiar graphing and plotting styles, most computational programs benefit from supplemental graphing packages. A great many of these are on the market; what follows is a nonexhaustive list of some of the more popular scientific graphing programs.

Lascaux Graphics produces some outstanding visualization aids: f(z) ($59.95), Fields and Operators ($59.95), and 4 Dimensional Hypercube ($24.95). New to the Mac, these programs are expressly designed to develop your intuition with problems involving functions of complex variables, vector calculus, and projections of geometrical objects in hyperspace on a plane. The ability to see the mappings of a complex plane directly often lets you guess solutions to whole classes of problems.

Another new program, DeltaGraph ($195, DeltaPoint), is capable of generating a wide variety of 2-D and 3-D graphics in color from spreadsheet or other tabular data, and it can be used for exploring functions in mathematics and for dazzling presentation-quality business graphics, as well (see "Plotting Away").

Other packages, designed mainly for graphing, offer general-purpose computational capabilities. If you have tables of experimental data and you want to explore them graphically (perhaps after a few simple data transformations), these programs may be a better choice than the symbolic/numeric math programs. Some representative current offerings are listed below.

Igor 1.1 ($195, WaveMetrics) is a 2-D plotting program with an emphasis on signal processing. Igor ("the scientist's assistant") offers Fourier and inverse Fourier transforms of data, curve fitting to a variety of waveforms, and a macro language for generating arbitrary transforms of data. This program offers quick calculation and plotting, with superior high-resolution LaserWriter graphics.

KaleidaGraph 1.1 ($179, Abelbeck Software) offers a respectable array of 2-D plots, combined with a pop-up RPN scientific programmable calculator for data transformation. A drawing tools palette and facilities for chart enhancement bolster this program's credentials for presentation graphics.

Passage ($200, Passage Software) for the Plus/SE and **Passage II** ($395) for the Mac II include *x-y* plotting, data smoothing, numerical integration and differentiation, and Fourier/inverse Fourier transformation of data series. Both programs offer polynomial curve fitting and algebraic data transformation; Passage II supports color and direct math coprocessor access for improved plotting speed.

Parameter Manager Plus 3.0 ($595, GenRad), is specifically designed for analysis of tabular experimental data, and it features an added-cost communications module that can control data-acquisition boards or download data from other peripherals. Besides more than 20 styles of scientific and statistical chart types and a command language with more than 100 functions, PM Plus lets you develop new chart types that can be saved as defaults for automated data analysis.

DScience ($495, Spectra Blue) is the largest of these programs and requires a Mac II or higher. DScience performs user-defined convolutions on data as well as Fourier operations and curve fitting. The program also offers statistics functions and can do matrix transformations of tabular data, either imported or entered in dScience's internal spreadsheet. Of the programs mentioned here, dScience alone can perform contour and surface plots—in color—of large (more than 100,000) sets of data points.

MacSpin 2.0 ($300, D^2 Software) is a specialist's program, developed exclusively for plotting multivariate data for 3-D viewing. Popular among statisticians for inspection of complex, clustered data sets, the program also allows algebraic transformation of variables and plotting of smooth functions in 3-D, as well as discrete statistical point sets.

NUMBER PROCESSORS

	Eureka: The Solver	MathCAD	MathView Professional	MatLab 1.1	TK Solver Plus 1.1
Company	Borland International	MathSoft	BrainPower	The MathWorks	Universal Technical Systems
Price	$195	$495	$249.95	$895	$395
System requirements	512K	1MB	512K	1MB	512K
Interface style	text	WYSIWYG	text	text	text
Platform compatibility *	1, 2	1, 2	1	1	1, 2, 3, 4
Matrix operations		•	•	•	†
Standard transcendentals	•	•	•	•	•
Special functions		10	20	12	17†
FFT	•	•		•	†
Integration		•	•	•	†
ODE solution		•	•	•	†
Statistics functions		9	12	15	19†
Graphics					
2-D plots	•	•	•	•	•
3-D plots		•	•	•	•
Color		•		•	
Graphic output formats					
PS				•	
EPS				•	
PICT	•			•	•

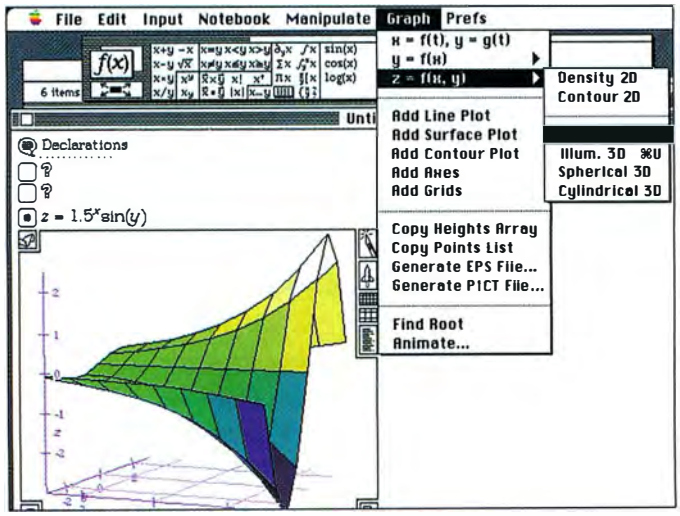
** 1 = Mac; 2 = PC; 3 = VMS; 4 = UNIX.* *† TK Solver Plus uses special program files to accomplish these functions.*

PowerMath II's leisurely pace has great educational value—you can watch how the program derives its answers as it lists each intermediate step on the screen, one step at a time.

Number Processors

MathCAD 2.0, a successful program for IBM PCs and compatibles, is now available on the Mac. Although programs ported from the PC frequently offer a disappointing plain-text interface, MathCAD has almost every nicety you could wish for: symbol menus, in-document scalable plotting regions with 3-D plots, and WYSIWYG equation representation for easy production of reports (see "What You See"). Using the symbol and operator menus, you construct problems in familiar math notation and direct their solution with a few simple commands from the Calc menu. The attractive and well-produced documentation could meet the standards of Claris or Microsoft, a rare circumstance for science and engineering software.

The basics for engineering and physics calculation are included in MathCAD, along with a helpful set of expandable examples based on textbook engineering problems, such as beam bending and anharmonic vibration. MathCAD also handles numerical calculation on complex numbers, vectors, and matrices; it performs iterative calculation (automatic repetitive calculation stepping through a series of test values) in several styles; and it solves linear and nonlinear equations. The program also includes packages for statistical calculation and for Fourier and inverse Fourier transforms. The calculation speed is acceptably optimized—Fourier transforms of several thousand real data points and inversion of a 10 × 10 matrix both take less than 3 seconds on a Macintosh IIx.



Coming Soon
Theorist, slated for release at the end of 1989, attempts to combine color graphics, symbolic computation, and palette-based WYSIWYG equation entry.

I say less than 3 seconds because the program's screen refresh is quite slow and inconsistent; it is possible that the calculations are significantly faster than you can detect from observing the screen. Also, the program often leaves statement fragments lying scattered on the screen, forcing you to issue the Redraw command. A complex screen full of symbol or plotting elements invariably takes several seconds to redraw, even on a IIx. This infelicity in the implementation of an otherwise attractive program should have been fixed before release.

MatLab 1.1, geared mainly for the kind of matrix computation needed by electrical or structural engineers, appears at first glance to be a specialist's program. In practice, a wide variety of problems in applied mathematics can be recast as matrix problems. One benefit of the MatLab approach is that it encourages MathWorks (MatLab's creator) to optimize the matrix computational algorithms for each computer: on a Mac IIx, MatLab takes two seconds to invert a 50 × 50 matrix or to Fourier transform 4096 complex data points. This is nearly 40 percent faster than MatLab's performance on a Mac II. No other program discussed in this article can approach MatLab for sheer numeric throughput.

The originators of the program have the refreshing honesty to call the Plus/SE version Edu-MatLab, seemingly indicating that they intend it for demonstration purposes only. This modesty is almost misleading—the SE version of MatLab can handle matrices nearly as large as the maximum size specified by MathCAD and at speeds that no other firm would find embarrassing.

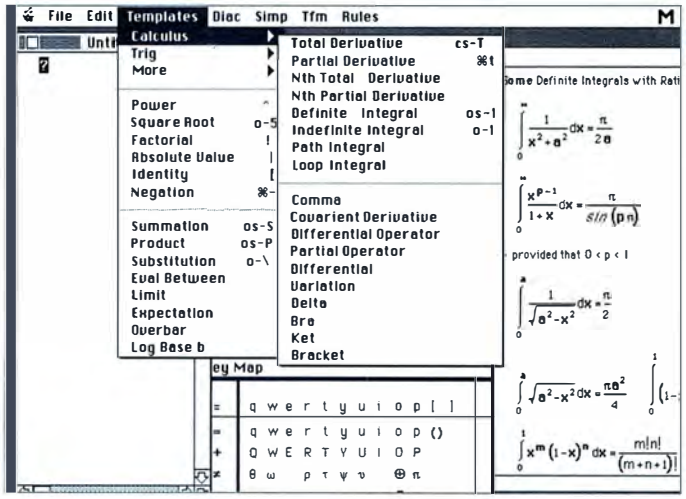
MatLab features a built-in programming language that is used in the interactive mode and is also used to construct scripts called M-files that automate processing of batch computations (see "And the Number Is"). Besides the expected matrix operations—inversion, factorization, eigenvector/eigenvalue calculation—MatLab offers regression, a library of signal processing functions (filtering, FFT), functions of mathematical physics, and numerical integration; and it solves nonlinear and differential equations. Although it is not emphasized in MatLab's documentation or advertising, the program is generally faster on most examples at unconstrained optimization and at solving systems of nonlinear equations than TK Solver Plus and Eureka (discussed below), programs that ostensibly specialize in just these functions.

The program allows you to create graphics, including 3-D mesh and contour plots, which can be saved as PICT or PostScript files. And you can enhance MatLab with three different toolboxes covering different aspects of linear and nonlinear systems theory. These are high-level professional packages for use in design of control systems and circuits. They're not for everyone, but as vertical-market software, they do represent a significant bargain.

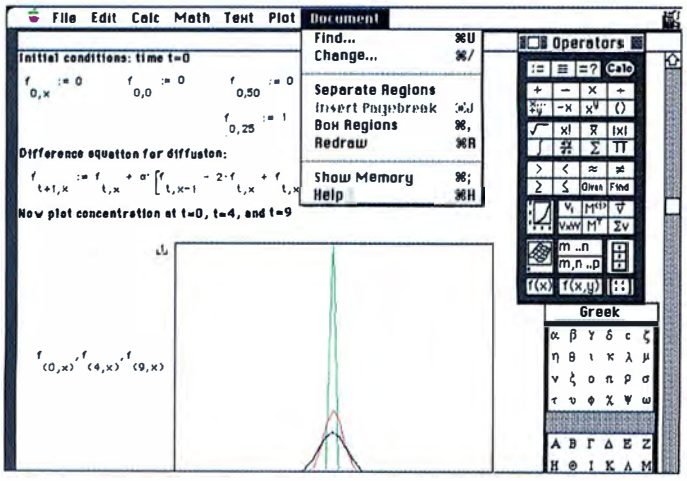
TK Solver Plus 1.1 is the latest incarnation of a program that dates back to the dawn of personal computing. There were several versions of TK well before there was a Macintosh, and these days TK can be used with most minis and personal computers.

In the TK vision of the world, all computations are at heart spreadsheet computations. The program forces you to define your problem in terms of a set of variables on one sheet; the rules connecting the variables on another; and functions, units, lists of various types, and plots on still other sheets (see "Multiplatform Advantage"). Although the TK format seems restrictive at first, it actually imposes a useful discipline on problem organization, a discipline that becomes particularly important when you are working on large engineering problems with dozens of variables in odd units.

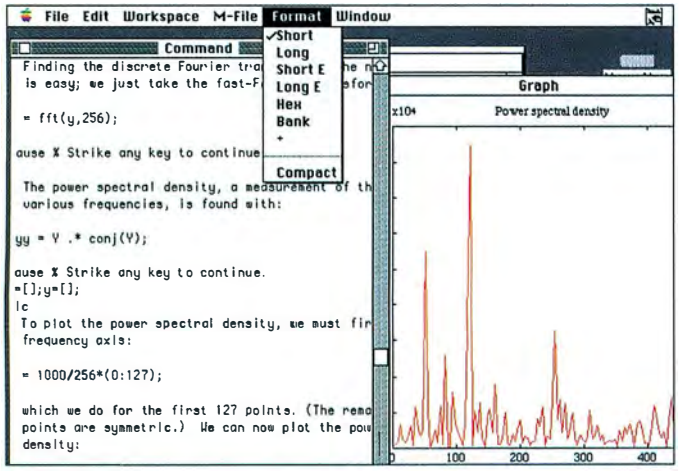
Because it is not always obvious how some types of problems should be set up in TK, the program package provides a library of examples that cover numerical

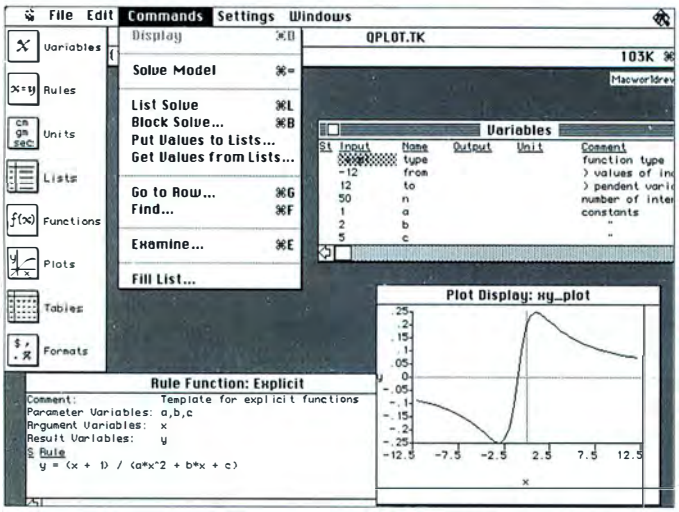


Critical Math
Milo offers symbolic computation with a WYSIWYG interface. Although it lacks the giant rule bases offered by Maple and Mathematica, it's an easier program to use for undergraduate-level problems.



What You See
At present MathCAD is the only numerical math package with a WYSIWYG interface, mixing graphs and equations (in symbols) on document pages. MathCAD offers a wide range of facilities and, as you might expect, superior report generation.





And the Number Is

At vector, matrix, and signal-processing computation, MatLab is the champion for numeric throughput. MatLab can be extended through toolboxes to cover a wide range of engineering topics.

Multiplatform Advantage

TK Solver Plus is the Mac version of a heavyweight engineering equation solver that is popular on platforms from UNIX to the PC. One of its attractions is the extensive set of add-on rule libraries for engineering specialties.

differentiation, matrix math, the use of TK's large library of built-in advanced functions, statistics, financial applications, and a variety of engineering computations. Similarly, one can buy Solverpacks for most areas of mechanical engineering, electrical engineering, architecture, and finance. If most of your work concerns calculating variations on a theme in a well-defined area, these special packages can be a cost-effective productivity tool.

Ambitious users willing to learn a new style of programming can use TK Solver Plus to mimic many of the aspects of an engineering expert system in which a matrix of IF-THEN-ELSE statements and logic-valued functions make decisions about which computational paths to pursue. The less ambitious may be content with purchasing canned programs.

Eureka: The Solver is a less formidable solver-type program available in PC and Mac versions from Borland International, a major force in PC databases and programming languages. Basically Eureka focuses on solving sets of linear and nonlinear algebraic equations, and even a beginning user can accomplish these functions after only a few minutes of practice. Eureka has a respectable graphing function, including an interactive zoom, and it is singularly adept at preparing reports for summaries of calculations.

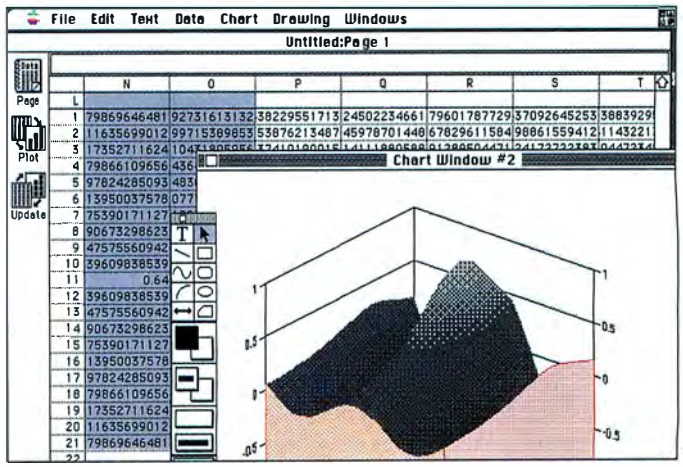
Thirty scientific and financial functions are included as part of Eureka's programming language, and an array of examples demonstrate how to solve problems from undergraduate physics through linear programming. Although Eureka is more limited in scope than a general-purpose equation processor such as MathCAD, Eureka features a particularly robust solution algorithm (less-capable algorithms can hang up with poorly considered initial values). Eureka provides you a relatively compact, low-cost way to add equation-solving to your software repertoire.

MathView Professional, the oldest of the programs discussed here, can't really be viewed as a MathCAD competitor. Lacking a programming language, MathView is more like the world's most sophisticated scientific calculator. It's as though you designed a calculator with buttons for all the topics in Abramowitz and Stegun's famous *Handbook of Mathematical Functions* and then threw in seven buttons for numerical integration in different styles and six more buttons for solving differential equations.

It offers most common types of statistical distributions, matrix operations, and routines for solving partial differential equations. Completing the package, MathView offers function plotting in 2-D and 3-D. While the interface seems basic by current standards, the underlying routines are as sophisticated as any except

Plotting Away

DeltaGraph is a new package that lets you plot spreadsheet or other tabular data in a vast variety of formats, supplementing the capabilities of graphics-poor computational programs.



MatLab's; and MathView can invert matrices and sum series as fast as MathCAD.

Summing Up

Mac users now have access to all the mathematical power tools—from simple engineering aids to symbolic computation systems capable of proving theorems in automata theory—produced by university computer science and engineering departments. Before choosing from among these applications, however, please note that one of the main investments you will make is time. It is more efficient to learn a single software package that can handle your work load over the next few years than it is to juggle three or four different programs that deal with distinct classes of problems.

If you use this guideline, the choices are fairly clear. For algebra, calculus, and upper-division college work, Milo works well; Maple and Mathematica can handle nearly anything up to the very cutting edge of contemporary research (the choice between the two depends on your hardware platform and graphics ambitions). When Theorist arrives, nestled somewhere between Milo and Mathematica, it promises to be another serious choice.

Among the numerical programs, MatLab is the undisputed choice for computation-intensive engineering work; TK Solver Plus offers the advantage of solution packages for business and finance, as well as a list of engineering topics. MathCAD has the only general-purpose numerical math system that exploits the Mac interface for communicating results in reports.

The pioneers in math program development wanted to produce an intelligent blackboard, a system that could understand symbolic equations and carry out computations according to a library of rules. In varying degrees of thoroughness and efficiency, this goal has been reached, and the Macintosh has evolved into the ideal platform for such programs.

As Macs incorporate more memory and faster CPUs and math coprocessors, we can expect WYSIWYG versions of the major symbolic math programs and ever larger rule libraries for the smaller programs that are already symbol based. Our ability to solve complex mathematical problems is being extended phenomenally. Even today, with just a little exposure to the software, we can accomplish math tasks that required the talents of a near-genius only a decade ago. ■

SYMBOL PROCESSORS

	Maple 4.2	Mothemotico 1.2	Milo	PowerMath II 2.5
Company	Brooks/Cole Publishing Company	Wolfrom Research	Porocomp	Central Products Corporation
Price	$395	$495 (standard) $795 (Moc II)	$249.95	$149.95
System requirements	1MB/hard disk	4MB/hord disk	512KE	512K
Interface style	text	text	WYSIWYG	text
Platform compatibility *	1, 3, 4	1, 2, 5, 6	1	1
Symbols				
Polynomials	•	•	•	•
Power series	•	•	•	•
Differentiation	•	•	•	•
Integration	•	•	•	•
Algebraic fractions	•	•	•	•
Analyticol solution of equations	•	•	•	•
Matrix operations	•	•	•	limited
Tensors	•	•		
Group theoretical operations	•	•		
Differential forms	•			
Analytical solution of ODEs	•	•		
Programming				
Procedural	•	•		
Functional		•		
List processing		•		
Numerical evaluation				
Integer functions	15	17		
Matrix operations	•	•		
Standard transcendentals	•	•	•	•
Special functions	39	35		
FFT	•	•		
Integration	•	•	•	•
ODE solution	•	•		
Statistics functions	15	5		
Graphics				
2-D plots	•	•	•	•
3-D plots		•		
Color		•		
Graphic output formats				
PS		•		
EPS		•		
PICT	•	•		

* 1 = Moc; 2 = 80386 PC; 3 = VMS; 4 = UNIX; 5 = Sun; 6 = VAX.

See *Where to Buy* for contact information.

***Charles Seiter** has been studying symbolic computation since the appearance of MACSYMA, and he was a beta tester for most of the programs in this article.*

A review of 1989, the year the Mac turned five, prosperity beckoned, and plenty of other stuff happened

Middle-Aged Crazy



IF YOU FIGURE THAT COMPUTER YEARS ARE LIKE DOG YEARS—EACH ONE THE EQUIVALENT OF SEVEN IN A HUMAN'S LIFE—THE MACINTOSH TURNED 35 AT THE BEGINNING OF 1989 AND HIT 40, THE SEPTEMBER OF ITS YEARS, JUST AROUND THE TIME THE LEAVES STARTED DROPPING. AND SURE ENOUGH, THE SIGNS OF MIDDLE AGE WERE EVERYWHERE IN THE WORLD OF MACINTOSH. CONSIDER ITS LIFE SPAN: PULLED FROM THE WOMB (AFTER A PERILOUSLY LONG INCUBATION) IN 1984, BABY MAC WAS BARELY ABLE TO PERFORM THE FUNCTIONS OF LIFE. IN 1985, A SOMEWHAT GANGLY ADOLESCENT ACQUIRED ITS FIRST HARD DRIVE, ALONG WITH A FEW PIECES OF FUNCTIONAL FURNITURE—MICROSOFT WORD AND A FEW OTHER SOFTWARE OFFERINGS—AND SET OFF TO MAKE ITS WAY IN THE COLD WORLD. THE BIG BREAK CAME JUST AT ADULTHOOD, 1986, WHEN THE MAC MATURED INTO A MAC PLUS CONNECTED TO A LASERWRITER RUNNING PAGEMAKER. ITS TWENTIES WERE HEADY TIMES, BUT WE COULD DETECT A MORE SERIOUS

by Steven Levy

PIERRE YVES GOAVEC

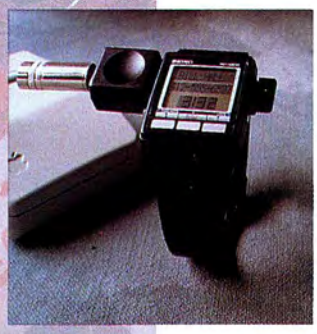

1989
1988
DECEMBER
APRIL
MADE IN U.S.A.



RICK FRIEDMAN

Yes, I Like the Computer Thing, John, but Can It Recite the Pledge of Allegiance?

George Bush attends a Sculley speech to high-school students in January and calls Sculley "a great achiever."



Useless Product of the Year

WristMac



BETTMAN ARCHIVE

You Never Give Me Your Money

The Beatles sued Apple Computer, claiming that the computer company, by incorporating music technology in its products, violated an agreement with the moptops' recording label, Apple Corps, Ltd.

side coming to the fore in 1987 and 1988—the thirtysomething years—when the software base stretched for miles, the Mac II was introduced, and Mac started courting impressive partners like Digital Equipment Corporation.

In 1989 the Mac, with a touch of distinguished gray (OK, platinum) at its sideburns, was finally as prosperous as its parents hoped it would be. Its tastes became more worldly; it now drove around in a powerful 68030 processor, and when it came to internal memory, external storage, and even screen size, its earlier accommodations seemed strictly grad-school issue. Luxury was the Mac's reward for its success.

But strange things often happen at this point in life. As soon as you pause to bask in the warm glow of achievement, you become aware of the cold draft of eternity blowing from the other direction. We all die eventually, and many of us have been known to spend a few of our middle-aged years going, well, a little batty as we come to terms with the prospect. Why shouldn't a computer go through the same stage?

It's easy to identify the pathology: On one hand there's an urge toward caution—so as not to jeopardize previous gains. On the other hand, there's a certain latent panic that things have to be *done* because tomorrow, you're dust. On the job, of course, the Mac is better than ever. But everywhere you looked in the world of Macintosh, there was a hint of instability—a middle-age crisis that added an air of mild hysteria to 1989.

Year of the CPU, and the CPU, and the CPU Apple promised us we'd have a lot of new Macintoshes this year, and they delivered a bushel. Put it this way—if Isaac Newton had been sitting under the Apple Computer tree, he'd have needed a crash helmet.

Did we need all those Macintoshes? Who knows? They just kept coming. They all seemed to have a few things in common, though. The processors were generally the Motorola 68030. The floppy drives



THE YEAR IN ICONS

were the HDFD SuperDrives, which store up to 1400K of data and can read MS-DOS–formatted disks as well as Macintosh disks. In almost all cases, the new computers were designed to be nearly as inexpensive to produce as the earlier, lower-power models. And not one computer was a dud: all of them provided some feature or capability that users desired.

Thus, while one message that came through clearly was that Apple was committed to constant improvement on the Macintosh line, an unintentional message was also transmitted: Don't rush out to buy a new Mac, because in two or three months Apple might announce something better. Just ask the folks who plunked down premium bucks for a Macintosh II, orphaned just as surely as if its parents, like young Bruce Wayne's, were gunned down on a street corner.

The SE Turns 30 In January Apple gave us the SE/30. This logical evolution of the original Mac had the essential accoutrements of the Macintosh IIx—namely the 68030 chip, a math chip, and the superdrive. As long as you didn't mind the small screen, this was obviously the Macintosh to buy. In fact, one day this will probably replace the SE itself.

Mac in a Box The most significant new computer, though, was unveiled in April in a hitchless coast-to-coast press conference. This was the Macintosh IIcx (notice how dull and middle-aged these computer names are?). The IIcx obviously is destined to be the new workhorse of the line, thus assuring that it won't be supplanted for at least a year or so. It's a more compact version of the Macintosh IIx, elegant, powerful, and with the aura of a winner. Apple couldn't make enough of them, which turned out to be a problem when sales of other models sagged while people waited for IIcx's.

Later in the year, Apple introduced an enhanced version of the IIcx, the IIci. With its 68030 processor running at a clock speed of 25 megahertz, the ci cost $1600 more than the cx, which means you're paying about a hundred bucks for each additional megahertz. But to get a really significant speed gain, you have to add a cache card and a video card. Only then can you sleep soundly, secure in the knowledge that you have the most powerful Mac—so far.

Significantly, Apple did not unveil any machine that attempted the jaw-dropping pyrotechnics provided by its prodigal founder, Steve Jobs, with his Next computer. Like most baby-boomers reaching middle age, Mac is waiting for its biological clock to reach midnight before it conceives the offspring that will supplant it.

At Long Last Laptop The most heralded introduction, though, was that of the Macintosh Portable. Apple had been stalling Mac users for years, insisting that it wouldn't introduce a laptop until the technology was up to Apple's standards. Well, the Portable *is* a breakthrough product, especially in terms of screen resolution and power-conservation technology. But at $6500 and 15.7 pounds, it's the Roseanne Barr laptop—you need a big lap and lots of money.

Meanwhile, those looking for less-opulent laptops could consider third-party options like the Wallaby, a $3000 system that uses the ROM chips from an existing Mac Plus or SE to power a very nifty 9-pound computer with a clear LCD screen. Or you could do what everybody else does—stick the standard Macintosh in a case and watch the damned movie while you're on an airplane.

Buzzword of the Year When it was not shoveling new machines into the pipeline, Apple was hawking something called desktop media, also referred to as multimedia or desktop MTV. Most of John Sculley's speeches revolved around this concept and seemed to be aimed at sparking a new boom as big as the celebrated desktop publishing explosion. Apparently not everybody at Apple shares Sculley's optimism, however: as evangelist Jim

NOVEMBER 1988



WriteNow 2.0 ships



AppleFax ROM upgrade tries to fix bugs

DECEMBER 1988



Dataquest reports Apple shipped more PCs than IBM in '88



First Next machines ship



Apple buys Coral Software

JANUARY



Apple sales drop, as do RAM prices



Sculley defends his strategies at stockholders meeting



SE/30 introduced

FEBRUARY



Apple announces rebate program



Beatles sue Apple Computer



Wingz ships, finally



RAM prices continue to drop

MARCH



Apple forced to drop prices



Apple announces IIcx



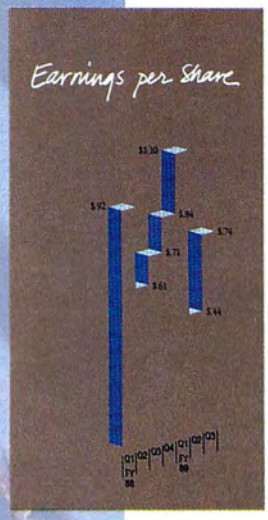
Technical market slumps—Microsoft stock falls 14 percent in one day



BETTMAN ARCHIVE

Jobs, Jobs, Jobs

Things are looking up for Steve Jobs. In 1989 he not only signed financing and distribution deals, but actually shipped machines.



Most Unreadable Mac-Generated Charts

The set of avant-garde bar graphs included in Apple's 1989 third-quarter report. You have to stare at it for about an hour before you can see how sales relate to income and earnings. Of course, Apple didn't intend it that way, we're sure.



DAN ESCOBAR

Trashy Video of the Year

Industry gadfly and Apple groupie Chuck Farnham, whose hobby is gleaning inside information from Apple, is preparing a documentary on beating Apple security.

Armstrong told *MacWeek,* "It will take another three or four years before multimedia is in the mainstream, so we don't want to build expectations."

No matter; multimedia is infused with sizzle, the quality that pumps adrenaline to a middle-aged heart. And so companies began claiming that their products were part of the multimedia revolution—whatever *that* was. Among the firms that piggybacked on the Apple push were a number of so-called information providers, ranging from *Newsweek* to ABC to Time Warner.

Boardroom Blues Apple executive offices in Cupertino must have been a very interesting place in 1989, at least during the rare times when half the people weren't on sabbatical. After all, according to Dataquest this was the year Macintosh sales figures surpassed those for IBM PCs. It was also the year when continued reorganizations by Apple commander in chief Sculley culminated in a company organized around polar opposites—product manager Jean-Louis "The Dark Prince" Gassée and a newcomer from an insurance company, Apple America head Allan Loren. Somewhere along the line, Apple management, which had been acquiring a reputation for genius, lost its luster.

Some of the actual blunders—a misjudging of the crisis in memory chips, and the oafish fourth-quarter price increase—occurred in 1988. But it was in 1989 that Apple had to answer for them. Earnings were lower than expected and critics were so numerous that John Sculley bitterly remarked to the *New York Times* that "Apple-bashing is in."

Interface Wars (continued) One of the bashers' favorite topics was Apple's insistence on pursuing a lawsuit against its largest software supplier, Microsoft, on the grounds that Microsoft's Windows software running on the IBM PC infringes on Apple's copyrighted Macintosh operating system. For those keeping score, there were two rulings on the case this year; one



THE YEAR IN ICONS

(continued)

going in Apple's favor and the other going in Microsoft's.

Battening Down the Hatches And for those who savor the rambunctious Apple culture that flourished in Mac's youth, there was yet another worry: the director of security at Apple, a former G-man, instituted an "Information Protection Program." In response, a group calling itself nuPrometheus got hold of part of the priceless code of the Mac operating system and sent it to a few journalists.

We never did get to find out whether the group had all the codes, because the magazines earmarked to be the intermediaries between the bandits and their would-be beneficiaries refused to run the ads upon which the information-drop scheme depended. Considering Apple's hacker roots, though, there was a certain delicious irony to the company's plan to seal itself from outsiders. The whole episode ranks up there with another revisionist classic of 1989—Jefferson Airplaner Grace Slick explaining that the famous line "feed your head" really meant "go home and read a book." Grace was kidding, though.

Thanks for Everything Apple honchos designated 1989 the Year of the Customer, and promised better support. The only tangible sign of this was a letter sent to all registered Mac users—the first ever—giving them information on various upgrades available for their equipment. In general, Apple's attitude toward its customers was still characterized less by handshakes than by the back of the hand. Product warranties remained at 90 days instead of the industry standard of a year. Meantime, for those who wanted to keep their Macintoshes current, Apple's upgrade prices were still prohibitively high.

Can't Beat the System Breaking tradition, Apple announced its new system software—System 7.0—almost a year before its scheduled release sometime in 1990. Developers and customers welcomed the chance to plan ahead, and there was much drooling over some of the promised features: virtual memory, an improved Finder, outline fonts, tear-off menus, and a new print architecture. Once all the smoke clears and the software developers bring out new releases with System 7.0 in mind, perhaps the most useful advance will be interapplication communication, which makes it possible for one program to instantly update documents in other programs; if you change the wording of a story in your word processor, the changes will show up in the page-layout software as well.

Of course, the system will have its price—it won't work with less than 2 megabytes of RAM, and you'll certainly want more. And cynics say that Apple announced it early—before it could say for certain all the features that will be included—more to preempt Adobe Type Manager and IBM's Presentation Manager than out of an urge to help customers. But we won't complain—unless this agreeable announcement becomes a persistently vaporish dream.

Software: The Ships Come In Speaking of vaporware, this is the year some long-delayed products finally stumbled to the finish line. We recall hearing, back when we were sitting on Granny's knee, announcements about products like Wingz, Microsoft Word 4.0, and the second release of 4th Dimension. Well, Granny's long buried, but in 1989 we finally got to see these beauties in shrink-wrap. What a trend—actually shipping products!

In other software news, there was no product that did to . . . well, anything, what VisiCalc did for spreadsheets. But plenty of people were trying to think one up.

Hardware: So What Else Is New? The wonderful, expensive world of color grew in importance this year, with the introduction of zillions of monitors, 24-bit boards, and even printers. No one introduced a cheap CD ROM drive, but the base of ROM disks grew slowly and stead-

APRIL

- IBM announces Mac clone priced at $1000
- Mac II, IIx sales drop due to demand for IIcx
- MACdex show at Spring Comdex flops
- Apple slashes Mac prices to schools
- 32-bit QuickDraw ships
- Microsoft Windows sales match Mac sales
- Word 4.0 ships, finally

MAY

- Demand for IIcx outstrips supply
- System 7.0 unveiled to developers
- SuperCard ships
- Adobe announces Adobe Type Manager
- Microsoft stock recovers

JUNE

- nuPrometheus sends out Mac source code
- Apple sends off its Year of the Customer letter
- Canon invests $100 million in Next
- Microsoft ships first Mac software on CD



DRAKE SOREY

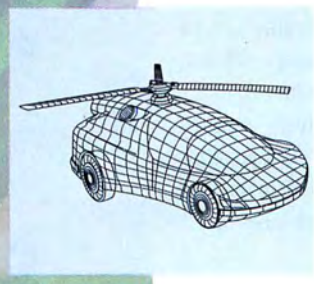
Heigh-Ho, Knowledge Navigator!

At January Expo in San Francisco, Kinetics brought a costumed Clayton Moore, the original TV Lone Ranger, to promote its LAN Ranger product, and gave out black masks.



But John, Tell Us What You Really Think

Adobe head John Warnock called the Apple-Microsoft font technology announcements "the biggest bunch of garbage and mumbo jumbo I've ever heard in my life."



It'll Never Fly

Apple's new advertising campaign has a story line about how some hotshot guys in marketing use desktop media to sell their bosses on the idea of a combination car-and-helicopter. Right.

ily, more on faith than on logic. Atari founder Nolan Bushnell finally found his way to the Mac, introducing MicroTV, a product that opens a window for television in your Mac II; its real significance is that it opens the Mac to all sorts of goodies broadcast over the airwaves.

PostScript printers got cheaper, just as Apple was shooting torpedoes at PostScript. And Hewlett-Packard introduced an ink-jet printer especially for the Mac, thoughtfully boosting its price to reflect the willingness of Mac people to throw their money away.

Competitor's Corner If the year had its ups and downs for Apple, consider the plight of its competitors. IBM, still plagued by clone competition, had the embarrassment of being passed by the Mac in sales; and its Presentation Manager, which is supposed to make DOS more Mac-like, is still not fully implemented. Compaq Computer, though, had another strong year, and overall the MS-DOS installed base still dominates the personal computer world.

In the workstation market, potential Apple rival Sun Microsystems experienced its first quarters in the red. But it was a good year for former Apple chairman Steve Jobs's Next Computer, which not only arranged a distribution deal with Businessland and got financing from Japan, Inc. (in the form of Canon), but actually shipped machines. Watch out.

Font, Font, Font (Till Daddy Takes the PostScript Away) But the biggest story involved the convoluted triangle of Apple, Microsoft, and Adobe. And we do mean convoluted. Take a deep breath and try to follow this: Apple used to love Adobe—the two of them made PostScript a page-description language standard. But last May, just about the time Adobe was announcing its Type Manager software (which would eliminate screen and printout jaggies), Apple jilted Adobe, saying it would no longer plan its future around PostScript. But (as the violins play in the background) that



THE YEAR IN ICONS

(continued)

was not all. In September, at the Seybold Publishing Conference, Apple and Microsoft (deep sounds from electric organ) announced an alliance: Apple will use Microsoft's Bauer PostScript clone, while Microsoft will be adopting Apple's new, open standard—a font technology codenamed Royal—that could supplant PostScript. Talk about a royal screwing! This forced Adobe chief John Warnock, who was looking like Meryl Streep after the dingo got her baby, to take the extraordinary step of releasing the previously top-secret specifications for Type-1 fonts. The font wars had gone ballistic, and unbelievably enough, the winners will possibly be the users, who eventually stand to benefit from the cheaper and more accessible standards.

In the Army Now The thrill we used to get when we saw a Macintosh on the desk of some celebrity, or even a suspendered Fortune 500 knowledge worker, is no longer there. The Macintosh is now a noncontroversial purchase. But it is news when Macs invade entirely new markets. Like the federal government. In 1989, we saw Macs purchased in bulk by NASA, the Postal Service, and, in a contract that could bring Apple $800 million in five years, the air force. Maybe helping nukes hit their targets wasn't what Andy Herzfeld had in mind, but after all, a "realistic" attitude toward business as usual is another typical sign of middle age. On the other side of the balance sheet, Apple gave a bunch of computers to the Peace Corps.

All in all, a good year for the Macintosh, if not a totally triumphant year for its manufacturer. Be thankful that the Mac, unlike many of its would-be competitors over the years, survived long enough to suffer a midlife crisis at all. Fortunately, the song we'll be humming as middle age progresses won't be "Only the Good Die Young." Instead, something appropriately smug, if somewhat prematurely senile—maybe the Barry Manilow classic, "Looks Like We Made It." ■

Steven Levy, contributing editor and resident Iconoclast, has been covering—and using—the Macintosh since its release six years ago. He still enjoys both pursuits.

Take This Year, Please

MISSING IN ACTION

Lotus 1-2-3 Macintosh	Mac clones
dBase Mac	The low-end Mac
Trapeze	HyperCard 2.0
MindWrite	Desktop presentations
WordStar for the Mac	Commercial HyperCard stacks
AppleLink Personal Edition	The Apple-DEC alliance
Studio/32	Macazine
Aba Software	MacGuide
Borland International	Macintosh Business Review
AST Research	

INVASION OF THE FAULTY POWER SUPPLIES

A study by Intelliquest of Austin, Texas, compared the preferences of Mac users to those of folks using MS-DOS. It found that unlike MS-DOS users, Macintosh people prefer Porsches to Cadillacs, would rather spend Sunday afternoon computer hacking than watching football, and choose horror films over comedies.

PRODUCT NAME OF THE YEAR

Word Torture, a series of HyperCard stacks that drill users in languages, among them Russian.

THE ANSWER TO THE QUESTION, WHATEVER HAPPENED TO THE SIXTIES?

Apple threw its fifth-anniversary party for the Macintosh at the site of the old San Francisco rock palace, the Fillmore.

PRODUCTS FROM HELL

The Apple Fax Modem
The ImageWriter LQ Printer
FlashTalk
Quantum 80-megabyte drive

THE FIVE PERCENT SOLUTION

"We don't have enough arms and legs to provide support directly," said Morris Taradalsky, explaining Apple's self-sufficiency policy. He estimated that customers and dealers should provide 95 percent of support themselves, leaving only the remainder as Apple's responsibility.

JULY

Apple recalls 40MB and 80MB hard disks numbered 00335507 to 01250863

CompuServe buys The Source

Apple fits SE with superdrive, cuts list price

Apple sells Adobe stock for $90 million profit

AUGUST

Apple ships Token Ring card and announces phase II AppleTalk

RasterOps releases $1000 24-bit color board

SEPTEMBER

Apple announces Portable, IIci

4th Dimension 2.0 finally ships

Microsoft and Apple announce font technology alliance

Adobe agrees to share PostScript hinting secrets

OCTOBER

Apple's year-end report: Sales soar but profits don't

Japanese government charges Apple in price-fixing scandal

NOVEMBER

Old-guard exec, and former Apple president, Del Yocam leaves

Object-Oriented Programming

by Brita Meng

What's the hottest idea in Macintosh programming? Hints: Apple thinks it's so important that engineers are writing the System 7.0 Finder with it. The development environment for the Next computer is based around it. The answer is object-oriented programming, or OOP, and it has been hailed as one of the most important building blocks of next-generation software.

From a programmer's perspective, OOP simplifies development of large, complicated software applications by making code easier to understand and maintain. This means that programmers can think more about how an application should work—and less about writing it.

For users, OOP means better applications—more accurate, flexible, and extendable than those currently available. Because OOP makes programming easier, it allows end users a chance to customize existing applications or develop new ones. Users can combine applications and exchange information between those applications, or control several applications with a script.

The World Is an Object

Now that you know the whys of OOP, let's take a closer look at the concept with an example: HyperCard and HyperTalk. Yes, HyperCard's language, HyperTalk, is an object-oriented language. In fact, if you've done any HyperTalk programming, you've already used some basic OOP principles.

The fundamental building block of OOP is the *object*. An object combines information and any operations that can be performed on that information into one single bundle. (In OOP lingo, this bundling is termed *encapsulation;* the operations are *methods*.)

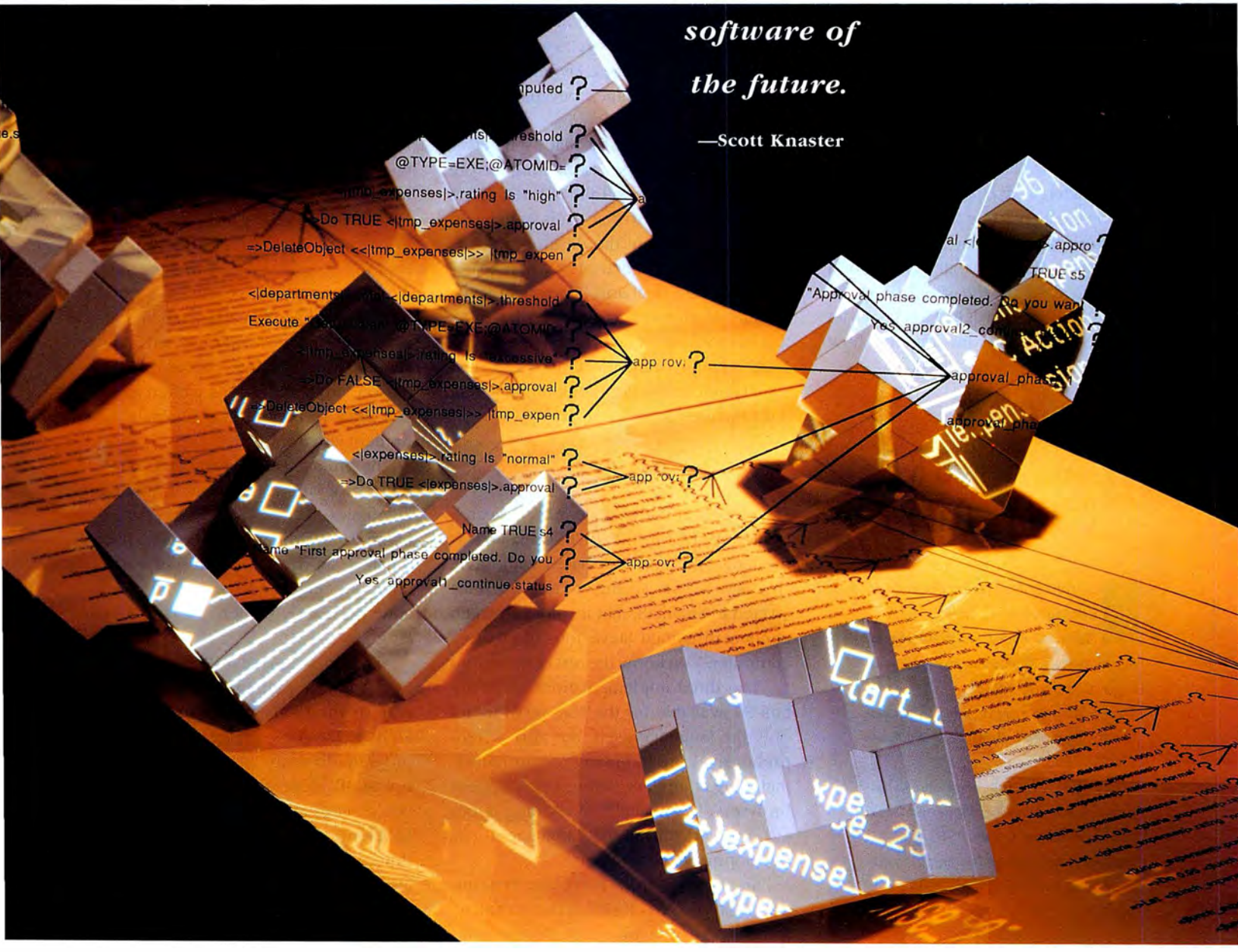
An object performs one of its methods when you send it a *message*. The important thing is that the message doesn't have to tell the object *how* to do something, only *to* do it. So, to get a HyperCard button to highlight when a user clicks on it—one of its methods—you simply check a box. Doing so sends a message to the button object telling it to perform that operation. The object interprets the message and is responsible for finding and executing the appropriate method. You needn't write anything that tells the button what steps to take to highlight itself, you just ask it to highlight.

Think of objects as computer chips—small modularized units with built-in sets of instructions to perform small operations, ready to be combined into a larger program. For example, a background, card, field, and button are all

LUIS DELGADO LISTINGS COURTESY OF NEURON DATA INC

Many of us believe in the promise of OOP to help bring about the great software of the future.

—Scott Knaster



objects in HyperCard that come with sets of instructions to do things—highlight, scroll, and so on. Put those objects together with customizable scripts, and you create a stack, which is itself an object. You'll get an idea of how much easier OOP makes programming if you imagine trying to write the visual effects available in HyperCard yourself.

Family Trees

Two other features of OOP help ease the programming burden. First, objects that respond the same way to a particular message can be grouped into classes. That way, you don't have to describe the message behavior of every object separately. For example, there are several different types of buttons (opaque, transparent, and so on) in HyperCard, but they all react the same way to messages. As a result, buttons are a class.

Second, one class of objects can *inherit* characteristics from another class. When you create cards in a stack, they can inherit properties from background cards. Any buttons, fields, or graphics on a background card do the same thing, or look the same, on a card. Just as classes let you avoid describing one by one how similar objects behave, inheritance means you don't have to start class descriptions from scratch.

Object-Oriented Languages

To take advantage of OOP features, you need a programming language or toolkit that supports them (see "OOP Languages and Tool Kits"). There are essentially three types of OOP languages.

Pure OOP languages provide all four object-oriented capabilities: encapsulation, message passing, inheritance, and user creation of classes. Hybrid languages offer object-oriented extensions to traditional procedural languages such as C or Pascal. Finally, languages that don't permit full use of inheritance and/or classes are called object-based languages. HyperTalk is an object-based language, because it has only five classes.

Apple's—and thus the Mac's—involvement with OOP goes back long before HyperCard and HyperTalk. In fact, objects are second nature to Mac users. When you select an icon from the desktop and the file menu suddenly activates, you're experiencing OOP firsthand, Macintosh style. Thanks to that object-oriented heritage, there is a variety of OOP languages for the Mac, ranging from old standbys to new visual languages (see "Programming OOP with Pictures").

Pure OOP

Developed at Xerox Palo Alto Research Center (PARC) in the 1970s, Smalltalk is the language most associated with OOP. (In fact, it was seeing a user interface written in Smalltalk that inspired a certain gentleman named Steve Jobs to create a computer. You know the rest of the story.)

The three implementations of Smalltalk-80 available for the Mac provide not only the language itself, but also a comprehensive programming environment, including compilers, debuggers, and class browsers. In Smalltalk, everything is object-oriented—from the language to its development environment.

Smalltalk-80 from ParcPlace Systems, a spin-off of Xerox PARC, is the complete, standard version of Smalltalk (not surprising considering ParcPlace's origins). Digitalk's Smalltalk/V Mac offers a subset (about 80 percent) of the Smalltalk language. And finally, there is Apple's unsupported version of Smalltalk-80 version 0.4; it is still being sold through the Apple Programmer's and Developer's Association (APDA), but Apple has no plans to update the language.



UNC CORNELL

To write PhotoMac, a color correction and separation application for desktop publishing, programmers at Avalon Development Group in Cambridge, Massachusetts, took advantage of MacApp, Apple's application framework.

Hybrid OOP

As revolutionary as Smalltalk is, the language still hasn't made tremendous inroads into the world of commercial-application development, primarily for one reason: any applications written in Smalltalk must run within the Smalltalk development environment.

In order to take advantage of OOP, then, programmers are turning to hybrid languages. Because they are based on familiar programming languages, hybrids mean a shorter OOP learning curve. In addition, programmers can still use any code previously written in a hybrid's base language.

Hybrid languages offer a choice between programming the old-fashioned way or the OOP way. You can use the OOP extensions all the way through a program, in some part of the program, or not at all, depending on the application you're coding. Flexibility can present a problem, however. You're not forced to think in terms of objects—as you are in Smalltalk. It's up to you to decide when an object-oriented approach is appropriate and when it isn't. Bouncing back and forth

WANT MORE ABOUT OOP?

For further information about OOP, see the following books.

***Object-Oriented Programming for the Macintosh*, Kurt Schmucker, Hayden Book Company, 1988.**

***Object-Oriented Programming: An Evolutionary Approach*, Brad Cox, Addison-Wesley, 1986.**

***Smalltalk-80: The Language and Its Implementation*, Adele Goldberg and David Robson, Addison-Wesley, 1983.**

***The C++ Programming Language*, Bjarne Stroustrup, Addison-Wesley, 1986.**

between OOP and traditional programming can get complicated, especially for large applications.

Pascal

Apple's Object Pascal is actually Apple's second hybrid extension to Pascal. (The first was Clascal, the development language for the Lisa.) With Apple's presence behind it, Object Pascal has become the standard OOP Pascal hybrid on the Mac.

Standard Pascal has four structured types: arrays, sets, files, and records. To permit OOP, Object Pascal adds a new type, objects. An object is similar to a record in that it can consist of several fields; however, it also contains its own private procedures and functions—its methods.

Three products support Object Pascal. Macintosh Programmer's Workshop (MPW) Pascal from Apple is an Object Pascal compiler designed for use with MPW—Apple's integrated development environment, or *shell*. You can buy the compiler and shell separately or bundled through APDA.

