Why Is This Man Smiling?

APPLE'S JEAN-LOUIS GASSÉE
SEE PAGE 124

1989 WINNERS
Computer Graphics on the Mac

8 DRAW PROGRAMS
Which One to Buy

MAKING THE BEST TABLES
A Step-by-Step Guide

12 COLOR MONITORS
Lab Testing for Image Quality
90% of Macintosh spreadsheet users have been working on this program.
Sohave we. Introducing Microsoft Excel 2.2.

In 1985, not long after the Macintosh veiled, Microsoft Excel became the compelling reason to buy one. Within minutes, it became a standard Macintosh. Before we knew it, a full 9 Macintosh spreadsheet users were swarming by it. Not surprisingly, they still are.

But, of course, we weren't satisfied to leave well enough alone—and Excel version 2.2 has come to the scene. In a big way.

In mathematical terms, 2.2 is greater than 2.1 in technical terms, your spreadsheets are limited to 1MB of memory—version 2.0 could handle the most of even 8meg machines, which translates into spreadsheets of outrageous proportions.

Equally outrageous: 40% faster calculations—thanks to advanced intelligent recalc.

As for presentation? Version 2.2 also lets you highlight data in ways well worth highlighting: You can pick up to 256 different fonts per sheet, including up to six styles and eight colors. You can change row height. You can shade. And basically pack your documents with more visual punch than ever before.

Microsoft Excel version 2.2. Another improvement designed to make Mac enthusiasts even more enthusiastic.

Something 90% of you are already used to. And you other 10% easily can be.

Microsoft

Making it all make sense.
Apple previews the Mac's latest system software, due sometime next year. To sample System 7.6's major revisions—everything from outline fonts to virtual memory—see page 124. (Photo by Paul Franz-Moore.)

**DEPARTMENTS**

- **How to Contact Macworld** ........................................... 10
  Reprints, subscriptions, *Macworld* in microform, editorial contacts.
- **Commentary/Jerry Borrell** ........................................... 19
  A wish list for the Macintosh of the 1990s.
- **Letters** ........................................................................ 27
- **Art Beat** ....................................................................... 39
  By Deborah Branscum/The artists and techniques behind selected illustrations.
- **The Iconoclast** ............................................................ 43
  By Steven Levy/A growing movement is using computers to empower the powerless.
- **Conspicuous Consumer** ................................................ 57
  By Deborah Branscum/The pleasures and pitfalls of buying vintage Macs.
- **State of the Mac** ........................................................... 73
  By Thom Hogan/Even the best presentation programs represent compromise.
- **Verbatim** ..................................................................... 81
  SuperMac's Steve Edelman on Apple, competition, and creating business.
- **New Products** ............................................................. 207
  A quick look at new Macintosh hardware, software, and accessories.
- **HOW TO/Quick Tips** .................................................... 227
  By Lon Poole/Illegible screen fonts, fractions in FileMaker, printers abroad, and more.
- **HOW TO/Getting Started** ............................................ 233
  By Jim Heid/Learn how to diagnose, fix, and even prevent some common Mac ailments.
- **HOW TO/Insights on ReadySetGo 4.5** ......................... 241
  By Robert C. Eckhardt/Tips for enhancing your desktop-publishing prowess.
- **Updates** ....................................................................... 249
  The latest software upgrade news.
- **Where to Buy** .............................................................. 253
  Contact information for products in this issue.
- **Best-Sellers** ............................................................... 284

**NEWS**

- **Mac Bulletin** ............................................................... 15
  Late-breaking news.
- **Macworld News** .......................................................... 99
FEATURES

Here Comes System 7.0 ...................................... 124
By Lou Poole/Preview next year's overhaul of the Mac's system software.

Macintosh Masterpieces ...................................... 132
By Joe Matazzoni/What's the state of Mac art? The winners of the second annual
Macintosh Masters art contest tell the story.

Draw, Pardner ..................................................... 140
By Steve McKinstry/Object-oriented draw programs are more responsive and accurate
than ever. Find out which is the fastest draw.

Screen Tests ....................................................... 148
By Adrian Mello/Which color monitors are the brightest stars? Macworld tests 12 color
display systems.

Best Table in the House ...................................... 157
By Steve McKinstry/Learn how to take the frustration out of creating desktop-published tables—
just follow these step-by-step lessons.

REVIEWS

SuperPaint 2.0 .................................................. 168
New version adds AutoTrace, bezier curves, airbrush, and more.

Agfa Compugraphic P3400PS .............................. 170
300-dpi PostScript printer.

The Art Importer 1.0 ........................................ 172
Font creation for EPS and PICT artwork.

Intersect CDR-77 ............................................. 174
CD ROM reader.

Liaison 2.0 ..................................................... 176
Network-bridge and modem-access software.

McMax 2.0 ..................................................... 179
Programmable relational database.

NumberMaze 1.0 .............................................. 181
Math Education for children.

Fastat 1.0 ...................................................... 185
General-purpose statistics program.

NetWare for the Mac 1.0 .................................. 188
Mac-PC network support.

Smalltalk/V Mac 1.0 and Objectworks
for Smalltalk-80 2.3 ........................................ 190
Smalltalk programming languages.

The Prolit Center 1.0 ...................................... 194
Business planning and projection.

SmartScrap & The Clipper 2.0 ......................... 197
DA Scrapbook replacement.

OvalTune 1.0 .................................................. 199
Graphics and music performance software.

Window Shopping ........................................... 203
MacProject II 2.0, MFLauncher II 1.0, HFS
Backup 3.0
Put the NFL at your fingertips.

Hands-on pro football excitement is as close as your keyboard with NFL Challenge from XOR. This exciting, action-packed computer game gives you updateable rosters of all 28 NFL teams, offensive and defensive playbooks, and true-to-life realism with penalties, injuries, substitutions, and more!

Operating on the IBM PC, PC-XT, PC-AT, and their compatibles as well as the Apple Macintosh, NFL Challenge puts you at the heart of the action as you select the starting lineups, drive downfield against the clock, and go head-to-head against the league's most innovative offenses and formidable defenses.

Kick off your home season with this software classic now at your local computer store. Or call 1-800-NFL-CHALLENGE TOLL FREE. Be sure to check out PRO Challenge™, Basketball Challenge™, Oligopoly™, and Bermuda Square™, examples of some other First Class Software from XOR.

MacGolf Classic

A premium edition of the best selling Macintosh game in the world.

MacGolf Classic puts you into a full perspective 3-D simulation of realistic golf action. You match your skills against fairways, roughs, sand traps, water hazards and trees.

MacGolf's two courses are together with the four MacCourses™ for a total of 108 holes, all in vivid full screen color on the Macintosh II.

MacGolf Classic gives you a player's eye view and an aerial overview of each hole with close up options. You have complete control of your position, ball placement, ball speed and direction, and selection of all 14 clubs. Spectacular digitized graphics and sounds add to the excitement.

MacGolf Classic is so close to the real thing it will improve your golf game. Every challenge should be this spectacular.
We found a measure they could both agree on.

Up on the hill it looked like another split along party lines. Both Macintosh and PC users fought for access to the same information. Until a TOPS network brought them together in bipartisan agreement, that is.

Maybe that's why TOPS has been voted the de facto standard for easy Mac-to-PC connectivity by some 600,000 users. All you have to do is install TOPS software in each Macintosh and PC on the network, add a network card to each PC, and you've got a quorum.

A polished diplomat in any arena, TOPS easily trades data from Lotus 1-2-3 to Excel, Microsoft Word PC to Word Mac and most other Mac and PC applications.

And if you're looking to discuss the issues with other networks and systems, such as Novell, AppleShare, and Sun NFS, TOPS provides the perfect forum.

No wonder, when it comes to making connections, TOPS is the people's choice. Call the TOPS Division of Sun Microsystems at 1-800-445-TOPS, ext. 307.

---

TOPS Tech Specs
- TOPS supports AppleTalk and FlashTalk running on twisted-pair cabling (telephone wire), and EtherTalk on thick or thin Ethernet cabling.
- All IBM PCs, PS/2 Models 25 or 30, or compatibles require TOPS FlashCard. 3Com EtherLink II or Western Digital EtherCard Plus. PS/2 Models 50 through 80, or compatibles require 3Com EtherLink/MC card.
- TOPS can be configured as a distributed, dedicated, or combination server network.

When you need connections.

From outside the U.S. and Canada, call TOPS at 1-415-769-8700, ext. 307. Or write to TOPS, 950 Marina Village Parkway, Alameda, CA 94501. For information on European distribution, call 44 276 51440.

Copyright © 1989 Sun Microsystems, Inc.
The application generator, a powerful engine that generates comprehensive multi-user data management systems.

Multiple open windows is unique to the Omnis 5 environment, allowing the programmer and the user to manipulate data on multiple open windows.

The first graphical database/application development program to run on both Macintosh™ and IBM™ (Microsoft Windows™ and OS/2 Presentation Manager™).

SQL is supported through a built-in CL/1™ interface.

Omnis 5 provides the graphic design tools of a Macintosh™-style draw program, including a tool palette, grid, fill effects, color, fonts, graphics, etc., for Window and WYSIWYG Report design.

Omnis 5 gives HyperCard™ stacks true multi-user database capabilities.

Omnis 5 Express™ automatically builds an Omnis 5 application based on the outline requirements provided by the user.
To debug a Pascal object like this lightning bolt lightning fast, there's only one choice. THINK Pascal. Because only THINK Pascal fully supports object oriented programming from creation to debugging. And only THINK Pascal lets you debug objects "on the fly."

For example, say you programmed an object, (Lightning Bolt), and it crashed. Your mission: debug. THINK Pascal's source level debugger pinpoints the exact code line of the crash, and shows all your variables and their values in plain English. Then, just run your program again. THINK Pascal lets you step through your source code while watching the variables... as your program is running. The result is faster debugging. And faster finishes. Whether you use objects yet or not.

You'll also blaze through compiling at 44,000 lines per minute. And link any size program in less than 2 seconds. THINK Pascal not only makes programming faster, its high-quality, ultra-compact code makes faster programs.

With an integrated environment of an ultra-fast compiler, editor, instant linker, and source level debugger, THINK Pascal gives you total Pascal speed. Any way you measure it. Try THINK Pascal, the #1 Pascal on the Mac. Its speed will shock you.

Call (800) 228-4122 Ext. 346G for more information.
WHAT DO YOU GET
THE WORLD'S LARGEST
ADOBE POSTSCRIPT

The AgfaType Collection—
A complete line of type products for any application, any resolution, any PostScript or
QuickDraw® printer—from AGFA Compugraphic, a Division of Agfa Corporation.

Professional™ Series: True Adobe PostScript fonts. Print them at any resolution
from 300 dpi to 2400 dpi. For your Macintosh®, IBM® PC, PS/2®, or compatible.
For the most demanding desktop applications.

Studio™ Series: User-defined PostScript fonts for the Macintosh. Unique alterna­
tive typefaces. Authentic and precise letterforms. Character outline accessibility for
customized headlines, logos, and special effects.

Desktop™ Series: Professional quality type. Complete with the only scalable font
program that provides high-quality bitmap fonts required for Apple Computer's
QuickDraw technology screen and page description language.

More choices. The AgfaType Collection is a
notch above other PostScript type libraries
because it gives you the typefaces you want plus
the performance characteristics suited to your
publishing needs. Select from the AgfaType
Professional Series, over 375 fonts under
license from Adobe Systems. The Agfa­
Type Studio Series features over 100
unique typefaces designed to typogra­
phers’ specifications. Mix both the Professional Series
and Studio Series fonts in the same application. And look
for Desktop Series fonts to give professional performance
for your QuickDraw printer.

Professional results. AgfaType
fonts are easy to use and instantly
enhance the readability and credi­
bility of your printed words.
Or take advantage of AgfaType’s
capabilities. Demanding profes­
ionals like Berkeley Typographers
in Boston use AgfaType for results
that reflect their commitment to uncompromising
quality. Output your files created with AgfaType from
any type house or service bureau
PostScript laser imagesetter. You
can be assured of full compatibility.

The AgfaType Collection—
Adobe PostScript technology com­
bined with professional quality type.
AgfaType is part of the growing family
of PostScript output devices and
imaging products from AGFA Compu­
graphic. We offer a full line of high­
performance laser imagesetters, plain
paper printers and high-resolution
scanners. AGFA Compugraphic has
been a leading supplier of type, type­
setting, and electronic publishing
products for over 29 years.