Hybrid OOP languages are based on familiar programming languages like C, Pascal, and LISP

Another compiler is TML Systems' TML Pascal II. TML Pascal runs under the MPW shell. Unlike MPW Pascal, the shell comes automatically bundled with the TML Pascal compiler.

The compiler in Think Pascal version 2.0 from Symantec also supports Object Pascal. Included with the compiler is the Think development environment, which comes with debugging aids and a syntax-checking editor.

C

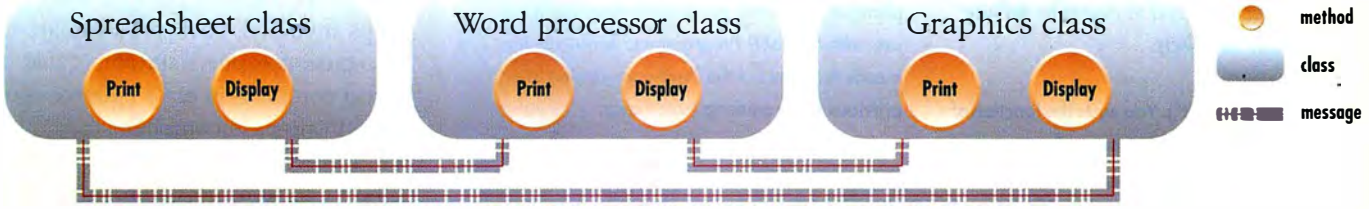
While there are at least four object-oriented extensions to the C language, C++ from AT&T Bell Laboratories (also the birthplace of C) appears to be the Macintosh standard. Apple has made a strong commitment to C++; software engineers

OOP vs. Traditional Programming

Traditional Program



Object-Oriented Program



Traditional programs (code and data) and object-oriented programs (objects and methods) differ greatly in structure. It is much more difficult to add functionality to a traditionally structured application than to one created with OOP.

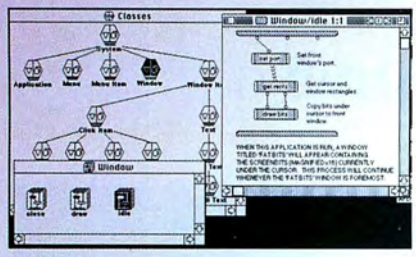
For example, take a word processor that allows you to incorporate graphics and spreadsheet tables into a document. In a traditional application, the programmer starts with a word processor core and adds code for displaying and printing graphics, and for displaying and printing tables. This approach presents several problems. Adding more code makes the entire application larger and slower. Also the application supports only those graphics and spreadsheet formats that the programmer has written code for. Should a new format become popular, the programmer has to go back into the application and write new code specifically to support that format.

An object-oriented word processor, meanwhile, treats data as objects, whether they are text, graphics, or spreadsheet tables. The objects themselves incorporate methods for displaying or printing. All the main word processing application has to do is send the graphics or spreadsheet object a message to display or print itself. To add support for a new graphics format, the programmer need rework only the graphics object. The main application remains untouched. Because an application created in OOP is modular in nature, you can easily add graphics capabilities to a spreadsheet, or word processor capabilities to a graphics program.

PROGRAMMING OOP WITH PICTURES

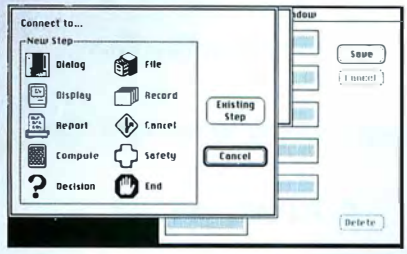
When Steve Jobs introduced the Next computer, in October 1988, one of the most striking demonstrations he did wos to program an OOP application simply by dragging icons and linking them. Within the past year, the Mac has garnered its share of visual OOP programming languages.

In many ways, Prograph from TGS Systems represents a visual alternative to MacApp. Prograph's Application Builder features a hierarchy of system classes that correspond to the major user interface elements of a Macintosh application (see "A Class Act"). You write the function of an application (a word processor, for example) in Prograph's visual language. You then combine the main application code with the user interface by defining methods for menu items and windows.



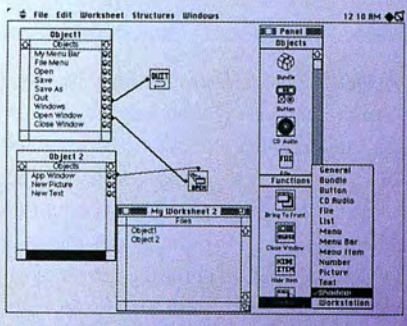
A Class Act
Prograph's language combines dataflow, object-oriented, and visual techniques; the icons are language elements you connect together to write a program. You work with the Application Builder's ready-made set of classes by defining new methods for objects.

Maxem Corporation's Cause is a visual, object-based programming language geared primarily to nonprogrammers. It breaks down programs into two parts, resources (like classes) and steps (like methods). You use the resources—windows, files, reports, and items—to design the look-and-feel of a program, then link them with steps like compute, display, or dialog (see "Step by Step"). Cause is especially good if you're interested in designing a simple, custom database. Maxem also offers a version of Cause for the IBM PC, so you can run programs on both the Mac and the PC.



Step by Step
Once you've defined a resource in Cause, you have to tell it what do do; for example, the Save button in the window needs to be told what should happen when it's highlighted. To connect the File step (which can save a file) to the button, just click on the file icon.

Serius89 from Serius Corporation comes in two versions, Serius89 Programmer and Serius89 Developer. Serius89 Programmer is similar to the Interface Builder available on the Next machine, in that you link previously written objects, buttons, and menus to create an application (see "Putting It All Together"). Serius89 Developer, which is analogous to the Next Application Kit, allows you to write new objects for use with Serius89 Programmer; Serius recommends that users of the Developer version have previous programming experience.



Putting It All Together
To assemble an application in Serius89, you link functions to objects—such as the items in a menu bar. When you compile that application, you can even draw an icon for it.



CHRIS SEWARD

David Smith, programmer of the game Colony, is using the OOP capabilities of Symantec's Think C to write a new, real-time, three-dimensional CAD system.

are using it to write future system software. Another object-oriented extension to C is worth a passing mention even though it's not available on the Mac. Objective-C from Stepstone forms the basis for the Next's development environment (see "What's Next?" *Macworld*, January 1989).

There are differences between the OOP implementations for Object Pascal and C++. First, unlike Object Pascal, the OOP cornerstone of C++ isn't a new data type. Rather, AT&T chose to extend a current C data type called STRUCT.

Second, you can't necessarily just compile C++ code to generate an application. In some cases, C++ is really a C preprocessor. That means C++ source code has to be translated to C source code and then compiled. Because there are two steps involved, such products are called two-pass compilers. Products that allow direct compilation of C++ source code are called one-pass compilers.

Two versions of C++ exist for the Mac. One is Glockenspiel C++ for A/UX, Oasys's version of the UNIX operating system.

In October, Apple introduced its version of MPW C++, a two-pass compiler. It includes Apple's version of AT&T's CFront 2.0 C++-to-C translator. MPW C++ fully supports AT&T's language definition, and includes some enhancements to support the Mac and Object Pascal functions.

Symantec, meanwhile, opted not to wait for the translator, making Think C version 4.0 the first Mac C compiler to offer object support and a C-based class library. The object extensions in Think C are actually a subset of C++, and provide OOP classes, methods, and inheritance.

(This subset is often referred to with tongue in cheek as C+–.) Because it is a subset of C++, classes of objects written in Think C can be used in C++ programs.

Other Languages

It's not surprising that OOP hybrids exist on the Mac for a variety of traditional languages besides Pascal and C. Both Macintosh Allegro Common Lisp from APDA (formerly Coral Software's Allegro Common Lisp) and ExperCommon LISP from ExperTelligence provide object-oriented extensions to LISP programmers under MultiFinder. Franz's Allegro CL offers the same capabilities under A/UX. There's even Quintus Prolog, an object-oriented extension to Prolog available from Quintus Computer Systems.

Apple's language Object Assembler, available as part of MPW Assembler, provides class definitions for the Motorola 68000 assembly language. Object Logo, a language that extended OOP to Logo, was another Coral Software product acquired by Apple; at this writing, it is unclear if Apple intends to continue selling it. HMSL from Frog Peak Music is an object-oriented extension to FORTH specifically written for experimenting with MIDI synthesizers.

Don't Call Us, We'll Call You

Languages that support OOP offer powerful tools for writing better applications. But the real power of OOP appears when application tool kits are available for an OOP language. For example, HyperTalk—the language—is nice, but it's HyperCard—the tool kit—that really lets you do things with HyperTalk. Tool kits like Apple's MacApp offer a framework around which you can build an application.

MacApp is a complete, self-contained application that implements most of the Mac user interface. Essentially, MacApp gives you all the common user interface elements you'd otherwise have to write correctly on your own. It has menus that pull down and windows that scroll, it works with desk accessories, and it prints on the ImageWriter and LaserWriter. MacApp even knows that after you choose a menu item, Undo should reverse it.

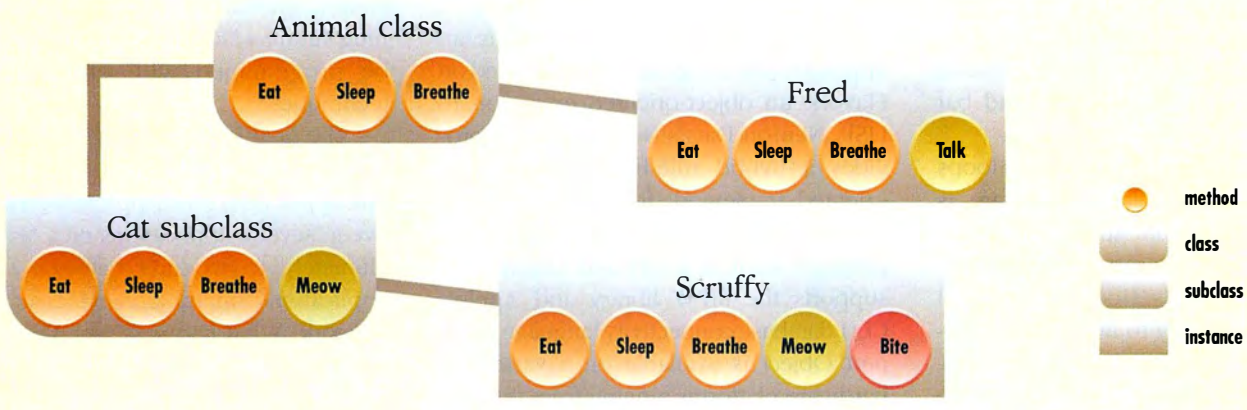
What's left for you to do? What you want the application to do. Think of building a bookshelf. MacApp provides the wood and nails, but everything else—how wide, the number of shelves—is up to you. MacApp itself is written in Object Pascal. You combine and link MacApp's

OOP application tool kits like MacApp make programming easier by providing objects that implement the Mac user interface

window, menu, and other objects with your own Object Pascal code. This still isn't a trivial task, but it is a lot better than starting from scratch.

There are some limits to MacApp. It can only build applications—not DAs, INITs, or F-keys. MacApp increases the size of an application built with it by 40K to 50K, as opposed to an application not built using it. And the number of objects

Inheritance Explained



Inheritance lets objects that have the same behaviors (called methods in OOP) share code. Here the Animal class has three methods: eat, sleep, and breathe. Cat, a subclass of Animal, inherits all three Animal methods, and adds a method that distinguishes it from all animals—meow. Any object belonging to a class (or subclass) is called an instance of that class. Scruffy, an instance of Cat, can meow (a method inherited from the Cat subclass), as well as eat, sleep, and breathe (methods inherited from the Animal class). Fred, another instance of Animal, shares the Animal class methods eat, sleep, and breathe. But not being an instance of Cat, Fred doesn't meow.

it can handle is limited. Nevertheless, using MacApp means that you can spend more of your programming time working on the function of an application than on its interface.

Although Symantec has announced its intent to support MacApp with Think Pascal, the only compilers that currently do are MPW Pascal and TML Pascal II.

Apple is planning future Mac environments that must be programmed with object-oriented techniques

Apple has provided the ability for MPW C++ code to interact directly with the next release of MacApp.

Symantec has developed its own Think Class Library (TCL), which comes complete with Think C, for C programmers. TCL implements all of the standard Mac user interface components and behaviors, such as windows, menus, controls, and palettes. Special items such as floating windows and tear-off menus are also provided. In addition, Invention Software offers an object-oriented source code library called Object GrafPak that works with Think C. With Object GrafPak, you can customize an application to generate color line graphs, scatter plots, and bar charts, among others.

Another application framework, Hoops Graphics System from Ithaca Software, is available on Macs; on Apollo, Sun, and Digital Equipment Corporation workstations; and on IBM PCs. Hoops contains all of the tools necessary to build 2-D and 3-D interactive graphics applications, including rendering capabilities. Currently, the only Mac language Hoops supports is Think C.

MetaCourier from Symbiotics is an object-oriented programming tool for networking. It allows Mac application developers to write programs that can access resources—databases, expert systems, and spreadsheets—on other computers such as the VAX and IBM PC via Ethernet.

OOP LANGUAGES AND TOOL KITS

Name	Vendor	Base Language	Price
Allegro Common Lisp	Franz	LISP	$1500
Cause	Maxem Corporation	n/a	$295 personal version
ExperAction	ExperTelligence	n/a	$795 professional version
ExperCommon Lisp	ExperTelligence	LISP	$995
Glockenspiel C++	Oasys	C	$795
HMSL	Frog Peak Music	FORTH	$150
Hoops Graphics System	Ithaca Software	n/a	$575
HyperCard/HyperTalk	Apple Computer	n/a	comes with Mac
MacApp	APDA	Pascal	$100
Macintosh Allegro Common Lisp	APDA	LISP	$495
MetaCourier	Symbiotics	n/a	$900
MPW C++	APDA	C	$175
MPW Pascal	APDA	Pascal	$150
Nexpert Object	Neuron Data	n/a	$5000 development version
Object GrafPak	Invention Softwore	C	$199.95
Prograph	TGS Systems	n/a	$195 interpreter (compiler available Q1 1990)
Quintus Prolog/MacObject	Quintus Computer Systems	Prolog	$495
SeriusB9 Developer	Serius Corporotion	n/a	$495
SeriusB9 Programmer	Serius Corporotion	n/a	$295
Smalltalk-80	ParcPlace Systems	Smalltalk	$595
Smalltalk-80 version 0.4	APDA	Smalltalk	$75
Smalltalk/V Mac	Digitalk	Smalltalk	$199.95
Think C	Symantec Corporation	C	$249
Think Pascal	Symantec Corporation	Pascal	$149
TML Pascal II version 3.0	TML Systems	Pascal	$195

ExperTelligence's ExperAction is an application-development system based on Flavors, an object-oriented extension to LISP. Neuron Data's Nexpert Object provides a hybrid rule-based and object-oriented framework for building expert systems. It can link to standard database products such as Excel and Oracle, and supports the MPW library and Apple's CL/1 database connectivity language. Nexpert Object is available on a variety of hardware platforms ranging from the Mac to UNIX workstations.

Looking OOPward

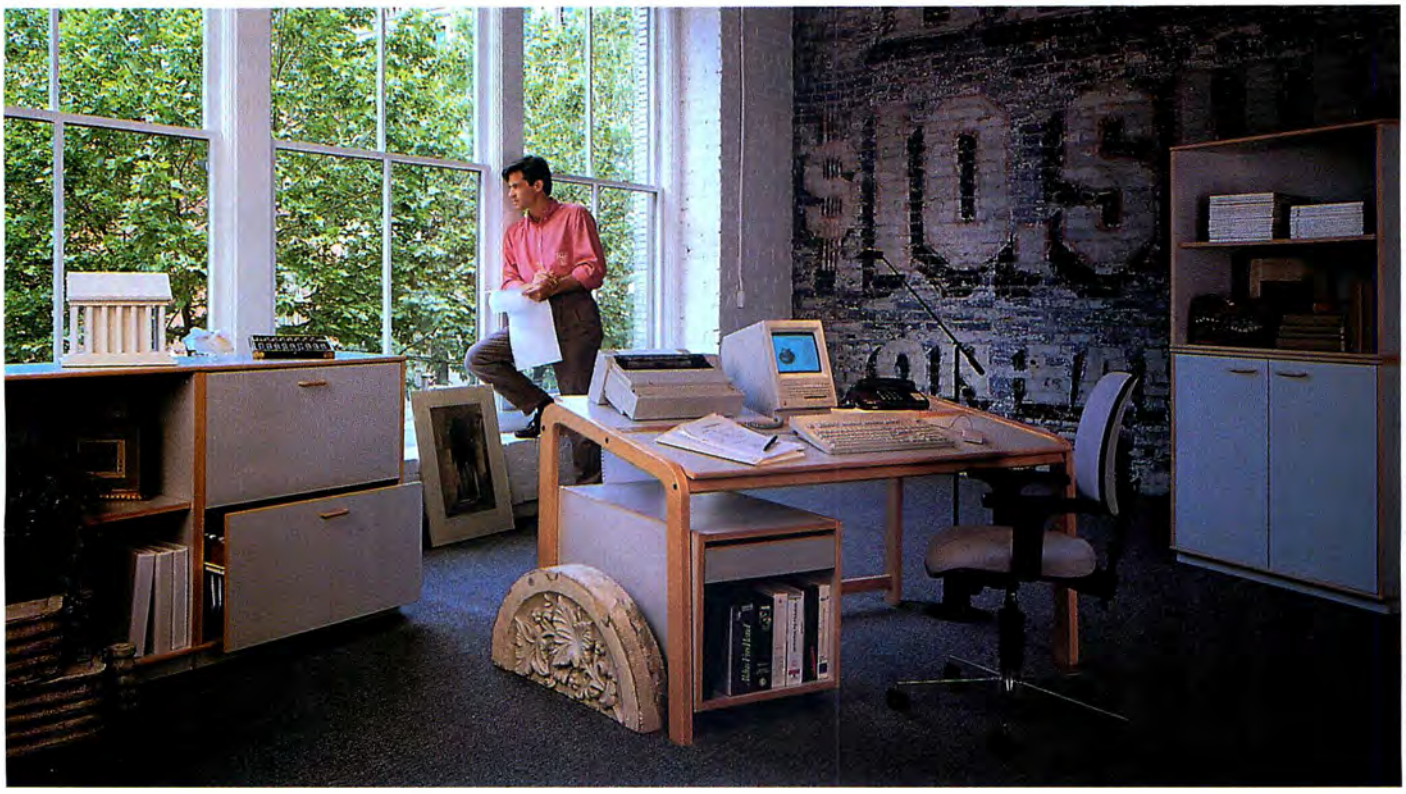
"Apple has made a long-term commitment to OOP," according to Jean-Louis Gassée. Indications are that object-oriented programming will become an even more integral part of Macintosh system software. Indeed, Apple is planning future Mac environments that must be programmed with object-oriented techniques.

The goal is to extend the Macintosh's OOP framework—from working within one application (MacApp), to working between several applications on a Mac, and ultimately to working between several applications on multiple Macs across a network. What happens with that framework is not only up to developers but also users.

Working with OOP requires learning a different style of thinking. But the power of relatively limited OOP environments like HyperCard shows how quickly anyone can build an application, given the appropriate framework. ■

See *Where to Buy* for contact information.

The table Apple would have designed, had they gone into the furniture business.



Any company with the vision to create a product as elegant and useful as the Macintosh® would have hit it big in any industry.

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Like the Macintosh itself, the MacTable was created to put information at your fingertips, quickly and easily. We accomplish this by thinking of the workspace not as an inflexible monolith, but as a network of individual surfaces onto which you can place each of your Mac components, like your printer, modem, external drive, mouse, even manuals. Everything with plenty of elbow room, easily within reach, and there when you need it.

Next, each surface tilts to optimize your eye-to-screen and hand-to-component efficiency. Rest assured that as your comfort increases, so does your productivity.

Finally, there's the overall design — sleek, contemporary, and mindful of the future of your computing needs. Because MacTable's surface panels can be arranged, your workspace can accommodate any model of Macintosh, from the Plus to the Mac II . . . to who knows what.

Surprisingly enough, all of this Mac-like versatility and European beechwood framing is more than affordable: only $299 for MacTable and $139 for the optional roll-away cabinet (doubles as a Laserwriter stand); $279 for the matching, ergonomically balanced chair; lateral file cabinet $239; bookshelves $119; and two-door cabinet $159.

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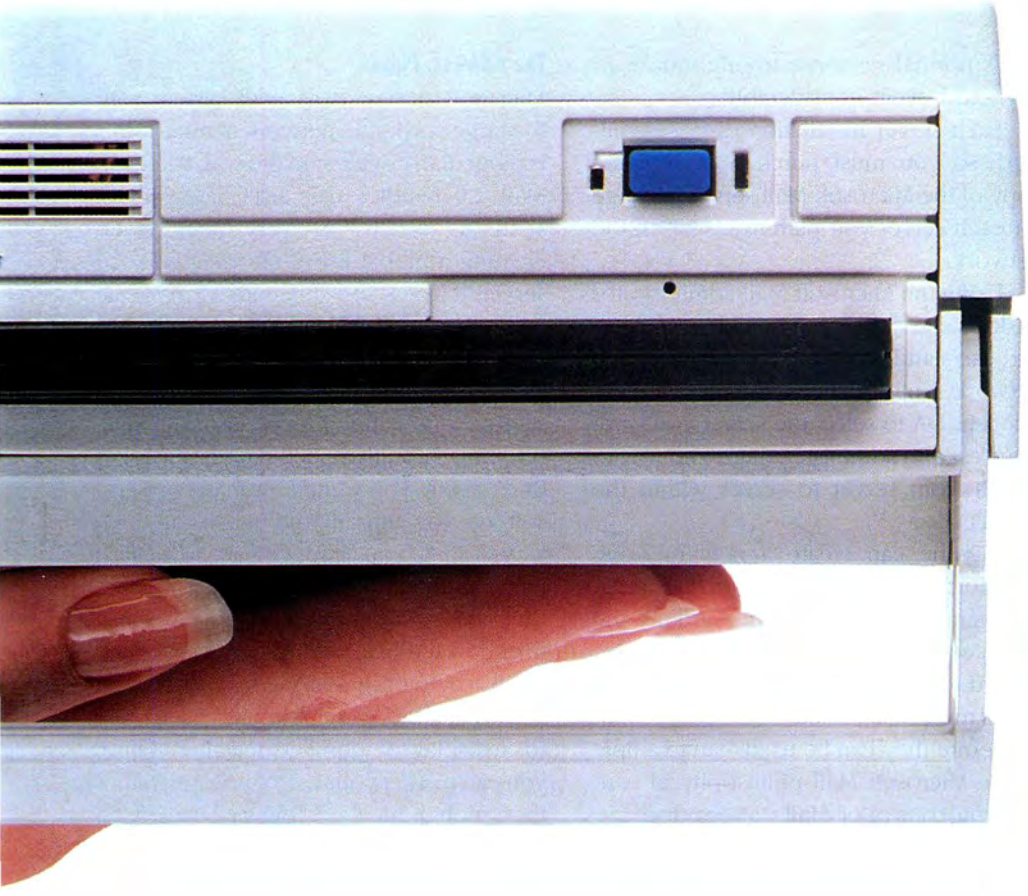


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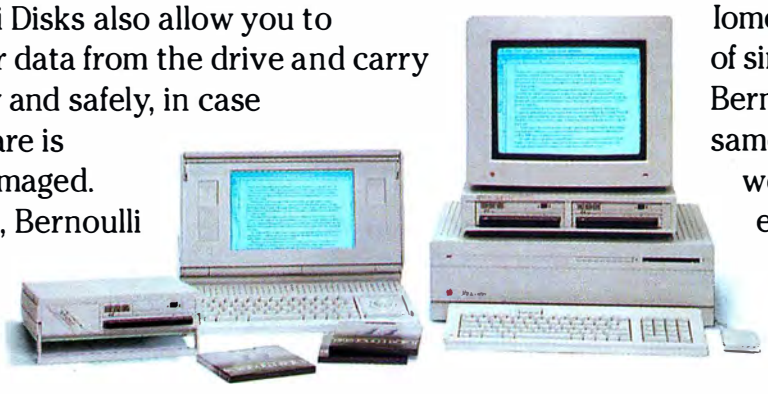
The portable computing world isn't very forgiving. The moment you grab your portable computer and walk out the door, your data is at risk. One bump. One wrong step. One clever thief. And your valuable data could be gone forever. But thanks to the rugged, removable design of the new Bernoulli Portable 44 for Macintosh,® you'll never have to face that prospect.

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Circle 260 on reader service card

REVIEWS

MICROSOFT MAIL 2.0

Electronic Mail Program

Pros: *Servers forward mail automatically; fast searches for user names; local and global address lists simplify addressing; network administration DA; links to Microsoft Word and Microsoft Excel; saves space by storing only one copy of multiple-address messages.* ***Cons:*** *No user-defined address lists; only one enclosure allowed per message.* ***Company:*** *Microsoft Corporation.* ***Requires:*** *Mac 512KE; AppleTalk network.* ***List price:*** *Server starter kit $395 (includes software for one server and one user); each additional user $125; 20-user pack $1495.*

A new generation of electronic mail has finally arrived from Microsoft. Microsoft Mail 2.0, which was based on an acquired product, InterMail, is a rewritten mail package that exhibits the simple look of InterMail but few of its problems.

Creating the Postal Service

Installing the mail server is extremely easy. You simply run the Microsoft Mail server installer on an appropriate Macintosh (the Mac you are already using as a file server, for instance) and restart the computer. Server administration, which includes creating users, user passwords, and groups, is done via the Microsoft Mail desk accessory. Initially, the server administrator logs in as Network Manager with *mail* as the password (changing the password is highly recommended, however, for security reasons).

The mail server can also be run in the background on a Mac, but only with caution. My tests indicate that running the mail server in the background slows the Mac's normal response to any mouse or keyboard event considerably.

Each server installation disk is serialized, so you must purchase a separate copy of the Microsoft Mail server package for each server you plan to install on the network.

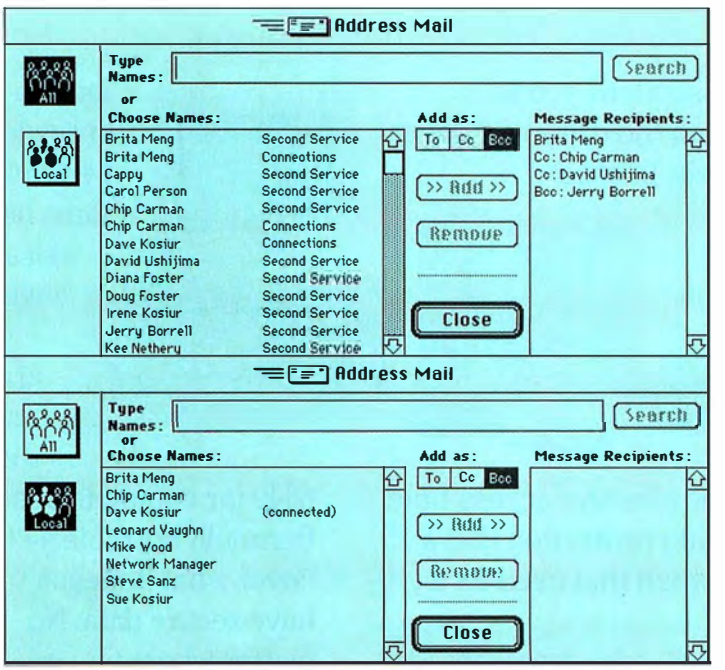
Using the Microsoft Mail administrator desk accessory you can quickly and easily add users and groups to any server on the network. Unfortunately, you must use the Chooser DA to select the server you want to access and administer; there's no way to switch from server to server within the Mail DA.

Anyone can create a new message form for MS Mail 2.0 using Form Designer, a program that uses HyperCard as the interface for form creation (forms are limited to a Mac SE screen size). But new forms must be installed by the administrator before they can be used—an example of the Microsoft Mail philosophy of centralizing control of Mail's appearance.

The Address, Please

Microsoft designed its mail system with the large corporate network in mind—this is particularly evident in the way Microsoft Mail 2.0 handles user lists. Each server sends its user list to every other server, creating a global list of all users on each server. If a new server becomes part of the network, the global user list is automatically updated.

In large networks, this global list can seem overwhelming to the user. Imagine scrolling through a 5000-name user list to find the one you want. Fortunately, Microsoft lets you simplify the user list in three ways. First, you can type in any user's name as an address in the blank provided; the name is accepted as long as there's a match in the list. Second, you can search the list by typing in a few characters and clicking on the Search button, which leads to a display of possible matches. Third, you can restrict your list to the local, rather than global, list (see "Big or Small?"). (A

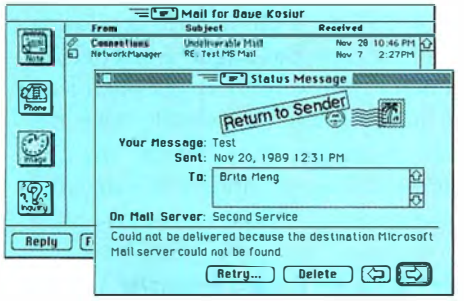


Big or Small? *This composite screen shot shows the difference between the global (top) and the local (bottom) user lists.*



Making It All Fit

The basic Microsoft Moil user window shows you all of your mail, with icons to indicate the type of message (a phone icon for a phone message, for example) and its urgency (urgent messages have an exclamation mark). The left side of the window contains icons for the four message types available with this setup. If more message types were available, this would be o scrolling list of icons.



Sorry, Addressee Unknown

When a server is unable to forward a message within a given amount of time (set by the server administrator), the message is returned to the sender with this status message.

local list contains only those users assigned to your selected server.)

As a user, you can neither create your own groups for addressing messages nor create special address lists. All groups are defined by the server administrator, and Microsoft Mail does not support custom address lists.

Getting the Mail Through

On a user's Mac, Microsoft Mail is an 87K INIT and an 18K desk accessory. As a user, you must first select (through the Chooser DA) a server; thereafter, you can ask Microsoft Mail to store your name, password, and server for automatic log-in each time you start your Mac.

The mail window has a simple layout, with a list of messages on the right and a scrolling list of icons on the left that represent the different message forms available (see "Making It All Fit"). For example, there is an exclamation mark for urgent messages and a paper clip for enclosures. If gateways are installed for communicating with other mail systems such as AppleLink or VAXmail, icons representing those services are also included in the list. Unfortunately, Microsoft Mail's icons are too small for my liking. And even though Microsoft Mail uses a two-level priority system (Normal and Urgent) for messages, it will not let you sort your mail by priority or sender to simplify searches; mail is sorted by time and date only.

You can send mail to any user without knowing, or caring, which server the recipient's connected to. Microsoft's store-and-forward technology takes care of forwarding mail from one server to another. If a server is out of commission or disconnected for more than a predetermined period of time, the mail is returned to you as undeliverable (see "Sorry, Addressee Unknown").

Did the Postman Ring Twice?

Now that Microsoft controls the development of its mail package entirely, Mail the second time around is a considerable improvement. Few of its predecessor's (InterMail) quirks are left in this new version. The mail database on the server is designed to maintain only one copy of any message or enclosure, regardless of the number of addresses, reducing the amount of storage required for messages. Plus, Microsoft Mail 2.0 now automatically recovers unused fragmented space in the database, getting rid of one of InterMail's biggest failings (and a cause of many crashes).

Microsoft Mail 2.0 is well designed for both small and large networks alike. Its interface is easy to understand. And Microsoft's attention to different ways of handling large user lists makes Mail easier to use on large networks. Depending on the number of users on your network, though, the price of Microsoft Mail can become much more expensive than its current main competitor, CE Software's QuickMail.—*Dave Kosiur*

See* Where to Buy *for contact information.

SUPERMAC SPECTRUM/24 VIDEO INTERFACE BOARD

32-bit Graphics Board

Pros: *Hardware pan and zoom; support for 13-inch and 19-inch monitors; huge virtual desktops; RGB NTSC video output.* ***Cons:*** *Expensive.* ***Company:*** *SuperMoc Technology.* ***Requires:*** *Moc II; 2MB RAM. Hord disk and more RAM recommended.* ***List price:*** *$3995 (for a limited time, $2499 with exchange for other Moc II video boards).*

RADIUS DIRECTCOLOR/24 VIDEO INTERFACE BOARD

32-bit Graphics Board

Pros: *Excellent software; supports both 16-bit and 32-bit pixels; crisp display (82 dpi).* ***Cons:*** *Works only with the Radius 19-inch monitor; expensive.* ***Company:*** *Radius.* ***Requires:*** *Moc II; 2MB RAM. Hord disk and more RAM recommended.* ***List price:*** *$4995 ($4295 for 19-inch monitor).*

RADIUS QUICKCOLOR GRAPHICS ACCELERATOR BOARD

QuickDraw Accelerator Board

Pros: *Makes 32-bit QuickDraw reasonably fast; inexpensive.* ***Cons:*** *Works with Radius graphics boards only.* ***Company:*** *Radius.* ***Requires:*** *Moc II; 2MB RAM; Radius DirectColor board. Hord disk and more RAM recommended.* ***List price:*** *$795.*



Apple keeps improving QuickDraw, the software responsible for everything you see on a Macintosh screen. Every new Mac to date has included an improved version of QuickDraw. The Mac IIci comes with 32-bit QuickDraw capable of handling 16.8 million colors simultaneously. For older machines, 32-bit QuickDraw is available as a disk that works with System 6.0.3.

With the release of 32-bit QuickDraw (also called Full Color QuickDraw), the Macintosh became a high-performance

(continues)

graphics workstation. The Radius and SuperMac display boards, the hardware side to 32-bit QuickDraw, equip the Mac to display photographic-quality images using millions of colors simultaneously. The Radius QuickColor board speeds up drawing and is the first commercially available graphics accelerator board for the Macintosh.

SuperMac Spectrum/24

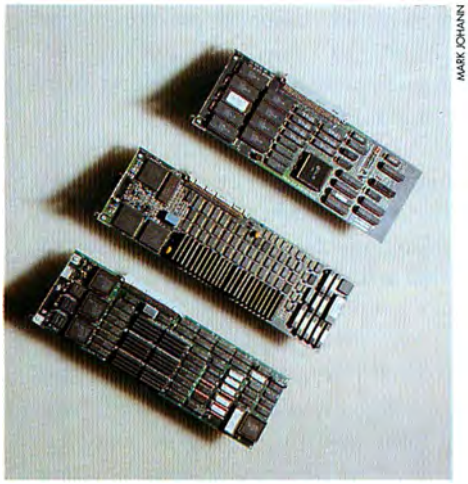
The Spectrum/24 that I used installed without difficulty and worked smoothly in almost every way. The documentation was well written and provided a good mix of technospeak and easy-to-understand instructions.

I used the Spectrum/24 board with a Sony GDM-1952 19-inch monitor (1024 by 768 pixels) and the Apple 13-inch AppleColor RGB Monitor (640 by 480 pixels). This board can support many different monitors. If SuperMac hasn't included your monitor, there is still a good chance you will be able to program the board to use it.

If you are using a standard Apple color or monochrome monitor, you can simulate a 19-inch (or larger) display using the hardware pan function. All Macintosh software, including the Finder, believes that the display is 1024 by 768 pixels, though the actual monitor is only displaying 640 by 480 pixels. When you move your mouse past the monitor's border, the screen pans across the larger virtual desktop. I use the Spectrum/24 with BarneyscanXP and a medical imaging package daily; the hardware zoom and pan is extremely useful as it obviates the need to purchase a 19-inch monitor. The board also supports 2x zoom.

The Spectrum/24 supports a variety of virtual desktop sizes, including 1024 by 768, 1024 by 1536, 2048 by 1536, and a whopping 4096 by 1536 pixels. In comparison, the Macintosh SE's screen has only 512 by 342 pixels. At any size larger than 1024 by 768, you run into restrictions on the pixel size. (Remember that displaying 24-bit pixels takes three times as much memory as displaying 8-bit pixels. In the case of 1024 by 768 pixels, it takes 3MB of video RAM.)

Moving around these huge virtual desktops can take time, too. At the largest size, the virtual desktop is the equivalent of a 56-by-21-inch monitor.


MARK JOHANN

The QuickColor Graphics Accelerator (top) and the DirectColor/24 (middle) both from Radius, and the Spectrum/24 (bottom) from SuperMac Technology

SuperMac has kept within Apple's hardware guidelines in every respect save one—power usage on the NuBus. The Spectrum/24 draws over 2 amps, which can cause problems when used with other boards in the Macintosh. SuperMac does not mention this in the manual.

Radius DirectColor/24 and QuickColor Graphics Accelerator

The Radius DirectColor/24 and QuickColor Graphics Accelerator are separate products; you can purchase and use the DirectColor/24 with or without the QuickColor board. The DirectColor/24 is the actual display board and the QuickColor works with it to provide improved performance. The boards I worked with made extensive use of surface-mounted technology and had few engineering changes. Both installed and worked perfectly. Radius also provides a grounding strap to avoid destroying the boards with static electricity.

The DirectColor/24 board allows you to work with 1-, 8-, 16-, or 24-bit pixels on the screen at an extremely high resolution of 1152 by 882. With so many pixels in a 19-inch display, the resolution becomes a crisp 82 dots per inch (dpi). Because this display also causes the Mac's text and images to be a bit smaller than normal, Radius includes a utility that displays menus in Chicago 18-point type (the normal is 12-point).

Radius also provides a well-designed Control Panel device to reduce the mousing around one does with the larger displays; this tear-off menu utility is a real wrist-saver.

Page layout and prepress applications benefit from being able to display entire pages at a time; similarly, MultiFinder takes advantage of the much larger desktop. Radius has oriented this product toward a market of graphic artists and printing professionals who need the higher resolution.

The DirectColor/24 only works with 19-inch Radius monitors, which weigh in at around 85 pounds and are expensive. Radius offers the option of buying a less expensive 16-bit board and upgrading later to 24 bits. With the ever-decreasing cost of memory, this might be an effective solution if you want to try out photorealistic imaging less expensively. Like the other 24-bit graphics boards, the DirectColor/24 draws more power than the Apple guidelines allow.

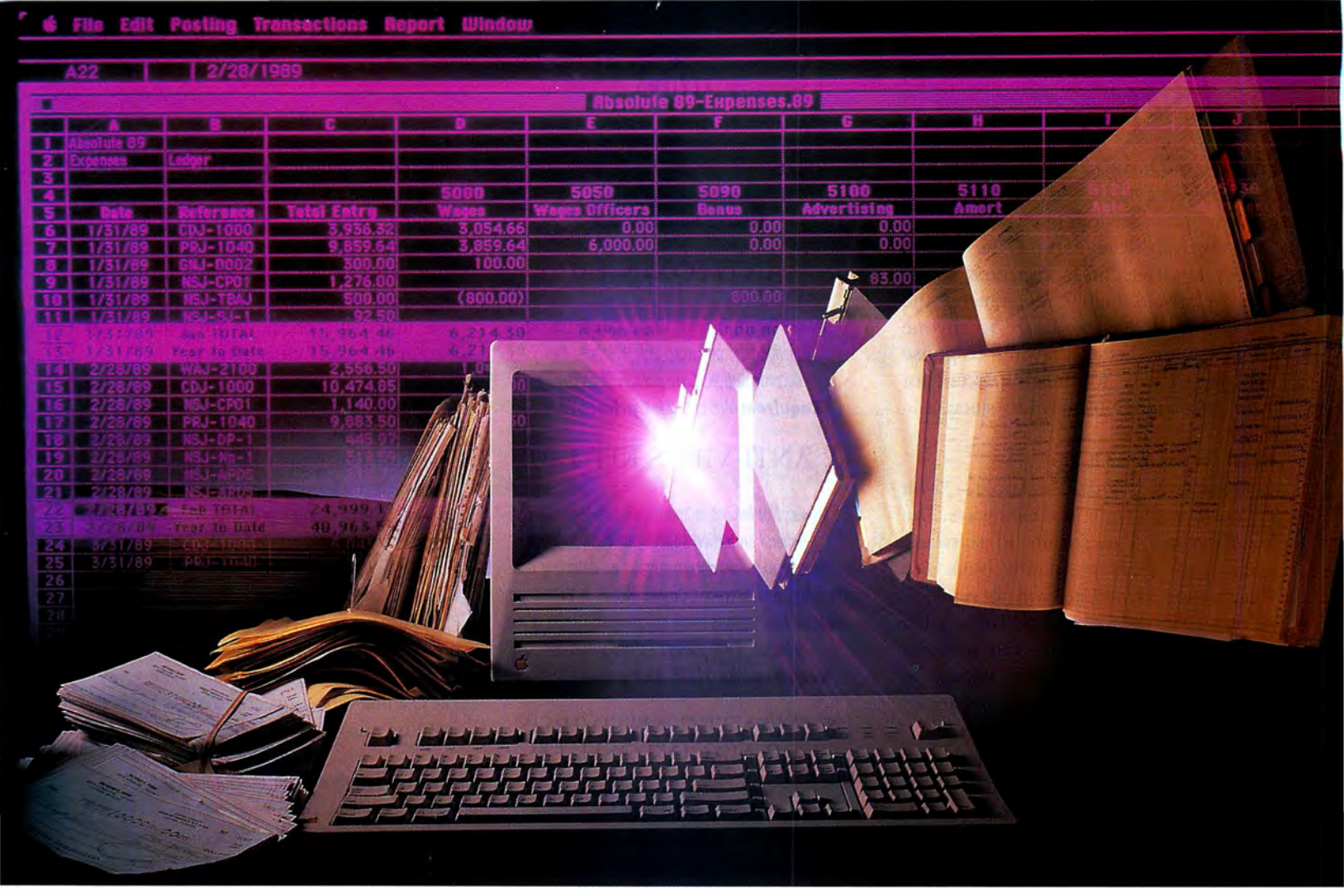
Radius QuickColor Graphics Accelerator

With the greater processing demands of 24- and 32-bit pixels, QuickDraw becomes less than quick. By using an Acorn RISC processor to offload some of the graphics processing, the QuickColor Graphics Accelerator works with the DirectColor boards and a seldom-used memory transferring mode of the NuBus built into every Macintosh II, IIx, and IIcx to increase speed.

The QuickColor accelerator is designed to work silently and efficiently and does so admirably. You can quickly become used to the speed increase in a very short amount of time. The accelerator board's performance is most noticeable with text drawing. Using a word processor in 32-bit mode can be irritatingly slow, but the QuickColor accelerator board speeds up the text display to 8-bit mode. Radius also lets you disable the board by pressing the Caps Lock key.

One caveat: QuickDraw will undoubtedly continue to change. Graphics acceleration requires an understanding of the

(continues)



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structure of QuickDraw, and for this reason Apple has suggested that developers restrain from delving into acceleration. The relatively low cost of the board, however, offsets these concerns somewhat. I would highly recommend the QuickColor accelerator board to anyone who requires better drawing response and doesn't have too much concern for what Apple might have up its sleeve.

Nice If You Can Afford It

Because both boards use Apple's 32-bit QuickDraw, they run in similar ways. The boards respond identically to software, even to the point of sharing bugs. For some reason, HyperCard will not run in 1-bit mode with the 32-bit QuickDraw patch installed. Apple recognizes this problem and intends to fix it in the next version of HyperCard. Similarly, Adobe Illustrator 88 and SimCity will not run with 32-bit QuickDraw installed, no matter what the bit setting. These programs run fine with these boards if you remove 32-bit QuickDraw (though the boards will not run in 16-bit mode or 24-bit mode without 32-bit QuickDraw).

If you are using 32-bit-compatible applications such as PixelPaint Professional or BarneyscanXP, there is nothing like seeing true color on the Macintosh. Similarly, if you have access to high-end RGB scanners, such as the Barneyscanner (for 35mm slides), the Mac becomes an exquisite imaging system.

Both display boards provide extremely high image quality, though the DirectColor board, with its higher resolution, is oriented toward the more demanding user. Perhaps the biggest difference between the two boards lies in cost. Radius addresses the expense problem by offering a 16-bit version of the DirectColor that can easily be expanded to support the full 24-bit spectrum; this savings is offset, however, by the additional cost of the QuickColor board which is highly recommended for use with the Radius graphics board. SuperMac, on the other hand, provides a board that works with any monitor and is lower priced.

—Peter Marx

See Where to Buy or circle 803 (DirectColor/24), 804 (QuickColor) on reader service card.

Antiviral Software

ANTITOXIN 1.0

Pros: *Detects common viruses.* ***Cons:*** *Limited functionality; awkward user interface; thin documentation.* ***Company:*** *Mainstay.* ***Requires:*** *Mac Plus.* ***List price:*** *$99.95.*

ANTI-VIRUS KIT 1.0

Pros: *Not limited to specific viruses—provides general protection against any destructive program; excellent documentation on detecting and preventing viral infections.* ***Cons:*** *Misses detecting some infected files; reports some noninfected files as being infected.* ***Company:*** *1st Aid Software.* ***Requires:*** *Mac 512KE.* ***List price:*** *$99.95.*

SYMANTEC ANTIVIRUS FOR MACINTOSH 1.0

Pros: *Good user interface and functionality.* ***Cons:*** *Requires updates to handle new viruses.* ***Company:*** *Symantec Corporation.* ***Requires:*** *Mac 512KE.* ***List price:*** *$99.95.*

VIREX 2.1

Pros: *Best all-round functionality.* ***Cons:*** *Updates expensive.* ***Company:*** *HJC Software.* ***Requires:*** *Mac Plus.* ***List price:*** *$99.95.*



For those of you who have been lost deep in the Amazon for the past few years, computer viruses are little programs that can infect files on your floppies and hard disks, propagating and spreading just like the real thing; and like the real thing, they can cause serious problems, such as deleting files, damaging documents, and wiping out entire disks. A number of public domain and shareware programs help detect, limit, and wipe out viruses; here are four commercial products designed to do the same.

There are some obvious difficulties in testing antiviral programs. One does not lightly infect one's own system with an existing virus, much less a new one (provided such is available). So the test was limited to having each program scan a disk that had several infected files containing the Scores and nVIR viruses, the remnants of a rather virulent outbreak I suffered late last year. Then an infected program was (gulp!) launched, allowing the automatic checking programs to attempt to detect virus actions.

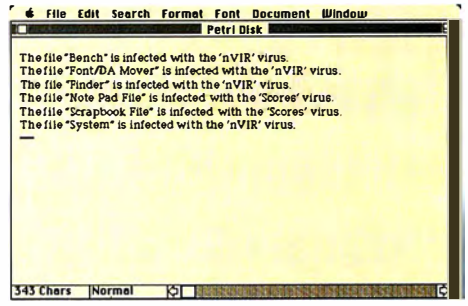
AntiToxin

This package consists of two parts: the program AntiToxin, which examines whole disks or individual files for specific viruses, then removes the viruses when found; and the AntiToxin INIT, which prevents infected applications from being loaded and executed. AntiToxin checks for the Scores, nVIR, Hpat, INIT29, and ANTI viruses. Viruses are removed automatically, unless you hold down the Option key while selecting commands from the File menu.

Symantec AntiVirus for Macintosh (SAM)

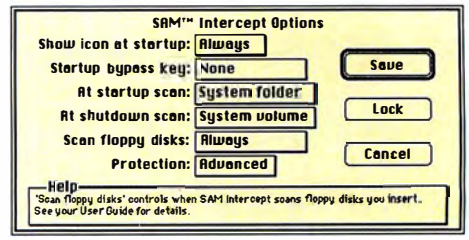
SAM consists of one program to detect existing viruses and another to guard against future infections. SAM Virus Clinic

(continues)



AntiToxin

The user interface on AntiToxin is a bit awkward; in order to view a list of infected files, you have to run the program, save the file as text, then open it up with an editor or word processor (not provided).

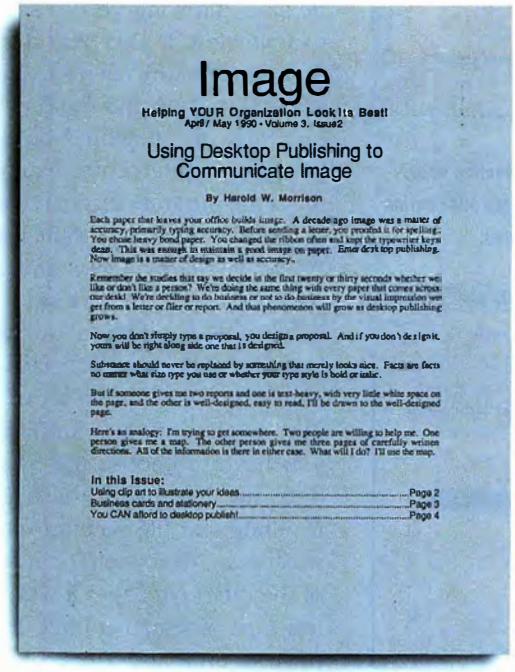


SAM

SAM Intercept can be customized to perform virus checks at different times and at different levels.

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April / May 1990 • Volume 3, Issue2

Using Desktop Publishing to Communicate Image

By Harold W. Morrison

Each paper that leaves your office builds image. A decade ago image was a matter of accuracy, primarily typing accuracy. Before sending a letter, you proofed it for spelling. You chose heavy bond paper. You changed the ribbon often and kept the typewriter keys clean. This was enough to maintain a good image on paper. Enter desk top publishing. Now image is a matter of design as well as accuracy.

Remember the studies that say we decide in the first twenty or thirty seconds whether we like or don't like a person? We're doing the same thing with every paper that comes across our desk! We're deciding to do business or not to do business by the visual impression we get from a letter or flier or report. And that phenomenon will grow as desktop publishing grows.

Now you don't simply type a proposal, you design a proposal. And if you don't design it, yours will be right along side one that is designed.

Substance should never be replaced by something that merely looks nice. Facts are facts no matter what size type you use or whether your type style is bold or italic.

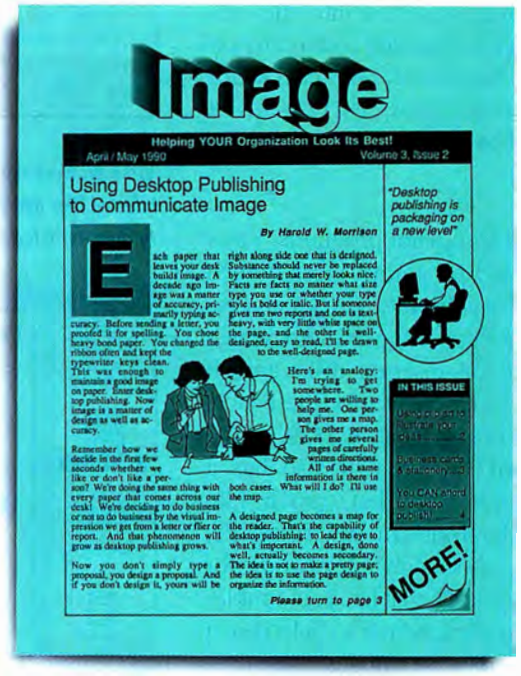
But if someone gives me two reports and one is text-heavy, with very little white space on the page, and the other is well-designed, easy to read, I'll be drawn to the well-designed page.

Here's an analogy: I'm trying to get somewhere. Two people are willing to help me. One person gives me a map. The other person gives me three pages of carefully written directions. All of the information is there in either case. What will I do? I'll use the map.

In this issue:
Using clip art to illustrate your ideas ..... Page 2
Business cards and stationery ..... Page 3
You CAN afford to desktop publish! ..... Page 4

Your word processor alone.

Soon After.


Image

Helping YOUR Organization Look Its Best!
April / May 1990 Volume 3, Issue 2

Using Desktop Publishing to Communicate Image

By Harold W. Morrison

"Desktop publishing is packaging on a new level"

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A designed page becomes a map for the reader. That's the capability of desktop publishing: to lead the eye to what's important. A design, done well, actually becomes secondary. The idea is not to make a pretty page; the idea is to use the page design to organize the information.

Please turn to page 3

IN THIS ISSUE

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scans a given volume and displays detected viruses; you can then ask it to attempt to remove viruses from specific files. SAM Intercept, launched at start-up, performs a number of checks, such as scanning floppies inserted into the system's disk drive for viruses and intercepting virus-specific actions. SAM checks for the Scores, nVIR, Hpat, INIT29, ANTI, MEV#, and AIDS viruses.

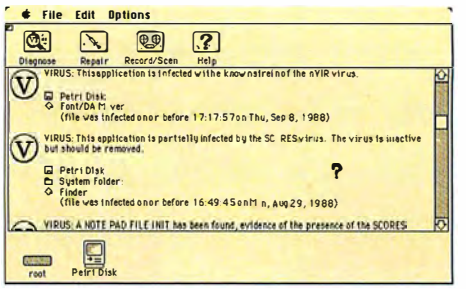
Virex 2.1

Like most of the antiviral programs, Virex 2.1 provides two programs: Virex, which checks disks for computer viruses and repairs infected files; and VirexGuard, which detects viruses on inserted disks and in opened files. Virex checks for the Peace, Scores, nVIR, nFLU, Hpat, INIT29, ANTI, MEV#, and AIDS viruses. It also has a Record/Scan function that, much like Inoculator in the Anti-Virus Kit, saves size, resource, and checksum information for each file on a disk. Then it lets you double-check that information later to help detect infection by unknown viruses.

Anti-Virus Kit

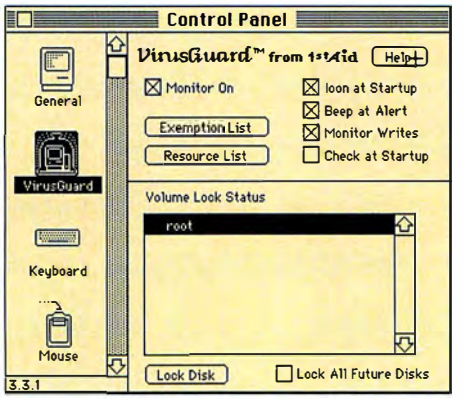
This package takes a very different approach from the other three. Instead of targeting specific viruses, it checks for virus-related actions and results. It has three separate programs: VirusGuard, Inoculator, and Same/Diff. VirusGuard is a CDEV, a program that starts running when you start up the system and that can be controlled via the Control Panel. VirusGuard monitors the activities of currently running programs, bringing up alert boxes when it detects suspicious behavior. Inoculator, on the other hand, keeps track of the files on a given disk and alerts you when any files unexpectedly change. Same/Diff performs a detailed comparison of two files—for example a current file and an archival copy—so that you can check for possible viral infections.

AntiToxin, SAM, and Virex each found all six infected files on the test floppy, though their diagnoses differed in a few cases. Anti-Virus Kit detected only three of the six infected files, completely missing the Scores and nVIR infections in the System file on the floppy, as well as the dummy Notepad and Scrapbook files



Virex 2.1

Virex provides the most detailed information about infected files and also lets you record file information to check for infection by unknown viruses.



Anti-Virus Kit

VirusGuard looks for virus-related activity while you're working.



Virex Guard

You can configure VirexGuard to diagnose disks on insertion, or upon request. You can also check files when they're opened, or only if you're suspicious.

created by the Scores virus. Anti-Virus Kit also mistakenly acted as though three different music applications on the root volume were infected. All four programs blocked attempts to launch the two infected applications from the floppy.

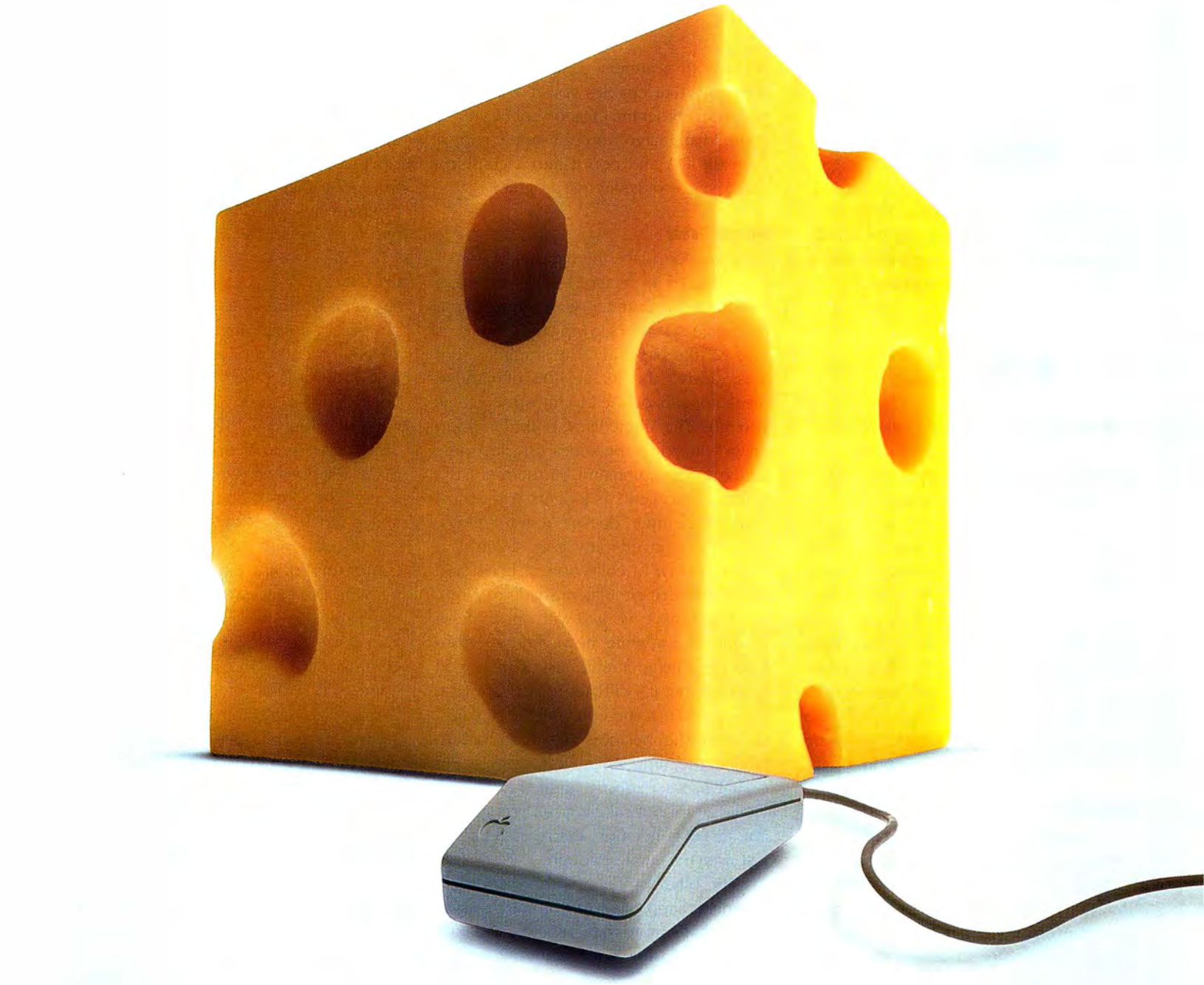
Recommendations? It's a toss-up between Virex 2.1 and SAM. Both have a scan/repair program, but Virex has more features than SAM Virus Clinic (including the Scan/Record feature) and gives more complete diagnoses. Both also have a watchdog INIT, but SAM Intercept is more flexible, allowing you to set the level of examination. It also performs more tasks than VirexGuard, such as volume and file scans at start-up and shutdown. If I had to pick just one it would be SAM, mostly because of Intercept's features; after all, that's the program that gets used the most.

AntiToxin is a distant third to both. While it shares Virex and SAM's two-pronged approach, it's less functional than either one. In addition, the user interface is awkward and unsatisfactory. For example, you can't see a list of the infected files while running AntiToxin; instead, you have to choose the Save As option from the File menu, then open up the resulting text file with an editor or word processor. Were AntiToxin half the price of the other packages it would be a good low-cost alternative; but it's the same price as SAM and Virex.

Three packages put you onto the upgrade treadmill (Virex has already gone through five versions, with HJC charging $15 per upgrade or $75 per year for an upgrade subscription). Anti-Virus Kit avoids that problem by not tying itself into specific viruses, but it also misses some viruses that you may want detected ahead of time—especially if the infected files might get passed on to someone who doesn't have an antiviral program. The idea behind Anti-Virus Kit is a good one, but it must detect existing viruses better (and not detect nonexistent ones) before it can compete with the other packages.

While $100 is a bit to plunk down for an antiviral utility, all it takes is one disaster—such as my combined Scores/nVIR infection last year—to convince you that the investment is worthwhile. And since you can buy any of these programs from mail-order firms for around $65 to $70, money is even less of a factor. If you really can't afford any of these programs, get one of the PD/shareware programs—but do get something.—*Bruce F. Webster*

See* Where to Buy *or circle 706 (AntiToxin), 707 (Anti-Virus Kit), 807 (SAM), 825 (Virex) on reader service card.



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Circle 15 on reader service card

LIGHTNINGSCAN

Hand-Held Scanner

Pros: *Generates gray scale.* ***Cons:*** *Difficult to scan straight; software adapted from another product.* ***Company:*** *Thunderware.* ***Requires:*** *Mac Plus; System 6.0.3; Finder 6.1.* ***List price:*** *$495.*

SCANMAN

Hand-Held Scanner

Pros: *Straightforward software.* ***Cons:*** *No gray scale; difficult to scan straight; resolution doesn't match Mac screen.* ***Company:*** *Logitech.* ***Requires:*** *Mac Plus.* ***List price:*** *$499.*

A hand-held scanner seems like a good idea. Imagine a scanner that costs only $500; scans photos, text, or line art up to 4 inches wide; and can be stored in a desk drawer. Both the ScanMan from Logitech and the LightningScan from Thunderware make these promises and more. However, problems with both their hardware and software add up to a handful of frustration.

Scant Setup

The scanning units of ScanMan and LightningScan are actually identical devices built by one Japanese company. In addition to the hand-held scanner itself, however, each one needs a SCSI controller box (which doesn't slip so easily into a desk drawer). Logitech's sleek and attractive box looks like an Apple external floppy drive. Thunderware's larger box is less elegant, sized halfway between a modem and a small hard disk. It's this controller box and the accompanying software that distinguish the two scanner systems.

The controller box plugs into the Mac's SCSI port. If you have an external hard disk, you'll have to disassemble the ScanMan and remove its internal terminators before attempting to daisy-chain it—a process that's much harder than it needs to be. In contrast, the LightningScan comes with an easy-to-install external terminator.

Once you've set up the system and installed the software, you're ready to scan. Both scanners come with a desk accessory that enables you to scan from within any program. In theory, once you've scanned an image, you can simply copy it from the DA and pop it into a graphics, database, or page-layout program.

Scanned Goods

To scan, you place the hand-held unit at one edge of an image. While pressing a button on the scanner, you drag it across the image. A row of glowing LEDs bounces light off the page, and the scanner's sensors receive the image; the bitmapped result appears on the Macintosh screen as you go. The immediacy is thrilling—an image on paper becomes an electronic image at your command. Furthermore, the clarity is excellent, as long as you realize that the scanner doesn't register grays; instead, it converts any gray shade to a *dither pattern* (a collection of black and white dots that simulate a shade of gray).

After you've worked with one of these scanners for a while, however, two problems become apparent. First of all, as you can imagine, it's difficult to scan straight. Even if you're a surgeon with the steadiest hand in the business, it's hard not to wiggle the unit while you drag it. For casual use a perfectly aligned scan isn't vital. But for optical character recognition and forms generation, the resultant scans just aren't accurate enough.

The other problem with a hand-held scanner is simply its size: you can't scan an image that's more than 4 inches wide. Of course, this is an obvious trade-off—to get a scanner that fits in your hand, you lose the ability to scan a full page. If you want to scan columns in a phone book, for instance, you'll be in good shape. But you can't scan both halves of a page and then try to fit them together in a graphics program; it's virtually impossible to join two separate scans seamlessly.



MARK JOHANN

ScanMan from Logitech (left) and LightningScan from Thunderware (right)

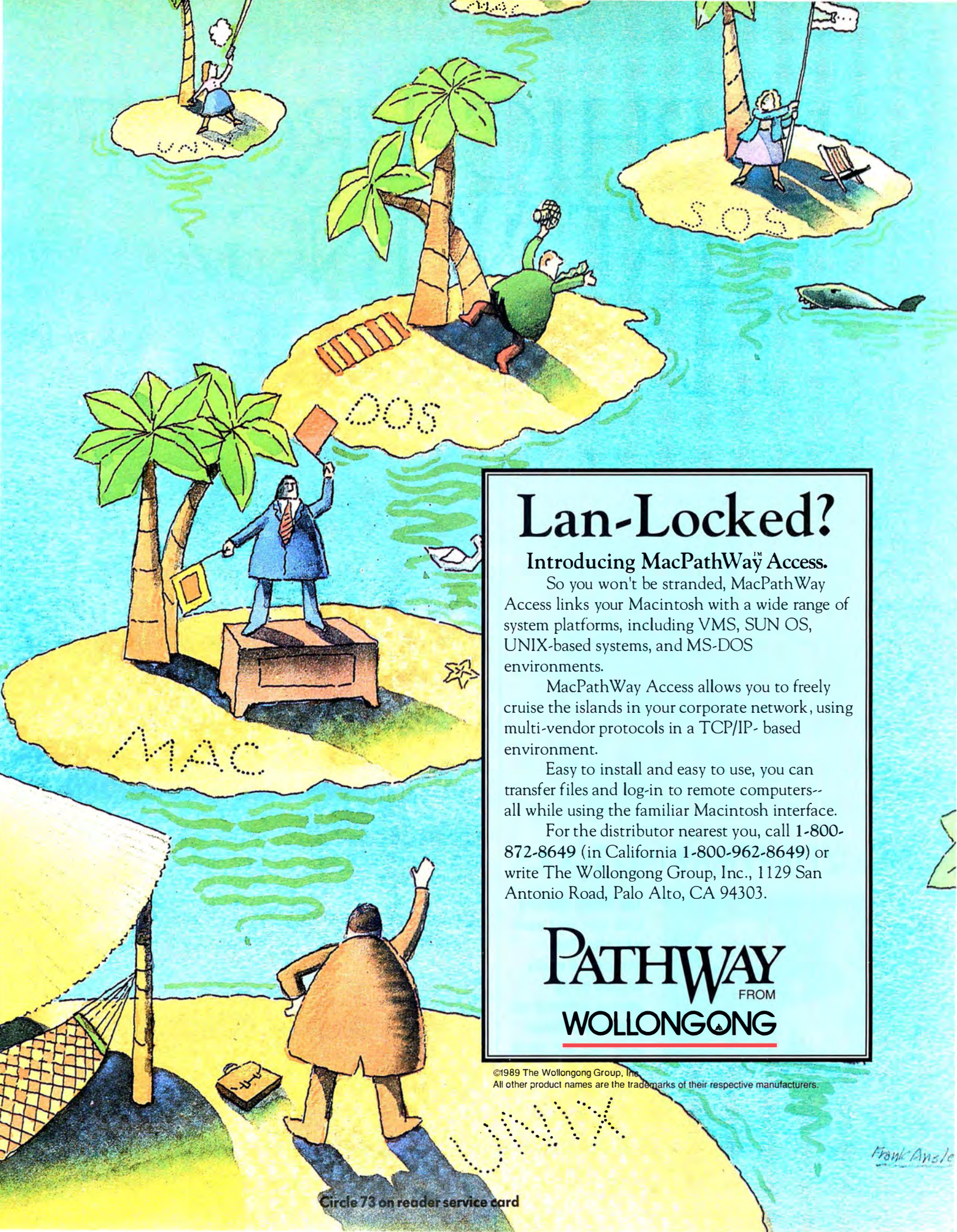
DPI-Opener

A switch on the side of the scanner lets you select a scanning resolution of 100, 200, 300, or 400 dots per inch. The problem is that the Mac screen resolution is only 72 dpi. (These scanners were originally developed for IBM computers, not the Mac.) So, to keep the one-dot-per-pixel relationship between image and screen, the software must display a screen image much larger than the original.

At this point scanner software becomes important. Both scanners' accompanying desk accessories attempt to alleviate the size problem by offering an actual-size view. When you choose this command from the menu, the image appears at 72 dpi—at the original image's correct size. Unfortunately, the ScanMan software accomplishes this feat by cramming the 200 dpi (or whatever multiple of 100 you specify) into a smaller area. The result is a muddy, blotchy, sometimes unrecognizable collection of black pixels. If you save the document in TIFF or PICT format, you can open it using a graphics program, content at least that your printouts will display the actual-size image at its full, scanned resolution.

The LightningScan software's Original Size command, on the other hand, has the intelligence to selectively weed out the superfluous pixels, so an image is still recognizable even when shown at 72 dpi. LightningScan's software is superior in another way, too: it can turn the dithered black-and-white scanned image back into a gray-scale image, helping to compensate for the scanner's inability to perceive grays. Once the image has been converted to gray scale, you can adjust the brightness and contrast levels without rescanning. (Of course, you won't be able to see the gray-scale image unless you have a Mac II with a gray-scale monitor.)

(continues)



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Frank Ansle

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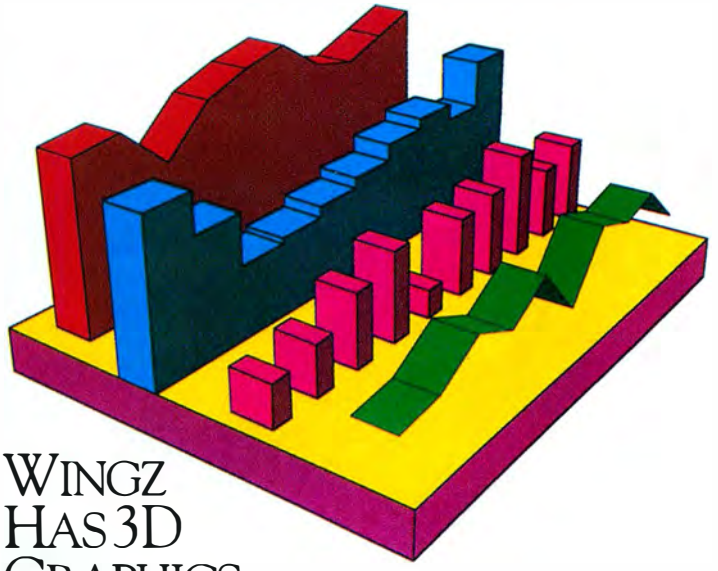
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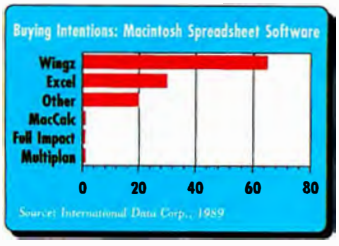
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User Satisfaction

Rank	Spreadsheet
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2	Excel
3	Full Impact
4	Other
5	MacCalc
6	MultiPlan

According to International Data Corporation (July, 1989), Wingz ranked number one in user satisfaction among Macintosh spreadsheet users.

WINGZ HAS FUTURE USERS.



The same survey found Wingz an eye-popping two-to-one favorite when people were asked which spreadsheet they intend to buy in the next six months.



WINGZ HAS BUTTONS.



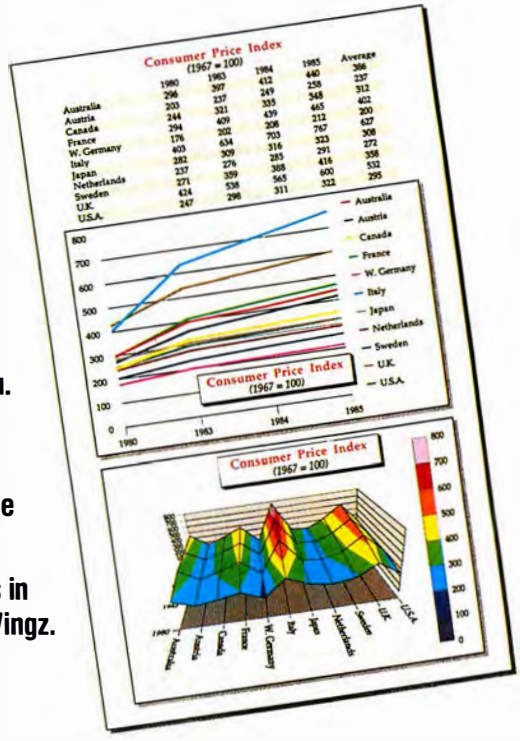
Buttons can make your spreadsheet as easy and natural to use as the radio or the dishwasher. They're easier and faster than menus or typing in commands. (You can also put other Macintosh controls, including radio buttons, check boxes and slide bars, directly onto the worksheet.) Just as important, buttons unleash the power of HyperScript. So you can attach lists of frequently used commands to buttons, and then execute them with the click of a mouse.

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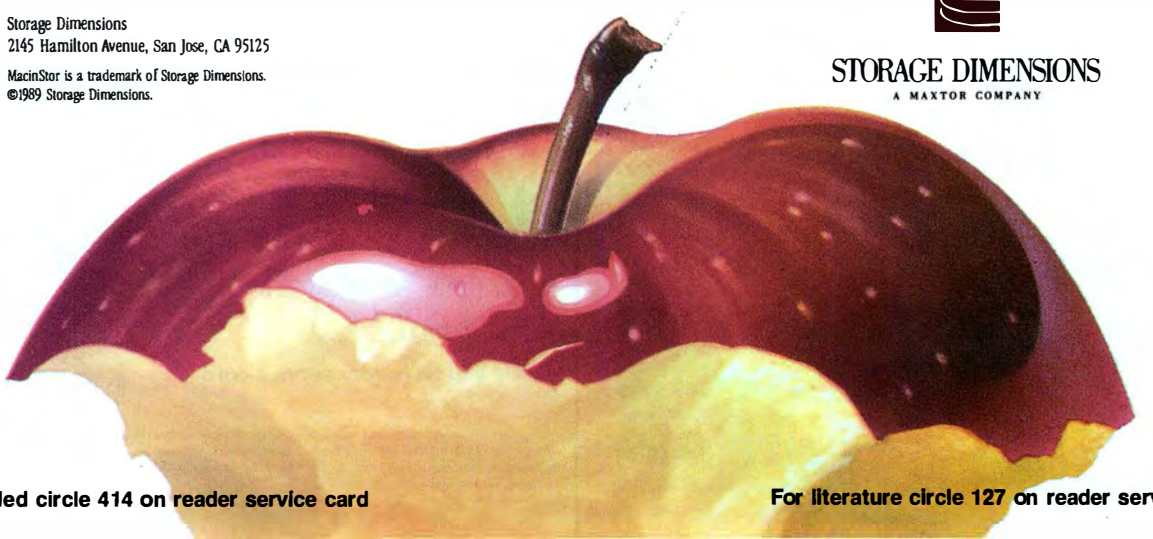
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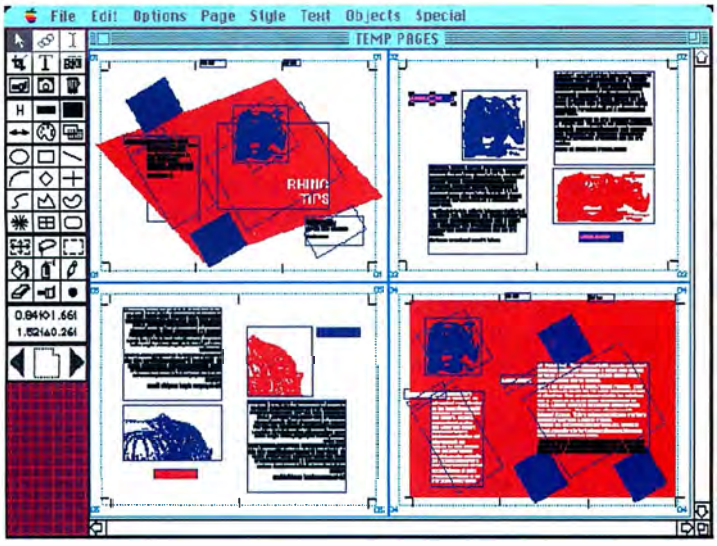
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To be called circle 414 on reader service card

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Even so, the LightningScan software is far from ideal. It's confusing and difficult to learn, and it's the same software that comes with the company's other low-cost scanner, the ThunderScan. Unfortunately, it has no Save command (only a Save As command), no close command, and has four nonintuitive graphic tools. Furthermore, many scanning options are dimmed in the LightningScan's menus and dialog boxes because they pertain only to the ThunderScan. The fact that Thunderware didn't take the time to perform at least a cosmetic rewrite of its ThunderScan software doesn't say much for the company's commitment to the LightningScan.



***Thumbnail View** Publish It lets you view and edit thumbnails, up to 12 pages across. Notice that rotated text and graphic elements (except draw objects created in Publish It) do not appear rotated on screen. You can see the rotated frames, however, for positioning.*

Scanning the Horizon

Both companies say that improved software is in the works. Logitech claims that its new software will also be able to recreate gray scale and that it will include a more intelligent actual-size option that won't reduce images to illegibility. Until these scanners improve, however, having one in the hand isn't worth $500.

—David Pogue

See Where to Buy or circle 752 (LightningScan), 808 (ScanMan) on reader service card.

PUBLISH IT 1.1

Page-Makeup Program

***Pros:** Includes page-layout, graphics, and word processing tools; excellent text- and graphics-manipulation tools; sophisticated typography; flexible page views; text runaround inside and outside of irregular objects; compact and fast.* ***Cons:** Iffy imports of formatted text; no undo for text changes; poor hyphenation, ruler guides, and batch spelling check; no gray-scale TIFF support; no crop marks; limited to eight QuickDraw colors.* ***Company:** Timeworks.* ***Requires:** Mac 512KE; 1MB for spelling checker. Hard disk and System 6.0 recommended.* ***List price:** $395.*



Remember Scoop, the Swiss army knife of desktop publishing software? It's back under the name Publish It—heavily debugged and with a cleaner interface, manuals, and online help, but containing essentially the same large assortment of features.

Although there are dozens of bells and whistles scattered throughout this program, its word processing and painting tools are limited. It does an impressive job of making pages, however—especially in terms of bringing robust draw tools to page make-up.

Setting Up Pages

Publish It offers left and right master pages, plus a "master" master page for elements that you want to repeat on every page. There's also a scratch page where you can put items to make them accessible from every page. There are seven zoomed views, from 12 percent to 800 percent. You can view single or double pages, single pages with the scratch page, or fully editable thumbnails (up to 12 across). The editable thumbnails are great for linking text frames or moving elements between pages.

The program lets you use one vertical and one horizontal ruler guide, but they're the same on all pages, and it's hard to reposition them. And Publish It's Floating Rulers feature is not as useful as multiple, adjustable ruler guides would be.

The program's alignment grid uses the familiar rows-and-columns block layout, with an option to use interval spacing (⅛ inch, ¼ inch, and so on, up to 1 inch). There is no custom grid option, however, and the number of ruler increments doesn't change when you zoom in and out. Publish It's grid system is not nearly as nice as PageMaker's, but it's effective and workable, especially with Publish It's excellent alignment controls (left, center, right, top, middle, bottom).

Publish It imports formatted text files from MacWrite 5.0, WordPerfect, WriteNow, Microsoft Works, and Word 3, and graphics in Paint, PICT, PICT2, EPS, and TIFF (black-and-white only) formats. However, it doesn't bring in all the formatting from Word files, and it misinterprets some formatting, notably right indents.

Text and Type

Text is contained in frames, which you link by clicking on them one after another with the linking tool (there are also methods for autolinking). Text can automatically flow outside (or inside!) of objects, and you can control how far from an object you want the text to wrap.

Type size and leading range from 4 to 127 points in increments of hundredths of a point. You can specify leading in lines, points, or points that are added to the autoleading value. You can specify space after a paragraph but not before.

You can also compress and expand type by percentage, and both automatic and manual kerning are provided, though you specify manual kerning in absolute rather than relative units. You can apply positive or negative kerning to selections of text, which provides good local control over tracking, making it easy to copyfit paragraphs.

(continues)

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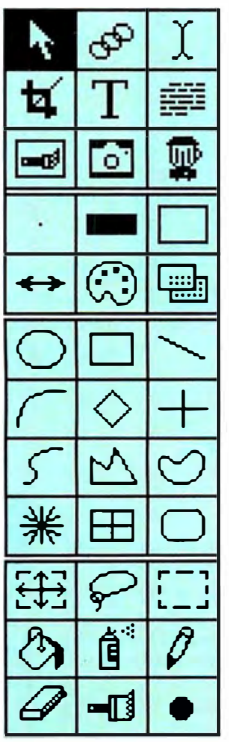
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You can fine-tune letter and word spacing for justification, and you can also set margins from fully ragged to fully justified. Hyphenation is a batch operation—select the text, then hyphenate all at once—but this feature is mediocre, so plan on scanning columns and adding some hyphens yourself.

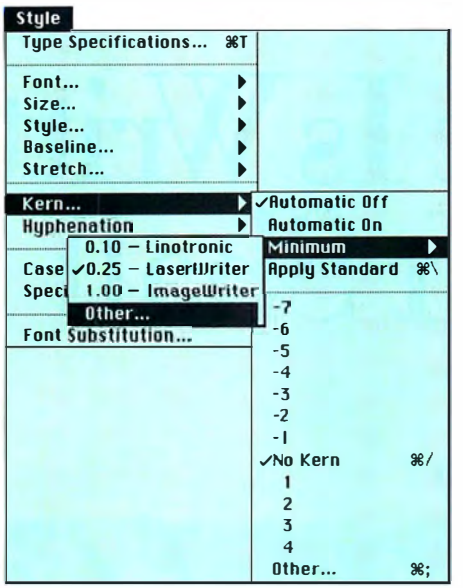
Publish It lets you set justification and tabs (left, right, center, and decimal, with optional leaders) from a tab ruler, but you can't set indents on the ruler—only from menus and dialog boxes. Special justification options let you slant the margins to the right; slant them to the left; form a vee; or make a pyramid. You can also align text in the middle, top, or bottom of a frame, or you can feather out the text with leading to fill the frame.

You can build paragraph styles that include both paragraph and character formatting, based on text you have formatted. Publish It does not import styles from Microsoft Word, however; all text comes in hard formatted.

The spelling checker is slow and clunky in batch checking mode—too slow for much serious use, but handy for occasionally checking words. The thesaurus is quirky at best. The only synonyms it finds for *distribution,* for instance, are *circulation* and *release.* The Find and Replace tools are excellent and speedy, allowing you to replace both text and text styles based on searches for either text or text styles or a combination.



Choose Your Palette
Publish It boasts four separate tool palettes. The first contains page-makeup tools; the second lets you change the settings for fills, lines, and so forth; the third is a palette of drawing tools; and the fourth is for painting.



Going Deep
Publish It sometimes overdoes the hierarchical menu routine. There are lots of kerning options, most on menus instead of in a single dialog box.

The biggest failing with text operations, however, is the inability to undo actions. You can't even undo cut, copy, and paste—not to mention style changes or replace.

Painting, Drawing, and Object Manipulation

Publish It offers a simple set of black-and-white painting tools for editing TIFF and MacPaint files, and you can convert any text or graphic object into a bitmap and blend bitmaps together. There's a complete set of drawing tools, including three unusual tools: diamond, starburst, and grid. There is no multipoint bezier tool, however.

Publish It lets you resize objects by percentage, bring to front and send to back, group and ungroup, align and align to grid, rotate (in 1-degree increments), flip, and create two smaller duplicates from one object. You can use pattern fills and tints in 1 percent increments, eight QuickDraw color layers, a variety of horizontal and vertical line weights, and arrow-endings for lines. It's not Aldus FreeHand, but it is a satisfactory environment for manipulating page elements.

You can print in black and white, in color, or with each color as a separate overlay (there's an "invisible" color layer for nonprinting comments). Publish It prints what it calls registration marks, but no crop marks. It can print facing pages on a single sheet and even collate them into a book. You can also print any thumbnail view.

Manuals, Online Help, and Reliability

The manuals do a good job of getting you up and running, and they answer most questions. Sophisticated users will be frustrated by some cursory explanations, but all users will be delighted by the indexed online help. Sample documents are provided, but they don't always take advantage of Publish It's advanced features. And, as is so often the case with templates, they're boring.

I had trouble with the program crashing, but several other users report a stable, bug-free experience. (My system is the probable culprit.) I had difficulty positioning the text cursor—another reason not to use Publish It as a word processor. The program works, however, and it performs fast—not surprising, since it's packed into only 240K of assembly-language code.

Publish It has to live or die on its page-makeup prowess. It brings the power of drawing tools to page makeup, but there are some drawbacks. The program's importing of formatted text is weak compared with that of its competitors, and its drawing powers don't match those of FreeHand or even SuperPaint 2.0. Publish It needs polish in the little things that make all the difference (undo for text changes, ruler guides, a grabber hand for moving around, useful ruler increments, conversion to open and closed quotes and em dashes on import, gray-scale TIFF support, crop marks).

Why should you buy Publish It instead of one of the big three? Any of three reasons: you have a 512KE, Plus, or SE that calls for a small, fast program; you can't afford both a text-capable draw program like FreeHand and a page-makeup program; or to complement other programs already in your library.—*Steve Roth*

See Where to Buy or circle 798 on reader service card.

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MATHCAD 2.0

Numerical Mathematics Software

Pros: *The only WYSIWYG numerics software for the Moc; convenient for complex numbers and matrix moth.* ***Cons:*** *Poor screen management.* ***Company:*** *MothSoft.* ***Requires:*** *Moc Plus.* ***List price:*** *$495.*

TK SOLVER PLUS 1.1

Numerical Mathematics Software

Pros: *Efficient solver algorithm; many third-porty solution libraries available.* ***Cons:*** *Teletype-style interface; cumbersome for small problems.* ***Company:*** *Universal Technical Systems.* ***Requires:*** *Moc 512KE.* ***List price:*** *$395.*

Back in the days of mechanical relay-based logic, the first-ever use for computers was numerical solution of equations. As a result, many sophisticated packages for numerical mathematics have evolved over the years. Although much current program code was developed originally for the IBM PC or VAX, many of these programs can now run on the Macintosh.

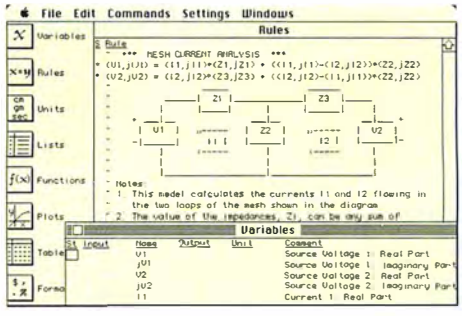
Two prime examples in this category are TK Solver Plus and MathCAD, programs that approach science and engineering computation in distinctly different ways. A comparison not only shows what these programs can do, but suggests what an ideal numerics package would have.

Playing by the Rules

TK Solver is essentially a collection of linked spreadsheets that helps you define a model, the program's basic computing unit. First you define all the variables in the model on a Variable sheet (each type of TK sheet also supports subsheets, for organizing large problems). Then you proceed to the Rules sheet, in which you establish the connections between the variables (see "A Place for Everything"). At this point, if you've entered enough initial data for independent variables in the input column of the Variable sheet, output values will automatically begin to appear for the dependent variables of your model. Since the Rules sheet lets you use logical (typically conditional) and symbolic expressions, not just standard algebraic formulas, you can handle many problems with just the rules and variables sheets.

You can create your own named functions on Function sheets, with procedures that can use parameters passed from any sheet. List sheets hold one-dimensional arrays of numeric or text entries; Table sheets provide a 2-D equivalent; and Plot sheets offer line, bar, or pie charts of data contained in other sheets. Finally, Unit sheets keep track of the often-confusing relationships between the units used to express the variables, and Numeric Format sheets associate a format with each variable. While some small problems can require what seems like an unconscionable amount of fussing around with sheets of various types during setup, this partitioning is actually one of the program's strengths. You are obliged to think through your calculation thoroughly at the outset and are subsequently rewarded for your efforts by easy documentation of the details of your model.

A better reward than this is to find that someone has already done this work for you and put the results up for sale. Solverpacks and equation libraries are available for mechanical engineering, construction, finance, electrical engineering, and unit conversion. These are generally referenced to standard industry handbooks. TK Solver Plus is distinguished from its predecessors by the inclusion of mini-packages covering statistics, signal processing, matrix calculations, and other functions you might well find tiresome to program yourself. The format of TK Solver Plus further encourages you to cobble together hybrid models, since variables, rules, and other elements can simply be cut and pasted from one set of sheets to another.



A Place for Everything

TK Solver Plus uses separate sheets (really linked spreadsheets in disguise) to store variables, rules, units, plots, and other data.

As seems to be the fate of many programs that include a System Independent Reference Manual (that's not just System 4.2 vs. 6.02—they mean inclepenclent of computer hardware entirely), the interface gives you screens of plain text rather than math symbols, and memory management is a problem. If, for example, you set a single global font and size for all output, the program will crash on larger problems under MultiFinder unless you make a generous allocation of memory—one large enough to suggest that you won't be happy doing real problems on a stock SE or Plus. Nonetheless, if you have a dog-eared copy of Fink and Beaty's *Standard Handbook for Electrical Engineers* on your desk, this program can be a relentlessly practical choice.

Automated Paper

Rather than stacks of spreadsheets, MathCAD presents you with a clean screen, a symbol palette with real math symbols for defining equations, and a large amount of behind-the-scenes programmed intelligence. Both notationally and in its set of functions and graphing facilities, MathCAD is something like the world's most highly evolved version of interpreted BASIC for scientists, a version that accepts WYSIWYG equation input, graphs with a single command, and remembers whatever variables you care to improvise. For smaller problems this gives great flexibility, and it encourages you to write clown a few equations in textbook notation as a starting point and then build larger problems from this simple core.

The facilities supporting this carefree approach to computation are impressive. Besides expected functions (transcendentals, including hyperbolics; basic statistics; solve functions) MathCAD offers Bessel and gamma functions, Fourier transform and its inverse (see "Obvious Symbol-

(continues)

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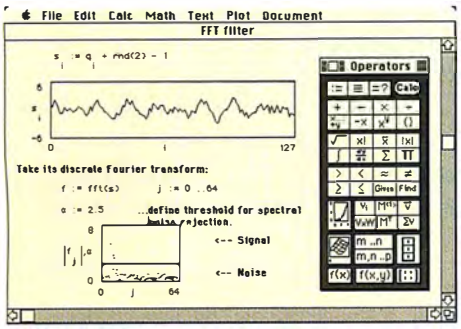
After all, when it comes to the Macintosh, *Nothing Runs Like a Fox!*

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Obvious Symbolism
In MathCAD you can set out a problem in standard math notation and direct the program to evaluate any expressions you have defined.

ism"), matrix operations, curve fitting with splines, and several styles of iterative equation solution. Complex-number computation is included, and it's possible to evaluate contour integrals in the complex plane in just a few lines. Graphs include both standard *X-Y* plots in 2-D, and 3-D surface plots with user-controllable shading. What more could you want?

Basically, you could want some refinement of the Mac-specific details. On a Mac IIx running only under the Finder, MathCAD seems entirely reliable; on a stock SE with MultiFinder the program crashed on several matrix and graphing tasks. On both machines, the screen tends to accumulate junk, so you have to redraw the screen a lot. MathSoft has diligently updated its IBM PC–based product and is likely to do so for the Mac as well, but it's remarkable that this otherwise admirable program could be released with such obvious practical and cosmetic flaws. For preparing clear representations of problem definition and solution, including sophisticated engineering analyses, MathCAD is still a standout, but the current version requires a sometimes unpleasant amount of hand labor for best results.

Adding It All Up

Ideally, a numerical computation program should offer an interface that uses standard math symbols, assemble computations for you in a form that facilitates documentation of problems, and include libraries offering most of the functions from postgraduate-level applied mathematics. And there shouldn't be any interface deficiencies. TK Solver Plus and MathCAD both provide about 75 percent of this ideal. You might also consider inspecting Matlab, if you do heavy-duty computational work, or Mathematica, if you need to explore a variety of approaches to individual problems. However, both TK Solver and MathCAD represent easy-to-learn alternatives to traditional programming languages, with enough functionality and extensibility to make the Mac a favorite computational tool.—*Charles Seiter*

See Where to Buy or circle 774 (MathCAD), 821 (TK Solver Plus) on reader service card.

WORKSPLUS COMMAND 2.0

Programming Add-on for Microsoft Works

Pros: *Adds powerful macro programming language to Microsoft Works; comes with numerous useful preprogrammed macros, including automatic log-on to telecommunications services and style sheets for word processor documents.* ***Cons:*** *Macro language may be too complex for most Works users.* ***Company:*** *Lundeen & Associates.* ***Requires:*** *Mac Plus; 2MB; hard disk; Microsoft Works.* ***List price:*** *$149.95.*

WORKSPLUS SPELL 2.0

Add-on Spelling Checker for Microsoft Works

Pros: *Fast; accurate; flexible; customizable, accurate hyphenation routine; well-designed keyboard glossary and word count features.* ***Cons:*** *Works only within Microsoft Works.* ***Company:*** *Lundeen & Associates.* ***Requires:*** *Mac Plus; Microsoft Works.* ***List price:*** *$99.95.*

Well before Microsoft released Works 2.0, the upgrade path from earlier versions had already been defined by a superbly engineered pair of software add-ons, WorksPlus Spell and WorksPlus Command. Developed independently by Tim Lundeen, Works' original author, they melded into Works as seamlessly as if they were standard equipment.

But Microsoft chose other ways to integrate spelling correction and macro making. Undaunted, Lundeen has responded with new releases of Command and Spell, boldly claiming that each is far superior to its built-in counterpart. My comparisons back him up—the question you'll have to answer is whether the improvements you pay for in Spell and Command outweigh the free ride you get in Works.

Spelling It Out

Back before Microsoft released Works 2.0, WorksPlus Spell was a must-buy; but the appearance of Works' own spelling checker makes the purchase less urgent. Yet Spell not only outdoes Works in both spelling acumen and performance but has extra features not found in Works alone.

Spell turns in an impressive performance at finding and correcting spelling mistakes. Spell can be set to check as you type or after the fact on blocks or entire files, while Works' own speller offers only the latter mode. Where Works' speller suggests only corrections beginning with the same letter as the misspelled word, Spell makes allowances for omitted, extra, or tangled letters, and for phonetic misspellings. As a result, even if Spell's best guess isn't right, you'll generally find the word you intended.

WorksPlus Spell also does a better job of leaving well enough alone. The standard-issue Works dictionary is supposed to have about as many entries as the WorksPlus version, but Microsoft's speller flags far more real words as errors. Curiously, many of the words omitted by Works' dictionary come from the personal computer domain—it blows the whistle on *resize, macro, desktop,* and *spreadsheet*—but even common, ordinary words such as *beep* and *embarrassing* get the red flag. By contrast, Spell pauses over far fewer legitimate words.

Both spellers let you add your own words to the dictionary, of course, and each offers a number of useful options governing the checking process. But Spell has one accuracy-promoting feature that Works alone can't touch: the dictionary can be customized on a document-by-document basis. If you're fond of abbre-

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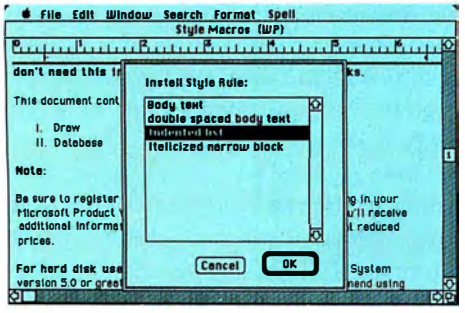
viations or acronyms in your professional correspondence, but don't want the alphabet soup approved automatically in letters to your mother, Spell can make the necessary adjustments.

I can't confirm Lundeen & Associates' claim that Spell is several times faster than the Works spelling checker, but in my own informal time trials it did consistently finish first. Certainly, Spell seems noticeably more responsive and can check a few selected words much more quickly than Works alone. The new version also adds one important speed-up feature: Spell now remembers what it has already checked, so when you call on it again for the same document, it just checks the changes you've made since the last run.

If you're a Works devotee, Spell's superior spelling talents may be enough by themselves to make you want to buy it. When you add in Spell's other features, the tug on the old purse strings becomes almost irresistible. Spell adds automatic hyphenation to your text documents, something the unaided Works lacks completely. It also has a "mini-macro" glossary feature that transforms abbreviations you've concocted (a single key will do) into complete words or sentences as you type.

In Command

Now that we've mentioned macros, let's tackle WorksPlus Command, the macro product for Works. With Works' own crude but effective macro-recording facility now on the scene, Command may be overkill for most Works users. Still, Command gives you far more control over automating Works' functions, and again, it offers additional features that make Works work better.



Working with Style

WorksPlus Command adds word processing style sheets to Works; they work just as well as if they'd been built in.

As in earlier versions, the package comes with a diverse set of preprogrammed macros. While they do whet your appetite for building custom macros, the macros that come with Command are more than stale tutorials. Among the functions they add to Works are automated log-on to telecommunications services, search and replace in database and spreadsheet files, and (along with many other text-oriented macros) style sheets for one-shot paragraph formatting (see "Working with Style"). Even if you never create your own macros, the prefab ones are well worth the price of admission.

Command offers two different ways to create your own macros: you can either record keystrokes and mouse events as you work, or you can write out macros in Command's powerful macro language. Even with the simpler record-as-you-go technique, Command has considerably more power than Works' macro maker—you can build in simple dialog boxes to get user input without any programming, for example.

But with the macro language and supporting tools, Works verges on becoming a programming environment for custom applications. Macros you write yourself can include loops, variables, and conditional branches (if you're in a database document, macros can sort; if you're editing text, they can check spelling). To give Works your own feel, Command includes a capable dialog box generator. An advanced macro debugger completes the package.

In version 2.0, Command gets an important structural improvement and a few minor revisions and additions, but it's functionally largely the same as before. The big change is that it runs considerably faster and needs less memory since macro source code files are now stored separately from the compiled macros.

The only problem with all of Command's power is that Works was designed for beginning and intermediate users. I remain dubious that many of those who picked Works for its simplicity over inherently more powerful applications will be interested in macro programming on the scale Command permits. If you're a fan of Works, my advice is to buy Command for the built-in macros, and consider everything else gravy.—*Steve Cummings*

See Where to Buy or circle 827 (WorksPlus Spell), 826 (WorksPlus Command) on reader service card.

MACENVELOPE PLUS 1.0

Envelope and Mailing List Utility

Pros: *Dramatically simplifies envelope printing; accepts imported graphics for return-address logos; has helpful database-like sorting and searching capabilities and adequate import/export capabilities.* ***Cons:*** *Doesn't permit mixing of type styles within a text block on the envelope.* ***Company:*** *Synex.* ***Requires:*** *Mac 512KE.* ***List price:*** *$295.*

MACINVOICE 1.02

Invoice Utility

Pros: *Extremely easy to use; has macro feature for quick form fill-out.* ***Cons:*** *Doesn't permit editing of invoice layout; no import/export feature.* ***Company:*** *Synex.* ***Requires:*** *Mac 512KE.* ***List price:*** *$69.95.*

MACPHONEBOOK 2.0

Phone Book Printing Utility

Pros: *Correctly handles the complex formatting required for printing double-sided pages in proper order.* ***Cons:*** *Doesn't share files with MacEnvelope directly; autodialing not available as a DA.* ***Company:*** *Synex.* ***Requires:*** *Mac 512KE.* ***List price:*** *$79.95.*



A trio of programs from Synex—MacEnvelope Plus, MacInvoice, and MacPhonebook—attempts to fill specialized needs left unmet by larger programs. Targeted primarily at small businesses, each of the three focuses narrowly on printing one type of document—envelopes, invoices, or telephone directories. MacEnvelope Plus, the best of the little family, is an extension of earlier versions of MacEn-

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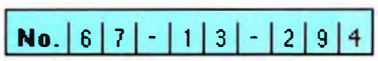
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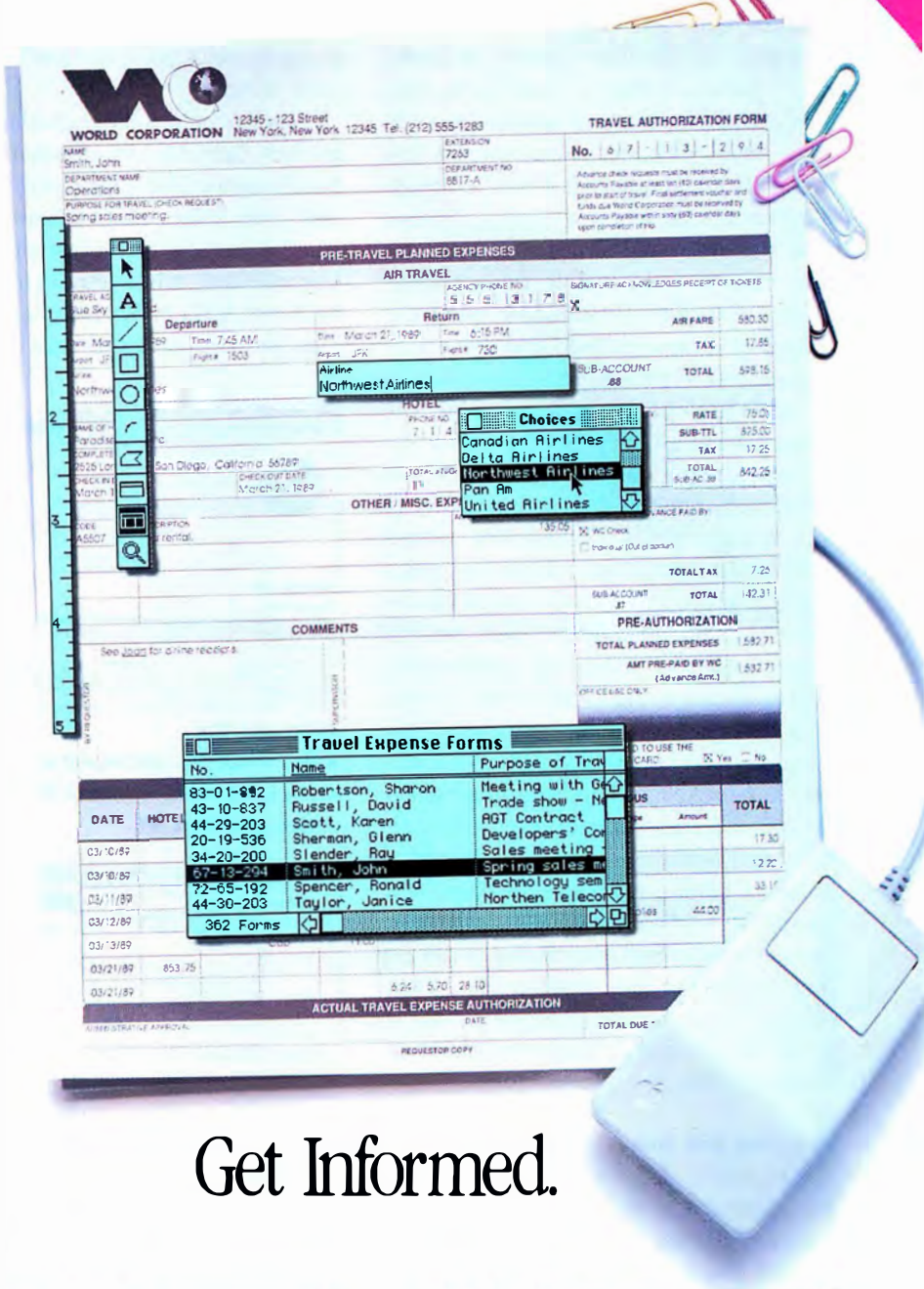
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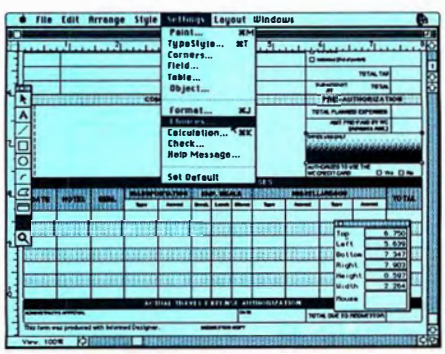
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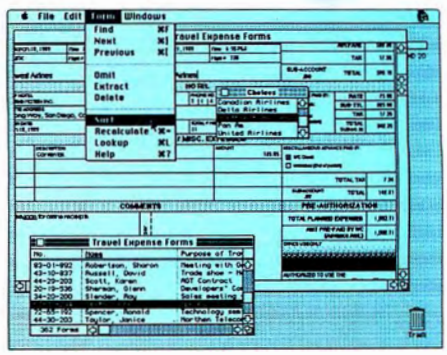
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velope. It lets you print mailing labels as well as envelopes in standard and custom formats, add PICT graphics to your envelopes as return addresses, and print postal bar codes for speedier delivery of letters (see "Addresses Plus"). In addition, you can exchange name and address records with other programs in several file formats. My only complaint is that although you can use different fonts for the address, return address, and a message, you can't mix fonts or styles within one of these items—you can't, for example, print the addressee's name in bold and the rest of the address in plain type.