Call us toll-free. For more about the AgfaType
Collection or for the name of your local authorized
AGFA Compugraphic dealer. 800-622-TYPE

AGFA COMPUGRAPHIC DIVISION
WHEN YOU COMBINE TYPE RESOURCE WITH TECHNOLOGY?
The original AnthroCart. Mobile. Incredibly strong. So many ways to solve your space and equipment problems. Choose different sizes. Move shelves around. Add space saving options. AnthroCart. Well designed Technology Furniture.

Look for our name.

AnthroCart®

Call us for more information: 800-325-3841

-----

MACWORLD

HOW TO CONTACT MACWORLD

Subscription Services
For subscription service questions, call 800/234-1038, 800/525-0645, or 303/447-9530, or write Subscription Services, P.O. Box 54529, Boulder, CO 80322-4529. To place new orders, call 800/642-9606.

Macworld in Microform
Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346, 313/761-4700.

Macworld Editorial
Mail or Courier Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107, 415/442-0766.

Letters to the Editor
All your written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to: Letters to the Editor.

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

Consumer Advocate
Been burned? Really steamed? Direct your concerns (by mail or electronically) to: Conspicuous Consumer, Deborah Branscum.

New Products and Updates
Direct press releases and product announcements (by mail or electronically), and shrink-wrapped software upgrades (by mail or courier) to: New Products Editor.

Editorial Calendars
For a copy of Macworld's editorial calendar, direct requests (by mail) to: General Information, Editorial Dept.

Reprints and Permissions
For written permission to quote or reproduce material from Macworld, direct requests (by mail) to: Reprints and Permissions, Editorial Dept.

Writing for Macworld
Please do not send us unsolicited manuscripts. If you're interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to: Writer's Guidelines, Editorial Dept.

August 1989, Volume 6, Number 8
Macworld (ISSN 0744-9677) is published monthly by IDG Communications, Inc., 501 Second Street, San Francisco, CA 94107. Subscription rates are $18.00 for 12 issues, $39.00 for 24 issues, and $99.00 for 36 issues. Foreign orders must be prepaid in US funds with additional postage: 10% (by year) for all countries (except Canada and Mexico). New subscriptions for all countries are: Second-class postage paid at San Francisco, CA. POSTMASTER: Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80322-4529. For dealer inquiries, call 303/521-5642 in California. 800/447-9530. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/442-0766.

Macworld is a publication of IDG Communications, Inc. Macworld is an independent journal not affiliated with Apple Computer, Inc, Apple, Apple Logo, Mac, MACINTOSH, and MAC are registered trademarks and MAELSTROM is a trademark of Apple Computer, Inc. Printed in the United States of America. Copyright © 1989 IDG Communications, Inc. All rights reserved. Macworld is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes more than 60 computer publications in more than 20 countries. Forty million people placed orders or made purchases through IDG Communications publications each month.
Two or three years from now, the typical laser printer will be a lot like the Business Laser Printer™: small, light, with a SCSI connector for a hard disk, and inexpensive.

That's how Publish! magazine characterized our Business Laser Printer (BLP), a Postscript® printer for Macintoshes®, IBM®s and IBM clones. We'd only add that the future has arrived ahead of schedule.

Simply stated, the BLP is a better way to translate the language called Postscript into the graphics, words and numbers people use to communicate in business.

Better because the BLP lets you—or anyone else on your AppleTalk® network—produce superior text with the aid of 39 fonts (four more than our nearest competitor).

Finally, the BLP even takes better care of your bottom line. In fact, you can buy a BLP and a dedicated hard disk for less than the price of a LaserWriter® II NT alone.

Someday, if Publish! magazine is right, other printers will offer all this. But if you prefer not to wait, just visit your authorized GCC Technologies dealer for a BLP demonstration. For more information, or the name of a dealer near you, phone (617) 890-0880.*

*In Canada, (800) 263-1415 © 1989 GCC Technologies, Inc. GCC Technologies, Peripherals With Vision, Business Laser Printer and the GCC Technologies logo are trademarks of GCC Technologies, Inc. All other product and company names are trademarks of their respective companies.

Circle 11 on reader service card
It is the second largest river in the world. And it carries nearly twenty percent of the world's total water to the ocean. It starts high up in the Peruvian Andes and provides the only means of transportation through the largest rain forest. It is the Amazon. It was discovered by the Western World in 1541 by Francisco de Orellana.
RADIUS PRESENTS THE TWO MOST COLORFUL PAGES IN THE HISTORY OF MACINTOSH.

Now for the first time in the history of Macintosh, you can work across two full pages with the photographic quality of 24-bit color. Introducing the Radius DirectColor Series.

Completely compatible with Apple's 32-bit QuickDraw, it's the precise electronic medium for working with real colors, real type and real photographs across two full pages.

With simultaneous access to every one of Macintosh's 16.7 million colors, our Radius DirectColor/24 is the perfect tool for retouching color photographs or producing high quality color publications.

If you don't require the full palette of Macintosh color, the Radius DirectColor/16 lets you work with 32,768 colors simultaneously.

And, upgrading to the Radius DirectColor/24 is as simple as adding video RAM.

For those of you who use only 256 of the Macintosh colors at one time, there's the 8-bit Radius Color Display System.

No matter which Radius color system you choose, you'll be working across two flicker-free, paper-like pages that give you 30% more working area than commonly seen on other 19 inch displays. Which means your work is never cropped off at the sides or chopped off at the bottom.

Naturally, you'll also reap the benefits of all the classic RadiusWare features.

Including Tear-off Menus in every application. The ability to capture any portion of your image as a PICT file. Small or large menu bars. Or other colormetric properties and direct control panel access.

So if you've been waiting to work with real colors across two real pages, visit a Radius Authorized Dealer. You can find one near you by calling 1-800-227-2795.

And get ready to make some colorful history of your own.
"We put the Jasmine DirectDrive through hell, but it got us through 'The Abyss.'"

"Fifteen months ago, we started working on a new underwater adventure movie called The Abyss. We needed a hard drive that could stand up to the worst possible circumstances. So we got two Jasmine DirectDrives. And immediately, we put them in the worst possible circumstances.

"We took them down to a hot, dusty place called Gaffney, South Carolina, where the majority of the film was shot. We put them in dirty rooms. We ran them almost 24 hours a day for over a year. They were dropped, they were covered with dust, they were bounced from location to location, they were used and abused—and they still worked great. We put them through as much hell as we went through. If anybody could break a drive, we could, and we didn't. They really performed for us.

"Often, we wouldn't have time to back everything up, so we just had to rely on the Jasmine drives to run properly all the time. And, even when they were really put through the ringer and we thought we were going to lose everything, the Symantec™ Utilities for Macintosh that come with the drives really saved us.

"We basically had the entire movie on those Jasmine drives. They were used to store storyboard scans, script changes, animation tests, and various files covering every aspect of the film. This took up hundreds of megabytes of disk space, because the storyboards that we scanned into our Macintoshes were constantly being revised and updated, and we couldn't afford to throw anything away during filming.

"The drives are still working great. We figure they'll probably have a long career in this business! And because they held up so well under pressure, so did we."
INDUSTRY NOTES

**Hell with Aldus**

Hell Graphics Systems is the first major pre-press vendor to announce support for Aldus' proposed Open Pre-press Interface. OPPI lets prepress systems accept desktop publishing files in standard PostScript format without forcing the prepress vendors to give up their own proprietary formats.

**Schlumberger Sells Plotter Division**

Océ is buying Schlumberger’s $125 million graphics division, which makes pen plotters and electrostatic plotters, including a Macintosh-compatible PostScript plotter.

**Mac ROM Exposed**

A group calling itself the nuPrometheus League has begun distributing free copies of source code for the Mac's ROM and other closely guarded Mac code. Though possession of the code is illegal, access to it would make it possible to produce a fully functional Macintosh clone.

**New Adobe Font Strategy**

Faced with the expanded role of QuickDraw and Apple's final rejection of Display PostScript, Adobe has announced the Adobe Type Manager. ATM will generate fonts for the Mac screen and for non-PostScript printers from Adobe's PostScript fonts. Adobe head John Warnock said ATM should be available by this fall, assuming licensing issues can be resolved.

**Apple, Tandem Join Forces**

Apple and Tandem are expected to make other joint-development announcements soon.

**Apple Reveals System 7.0**

Apple's new System, which it expects to deliver early next year, features embedded support for the SQL minicomputer and mainframe database standard; Inter-Application Communication, which makes it possible to dynamically share data across different applications; a new print-driver architecture that will support many more printers and simplify developing new printer drivers; and a much-improved Finder. System 7.0 will require 2MB of memory, and many older or nonstandard applications are likely to be incompatible with it. For a more detailed report, see "Here Comes System 7.0" in this issue.

**HP Moves DeskJet Printer to the Mac**

Hewlett-Packard has designed a Mac-compatible version of its popular DeskJet printer, which offers 300-dpi resolution in an inexpensive desktop model. The DeskWriter will list for $1195 and print about 1 page per minute, or 2 pages per minute in draft mode. Completely QuickDraw-compatible, it includes a Chooser-level printer resource and cable. HP expects to begin shipping the printer in early July. For more information, call Hewlett-Packard at 800/752-0900.

**RasterOps Ships SE Display and Accelerator Subsystem**

Last month RasterOps Corporation began shipping its ClearVue/SE, a combination CPU accelerator, display board, and 19-inch monochrome monitor for the Mac SE. The accelerator, which is integrated into the display board, bumps the SE's processing speed from 8MHz to 16MHz. The display board refreshes the monitor at 72Hz, and allows the SE's internal screen to function as a second monitor or zoom window. The ClearVue/SE subsystem retails for $1995. The company is also shipping a similar display board/accelerator, the $695 ClearVue/SE APD, for Apple's Page Display monitor. For more information, call RasterOps at 408/562-4200.

**Database News Beat**

Major upgrades to at least three databases should have arrived by the time you read this. Odesta's Double Helix II is graduating to Double Helix 3.0. The new version features greatly enhanced speed, the ability to use VAX files in their native format, and HyperCard-like buttons that trigger sequences of events.

*From ProVue Development comes Panorama 1.1,* which adds support for imported EPS graphics, more sophisticated text calculations, new time and financial functions, more chart styles, and the ability to use sounds in a database design.

Finally, the unusual graphics-based Business Filevision is becoming Filevision IV and adding support for PICT, EPS, gray scale and color, a 30-by-32-inch maximum layout, 32 database layers per file, and integrated text and graphics import and export. For more information, contact Odesta at 312/498-5615; ProVue at 714/892-8199; and Marvellin at 213/450-6813.

**Blyth Is Back with Omnis 5.0**

Blyth Software is reemerging with a new and impressive version of Omnis. Version 5.0 sheds the ugly, text-based interface of yesterday and comes with tools built in for creating Mac-like applications. For the end user, the new version supports radio buttons; real Mac windows, dialogs, and menus; and background graphics with live buttons. For the developer, there is support for CL/1, a set of XFCNs and XCMDs for communicating with HyperCard, multiuser support, and a user-friendly code-cutting environment. Omnis 5.0 for the Macintosh will list for $695 and should be available (continues)
Mac Bible Gets to Works

The publisher of the popular Macintosh Bible plans to publish a tutorial and reference for Microsoft Works 2.0, written by well-known Macintosh wizard Sharon Zardetto Aker. Goldstein & Blair's new book should be available this fall.

Upgrades Come Down

MacProducts USA has dropped the prices of its memory upgrades and add-on SCSI ports. Both 128K-to-512K and 512K-to-1MB upgrades now cost $149, and a SCSI port costs $69. For more information, call MacProducts USA at 512/343-9441.

Irwin Supporting MacPeak

MacPeak, vendor of mass storage and accelerator boards, has ceased retail operations. Irwin Magnetics owns a major share of MacPeak and will service and support MacPeak products and sell products not under development by the newly formed MacPeak Research. For information, call Irwin at 313/930-9000.

Semantic Microsystems Now Lightship Software

Semantic Microsystems of Beaverton, Oregon, has changed its name to Lightship Software. For more information, contact Lightship at 503/244-4020.

Softsel Connectivity Sales Up 800 Percent

The Connectivity Solutions division of Softsel Computer Products of Inglewood, California, has increased its sales by 800 percent since May of 1988. The division sells products for the Mac and the IBM PC and compatibles for more than 20 vendors.

Plus Finds a Home

Olduvai Software has formed a deal to market Format Software's German-born Plus in the United States. Plus extends HyperCard's free-form application-building capabilities with color, support for standard Mac windows and dialogs, and a scripting-language super-set of HyperTalk.

TrueForm Rides Again

Version 2.0 of TrueForm, the electronic forms-generation and forms-management package, has many new features: using multiple search criteria to search through stacks of forms (no relation to HyperCard stacks); grouping logically related fields to prevent data entry errors such as pushing more than one radio button in a group; more spreadsheet and database functions and operators; two levels of password protection; and built-in hooks for 4th Dimension databases. Version 2.0 has no drawing tools. At $395, version 2.0 is $100 less than the original release; registered owners of TrueForm 1.0 can upgrade at no cost. Version 2.0 should be available by the end of July. For more information, contact Adobe at 415/962-2000.

Taking Another Form

Shana Corporation is readying its heavyweight forms product for market. Informed, like most other forms packages, is a two-module set, and the first module, Informed Designer, should ship before the Boston Macworld Expo in August. It will list for $295. The second module, Informed Manager, will be released later. Informed Manager will list for $195 and will have a database back-end built on Shana's database-development product, InsideOut. The first version of Manager will be flat-file, but a later version will take advantage of InsideOut's relational capabilities. For more information, contact Shana at 403/463-3330.

Relisys' Tefax Integrates Five I/O Functions

Relisys is now shipping Tefax System Model RA2110M, an integrated thermal printer, graphics scanner, copier, fax machine, and fax modem for the Mac. The $1,959 device operates at 200-by-100 dpi resolution or at 200-by-200. Relisys also will bundle Solutions' BackFax software, which supports full background communications from within Mac applications. BackFax, which normally lists for $245, will be included gratis beginning in August, and people who bought Tefax before then will receive a free upgrade. For more information, call Relisys at 408/945-9000.

The Key to Planning

Symmetry is working with an Australian developer to design and bring KeyPlan to the United States market. Symmetry is billing KeyPlan as a simple-to-use project-management tool that is not intended to satisfy professional project managers but is powerful enough for most other business users. It imports Acta outlines and allows users to assign dependency in a PERT chart format, and from there it provides most of the features project managers need, such as critical path determination and manual resource leveling. Symmetry expects to ship KeyPlan in July. It will list for $449. For more information, contact Symmetry at 602/844-2199.

A Very Secure Feeling

With Access Control Environment, nicknamed ACE, users or system administrators can assign or deny privileges for copying or deleting files; initializing disks; opening or moving folders; using DAs and applications; using printers, file servers, and other network devices... in short, ACE makes it impossible for an unauthorized user to trespass in your electronic homestead. Users who take turns sharing a machine can each be assigned a separate, password-protected set of privileges. ACE also offers run-of-the-mill file encryption. ACE should begin shipping in the third quarter of 1989, at $279 list. A 5-pack will list for $895, and a 10-pack for $1495. For more information, contact Cassady & Greene at 408/624-8716.

Microsoft Word's Little Herald

The Cobb Group's Word 4 Companion by Gena B. Cobb, Allan McGuffey, and Judy Mynhier is an essential supplement to Microsoft's manuals. It's readable, thorough, and concise; the only criticism that can be made is that for anyone who read Word Companion, for Word 3.0, there is a lot of duplication. Word 4 Companion lists for $22.95. For more information, contact the Cobb Group at 502/491-1900.
The easiest way to learn Macintosh software is to play it by ear.

The fastest way to learn software is to have an expert sit beside you and talk you through the program, step by step. With your hands on the keyboard, trying each new skill as it's explained, learning is a snap.

So Personal Training Systems gives you that expert—on an audio cassette. Each 90-minute tutorial contains the cassette, example files on a disk, and a quick reference card. It's like having your own private tutor...only this one works anytime, anywhere, and doesn't charge by the hour.

In addition to training on the Macintosh itself, tutorials are available for Microsoft Excel, Word and Works; Aldus PageMaker and Persuasion; Adobe Illustrator 88; and HyperCard. Since we offer beginning, intermediate and advanced levels for each software program, there's sure to be one that meets your needs.

All our tutorials are unconditionally guaranteed. You'll learn how to use your Mac or favorite software program—without opening a book or attending a class—or your money back.

So if you're looking for a fast, convenient, affordable way to learn, contact Personal Training Systems by calling 1-800-TEACH-99, or mail in the coupon below. Because we know you have better things to do with your time.

□ YES, please send me information on Personal Training for:
  - Macintosh
  - Excel
  - Word
  - PageMaker
  - Illustrator 88
  - FileMaker
  - HyperCard
  - Persuasion
  - Works

Name _____________________________
Company __________________________
Street _____________________________
City _____________________________ State _________
Zip _____________________________ Number of Macs _________

PERSONAL TRAINING SYSTEMS
P.O. Box 54240 ● San Jose, CA 95154 ● 408-559-8635
800-TEACH-99

Circle 42 on reader service card
La Cie products are the choice of professional critics and critical professionals. But don’t take our word for it, take Macworld’s, MacUser’s and La Cie customers. You will find that La Cie creates the standards for excellence.

“Sure winners, the lightweight, silent and inexpensive Cirrus drives from La Cie come with first-rate utility software.”


Cirrus drives are fast and quiet—most models boast a 1:1 interleave and 15 ms seek time. Cirrus drives are first in speed and silence in the Macworld tests. We achieve speed by pairing the finest 3-1/2” drive technology with the best software drivers available exclusively from La Cie. Cirrus is silent because La Cie uses 1/2 speed fans—found only in Cirrus drives.

“There’s no benchmark test for hardware design, but the elegance and convenience of a drive—an external one in particular—should concern you.”


La Cie offers you mass storage solutions from 30 to 610 megabytes. Except for the 610, all drives weigh under 4-1/2 pounds and measure less than 3”x6”x9”. These compact units don’t clutter up your desk-top and do fit into our shoulder-strapped Cordura carrying case or inside your briefcase for easy portability.

<table>
<thead>
<tr>
<th>Capacity (Mb)</th>
<th>Speed (ms)</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>40</td>
<td>599</td>
</tr>
<tr>
<td>42</td>
<td>35</td>
<td>699</td>
</tr>
<tr>
<td>70</td>
<td>25</td>
<td>799</td>
</tr>
<tr>
<td>84</td>
<td>15</td>
<td>999</td>
</tr>
<tr>
<td>111</td>
<td>15</td>
<td>1,199</td>
</tr>
<tr>
<td>142</td>
<td>15</td>
<td>1,499</td>
</tr>
<tr>
<td>177</td>
<td>15</td>
<td>1,799</td>
</tr>
<tr>
<td>613</td>
<td>15</td>
<td>3,199</td>
</tr>
</tbody>
</table>

“Silverlining performs hard-disk management tasks like formatting, partitioning, diagnostics, password protection, defragmentation and much much more."

“Of all the drives tested, we recommend La Cie’s Cirrus drives.”


So compare. You’ll find there’s really no comparison at all—just lots of good reasons to order your Cirrus drive today.

Call us now.
1-800-999-0143

La Cie LTD.
16285 SW 85th, Bldg. 306,
Tigard, OR 97224, (503) 684-0143.

Prices shown are cash prices and do not include shipping. Add 3% for VISA, Mastercard, 5% for American Express. Add 7% for sales handling. Cirrus, La Cie, Silverlining and Silverserver are trademarks of La Cie Ltd. Macintosh is a trademark of Apple Computer. Prices and specifications shown are subject to change without notice.

Circle 145 on reader service card
So I'm sitting here. It's late. Another long day at the office. It's the usual San Francisco summer night. Fog horns sounding outside my window. Cold. Ted Koppel is tackling another issue on the tube. Mayor Koch is about to begin a harangue when Ted takes a break for a commercial. And in that commercial Canon is promoting the bejesus out of its color copiers. This WASP in a Brooks Brothers suit holds up some great-looking color output. Suddenly, out of the depths of my mind, appears an image of Jean-Louis Gassée. (Gawd. What did this writer have for dinner, you ask?) Anyway, I'm recalling a time just after the Next announcement. Jean-Louis looked archly toward someone and said, "You think we don't know about the erasable optical technology Canon has? We're pretty good customers of theirs, by the way."

Well, one thing leads to another, and pretty soon I start to wonder whether the printing engine in that color copier could be driven by a Mac. All of which prompts me to walk over and switch off Hizzoner, and turn a once-productive mind toward what could be.

Okay, I admit the announcement of the new system software (which dealers will have available for customers next winter) also has me charged up: thinking about the future. I was in the audience, watching the demos for System 7.0 at the Developer's Conference in May. At one session about the script manager, an Apple engineer, before my eyes, typed on a screen in what looked like handwriting. Over the decade that I have been working on computers and writing a lot, I've always wanted a typeface that looked like handwriting. As the demonstration progressed I learned that it is not a font, but the computer's ability to deal with ligatures—the curved lines that connect two letters (say, ff or fi) — that makes this possible. It seems so incremental an improvement, and yet that revelation was inefable. So if Apple is once again making some real headway in improving how computers work, it must be time to raise new challenges. (What can I tell you? People only write when something's wrong. Or before they're put under nondisclosure and still have the opportunity.)

UNOFFICIAL WISH LIST 1989

A low-cost Mac. Hmmm. No surprise there. After all, John Sculley has already announced it. It's more a question of when. Better not wish for Christmas; I never get what I want for Christmas. Spring would be nice. Now, down to particulars. Make it small, about the size of the old Apple 20-megabyte hard disk—just big enough for a system board (and using the same SIMM slots as the II family, please). Add a color ROM (32-bit QuickDraw), and one expansion slot. And listen, willya? Make the damn thing so I can open it like a Mac II and just add stuff without having to rattle through my tool drawer.

Yo, put Ethernet on this machine. Sure, I know it costs a lot. We all have problems. (You should see my alimony payments. You don't hear me screaming about that when someone wants better articles in the magazine, do you?) I'll take it with a 68020, but I would really rather have a 68030. I mean, a real man wants a machine with a big processor. And if you don't use an '030, then don't come back to me in a year saying that I can't have this or that because "you need an '030." Really. Don't do that, even though the low-cost machine is going to cost under $1000, and a color monitor won't make it that much more—or is that another wish? Now, in terms of storage...

3 1/2-INCH ERASABLE OPTICAL DRIVE

Hey. Surprise us. Do something that hasn't been done by everyone else. Buy the technology for 3 1/2-inch erasable drives and put it in all the machines. Awright! At least make it an option on the low-cost Mac. I know you can do this. I've had an erasable optical Jasmine 600MB monster on my desk for almost three months now. It's as reliable as a rock. And fast—the 30-millisecond access time competes with a hard

(continues)
drive for speed. (I imagine John Belushi screaming “Are you listening?” and hanging a 3½-inch platter on the desk on “Weekend Update”). We deserve removable 200MB erasable optical disks. Mac users are cursed with a love of computing, so we should be allowed sufficient disk storage. It should also be available via an external SCSI drive in a chassis like the current floppy drive’s.

**4-MEGABIT RAM**

And speaking of storage, a related topic, memory, comes to mind. Time to see Apple move ahead of the memory curve for a change. It’s getting real old hearing the recurrent caveat: “Well, when the 4-megabit parts are available you’ll be able to have XX megabytes in system memory.” Wait, I’ve got it, Jean-Louis—tell John that it’s a commodity issue. Packaging. Big bottles, little bottles. “The New Generation” thing. You know, if you ship bigger memory parts, the consumers will pay for them and not notice that they’re paying more. Put another way, you need to design packages that make it easier for people to get more memory into the home. I’m sure research will tell you that there are few limits to the consumption of memory.

**LIVE, FROM WORK, IT’S NTSC**

I want to do two things with my Mac and my TV. I want to open a window on the Mac and have live video displayed in one corner. I want to have CNN playing throughout the day in a small window in another corner so I can watch for that story they’re broadcasting about the new low-cost Mac. I suppose we will eventually wire Macworld with fiber optics. Then that same window will be able to deliver the equivalent of a picture phone, but until then I’ll settle for live television without a lot of hassle.