MacEnvelope Plus adds several features that do a better job of meeting the volume-mailing needs of businesses and other organizations. The biggest change is in capacity: while MacEnvelope stored only 1600 records, MacEnvelope Plus stores up to 100,000. You can now assign one or more 1-character flags to each record. These serve as codes for categorizing addresses according to whatever scheme you devise: A for awful customer, F for fabulous, and so on. And Plus gives you much more control in selecting which records to print, export, or delete—for any of these operations you can specify a range of names, zip codes, or flags, or a combination of these criteria. Plus can also recognize imported records that duplicate ones already in your mailing list. I can't imagine managing mailing chores for a small or midsized business without MacEnvelope Plus.

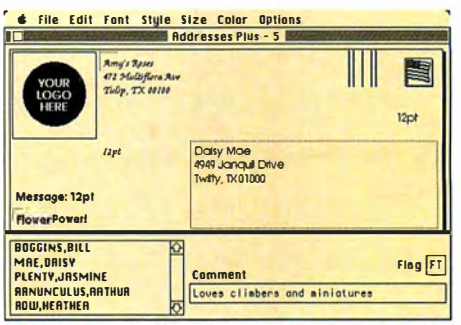
That Small Black Book

On to MacPhonebook, which is primarily designed to help you print phone directories and address books. You can type in names, phone numbers, and addresses or import them from a database program or from MacEnvelope Plus (see "MacPhonebook"). When you're ready to print, you choose one of four different formats, ranging from a little black book you can stuff in your wallet to a corporate-style desk directory.

MacPhonebook does the hard work for you; you choose the format, and the program breaks up the names and numbers into pages that print nonconsecutively on both sides of each piece of paper. A few minutes of snipping, folding, and stapling and voilà—you have a finished phone book in alphabetical order, with all the pages printed on both sides. The program even provides you with a few vinyl covers.

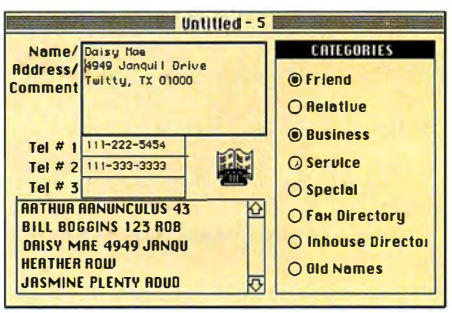
There's quite a bit of overlap of capabilities between MacPhonebook and MacEnvelope Plus. Obviously, both store and print names and addresses; in fact, MacPhonebook can even print labels. Unfortunately, while you can transfer data back and forth in MacEnvelope Plus format, the two programs can't share the same files directly. If you want to store the same names in both programs, you must waste disk space on duplicate files and waste time on the export/import cycle. Like the earlier MacEnvelope, MacPhonebook has a capacity of just 1600 names—a bit limiting for some midsized firms.

MacPhonebook can also dial a telephone for you via modem. This function works fine, as far as it goes. But since MacPhonebook isn't a DA, the autodialing feature isn't always available when you need it.



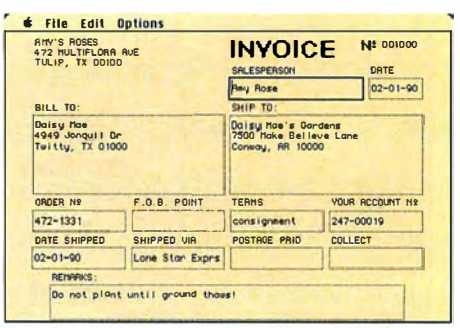
Addresses Plus

In MacEnvelope Plus, you can print a single envelope by clicking on the addressee's name in the scrollable window at the lower left.



MacPhonebook

MacPhonebook lets you enter and store names, addresses, and phone numbers on this simple screen.



One Size Fits All

MacInvoice's generic, one-size-fits-all invoice form.

MacInvoice

MacInvoice is the least flexible of the three Synex utilities, but it may still fill a niche at some small companies. MacInvoice's only contribution is to provide one generic invoice form, which you fill out and print as often as you like (see "One Size Fits All"). You can't customize the layout of the form, though you can change the titles on the fields.

A couple of modest frills ease the process of filling out invoices. You can call back information in one or more fields from a previous invoice to avoid retyping repeated information. You can also create quick macros for filling in a frequently used phrase—for example, you could use a UPS or Federal Express macro to fill in the Shipped Via field on each invoice. MacInvoice will print a summary journal that contains invoice numbers, dates, addressees, and amounts, and points out breaks in invoice numbering sequence. Unfortunately, there's no function for calculating totals, sales tax, and so on, automatically.

But MacInvoice's most serious limitation is the lack of an export function. Though the invoices you fill out and print on the Mac look nice, you have to retype the same information to get it into a database or accounting program. Despite its inflexible invoice design, however, MacInvoice may make sense for you, especially if you don't want to pay for the privilege of designing your own forms with a dedicated forms-design package.

—Steve Cummings

See Where to Buy or circle 753 (MacEnvelope Plus), 761 (MacInvoice), 766 (MacPhoneBook) on reader service card.

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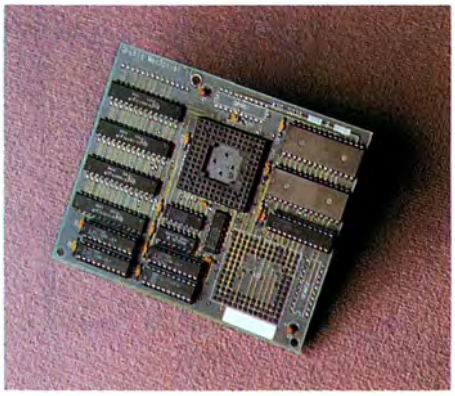
MACSPRINT II

Cache Board for the Mac II

Pros: *Inexpensive; easy to use; four-year warranty.*
Cons: *None.* ***Company:*** *Orchid Technology.*
Requires: *Mac II.* ***List price:*** *$299.*

With the introduction of the 68030-based Macintoshes (IIx, IIcx, and SE/30), users of plain Mac IIs have longed for greater speed at a reasonable price. The Apple upgrade to a IIx logic board is priced at just over $2000 (not including the high-density disk-drive upgrade). Third-party Mac II accelerators are another option, but I don't know of any priced under $1000. The MacSprint II speed-up board changes all that. At $299, it's an inexpensive cache board that provides a speed boost rivaling those of expensive CPU upgrades.

Instead of replacing the Macintosh's CPU with a faster one, the MacSprint relies on a small circuit board that contains a 32K static RAM cache. The cache improves storage of recently used data or instructions in its ultra-high-speed RAM, thus eliminating the wait state. It is faster to retrieve the information from the cache than from system board RAM or a disk, and the cache's performance boost—20 to 30 percent—is within a few percentage points of more expensive CPU upgrades.


MARK JOHANN

MacSprint II from Orchid Technology

Prove It

The real-world and software-benchmark tests I performed failed to confirm Orchid Technology's claim that the MacSprint II "boosts Macintosh II performance up to 30 percent," but it may prove true for certain tasks and applications.

In the Word 4.0 search-and-replace test, which substituted periods for spaces in 7000 instances, MacSprint II achieved a 21 percent speed improvement. The incremental fill test required Full Impact to fill each cell in a 256-by-256 matrix with the sum of the previous cell plus 144; here MacSprint increased the speed by 17 percent.

The remainder of the tests were performed using Speedometer 2.1, a shareware utility for measuring the Mac's performance. The basis for comparison is the Mac SE with an Apple HD20 internal hard disk, which is assigned a value of 1.0. In other words, a stock Mac II has a performance rating 3.89 times faster than a stock SE; with MacSprint II installed, it is 4.5 times faster than the SE.

Subjective Impression

The numbers don't tell the whole story though. Quitting to the Finder, searching, replacing, and scrolling are all definitely faster with the cache on. Benchmarking the screen-refresh rate is almost impossible without sophisticated test software, but there was a perceptible speedup with the cache turned on. PageMaker and Word scrolled and refreshed the screen faster, and most operations in drawing programs like Canvas 2.0 or MacDraw II seemed faster, too.

After a few days of use, I found I could tell within minutes whether the cache was on or off. I was pleased with its performance and found no software or hardware incompatibilities in over six weeks of heavy use with dozens of programs. In fact, MacSprint II worked so well that rather than return the review unit, I simply bought it.

Installation

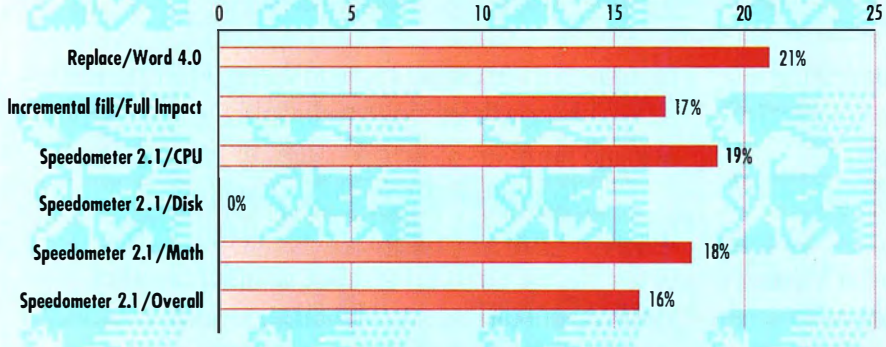
Installation is not for the faint of heart. If you're not comfortable prying chips loose and disconnecting disk drives, you should have MacSprint installed by a professional service technician. Thanks to the clear and concise eight-page manual, I had no trouble installing the board, though it did take me half an hour (the box says "installs in five minutes"). Be careful though—the pins on both the 68020 chip and the MacSprint II are easy to damage.

Once the board is installed and you've reassembled the Mac, you simply copy the MacSprint CDEV into the System Folder and restart.—*Bob LeVitus*

See Where to Buy or circle 770 on reader service card.

MACSPRINT II ADVANTAGE

Measured in the percentage of speed improvement over a stock Mac II



The CPU test is skewed toward graphics; the math test performs computations including square roots, sines, cosines, and tangents; and the disk test repeatedly reads and writes 24K blocks. The overall rating is a weighted average from the other tests with the CPU test weighted at 60 percent and the disk and math tests weighted at 20 percent each.



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QUICKEN 1.5

Home Finance/Checkbook Program

Pros: *Inexpensive; simple to use; offers many keystroke shortcuts; good reporting facilities.* ***Cons:*** *Only allows one account at a time to be active; no graphs.* ***Company:*** *Intuit.* ***Requires:*** *Mac 512K. Printer recommended.* ***List price:*** *$59.95.*

Personal finance programs help you budget, print checks, handle recurring transactions, produce summaries by category for tax returns, and watch where your money goes. Quicken 1.5 is more than up to these tasks, and owners of version 1.0 can upgrade to 1.5 for only $19.95.

Using Quicken

To open a new account in Quicken you must first set its starting balance and define the account type as either home, small business, or for use with the MacInTax tax-preparation program. Within these three account types Quicken provides three extensive sets of income and expense categories, and you can customize these—at any time, even when you are entering a transaction. You can also assign a monthly budget amount to each category, which helps you keep tabs on your actual spending and saving activities.

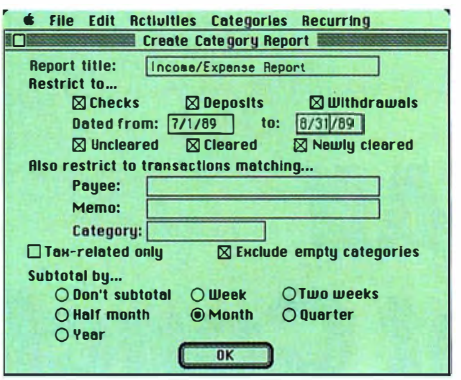
Data can be entered in either the Enter Transactions screen or the Write Checks screen. Enter Transactions can be used for any type of transaction—deposits, withdrawals, or hand-written checks. Write Checks is used for checks that you intend to print. As you enter data, Quicken provides several shortcuts. Check numbers and dates can be changed in the Write Checks window by pressing the plus (+) or the hyphen (-) key, for instance. Split transactions can be entered by typing the first few letters of each category or selecting the appropriate categories in the transaction list. You can also use the option to keep lists of account categories and recurring transactions in the Write Check window, which helps speed the data entry process.

You can set up recurring transactions, specifying the type, the payee or a description, the categories it will be split between (and the amounts, if you wish), and any memo you want. You can also enter the recurring transaction's next due date or a group classification. You can use the Group Entry window to select either the due date or group classification to record your transactions quickly.

Checks and matching window envelopes suitable for most dot-matrix and laser printers can be ordered from Intuit. Quicken even includes a HyperCard stack, CheckArt, to personalize your checks with an emblem or logo.

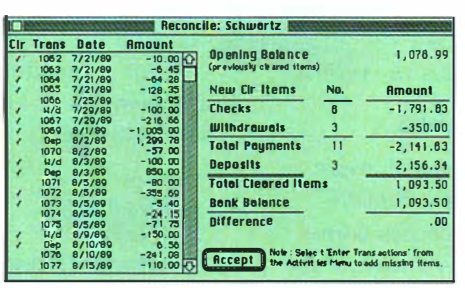
What's New?

Although not dramatic, the changes introduced in 1.5 are welcome. Most can be classified as improvements rather than new features. Quicken now lets you print three different styles of checks: standard, wallet size, and voucher (payroll type). If you use a LaserWriter, you can print partial sheets (there are three checks per sheet). Version 1.5 also allows you to allocate up to seven payroll deductions—up from five in version 1.0.



Reports

Version 1.5 allows three basic report types: transaction, category, and budget. Within each, you can specify a range of dates and the type of transaction; restrict output to a specific category, memo, or payee; and generate subtotals by time periods. Transaction reports can also include payee subtotals.



Account Reconciliation

It's easy to reconcile an account with your bank statement. Each time you click on an item in the transaction list (far left) to indicate that it has cleared, the totals on the right are updated.

The biggest change, however, is in Quicken's financial reporting facilities (see "Reports"). You can now create multiple-column reports, such as a profit and loss statement that shows the different time periods for expense and income categories. Also, any change made to a transaction in the report is automatically reflected in the report totals.

Quicken is targeted for home and small business use. If your major financial activities center around a single checking account, this is the program to have. When tax time comes around, a few mouse clicks will produce reports that you can use in your returns. Data can also be exported from Quicken to a SYLK file (for further analysis in Excel, for instance), a text file (for further editing), or for use with MacInTax.

The program's biggest limitation is its inability to handle transactions involving multiple accounts. You can create separate accounts for checking, savings, certificates of deposit, mutual funds, and so on, but Quicken can only deal with one account at a time. To transfer funds from your savings to your checking account, you'd have to record a withdrawal from the savings account, close that account, open the checking account, and enter a separate deposit. Similarly, there's no easy way to produce a net worth statement without making a special assets/liabilities account that you must periodically update by entering the current balances from each of your other accounts.

In short, as your financial situation becomes more complex, you may outgrow Quicken. Nevertheless, until your needs change, Quicken is the place to start. It's not an everything-but-the-kitchen-sink personal finance program, but what it does, it does extremely well.

—Steven Schwartz

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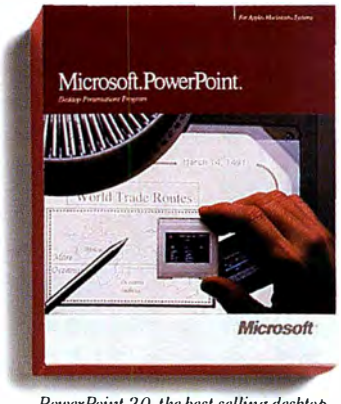


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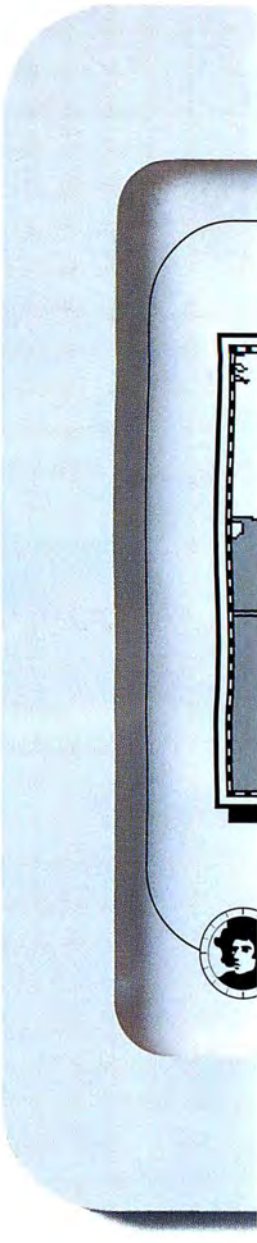
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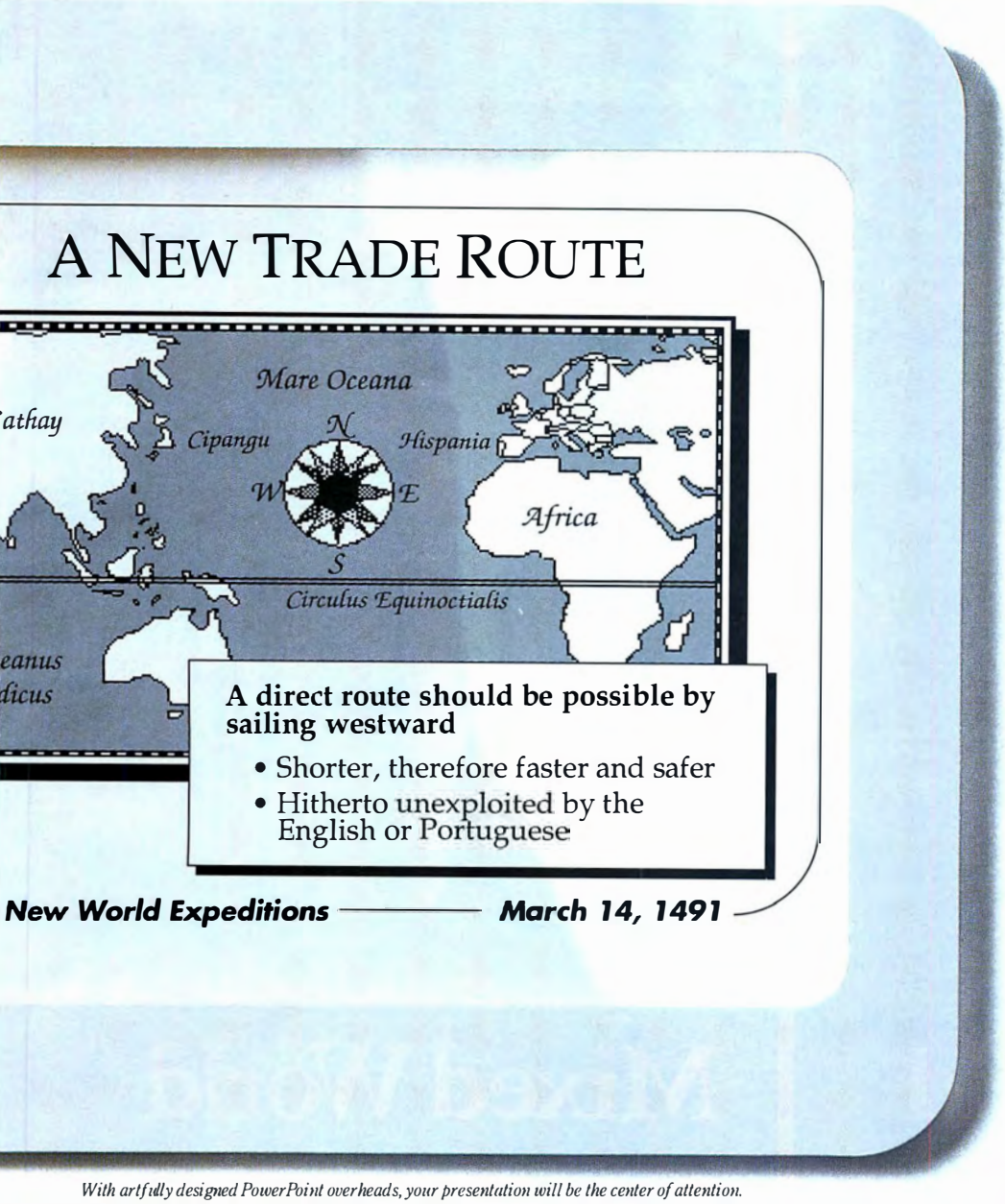
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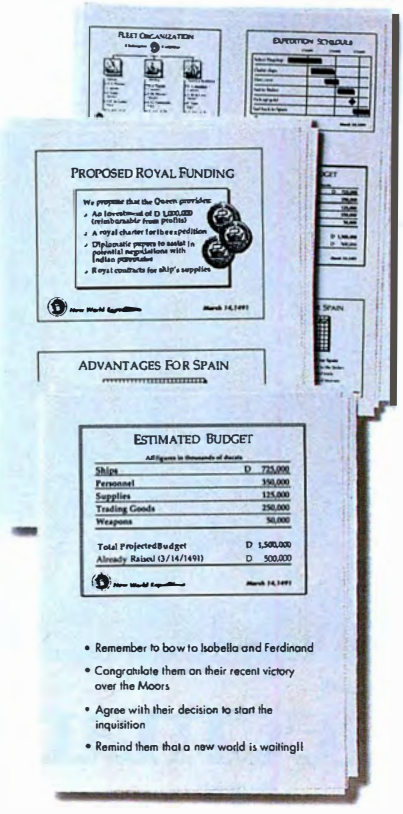
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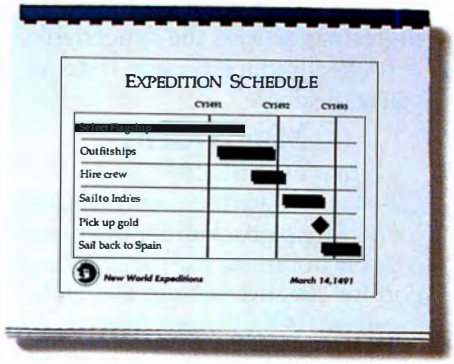
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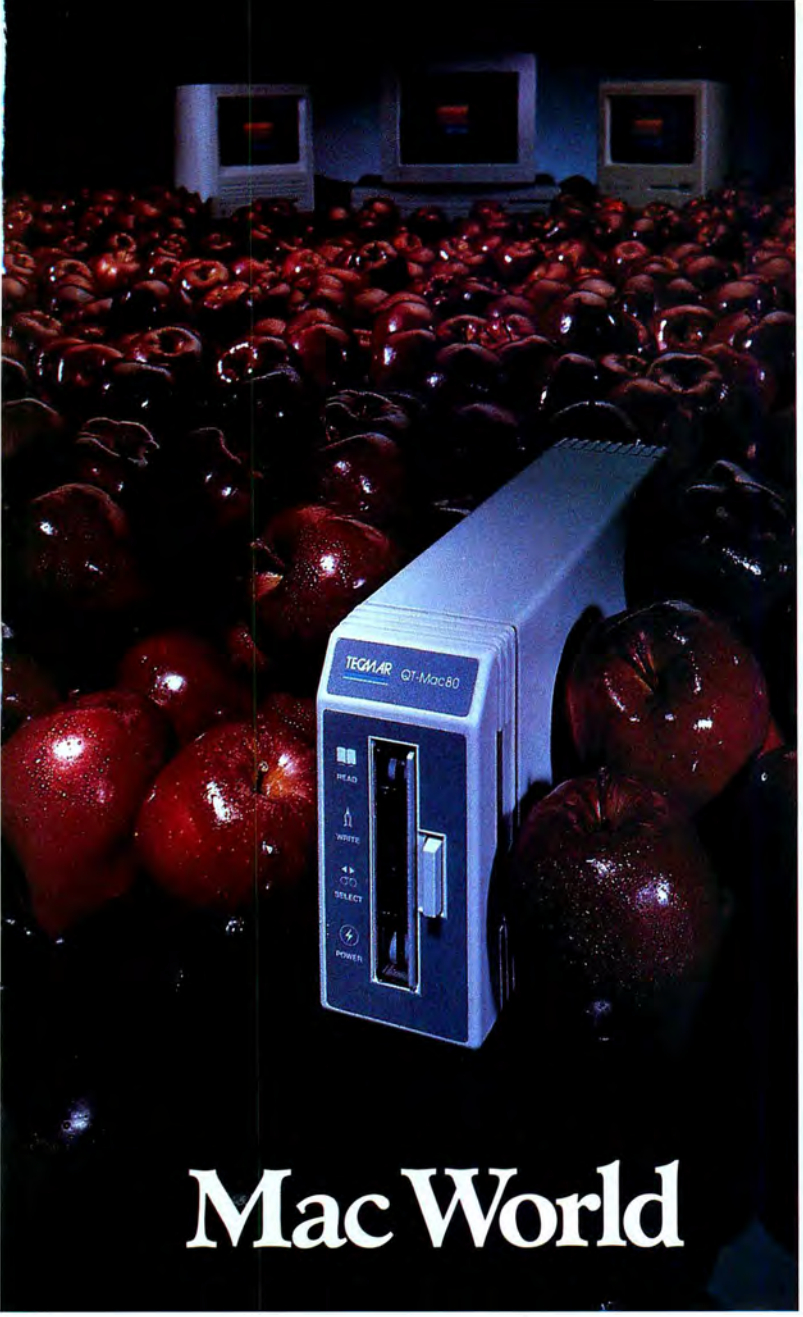
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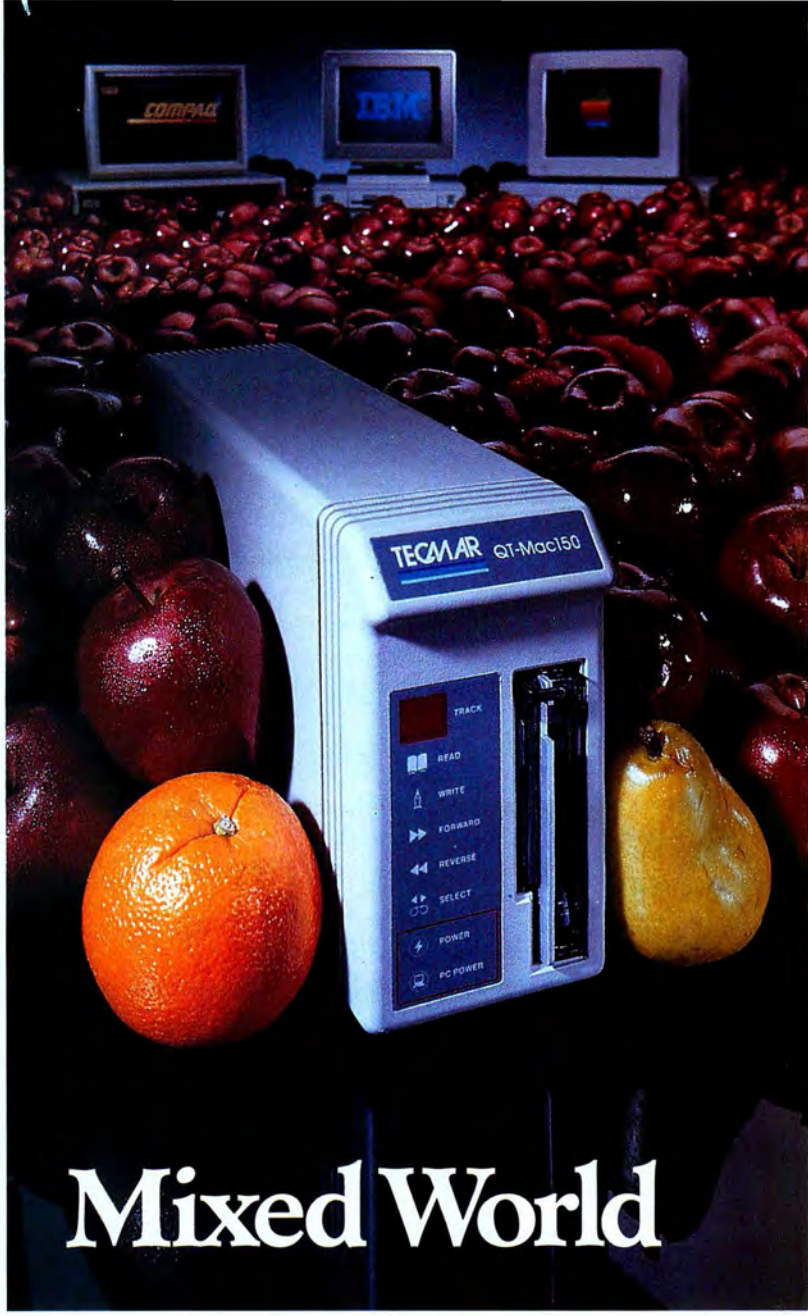
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	Plus	SE	II	IIX	PC	PS/2™
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Circle 321 on reader service card

MACINTERIORS 1.0

3-D Room-Layout Program

Pros: *Lets you view room layouts from any angle; easy-to-follow tutorials; relatively fast.*
Cons: *Difficult to learn.* ***Company:*** *Microspot.*
Requires: *Mac Plus.* ***List price:*** *$295.*

In designing a room layout, you can draw an overhead plan, rely on one of those room-design kits with little plastic shapes that stick to a board, or you can create a layout in a drawing program. All of these approaches let you determine which pieces of furniture will fit where, but they don't allow you to see how the room will look when you stand, say, by the window. MacInteriors, in contrast, lets you create pieces of furniture, put them in a room, and view the results from virtually any angle.

MacInteriors comes with a few ready-made items, but you will probably need to make some of your own. The program's Design mode features a few simple tools for drawing 2-D rectangles and polygons, as well as 3-D cubes and prisms that you piece together to construct furniture and other items.

As you work in one view you can open other windows for alternate views. Each item can be displayed as a solid object or as a wire frame, and solid objects can be filled with a pattern. There is no on-screen ruler, but a dimension box in the screen's lower-left corner shows you an item's size as you draw. You don't need to be precise, however, because you can call up a dialog box and specify the item's exact length, breadth, and depth.

When you finish building something, you merge all of its component pieces and save the finished whole to a library. A library, which holds up to 64 items with up to 64 surfaces each, is linked to the file it is created in, but you can save a file as a stationery pad and use its library for new plans.

Creating Your Personal Space

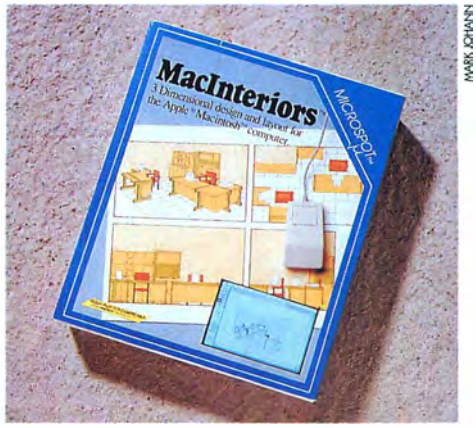
MacInteriors' easy-to-follow tutorials take you through the steps of making a file cabinet and a simple desk. They also teach you how to create various types of rooms in the Planning mode, which is similar to the Design mode with its dimension and sizing dialog boxes, but uses a different collection of tools. A room-drawing tool, which works like the typical rectangle tool, lets you quickly create simple rooms. A fixture tool is used to draw individual right-angle walls and to place doors and windows. A diagonal fixture-tool lets you create walls that aren't at right angles.

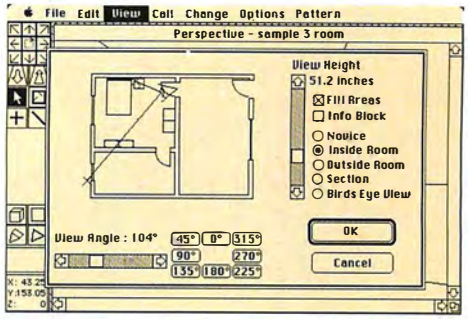
Learning how to place objects when planning a room, however, can be frustrating. For example, one of the exterior walls I was drawing kept appearing in the wrong place on the screen. Doors and windows often showed up at right angles to the wall or in a wall on the wrong side of the room. Moving the cursor to where I wanted an item to appear rarely corrected the problem. I found it easier to let things fall where they would and then move them than to figure out how to get them to appear in the right place as I drew them.

When your overhead plan is finished, you call up items of furniture from the library and position them. You can rotate an item and you can flip an item on any or all of its axes.

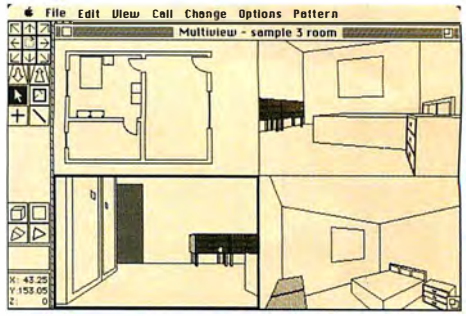
Room with a View

MacInteriors can seem like little more than a temperamental drawing program until you take advantage of its power to display a layout from any angle or elevation. In the Perspective window you can call up a dialog box (see "Change Perspective") that allows you to see how things look from anywhere in the plan. And redraw is accomplished relatively quickly in simple room designs, although it gets sluggish in layouts that have many surfaces, such as irregularly shaped items created with the prism tool or complicated desks or chairs.





Change Perspective
This dialog box lets you change views by moving the "eye" (in the doorway top-center), by resetting the viewing height, or by widening or narrowing the view angle.



Multiview Window
This window lets you display up to four views of a layout, such as the overhead view and three different perspectives pictured here.

The layout can be scaled to fit the screen, to be actual size, or to be any size in between. You can gather several different views into one window (see "Multiview Window"), and you can print any of the views on an ImageWriter, LaserWriter, or plotter (with MacPlot, Microspot's optional plotter driver).

If you want to produce three-dimensional renderings of room layouts and you're not a designer by trade, you should consider MacInteriors. Be prepared, however, to spend a considerable amount of time building a library of furniture, planning your layout, and—most important—getting the program to do what you want it to do. With patience and perseverance, however, it works.—*Gerry Lukos*

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SUPERGLUE II 2.01

Print-to-Disk Utility

Pros: *Extremely versatile way to share Macintosh documents; allows Post-it–style notes to be attached to documents; easy to use.* ***Cons:*** *None.* ***Company:*** *Solutions International.* ***Requires:*** *Mac Plus.* ***List price:*** *$119.95.*

CANOPENER 1.0

Document-Browsing Utility

Pros: *Innovative user interface; opens and browses most types of documents.* ***Cons:*** *User interface can be confusing when first viewed in black and white.* ***Company:*** *Abbott Systems.* ***Requires:*** *Mac Plus.* ***List price:*** *$125.*

Although we've been hearing about the paperless office for years, people still use paper, partly because it's a lot easier to manage than electronic documents. Two new products, SuperGlue II and CanOpener, are designed to give electronic documents some of the same advantages as paper ones.

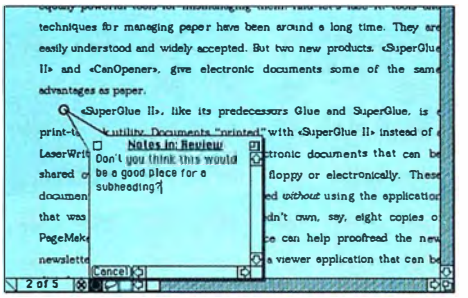
SuperGlue II, like its predecessors Glue and SuperGlue, is a print-to-disk utility. Documents printed with SuperGlue II, instead of on an actual printer, become electronic documents that can be shared over networks or distributed on floppy disks. These documents can then be viewed and printed without using the application that created them. You needn't own, for example, eight copies of PageMaker just so everyone in your office can help proofread the newsletter. SuperGlue II even includes a viewer application that can be distributed without license fees.

SuperGlue II improves on its predecessors by allowing certain modifications to be made to the printed document. You can extract the text from the document or substitute different fonts while preserving the line or character spacing of the original. Unlike earlier Glue products, SuperGlue II can match fonts by name instead of number, so the mysterious font changes that used to occur can be prevented.

SuperGlue II includes a handy F-key called OneTimer that can invoke the SuperGlue II driver once, then return the system to its regular printer. Longtime Glue users will appreciate this convenience. An even more impressive feature is GlueNotes, an electronic equivalent to Post-it sticky notes (see "Pasting In Comments"). With GlueNotes, any document can be circulated among SuperGlue II users in a workgroup, annotated, and returned to the document's creator for revision. After annotating, you can exchange just the notes file—a big time-saver when working with large documents by modem.

Browse Any Document

One advantage to paper documents is that if you remember seeing some scrap of information somewhere, but don't remember exactly where, you can often locate it by doing an exhaustive search of nearby papers. With electronic documents, however, your information could be buried in folders on a huge hard disk, and your search could involve tediously opening each document in turn and laboriously relaunching many different applications.



Pasting In Comments
SuperGlue II allows workgroup members to paste comments into documents printed with its SuperImageSaver print-to-disk driver.



A New Interface
CanOpener's interface sports three-dimensional buttons and a streamlined, modern look. The design looks much better on color or gray-scale displays.

Abbott Systems' CanOpener is a clever utility designed to make just this sort of search easier. It extracts pictures, text, icons, or sounds from documents and searches folders or entire disks for specified text strings, storing any items it finds in a Scrapbook-like library. Even better, CanOpener can access information in almost any document, regardless of its creator.

The most striking thing about CanOpener is its graphic design. From the packaging, with its bold images and poster-size reference sheet, to its user interface with 3-D buttons and animated cursor, the product sets a new standard for Macintosh visual aesthetics (see "A New Interface"). It's functionally efficient, too. The window can be reduced to an icon to avoid desktop clutter, buttons can be selected and pushed without using the mouse, and CanOpener remembers a number of default settings between sessions.

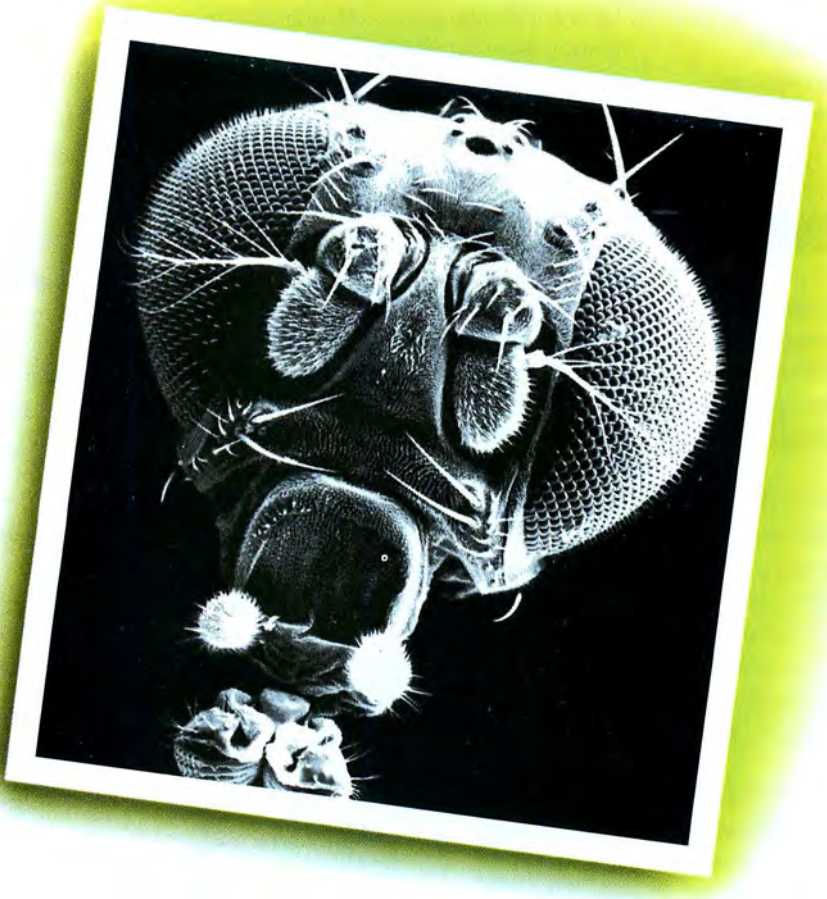
But CanOpener's advanced user interface is also one of its shortcomings. While it looks great on a color or gray-scale monitor, it's a bit confusing when first viewed in black and white. When shrunk to an icon, CanOpener causes MultiFinder's shut-down operation to fail. It would be nice if searches, which can be quite time-consuming, could be done in the background. Still, these are minor complaints. For finding, extracting, and archiving information from documents created with many different applications, CanOpener can't be beat.

Both SuperGlue II and CanOpener include application versions as well as fully functional desk accessory versions, so they are equally at home with or without MultiFinder. Documentation and support are good for both programs.

It will be a long time, if ever, before computers replace paper completely. Still, with SuperGlue II to serve as a copy person and CanOpener for an electronic file clerk, adapting to the electronic office might not be as traumatic as some have feared.—*Ron Risley*

See Where to Buy or circle 815 (SuperGlue II), 717 (CanOpener) on reader service card.

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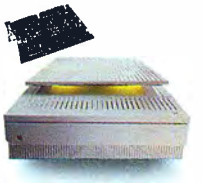
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MOBIUS MULTISCREEN 2.0

Multiscreen Video Board for the Mac SE

Pros: *Works well with inexpensive 14-inch monochrome monitors and Apple 12-inch monitor.* ***Cons:*** *Uneven driver support; documentation needs some polish.* ***Company:*** *Mobius Technologies.* ***Requires:*** *Mac SE; System 6.0.2.* ***List price:*** *$395.*

You're sick of opening, closing, and juggling windows. You think squinting at the SE's screen might be damaging your eyes. You really can't justify buying a costly full-page or dual-page display or a Mac II. Mobius Technologies' MultiScreen—which lets you attach to the SE the various Apple monitors available for the Mac II, inexpensive IBM PC–compatible monitors, and Apple-compatible portrait displays—may be your solution.

MultiScreen consists of a video board, which plugs in to the SE's expansion bus slot, and software to drive various monitors. I tested MultiScreen with the Princeton Graphics MAX-15, the NEC MultiSync II, and the Apple 12-inch monochrome displays on a standard dual-floppy SE. For the Apple 12-inch display, you'll need a longer power cord than the one that comes with the Mac II. Also, the Mac II's interface cable is barely long enough to provide the 15-inch corridor necessary between the two screens, so you might want to invest in a longer one.

Installation is clearly explained, and it's simple enough provided you have access to the long torx screwdriver required to open Mac Pluses and SEs. (I managed to break two of the hex nuts on the back of my Mac by overtightening them with a ratchet driver, so save tire-changing torque for your car.)

Warning: Unless you have technical training or knowledge to work inside the Mac, don't do it. High-voltage components may cause physical harm to you as well as to the machine.

Software installation is simple: you copy the MultiScreen INIT file into your System Folder and choose the display and resolution. You can change optional features any time by clicking the MultiScreen icon in the Control Panel.

It's important to follow the instructions on how to position the external monitor. If you put it too close to the SE, electromagnetic interaction between the SE's transformer and the transformer in the monitor will produce horizontal scan lines on the SE. In the case of the NEC MultiSync, I couldn't get the SE and the monitor far enough apart (I tried up to 3 feet) to restrain their transformers from interfering with each other. For some inexplicable reason, the mouse pointer was also slowed down.

MultiScreen lets you either switch to a larger external screen or extend the SE's screen by adding on the width of another monitor. Although the latter option takes some getting used to, it allows you to have one set of windows open on one screen while you work on a document on another. This makes MultiFinder's ability to toggle between multiple applications and documents without sorting through all your layers a bit easier. When you are scrolling through documents, MultiScreen's SpeedScroll facility speeds up QuickDraw an average of 20 to 30 percent.



The Mobius MultiScreen video board allows you to work on documents across two screens.

Configuration choices include being able to work on only the SE or the external screen, or being able to work on both, with the external monitor on whichever side you prefer. In this configuration, the software allows the pointer to move freely between the monitors as if they were one large screen. You can line up the external screen with the SE screen for better horizontal movement between the two. The menu bar can be displayed on either screen, so you can use one screen as command central and the other to display documents. And if you ever want relief from the white screen, the inverse video toggle can paint a much darker picture.

Some of MultiScreen's nicer features are a screen saver for both screens and a magnifier for enlarging images from 2 to 8 times (available only when working exclusively on the external monitor). Even though dialog boxes will still be normal size, you can opt for a larger menu bar and cursor, and you can turn the menu bar into QuickKey-accessible pop-up menus. You can also automatically add zoom boxes to document windows.

My favorite feature is that not only can you move the pointer freely between the two screens at their central meeting point, but you can also exit at the left edge of one screen, sneak around back, and enter through the right edge of the other. Imagine being able to jump between columns A and O without scrolling on a spreadsheet that spans the width of two monitors. The save-screen-to-disk-or-printer facility is a nice idea, but it regularly crashed on my system. Another annoying feature is the *x-y* mouse position counter at the bottom of the screen that doesn't seem to serve much purpose.

MultiScreen's software offers resolutions of 640 by 480, 720 by 540, and 800 by 560 pixels. At the higher settings, more is visible on screen but the text and graphics shrink. As with full page displays, the main advantage of MultiScreen is to extend your visual window, not necessarily to enlarge or sharpen the elements on the screen.

If you've got extra Samsung, NEC, or Tatung monitors around, I'd recommend using them with a MultiScreen-equipped SE, but I wouldn't buy them specifically for that purpose; I found the driver support for them uneven. However, when used with an Apple 12-inch or Apple Portrait monitor, a Sony MultiScan, or a Princeton Graphics Max-15, the Mobius MultiScreen board provides an inexpensive solution to SE microscopy.

—Nancy Canning

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Circle 93 on reader service card

WINDOW SHOPPING

by Lawrence Stevens

This month we look at two special-purpose graphics packages, a handwriting-analysis tool, and a program that provides amortization tables.



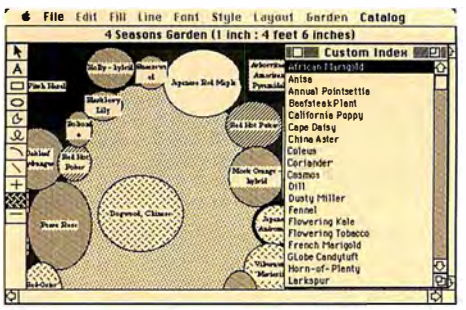
RON CHAN

Mum's the Word 1.1

Mum's the Word (Terrace Software, $125) provides graphics tools and a database to help you plan a garden. The program includes an object-oriented graphics screen, similar to the early versions of MacDraw, along with a Plant Catalog database of over 300 plants.

Double-clicking on a name in the plant index displays specific information about that plant, such as hardiness, height range, optimal spacing, recommended season for planting, and any negative features. You can edit the record to reflect your actual experience and you can add new records for plants not included in the catalog.

The most powerful feature of Mum's the Word is its ability to create a custom index that contains only those plants that meet your personal criteria for class, type, hardiness, planting season, color, blooming season, and ideal soil and light conditions.



Planning Your Garden

The garden scale is listed at the top of this screen. To lay out the garden, you draw the beds using the graphics tools. You then drag the name of each plant from the index at the right to the bed. You can double-click on any bed to view the database record of its plant.

To use Mum's the Word to plan your garden, you set the scale and draw the shape of your garden using the drawing tools. Next, you use the database to help decide which plants to include and to determine their best location. You then draw the beds. Finally, you drag each plant's name from the index to its designated bed. Whenever you double-click on a bed, the database record of the plant appears on the screen.

Although the graphics section of this program is customized for landscaping, there is no reason you couldn't use Mum's the Word as a general-purpose drawing program. It provides a grid (but no Snap To function), and has all the major drawing tools, a full pattern palette, and eight line thicknesses.

If your garden contains the same plants year after year, you'll probably have no trouble laying it out with a general-purpose graphics program or even pencil and quadrille paper. But if you want to experiment with new plants and try out different arrangements, Mum's the Word can save you hours of thumbing through plant catalogs and gardening manuals.

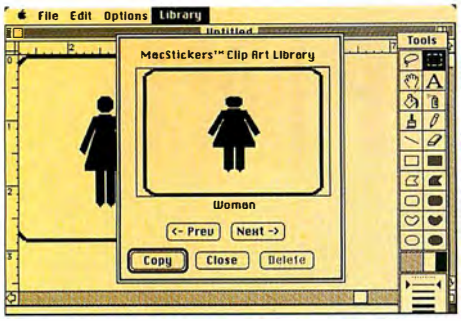
MacStickers 1.0

MacStickers from International Computer Services ($49.95) is a bitmapped paint program supposedly customized for designing and printing labels such as bumper stickers, disk labels, and badges. Actually, the program offers only a small set of templates for bumper stickers two or three to a page, large and small name badges, and disk labels. The package includes a 32-sheet assortment of colored and white heavy stock and adhesive-backed sticker pages.

While MacStickers is slower than the present generation of paint programs and lacks multiple windows and tear-off menus, it does have two features not found in some other paint programs. The first is a library where you can save objects and then paste them into a document with one mouse click. The second, a Pen Transfer Mode window, gives you six options for drawing an image on screen. For example, you can choose whether newly drawn objects should always appear in front of or behind previously drawn objects. Or you can specify that when any object overlaps a second object, the edges of the lower object appear as a dotted line on the upper one.

I recommend a full-featured paint program if you can afford one. You'll have no problem creating your labels. But if you can live with a paint program that is slightly less than state of the art, MacStickers gives you about the best value for your money that I've seen in a long time.

(continues)



The MacStickers Library

This window makes it easy to save and use symbols that you might need for stickers and badges. The program comes with about 25 images, but you can add more. You browse through the library by clicking on the Prev or Next buttons. Clicking the Copy button copies and pastes the figure into the document. Although you can name each image, the program doesn't sort them in alphabetical order, so it can be cumbersome to find images in a large library.

AmPack 4.2 and AmPack Plus 4.2

AmPack (Softflair, $49.95), a program that determines loan amortization figures, is intended not for loan officers but primarily for borrowers. AmPack Plus ($89.95), which adds a number of features, is for bankers, real estate brokers, and other professionals who deal with loans.