The other thing I want to do with television technology is to use my Macintosh to edit and title videotape. Don’t mistake my wish for a redirected desire to turn the Mac into a VCR. I’ll still need a VCR. But I want programs like Farallon’s MacRecorder translated into the video realm so that I’ll be able to run my Mac like a videotape editing machine. I want to overlay graphics, text, and voice; edit; and produce a finished videotape to view on my VCR.

What’s my wish? Video out and video in. Standard. No dealer handling. No preparation charges. Don’t charge me for the transmission (and this wish does not constitute a Swiss Army knife) in my intellectual vehicle. Just give it to me.

**PERIPHERALS FOR THE REST OF US**

I want a color laser printer, under $8000 (preferably under $6000), with a good duty cycle (it won’t clog, misfeed, wear out) that will have no problems printing anything that 32-bit QuickDraw can handle. Users should be able to choose black-only output from the print dialog box. Jean-Louis, a color laser printer would be like a beautiful woman going to war (Guy Kawasaki promised us this would work with you).

**USER-DEFINABLE FINDER**

There is already a great deal of talk about AppleScript, a scripting language that will become part of system software, so I probably don’t need to wish for that. But a clarification is in order. Please don’t make it another arcane, though slightly more accessible, programming language. Keep the scripting simple. One class of words, say, verbs, should represent actions. Another class of words, say, nouns, should represent objects. Grammatical rules would define the syntax. “Get and print Jerry’s applelinks” should get and print my AppleLink messages. Make other functions parallel the English language as well. At the very least, a few of us would have to remember the distinction between a gerund and a participle. My God—computer teaches man. Plus, I could create neat icons on my desktop that would do things I actually want my computer to do. Provided I had the time, I could create agents of my own—Knowledge Navigator here today.

So congratulations all around on System 7.0. You’ve done more than most of us can appreciate. More important, you’ve put Apple back into a position of technical leadership. Now go do more good things.
EVERYONE PROMISES TO TAKE FULL ADVANTAGE OF THE NEW MACINTOSH...
The Second Quarter of 1990 saw Articulate Designs strengthening its position as the leader in marketing communications in the Bay Area. The most significant event was the completion of negotiations with the Oakland Rebels, a new football franchise, that will have Articulate Designs create the complete team image for the club—logo, uniforms, tickets, and marketing materials. The $5 million deal calls for the consulting and design work into the mid-1990's.

The company posted profits of $1.5 per share this quarter, on $244,568 of revenue, marking the third quarter in a row that profits have been increased. The acquisition of PeachTree Printing in the Fourth Quarter 1989 began to pay dividends, as the in-house production facilities was of $5 million. In the fourth quarter, the company reported a profit of $1.5 per share on revenue of $244,568, marking the third consecutive quarter of increased earnings.

The company posted profits of $1.5 per share this quarter, on $244,568 of revenue, marking the third quarter in a row that profits have been increased. The acquisition of PeachTree Printing in the Fourth Quarter 1989 began to pay dividends, as the in-house production facilites was of $5 million. In the fourth quarter, the company reported a profit of $1.5 per share on revenue of $244,568, marking the third consecutive quarter of increased earnings.
The world of Macintosh word processing just got a lot more sophisticated. And a lot simpler.

Presenting FullWrite Professional™. It's the first word processor that fully utilizes the power of the new generation of Macintosh. Yet it's as intuitive as the Macintosh™ itself.

IN WRITING: **FullWrite.**

FullWrite gives you the power to create persuasive, hard-hitting communications in a lot less time. With a lot less effort.

How? With advanced page layout features that let you format a single page memo or a 400-page manual in seconds. And as you make changes, FullWrite updates the entire document immediately, re-wrapping text around illustrations and remembering things like page references and footnote numbering.

Best of all, you see your output on screen as you work. From indexes to hairline rules; from redline markups to kerning and leading control.

Layout, graphics, and outlining are all there when you need them.

But like the newest generation Macintosh, FullWrite is more than just the sum of its parts. It's a whole new way to communicate your ideas.

**Free FullWrite Sampler.**

Seeing is believing. Give us a call at 800-437-4329, ext. 2100; We'll send you a full-capability product sampler, absolutely free.

There. You've got it in writing.
Price/earnings multiple of blue-chip stocks

Close-Up on Government Spending

Entitlements have become increasingly burdensome as a percentage of total government outlays. As a result, funds for social services have been reduced.

1985 Outlays: $546 Billion
1989 Outlays: $1,023 Billion
Spreadsheet software has taken a great leap forward.

Presenting Full Impact.” It’s the first spreadsheet to truly harness the power of the new generation of Macintosh computers. To convert the complexity of numbers into the power of communication.

**BACK IT UP: FULL IMPACT.**

Beginning, of course, with your numbers. Because now you can take them places they’ve never been before—quickly and intuitively. For example, create a chart—or several charts. Place them exactly where you’d like. Make your point clear with a paragraph of text. Then make it clearer by using different fonts, sizes, styles, or all three. Sign your work with the company logo. And print it all on a single impressive page.

It’s that powerful. And as easy as clicking on an icon.

**Free Full Impact Sampler.**

There’s a lot more we could say. Like how we succeeded in inventing an intuitive way to create macros. Or how virtual memory lets you create the largest Macintosh spreadsheets ever. But we’d rather let Full Impact make its own first impression.

So give us a call at 800-437-4329, ext. 3600* and we’ll send you a full-function product sampler, absolutely free.

We think you’ll be impressed with our numbers.
with Hewlett Packard® DeskJet™ printers*; AppleFax™ Modems; Epson® compatible printers**; Hewlett Packard-compatible laser printers*; Apple® Personal Modems; many other standard peripheral devices.

Making the Right Connections
The new OrangePort lets your whole Macintosh AppleTalk network use your peripherals which may currently be tied up by a single Mac or PC. Just plug the OrangePort into your network like any other device, set it up once, and put that printer, modem or plotter to work for the entire office. This could save you thousands of dollars in peripheral purchases, as well as unclutter individual desktops and workspaces. OrangePort is also fully compatible with Orange Micro's line of Grappler interfaces, making hundreds of popular printers AppleTalk compatible.

Simple Networking?
OrangePort has been specially engineered to suit your needs. Installation is fully menu driven, so you don't have to figure out a lot of technical information. In fact, most popular devices are listed by name. This means automatic installation to all the right specifications. The OrangePort even manages and queues multiple users just like a dedicated network device. If it works on your Mac, OrangePort will bring it to your network.

Painless Investment
With all this compatibility, you're probably expecting a lofty price tag. Surprise. OrangePort carries a price tag of under $250. So what are you waiting for? Visit your Apple dealer and see how OrangePort lets your AppleTalk talk.

* Using Grappler LS or Grappler LQ printer interface
** Using Grappler LQ or Grappler C/Mac/GS printer interface

Grappler and OrangePort; Apple, Macintosh, AppleTalk, and AppleFax; Epson; Hewlett Packard and DeskJet; are trademarks or registered trademarks of Orange Micro, Inc.; Apple Computer, Inc.; Epson America, Inc.; and the Hewlett Packard Co., respectively.
LETTERS

A forum for Macworld readers

The Apple Killer

We would like to remark upon a curious software bug in the new IBM “Apple Killer” system heralded in your April issue. The Iconoclast column has generated tremendous interest well in advance of the planned “official” product advertising. After all, a Macintosh-compatible IBM product offering more features than a Macintosh IIcx color system, all for under a suggested retail of $1000...

MacFriends, the nation’s leading Macintosh-only store, is heavily committed to the new machine. We ordered 250 initial units, with a standing order for 100 more each week over the next 90 days, which we will sell at 25 percent off list.

Our toll-free line is ringing off the hook with orders (thanks to your timely article). Even so, our steady supply is holding out nicely, and we can ship immediately most of the time. But there are a few problems...

There’s a funny bug in the Alarm Clock DA included in the system software. Even after you set the time and date, each power-up finds the clock reset to the default starting date, which is the same as the official product release date: April 1.

Checking with Microsoft, we learned that something more sinister was afoot. A programmer with a secret loyalty to Apple deliberately did this and also fouled up the Notepad DA. The last page holds a message, which, like the April 1 date, cannot be erased. It reads, “April Fool! You bought me, and now you’re stuck with me. You should have bought the real MACoy.”

Now this is what we’d call a real April Fools’ joke.

Ralph Owen
MacFriends
Portland, Oregon

It’s Time to Move On

Just finished your exciting article on IBM’s new Macintosh clone. I have been working with Macs for over three years but still don’t own one. The truth is, I can’t afford to go that much into debt because of other priorities like house payments, food for the table, my wife’s education. What a great feeling it was to discover that someone was finally about to produce a Macintosh-type computer that the average person could afford. Come April 1st, I am going to buy one of those IBM computers, which will require me to start a subscription to a magazine that covers IBM computers. I won’t need to read about Macintoshes anymore, so please cancel my subscription to Macworld as of April 1, 1989. Sorry about this; I was very happy with your magazine, but I won’t be needing it any longer.

Robert Finley
Seattle, Washington

Corrections


CaptGen (Macworld News, June 1989) is a video character generator by Mikrologix Software (Tucson, Arizona, 602/325-8794).

HyperAnimation is a registered trademark of BrightStar Technology (“Move It!,” June 1989).

Is Microsoft Listening?

Bravo. It’s been a long time since I’ve been taken in as fully by an April Fools’ joke. I was so excited. I read and reread the article. I knew it sounded too good to be true. But did that matter? Noooooo. I wanted this new machine. I could see where it would fit. I was planning on selling my SE and buying three or four of these clones. Why not? It was such a terrific deal. I admit I’m disappointed, but maybe, just maybe Bill Gates has read the article too. If you did, Bill, how about it?

Robert E. Pennington III
address unknown

There’s Something Unreal about This

As one who is still on the fence, undecided about whether to go the Mac or PC (continues)
route, I found your announcement of IBM's Mac clone welcome news. Now, perhaps the combination of the Mac's widely vaunted user-friendliness and IBM's reliability will give us the best of both worlds.

I can only wonder how your advertising department failed to get a splashy gatefold from IBM to officially announce this stunning development. Without it, your story still seems unreal.

Or is it a joke? April...I get it. Their lawyers will be in touch.

Walt Lankevau
Blairstown, New Jersey

Believing the Unbelievable

On March 20, I received a call from our community development consultant, who is, like me, a dedicated Mac user. He had just received the April issue of Macworld and told me to read the article by Steven Levy, "Introducing the First Mac Clone."

I grabbed the magazine, tore off the plastic, and quickly found the article. I couldn't believe my eyes. A Mac clone with more power and memory than a Mac II, with built-in software and color monitor and fax and 2400-baud modem, for a quarter of the price of a Mac II! This was amazing.

I decided to call IBM to check this out. A pleasant-sounding woman answered the phone. "I just read that IBM has developed a Mac clone," I told her.

"Did you read this in Macworld?" she inquired.

"Why, yes."

"It's a joke."

Her words knocked me as cold as would a Tyson uppercut.

I quickly called our community development consultant. "How can they do that?" he asked. "They even printed Bill Gates's name. And IBM. It's supposed to be shipped April 1st." April 1st. Suddenly it dawned on him. He repeated those two words again. Finally I realized it too. What a fantastic April Fools' Day prank. I should've known better.

Well, Steven Levy, I owe you one.

William J. Coleman
Scranton, Pennsylvania

Pixemaster and Scannaster

I'd like to clarify a few points in your April issue. First, in your Commentary on the MacWorld Expo, you listed our solid inkjet printer, the Pixelmaster, as a $9000 thermal jet printer. The Pixelmaster actually lists for $7690. Second, in Bruce Webster's review of color scanners [Reviews], our Scannaster is listed at $8195, while Sharp's JX450 is $6995. Our price includes the National Instruments (not National Semiconductor) GPIB board, cable, and Scan-It software, while the price of the JX450 does not.

Edward J. Marino
Howtek Inc.
Hudson, New Hampshire

The price we listed for the Pixelmaster was correct when the column was written; unfortunately, we were not informed of the change.—Ed.

(continues)
Key Features:

- All the standard drawing tools
- Unlimited layers
- Ultra-fine hairlines
- Editable arrowheads
- Smooth polygons
- Object libraries
- ± 32x magnification/reduction
- Text rotation
- High precision
- 8 available colors
- Auto-dimensioning of lines

MacDraw owners: Trade up to Canvas 2.0 for just $99. Simply send your MacDraw Master Disk to Deneba at the address shown below, along with check or credit card info (card #, issuer, expiration date & signature).

We'll send you Canvas 2.0. The new big cheese in drawing programs.

If you want to see the Canvas difference for yourself, send us $995 to receive a fully-featured Demonstration Copy.
Unlocking the Mysteries of RAM

While reading the March issue, I came upon several inconsistencies. Thom Hogan's excellent article, "Pondering Performance" [State of the Mac, March 1989], really helps novices like me understand many Mac concepts. However, he states that the SE has 120ns RAM and that virtually all software accesses SANE and not the coprocessor directly.

Bruce Webster's article about processors ["Processors: Is Faster Better?"] was very interesting but a bit confusing (especially regarding RAM requirements). He says the SE has 150ns RAM and that most manufacturers access the coprocessor in their applications.

Both articles mention RAM speed, clock speed, and wait states. Will faster RAM actually speed up performance?

Russ D. Granich
San Francisco, California

First, the SE requires 150ns access time or faster. At one time, SEs were shipping with 120ns RAM, which led to the confusion. The SE/30, by the way, requires 120ns RAM.

Second, before the MPW system recently started supporting direct 68881 calls, very few programs avoided SANE. Finally, faster RAM has no effect on system speed—the CPU/HMMU imposes a wait state on all RAM regardless of how fast the CPU/HMMU can respond.—Ed.

Pondering Obsolescence

I have a couple of comments on "Pondering Performance" [State of the Mac, March 1989]. The 68020 and the 68030 chips I've worked with had 256 bytes of cache memory, not the 128 bits stated in the article. Either somebody made a goof or you have found a very strange variant of the 68020/030.

The second comment is, aren't we becoming a bit jaded about small computers? I have often commented that the half-life of digital technology is about five years, but to complain that a two-year-old machine is obsolete seems a bit much.

Everett M. Greene
Ridgecrest, California

Yes, the 020/030 chips do have 256 bytes of cache memory. The original reference was to the cache's being loaded 128 bits at a time; it somehow got shortened into "128-bit cache."

As to the life cycle of equipment, it's only been in the last year that Mac software has really coalesced into mature, professional-caliber tools, and it is with that software that the Mac II shows its age.—Ed.

A/UX with a Friendly Face

In the sidebar, "A/UX version 1.1" ["The Mac SE Turns 030," March 1989], you say there is no Finder-like interface for A/UX applications. InterfaceR, developed by List Spa, offers Mac-style access to UNIX services and files. It is bundled by Apple Computer Italy with every A/UX sold in Italy, and it is distributed all over Europe, Canada, Japan, China, and the Far East. In the United States it is distributed by Bonsu.

Jean-Claude Morel
List Spa
Pisa, Italy

Bonsu tells us InterfaceR has not been publicized here, as it has been abroad, but it can be ordered from Apple dealers and other computer stores. We apologize for overlooking it.—Ed. (continues)
"Two thumbs up!"
ORACLE for Macintosh.
Only $299.

Finally, there’s one thing these two guys can agree on: ORACLE® for Macintosh. That’s because ORACLE for Macintosh now turns both HyperCard and 4th DIMENSION into full-function SQL databases. It also gives them transparent connectivity to over 80 different systems, including PCs, DEC VAXs and IBM mainframes—even IBM DB2 and SQL/DS databases.

Special Limited Time Offer
Whatever application you’re currently using—HyperCard or 4th DIMENSION—ORACLE for Macintosh gives you industry-standard SQL. And for a limited time, ORACLE for 4th DIMENSION is included free with every copy of ORACLE for Macintosh. $299* delivers our stand-alone version for your Macintosh. $999** delivers all this, plus transparent access to remote ORACLE and IBM databases on your host systems. So call today. Our 30-day money-back guarantee is your assurance we’ll deliver a four-star performance.

Dear Oracle
20 Davis Dr. • Belmont, CA 94002 • 1-800-ORACLE1, ext. 7835

I have (check one) □ HyperCard 1.2 □ 4th DIMENSION Version 1.0.6 Enclosed is my □ check, or □ VISA □ MasterCard □ AmEx credit card authorization for:

- $199 ORACLE for Macintosh Developer’s Version
  (Includes HyperCard Interface and ORACLE for 4th DIMENSION) $199
- $199 ORACLE for 4th DIMENSION Available June 1989. (I already have ORACLE for Macintosh and 4th DIMENSION) $199
- $999 ORACLE for Macintosh Networking Version
  (Includes an unrestricted license of ORACLE for Macintosh SQL/Net Networking Software and protocols for Macintosh and, for a limited time, ORACLE for 4th DIMENSION) $999

Please add appropriate sales tax $15.95
Shipping and handling $15.95
Total (Offer valid only in USA) $1,474.90

NAME _____________________________________________________________________________
TITLE ________________________________________________________________________________
COMPANY ____________________________________________________________________________
STREET (no P.O. box, please) ____________________________________________________________
CITY __________ STATE ______ ZIP ___________ ________________
TELEPHONE __________________________
CREDIT CARD NO ____________ CARD EXPIRATION DATE ______________
SIGNATURE __________________________________________________________________________

TODAY’S DATE _______ MAC WORLD

[Image of two individuals giving thumbs up]

"I like the seamless way ORACLE gives HyperCard full-power database and networking capabilities. Teaming the total flexibility of HyperCard with the strength of SQL is a masterstroke!"
Dan Shafer, Author of HyperTalk Programming

"I like the seamless way ORACLE opens up minis and mainframes to 4th DIMENSION. Teaming the total flexibility and strength of 4th DIMENSION with SQL is a masterstroke, indeed."
Guy Kawasaki, President of ACHUS, developers of 4th DIMENSION

*Stand-alone version licensed for developers only. Requires Macintosh SE or II with 7MB of RAM, 1.44MB disk space, floppy disk drive, and HyperCard 1.2. Includes 30-day installation support, ORACLE database, Hyper-SQL (HyperCard Interface), SQL/Plus, QD and Pro-C (Macintosh Programmer’s Workshop required for program debugging). System 4/80 and System 4/170 required. "Plus" functionality requires a $299 maintenance upgrade to ORACLE for 4th DIMENSION. "Net" functionality requires a $299 maintenance upgrade to ORACLE for 4th DIMENSION. ©1989, ORACLE.

**Full unrestricted license of ORACLE for Macintosh SQL/Net Networking Software and protocols for Macintosh and, for a limited time, ORACLE for 4th DIMENSION.
Master your Mac.  MACWORLD
Inspiration. Monthly.
Now just $24 a year.

Almost 50% off the annual cover price!

Macworld gives you the know-how to try new applications. The courage to take on power upgrades. The insight to make informed buying decisions. Macworld gives you more, so you can get more from your Macintosh.

News
Previews
Applications
Short-cuts

Reviews
How-tos
Support
Guidance

Create your own Masterpiece.

Enter Macworld's Macintosh Masters art contest.

Our first grand-prize winner, April Gtieman, took home a Macintosh II donated by Apple Computer, Inc. (see reverse for contest details)

3 ways to subscribe!

Mail in the postage-paid card today.
Telephone: 1-800-288-6848 ext. 4889
Dial in: 1-800-950-9753

Subscribe on line with Electronic Mail.
At the login prompt, enter code: 4819
Modem settings: 1200 BAUD, 8-N-1

This ad was created on a Macintosh using Adobe Illustrator, Aldus Pagemaker, Microsoft Word.
The Premiere Macintosh Magazine.
12 issues for just $24.

Plug into the Mac's power:

- Push further.
- Aspire higher.
- Get what you want.
- Learn what you need.
- Master your Mac.
- Macworld, every issue, every month.

Macintosh Masters Art Contest

In 1988 Macworld launched the first-ever Macintosh Masters art contest. The response was enthusiastic—we received hundreds of creative submissions from Mac artists around the world. So we decided to hold the competition annually. This year's winners will be featured in the August 1989 issue of Macworld.

Enter your Masterpiece.

You have until March, 1990 to create your own Mac Masterpiece. The winners will choose from a top-notch assortment of hardware and software donated by contest sponsors. For more information on the Macintosh Masters Contest, write to:

Macintosh Masters
MACWORLD
501 Second Street
San Francisco, CA 94107

Be a Mac master.
Quicken is the absolute fastest, easiest way to do your personal or small business finances. It saves you hours of time while perfectly organizing your finances. With Quicken, you’ll always know exactly how much money you have and where it’s going.

Forget Financial Hassle
Quicken is so automatic, it does your financial work for you. It actually learns your regular bills. Just confirm the payment amounts on your auto loan, utilities, and other bills. Quicken does 14 bookkeeping steps and hands you the printed checks already addressed for mailing. All you do is sign them and seal the envelopes.

Finish Financial Work in Seconds
Instead of dreading tax time, use Quicken to print itemized lists supporting each tax deduction. Or, let Quicken deliver other detailed reports such as income and expenses by category, P&Ls, and budget vs. actual comparisons. Quicken provides complete reports on screen or on paper almost instantaneously. Quicken will finish in seconds the same work that used to take you hours.

No Accounting Mumbo Jumbo
Quicken is as easy as the pen and paper you use now. You’ll see the familiar checkbook and check register right on your screen. The only thing that changes is how fast you finish your financial chores. This is bookkeeping that’s totally hassle-free.

The World’s #1 Selling Financial Software
Here’s why Quicken is the world’s most popular:

...an all-around excellent product. It is one of the best implementations of the Macintosh user interface that we’ve seen; it’s very fast even when running from floppy disk.
—David Beaver, MacWeek

Quicken is a great program. ...Its combination of an outstanding implementation of the Mac interface, sophisticated keyword searching techniques, and a readable, well-designed manual make it the industry standard.
—Ken Landis, MacUser

For Personal and Small Business Use
No other financial software provides more flexibility to handle the wide range of personal or business needs. Quicken is for service and manufacturing businesses, doctors, consultants, designers, retailers, as well as for households. Quicken is ideal for anyone who wants relief from bookkeeping hassles.

Specifications:
Software Compatibility: Exports data in PXL format for use in spreadsheet like Excel® Export data to HyperCard®
Hardware Compatibility: All Macintosh with 512K RAM. All printers, including laser printers. Also available for IBM and compatibles, Apple IIe, IIc, IIci, Mac, and DOS
Capacity Unlimited number of bank accounts. Unlimited number of transactions. Unlimited number of income/expense categories. Maximum amounts to $9,999,999.99
Optional: Quicken+Disk, Quicken+Print

Try Quicken FREE for 30 Days
Order Quicken from the coupon below, or through our toll-free 800 number. If you’re not completely satisfied with Quicken for any reason, simply return it for a full refund. No questions asked.

Call 800-624-8742 (in California, call 800-468-8481), or send this coupon with your check or credit card number to limit.

Name __________________________
Address _________________________
City __________________ State ______
Zip __________________ Phone ______

□ Macintosh version □ IBM version
□ Apple II version □ DeskMate version
□ 3.5-inch disk □ 5½-inch disk
□ Check enclosed (no purchase orders, please)
□ Visa □ MasterCard □ Am Ex

Card Number ______________________
Expiration Date ____________________

Intuit
540 University Avenue
Palo Alto, California 94301

MW 6089
When you combine Aldus PageMaker with Aldus' FreeHand, you have the power to create anything imaginable. And do it faster and easier than ever before.

Today's best-selling desktop publishing and advanced drawing programs give your Macintosh powerful capabilities. And they give you unequalled versatility, control, and productivity for serious desktop publishing.

With Aldus FreeHand, you can produce everything from simple graphics to sophisticated illustrations. Unlike other advanced drawing programs, it lets you see your changes on the monitor while you work. So it's easy to refine a shape or apply PANTONE® Colors without losing sight of the big picture.

And Aldus FreeHand gives you greater text handling capabilities than any other program. Which gives you total control over typography. Curve text on a path, rotate or stretch type, mix sizes, fonts, and colors. You'll spend less time running back and forth to the typesetter. And less money on type.

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. **Offer good in U.S. and Canada only and expires 9/30/89. Aldus, the Aldus logo, and PageMaker are registered trademarks and Aldus FreeHand is a trademark of Aldus Corp. Macintosh is a registered trademark of Apple Computer Inc. PANTONE® is a registered trademark of Pantone, Inc. ©1989 Aldus Corp. All rights reserved.
After you polish your graphics and display type in Aldus FreeHand, place them into PageMaker. And marvel at how well these powerful design tools work together.