The main window includes Loan Amount, Interest Rate, Term in Years (you can change Years to any of six other intervals such as Weeks or Bi-Weeks), Payment Amount, and First Payment Date (input in this box is optional). Fill in any three of the nonoptional boxes, and the program solves for the fourth. For example, you can type in the prevailing interest rate and term period along with the maximum amount of available money for monthly payments, and the program gives the maximum loan amount. You can then do "what-if" analysis to see how changing the term or interest rate affects the maximum loan amount.

AmPack also creates in-depth reports that can be viewed on screen, printed, or pasted to the Clipboard in either text or data (tab-delineated) form. The report lists periodic payment, interest payment, principal payment, and principal balance for every month (or other interval) that the loan will be outstanding.

AmPack Plus takes into account a large number of loan options when generating the report. For example, the first payment can be modified based on the number of days interest is accrued, the loan can be amortized as interest or principal payments only, payments' due dates can be scheduled to skip specific days or a given month each year, and the effect of unscheduled interest or principal payments can be listed. AmPack Plus can also figure the annual percentage rate based on points and fees, and can generate a rate disclosure statement.

AmPack Plus is excellent for professionals who do not have access to a corporate mainframe to generate loan reports. The advantage of AmPack is less clear; if you are shopping for the best mortgage, a ten dollar amortization book might be a more cost-efficient alternative. However, if you want to discover how best to invest in real estate, AmPack can be a helpful guide.

Handwriting Analyst 3.1

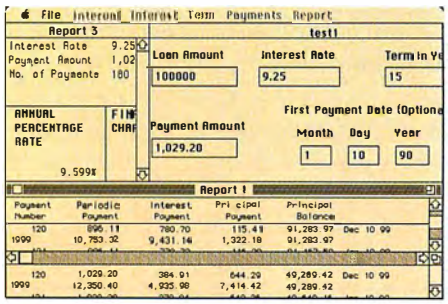
Handwriting Analyst from CIASA ($69.95) asks you approximately 80 multiple-choice questions about the handwriting you want to assess. It then generates a seven-page, single-spaced report, describing the person whose writing it is according to six headings: Physical and Material Drive, Emotional Characteristics, Intellectual Style, Personality Traits, Social Behavior, and Vocational Implications. You can analyze either the subject's signature (which indicates his or her public image), text (which indicates real personality), or both. If you choose to analyze both, discrepancies between the public image and the real personality are listed side by side in the report.

The multiple-choice questions are clear and easy to follow. For example, the Y Loop Fullness screen offers five choices: Full, Moderate, Thin or Retraced, Downstrokes Only, or Mixed. Each screen of options has one or two associated instruction screens that fully describe each of the choices. The manual also contains handwriting samples illustrating each option. The package even comes with an acetate template to help you measure letters and determine slant.

The report seems particularly geared toward employers, since much of it deals with ability to work with others, level of desire for money, and problem-solving ability. But there is also enough information to meet most general users' needs.

The program's basic approach to graphology can result in statements that seem somewhat contradictory. For example, in one of my tests, the subject was described variously as "not restless or a go-getter . . . less physically active than most people" and as having "a lot of vitality and a zestful, exuberant attitude." This problem notwithstanding, Handwriting Analyst was accurate about four times out of five, as far as I could ascertain.

Because the program is basic and because, as nonprofessionals, most of us make some errors in answering the multiple choice questions, it would be a mistake to rely on Handwriting Analyst as the sole tool for assessing a prospective employee, tenant, or customer. But it can be useful for gathering general information to then corroborate through other means. Also, if you're thinking about studying graphology seriously, this program might be a good way to get your feet wet, and the manual offers suggestions for further study. Even if you don't have a serious interest in handwriting analysis, this program can be a nice icebreaker at parties. M



AmPack Plus Peports

AmPack Plus gives you multiple windows so you can compare different loan options. The window entitled test1 contains all the main mortgage data. Report 1 and Report 2 (at the bottom of the screen, partly obscured by Report 1) compare the 120-month (10-year) payment data for a 15-year mortgage and a 30-year mortgage. Report 3 gives the annual percentage rate based on 2 points.

See Where to Buy or circle 783 (Mum's the Word), 771 (MacStickers), 705 (AmPack), 705 (AmPack Plus), 739 (Handwriting Analyst) on reader service card.

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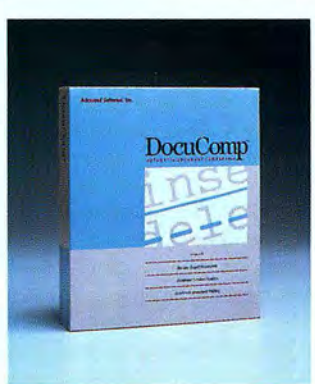


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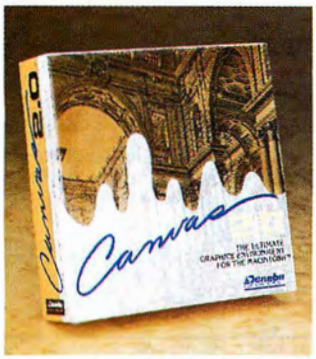
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Net Bridge or TeleBridge ..... 339.
Tactic Software
Font Share ..... 149.
TOPS Tops 2.1 Mac ..... 145.
Tops Dos or Net Print ..... 114.
Tops FlashBox ..... 125.
Tops Repeater ..... 129.
Tops FlashCard ..... 159.
InBox-MacConnection ..... 45.
InBox-Starter Kit ..... 149.
Tops Teleconnector Din8 or DB9 ..... 29.



DocuComp by Advanced Software

DocuComp compares different versions of a word processing file or programmer's code. Frustrated with marking up hard copy? No More! *DocuComp* reports changes as minor as added commas or as major as a complete rearrangement and lists all changes by page and line number. *DocuComp* is being adopted as a standard in Fortune 500, government, writing, legal and academic circles. ..... **$89.**

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Canvas 2.0 by Deneba Software

Canvas 2.0, one of the top graphics programs, includes many new features: unlimited layers, positioning to 1/64,000 inch, Bezier curves and polygons, and 16.7 million colors on the Mac II. Converts bit mapped images into objects. *Canvas 2.0* rivals CAD programs. For business graphics, presentations, desktop publishing, engineering or architecture, *Canvas 2.0* helps you create. .... **$169.**

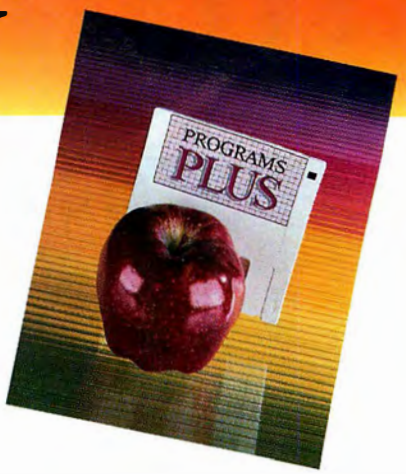
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Applied Engineering
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Best Data Products
SmartOne 2400/1200 w/software & cable ..... ***Special*** 145.
Hayes Microcomputing
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Prometheus
Promodem 2400M Ext. *(MAcKNOWLEDGE & Cable)* ..... 199.
Promodem 2400SE Int. *(MAcKNOWLEDGE & DA)* ..... 209.
Promodem 2400MII Int. *(II, IIx, IIcx) (MAcKNOWLEDGE & DA)* ..... 269.
Promodem 9600M Plus Ext. *(MAcKNOWLEDGE & Cable)* ..... 750.
Promodem 2400M Fax ..... ***Special*** 209.
Supra Corporation
Supra Modem 2400 ..... 115.
STF Direct
FAXstf ..... 445.
U.S. Robotics
Courier HST 9600 Dual Standard ..... 999.



MacLuggage for the Mac SE by I/O Design

MacLuggage features a tear and soil resistant Cordura outer shell and ultra-high density foam. It has compartments which holds mouse, cords, extended keyboard and external hard drive. Comes in navy, platinum and black. ..... **$69.**

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Affinifile ..... 42.
Casady & Greene, Inc
QuickDex 1.4A ..... 31.
CE Software DiskTop v4 ..... 65.
Deneba Software
Comment 2.0 ..... 58.
Icom Simulations MacKern ..... 114.
Jam Software
Smart Alarms w/Appt. Diary ..... 49.
Smart Alarms Multi-User Appt. Diary *(1-4 users)* ..... 99.
Smart Alarms Multi-User Appt. Diary *(5-8 users)* ..... 149.
Smart Alarms Multi-User Appt. Diary *(9-15 users)* ..... 199.
Solutions, International
Super Glue II ..... 61.
SmartScrap & The Clipper V2.0 ..... 45.
Symmetry
HyperDA *(Req. 512K)* ..... ***Special*** 49.



2400MFAX by Prometheus

The ***2400MFAX*** is part of the new ProModem Data/Fax Series. The *2400MFAX* adds Group III, originate-only, 4800 bps fax capabilities to a 2400 bps data modem at a price comparable to standard 2400 bps modems. Get the convenience and flexibility of your own personal data and fax modem whether at the office, home or on the road. The *2400MFAX* Data/Fax modem includes two popular software packages, BackFAX and MAcKNOWLEDGE. ..... **$209.**

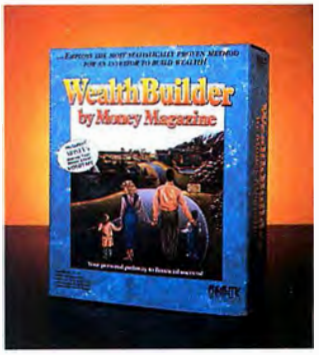


Go Master by Toyogo

Go: the oriental strategic board game originated in China 4,000 years ago. "If you are looking for a captivating game suitable for children or mathematicians...I strongly recommend you try the Nemesis software." Modern Electronics. ..... **$49.**

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Acius 4th Dimension v2.0 ..... 469.
4th Dimension *(Free Upgrade)* ..... 339.
Activision
Reports for Hypercard ..... 65.
Apple Computer
HyperCard ..... 42.
Blyth Software
Omnis 5 ..... 347.
Borland Reflex Plus ..... 185.
Claris FileMaker II ..... 219.
Exodus
Retriever ..... 59.
Fox Software
FoxBASE+ v2.0 ..... ***Special*** 279.
FoxBASE+ Multi-User v2.0 ..... 355.
FoxBASE+ Runtime v2.0 ..... 155.
Generation Four
Multiuser Business Administration Series:
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Icom Simulations
Formulator ..... 89.
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DataDesk Professional ..... 285.
GeoQuery ..... 198.
Preferred Publishers
DAtabase ..... 69.
ProVUE
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Software Discoveries
RecordHolderPlus ..... 64.



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Beacon Technology
HyperBible King James.....143.
HyperBible International.....165.
Borland
Turbo Pascal.....68.
Bright Star Technology
Hyper Animator.....99.
Microsoft Quick Basic.....65.
Millennium Software
HyperX.....69.
Olduvai Corporation
Olduvai PLUS.....***Special*** 99.
Power Up Hyper Tutor.....29.
Smethers Barnes
Prototyper.....187.
SoftStream UltraSpec.....95.



VocabuLearn by Penton Overseas

Dynamic foreign language program for the Mac! This interactive Hypercard Stack is available in five languages and two levels. Each program contains (2) 90-minute audio cassettes, complete word list and HyperCard Version 1.2.

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Mac 68020/030 Dev. System.....99.
Digitalk, Inc.
Smalltalk/vmac.....125.
Hyper Press
Icon Factory.....29.
Script Expert.....45.
Intelligent Developer.....219.
Icom Simulations
HyperTMON.....59.
TMON.....88.
Individual Software
101 Scripts & Buttons HyperCard.....35.
Manx
Aztec C.....62.
Aztec C Unitools.....62.
Aztec C + MPW.....94.
Aztec C + SDB.....94.
Somak Software
ScriptEdit.....***Special*** 51.
Symantec
Think C.....155.
Think Pascal.....95.
Just Enough Pascal.....47.
TENpointO
FocalPoint II.....117.
theResult Software
Dialoger.....***Special*** 69.
Timeworks
Hyperworks Organizer.....57.
Trendware Corporation
Stack Cleaner.....29.
HyperTools 1 or 2.....52.
XCAL.....79.
T.M.L.
TML Pascal II V3.0.....109.
TML Source Code Library II.....39.
Zedcore
ZBasic 5.0.....87.



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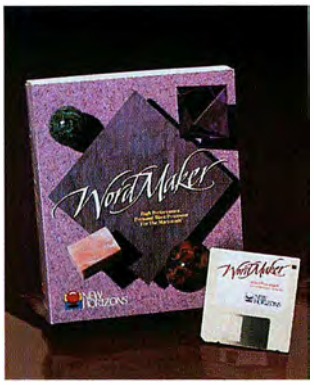


Leprechaun by Shodan

Leprechaun lets you step into an enchanted world where you are the leprechaun king. A strategy game for everyone with 175 levels. Includes built-in editor, full color graphics and digital sounds. Macintosh Plus or later. ..... **$35.**

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Virtual VM3 .....125.
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Dove Computer Marathon 030 Acc. ....969.
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Daynafile DF0100 Single .....499.
Dolphin Systems Flipper 44 .....1119.
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Preferred Publishers Exposure .....54.
Silicon Beach Software SuperCard .....128.
SuperPaint 2.0 .....128.
Digital Darkroom .....249.
Super 3D 2.0 .....315.
SoftStream HyperHIT .....123.
Solutions International The Curator .....72.
Springboard Certificate Maker .....18.
Springboard Publisher II .....89.
SuperMac Software
Pixel Paint v2.0 .....225.
Pixel Paint Professional .....395.
Synergy KaleidaGraph .....139.
Tactic Software Art Clip vol 2 .....69.
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45 MB Removable HDD by Cutting Edge

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PreSchool Disk 2 ..... 28.
WordSearch ..... 28.
PreSchool Pack ..... ***Special*** 49.
Pelican Software
Dinosaur Days ..... 24.
Monsters & Make Believe ..... 24.

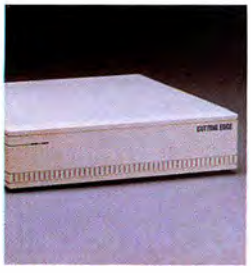


Two Page Monochrome Monitor by Cutting Edge

The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 Hertz and a high resolution of 72 DPI. Comes with a 1 year warranty and 30 day money back guarantee. ..... **$935.**

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Perceive ..... 50.
Finale ..... 399.
Davidson & Associates
Speed Reader II ..... 27.
Math Blaster or Word Attack! ..... 27.
Electronic Arts
Mavis Beacon Typing ..... 32.
Deluxe Music Construction Set V2.5 ..... 84.
Deluxe Recorder ..... 95.
First Byte
Dinosaur Discovery Kit ..... 27.
Puzzle Storybook or Rhyming NoteBook .. 27.
Great Wave Software
KidsTime ..... 26.
Kids Math ..... 26.
Penton Overseas
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VocabuLearn/ce Spanish, French, German or Italian *(Level 2)* ..... 30.
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Different Drummer ..... 55.
Simon & Schuster
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Springboard Top Honors ..... 59.
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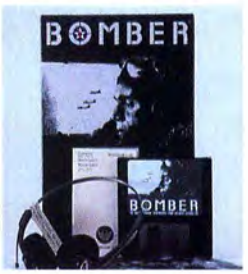


Hard Disk Drives by Cutting Edge

The hard drives range in capacity from 20 to 180 Megs. They are fast (aver. access time 20-28 ms.), and each has quality and dependability built in as evidenced by an average 70,000 hrs MTBF. The streamlined design fits comfortably under the Mac.

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HardTop Image II Cover ..... 16.
Laser Printer Stand ..... 28.
Large Screen Monitor Stand ..... 38.
CH Products Roller Mouse ADB ..... 119.
Cutting Edge
Cutting Edge MCK-105QK KB w/Quickeys ..... 133.
DataDesk Hyper Dialer ..... 29.
MAC-101 Keyboard/Beige *(128k/512k & MacPlus)* ..... ***Special*** 139.
MAC-101 ADB Keyboard/Platinum *(Mac SE & MacII)* ..... ***Special*** 139.
Foreign Keyboards Available ..... Call
Ergotron Mousecleaner 360° ..... 15.
MacTilt *(Mac, SE or II)* ..... 68.
Muzzle SE ..... ***Special*** 62.
Muzzle Mac II ..... ***Special*** 68.
System Saver Mac *(Beige or Platinum)* .... 63.
Space Saver Printer Stand ..... 17.
Super Base ..... 34.
System Saver SE ..... 52.
Masterpiece Mac II ..... 105.
New Turbo Mouse *(Reg. or ADB)* ..... 109.
Universal Copy Stand ..... 22.
Universal Printer Stand ..... 14.
Apple Color Monitor or Full Page Display Polarizing Filter ..... 63.
Two Page Display Polarizing Filter ..... 135.
Power Back 330 ..... 269.
Power Backer 450 ..... 339.
Power Backer 520 ..... 399.
Key Tronic
Mac Pro Keyboard w/Tempo II ..... ***Special*** 119.
Lynx Computer
Turbo Trackball *(Mac & Mac+ or Mac SE & MacII)* ..... 59.
MicroSeeds WristMac ..... 145.
WristMac Executive ..... 189.



Bomber by Inline Design

Bomber is an intensely realistic action-adventure recreating the sights, sounds and split second decisions of young B-17 crews in the sky's over Nazi Germany. Digitized sound, animation and a 10 man crew. HyperCard required. Mac Plus-Mac IIci. .... **$25.**

ACCESSORIES (CONTINUED)

Farallon MacRecorder Sound System *(Mac SE or Mac II)* ..... 164.
GDT Softworks Print-Link Collection ..... 65.
JetLink Express ..... 89.
Goldstein & Blair
Macintosh Bible 2nd ed. ..... 18.
I/O Design
Mac Luggage in Navy, Black or Plat.
Mac Plus Carrying Case ..... 59.
MacSE Carrying Case ..... ***Special*** 69.
MacIICX Carrying Case ..... 89.
Mac II Carrying Case ..... 99.
Imagell Carrying Case ..... 49.
Mobius Fanny Mac QT *(Beige or Platinum)* ..... 59.
Mouse Systems
A+ Mouse *(MacPlus)* ..... 63.
A+ ADB Mouse *(Mac SE/Mac II)* ..... 83.
Moustrak MousePad 7"x9" Size ..... 7.
MousePad 9"x11" Size ..... 8.
Moustrak Pad L/F 9"x11" ..... 9.
Orange Micro Grappler Spooler ..... 38.
Alphabits ..... 69.
Grappler L/S ..... 102.
Grappler L/X ..... 129.
Practical Solutions Cordless Mouse ... 109.



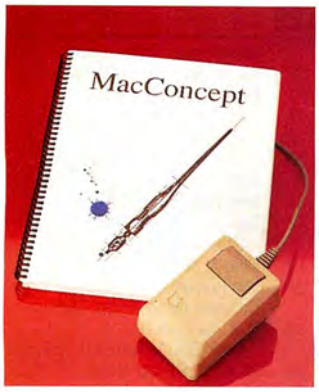
Micro TV by Aapps Corp.

Aapps ***Micro TV*** is a Nubus card that displays real time TV and other video sources in a window on a Macintosh II series in 128 gray scale. ..... **$275.**

ACCESSORIES (CONTINUED)

Kalmar Designs
Teakwood Roll-Top Disk Cases:
Micro Cabinet *(holds 45 disks)* ..... 14.
Double Micro Cabinet *(holds 90 disks)* .... 21.
Triple Micro Cabinet *(holds 135 disks)* .... 31.
Kensington Mouseway *(Mouse ad)* ..... 7.
ImageWriter or ImageWriter II Cover ..... 9.
Macintosh Plus/SE Dust Cover ..... 9.
Apple Security Kit ..... 34.
Antiglare Polarizing Filter ..... 33.
Mac II Stand and Cable Kit ..... 64.
Mac II Monitor Stand ..... 64.
Power Tree Surge Suppressors (10, 20, or 50) ..... Call
Model Fax Protector 10 ..... 15.
Modem Fax Protector 20 ..... 25.
Printer Muffler Stand *(80 & 132)* ..... 22.
Printer Muffler 80 ..... 43.
Ribbons
Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold
ImageWriter Ribbon ..... 4.
ImageWriter Black 6-pack ..... 20.
ImageWriter Rainbow Pack *(6 Colors)* ..... 20.
ImageWriter II-Four Color Ribbon ..... 9.
ImageWriter LQ Black ..... 17.
ImageWriter LQ Four Color ..... 20.
Seikosha Ribbon Black ..... 6.
Sopris
High Trek Imagewriter II Carry Case ..... 49.
High Trek Mac Plus Carry Case ..... 59.
High Trek Mac SE & ext kybd Carry Case 69.
Targus Imagewriter II Carry Case Blk. ..... 43.
Macintosh Plus Carry Case Blk. ..... 53.
Deluxe MacPlus-XKB Blk. ..... 69.

30 DAY MONEY-BACK GUARANTEE ON SELECTED PRODUCTS



MacConcept 3.0 by Klex Software

The 3D conceptual design system, sophisticated enough for engineers to illustrate complex wireframes, yet simple enough for artists to manipulate them into masterpieces. It provides multi-dimensional spacial design features that match those found in industry's most sophisticated design systems. Those include real-time dynamic rotation and perspective, multiple design levels, animation and floating point accuracy.... **$999.**



FileGuard Extended Ed. & FileGuard 1.04 by A.S.D.

FileGuard Extended Edition ($129) protects your hard drives from unauthorized access (including security bypass with a system diskette), copying and erasure; applications and files from unauthorized access, deletion and/or illegal copying; desktop (including system folder) from alterations by unauthorized users. ***FileGuard 1.04 ($95)*** is for those who require file protection only (encryption/decryption that is quick and automatic).

PRINTERS, DIGITIZERS & MONITORS

Aapps
Micro TV ..... ***Special*** 275.
Complete PC
Complete Hand Scanner 400 ..... 165.
Complete Hand Scanner OCR ..... 189.
Complete Half Page Scanner ..... 195.
Complete Full Page Scanner ..... 585.
Cutting Edge
Two-Page Display
Monochrome Monitor ..... ***Special*** 935.
Digital Vision
Computer Eyes Mac ..... 195.
Computer Eyes Mac II ..... 349.
GCC Technologies
Writemove Printer ..... 555.
Personal Laser Printer ..... 1755.
Koala Technologies Corp.
MacVision 2.0 *(Digitizer)* ..... 219.
Mac Director ..... 109.
Kurta IS ADB Tablet 8½x11 ..... 245.
IS ADB Tablet 12x12 ..... 385.
IS ADB Tablet 12x17 ..... 625.
Cordless 4 Button Cursor ..... 65.
LogiTech
ScanMan ..... 345.
Seikosha
SP1000 *(Imagewriter comp.)* ..... 229.
Summagraphics
Bit Pad Plus ..... 319.
ThunderWare ThunderScan ..... 185.
LightningScan ..... 369.
Mac II Power Accessory ..... 42.



Super/SuperLaserSpool by SuperMac Software

SuperSpool ($58) and ***SuperLaserSpool ($88)*** take control of printing in the background and return the Mac to your control in seconds. These best-selling print spoolers are the fastest available and include a special desk accessory that lets you delete documents from queue, re-order them, reroute documents to other printers (SLS) and preview or zoom in on documents.

SPELLING & GRAMMAR CHECKERS

Deneba Software
Big Thesaurus ..... 59.
Spelling Coach 3.0
Professional ..... 115.
Electronic Arts
Thunder! II ..... 52.
Lundeen & Associates
WorksPlus Spell ..... 55.
Microlytics, Inc.
Word Finder *(Synonym Finder)* ..... 35.
Electronic Word Finder ..... 59.
DataStor Personal Organizer ..... 95.
Sensible Software
Sensible Grammar or BookEnds ..... 53.
Working Software
Spellswell 2.0 ..... 45.



Gravis MouseStick by Advanced Gravis

Gravis and Data East have joined together to create a sensational challenge by including Super Hang On with every ***Gravis MouseStick.*** The *MouseStick* offers incredible precision, versatility, and durability. As one *MouseStick* user states, "A definite must for the Mac user! Increases productivity in DTP and graphics, as well as making games much more fun." Available in ADB, Plus and Apple IIgs versions. ..... **$69.**

UTILITY SOFTWARE

Adobe ATM *(Adobe Typeface Manager)* ... 57.
ATM+ *(Adobe Typeface ManagerPlus Pak)* ..... 113.
Abbott Systems, Inc. CanOpener ..... 65.
ALSoft Master Juggler ..... 64.
MultiDisk ..... 49.
Disk Express II ..... 64.
Font/DA Juggler Plus ..... 42.
A.S.D. TWINS ..... 69.
FileGuard v1.04 ..... ***Special*** 95.
FileGuard II ..... ***Special*** 129.
Berkeley System Design After Dark ..... 25.
Stepping Out II ..... 50.
Beyond Inc. Menu Fonts 2 ..... 28.
Borland Sidekick 2.0 ..... 68.
Bravo SPAMM ..... 49.
Central Point Software
Copy II Mac *(Includes MacTools)* ..... 22.
CE Software
QuicKeys *(Macro Program)* ..... 65.
MockPackage Plus Utilities ..... 32.
Dantz Software Development
Retrospect ..... 149.
Dayna Communications
DosMounter ..... 55.
Dubl-Click
Calculator Construction Set v2.0 ..... 45.
Farallon Computing
Screen Recorder ..... 125.
Fifth Generation Systems
Suitcase II ..... 44.
DiskLock ..... 107.
FastBack II ..... 107.
Power Station ..... 34.
Pyro! ..... 14.
HJC Virex ..... 55.
Icom Simulations On Cue ..... 35.
Ideaform MacLabeler Plus ..... 42.
Insight Development MacPrint ..... 79.
Kent Marsh QuickLock ..... 57.
MacSafe or KnightWatch ..... 87.
Loop Software PictureBook ..... 40.
Lundeen & Assoc.
WorksPlus Command ..... 85.
Magic Software Auto Save II ..... 28.
POWERICONS ..... 39.
POWERmenus ..... 39.
Back-Matic ..... 50.
MainStay
AntiToxin or ClickPaste ..... 55.
Microlytics, Inc.
GOfer v2.0 ..... 46.
Microseeds INITPicker ..... 27.
Redux ..... 51.
ScreenGems ..... 39.
Olduvai Software MultiClip ..... 50.
Read-It! O.C.R. Personal ..... 97.
Read-It! O.C.R. 2.1 ..... 239.
PCPC HFS Back-Up 3.0 ..... 54.
Peripheral Land TurboOptimizer ..... 39.
TurboBack ..... 51.
TurboCache ..... 69.
TurboSpool ..... 69.
SuperMac Software
SuperSpool 5.0 ..... ***Special*** 58.
SuperLaserSpool 2.0 ..... ***Special*** 88.
Diskfit 1.5 ..... 58.
Sentinel 2.2 ..... 88.
Symantec
Symantec Utilities for Mac *(SUM II)* ..... 95.
Symantec AntiVirus for Mac *(S.A.M.)* ..... 63.
TENpointO OpenIT! ..... 49.
Williams & Macias DiskFinder ..... 25.
myDiskLabeler w/Color ..... 28.
myDiskLabeler
w/LaserWriter Option ..... 33.
StickyBusiness ..... 89.
XTree Company XTree ..... 52.



Insight Expert Accounting Series by Layered Inc.

Insight Expert Accounting Series, the #1 award winning accounting package for the Macintosh, consists of 6 stand alone or fully integrated modules. Now includes IMPORT capabilities. SAVE $$$ NOW on 3-Pak Holiday Special. ..... **$395.**

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STRATFORD, CT 06497
1/800/832-3201

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Rags to Riches 3-Pack by Chang Labs

Renowned for its Mac interface and ability to simplify accounting, ***Rags to Riches*** is a fast, powerful, and flexible financial management system. Modules include: General Ledger, Accounts Receivable and Accounts Payable. There's also Inventory Control featuring built-in P.O.S. And, to service the professional sectors there's Professional Billing, which allows for both time and material billing. ..... **$285.**

BUSINESS SOFTWARE

Abacus Concepts StatView II *(Mac+, SE, II w/68020 & 68881)* ..... 279.
StatView SE+ Graphics ..... 199.
A.E.C.
FastTrack Schedule ..... 114.
AEC Information Manager ..... 405.
Antic Software
Flexforms Business Template 1 ..... 49.
Flexforms Business Template 2 ..... 49.
Ashton Tate
Full Impact ..... 249.
Palo Alto Software
Business Plan Toolkit ..... 75.
Paracomp
Milo ..... 155.
Portfolio Systems
Dynodex ..... ***Special*** 89.
Power Up Calendar Creator ..... 38.
Address Book Plus *(Book Binder)* ..... 85.
Fast Forms ..... 89.
Preferred Publishers
Direct Mail ..... 54.



Dialoger by theResult Software

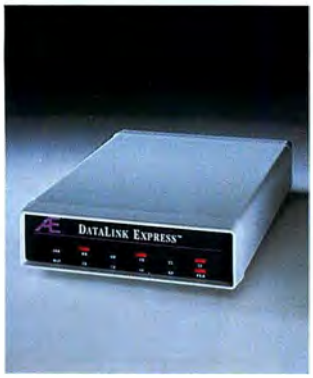
Dialoger lets you design, create and control dialog windows entirely within HyperCard. Perfect for both novice and expert users. Break through HyperCard's limits with color, lists, pop-ups and total interactive control. ..... **$69.**

BUSINESS SOFTWARE (CONTINUED)

Chang Laboratories C.A.T. ..... 225.
MacCalc ..... 79.
Claris MacProject II ..... 365.
Smartform Designer ..... 285.
Individual 101 Macros For Excel ..... 35.
Mainstay Capture ..... 45.
Mac Flow 3.0 ..... 125.
Mac Schedule ..... 109.
Micro Planning International
Micro Planner 6.1 ..... ***Special*** 325.
Microsoft Microsoft Works 2.0 ..... 185.
Microsoft Excel 2.2 ..... 249.
Micro Trading Software
Stock Watcher ..... 185.
Nolo Press WillMaker 3.0 ..... 32.
For the Record ..... 28.
Pro Plus WallStreet Investor v3.0 ..... 395.
Satori Software Bulk Mailer 3.3 ..... 78.
Bulk Mailer Plus ..... 185.
Select Micro Systems, Inc.
Exstatix ..... 209.
MapMaker v4.0 ..... 239.
SoftStream Endeavour Planner ..... 99.
SoftView MacInUse ..... 42.
Form Set Business Forms ..... 52.
Symmetry KeyPlan ..... 279.
Synex Mac PhoneBook ..... 45.
Mac Envelope 4.1 ..... 55.
Mac EnvelopePlus ..... 147.
Systat Systat 4.0 *(Specify MacPlus, SE or Mac II)* ..... 459.
Fastat ..... 165.

DataLink Express Modem by Applied Engineering

Introducing ***DataLink Express***, the first fully Hayes compatible 2400 baud modem designed specifically for the Mac. With the first comprehensive status light array, "Line Engage" indicator and upgradeable design (add send-Fax capability and MNP error correction). Comes complete with a perfectly matched Mac-platinum case, a Macintosh-type serial port input, a DB-25 connector and communications software. ..... **$189.**



ENTERTAINMENT SOFTWARE

Access
World Class Leader Board Golf ..... 27.
Accolade Hard Ball or Mean 18 ..... 27.
4th & Inches ..... 27.
FastBreak ..... 27.
Grand Prix Circuit ..... 30.
Activision Manhole ..... 30.
Manhole CD ROM ..... 35.
Cosmic Osmo ..... 42.
Artworx GrailQuest or Daily Double Horse Racing ..... 19.
Bridge 6.0 ..... 24.
Bethesda Softworks
Wayne Gretzky Hockey ..... 39.
Broderbund
Ancient Art of War or At Sea ..... 26.
ShufflePuck Cafe or Star Wars ..... 24.
SimCity ..... 29.
SimCity Supreme Pack ..... 48.
Bull City Software Moriarty's Revenge ..... 32.
Bullseye Software
Fokker Triplane Flight Simulator ..... 24.
P51 Mustang or Ferrari Grand Prix ..... 32.
MicroProse Pirates ..... 34.
Microsoft Flight Simulator 1.02 ..... 32.
Miles Computing Inc.
Harrier Strike Mission II or The Fool's Errand ..... 32.
Puzzle Gallery ..... 27.
Might and Magic ..... 35.
Mindscape King Of Chicago ..... 18.
Balance of Power 1990 or Crossword Magic ..... 29.
Deja Vu or Deja Vu II ..... 29.
Shadowgate or Siboot ..... 29.
Defender of the Crown, Colony or The Uninvited ..... 29.
Captain Blood, Hostage or Gauntlet ..... 29.
PCAI (XOR) Task Maker ..... 27.
MacGolf or Lunar Rescue ..... 34.
MacCourses ..... 20.
Road Racer ..... 39.
Mac Golf Classics ..... 53.
NFL Challenge ..... 53.
Premier Technology Net Trek ..... 35.
Strategic Conquest Plus 2.0 ..... 35.



ScriptEdit by Somak Software

ScriptEdit is a powerful desk accessory for HyperCard. Edit multiple scripts simultaneously, global search-and-replace, custom editing with XCMD, script compare feature and much more! Includes installation stack with tips. ..... **$51.**

ENTERTAINMENT SOFTWARE (CONTINUED)

California Dreams Block Out ..... 27.
Casady & Greene, Inc. Crystal Quest ..... 25.
Crystal Quest w/Critter Editor ..... 41.
Centron Casino Master ..... 45.
Casino Master *(Mac II)* ..... 50.
Data East Super Hang On ..... 27.
DataSoft Time & Magik ..... 29.
Hunt for Red October ..... 32.
Discovery Software Arkanoid ..... 26.
Electronic Arts Bards Tale ..... 32.
Chuck Yeager Flight Simulator ..... 32.
Starfleet I ..... 36.
One-On-One, Pinball Construction Set, Seven Cities of Gold, SkyFox, or Patton vs Rommel ..... 15.
Primera Smash Hit Racquetball II ..... 18.
Shodan Leprechaun ..... ***Special*** 35.
Sierra On-Line
Space Quest or Space Quest II ..... 29.
Leisure Suit Larry, Silpheed or Gold Rush ..... 23.
Police Quest or ManHunter ..... 29.
King's Quest I, II or III ..... 29.
Siiicon Beach Software
Airborne or Enchanted Scepters ..... 15.
Dark Castle or Apache Strike ..... 32.
Beyond Dark Castle ..... 32.
Sir-Tech Mac Wizardry ..... 35.
SoftStream, Inc. Colour Billiards ..... 35.
Mac Man or Solitaire DA ..... 23.

Blueprint by Graphsoft

Blueprint is a professional-level 2D CAD program that has it all at a price you can afford: Layers, fillets, DXF, constraint palette, auto-dimensioning, high precision, hatching, EPS, symbol library plus more. Unsurpassed quality. ..... **$295.**



ENTERTAINMENT SOFTWARE (CONTINUED)

Hayden Software Sargon IV ..... 29.
Infocom
Leather Goddesses of Phobos ..... 15.
Beyond Zork or HitchHiker's Guide ..... 15.
Zork Trilogy ..... 20.
QuarterStaff ..... 29.
Arthur or Journey ..... 29.
Zork Zero ..... 35.
Inline Design Bomber ..... ***Special*** 25.
Maxis Software Sim City Terrain Editor ..... 18.
MicroLeague Sports
MicroLeague BaseBall II ..... 39.
Software Toolworks Life & Death ..... 32.
Chessmaster 2100 ..... 32.
Sphere, Inc. Tetris ..... 19.
Tetris *(Mac II)* ..... 24.
GATO, Orbiter or Pt-109 ..... 26.
Vette! ..... 26.
Solitaire Royale *(SE or II)* ..... 19.
Falcon 2.0 ..... 31.
Springboard Hidden Agenda ..... 36.
SubLogic Jet ..... 32.
Toyogo, Inc. Go Master ..... ***Special*** 49.
Joseki Tutor ..... ***Special*** 30.

NOW OFFERS FREE TECHNICAL SUPPORT 1-800-832-3201



Tempo II by Affinity Microsystems

Tempo II can take a series of keystrokes or mouse clicks and turn them into a one key code. Whether your macro just selects a font or performs hundreds of steps through multiple programs, *Tempo II* replays it all with a single keystroke. And as your needs grow, *Tempo II* meets them. Transfer directly between applications, autopaste text and graphics, repeat your commands 100's of times. Great for automating data transfers! .... **$75.**

ACCOUNTING PACKAGES

Aatrix Software
Aatrix TimeMinder .....149.
Aatrix Payroll Plus .....149.
Aatrix Checkwriter v2.0.....35.
Aatrix TimeCard .....69.
Aatrix Payroll v3.5 .....95.
Brown-Wagn
MacLedgers .....155.
Service Industry Accounting .....205.
Chang Labs Rags to Riches Professional 3 pack .....355.
Rags to Riches Retail Business 3 pack .....355.
Intuit
Quicken v1.5 .....36.
Layered
Insight One Write .....99.
AtOnce! .....***Special*** 285.
Insight Expert INV or Time Billing .....***Special*** 395.
Insight Expert GL, AR, AP or Payroll .....***Special*** 395.
MECA
Managing Your Money .....124.
Money Magazine
WealthBuilder .....***Special*** 149.



MacKids Preschool Pack by Nordic Software

MacKids Preschool Pack ($49), includes six educational lessons in color. It teaches your child the ABC's, shapes, counting and more in a fun and exciting manner. Ten additional *MacKids* programs are available in black & white format.

ACCOUNTING PACKAGES (CONTINUED)

Rags to Riches 3-Pak 3.1 *(GL/AR/AP)* .....***Special*** 285.
Rags to Riches Inventory Control.....235.
Rags to Riches Professional Billing.....235.
Rags to Riches GL, AR, or AP.....118.
Check Mark
MultiLedger .....239.
Payroll .....179.
Cash Ledger .....119.
Computer Associates
Simply Accounting .....219.
Dac Software
Dac-Easy Light .....42.
Dow Jones
Market Manager PLUS.....189.
Monogram Business Sense.....269.
Dollars & $ense 4.1c .....81.
Niles & Associates
Grant Manager .....249.
North Edge Software
Timeslips III.....169.
Peachtree
Back To Basics Professional *(GL/AR/AP/INV)* .....155.
ProPlus Software
ProPlus Accounting .....619.
Satori Software
Components GL.....369.
Survivor Software
MacMoney 3.0 *(Enhanced Ver.)* .....59.



Nisus by Paragon Concepts

With ***Nisus***, word processing comes of age. Only *Nisus* has unlimited undos, graphics within text, recordable macros, Easy Grep, effortless indexing, footnotes/endnotes, hyphenation, 10 clipborads, automatic repagination, on-screen/printing line numbers, intelligent spell checking, plus all the search and replace power of QUED /M. And it's not just for superusers — *Nisus* needs only a Mac Plus or larger. ..... **$245.**



atOnce! by Layered Inc.

atOnce! is the next generation in high-speed small business accounting. Included in one seamlessly integrated module are four full featured applications: General Ledger, Accounts Receivable w/Billing, Accounts Payable & Payroll. ..... **$285.**

COMMUNICATION SOFTWARE

Compuserve Compuserve Starter Kit ....24.
Compuserve Navigator .....39.
DataViz MacLink Plus/Translator .....99.
MacLink Plus with Cable .....119.
Freesoft White Knight v.11 .....85.
Hayes Smartcom II 3.1.....87.
Infosphere
Liaison.....***Special*** 169.
Insigna SoftPC .....245.
Prometheus MAcKNOWLEDGE .....139.
Meta Comet
Accu-Weather Forecaster .....57.
Software Ventures
Microphone II v3.0 .....215.
Solutions, International BackFax .....124.
Synergy Software VersaTerm .....88.
VersaTerm-Pro .....174.
Traveling Software LAP-LINK .....81.

WIN A JACKPOT BONANZA

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1) No purchase necessary to win. **2)** Prize will be one gift certificate only. **3)** Original entries only. **4)** All entries must be received by January 31, 1990. Sponsor not responsible for late, lost or misdirected mail. **5)** Winner selected by Independent Certified Public Accountant for Programs Plus in random drawing. All decisions are final. **6)** Odds of winning depend on number of entries. **7)** Winners responsible for taxes. **8)** Programs Plus will announce winner on or about February 5, 1990. **9)** Winners notified by mail. **10)** If unable to contact winner, an alternate will be selected by random drawing. **11)** Contest is open to U.S. residents except where prohibited by law. **12)** Employees of Programs Plus and suppliers are not eligible.

HyperDA 1.2 by Symmetry

This desk accessory allows you to access HyperCard stacks anytime, on any Mac from the 512K and up. Browse, search, phone dial, copy text and graphics and even print stacks. New version 1.2 allows you to add or modify text in existing text fields. ..... **$49.**



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The Ehman 45MB Removable Hard Disk Drive is a better way to get the mass storage and computing capacity you've been needing. So why be limited by conventional hard drives, when you can have Ehman's unlimited capacity for just a few dollars more.

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Circle 500 on reader service card

NEW PRODUCTS

Edited by
Mary Margaret Lewis

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.

HARDWARE

Dart Card

High-speed, solid-state SCSI RAM drive compatible with Mac Plus and all later models. Can be configured to provide up to 64MB of storage. $2695 with 10MB installed. Newer Technology, 316/685-4904.



Dart Card

EasyStreet Net/Mac

Mac/PC network communications system that allows Macintoshes to share files and peripherals with each other and with IBM PC compatibles. Uses menu selection to set up serial connections over one or more NewBridge data controllers. For networks of up to 16 ports $250; for networks of up to 56 ports $450. NewBridge, 703/834-3600.

FilmPrinter Plus

Upgraded version of Mirus FilmPrinter. Includes SCSI and parallel ports for computing across multiple personal-computer platforms, and camera that allows frame counts and camera control to be incorporated into the various software drivers. $5995. Mirus, 408/980-7773.



FilmPrinter Plus

4MB SIMM

4MB SIMM board that uses eight 4MB DRAM chips (rather than thirty-two 1MB chips). Plugs in to existing sockets on the system board of the Mac SE/30, II, IIx, and IIcx. $2395. Newer Technology, 316/685-4904.

hammerDAT and hammerTape FMF

Tape backup systems. The hammerDAT uses helical-scan digital audiotape technology to store up to 1.3GB of data onto a single 4mm DAT cartridge. The hammerTape FMF uses mainframe technology to back up 570MB at a rate of up to 54MB per minute. hammerDAT $3995; hammerTape FMF $9995. FWB, 415/474-8055.

Hand-Held Scanners

Monochrome and color hand-held scanners. Monochrome model scans at 400 dpi; uses variable image to create bayer, mesh, or spiral dithering patterns for monochrome line art and halftones. Color model provides three-color, single-pass scanning for a palette of more than 4000 available colors. Monochrome model 400A $500; color model 270A $850. Accel, 714/757-1212.

HP PaintJet XL Printer

Runs two times faster than original PaintJet. Recommended usage has increased from 20 pages per day to up to 60 pages per day. Uses both 8½-inch and 11-by-17-inch paper. $2495. Hewlett-Packard, 619/592-4676.



HP PaintJet XL Printer

ImageScanner 1200

Scanning subsystem for high-resolution scanning and imagesetting capabilities. Lets user capture and edit continuous-tone and line-art images, which can be output to any Varityper PostScript laser imagesetter. $28,995. Varityper, 201/887-8000.

Lasergraphics LFR

Digital film recorder that allows PostScript-language color imaging using Freedom of Press software. $10,000. Lasergraphics, 714/660-9497.



Lasergraphics LFR

Microtech OR650

Erasable, rewritable optical storage system that uses high-capacity, removable storage media. Based on ANSI, ECMA, and ISO standards, and on Sony magneto-optical erasable mechanism for increased archiving speed. Subsystem (includes cartridge) $4795; additional cartridges $299 each. Microtech, 203/468-6223, 800/325-1895.

Phone Line Manager

Voice/data switch that automatically routes and sends voice, fax, and modem calls over a single phone line. Connects directly to existing phone line. $249. LaCie, 503/684-0143.

(continues)

PrecisionColor Calibrator

Display calibration device that works with Radius 8-, 16-, and 24-bit color monitors, Apple's 8-bit color system, or the Radius Gray Scale Display System. $695. Radius, 408/434-1010.



PrecisionColor Calibrator

Smart Label Printer

Compact printer that prints letter-quality labels (for envelopes, disks, name tags, and so on) using its own software. Printer weighs just over a pound. $249.95. Seiko, 408/922-5900.



Smart Label Printer

SuperScan Plus

20-inch color monitor that does autoscanning and autosynching, accepts any video signal between 30kHz and 64kHz. Compatible with Mac II and a number of other graphics controllers. $3295. Nissei Sangyo America, 800/441-4832.

Two-Page Monochrome Monitor

19-inch monochrome monitor that includes controller board and tilt/swivel base. Runs at a resolution of 1152 by 870 pixels, displays at 72 dots per inch, and has vertical refresh rate of 70Hz. $895. Ehman, 307/789-3830.

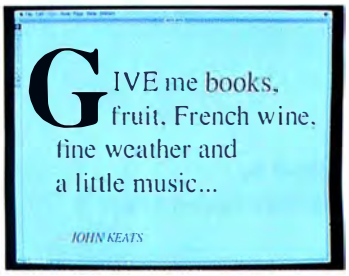
SOFTWARE

Adobe Type Manager

System software designed to produce Adobe PostScript language outline-quality fonts for output to QuickDraw printers (such as the ImageWriter and HP DeskWriter) and to the screen display. 1MB min. memory. $99. Adobe, 415/961-4400.

The Algebraic Proposer

Worksheet program designed for computational problem solving. Includes sample problems in arithmetic, estimation, algebra, physics, chemistry, and economics. Includes tutorial and displays problems graphically. 1MB min. memory. $79.95. True Basic, 800/872-2742.



Adobe Type Manager

The Animation Stand

Animation software designed for professional animators. Provides unlimited number of frames and lets you see the frames in an unlimited number of layers and pixel depths. Comes with a paint program and 2-D and 3-D drawing and shading tools. 1MB min. memory. Full copy



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$7495; demo disk $40. Linker Systems, 714/552-1904.

Bomber

Adventure game that re-creates the sights, sounds, and experiences of B-17 crews flying in the skies over Hitler's Europe. Object of the game is to complete 25 successful missions so you can get rotated back to the United States. Written in HyperTalk with scrolling graphics, simultaneous action, and uninterrupted sound. 1MB min. memory. $39.95. Inline Design, 212/222-4837.



Bomber

CA-Cricket Stylist

Drawing program that supports 32-bit QuickDraw. Combines traditional object-oriented drawing with bezier drawing to produce special effects. Compatible with all PostScript output devices. 1MB min. memory. $295, $99.95 for owners of CA-Cricket Draw. Computer Associates International, 516/227-3300.

CD Companion Series

HyperCard software that works with CD ROM drive and includes audio CD as well. Explores specific musical works using text, graphics, and audio examples. First in series is Ludwig van Beethoven: Symphony No. 9, a five-part HyperCard program. 1MB min. memory. $99.95. The Voyager Company, 213/451-1383.



CA-Cricket Stylist

Dialoger

Combination of four HyperCard stacks designed to be an environment for design, creation, and control of any type of dialog box within HyperCard. Supports Dialog Manager, lists, pop-up menus, and styled text. 1MB min. memory. $94.29. The Result Software, 919/294-5034.

DT Publisher

Disk series of desktop publishing resources for the Mac that will be released in the form of one new volume each quarter. Includes three PostScript-compatible laser fonts, more than 350K of EPS graphics, two PageMaker-compatible design templates, and a DA for viewing graphics. 1MB min. memory. $29.95. Softdisk Publishing, 318/221-8718.

ESR

Electron spin resonance spectral-simulation program that supports all naturally occurring isotopes for the first 103 elements. With user-definable nuclear abundances, spectrometer frequency, line width, spectral width, g, coupling constant, and spectral resolution. Simulates up to 24 nuclear spin sets. 512KE min. memory. $175. Calleco Scientific Software Publishers, 303/493-8573.

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Genealogy program that stores and organizes family tree information. 512K min. memory. $157.50. Qunsept, 617/641-2930, 800/637-7668.

FaxGate

Program for use with BackFax to provide fax service for all the users on a Microsoft Mail or QuickMail network via a single fax modem and phone line. Runs in the background on a mail server. 2MB min. memory. $245 per mail server. Solutions, 802/865-9220.

Hey I Can Print

Application that consists of three stacks: Correspondent, ScriptReports, and Focal Point Menu Installer. Enables HyperCard browsers to collect sorted address information from any stack using one to five levels of selection criteria. 1MB min. memory. $99. R&B Software, 617/787-0728, 800/627-9778.

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Chooser-level software that makes the HP PaintJet printer and the HP PaintJet XL printer QuickDraw-compatible. Provides 8 colors on the Mac Plus and SE and up to 16 million colors on the Mac II series. Supports 32-bit color QuickDraw. Driver includes 13 LaserWriter matching fonts scalable from 6 to 250 points. Supports background printing. 1MB min. memory. $125. Hewlett-Packard, 619/592-4676.

IdeaFisher

Lexicon of words, associations, and questions that can be used to help generate new ideas in advertising, writing, or other areas that involve problem solving. 7MB min. memory. $495. Fisher Idea Systems, 714/474-8111.

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Interactive Physics

Software that uses animation to illustrate physics concepts for the beginning college-level physics student. Can be used as a demonstration tool or a problem-solving tool to investigate quantitative and qualitative physics problems. Includes objects such as springs, ropes, dampers, meters, and a variety of mass shapes. 1MB min. memory. $449; volume discounts available. Knowledge Revolution, 415/377-1940.

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Statistical program that displays information in chart



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Microsoft, however, sees it as a strategic business investment that should dramatically boost communication and productivity five minutes after installing it.

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$7495; demo disk $40. Linker Systems, 714/552-1904.

Bomber

Adventure game that re-creates the sights, sounds, and experiences of B-17 crews flying in the skies over Hitler's Europe. Object of the game is to complete 25 successful missions so you can get rotated back to the United States. Written in HyperTalk with scrolling graphics, simultaneous action, and uninterrupted sound. 1MB min. memory. $39.95. Inline Design, 212/222-4837.



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Monitor: SONY® 1271
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Bits per Pixel: 16



Monitor: Electrohome® 1910
Resolution: 1024 x 768,
Interlaced
Bits per Pixel: 32



Monitor: Apple® RGB
Resolution: 640 x 480,
Non-interlaced
Bits per Pixel: 16



Monitor: Electrohome® 1210
Resolution: 768 x 576
PAL, Interlaced
Bits per Pixel: 8



Monitor: SONY® 1302
Resolution: 1024 x 768,
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The NuVista 1M($2995) is the ideal multi-media card. It combines overlay, capture and 32-bit display all into one card. With the NuVista 1M and a VIDI/O™ Box, you can videotape any standard Macintosh®II desktop application, such as MacroMind Director.™ You can even use our free software to overlay text or graphics from applications onto live video. Or you can capture images from any standard video source like a VCR, laser disk or video camera. And of course any image captured with NuVista can be placed into PageMaker® or other desktop publishing programs, in monochrome, 8-bit color or true color at a full 32-bits. It's your choice.

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Actual unretouched screen displays of the same image at varying resolutions. The Super VHS set was driven by a NuVista 4M through a VIDI/O Box, which encoded the RGB signal into an S-Video signal.

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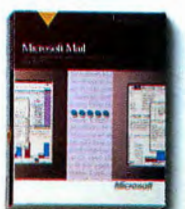
Software that uses animation to illustrate physics concepts for the beginning college-level physics student. Can be used as a demonstration tool or a problem-solving tool to investigate quantitative and qualitative physics problems. Includes objects such as springs, ropes, dampers, meters, and a variety of mass shapes. 1MB min. memory. $449; volume discounts available. Knowledge Revolution, 415/377-1940.