Only PageMaker's unique combination of precision and grace can make page layout such a rewarding experience. For both short and long documents. Ruling, kerning, spot color, text flow, wraps. You name it. It's all there, in a familiar environment as natural as your drawing board.

When you combine Aldus FreeHand and PageMaker, you have more than today's most advanced illustration, design, typography, and page layout capabilities. You have a creative edge in business.

Discover today's powerful design team.

Call 1-800-333-2538, Department J-2, for your FREE copy of the Aldus Design Team information packet. Or visit your nearest authorized Aldus dealer.

PENS WHEN YOU ER A FREE HAND.
Computers R Us

Iza Weiman was way off base with her review of Alphabet Blocks by Bright Star [Reviewers, February 1989]. Comparing it to Reader Rabbit was like comparing apples to oranges. My four-year-old daughter enjoys both programs, but for different reasons. The secret to Alphabet Blocks is the phonics, something my little girl is very interested in. She knows this is the code to break if she wants to read, and she can't learn phonics from Reader Rabbit. Alphabet Blocks' questions, reinforcing Elf, letter identification, matching book, and use of the keyboard are more than enough to keep her attention.

Suggesting parents buy wooden alphabet blocks instead of this software was the height of irrelevance. The attraction for children is the computer. Your trashing of a successful program was simply poor reporting.

Bob Solum
Lynnwood, Washington

Changing Fonts in Scanned Text

I recently bought an Apple scanner and was wondering if any of the OCR software reviewed in the February 1989 issue of Macworld ['The Reading Edge'] allow you to change the fonts once the text is placed in a PICT, MacPaint, or TIFF file. If not, what would be the easiest way to change the font after scanning?

N. Calvin Han
Los Angeles, California

You won't be able to alter the font in the scanned text (MacPaint, TIFF, PICT, and so on) while it's a bitmapped graphic. You can change fonts in the conventional way (in your word processor) after the scanned image has been converted to text via OCR software.—Ed.

A Fax Modem Fan

I couldn't believe my eyes when I read Dave Kosior's article "Mac Fax: Not Ready for Prime Time" [March 1989]. I bought my first Mac because as a small-business owner I found computing the best way to take care of all the paper that was piling up on my desk.

I concede that the addition of a scanner could eventually put the price of my unit slightly above that of a stand-alone fax unit. But if I were to follow Kosior's advice, my desk would look like it did before I bought my Mac. Instead, with my fax modem, all the paper that's coming in through the phone lines stays inside my Mac where it belongs.

I wouldn't trade my fax modem for anything, and I think a lot of your readers would feel the same. So, come on, in all fairness, let's give the fax modem a little more credit.

Sam Edwards
Brooklyn, New York

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702) or MCI Mail (addressed to Macworld) Include a return address. We regret that due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld. 

BLUEPRINT

Move Up to Professional 2D CAD for only $449.00

There's no longer any need to pay $1,000, $1,500, and more for 2D CAD on the Mac. Blueprint provides a complete, professional-level system for only $449.00. Graphsoft, producer of Blueprint, has years of experience designing award-winning CAD. With Graphsoft's Blueprint, you get the quality you expect of professional-level CAD backed by a 30-day money-back guarantee. Blueprint offers:

- Layers
- Multiple scales—high accuracy
- Advanced auto-dimensioning
- Built-in DXF translator
- Encapsulated PostScript
- Hierarchical symbol library

Also: Object rotation by degrees, minutes, and seconds, fillets, cubic and bezier splines, full-and quarter arcs, post-rotation by degrees, a constraint palette that lets you create tangents, parallels, and perpendiculars, and draw at any angle. Hatching, mirroring, zoom, auto-join, trim, double lines, full color, witness lines, powerful array duplication plus much much more!!

MACDRAW II USERS: UPGRADE FOR ONLY $299.00! Call today.

Graphsoft 8370 Court House Ave, Suite 202 Ellicott City, MD 21043  •  1-301-461-9488 fax: 1-301-461-9345. In Canada: 604-380-6911 In Australia: 61-7-369-1204

Circle 77 on reader service card.

MACWORLD • AUGUST 1989
Now Your Network Can Go Wherever You Can Go.

No matter where in the world you go, now you can take your office network with you. Because Dial-In Network Access™ from Shiva lets you access your office PhoneNet® or AppleTalk® network from anyplace you happen to be. Dial in from home, a customer's office, a motel room or the middle of nowhere. Use Microsoft Mail™, TOPS™, AppleShare™, a LaserWriter®, or any other network resource just as if you were right there in front of your office Mac. All you need is a phone line, a Macintosh® or IBM-compatible PC and a modem. If you have an IBM-compatible laptop, you don't even need a power outlet! Your office network will need a NetModem™ or a TeleBridge™ with an ordinary modem. Dialing in is easy – just click on a control panel icon and select the remote network you want. It's just as simple on a PC. And you can list different names and communication settings for each network. Wherever you go, now you can take your network along – with Dial-In Network Access.

Call 1-800-458-3550, or write Shiva, 155 Second Street, Cambridge, MA 02141.
Ten Reasons Why FileMaker® Users Are Switching To Panorama™

1. Panorama’s drawing package is far superior for creating and revising forms. In fact, no other database even comes close to Panorama’s drawing capabilities. If you’ve ever struggled with FileMaker® to get a form to look just right, you’ll really love the Panorama difference.

2. Panorama dramatically improves data entry speed and accuracy. If you’re not the best typist in the world (or even if you are) you’ll appreciate our exclusive data entry short-cuts like Clairvoyance® and Value Bars.

3. Recordable macros make anyone a power user. Customize your databases by adding macro buttons and menus.

4. Powerful mail merge does everything but lick the stamps. Panorama can organize and maintain accurate mailing lists, create and print customized form letters and mailing labels, and even calculate postage.

5. Outlines are an indispensable organizational tool you won’t find in any other database. Panorama organizes your data into an outline structure on command, then automatically calculates summaries for each outline level. You can expand the outline to show the detail, or collapse it to see the big picture.

6. Panorama’s built-in charts eliminate the hassle of transferring data to a separate charting program. Each chart is totally integrated with the data, and instantly updates to reflect any change.

7. Panorama’s exclusive Flash Art gallery revolutionizes the way databases handle pictures. Until now, using pictures in a database meant tediously pasting in one picture at a time. Panorama’s Flash Art avoids this time-consuming process by letting you key in pictures by name.

8. Panorama lets you work with both form and spreadsheet views of your data at the same time. Panorama’s row/column view is easy and intuitive to use.

9. Panorama can import your existing FileMaker® data in seconds (over 10,000 records per minute). As an extra bonus, your files will actually shrink by 40 to 90 percent when converted into Panorama. Panorama can also convert data from 4th Dimension®, Double Helix®, Excel®, Works® and many more—all in seconds.

10. If the first nine reasons sound good, wait till you see how incredibly fast Panorama is. Like its award-winning predecessor OverVUE®, Panorama establishes a quantum leap in database performance. Panorama out-searches, out-sorts, out-calculates, and generally outclasses the competition.

For breathing new life into old fields, Panorama wins.” — MacUser

Best New Flat-File Manager
ART BEAT

by Deborah Branscum

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

Artist: Max Seabaugh has been a graphic designer for 20 years.
How It Was Done: The opening art for our feature on system software 7.0 began as a felt-tip-pen drawing on tissue paper. Once the rough drawing was approved, Seabaugh scanned it into his Mac II with an AppleScanner. He saved the file as a MacPaint document and then opened it within Illustrator 88.

The bitmapped image from the scanner stays in the background and can't be manipulated. "The sketch becomes a basis to work from," says Seabaugh. "It's exactly like using tracing paper." The artist uses the pen tool to trace, change, and improve on the initial drawing, and groups objects and colors them as he draws.

Seabaugh worked with cut paper before he began using a computer. "Illustrator can create the same effect as cut paper: shapes made of color lying on top of one another," he says. "And it can be done easily and quickly."

Artist: Ward Schumaker designed several corporate magazines before moving to illustration.
Tools: Mac Plus with 20MB hard drive, AppleScanner, MacPaint.
How It Was Done: Schumaker, a computer novice, was asked to use a Mac for Getting Started. He drew the sketch by hand, scanned in the image, then cleaned it up on screen. He used the mouse to "scribble" the background.

The illustration took two days, including concept, changes, and fine-tuning. "If I had done this in ink and they'd asked for changes, the changes would have taken two hours," he says. "On the computer, it took 15 minutes."

PERFORMANCE THROUGH HARDWARE
The Mac286 and Mac86 open up new windows of opportunity by insuring compatibility with all major MS-DOS application packages. In fact, you can use MS-Windows", AutoCad", Lotus 123", Lotus Symphony", Flight Simulator", while simultaneously executing your favorite Mac program. Fortran, Pascal, and C language compilers can be run in the Mac286 or Mac86 windows. You can now turn your Macintosh II into a full development system.

PERFORMANCE THROUGH FILE SHARING
Transport files from your Mac286 or Mac86 window through the TOPS network to another Macintosh. Copy and Paste graphics from an MS-DOS charting program directly into Microsoft Word", PageMaker", or MacWrite" on your Macintosh. Transport files easily back and forth between Macintosh and MS-DOS formats by using the Mac286 file utilities. With two quick steps, files as complex as AutoCad designs or as simple as text files can be transferred back and forth between the Mac286/86 and the Macintosh.

Circle 265 on reader service card.
The new 16" MultiSync® 4D and 20" 5D both offer compatibility with a wide range of graphics boards and computer systems. Both are optimized for the IBM PS/2, PC/AT/XT (and their 100% compatibles) and the Mac II. Both offer a microprocessor-based digital control system for preset and custom graphics modes, instant screen
bigger.

configuration and optimal image. And both give you great resolution—the 4D, from VGA up to 1024 x 768; the 5D, from VGA to 1280 x 1024.

The only difference: one is for large ideas. The other, for extra-large. For literature, call 1-800-826-2255. For details, call NEC Home Electronics (USA) Inc. 1-800-FONE-NEC.

Circle 257 on reader service card
And then... Maxell created the RD Series.

Never before has this level of Reliability and Durability been available in floppy disks. Introducing the new RD Series from Maxell. Twice the durability of the disks you're now using. Twice the resistance to dust and dirt. And the RD Series is ten times more reliable than conventional floppy disks. The Gold Standard has always meant maximum safety for your data. Now it means even more.
Access for All

Powerless hands, meet the computer

by Steven Levy

normally I seek the future's cutting edge in Silicon Valley, most often within demo rooms and programmers' cubicles. But while technology marches on (insensitive to its own indelible impact), there is another movement, no less important. I am referring to the movement to assure that technology will work for human beings and not against them, that it will work for the good of a unified society and not aggravate an already splintered community.

While many silicon-based dreams will come true (after all, one day someone will come up with a cheap flat-screen monitor), success in this other movement is by no means assured. Yet those in the forefront are determined—and surprisingly optimistic.

To share their views with you, I rode the subway to East Harlem, to the basement of a housing project. Within a cluster of rooms with institutional trappings is a garden of about 40 computers—IBM PCs, Apple IIs, Macs. This is where the Playing to Win (PTW) project each week serves 500 members who otherwise would have little or no access to computers. PTW is a model for the community computing movement, which begs and borrows equipment and grants so that blacks, Hispanics, disabled people, and women can gain a footing in the new world so easily inhabited by white males.

Antonia Stone, PTW's founder, gives me a brief tour of this facility and then invokes the gospel. "The problem," she says, "is that computers could be another divisive element in a society that already has divisive elements." The irony is that computers also have the potential to do the reverse, to empower the powerless—if only the powerless could get their hands on them. So eight years ago Stone vowed to change things. Powerless hands, meet the computer.

On a very small scale this happens at Playing to Win (which, incidentally, receives no government funds). Stone shows me a weekly schedule—all the time slots are filled with a mixture of classes from neighboring public schools, adult literacy programs, vocational and rehabilitation groups, Head Start classes, and open hours where any East Harlem resident can use the computers for a nominal sum. Trained counselors are on hand to help novices. Stacks of software, much of it donated by publishers, are available. The most popular machines, naturally, are the two Macintoshes, gifts from Apple Computer; both have long sign-up lists. Since one of the Macs is equipped with a LaserWriter, PTW can offer desktop publishing services to its members, as well as to local nonprofit groups.

This is all well and good. But let's be realistic here. The problem can't be solved in a Harlem basement. To quote Stone herself, "We serve 500 people, which seems like a lot, but it's not even a drop in the bucket." The fact is, folks, that in this fine land of ours computer access is about as equitably distributed as, say, money. While a certain segment of America has become so comfortable with computers that it has lost the ability to imagine what life was like without that power, other segments still regard the machines with a mixture of distrust and longing.

A FACE IN THE CROWD

And then there is the computer industry itself. Not exactly a picture of equal access and integration. I chanced to scan the audience during a lull at one of the crowded Macworld Expo keynote sessions last January. Of a thousand faces, perhaps two or three were black. The closest thing to soul you see at an Expo is the Yuppy-Motown bands that play the parties. Stone notes that this imbalance is the rule rather than the exception, and when speaking at these events she calls attention to it. Stone hopes one day she won't have to.

So does Santiago Rodriguez. Formerly the affirmative action officer at Stanford University, last year he signed on as head of Apple Computer's newly titled Office for Multicultural Programs. As he outlined the innovative ideas coming from his office, Rodriguez demonstrated a quick (continues)
mastery of Apple-speak. But beneath the jargon, I heard common sense.

"Think of diversity as a value-added perspective in everything we do," he says, explaining why Apple sees its efforts to more fully integrate its work force as not only a responsibility but a good business move. "If you limit talent artificially, you don't get full value. We have an incredible self-interest in doing the right thing."

He admits that Apple has been slow in recognizing this need. "Someone asked me what our biggest problem is (in realizing diversity) was," Rodriguez says. "My answer was that a lot of people don't think there is a problem." This attitude is typical of many in the computer industry who don't realize that extra steps must be taken to include those who might be excluded by business as usual. "One reason our work force is so white is that it grew so fast," Rodriguez says. "We hired by word of mouth and networks, and the people tended to be upper-middle-class whites."

To address this problem, Rodriguez not only uses traditional affirmative action tactics but also creates programs within Apple to remove subtle impediments within the corporate culture that might otherwise keep minorities off the fast track.

**CENTERS OF POWER**

Rodriguez is confident that Apple will attain the diversity it seeks. But the problem, of course, goes much deeper. "We need to level the playing field early on. That is where the Well-Meaning Dream comes in: empower a generation of deprived kids with school programs and community centers like Playing to Win."

Again, the makers of the Macintosh are doing the honorable thing. I talked to Fred Silverman, who manages Apple's Community Affairs group. "We feel very committed to helping people who don't have access to the technology get access to it," he says, also obviously proficient in presenting the official story. "People developing their potential is part of the reason for Apple Computer." Besides donating about $1 million worth of equipment a year to schools, Silverman's group doles out computers to 150 learning centers in 34 states. If by introducing talented youngsters to computers these gifts eventually help integrate the industry, "it would be a wonderful result of our efforts," says Silverman.

**THE LUCKY FEW**

More immediately, these computer centers are helping certain individuals reap dividends from computing now. For instance, in the Computers and You program, run from the Glide Memorial Church in San Francisco, three groups benefit from the bevy of Apple II GSs and Macintoshes on hand. Preschoolers get early exposure to hands-on stuff like Logo. Students in after-school programs use computers to diagnose areas of academic weakness. And adults become familiar with computers and learn applications to help them in the work force.

But as we have seen, these folks are drops in the bucket. The problem is the (continues)
**Programs Plus**

**MODEMS**

- ProModem 2400SE
- Anchor Automation CMS CMS 2400BMX
- Supra Corporation Siring Quartet, Country or Heavy Metal 14. Dinosaur Discovery Kil, Puzzle

**EDUCATIONAL/CREATIVE SOFTWARE**

- Ars Nova Pratica Musica 2.1
- Barron’s Barron’s SAT

**NETWORKING SOFTWARE & HARDWARE**

- CE Software QuickMail 1-10 users 2.0
- Farrallon PhoneNET AppleTalk
- PhoneNET Dim 8 or Dim 69

**PRINTERS & DIGITIZERS**

- Digital Vision Computer Eyes-Mac 209
- Logitech ScanMan Special 349

**BIZNESS SOFTWARE**

- Abacus Concepts StatView II (Mac+, SE, or w/68020 & 68881)
- Nolo Press WillMaker 3.0
- StatView SE+Graphics
- Paracomp Milo
- A.E.C. FastTrack Schedule
- Power Up Fast Forms A/E.C.
- Ashton Tate Full Impact
- For the Record
- BrainPower Architect
- Pro Plus WallStreet Investor V3.0
- Chang Laboratories C.A.T.
- Sutori Software
- MacCalc
- Bulk Mailer 3.2
- Clark’s MacProject II
- Bulk Mailer Plus
- Smartform Designer
- Select Micro Systems, Inc.
- Individual 101 Macros For Excel
- Exaitrix
- Mainstay Capture
- SysTalk
- Mac Flow 3.0
- Systal
- Mac Schedule
- Bulk Mailer 3.2
- Meta Software MetaDesign
- Special 78
- Micro Planner International
- Special 189
- Microsoft Windows 2.0
- Mac Invoice
- Microsoft Excel 1.5
- Special 55

**BUSINESS SOFTWARE**

- ExcelPro 1.0
- RealWorld 1.0
- Microsoft Works 2.0
- Nisus
- Microsoft Excel 1.5
- Metavision
- Nisus
- Microsoft Works
- Microsoft Works 2.0

**DISCIFIT 1.5**

Now there is no excuse for not protecting the information on your hard disk! Quickly and automatically, DiskFit performs an incremental back-up of your hard drive onto standard or high-density floppy's, cartridges, tape or other hard drives. Allows you to select the type of files for back-up and finder-readable storage format lets you copy single files from the back-up media in the Finder. $53.
Simply Accounting by Bedford Software

Simply Accounting, for small to medium size businesses, is sophisticated enough to please CPA's but simple enough to allow accounting and computer neophytes the power of a full accounting program. Includes general ledger, accounts payable, accounts receivable, payroll (50 state and federal tax schedules built-in), inventory and jobcost. It received a 7.9 rating from InfoWorld and four mice from MacUser. ............ $219.

UTILITY SOFTWARE

<table>
<thead>
<tr>
<th>Utility Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Systems, Inc. CanOpener</td>
<td>79</td>
</tr>
<tr>
<td>A.L.Soft Starter Juggler</td>
<td>64</td>
</tr>
<tr>
<td>Microdisk</td>
<td>49</td>
</tr>
<tr>
<td>Disk Express</td>
<td>49</td>
</tr>
<tr>
<td>Font/DA Juggler Plus</td>
<td>42</td>
</tr>
<tr>
<td>A.S.D. FileGuard</td>
<td>Special 129</td>
</tr>
<tr>
<td>Berkeley System Design</td>
<td>55</td>
</tr>
<tr>
<td>Stepping Out II</td>
<td>52</td>
</tr>
<tr>
<td>Beyond Inc. Menu Fonts 2</td>
<td>26</td>
</tr>
<tr>
<td>Central Point Software</td>
<td>20</td>
</tr>
<tr>
<td>Copy II Mac (Includes MacTools)</td>
<td>20</td>
</tr>
<tr>
<td>PC Tools Deluxe Mac</td>
<td>42</td>
</tr>
<tr>
<td>CE Software</td>
<td>Special 57</td>
</tr>
<tr>
<td>QuickKeys (Macro Program)</td>
<td>69</td>
</tr>
<tr>
<td>MockPackage Plus Utilities</td>
<td>32</td>
</tr>
<tr>
<td>Farallon Computing Screen Recorder</td>
<td>133</td>
</tr>
<tr>
<td>Fifth Generation Systems</td>
<td>45</td>
</tr>
<tr>
<td>Suitcase II</td>
<td>119</td>
</tr>
<tr>
<td>FastBack II</td>
<td>35</td>
</tr>
<tr>
<td>Power Station</td>
<td>15</td>
</tr>
<tr>
<td>HJC Virex</td>
<td>49</td>
</tr>
<tr>
<td>Icon Simulations On Cue</td>
<td>35</td>
</tr>
<tr>
<td>Insight Development</td>
<td>79</td>
</tr>
<tr>
<td>MacPrint</td>
<td>Special 79</td>
</tr>
</tbody>
</table>

DESK ACCESSORY PROGRAMS

<table>
<thead>
<tr>
<th>Desk Accessory Program</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affinity Microsystems</td>
<td></td>
</tr>
<tr>
<td>Tempo II</td>
<td>89</td>
</tr>
<tr>
<td>Afnitio</td>
<td>45</td>
</tr>
<tr>
<td>Casady &amp; Greene, Inc</td>
<td>32</td>
</tr>
<tr>
<td>QuicDex 1.4A</td>
<td></td>
</tr>
<tr>
<td>CE Software DiskTop</td>
<td>32</td>
</tr>
<tr>
<td>Deneba Software</td>
<td>62</td>
</tr>
<tr>
<td>Comment 2.0</td>
<td></td>
</tr>
<tr>
<td>Jam Software</td>
<td></td>
</tr>
<tr>
<td>Smart Alarms w/ Appl. Diary</td>
<td>65</td>
</tr>
<tr>
<td>Multi-User Appl. Diary w/ Smart Alarms</td>
<td>115</td>
</tr>
<tr>
<td>Mainstay Think 'n Time</td>
<td>59</td>
</tr>
<tr>
<td>Solutions, International</td>
<td></td>
</tr>
<tr>
<td>Super Glue</td>
<td>49</td>
</tr>
<tr>
<td>SmartScrap &amp; The Clipper V2.0</td>
<td>46</td>
</tr>
<tr>
<td>Symmetry HyperOA (Req. 512K)</td>
<td>35</td>
</tr>
</tbody>
</table>

MAC-101 Keyboard by DataDesk

Replace your Mac's keyboard with the MAC-101 by DataDesk. The positive tactile, firm feel 101 includes a full numeric keypad, 15 function keys, 6 page control keys, and a T-style cursor pad. Includes 101-Keys desk accessory software, a powerful macro utility that allows you to exploit the full power of the function keys in almost any Mac application. Available in ADB and non-ADB versions. ............ $145.

DATABASE MANAGEMENT

<table>
<thead>
<tr>
<th>Database Management Program</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acris 4th Dimension</td>
<td>Special 365</td>
</tr>
<tr>
<td>Activation</td>
<td></td>
</tr>
<tr>
<td>Report for Hypercard</td>
<td>69</td>
</tr>
<tr>
<td>Focal Points &amp; Business Class Bundle</td>
<td>49</td>
</tr>
<tr>
<td>Apple Computer HyperCard</td>
<td>42</td>
</tr>
<tr>
<td>Borland Reflex Plus</td>
<td>169</td>
</tr>
<tr>
<td>Claris FileMaker II</td>
<td>229</td>
</tr>
<tr>
<td>Fox Software FoxBase+</td>
<td>205</td>
</tr>
<tr>
<td>FoxBase+ Multi-User</td>
<td>315</td>
</tr>
<tr>
<td>FoxBase+ Runtime</td>
<td>125</td>
</tr>
</tbody>
</table>

SPELLING & GRAMMAR CHECKERS

<table>
<thead>
<tr>
<th>Spelling &amp; Grammar Checker</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aegis Development</td>
<td></td>
</tr>
<tr>
<td>Doug Clapp’s Word Tools 2nd Edition</td>
<td>42</td>
</tr>
<tr>
<td>Deneba Software</td>
<td>62</td>
</tr>
<tr>
<td>Sensible Software</td>
<td>115</td>
</tr>
<tr>
<td>Electronic Arts Thunder II</td>
<td>52</td>
</tr>
<tr>
<td>Lundeen &amp; Associates</td>
<td>46</td>
</tr>
<tr>
<td>WorksPlus Spell</td>
<td></td>
</tr>
<tr>
<td>Microlytics, Inc.</td>
<td></td>
</tr>
<tr>
<td>Word Finder (Synonym Finder)</td>
<td>33</td>
</tr>
<tr>
<td>Electronic Word Finder</td>
<td>79</td>
</tr>
<tr>
<td>Sensible Grammar or Book Ends</td>
<td>53</td>
</tr>
<tr>
<td>Working Software</td>
<td>45</td>
</tr>
<tr>
<td>Spellsell 2.0</td>
<td></td>
</tr>
</tbody>
</table>

FileGuard by ASD Software

FileGuard is the automatic file protection program that provides a comprehensive solution to all your problems of security and confidentiality. This integrated software will enable the user to easily encrypt and decrypt documents for protection against unauthorized access. FileGuard is so transparent that it will not alter the habits of Macintosh users in any way. ............ $129.