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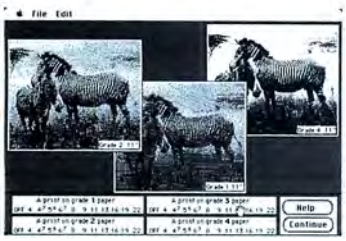
form. Does rotation and spinning and has 3-D effects. 1MB min. memory. $695. SAS Institute, 919/467-8000.

King Frog

Early reading program. Interactive, illustrated storybook that lets children move from frame to frame. Optional digitized voice reads the story. Child can click on any word to have it repeated or click on frame to keep the story moving forward. 1MB min. memory. $29.95. Actreo Software, 612/546-3456.

MacPhotography

College-level electronic textbook of black-and-white camera and darkroom processes. Simulates real-life darkroom experiences. 512KE min. memory. Complete set $79.50 plus $3.50 s/h; individual modules $49.50



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plus $3.50 s/h. Joseph Ciaglia, Photographer, 215/985-1092.

MitemView

Software-development tool that helps create graphical user interfaces for Mac-to-mainframe applications without host system modification. Uses HyperCard. 1MB min. memory. $995. Mitem, 408/449-8801.

NeuroSmarts

Simulates a neural network, allowing for automatic identification of patterns in applications such as financial forecasting and medical diagnosis, and extracting decision rules from business and engineering data. 1MB min. memory. $800. Cognition Technology, 617/492-0246, 800/622-2829.

PicturePak

Electronic business clip art library designed in MacDraw II library format. Contains over 900 images in 5 editions. 512K min. memory. Individual editions $145; set of three $350; set of five $550. Marketing Graphics, 800/368-3773.

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Software for candidates running for political office. Helps with precinct targeting, budgeting, candidate's scheduling, and press relations. Can be updated annually to reflect changes in Federal Elections Commission requirements. 2MB min. memory. $3500. Aristotle Industries, 202/543-8345, 800/243-4401.



PicturePak

68020/30 Assembler

Assembler for the SE/30 and Mac II series that enables users to take advantage of the extended addressing modes and instruction sets of the 68020 and 68030 processor, the 68881 and 68882 math coprocessors, and the 68851

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SuperMOM/Home Business Version

Database-management program for sales, invoicing, and mail order that can handle up to 5000 customers. 1MB min. memory. $249. National Tele-Press, 707/937-2848 inside California, 800/448-0988 outside California.

Tablecloth

Screen utility for tidying the screen under MultiFinder. Covers all background windows and icons leaving only the foreground application visible. Contains a screen saver. Optional password protection. 1MB min. memory. $49.95. User-Tek, 800/888-7640.

Tempo II

Macro-generation program records a series of keystrokes and mouse actions and plays them back as a single command. Macros can repeat or branch to other macros as needed. 1MB min. memory. $149.95. Affinity Microsystems, 303/442-4840, 800/367-6771.

TrueForm

Forms-processing software designed to automate creation of users' existing forms. Allows changeover from paper to computerized forms without having to change the form itself. 1MB min. memory. $99. Adobe, 415/961-4400.

Where in Europe Is Carmen Sandiego?

Sequel to Where in the World Is Carmen Sandiego? Includes a Crimestopper's Notebook, a Factfinder's Database, and the Rand McNally Concise Atlas of Europe. Pits players against Carmen Sandiego and her gang, who have launched an international crime wave and are stealing treasures and landmarks. 512K min. memory. $49.95. Brøderbund Software, 415/492-3200.

ACCESSORIES

Computer/Lit Calendar

Desktop calendar designed to help computer users enlarge their computer vocabulary. Each day's calendar page defines a different computer term. $9.95; volume discounts available. Computer Expressions, 215/222-4400.



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Series of nylon dust covers for Macintosh computers, keyboards, monitors, and printers. Water-resistant, stain-resistant, and antistatic. $12.95 to $28.95. JTB Communications, 312/263-3063.

Erase-A-Label

Erasable computer disk labels for 5¼-inch and 3½-inch floppy disks. Comes with special ink pen and 20 labels. $4.99. Erase-A-Label, 214/387-9303.

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UPGRADE ANNOUNCEMENT

DiskTop™ Version 4.0 from CE Software

"The new DiskTop 4.0 package is the ultimate finding device. If you can't find it with DiskTop or GOfer, it's not there".
-Bob LeVitus, Author, Dr. Macintosh



If you've ever wished the Macintosh Finder was ... well, better at finding ... we have great news for you! The new version of DiskTop, the multipurpose disk management toolkit from CE Software, makes finding files and information within files so much faster and easier that you'll wonder how you ever lived without it.

Here's an example of DiskTop 4.0's power: You want to find all the files over 300K that haven't changed in three weeks. Quickly. You need to make room on your hard disk, so you save the files to a floppy and delete them. DiskTop 4.0 retains the list of files you found so you can copy, move or delete the files you found.

Also new in version 4.0: You can teach DiskTop to automatically launch the programs you use most often, even attach files to the launch. You save keystrokes, mousestrokes, and most important, your time! And this power is instantly accessible within DiskTop. Either from your Apple menu or a quick "hot key" away.

And DiskTop 4.0 includes Gofer, a $79.95 value, at no extra cost! Now you have the power to search the contents of files. It's very handy when you're looking for a phrase, fact or note, but can't remember which file it's in.

We've listed but a few of the new features that make DiskTop 4.0 the most capable and essential tool for finding, launching and working with information on a Mac. We've enhanced every corner of the product, adding the features you, our users, told us you wanted.

Current registered DiskTop users can upgrade to version 4.0 for $30. If you're still waiting to discover the power of DiskTop, call 1-800-5-CESOFT today for the name of the nearest CE Software retailer or direct supplier.

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1854 Fuller Road, PO Box 65580, West Des Moines, Iowa; 1-800-5-CESOFT. Suggested retail price for DiskTop is $99.95.
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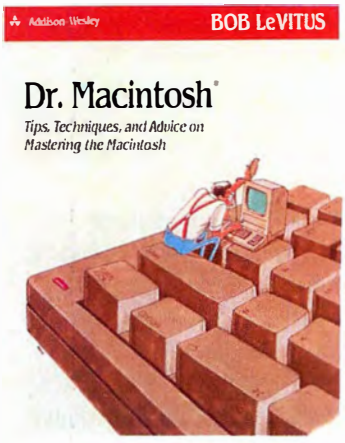
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SuperCard handbook by Dan Gookin includes reference guide and documentation, instructions for getting started with SuperCard and for importing HyperCard stacks, and list of all SuperTalk commands. Compute Books/ Chilton Book Company, 215/964-4000, 800/345-1214.

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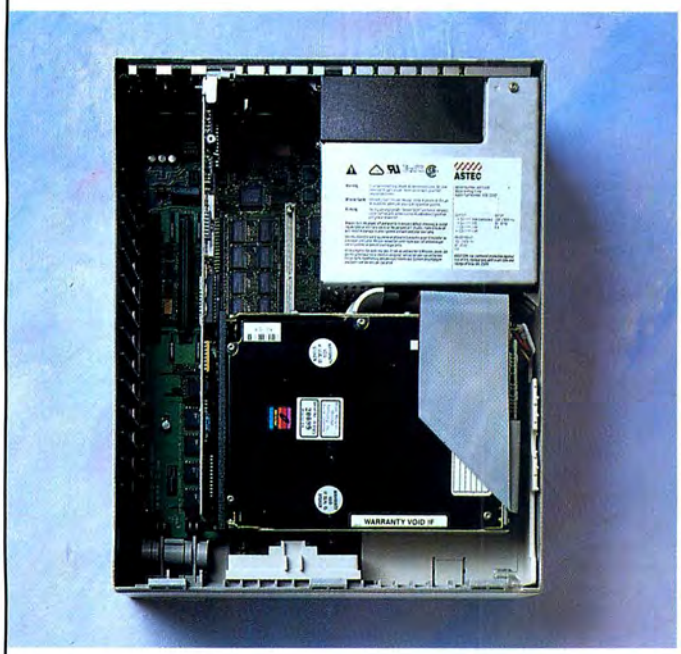
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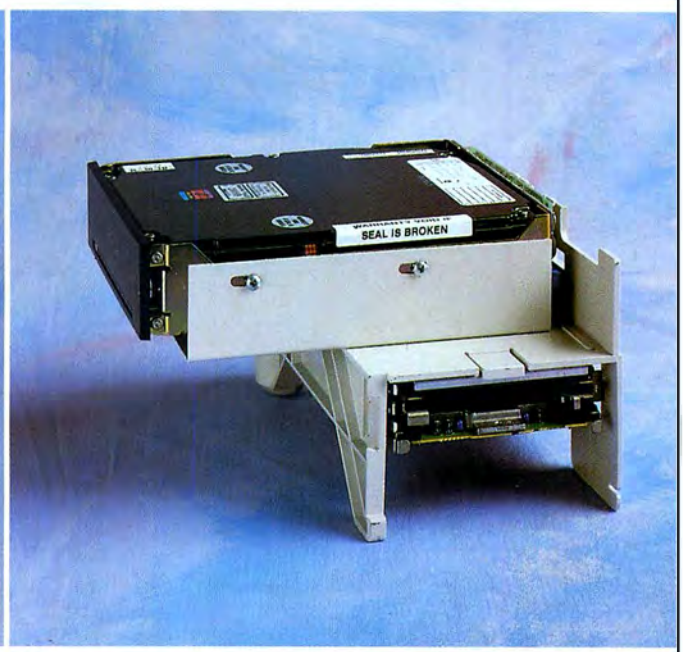
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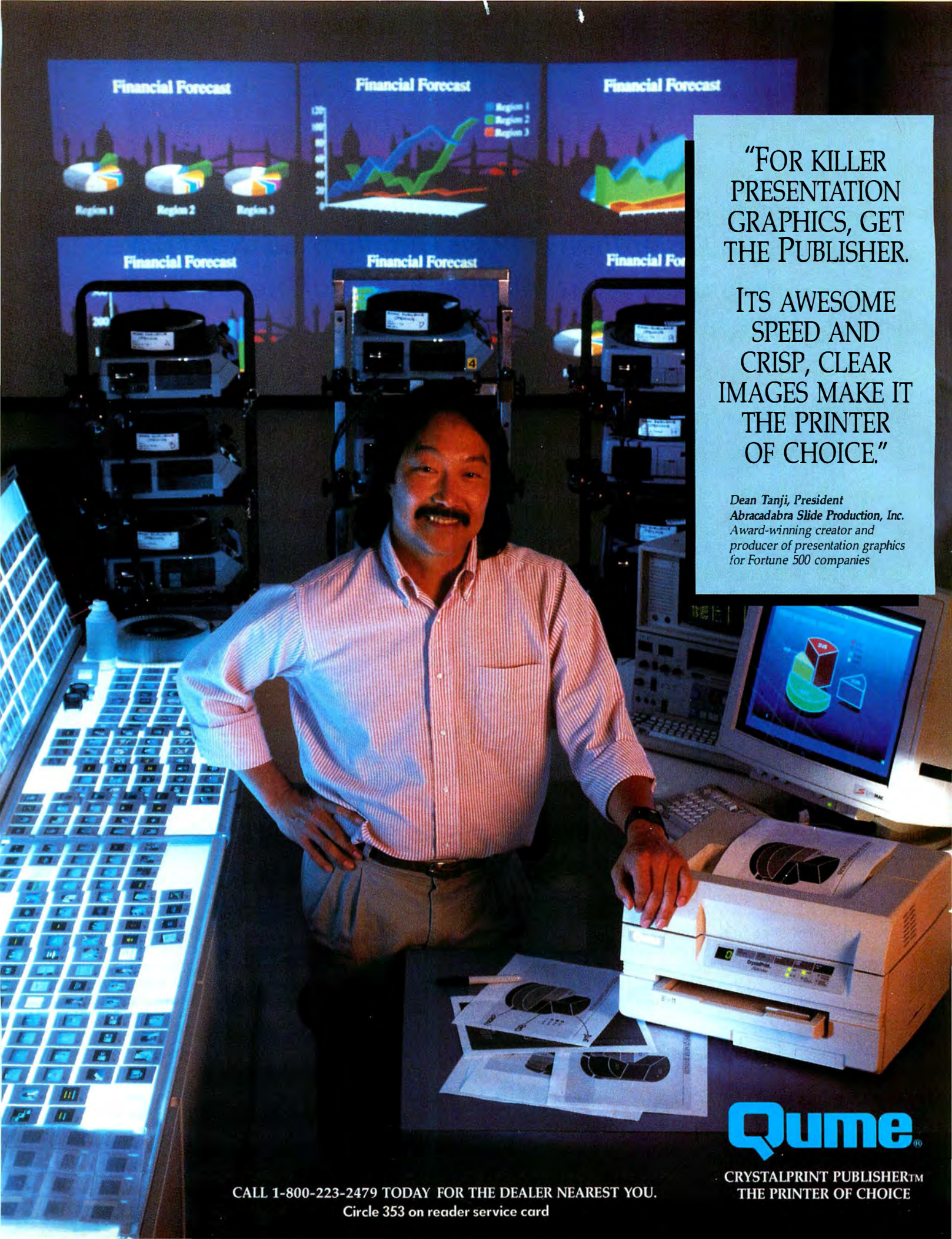
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Quick Tips

Hidden disk space, Word 4.0 table reorganization, HyperCard button text styles, and more

by Lon Poole



Some time back (February 1988, to be exact) a tip suggested putting fonts in HyperCard stacks so that those fonts would always be available, even if they weren't installed in the System file. Apple now advises against putting fonts in any document—including HyperCard stacks. Installing fonts in documents is known to cause memory problems, which may lead to the application quitting unexpectedly and even to system crashes. Macintosh Technical Note 245 (first published in August 1989) advises, "If you feel that your stack loses all its artistic merit without a certain font, you should license it for distribution in a suitcase file and let the users install it in their systems."

TOO MUCH TO PASTE

Q Upgrading my Mac SE to 4MB last year really made a big difference—especially for heavy-duty jobs, but the Clipboard seems unable to use the improved elbow room. For example, trying to paste a SuperPaint picture larger than about 32K into WriteNow 2.0 results in a message saying the picture is too large. My slow and dirty solution has been to print the WriteNow text with gaps where the too-large pictures are supposed to be and then print those directly from SuperPaint in a separate pass. But even with a LaserWriter, such steam-driven tactics tend to cause serious bouts of nail biting when deadlines are tight, not to mention the paper wasted to get the results to come out right. What's the solution?
Aller Spanninga
New Plymouth, New Zealand

A It's WriteNow 2.0 that restricts the amount you can paste to 32K. The system limit, which equals half the memory available to the application, would allow pasting a much larger selection. The next version of WriteNow, which T/Maker is now working on, may let you paste bigger pictures. Otherwise, your only recourse is to switch word processors or use a page-layout application. I have successfully pasted a 57K color picture from SuperPaint into MacWrite II, Word 4.0, Works 2.0, PageMaker 3.01, ReadySetGo 4.5, QuarkXPress 2.11, and WordPerfect 1.0.2. The image also went into FullWrite Professional 1.0 but was converted to black and white.

RESTRICTED HYPERCARD FINDS

Q The Find button in HyperCard searches all fields for chosen text. Is there a way to search only selected fields?
Ted Chang
Charlottesville, Virginia

A HyperCard's Find command (press ⌘-F or choose Find from the Go menu) searches background fields and card fields for text you specify. You can't restrict the search to one card field, but you can restrict it to one background field by adding to the end of the Find command the word *In* and the name, number, or ID of a background field. Here is an example:

```
find "mad world" in bg fld "title"
```

A Find command like the one above goes to the next card that contains each word in the text you want found. (Words are separated by spaces.) The found words can be in any order, but they must all be in the specified background field. The found words must start with, but can be longer than, the words they match in the Find command.

You can further modify your search criteria by adding one of these words—Chars, Words, String, or Whole—to the Find command (see "Find Control").

CAPS LOCK DEAD IN QUICKEYS

Q Why is it that Caps Lock is disabled when I enable QuicKeys?
Gerald Johns
San Diego, California

A QuicKeys 1.0 treats Caps Lock as a modifier key (like the Option and ⌘ keys). Versions 1.1 and 1.2 ignore the Caps Lock key completely. With those

(continues)

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FIND CONTROL

	LOOK FOR		LOOK AT		
	separate words	complete phrase	word beginnings	anywhere	whole words
find	•		•		
find chars		•		•	
find word	•		•		•
find string		•		•	
find whole		•	•		•

Five variations of the Find command give you some control over how HyperCard searches for text. Find string and find whole are available only in HyperCard 1.2 and later versions.

versions, Caps Lock can be used only for typing capital letters. If you upgrade key sets from version 1.0 using Quick Access, keystrokes that include the Caps Lock key will no longer work. Also, Caps Lock does not work if you use QuicKeys aliases to reconfigure the Mac keyboard to another layout, such as Dvorak or VT100.

IMAGEWRITER'S BEST

Q When I print Microsoft Word 3.01 documents in 12-point New York on an ImageWriter II using Best quality, I'm very pleased with the results. But when I print PageMaker 2.0 documents using the same font and print quality, I'm disappointed because the results look like Faster quality. The 24-point size is installed in PageMaker. How can I improve the look of my PageMaker documents?
Dan McKinney
Anderson, South Carolina

A I have no trouble printing Best quality on an ImageWriter II from PageMaker 2.0 or PageMaker 3.01. Perhaps you have 12-point New York installed in the System file and 24-point New York installed only in PageMaker itself. If the System file contains one or more sizes of a particular font, the Mac won't look in any other files for additional sizes of that font. Use Font/DA Mover to make sure all the sizes you need of a single font are in one file—normally the System file.

If you use a utility such as Suitcase II, Font/DA Juggler, or MasterJuggler to keep some of your fonts in files other than the System file, make sure the System file doesn't contain any sizes of those fonts. New York and other basic fonts can sneak back into the System file when you upgrade or replace system software.

REORGANIZING WORD 4.0 TABLES

TIP: To easily reorder the rows of a table in Word 4.0, choose Outlining from the Document menu. In outline view, you can move any row up or down by dragging it with the mouse. In contrast, cut-and-paste when you're not in outline view is much more work. The Cut command leaves an empty row behind, which you must later delete. The Paste command can't insert a row above an existing row but must always replace a row, so you must insert a blank row before pasting.
Leland McArthy
Mountain View, California

UNTAPPED DISK POTENTIAL

TIP: Your Apple hard disk may have a megabyte or more of concealed disk space. Free space usually exists on an Apple hard disk unless HD SC Setup has been used to create a custom partition. Simply initializing an Apple hard disk creates a standard-size partition regardless of the disk's actual capacity. An Apple HD40SC hard disk, for example, always initializes at 40,000K. The Quantum 40 disk mechanism used in many HD40SC drives has an actual capacity of over 41,000K. Mechanisms made by Sony and others, which Apple also uses in many HD40SC drives, may have different capacities.

To find out if your disk has extra space, start the HD SC Setup utility (it's on the System Tools disk that comes with the Mac). Click the Partition button. If you then see a dialog box listing several pre-

(continues)



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```
--This handler lets the user change the text font, size, style, and
--alignment using the text style dialog
--
--CAUTION: The selected button is brought to the front of
--       its layer (card or background) even if you cancel
--       the text style dialog
--
on doMenu menuItem
  if menuItem is not "Button Info..." or the optionKey is up
  then pass doMenu

  set the cursor to watch
  lock screen
  --save user's preferences
  put the textFont into prefTextFont
  put the textSize into prefTextSize
  put the textAlign into prefTextAlign
  do "put" && quote & the textStyle & quote && "into prefTextStyle"
  put the editBkgnd into prefEditBkgnd

  --determine which button was selected and paste at the top
  --of its layer (background or card)
  put the number of bkgnd buttons into bkBtns
  doMenu "Cut Button"--cut the selected button
  set the editBkgnd to (bkBtns ≠ the number of background buttons)
  doMenu "Paste Button"
  if the editBkgnd is true
  then put "last bkgnd button" into selectedBtn
  else  put "last card button" into selectedBtn

  --use the button's current text attributes as defaults
  set the textFont to the textFont of selectedBtn
  set the textSize to the textSize of selectedBtn
  set the textAlign to the textAlign of selectedBtn
  do "set the textStyle to" && the textStyle of selectedBtn

  choose text tool --use text tool to
  doMenu "Text Style..." --get text attributes

  --change the button's text attributes
  set the textFont of selectedBtn to the textFont
  set the textSize of selectedBtn to the textSize
  set the textAlign of selectedBtn to the textAlign
  do "set the textStyle of selectedBtn to" && the textStyle

  --restore preferred settings
  set the textFont to prefTextFont
  set the textSize to prefTextSize
  set the textAlign to prefTextAlign
  do "set the textStyle to" && prefTextStyle
  set the editBkgnd to prefEditBkgnd
  select selectedBtn
  unlock screen
  doMenu "Button Info..."
end doMenu
```

Button Font

Put these script lines in the stack script of your HyperCard Home stack and you can select a button's text font, size, style, and alignment using the standard text-style dialog.

TEXT ATTRIBUTES OF BUTTONS

TIP: Ideally, HyperCard should provide a dialog box for changing the text font, size, style, and alignment of a button the same way it does for a field. In versions 1.2.2 and earlier, however, you must write a script or type lengthy commands in the message box. The script lines in "Button Font" let you use the standard HyperCard text-style dialog box to select a button's text attributes. After putting the script lines in the Home stack's script, you can change any button's text style by selecting the button with the Button tool and pressing the Option key while choosing Button Info from the Objects menu. (Note that a button with an icon always uses plain Geneva 9; you can change only its justification.) When you dismiss the text-style dialog box, the normal Button Info dialog box appears.

Robi Khan
Saskatoon, Canada

The script has a sly side effect: it gives the button you select the highest number and renumbers all other buttons below it, which puts it in front of all other buttons and fields in the same layer (card or background)—even if you cancel the text-style dialog. If your scripts refer to buttons by number (instead of by name or by ID), they may no longer work. As long as you keep these limitations in mind, the script is very useful. ◘

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Lon Poole answers readers' questions and selects their tips for this monthly column. His many personal computer books include the quick reference HyperTalk *(Microsoft Press, 1988) and a new book of Mac tips (soon to be published by Microsoft Press),* Amazing Mac Facts.

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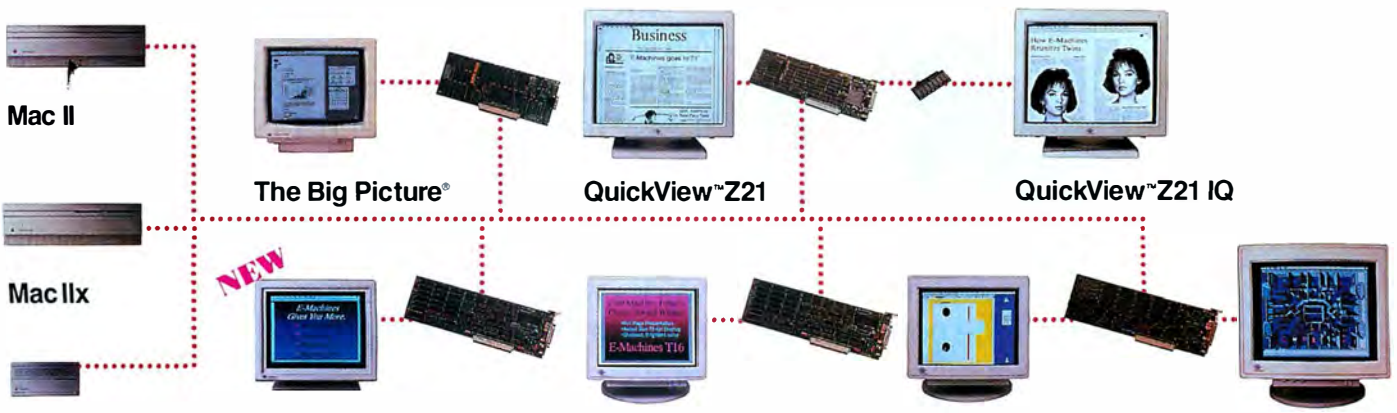
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Getting Started with Buying a Mac

How to assemble a system that meets your needs—and budget

by Jim Heid

Today's Macintosh shopper faces more decisions than the president on a bad day. Apple currently offers eight Macs, ranging in price from $1799 for a bare-bones Plus to roughly $10,000 for a maxed-out Mac IIx. Hundreds of independent, or *third-party,* manufacturers supply thousands of programs and hardware add-ons. You can outfit a system using only Apple hardware, or combine components from different firms. You can shop at a local dealer, or through the mail. Buy the right system, and you'll wonder how you got along without it. Buy the wrong one, and you'll feel betrayed by technology as you watch it depreciate and collect dust.

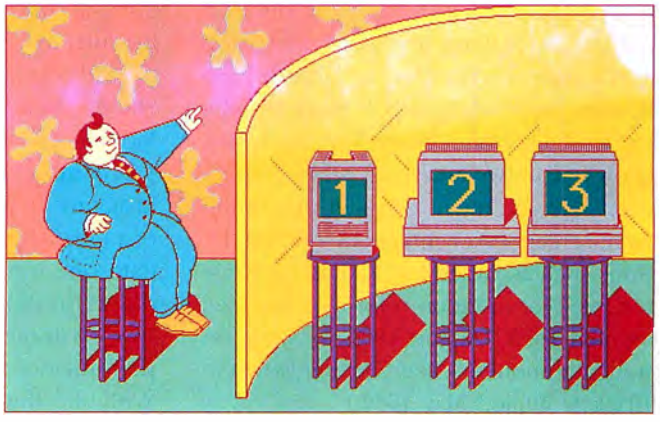
This month, we make our way through the maze of issues you need to consider when assembling a Mac system, with the goal of helping you decide what combination of hardware is best for you.

MONEY IS EVERYTHING

Many consultants and experienced users will suggest that you answer the following questions to determine what to buy:

1. What tasks do I want to use the Mac for?
2. Which programs can perform them?
3. What kinds of hardware are required?

A valid approach, I'd preface it with a more pragmatic question: How much can you spend? The fact is, what you *want* a Mac to do and what an affordable system *can* do are often two different things.



MARK UBICH

Thus, you can't accurately answer the first question until you determine your budget.

Addressing your finances is especially important in the Mac world, where "bargain" often means "less than a new car." I'm exaggerating, but it is true that Macs generally cost more than the other major microcomputing standard, the IBM PC and its work-alikes, or *clones.* But the Mac is also easier to learn. If your time is worth money, the system's higher cost may easily be offset by the time you save learning it, especially if you or someone else will be training employees.



HARDWARE DECISIONS

You've thought about what you want to do with the Mac and you've determined which programs you want to use. You're ready to start shopping for hardware. That means addressing the seven basic areas that differentiate each Mac model.

- *Size* If portability is important, you'll want to consider the new Mac Portable or one of the members of Apple's *compact Mac* line: the Plus, SE, and SE/30. (The members of the Mac II family form the *modular Mac* line.) Of these, the Portable is the only one that runs on batteries.
- *Speed* The Mac SE/30 and the II family are faster than the Plus, SE, and Portable, and therefore are better able to handle applications that demand fast processing speed. Even the lowly Mac Plus can handle such tasks as simple word processing and filing, monochrome drawing, telecommunications, and file serving to a small network. Other duties are better handled by an SE, including light-duty desktop publishing and spreadsheet work, and creating and using HyperCard stacks. You'll want a fast Mac for working with large databases or spreadsheets, large word processor documents with indexes and tables of contents, color illustrations or animations, or large desktop publications containing color.
- *Expandability* The SE and II families contain internal *expansion slots* into which you can plug circuit boards that add to the machine's capabilities. *Accelerator boards* boost performance, *video boards* control

(continues)

COMPARING MACS

	Plus	SE	SE/30	II	IIx
Portability	good (weighs about 16 lbs., has built-in screen, but requires power source)	good (weighs about 20 lbs., has built-in screen, but requires power source)	good (weighs about 20 lbs., has built-in screen, but requires power source)	poor (large system unit and external monitor make transporting difficult)	poor (large system unit and external monitor make transporting difficult)
Speed (1=slowest, 6=fastest)	1	1.3	4	3	3.8
Internal Expandability	poor (no slots)	good (1 slot)	good (1 slot)	excellent (6 slots)	excellent (6 slots)
Video flexibility	poor (supports single built-in screen only)	very good (supports external monochrome monitors)	very good (supports 1 external monochrome or color/ gray-scale monitor)	excellent (supports up to 5 color/ gray-scale monitors)	excellent (supports up to 5 color/ gray-scale monitors)
Memory capacity [2]	very good (up to 4MB)	very good (up to 4MB)	excellent (up to 8MB)	excellent (up to 8MB)	excellent (up to 8MB)
Floppy-disk storage capacity [1]	foir (1.6MB)	good–excellent (2.4MB with BOOK drives; 4.2MB with 1.4MB drives)	very good (2.8MB)	very good (2.8MB)	very good (2.8MB)
Virtual memory support	no	no	yes	yes (with upgrade)	yes

[1] These values represent each machine's floppy storage capacity when equipped with the maximum possible number of floppy drives that each machine can accommodate; capacity is less when fewer drives are used. Also, two sets of values are listed for the SE because machines manufactured after August 1, 1989 are equipped with the 1.4MB high-density floppy drive. A floppy drive upgrade for older SEs is available.

[2] Maximum memory values reflect the use of 1MB SIMMs, currently the most widely available. The only exception is the Mac Portable, which currently uses 256K static RAM chips. Also, NuBus-equipped Macs can accommodate additional RAM on expansion boards; however, the Mac's current system software can access only 8MB of RAM. System 7.0 will be able to access additional RAM.

specialized monitors, and *communications boards* let you connect to other computers over the phone or to high-speed office networks. (For more on the virtues of expansion slots, see "Getting Started with Expansion Slots," *Macworld*, April 1989.) Expansion slots are also an excellent defense against obsolescence. For example, an accelerator board such as the Radius Accelerator 25 can make a lowly SE roughly as fast as a Mac IIci (for more information on the IIci, see *Macworld News*, November 1989).

▪ *Video features* The Macintosh Portable, Plus, and SE can display only black screen dots and white screen dots, or *pixels*. If you want to work with color or true shades of gray (like those displayed by televisions), you'll want an SE/30 or a member of the II family equipped with color or *gray-scale* video hardware. If your applications demand speed and if you're content to work with 256 simultaneous colors or gray shades, consider the Mac IIci, the only modular Mac that contains built-in video hardware. For business graphics, presentations, black-and-white scanned images, and many desktop publishing applications, 256 colors are more than enough, but they may not be adequate for working with scanned color photographs or illustrations. For those tasks, you may want a *24-bit color board* such as SuperMac's Spectrum/24 or RasterOps's ColorBoard 264. For desktop publishing, drafting, and word processing applications, consider a large-screen monitor such as Apple's Portrait Display or Two-Page Monochrome Monitor, which show one or two letter-size pages, respectively. Or you might consider one of the large-screen color monitors offered by firms such as SuperMac, Radius, and RasterOps. (For more on color monitors, see "Screen Tests," August 1989; for more on noncolor monitors, see "Getting Down to Black & White," May 1989.)

▪ *Memory capacity* If your applications demand speed, chances are they'll devour memory and disk space, too. All Macs come standard with 1 megabyte of RAM. That's barely enough. (These days, it's rarely enough.) A 2MB machine will let you run two or three programs simultaneously under MultiFinder and switch between them with a mouse click. If you plan to work extensively with digital sounds and color images, you'll probably want (if not need) 4MB. If you want to be able to run several memory-devouring applications at once, consider an SE/30 or a modular Mac. They can accommodate up to 8MB using 1MB memory boards called SIMMs, short for Single Inline Memory Module.

▪ *Disk-storage capacity* Today's complex programs require the speed and capacity of a *hard disk*, and any Mac can accommodate one (or more). Simply put, a hard disk is the most important add-on you can buy. Without one, you'll endure slow performance and frequent disk-swapping. With one, the Mac will start programs and open documents swiftly, and you'll be able to switch between programs and documents without shuffling floppies (see "Getting Started with Mass Storage," December 1988, for more details on hard

IIcx	IIci	Portable
fair	fair	very good
(small system unit, but	(small system unit, but	(weighs under 16 lbs.,
requires external monitor)	requires external monitor)	has built-in screen,
		runs on batteries)
3.8	5–6	2.5
very good	very good	good
(3 slots)	(3 slots)	(3 specialized slots)
very good–excellent (supports up	very good–excellent (supports	very good
to 3 color/gray-scale monitors)	up to 4 color/gray-scale monitors)	(highly legible built-in screen; will support external
		color/gray-scale monitors with Apple adopter)
excellent	excellent	fair
(up to 8MB)	(up to 8MB)	(up to 2MB)
very good	very good	fair
(2.8MB)	(2.8MB)	(1.4MB)
yes	yes	no

disks and other high-capacity storage media).

By shopping from mail-order firms such as MacConnection, you can buy a 20MB or 30MB drive for just a little more than what Apple charges for an external floppy drive. You won't need one if you're buying a hard disk. But without a hard disk, a second floppy drive is essential.

▪ *Virtual memory support* Last May, Apple announced plans for a major upgrade to the Mac's system software, System 7.0, which it expects to release before the summer of 1990. System 7.0 will provide a *virtual memory* feature that lets the Mac treat a hard disk as an extension of RAM, thus allowing you to run several large programs simultaneously. System 7.0 will require a minimum of 2MB of RAM, and Apple recommends that you buy enough memory to accommodate the largest program you plan to run, so you may need more than 2MB.)

All Macs from the Plus on will be able to run System 7.0, but the Plus, SE, and Portable won't support the virtual memory features. (The II won't either, unless you add a $400 chip.) So, if you want to be completely ready for System 7.0, consider an SE/30, IIx, IIcx, or IIci. But don't base a purchase on this factor alone. Add a few megabytes of memory, and any Mac can run several large programs at once.

"Comparing Macs" shows how each Mac model fares in these categories.

START THE PRESSES

Chances are you'll want to commit your work to paper. If your budget is tight, consider a *dot matrix* printer such as Apple's ImageWriter II or ImageWriter LQ—both print by striking a cloth ribbon with a series of fine wires. ImageWriter output looks good, but it has that computer-printer look. However, because ImageWriters are *impact* printers and can accept *continuous-feed* paper stock, they're the scribes of choice for printing on multipart business forms and mailing labels. Both the ImageWriter II and the LQ accept optional boards that let you share the printer with Macs interconnected by *LocalTalk* network cables.

If you plan to do desktop publishing, you'll want a *laser printer*. These use photocopier-like mechanisms to produce sharp output that looks similar to the output of a typesetting machine, with print resolution of 300 dots per inch versus an

(continues)



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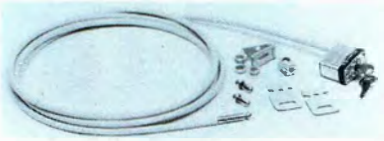


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ImageWriter II's 140 dpi and an LQ's 216 dpi. A laser printer's resolution is still short of a typesetter's (1270 dpi and up), but it's sharp enough to render the subtle line strokes and serifs of most typefaces.

The least expensive laser printer is the $2099 GCC Personal LaserPrinter (PLP). The PLP produces first-rate output, but it can be slow, and it requires that you designate a portion of your hard disk for font storage. And, if you want to share a PLP with other Macs, you'll need a $500 add-on called PLP Share.

If you're serious about publishing, you'll want a printer that uses Adobe Systems' *PostScript* page-description language. PostScript printers such as Apple's LaserWriter IINT and NTX contain powerful computers that can produce remarkable graphic and type effects. They also contain software and built-in network connectors that let you share a printer with other Macs and with IBM PCs.

Alas, PostScript printers aren't cheap. The NEC SilentWriter LC 890 is often discounted to about $3000 by mail-order houses, but such printers generally go for between $4000 and $6000. PostScript clones—printers that act like PostScript printers but don't use Adobe's version of the language—such as Qume's CrystalPrint Publisher, Jasmine's DirectPrint, the La Cie Panther PDX, and the Abaton QuickStep, all of which are identical except for their labels and list prices—often sell for less, but I've had mixed results with them. I recommend buying the real thing. (For more details on laser printers, see "Getting Started with Laser Printers" and "Paging All Printers," in October 1989.)

You can get PostScript output without buying a printer: take completed documents to a desktop publishing *service bureau* for printing. Many printing companies and college libraries also rent time on Macs and PostScript printers. These alternatives aren't as convenient as having a printer in your home or office, but saving several thousand dollars can make a little inconvenience palatable.

OTHER ADD-ONS

With a *modem* and *communications software,* you can send electronic mail on

(continues)



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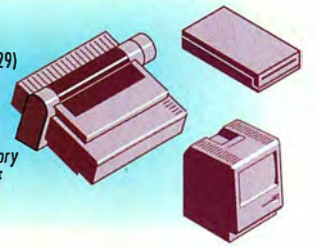
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SAMPLE SYSTEMS

Low-Cost System

Macintosh Plus ($1799)
External floppy drive ($429)
ImageWriter II ($595)
Future additions:
External SCSI hard disk, 2400-baud modem, memory upgrades (to maximum of 4MB).



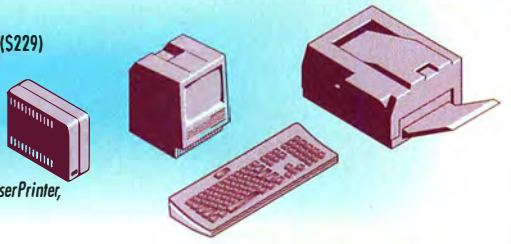
Portable System

Macintosh Portable ($5799–$6499)
GCC's WriteMove printer ($579)
Future additions:
Apple video adapters, monitor for office use.



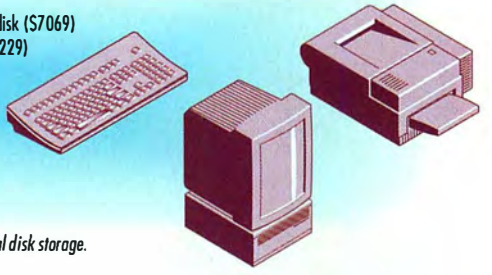
Economical Business/Professional System

Macintosh SE ($2869)
Apple Standard Keyboard ($129) or Apple Extended Keyboard ($229)
40MB hard disk ($1299 for Apple HD 40SC; many alternatives available for under $1000)
GCC Personal LaserPrinter ($2099)
Memory upgrade to 2.5MB ($999 for Apple's)
Future additions:
Accelerator board, upgrade to PostScript-based GCC Business LaserPrinter, large-screen monitor, 2400-baud modem, memory upgrades.



Performance-Oriented Business/Professional System

Macintosh IIcx with 40MB hard disk ($5369) or with 80MB hard disk ($7069)
Apple Standard Keyboard ($129) or Apple Extended Keyboard ($229)
PostScript laser printer ($4999 for Apple's LaserWriter IINT; many comparable printers available for less)
Memory upgrade to 5MB ($1999 for Apple's)
Video card ($499–$648 for Apple's)
Monitor ($999 for AppleColor High-Resolution RGB monitor; $399 for Apple High-Resolution Monochrome Monitor)
Future additions:
More memory, additional monitors, 9600-baud modem, additional disk storage.



Listed here are four ways to assemble a Mac system, each geared to different needs and price ranges. The prices listed after each item are Apple's suggested retail prices as of October 1, 1989; you may find dealers offering discounts of 20 percent or more, especially if you shop in urban areas. With items whose prices are listed as "$000 for Apple's," you're likely to find less-expensive alternatives from third-party manufacturers.

When you buy a member of the SE or II family, you purchase the keyboard separately. The Apple Extended Keyboard costs more than the Apple Standard Keyboard but provides additional keys, including *cursor control* keys, which make it easier to navigate large word processing documents, and *function keys*, which many programs let you use as an alternative to choosing commands with the mouse.

services such as MCI Mail, Connect, and CompuServe. You can also tap into a vast network of computer users to exchange ideas and obtain freeware and shareware.

If you'll be doing desktop publishing or computer illustration, you might consider a *scanner*, which lets you turn artwork and photographs into digital images that you can alter, or trace over and include in publications. Combine a scanner with *optical character recognition* (OCR) software such as Caere's OmniPage, Olduvai's Read-It, or CTA's TextPert, and you can scan pages of text and edit the resulting files using your word processor. (For more details, see "Getting Started with Scanners," November 1988; for a detailed look at OCR software, see "The Reading Edge" in February 1989.)

WHICH ROUTE FOR YOU?

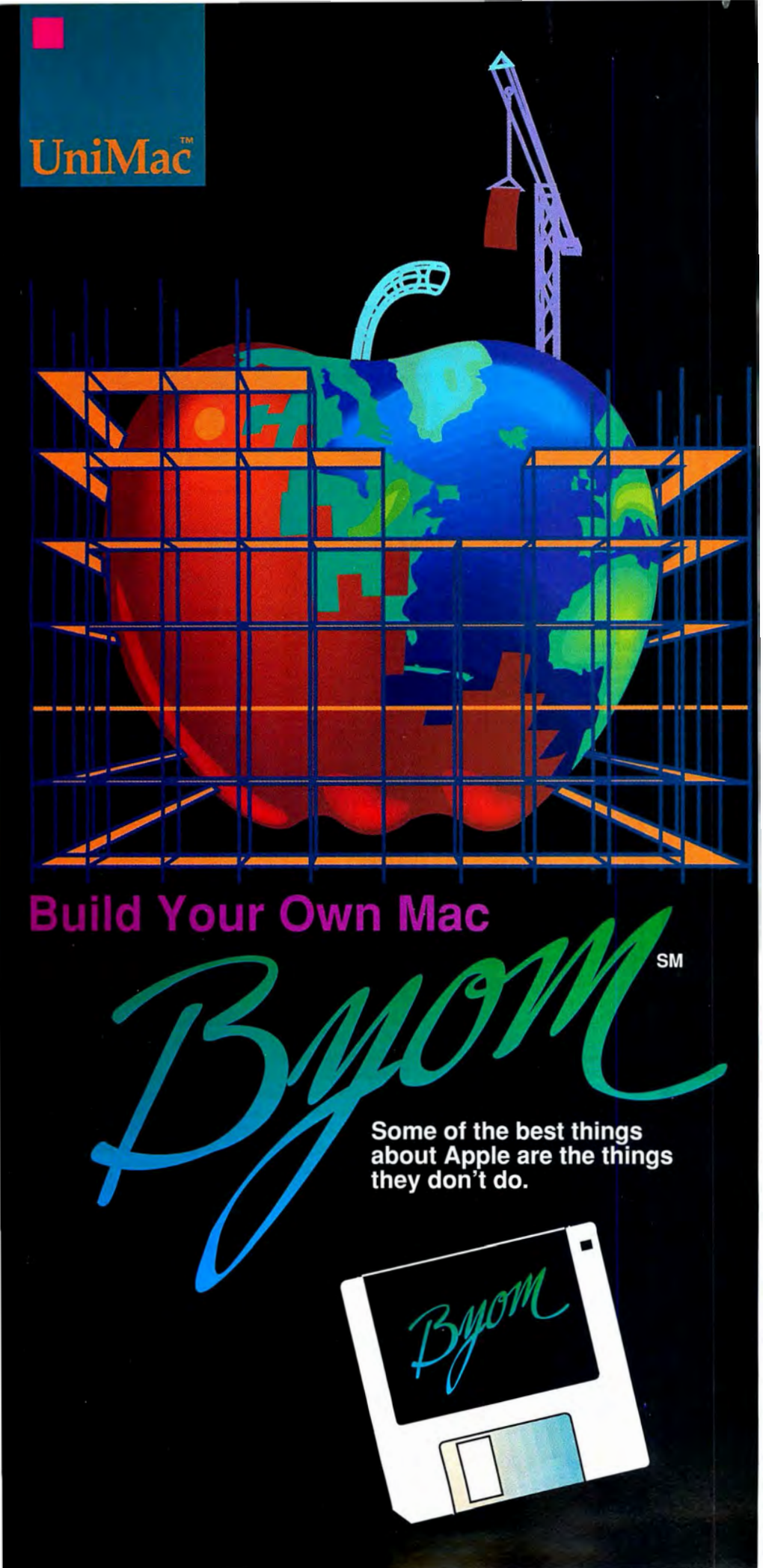
Before you buy a Mac, you need to weigh the differentiating factors and determine which ones are most important to you. This will help you get the machine best suited to your present and future situation.

Aside from actually writing out the check, this is one of the hardest steps in the purchasing process. It's at this juncture that you'll realize just how many ways exist for you to reach your hardware goals. For example, say you've determined that you need a fast Mac with a hard disk and 4MB of memory. Should you buy an SE/30 or a member of the II family? Or should you get an SE and install an accelerator board? Should you buy a stripped-down Mac and buy a mail-order memory upgrade and hard disk? Or should you spring for a system in which those components are factory installed?

"Sample Systems" shows four routes you might take. And there are a few buying tips I can pass along to steer you in the right direction.

- Buy the fastest Mac you can afford, even if your present needs are simple. You'll enjoy top-notch performance, and your hardware will be ready to accommodate System 7.0 and the larger, more complex programs that will undoubtedly be developed to exploit its talents. At the very least, your system will retain its value better should you decide to sell it.
- Avoid the Plus if your budget allows it. This nearly four-year-old Mac runs virtually all of today's software, and it will be able to run System 7.0 (although it won't support virtual memory). But its weakling power supply and lack of an expansion slot make obsolescence-shattering upgrades such as accelerator boards impractical and risky. If you can, buy an SE instead. Its single expansion slot gives it a brighter future, it can reliably handle an internal hard disk, and it's a bit faster than the Plus.
- Don't be afraid to mix and match components. You can save money by buying non-Apple hard disks, printers, modems,

(continues)



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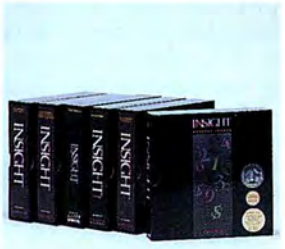
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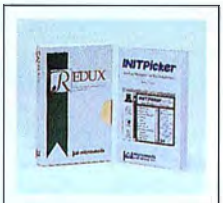
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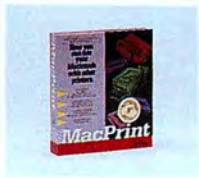
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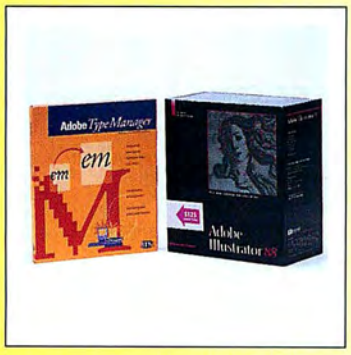
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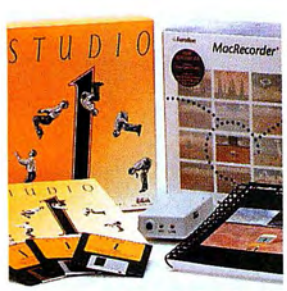
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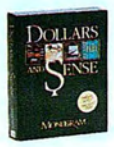
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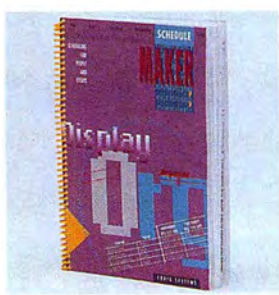
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T-2000 19,000 BPS ..... 1254.
T-2500 V.32 19,000 ..... 1254.

U.S. Robotics
2400 Baud ..... 347.
9600 Baud HST ..... 685.

MONITORS, GRAPHICS CARDS & COLORBOARDS

Micron Colorboards
Nb-10-78 (8 Bit) Mac II's (for 19" monitors) ..... 598.
Nb-6-48 (8 Bit) Mac II's (for 13-14" monitors) ..... 385.

NEC - Color Monitors
MacSync 14" ..... 599.
NEC MultiSync XI 20" ..... 2695.

RasterOps
ClearView 19" SE Monitor w 16MHz Board (B&W) ..... 1595.
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108+ SE/30 ..... 1439.
224 (32 Bit Color) ..... 3995.
264 Mac II (24 Bit) ..... 785.
264 SE/30 (24 Bit) ..... 1038.
Trinitron 19" ..... 3398.

Sony - Color Monitors
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16" HG Multiscan ..... 2498.
19" HG Multiscan ..... 3198.

Taxan
Crystal View - Mac SE, II, IIx, IIcx, SE/30 ..... 1395.

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Mac SE - 030 25MHz ..... 1595.
Mac SE - 030 33MHz ..... 2395.
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68030 33MHz ..... 3098.
68030 40MHz ..... 3748.
68030 50MHz ..... 4498.
Fast Cache IIci ..... 756.



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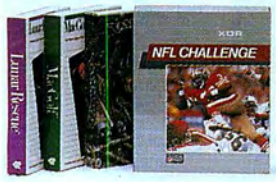
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548 (512k to 2mb) ..... 432.
548e (512kE to 2mb) ..... 415.
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National Semiconductor
Maccelerate A/Ux ..... 469.

Orchid Technology
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68020 SE 25MHz ..... 1118.
68030 SE 16MHz ..... 976.
68030 SE 20MHz ..... 1118.
68030 SE 25MHz ..... 1397.
GemKit (allows user to put Gemini 020\030 Accelerators into Mac Plus, 512kE, 512k and 128k, w/ optional extra RAM memory & SCSI port ..... 149.

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FI-1 Ethernet LAN/68020 Accelerator SE ..... 895.
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Farallon - PhoneNet
DB-9 ..... 34.
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Star Controller EN ..... CALL
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EtherPort L Mac II's ..... 498.
EtherPort L Mac SE/30 ..... 498.
Fast Path ..... 1945.

MacTech
TeleConnector DIN-8 ..... 17.
TeleConnector DB-9 ..... 17.

Nuvotech - Turbo Net
Turbo Net DB-9 ..... 25.
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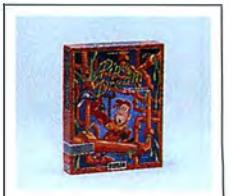
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Naval Battle ..... 27.
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VocabuLearn/ce German ..... 30.
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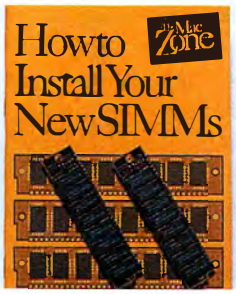
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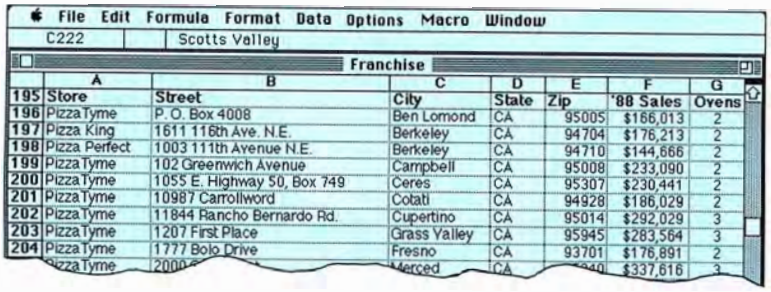
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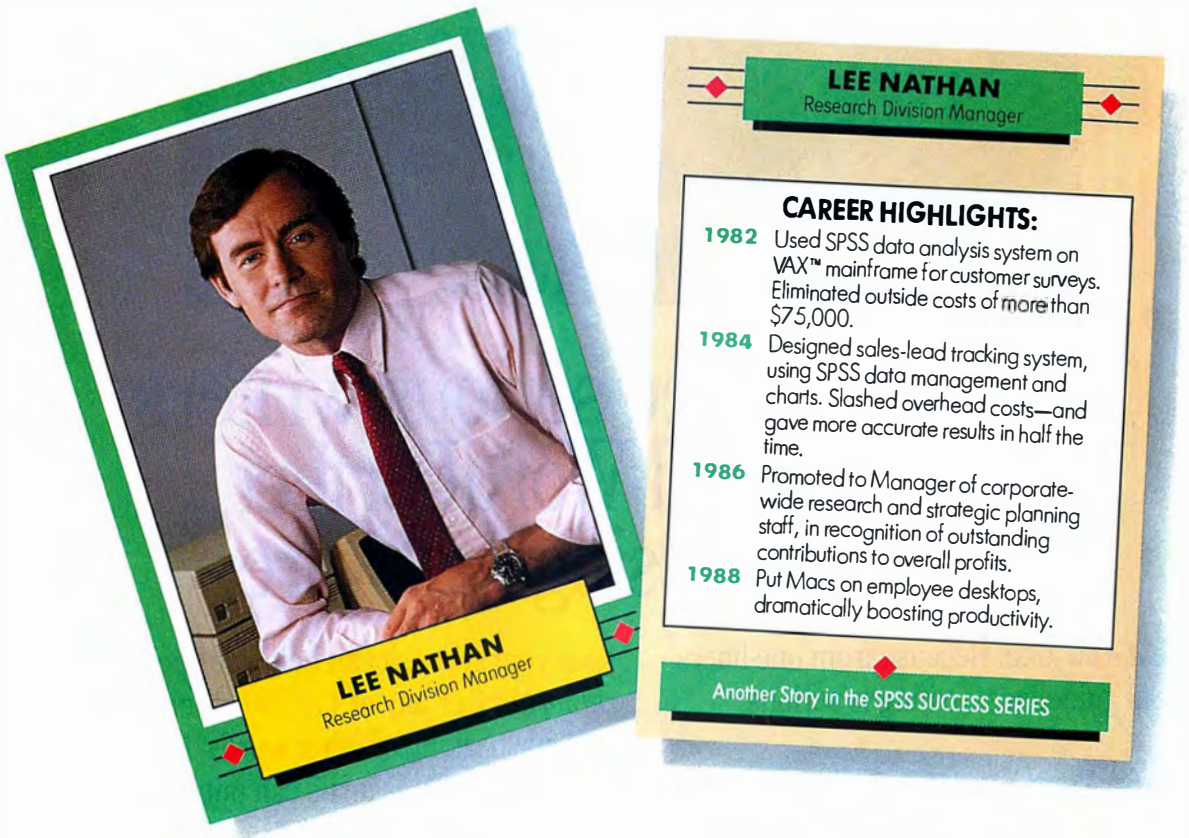
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See *Where to Buy* for contact information.

Jim Heid is a Macworld *contributing editor who each month focuses on a different aspect of Mac fundamentals. His latest book is* Inside the Apple Macintosh, *an advanced user's guide (Brady Books).*

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Insights on 4th Dimension 2.0

Tips for harnessing this powerful database management tool

by Tony Oppenheim

By adding more than 300 features to 4th Dimension (commonly referred to as 4D), ACIUS has created a rich environment for database users at all levels. Report and label generators, object scripts, automatic bidirectional file relationships, automatic button actions, and many other new features make 4th Dimension 2.0 a powerful tool for users and developers alike.

STRUCTURING YOUR DATABASE

Whenever you create a new 4th Dimension database, you see a Structure window, which is where you set up and modify your database structure. Here are a few tips for streamlining the process ("Navigating Your Structure" shows some of them in action).

Double-click on a file name to see a list of all existing layouts for that file or to create a new layout for that file. To add new fields to the file, double-click on the area below the file name and below any existing fields in the file. You can also double-click on an existing field to modify its attributes or change its name.

Use the Show Page icon in the lower-left corner of the Structure window to navigate complex structures. Click on this icon to display a sized-to-fit view of your entire structure. Then to scroll to a different area of the structure quickly, move a gray box over the area you wish to view and click the OK button (a feature also available in 4D's Layout editor).



TRUE OR FALSE

One of 4D's new field types is Boolean, which stores logical values of true or false. The default setting is a pair of radio buttons labeled Yes and No, but a Boolean field can also be displayed as a single check box. To select a value for a Boolean field, you can click on one of the radio buttons or on the check box, or type **Y** or **N**. You can change the default to other values—for example, Married or Single. You can select your choice by typing the first character, in this case, **M** or **S** (typing **Y** or **N** will also still work).

SETTING UP LAYOUTS

If you use one of 4D's standard layout forms and you don't select any fields to be in the layout, 4D automatically creates a layout with all the fields in the file. Even if you don't want all fields included, it's often easier to modify these generated layouts than to build one from scratch.

When adding a new field to a layout you usually want to match the visual formatting characteristics of the fields already in the layout. 4D's object-oriented approach makes this a snap. Select one of the fields that is already in the layout—along with its label—and click the Duplicate icon in the tool palette (or press ⌘-D). Once the duplicate is created, drag it into position and adjust its size if necessary. Then double-click on the field from the scroll box of field names in the Field Definition dialog box.

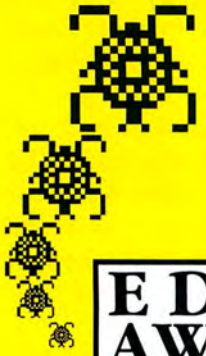
If you've added several fields to a file's structure and need to modify the layout to reflect the changes, use the Add to Layout command from the Layout menu (this menu appears only when you are using the Layout editor). This will allow you to either quickly create an entire new setup for the current layout or just add a group of fields to the layout without having to create them one by one.

THE FIRST FIELD

The entry order of fields you set in the layout determines the order in which the cursor moves from field to field as the user enters data and tabs through the database. An often confusing aspect of this process is how to change the first enterable object (a field or variable) in the layout.

After you've opened the layout, select Entry Order from the Layout menu. A line appears connecting all the enterable objects on your layout. Use the Entry Order pointer to click and drag from the current first object in the layout to the desired first

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LAYOUT EDITOR SHORTCUTS

⌘-Click (with any tool but text tool)
Returns you to the arrow tool

⌘-Click-drag
Creates a new object with the last-selected tool

⌘-Shift-click on an object
Places a 1-pixel border around the object

Option-click on an object
Opens the object's script

Control–double-click on an object
Opens the object's Position dialog box

Control select
Holding down the Control key while selecting an object selects only the objects completely enclosed by the selection rectangle.

Shift-drag a control marker
Moves the selected control marker and all markers below it

Other Shift key options
Pressing the Shift key while creating or modifying an object constrains movement so that lines will be only vertical or horizontal; rectangles will always be square; and ovals will be circles.

object. This makes the desired first object the second object in the data entry order. Then drag from the desired first object to the current first object and you're done. Click on any tool in the palette to let 4D know you've finished changing the entry order.

SWITCHING BETWEEN FILES

In the User environment, ⌘-spacebar toggles to display and hide the List of Files window. From this window you can change the current file and the current input and output layouts for any file.

SELECTING RECORDS

In addition to letting you select records via a search, 4D lets you select records manually. You select multiple records by either Shift-clicking to select contiguous records or ⌘-clicking to create a discontiguous selection. Once you've highlighted the records you want, select Show Subset from the Select menu. 4D then lists only the selected records. You can use those records for a report, graph, labels, or any other 4D operation that works on a selection of records.

IMPORTING

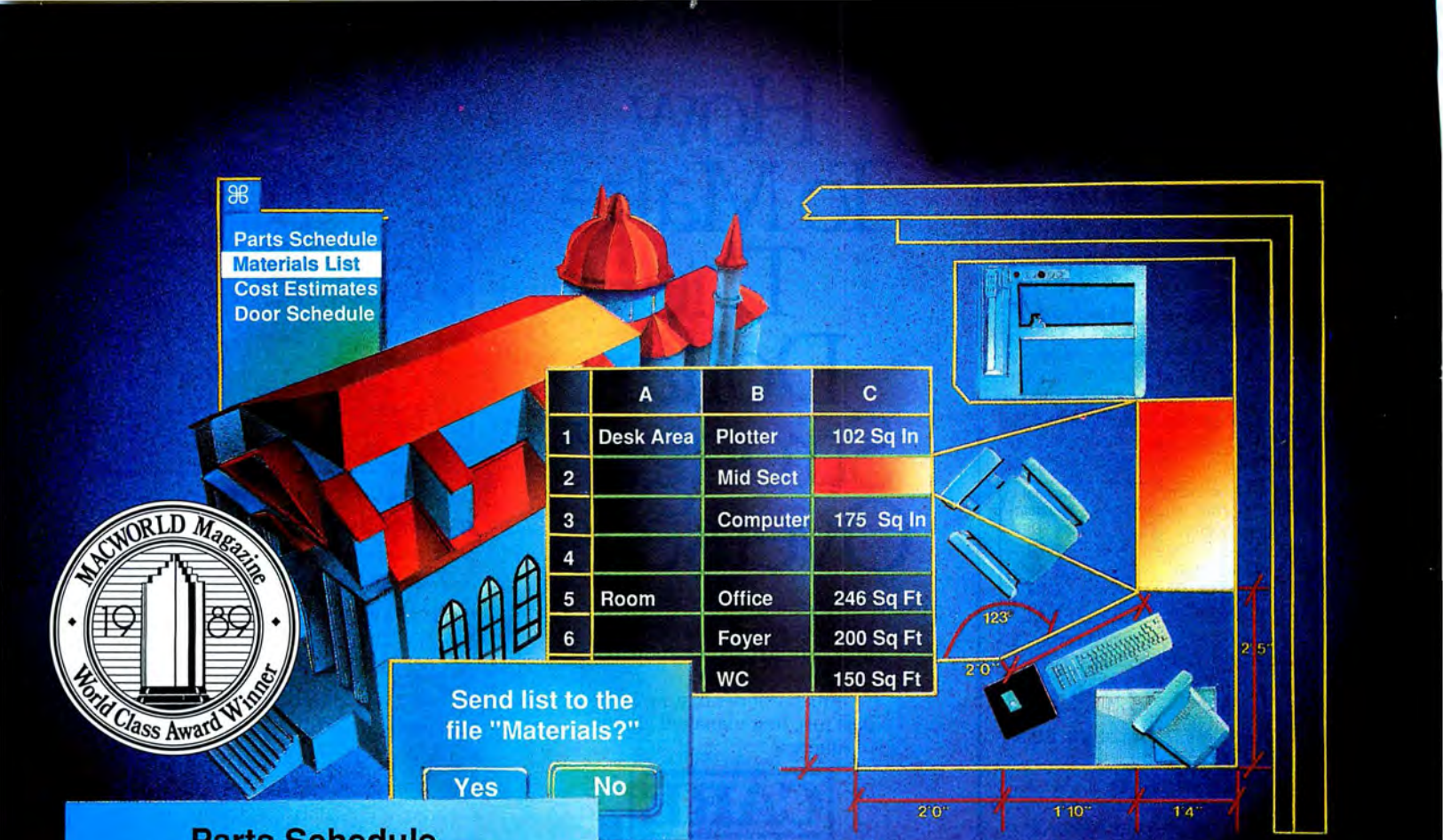
If you've worked with other database programs, you probably have data you want to import into 4D. It turns out that the fastest method of doing this is also the easiest. If the data you wish to import is saved as Text, DIF, or SYLK, you can use the Import Data command in the File menu of the User environment.

If the fields in the data file you're importing are in the same order as the fields in your 4D database, you can just click Open and 4D automatically places the fields from the data file in the corresponding 4D fields. Even if the fields in both files are in the same order, the process goes much faster if you use the import list at the bottom of the Import Data dialog box, which tells 4D where to place the data as it is imported. The difference in speed is dramatic. This feature also enables you to map the fields in a data file to any field in your 4D database.

SEARCHING

The Save and Load feature of the Search editor saves time by allowing you to store, modify, and reuse searches. After performing a Search by Layout in the User environment, 4D displays the search criteria in the Search editor and gives you the option of saving. Next time you want to perform the search, just use the Load button in the Search editor to retrieve the

(continues)



	A	B	C
1	Desk Area	Plotter	102 Sq In
2		Mid Sect	
3		Computer	175 Sq In
4			
5	Room	Office	246 Sq Ft
6		Foyer	200 Sq Ft
		WC	150 Sq Ft

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Color Support

4D's color submenu lets you select both a foreground and a background color for each 4D object. You can copy custom palettes into the database structure to replace 4D's default palette.

search criteria. Saved searches are a boon for less experienced users who need to access your database. They don't need to figure out how to set up a complex search; they merely retrieve one you've already created. 4D also performs relational searches via the Search editor; for example, you can search the Invoice file for all Invoice records belonging to customers with balances higher than $10,000. 4D's automatic relations make this possible even though the balance is stored only in the Customer file.

SORTING

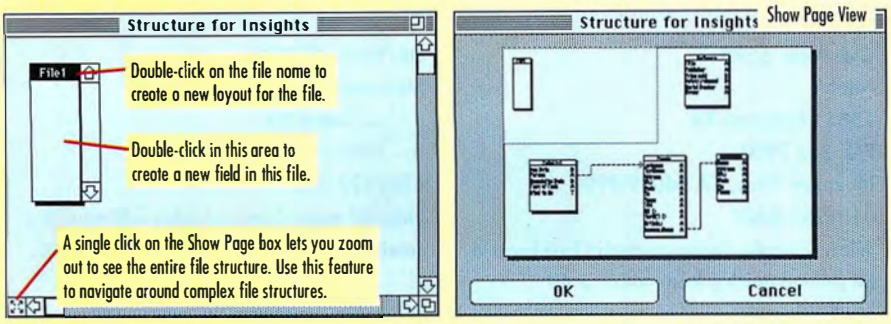
4D 2.0 performs relational sorts. For example, if you set up an automatic relation between the Employees and the Companies files, users can easily sort employee records based on the zip codes stored in the Companies file without having to store those zip codes in the Employees file.

In 4D 2.0 you can sort by formula, for example, based on the length of the data stored in a field, or on a particular character in the field. The latter is useful for creating directory-style reports that have a break between names starting with different letters of the alphabet (see the Contacts II example that comes with 4D).

BY DEFAULT

4D 2.0 provides codes for setting default values, which can be used in layouts and in the Quick Report editor. These include #D, the date from the Macintosh clock; #H, the time from the Macintosh clock; and #P, the current printing page (for use in re-

NAVIGATING YOUR STRUCTURE



Here are a few power tips for the Structure editor.

ports). These codes can be entered into the Default box in the Field Definition dialog box. You may also place a string or numeric constant in the Default box.

4D also has a default color palette. While there's no way to change 4D's color palette on the fly, you can copy a palette into the 4D application structure file with ResEdit. 4D will use this custom palette instead of its own.

EXPORTING QUICK REPORTS

The 4D 2.0 Quick Report editor allows you to print reports to disk, making it a powerful tool for exporting data to word processors and page-layout programs. The Quick Report editor exports calculated fields, subtotals, and grand totals. It even lets you export only selected parts of a report (select Hide Line from the Edit menu). As a result, you can create formatted text files that would have required hours of programming in previous versions of 4D.

To print a report to disk, select the Print To command from the File menu of the Quick Report editor. In the dialog box that appears, select the Disk File option. When you select print, 4D presents a create file dialog box that allows you to name the report file.

FUN WITH FILTERS

Filters are one of the most interesting features of 4D 2.0. You add entry filters for fields in the Field Definition dialog box or set them procedurally with the 4th Dimension language. Filters can help the person entering data understand what is expected in a field and make it impossible to enter the wrong type of data.

You can use filters to provide the user with instructions that are specific to a particular field. For example, this filter

```
&9Enter phone number: (###) ###-####
```

causes the following message to be displayed in the field only while the user is entering the phone number.

```
Enter phone number: (___)___-____
```

Make the field large enough on the layout for the message to be displayed.

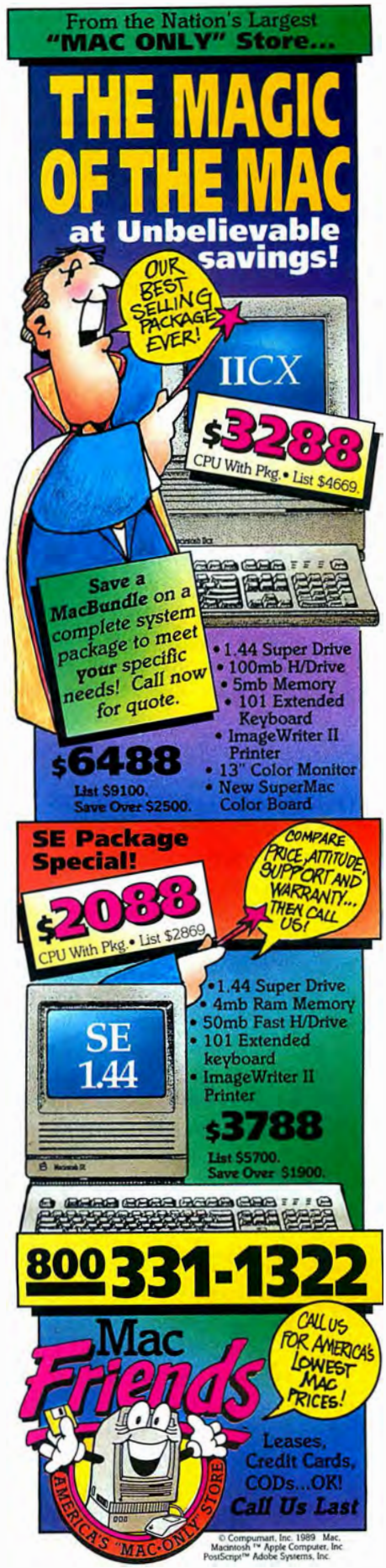
STYLES

Using styles to save complex display formats and entry filters makes it much easier to reuse or modify the formats or filters. You can change a style in the Edit Styles dialog box (which is hidden away in the Preferences dialog box of the Design environment). That style is automatically updated wherever you've referenced it.

PROCEDURE/SCRIPT EDITOR

Although you can use 4D without ever writing a procedure or script, the time will come when you want to take advantage of 4D's powerful built-in language. 4D provides two ways to create and edit procedures: a Flowchart editor and a Listing editor. Scripts and procedures created with one cannot be opened by the other.

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Use the Listing editor. The Listing editor is by far the most popular editor for creating 4D scripts and procedures. All of 4D's documentation and examples revolve around the use of the Listing editor. If you use the Flowchart editor you'll find that you're largely on your own.

You may think it's a good idea to choose Listing as the default in the Preferences dialog box in the Design environment. *Don't do it.*

The best setting for the Procedure Default is No Default. If you Option-click on a field or variable in the Layout editor, that object's script opens automatically. However, if no script exists for that object, 4D creates a new script of the default type. This can be a problem if you didn't intend to use the object script, since there is no way to delete the script without deleting the object. With a No-Default setting, 4D still opens existing scripts immediately. But if a script doesn't already exist, you'll get a dialog box asking which type of procedure to create. This gives you a chance to cancel creation of a new script.

LISTING EDITOR SHORTCUTS

A Fields list, at the bottom-middle of each Procedure window, displays the names of the fields and layouts in your database. Clicking on an item in this list—or on the file name itself—automatically inserts the item into your procedure. You can access the fields and layouts of any file in your database from the Fields list.

In a database with many files, it may be tedious to click on the left and right arrows to find the file you're looking for. If you click on a file name and hold the mouse button down for about a second, a pop-up list of all the files in the database appears. Use this pop-up to go directly to the file you want. This shortcut is also available in the Search editor, the Sort editor, Quick Report, and Apply/Search by formula.

In the bottom-right portion of Procedure windows, 4D presents a list of all available built-in, user-defined, and external routines. If you press the ⌘ and Shift keys while typing the first couple of letters of a built-in routine, the listing of routines automatically scrolls to the correct entry. You then simply click on it to enter it into your procedure.

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A similar shortcut is available in the Procedure dialog box (which you see when you select Procedures from the Design menu in the Design environment). Once you expand the list of global procedures, type ⌘-Shift and the first couple of letters of a global procedure name, and 4D scrolls to it. Don't forget to use the Sort button as you add new global procedures to keep them in alphabetical order.

FAST CLEANUP

To quickly close all the open windows in the Design environment, click the close box of the front window while holding down the Option key.

GETTING THE BUGS OUT

One of the most powerful programming features of 4D is its built-in debugger. Whenever one of your procedures or scripts is running, you can access 4D's Debugger by Option-clicking. The Debugger lets you step through the code in the upper half of the window and check the current values of fields and variables in the window's lower half.

The Debug window has no zoom box in the title bar, but double-clicking on the size box in the lower-right corner makes the window zoom in and out.

You can change the amount of space allotted to each part of the window by Option-dragging the line that separates the top and bottom halves of the window.

You can enter any valid 4D expression in the lower half of the Debug window (called the expression evaluation area). 4D evaluates the expression and shows its current value.

A pair of pop-up menus in the Debugger make it easier to enter a field name or an expression that uses a 4D routine. To access the menus, click in the expression evaluation area to set an insertion point. Then, to get a complete listing of your file structure, hold down the Option key and click at the insertion point. For a complete list of built-in 4D routines, hold down the ⌘ key and click at the insertion point. These pop-ups may take a few moments to appear, so be sure to hold down the mouse button long enough. Any item you select from the pop-up menu is entered at the insertion point in the Debug window.

CONVERTING FROM 1.0 TO 2.0

Before you run the Converter program on your 1.0 database, run the Repair Database option of 4D Tools 1.04. This cleans up the data and provides a smoother conversion.

After conversion you may want to optimize some layouts. In many cases, layout procedures will no longer be nec-

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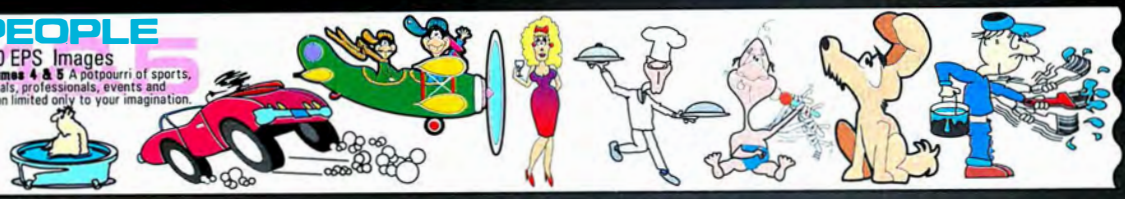
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Digit-Art MAC by Image Club is vector based PostScript clip art that can be used with any popular Macintosh applications such as PageMaker, ReadySetGo, X-Press, CricketDraw, FreeHand, and Illustrator. You can maximize printing detail with any PostScript laser printer including a Linotronic for typesetting sharpness. Image Club Digit-Art is easy to customize or add color to for separations when used with Adobe Illustrator or Aldus FreeHand. Unlike jaggy edged, 300 dpi scanned bit-map clip art (edited only with paint programs), Digit-Art is PostScript (EPS). You will experience scaling and editing flexibility without any loss of image quality. Your Image Club art is expertly rendered by our staff of in-house artists and is equivilent to the very best in line art when reproduced on a PostScript printer. Digit-Art is available on the ArtRoom CD-ROM and in diskette packages as featured above.

Digit-Art PC for PostScript printers is compatable with PageMaker, Ventura or any other program that will accept EPS format graphics. There is even a version of Digit-Art thatwill print on non-PostScript printers such as the HP LaserJet (PC TIFF). Digit-Art PC is available on the ArtRoom PC CD-ROM or in diskette packages.

Also on disk - the Image Club Typeface Library - 600 licensed PostScript typefaces for Mac or PC. Call for a catalog.

Digit-Art Volume	1	2	1&2	1,2&8	3	4	5	4&5	6	3&6	7	8	9	10	9&10	13	14	15
# 800K Disks	3	4	7	10	5	3	3	6	3	8	5	3	5	2	7	5	5	5
Mac EPS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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PC TIFF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Price	$99	$99	$168	$199	$149	$99	$99	$168	$99	$199	$99	$99	$149	$99	$199	$99	$99	$99

This ad - color and all - was created with Image Club clip art and typefaces using a Mac II, PageMaker 3.0.1, Illustrator 88 and FreeHand 2.0. Color separations were output as negatives on a Linotronic.

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essary (due to the new scripting capability in 2.0). However, there is no way to delete a layout procedure. Even if you remove all the code from the procedure, at least one line will be interpreted. Here's how to get around the problem. After converting a layout procedure to scripts connected with the appropriate objects, just cut and paste the existing layout into a newly created layout. Then delete the old layout along with its layout procedure. The new layout will execute a little faster because it won't have a layout procedure.

If you've used any arrays in your 1.0 application, be sure to read the section on arrays in *4th Dimension Language Reference*. It tells how to convert 1.0 array structures to 2.0 arrays. You'll see real increases in speed of array operations and you'll also ensure compatibility with future versions of 4D.

Examine the new programming structures available in 4D 2.0. Wherever possible use For loops, since they're at least twice as fast as While loops. One easily overlooked feature of For loops is the ability to modify the counter from within the loop, allowing you to conditionally exit the loop.

4D ADD-ON PRODUCTS AND SERVICES

There are quite a few third-party products and services to enhance your use of 4D, ranging from external procedures that add word processing, graphics editing, and 3-D graphing to consulting services and full-blown custom applications (see "4D Add-ons"). The ACIUS Solutions directory (available from ACIUS) provides information about many of these add-ons.

TECHNICAL SUPPORT

One of the best features of 4th Dimension is ACIUS Technical Support. Fortunately, it doesn't end at 5 p.m. on Friday. If you have a modem (and CompuServe Navigator), log on to the ACIUS forum on CompuServe (in Appvend A Subtopic 2), a very active forum populated by both ACIUS tech support and 4D developers from around the country. Post a question about any 4D-related topic here and you'll most likely have an answer within a few hours. If you do visit the ACIUS forum, drop me a note to say hi (Tony Oppenheim, 76344,1167).

Many of the tips for this article came from regular users of the ACIUS forum. Some notable contributors include Bob Shurtleff, Peter Schwitz, Alan Schlingenbaum, Richard Taylor, and Paul Lambert. We received many more contributions than we could possibly use.

SHARING THE WEALTH

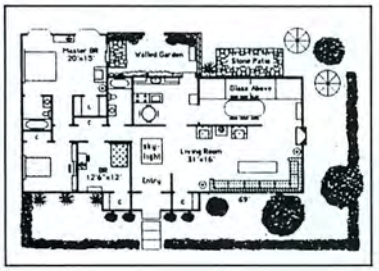
If you've found a tip or shortcut not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips, Macworld*, 501 Second St., San Francisco, CA 94107. Ⓜ

See *Where To Buy* for contact information.

Tony Oppenheim is an ACIUS certified developer based in New York City. His firm, Options Computer Consulting, creates 4th Dimension database systems for a wide variety of clients in the New York Metropolitan area.

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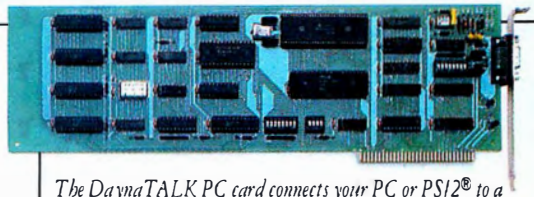
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Scheduled macros	YES	NO	NO	NO
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UPDATES

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.

Construction Set version 2.0 allows you to create an unlimited number of parts such as buttons and LEDs; "paper tape" graphic can hold up to 32K; includes financial functions, bit-operation functions, and functions that affect the calculator itself. Dubl-Click, 9316 Deering Ave., Chatsworth, CA 91311; 818/700-9525. $25; $89.95 new.

Excellerate for Microsoft Excel 2.2 adds two new modules: What's New for 2.2 and Macros for 2.2. Macros for 2.2 covers the new macro features in Excel 2.2, and What's New for 2.2 covers other features such as creating borders, using multiple fonts, assigning colors, adding notes to cells, protecting and auditing spreadsheets, using data forms, and using internal and external macros. Personal Training Systems, 828 S. Bascom, #100, San Jose, CA 95128; 408/559-8635. $25 per module; $49.95 per module (nine-module set) new.

Gofer version 2.0 performs searches for any Mac hard disk or file server and supports a variety of additional programs, such as FullWrite, MacWrite II, Word 4.0, and Microsoft Works. Includes wildcard function and Search-Set feature to make it easier for users to locate hard-to-find information, and to let users retrieve lost data using a minimal amount of information. The Search-Set feature allows users to retrieve information from a variety of sources by saving predefined searches as a separate file. Move to Desktop feature lets the user load the file into any desktop application on the Mac. Microlytics, One Tobey Village Office Park, Pittsford, NY 14534; 716/248-9150. $25; $79.95 new.

Hard Disk Partition version 3.0 adds expandable partitions, on-the-fly encryption, and multiuser access control. FWB, 2040 Polk St., #215, San Francisco, CA 94109; 415/474-8055. $30; $79.95 new.

HyperDA version 1.2 lets users modify existing text fields, acts as an interactive HyperCard stack tool, and lets users designate a default stack to automatically open when HyperDA is accessed. Symmetry Corporation, 761 E. University, Mesa, AZ 85203; 800/624-2485. $15; $89 new.

Macintosh Pascal version 3.0 adds support for System 6.03 and networks. Runs on all Mac models and is compatible with MultiFinder. Improved network file support lets users print the program's output to a networked printer and launch the program from a server. Simplifies installation and allows users to print and save text or drawing windows. Symantec, 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600. $49 for educational users; $69 for noneducational users; $62.50 per unit new.

MacSmarts Professional version 3.0 and **MacSmarts** version 3.3 are compatible with SuperCard. MacSmarts Professional 3.0 can handle up to 4000 rules per knowledge

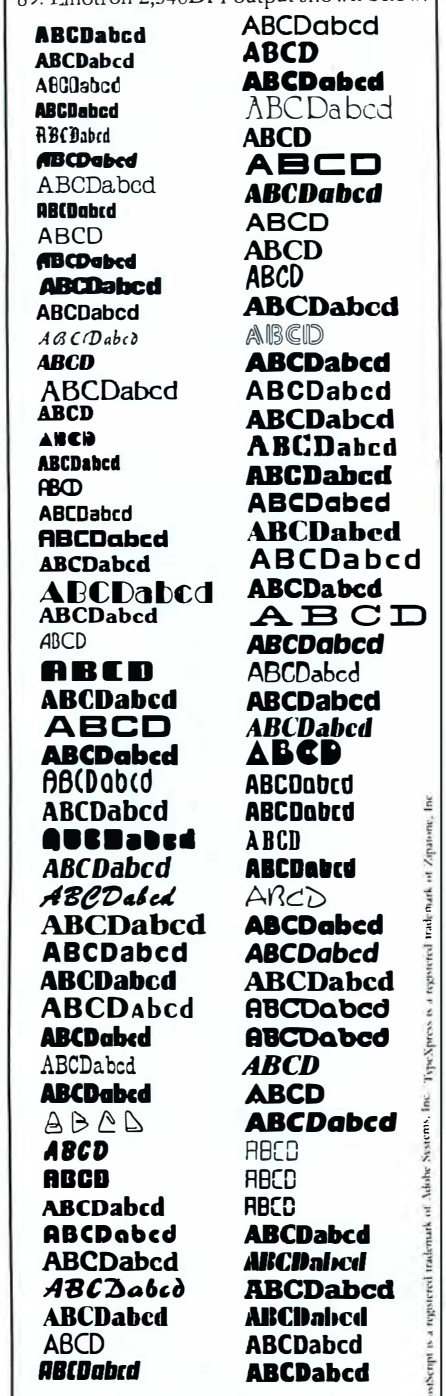
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base and 1000 examples per rule for creating expert systems. Includes a report generator for expanded advice in both text and graphics form and session reporting. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138; 617/492-0246. MacSmarts Professional free; $100 to upgrade from MacSmarts; $495 new. MacSmarts $50; $195 new.

MapMaker version 4.0 contains a tool palette with object-oriented color drawing tools for lines, arrows, rectangles, ovals, and editable polygons. Also includes interactive distance and latitude/longitude functions, is capable of drawing map sizes of up to 10 by 10 pages, and allows placement of map boundaries into individual layers, which can be displayed or hidden independently. Includes PostScript hairline line widths, and has expanded import/export capabilities for graphics and data. Select Micro Systems, 322 Underhill Ave., Yorktown Heights, NY 10598; 914/245-4670. Free if originally purchased after July 1, 1989; $75 if purchased before that date; $395 new.

Mathematica version 1.2 supports linear programming, differential equations, statistics, and concurrent processing. Also has a feature to select interactive 3-D viewpoint and supports Adobe Illustrator format. Wolfram Research, P.O. Box 6059, Champaign, IL 61821; 217/398-0700. $45; $495 new.

Minimum Requirements version 2.0 records financial transactions, generates reports, produces invoices, and tracks fixed assets. Includes cash-requirements scheduling feature. Spreadware, P.O. Box 4574, Hayward, CA 94540-4574; 415/794-4388. $7.95; $59 new.

PrintBar version 2.0 adds three volumes. Volume 1 includes Code 39; Volume 2 contains UPCA, UPCE, and EAN; Volume 3 is Interleaved 2 of 5. Supports Linotronic, LaserWriter, and ImageWriter printers. Bear Rock Software, 6069 Enterprise Dr., Placerville, CA 95667; 916/622-4640. $195 to upgrade to version 2.0; $49 to upgrade to version 1.2; $225 per volume; $495 for three-volume set new.

QuickPie version 2.0 has the ability to place clip art graphics into pie charts created with QuickPie. Comes with a custom clip art sampler, which contains an 8-bit color pizza, copper penny, and other images suitable for creation of pie charts. Has variable line thicknesses, three label-placement styles, independent font and style control over individual pie wedges, and horizontal or vertical 3-D effects in either tube or drop-shadow modes. Prophecy Software, 3650 Silverside Rd., #3, Wilmington, DE 19810; 302/994-1502. Free; $79.95 new.

Think C version 4.0 supports classes, methods, inheritance, and polymorphism. Class library provides the building blocks to implement a standard Macintosh interface. Compiles up to 48,000 lines per minute on a Mac II and has integrated language-sensitive text editor. Symantec Corporation, 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600. Free if originally purchased after July 1, 1989; $69 plus $5 s/h if purchased before; $249 new. M

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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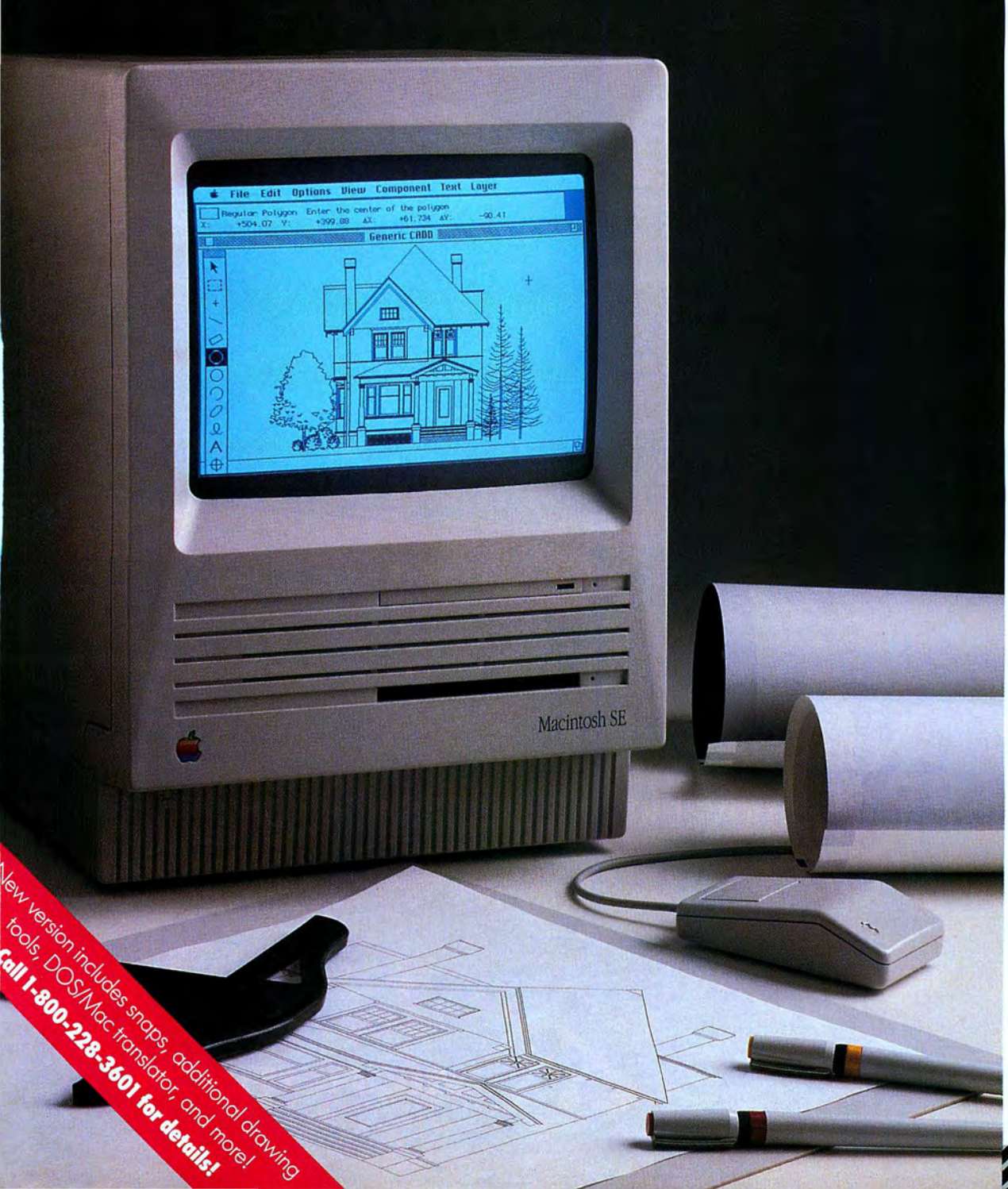
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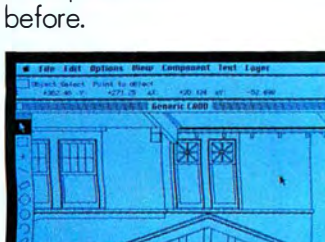
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1989 ANNUAL INDEX

by Erfert Fenton

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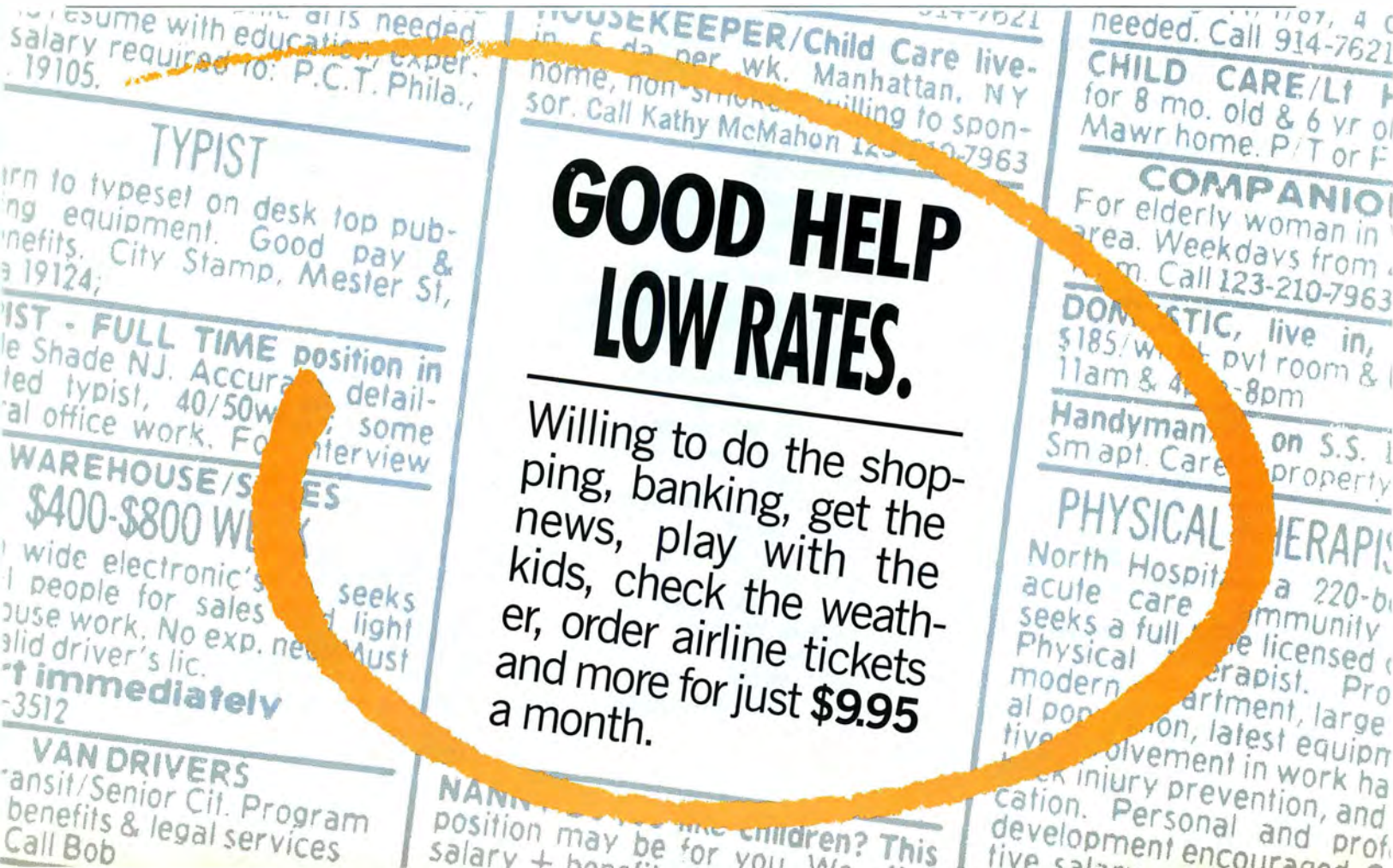
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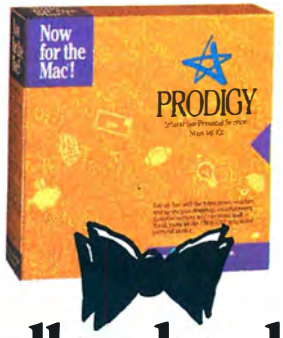
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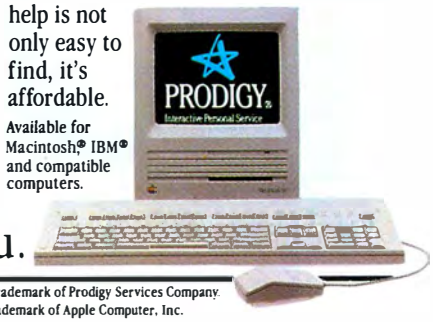
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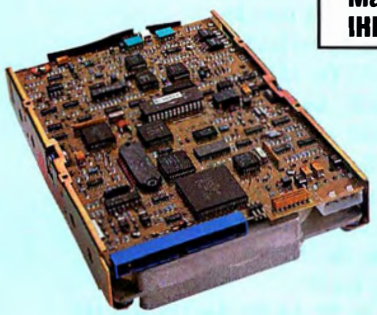
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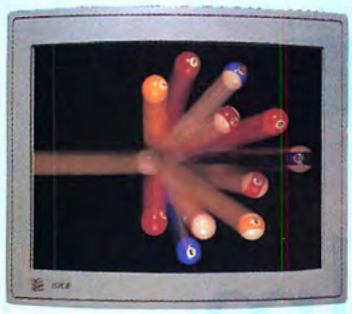
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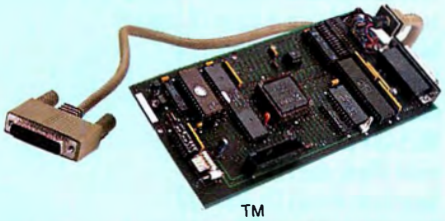
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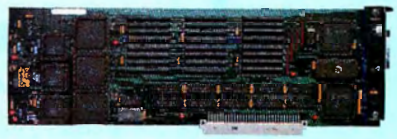
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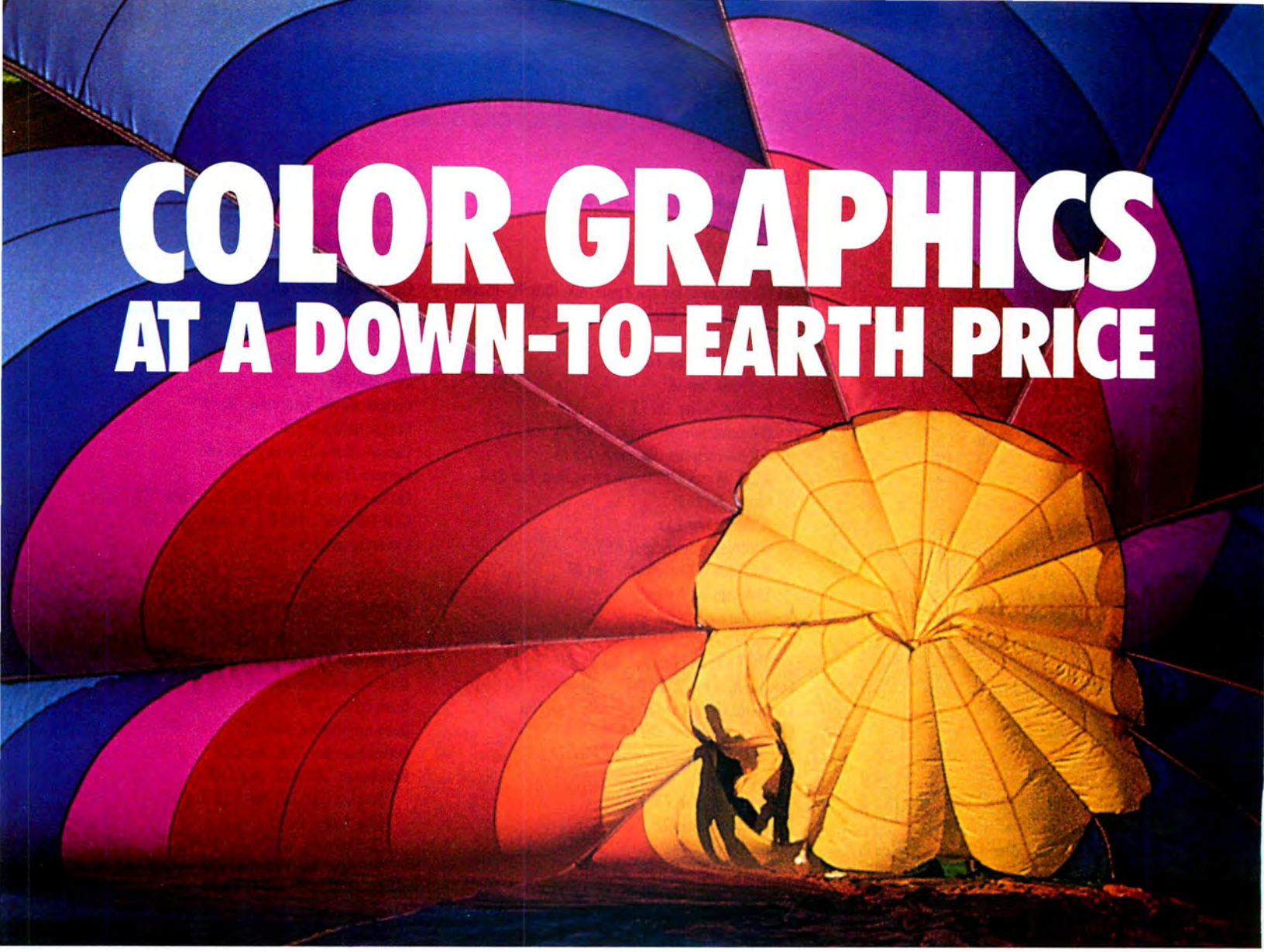
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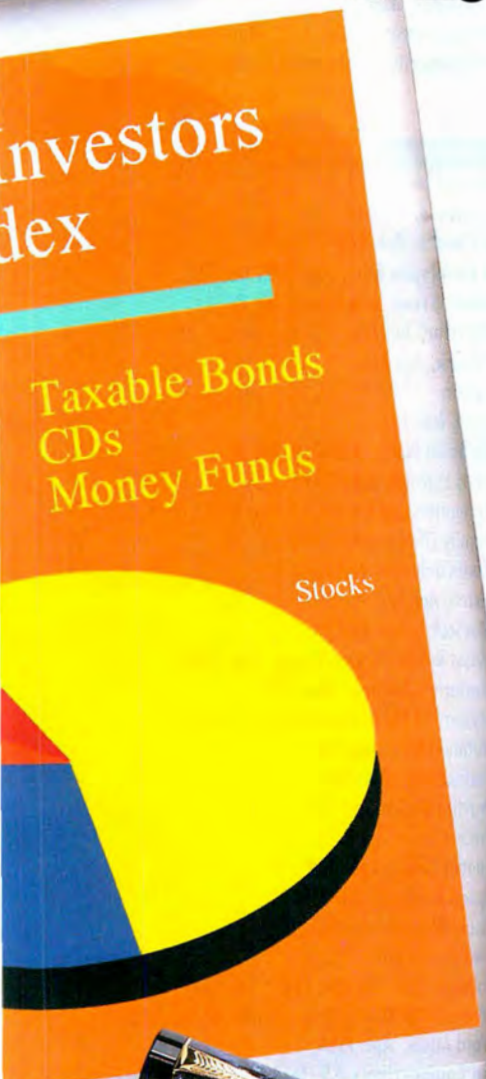
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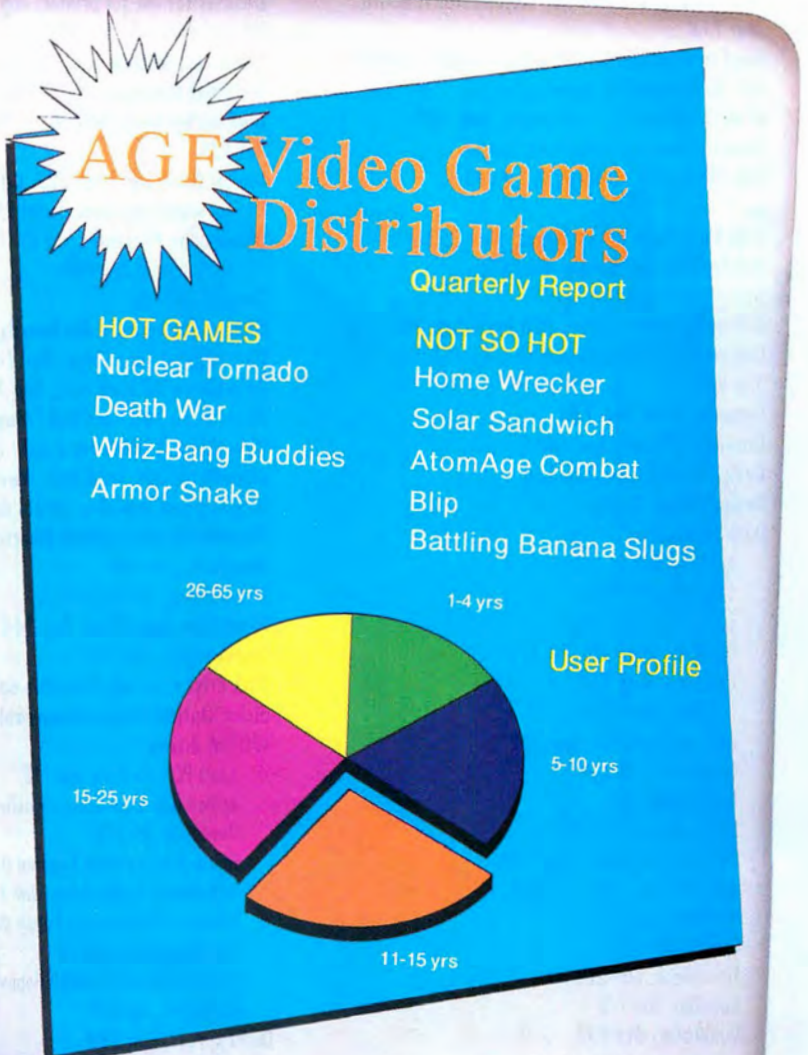


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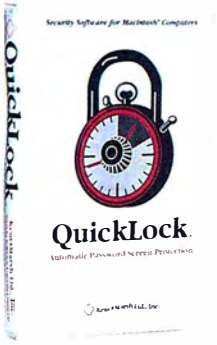
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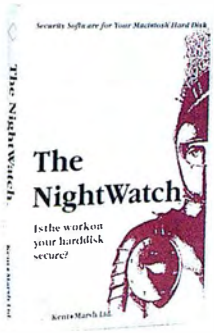
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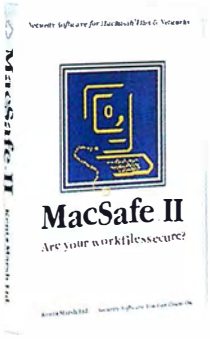
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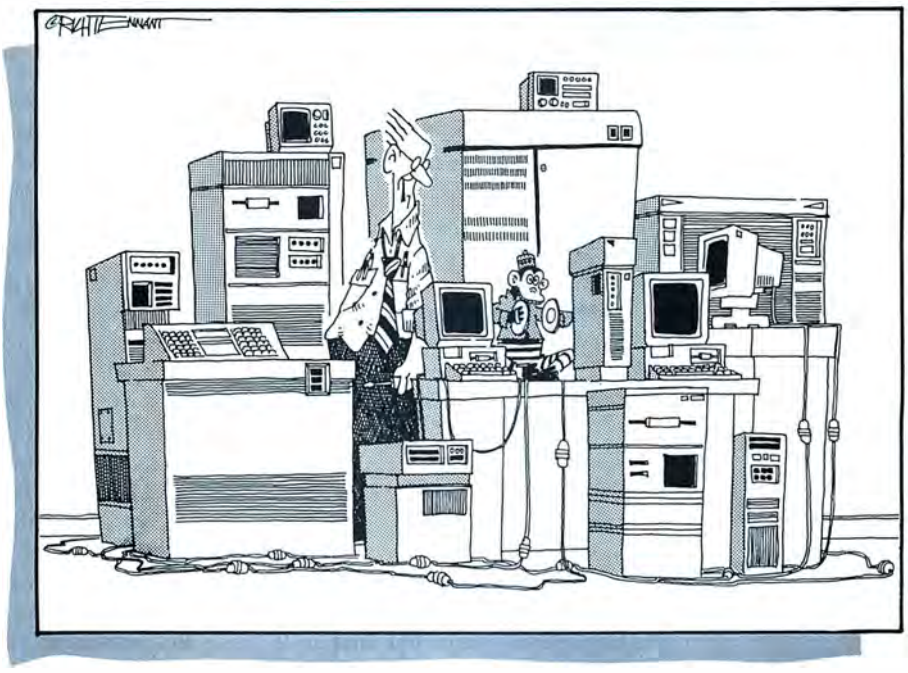
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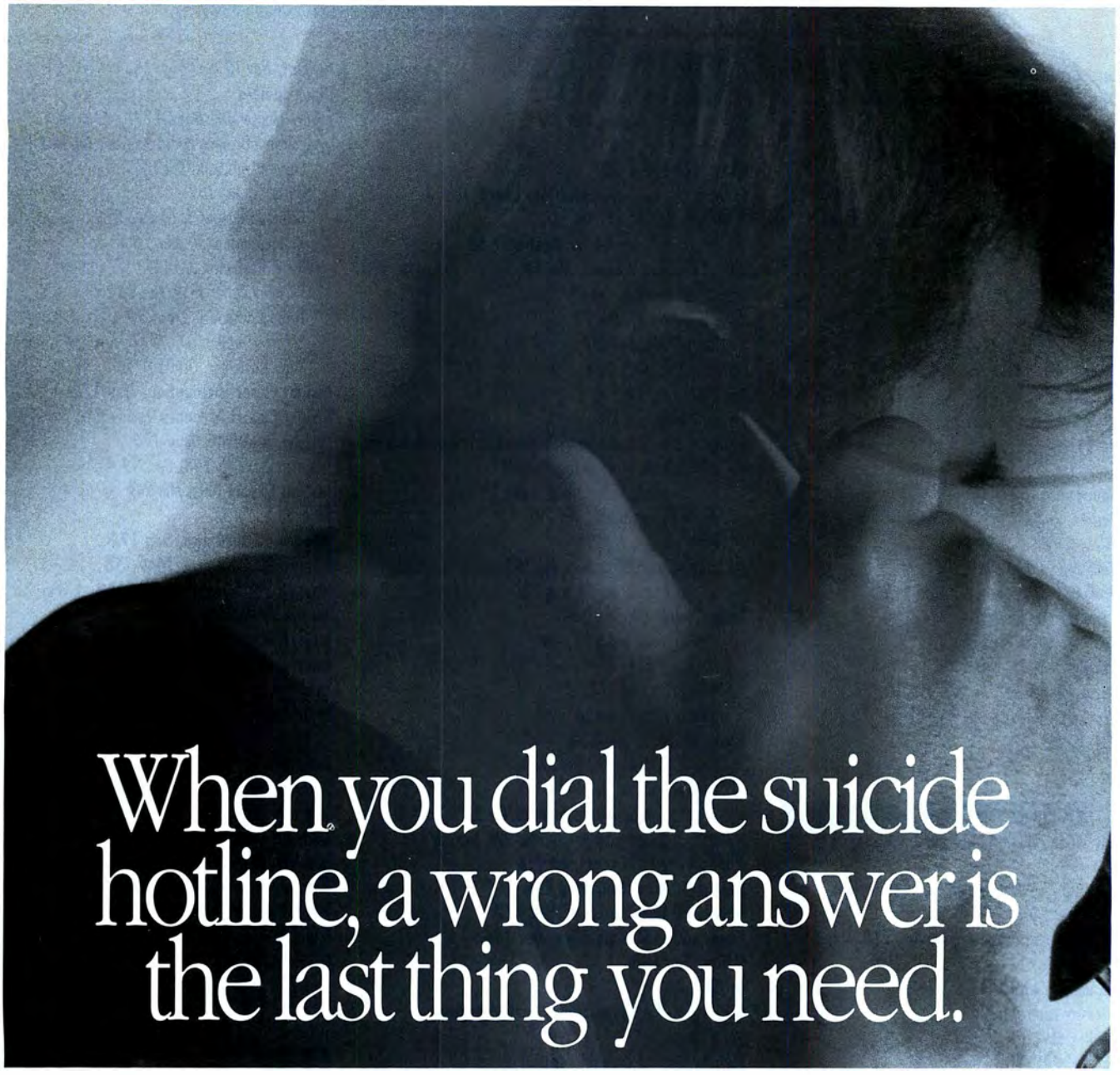
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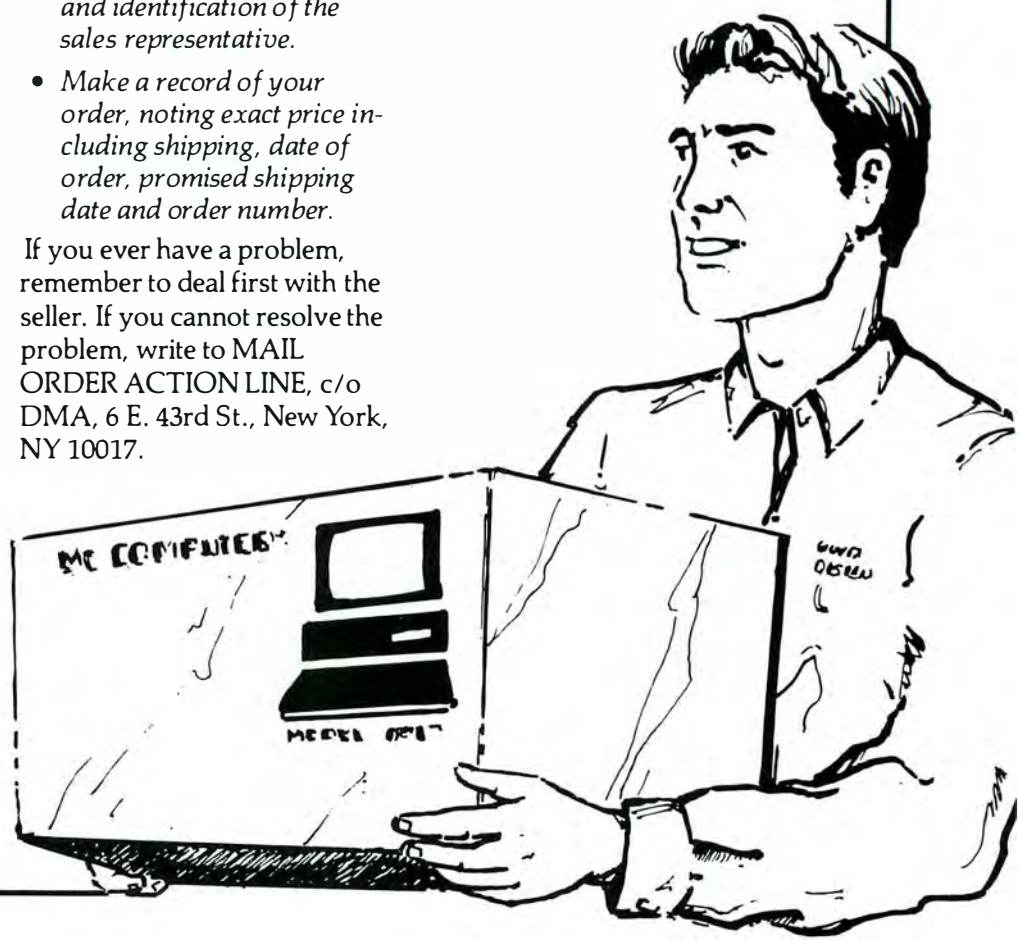
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WHERE TO BUY

This listing provides company addresses and phone numbers for products mentioned in this issue. Allow several weeks for responses to reader service card inquiries. Asterisks indicate vendors who prefer to be contacted directly.

Reader Service

A

701 **Abaton Quickstep** Abaton, a Division of Everex, 48431 Milmont Dr., Fremont, CA 94538; 415/683-2226, 800/444-5321.

702 **After Dark** Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709; 415/540-5536.

703 **Allegro Common Lisp** Franz, Inc., 1995 University Ave., Berkeley, CA 94704; 415/548-3600, 800/333-7260.

704 **A.M.E.** Casady & Greene, Inc., P.O. Box 223779, Carmel, CA 93922; 408/624-8716, 800/331-4321.

705 **AmPack, AmPack Plus** Softflair, Inc., 8753 Park View, Milwaukee, WI 53226; 414/797-4490.

706 **AntiToxin** Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; 818/991-6540.

707 **Anti-Virus Kit** 1st Aid Software, Inc., 42 Radnor Rd., Boston, MA 02135; 617/782-4676, 800/843-3497.

708 **AppleColor High-Resolution RGB Monitor, Apple Extended Keyboard, Apple Hard Disk 40SC, Apple High-Resolution Monochrome Monitor, Apple Standard Keyboard** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

Reader Service

713 **AppMaker** Bowers Development Corp., P.O. Box 9, Lincoln Center, MA 01773; 617/259-8428.

B

714 **Bernoulli Box** Iomega Corp., 1821 West 4000 South, Roy, UT 84067; 801/778-1000, 800/456-5522.

715 **BulletProof** Spectra Micro Development, P.O. Box 41795, Tucson, AZ 85717; 602/884-7402.

C

716 **Camouflage** usrEZ Software, Inc., 1206 E. Pike St., Seattle, WA 98122; 206/353-0181.

717 **CanOpener** Abbott Systems, Inc., 62 Mountain Rd., Pleasantville, NY 10570; 914/747-3116, 800/552-9157.

718 **Cause** Maxem Corp., ASU Research Park, 7855 S. River Pkwy., Tempe, AZ 85284; 602/491-2466.

719 **ColorBoard 264** RasterOps Corp., 10161 Bubb Rd., Cupertino, CA 95014; 408/562-4200.

720 **CompuServe Information Service** CompuServe, P.O. Box 20212, Columbus, OH 43220; 614/457-8600, 800/848-8199.

721 **Computers & Security** Elsevier Science Publishers, 655 Avenue of the Americas, JIC Dept., 3rd. Fl., New York, NY 10010; 212/633-3750.

722 **Connect Business Information Network** Connect, Inc., 10161 Bubb Rd., Cupertino, CA 95014; 408/973-0110, 800/262-2638.

Reader Service

723 **CrystalPrint Publisher** Qume Corp., 500 Yosemite Dr., Milpitas, CA 90035; 408/942-4000, 800/223-2479.

D

724 **DeltaGraph** DeltaPoint, Inc., 200 Heritage Harbor Rd., Ste. G, Monterey, CA 93940; 408/648-4000.

725 **DiskLock** Fifth Generation Systems, Inc., 11200 Industriplex Blvd., Baton Rouge, LA 70809; 504/291-7221, 800/225-2775.

726 **dScience** Spectra Blue, 7739 E. Broadway, #248, Tuscon, AZ 85710; 602/296-3899.

E

727 **Empower** Magna, 2540 N. First St., #302, San Jose, CA 95151; 408/433-5467.

728 **Eureka: The Solver** Borland International, P.O. Box 660005, Scotts Valley, CA 95066-0005; 408/438-8400, 800/331-0877.

729 **ExperAction** ExperTelligence, 5638 Hollister Ave., #302, Goleta, CA 93117; 805/967-1797.

730 **ExperCommon Lisp** ExperTelligence, 5638 Hollister Ave., #302, Goleta, CA 93117; 805/967-1797.

F

731 **Fields and Operators** Lascaux Graphics, 3220 Steuben Ave., Bronx, NY 10467; 212/654-7429.

732 **FileGuard Extended Edition** ASD Software, Inc., 4650 Arrow Hwy., Ste. G-21, Montclair, CA 91763; 714/624-2594.

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733 **4 Dimensional Hypercube** Lascaux Graphics, 3220 Steuben Ave., Bronx, NY 10467; 212/654-7429.

734 **Ft.Knox** Transfinite Systems Company, Inc., P.O. Box N, MIT Branch, Cambridge, MA 02139; 617/969-9570.

735 **f(z)** Lascaux Graphics, 3220 Steuben Ave., Bronx, NY 10467; 212/654-7429.

G

736 **GCC Business LaserPrinter, GCC Personal LaserPrinter** GCC Technologies, 580 Winter St., Waltham, MA 02154; 617/890-0880, 800/634-9737.

738 **Glockenspiel C++** Oasys, 230 Second Ave., Waltham, MA 02154; 617/890-7889.

H

739 **Handwriting Analyst** CIASA, 2017 Cedar St., Berkeley, CA 94709; 415/644-2771.

740 **Hard Disk DeadBolt** FWB, Inc., 2040 Polk St., #215, San Francisco, CA 94109; 415/474-8055.

741 **HMSL** Frog Peak Music, P.O. Box 9911, Oakland, CA 94613; 415/485-6867.

742 **Hoops Graphics System** Ithaca Software, 902 W. Seneca St., Ithaca, NY 14850; 607/273-3690.

743 **HyperCard** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

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I

744 **Igor** WaveMetrics, P.O. Box 2088, Lake Oswego, OR 97035; 503/635-8849.

745 **InfoGuard** Advanced Gravis Computer Technology Ltd., 7033 Antrim Ave., Burnaby, BC, Canada V5J 4M5; 604/434-7274, 800/663-8668.

J

746 **Jasmine DirectPrint** Jasmine Technologies, Inc., 1740 Army St., San Francisco, CA 94124; 415/282-1111.

K

747 **KaleidaGraph** Synergy Software, 2457 Perkiomen Ave., Reading, PA 19606; 215/779-0522, 800/876-8376.

748 **KeyLock** Viking Tech, Inc., P.O. Box 1661, Solana Beach, CA 92705; 619/481-9900, 800/955-5625.

L

749 **La Cie Panther PDX** La Cie, Ltd., 16285 S.W. 85th, #306, Tigard, OR 97224; 503/684-0143.

750 **LaserWriter IINT** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

751 **Liaison** Infosphere, Inc., 4730 S.W. Macadam Ave., Portland, OR 97201; 503/226-3620, 800/445-7085.

752 **LightningScan** Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563; 415/254-6581.

M

* **MacApp** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

753 **MacEnvelope Plus** Synex, 692 10th St., Brooklyn, New York 11215; 718/499-6293, 800/447-9639.

754 **MacInteriors** Microspot, 21060 Homestead Rd., #207, Cupertino, CA 95014; 408/739-0222, 800/622-7568.

* **Macintosh Allegro Common Lisp** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

755 **Macintosh Portable** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

* **Macintosh Programmer's Pascal** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

* **Macintosh Programmer's Workshop** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

* **Macintosh Programmer's Workshop C++** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

756 **Macintosh SE** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

757 **Macintosh IIcx** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

758 **Macintosh II 4bit Video Card** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

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761 **MacInvoice** Synex, 692 Tenth St., Brooklyn, NY 11215; 718/499-6293, 800/447-9639.

762 **MacKablit** Secure-It, 18 Maple Ct., East Longmeadow, MA 01028; 413/525-7039, 800/451-7592.

763 **MacLink Plus PC** DataViz, Inc., 35 Corporate Dr., Trumbull, CT 06611; 203/268-0030.

* **Mac Lock** Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789; 714/595-4838.

764 **MacLock** Verge Technologies, 510 Oak Grove Rd., Norfolk, VA 23505; 804/423-2042.

765 **MacPaint** Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/334-3535.

766 **MacPhonebook** Synex, 692 Tenth St., Brooklyn, NY 11215; 718/499-6293, 800/447-9639.

767 **MacSafe** Kent Marsh Ltd., 1200 Post Oak Blvd., #210, Houston, TX 77056; 713/623-8618, 800/325-3587.

768 **MacSaver** Checkmate Technology, Inc., 509 S. Rockford Dr., Tempe, AZ 85281; 602/966-5802, 800/325-7347.

769 **MacSpin** D² Software, P.O. Box 50052, Austin, TX 78763; 512/478-2393.

770 **MacSprint II** Orchid Technology, 45365 Northport Loop W, Fremont, CA 94538; 415/683-0373.

771 **MacStickers** International Computer Services, Inc., 300 Three First National Plaza, Chicago, IL 60602; 312/630-4895.

772 **Mac II FSS** FMJ Security Systems, 1984 Gladwick, Compton, CA 90220; 213/632-9751, 800/322-3365.

773 **Maple** Brooks/Cole Publishing Co., 511 Forest Lodge Rd., Pacific Grove, CA 93950; 408/373-0728, 800/354-9706.

774 **MathCAD** MathSoft, Inc., One Kendall Square, Cambridge, MA 02139; 617/577-1017, 800/628-4223.

775 **Mathematica** Wolfram Research, Inc., P.O. Box 6059, Champaign, IL 61821-9902; 217/398-0700, 800/441-6284.

776 **MathView Professional** Brain-Power, Inc., 30497 Canwood, #201, Agoura Hills, CA 91301; 818/707-1712, 800/345-0519.

777 **MatLab** The MathWorks, Inc., 21 Eliot St., South Natick, MA 01760; 508/653-1415.

778 **MCI Mail** MCI Mail, 1150 17th St. NW, #800, Washington, D.C. 20036; 202/293-4255, 800/444-6245.

779 **MetaCourier** Symbiotics, 875 Main St., Cambridge, MA 02139; 703/556-8756.

* **Microsoft Mail** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.

780 **Milo** Paracomp, Inc., 123 Townsend St., #310, San Francisco, CA 94107; 415/543-3848.

781 **MultiDisk** ALSoft, P.O. Box 927, Spring, TX 77383-0927; 713/353-4090.

782 **Mobius MultiScreen** Mobius Technologies, Inc., 6020 Adeline St., Oakland, CA 94608; 415/654-0556, 800/669-0556.

783 **Mum's the Word** Terrace Software, Box 1236, Cambridge, MA 02238; 617/491-4725.

784 **The Muzzle** Ergotron, Inc., 3450 Yankee Dr., #100, Eagan, MN 55420; 612/452-8135, 800/888-8458.

N

785 **NEC SilentWriter LC 890** NEC Information Systems, Inc., 1414 Massachusetts Ave., Boxborough, MA 01709; 508/264-8000.

786 **NetModem V2400** Shiva Corporation, 155 Second St., Cambridge, MA 02141; 617/864-8500, 800/458-3550.

787 **Nexpert Object** Neuron Data, 444 High St., Palo Alto, CA 94301; 415/321-4488.

788 **NightWatch** Kent Marsh Ltd., 1200 Post Oak Blvd., #210, Houston, TX 77056; 713/623-

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8618, 800/325-3587.

- **Object GrafPak** Invention Software, P.O. Box 3168, Ann Arbor, MI 48106; 313/478-9464.

789 **OmniPage** Caere Corp., 100 Cooper Ct., Los Gatos, CA 95030; 408/395-7000.

790 **Oz Guardian** Tri-Data Systems, Inc., 1450 Kifer Rd., Santa Clara, CA 94086-5306; 408/746-2900, 800/874-3282.

- **Packer** Bobbing Software, 67 Country Oaks Dr., Buda, TX 78610; 512/295-5045.
- **PackIt** Shareware, Harry Chesley, 1850 Union St., San Francisco, CA 94123.

791 **Padolock** Doss Industries, 1224 Mariposa St., San Francisco, CA 94107; 415/861-2223.

792 **Parameter Manager Plus** GenRad, Inc., 510 Cottonwood Dr., Milpitas, CA 95035; 408/432-1000, 800/443-6723.

793 **Passage** Passage Software, Inc., P.O. Box 8874, Ft. Collins, CO 80525; 303/490-1380.

794 **P/C Privacy** MCTel Inc., 5070 Parkside Ave., #1300, Philadelphia, PA 19131; 215/879-3819.

795 **PC Tools Deluxe** Central Point Software, Inc., 15220 Greenbrier Pkwy., #200, Beaverton, OR 97006; 503/690-8090.

796 **PowerMath II** Central Products Corp., 2211 Norfolk, #518, Houston, TX 77098; 713/529-1080.

797 **Prograph** TGS Systems, 1127 Barrington St., #19, Halifax, Nova Scotia, Canada B3H 2P8; 902/429-5642, 800/565-1978.

798 **Publish It** Timeworks, 444 Lake Cook Rd., Deerfield, IL 60015; 312/948-9200, 800/535-9497.

799 **Quicken** Intuit, 540 University Ave., Palo Alto, CA 94301; 415/322-0590, 800/624-8754.

800 **QuickLock** Kent Marsh Ltd., 1200 Post Oak Blvd., #210, Houston, TX 77056; 713/623-8618, 800/325-3587.

801 **Quintus Prolog/MacObject** Quintus Computer Systems, 1310 Villa St., Mountain View, CA 94041; 415/965-7700.

803 **Radius Accelerator 25, Radius DirectColor/24 Interface** Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131; 408/434-1010.

804 **Radius QuickColor Graphics Accelerator** Radius, Inc., 1710 Fortune Dr., San Jose, CA 95131; 408/434-1010.

805 **Read-It** Olduvai Corp., 7520 Red Rd., Ste. A, South Miami, FL 33143; 305/665-4665, 800/822-0772.

806 **R-Server** Solana Electronics, 7124 Convoy Ct., San Diego, CA 92111; 619/573-0801.

807 **SAM** Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600.

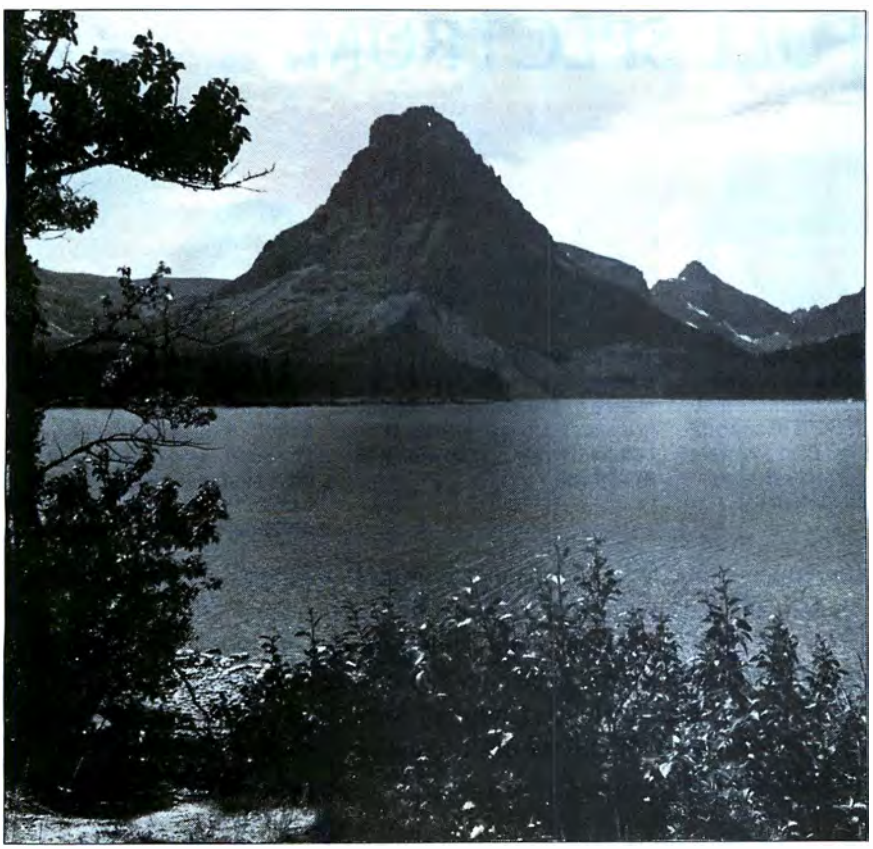
808 **ScanMan** Logitech, Inc., 6505 Kaiser Dr., Fremont, CA 94555; 800/231-7717.

- **Sentinel** SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086; 408/245-2202.

809 **Serius89 Developer** Serius Corp., 1981 East 4800 South,

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810 **Serius89 Programmer** Serius Corp., 1981 East 4800 South, Salt Lake City, UT 84117; 801/272-7788, 800/876-6847.

811 **Smalltalk-80** ParcPlace Systems, Inc., 1550 Plymouth St., Mountain View, CA 94043; 415/691-6700, 800/822-7880.

* **Smalltalk-80 0.4** APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

812 **Smalltalk/V Mac** Digitalk, Inc., 9841 Airport Blvd., Los Angeles, CA 90045; 213/645-1082, 213/922-8255.

813 **StuffIt** Aladdin Systems, Inc., 217 E. 86th St., #153, New York, NY 10028; 212/410-3080.

814 **SUM II** Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600.

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815 **SuperGlue II** Solutions International, 30 Commerce St., Williston, VT 05495; 802/865-9220.

* **SuperMac Spectrum/24 Video Graphics** SuperMac Technology, 485 Potrero Ave., Sunnyvale, CA 94086; 408/245-2202.

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816 **TeleScrambler I** Metme Corp., 1 Pensacola Plaza, #222, 125 W. Romana St., Pensacola, FL 32501; 904/434-9964.

817 **TextPert** CTA, Inc., 866 Second Ave., New York, NY 10017; 212/759-6201.

818 **Theorist** Prescience, 814 Castro St., San Francisco, CA 94114; 415/282-5864.

819 **Think C, Think Pascal** Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600.

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821 **TK Solver Plus** Universal Technical Systems, Inc., 1220 Rock St., Rockford, IL 61101; 815/963-2220, 800/435-7887.

822 **TML Pascal** TML Systems, Inc., 8837-B Goodbys Executive Dr., Jacksonville, FL 32217; 904/636-8592.

823 **TraqNet Controller/InfoKey** LeeMah DataCom, 3948 Trust Way, Hayward, CA 94545; 415/786-0790, 800/992-0020, 800/924-9369.

V

824 **VIP** Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; 818/991-6540.

825 **Virex** HJC Software, Inc., P.O. Box 51816, Durham, NC 27717; 919/490-1277.

W

826 **WorksPlus Command** Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604; 415/769-7701, 800/233-6851.

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827 **WorksPlus Spell** Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604; 415/769-7701, 800/233-6851.

828 **WriteMove** GCC Technologies, 580 Winter St., Waltham, MA 02154; 617/890-0880, 800/634-9737. M

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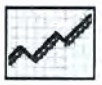
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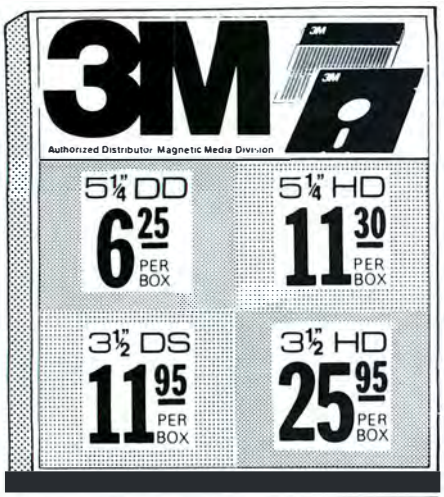
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THE FTC MAIL ORDER RULES STATE:

1. The Seller must ship your order within 30 days of receiving it, unless clearly stated otherwise in the advertisement.

2. If the Seller cannot ship your order when promised, you must be notified in writing prior to the promised date. The notice must specify a new date if available, and must give you the opportunity to (a) cancel with a refund; (b) agree to a specified delayed shipping date; or (c) agree to an indefinite delay.

3. The Seller's notice must include a postage-paid reply envelope or card so that you may indicate your preference. If you do not respond, the Seller may assume you agree to the delay.

4. Even if you agree to an indefinite delay, you retain the right to cancel at any time before the merchandise has been shipped.

5. If you cancel an order that has been paid by check or money order, the Seller is obligated to mail your refund within seven business days. If you paid by credit card, the Seller must credit your account within one billing cycle following receipt of your cancellation. Store credits or vouchers are not acceptable in place of a refund.

6. If the item you order is unavailable, the Seller may not send you substitute merchandise without your consent.

DO'S AND DON'TS

By mail:

- Compare prices, including sales tax and shipping fees, before you order. Your purchase may be exempt from sales tax—check your state laws on collection regulations. Handling, packing, and shipping fees are legal and most states tax these services.
- State the precise specifications of the merchandise, such as model, make, size, component parts, etc.
- Confirm the price and expected delivery date as advertised.
- State on your order whether you will accept substitute merchandise if the item you specified is unavailable. If you won't accept a substitute, state that your payment should be returned.
- Record of payment is essential if a problem arises, so do not send cash.
- Keep copies of your order and all associated correspondence. Your records should include the company's name, address, and phone number; a description of the merchandise; your canceled check or money-order carbon; the date you mailed the order; and any sales slips and shipping receipts.
- Do not insure your order. It is the Seller's responsibility to make sure you receive your merchandise.

By phone:

- Note the name of the person who takes your order, and the time and date of your conversation.
- Make a record of your order, the price, promised availability, and the expected components.
- Save all correspondence, including your canceled check or money-order carbon and any written confirmation sent by the Seller.

Questions to ask:

- Does the advertised merchandise include all necessary parts and accessories? Are they made by the same manufacturer? Is the version number or model number the same? Is the product compatible with the hardware/software you intend to use it with?
- Can your order be shipped immediately? If not, when will it be available for shipping?
- Has the advertised price increased?
- What warranties does the merchandise carry? Who provides the service?
- What is the Seller's return policy? Exchange or repair? The refund policy?
- If a problem arises, with whom should you correspond?

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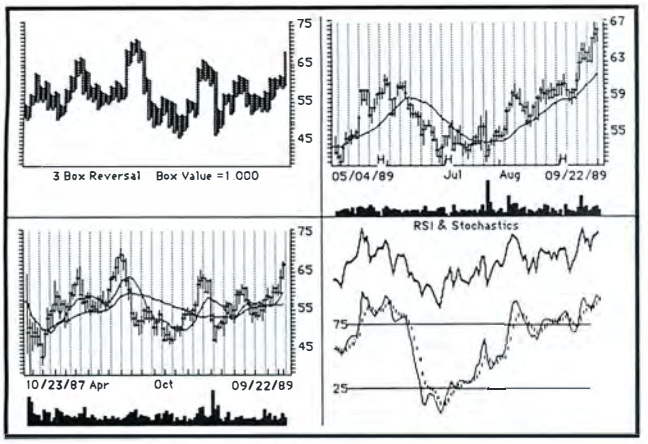
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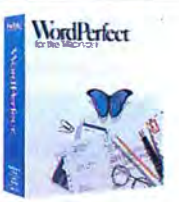
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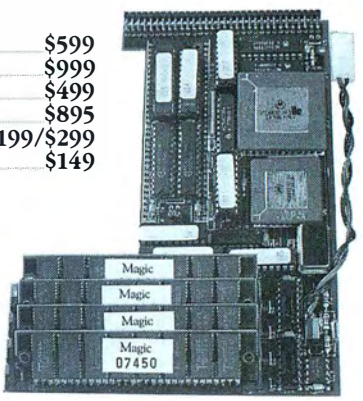
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Cutting Edge 20 *65ms*	$529.	**$419.**
MacBEST 20 *32ms*	$499.	**$429.**
30 Megabyte		
Caché Systems 30 *28ms*	$559.	**$489.**
CMS Enhancements 30 *32ms*	$589.	**$489.**
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Industry leading Quantum quality, dependability and fast access speeds at affordable prices. Backed by our *Two Year Warranty*, all Quantum drives come complete with cables and software.

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CMS Enhancements 45 *32ms*	$649.	**$589.**
Cutting Edge 47 *30ms*	$649.	**$539.**
Quantum 40 *19ms* (2 Yr. Warranty)	$699.	**$569.**
60 Megabyte		
Caché Systems 60 *28ms*	$729.	**$579.**
CMS Enhancements 60 *40ms*	$749.	**$649.**
Cutting Edge 60 *28ms*	$699.	**$599.**
80 Megabyte		
Caché Systems 80 *28ms*	$849.	**$679.**
CMS Enhancement 81 *28ms*	$899.	**$779.**
CMS Enhancement 90 *18ms*	$1,199.	**$1,049.**
Cutting Edge 85 *28ms*	$725.	**$699.**
Quantum 80 *19ms* (2 Yr. Warranty)	$949.	**$799.**
100-180 Megabyte		
Caché Systems 150 *16ms*	$1,499.	**$1,299.**
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CMS Enhancements 170 *18ms*	$1,799.	**$1,549.**
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Imprimis - MacWren Runner 320 *10.7ms*	$2,999.	**$2,649.**
Imprimis - MacWren 600 *16ms*	$3,399.	**$2,799.**
CMS Enhancements PD 300 *16ms*	$2,549.	**$2,395.**
CMS Enhancements PD 600 *16ms*	$3,699.	**$3,499.**

SE, SE30 & IIcx, IIci Internals

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Caché Systems 30 *28ms*	$425.	**$375.**
CMS Enhancements Pro 30 *38ms*	$479.	**$399.**
Cutting Edge 32 *30ms*	$479.	**$395.**
40 Megabyte		
Caché Systems 45 *28ms*	$499.	**$449.**
CMS Enhancements Pro 45 *32ms*	$569.	**$469.**
Cutting Edge 47 *30ms*	$529.	**$444.**
Quantum 40 *19ms* (2 Yr. Warranty)	$599.	**$469.**
80 Megabyte		
Quantum 80 *19ms* (2 Yr. Warranty)	$889.	**$699.**
100 Megabyte		
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CMS Enhancements Pro 45 *32ms*	$569.	**$469.**
Cutting Edge 47 *30ms*	$529.	**$444.**
Quantum 40 *19ms* (2 Yr. Warranty)	$599.	**$469.**
60 Megabyte		
Caché Systems 60 *28ms*	$639.	**$499.**
CMS Enhancements Pro 60 *40ms*	$649.	**$579.**
Cutting Edge 60 *28ms*	$679.	**$489.**
80 Megabyte		
Caché Systems 80 *28ms*	$729.	**$575.**
CMS Enhancements Pro 80 *28ms*	$749.	**$669.**
Cutting Edge 80 *28ms*	$689.	**$599.**
Quantum 80 *19ms* (2 Yr. Warranty)	$889.	**$699.**
100-170 Megabyte		
Caché Systems 150 *16ms*	$1,429.	**$1,199.**
CMS Enhancements PI 170 *16ms*	$1,699.	**$1,499.**
Quantum 105 *19ms* (2 Yr. Warranty)	$999.	**$799.**
300-600 Megabyte		
CMS Enhancements PI 300 *16ms*	$2,399.	**$2,195.**
Imprimis - MacWren 300 *16ms*	$2,349.	**$1,999.**
Imprimis - MacWren Runner 320 *10.7ms*	$2,649.	**$2,499.**
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Irwin 40 Meg Tape	$1,100.	**$949.**
Irwin 80 Meg Tape	$1,499.	**$1,149.**
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(Will fit *Any* 44 Removable Drive)	$119.	**$94.**

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Hewlett Packard		
DeskWriter	$999.	**$849.**
Ricoh		
Ricoh PostScript Laser Printer	$3,399.	**$3,199.**
Qume		
Crystal Print Publisher	$3,299.	**$2,949.**
ScriptTEN Postscript Printer	$3,499.	**$2,999.**

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E-Machines Z-21 SE	$1,999.	**$1,789.**
E-Machines Z-21 SE30/II	$2,099.	**$1,879.**
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Accelerator Boards

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MaraThon 020 MSE 4 (1 Meg/Math Chip)	$999.	**$884.**
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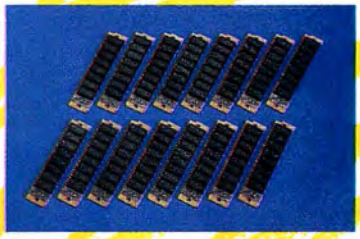
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POWERDrive 40/I	Quantum	19ms	$449
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Display ads are sold by column inches (2″ minimum). Standard red is available as a second color. Text-only listings are available for a minimum of three issues at $399 per issue $1197 total).

For more information, space closings, and material deadlines, please call toll-free 800/888-8622.

Instant Link: Macintosh Products, Manufacturers, Services

The Macworld Catalog
501 Second Street
San Francisco, CA 94107
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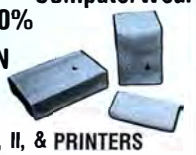
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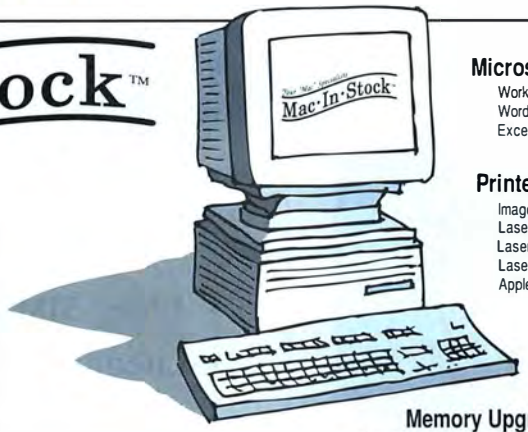
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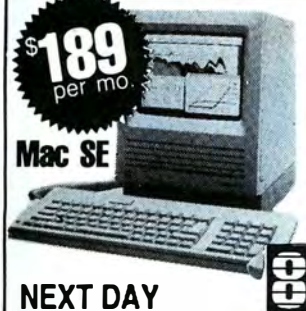
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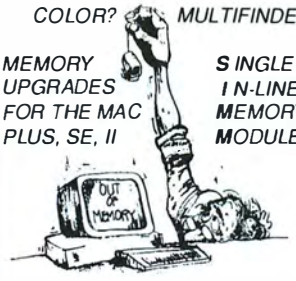
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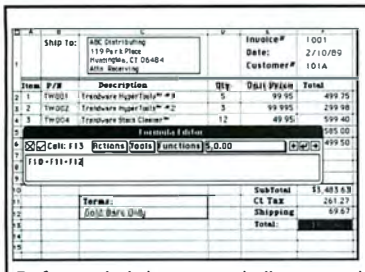
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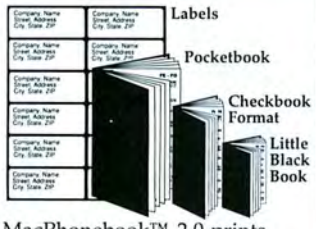
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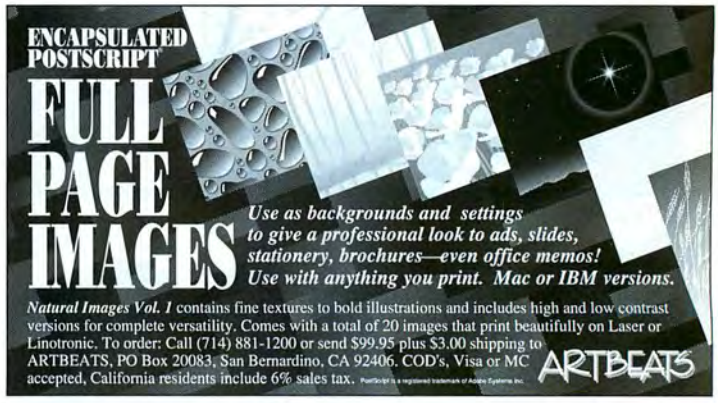
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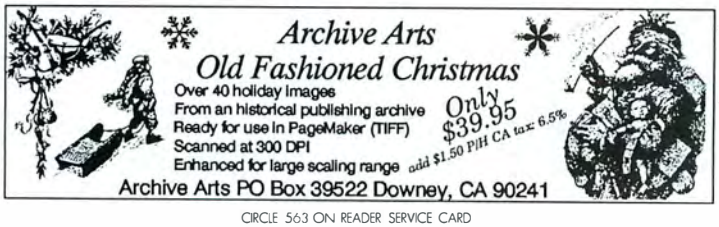
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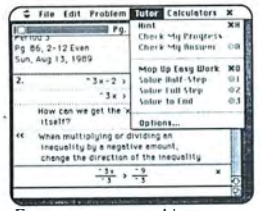
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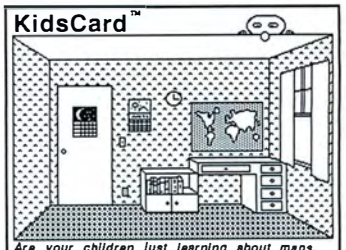
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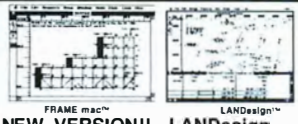
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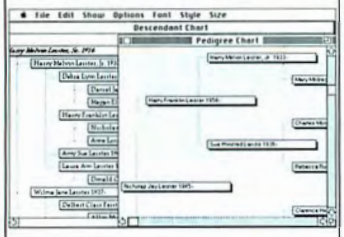
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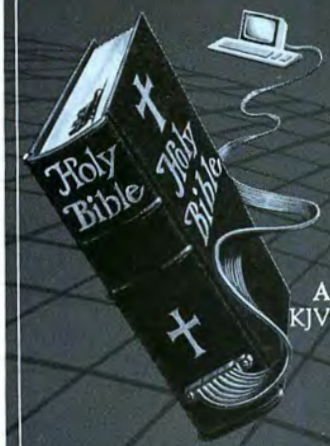
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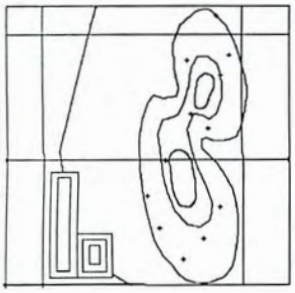
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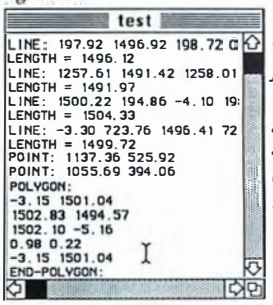
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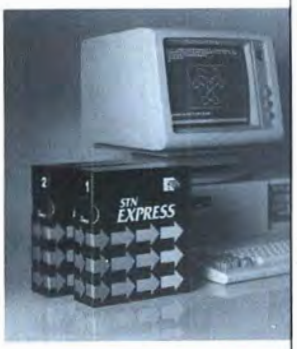
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BEST-SELLERS

BUSINESS SOFTWARE

Months on chart	Last month	This month		
56	1	1	**Microsoft Word**	*Microsoft*
47	2	2	**Microsoft Excel**	*Microsoft*
35	3	3	**Microsoft Works**	*Microsoft*
43	4	4	**Aldus PageMaker**	*Aldus*
32	5	5	**MacWrite**	*Claris*
44	—	6	**MacDraw**	*Claris*
16	9	7	**WordPerfect for the Macintosh**	*WordPerfect*
9	7	8	**Aldus FreeHand**	*Aldus*
2	8	9	**Wingz**	*Informix*
11	6	10	**QuarkXPress**	*Quark*

EDUCATION SOFTWARE

10	2	1	**Where in the World Is Carmen Sandiego?**	*Brøderbund*
39	3	2	**Math Blaster**	*Davidson & Associates*
23	1	3	**Reader Rabbit**	*The Learning Company*
2	4	4	**Math Rabbit**	*The Learning Company*
35	—	5	**Typing Tutor IV**	*Simon & Schuster Computer Software*

ENTERTAINMENT SOFTWARE

39	1	1	**MacGolf**	*XOR/PCAI*
35	3	2	**Dark Castle**	*Silicon Beach Software*
2	—	3	**SimCity**	*Maxis Software*
18	—	4	**Falcon**	*Spectrum HoloByte*
7	4	5	**Crystal Quest**	*Casady & Greene*

NETWORK/DATA COMMUNICATIONS

35	1	1	**TOPS**	*TOPS*
31	2	2	**AppleShare**	*Apple Computer*
5	4	3	**Netware for the Macintosh**	*Novell*
38	5	4	**LocalTalk**	*Apple Computer*
5	—	5	**Red Ryder**	*FreeSoft*

HARD DISKS*

16	1	1	**MacStack SD20**	*CMS Enhancements*
30	3	2	**Apple Hard Disk 20SC**	*Apple Computer*
7	—	3	**MacStack SD30**	*CMS Enhancements*
1	—	4	**Rodime 40 Plus External**	*Rodime*
1	—	5	**Cutting Edge 20MB**	*Cutting Edge*

ADD-IN BOARDS/MEMORY

25	1	1	**Radius Accelerator**	*Radius*
13	2	2	**Radius Interface Display**	*Radius*
25	3	3	**Apple 2MB Memory Expansion Kit**	*Apple Computer*
21	4	4	**Apple 1MB Memory Expansion Kit**	*Apple Computer*
15	—	5	**Macintosh II Video Card**	*Apple Computer*

PRODUCT WATCH

Recent or forthcoming products of particular interest.

ColorSpace IIi *Mass Microsystems* Full-motion video board for Multisync monitors

QuickCAD Graphics Engine *Radius* RISC-based accelerator

Spectrum/24 Series III *SuperMac Technology* Graphics display board and accelerator

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during September 1989.

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MacUser Magazine, May 1989

"Readers' Choice"
MACazine, January 1989

"Golden Gavel Award"
MacGuide, Winter 1988



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	Copy & paste large area	*Search for a word*	*Spell check document*	*Change indents & double spacing*	*Undo ruler changes*
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MacWrite II	45.9 sec.	40.2 sec.	33.6 sec.	44.7 sec.	24.7 sec.
MS Works 2.0	1 min. 50.8 sec.	35.7 sec.	5 min. 13.4 sec.	2 min. 24.1 sec.	1 min. 14.5 sec.
MS Word 4.0	21.6 sec.	11.0 sec.	3 min. 55.1 sec.	39.4 sec.	25.8 sec.

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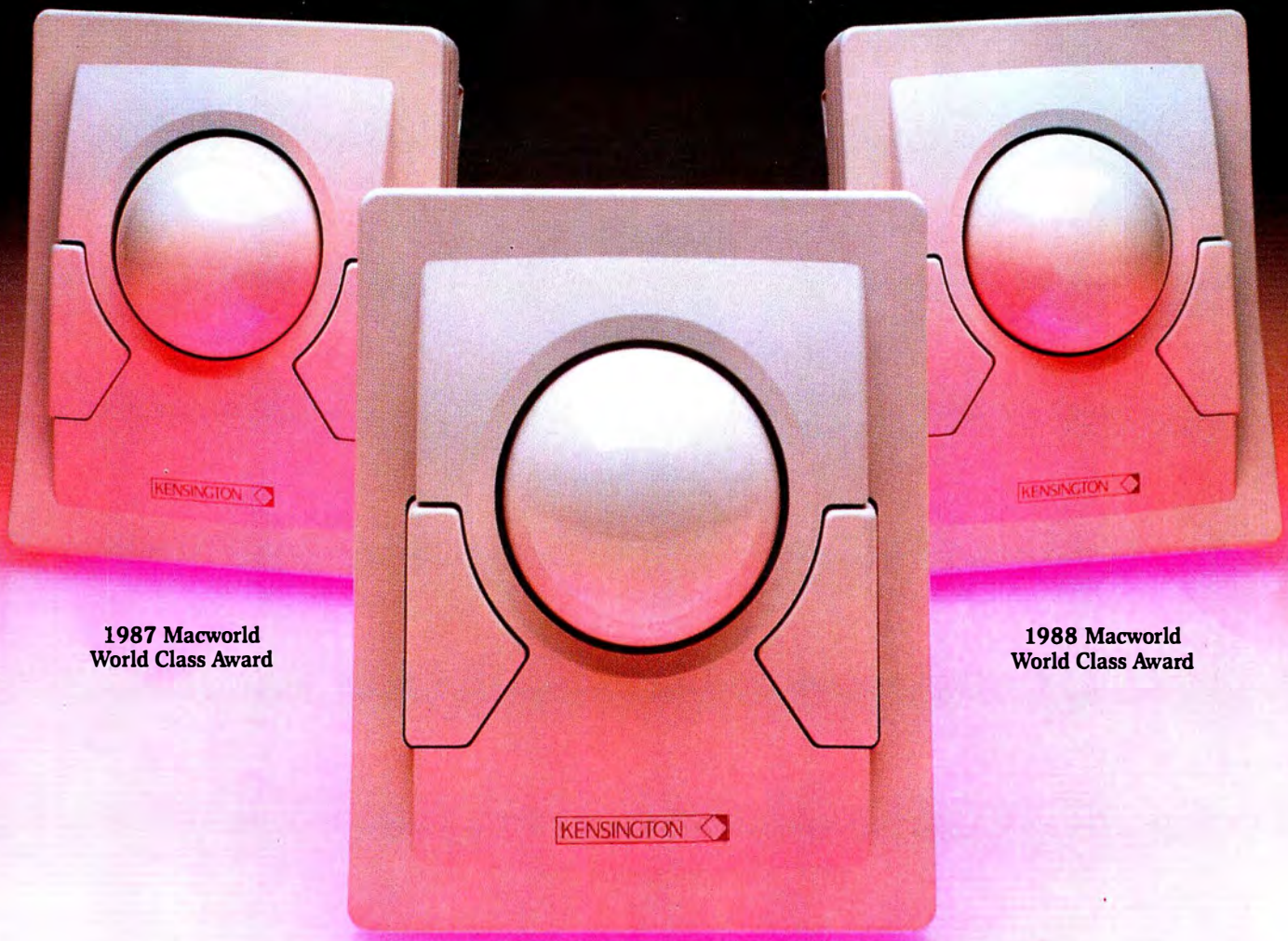
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