FAX: 203/381-9043
Inquiries: 203/378-3662
Canada: 1/800/344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497
1/800/832-3201
**ACCOUNTING PACKAGES**

**ACCOUNTING PACKAGES**

<table>
<thead>
<tr>
<th>Package</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hayes Smartcom II 3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compuserve Navigator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freesoft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DataViz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prentice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacLink Plus/Translator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacPlot by Micro Spot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powerful MacAccounting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simply Accounting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chang Labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rags to Riches Gen. 3-Pak 3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rags to Riches GL, AR, or AP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Mark MultiLedger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payroll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash Ledger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dac Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disc-Easy Light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inutil Quicken</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMMUNICATION SOFTWARE**

**COMMUNICATION SOFTWARE**

<table>
<thead>
<tr>
<th>Package</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compuserve Starter Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsuite Navigator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dataviz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacLink Plus/Translator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freesoft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Ryder II 10.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hayes Smartcom II 3.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FASTAT by SYSTAT**

**FASTAT by SYSTAT**

**FASTAT by SYSTAT**

**GRAPHICS SOFTWARE**

**GRAPHICS SOFTWARE**

<table>
<thead>
<tr>
<th>Software</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G Graphics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Images w/Impact Graphics &amp; Symbols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Images w/Impact Business 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characterizer v. 88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streamline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe Collector's Ed. 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newsletters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forms &amp; Schedules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITG Catalogue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helvetica Condensed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stencil, Hobo, Brush (63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life (63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concert (64)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gothic 10/Tempo (65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adobe Fonts (Various variants)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aldus Freehand</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STUDIO/1 by Electronic Arts**

**STUDIO/1 by Electronic Arts**

**STUDIO/1 by Electronic Arts**

<table>
<thead>
<tr>
<th>Software</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MathSoft MainCAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro: Maps MacAtlas Hyper Attas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashton Tale Full Paint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broderbund Print Shop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawing Tables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casady &amp; Greene Vivid Impressions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gull Pack (vol. 6 &amp; 20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headline Pack (vol. 10-12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern Pack (vol. 7, 14-16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distinctive Pack (vol. 8, 19-22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carson Pack (vol. 3-6, 8-13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE Software Calendar Maker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claris MacPaint III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claris MacPaint II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claris MedPaint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claris Cad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracomp Silvex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IaconiC Graphics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silicon Beach Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Darkroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super 33 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solutions International</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Curator (Catalog Your Art)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Springboard Certificate Maker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Springboard Publisher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuperMac Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.I.R. Studio 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synergy Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picture Base &amp; Wet Paint Bundle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synergy KaleidaGraph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T/A Master Christian Images</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click Art EP3 Illustrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zenker DeskPaint 2.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MacEnvelope 4.0 by Syntex**

**MacEnvelope 4.0 by Syntex**

**MacEnvelope 4.0 by Syntex**

<table>
<thead>
<tr>
<th>Software</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
</table>

**MacEnvelope 4.0 by Syntex**

**MacEnvelope 4.0 by Syntex**

<table>
<thead>
<tr>
<th>Software</th>
<th>Year</th>
<th>Price</th>
</tr>
</thead>
</table>
Now Toll-Free
In Canada
1-800-344-7753

Monday thru Friday
9 a.m. - 9 p.m.
(Eastern Time)
Saturday
9 a.m. - 6 p.m.
(Eastern Time)

SPECIALS good through August 31, 1989

Insight Expert Accounting Series
by Layered Inc.

A series of stand-alone or fully integrated accounting modules for general ledger, accounts receivable/billing, accounts payable, payroll, inventory control and time billing which gives you answers, advice and analysis. Now includes Data Import! ....... $409.

WORD PROCESSORS & DESKTOP PUBLISHING

Access Technology Mind Write 2.0 95.
Mind Write Express 135.

Allan Bonadio Associates
Expressionist 2.0 79.

Adobe Corporation
Adobe Photoshop 139.

Apple Computer
HyperCard 2.0 (boxed) 129.

Arizona Corporation
Symantec Lightspeed C 165.

Artistic Systems
Lightspeed Pascal 95.

Buzza Software
Just Enough Pascal 49.

Cayuga Computing
Tenpoint FocalPoint II 119.

Checkpoint
Trendware Corporation Stack Cleaner 29.

Claris Corporation
HyperTools 1 or 2 58.

Colin Systems
HyperTools 1 or 2 58.

DataCall Software
HyperTools 1 or 2 58.

Davidson Systems
Data Import! 409.

Dow Jones
Microsoft Word 4.0 255.

Electronic Arts
Paragon Concepts Nisus Special 259.

Extra Value
Preferred Publishers 59.

Fujitsu
Quark, Inc. 489.

Gale Inc.
QuarkXPress V2.0 489.

Genealogy
QuarkStyle 119.

Gloria Software
Symantec More II 255.

Heiman
Symmetry Acta Advantage 65.

IBM
X/Maker Company 109.

Intelligent Software
Working Software 179.

Juran Associates
Working Software 179.

Kaboodle Software
Working Software 179.

Knowledge Systems
QuickLetter 75.

LaserSoft
HyperCard 2.0 (boxed) 129.

Learning International
HyperTools 1 or 2 58.

Microsoft
Microsoft Word 4.0 255.

MicroPro
Vantage 59.

MicroPro
Quark, Inc. 489.

MicroPro
QuarkXPress V2.0 489.

MicroPro
QuarkStyle 119.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.

Microsoft
Microsoft Word 4.0 255.
FastTrack Schedule 1.02

**Our Policy**

★ VISA and MASTERCARD accepted. No surcharge.
★ Your credit card is not charged until we ship.
★ If we must ship a partial order, the shipment that completes the order is sent freight free.
★ All shipments insured; no additional charge.
★ Upon receipt and approval, personal and company checks now clear the same day for immediate shipment.
★ No sales tax except orders shipped within CT, add 7.5% tax.
★ COD maximum $1000, cash or certified check.
★ 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. Prices subject to change without notice. All items subject to availability.
★ Call us anytime Monday thru Friday 9:00 to 9:00 Eastern Time, or Saturday 9:00 to 6:00 Eastern Time. You can call our business offices Monday thru Friday 9:00 to 5:30 Eastern Time at (203) 375-3560.
★ Purchase Orders accepted at our discretion, for more information call (203) 378-1926, 9:00 to 5:30 Eastern Time.

**Shipping**

★ Continental U.S.: Add $3.00 per order to cover Airborne Express Overnight, unless UPS ground delivers next day. Some areas require an additional day.
★ All (instock items) ordered by 6:00PM Eastern Time Monday thru Friday will ship that evening. Barring computer failures or other catastrophes.
★ Mail-in orders (especially from foreign countries), please furnish telephone or fax number.
**MacPrint 1.1 by Insight Development**

Introducing MacPrint 1.1, an easy-to-use software package that lets you use virtually any Mac application on alternative printers. Including HP LaserJet 1+, HP LaserJet II and compatible plus the HP DeskJet and DeskJet Plus. Use MacPrint 1.1 for true WYSIWYG performance. Four Compugraphic font families are included with point sizes from 8 to 96. Completely transparent after installation. ... $79.

**DISK DRIVES/HARD DISKS/UPGRADES**

| 1 Meg SIMMS | Call | MacSnap 548 ($12K to 2MB) | 459. |
| CMS | MacSnap 54ER ($512E to 2MB) | 549. |
| SD Ser. | MacSnap 548S ($512E to 2MB) | 549. |
| SD Ser. | MacSnap 548S ($512E to 2MB) | 599. |
| Cutting Edge | MacSnap Plus 2 (MacPlus to 2MB Non Expandable) | 499. |
| Cutting Edge Wedge XL 30 | Special | 149. |
| Plus SCSI Hard Drive | MacSnap 26E or 1024 Option | 1MB or Mac II Memory Exp.) | 499. |
| Cutting Edge Wedge XL 45 Plus SCSI Hard Drive | Special | 119. |
| Plus SCSI Hard Drive | Mobius Technologies | Special | Call | MultiScreen Video Card | 349. |

**MicroPhone II V3.0 by Software Ventures**

This stunning new version of the top telecon software for the Mac offers the most comprehensive collection of life transfer protocols including ZMODEM, unmatched power in scripting, color, sound and support for XCMDs and XFCNs. ... $219.

**ENTERTAINMENT SOFTWARE**

| Access | World Class Leader Board Golf | 26. |
| Accolade | Hard Ball or Mean 18 | 27. |
| 4th & Inches | Universal Military Simulator or Manhole | 27. |
| Avricion | Might and Magic | 26. |
| Borderbound | Ancient Art of War or Alien Sea | 27. |
| Cutting Edge Wedge XL 30 | Shuffel/Puck Cafe | 24. |
| SimCity | BullsEye Software | 27. |
| Cutting Edge Wedge XL 45 Plus SCSI Hard Drive | Crystal Quest | 26. |
| Cutting Edge Wedge XL 45 Plus SCSI Hard Drive | Crystal Quest w/Critter Editor | 28. |
| Dolphin Systems | CrapsMaster, RouletteMaster | 28. |
| Flipper 44 | Blackjack Ace | 42. |
| Integra Series 20-80 | Blackjack Master or BaccaratMaster | 27. |
| Personal Computer Peripherals | Casino Master | 54. |
| Platinum Card | Casino Master (Mac II) | 55. |
| Personal Computer Peripherals | Platinum Card | 999. |
| Optional Built-In Modems | (Mac II) | 999. |
| MacBottom HD 45 | (4MB SCSI Hard Disk) | 789. |
| MacBottom HD 70 | (7MB SCSI Hard Disk) | 999. |
| MacBottom HD 84 | (8MB SCSI Hard Disk) | 1249. |
| Video Technology | Laser 800k External Drive | 165. |

**Smart One 2400XMAC by Best Data Products**

The Smart One 2400XMAC — a complete package for the Mac. Includes free communication software, free cable assembly, free access to CompuServe and Con-nect Professional Information Network, 100% Hayes compatible. Two year warranty. ... $169.

**Go Master & Joseki Tutor by Toyogo, Inc.**

*Go: the oriental strategic board game. Go Master ($49): world's strongest playing program, "one of the most extraordinary automated aids to Go instruction developed." (MacWorld June '89). Joseki Tutor ($30): advanced comer-opening study.*
whole damn ocean. It seems more than daunting. It seems hopeless. Yet as I spoke to people in the movement, I was struck by rampant optimism.

Nobody underestimated the problem, but everybody seemed to think that we could get a handle on it. How? By massive expansion of the programs in operation. Organizations like Playing to Win and Computers and You see themselves as pioneers who will lend their experience to other groups. The Well-Meaning Dream would have us imagine a computing center in every community that needs one.

“When there are 20,000 access centers, you won’t see any problem,” says Margaret Barclay, PTW’s director of development. Timothy C. Jamerson II, who manages Computers and You, seconds the notion. “I’m totally optimistic,” he says, “that this is a viable solution to the imbalance in computing access.”

There are real problems imagining how this particular dream could become reality. Take, for instance, the corporations now donating machines by the hundreds. How eager will they be to donate computers by the tens of thousands? But perhaps we should take a cue from the people who claim that good works will yield results. Let’s call those unmentioned, but obvious problems—are you listening, Norman Vincent Peale—challenges.

Most important, these challenges are not simply for other people: they are challenges for us, those who live for computers and make a living by them. Using computers to empower people will not succeed as a spectator sport: it will only work if we recognize its importance, and do something about it.

I’m going back to that computer center in East Harlem to donate some surplus equipment and share some of my skills. And here’s why: the day of my visit to the center, I listened as one of the center’s counselors introduced a young black man to telecommunicating. The two of them sat side by side in front of a Mac SE hooked up to CompuServe, from which they accessed the Online Airline Guide.

“See, you choose your destination,” said the counselor. “London, Rome, Paris, wherever you want to go. Then you can choose what time you want to go. And then you can book your ticket and even choose your seat.”

The young man, who I later learned had never touched a computer before, surveyed the screen. He scrolled madly through the flight listings. He seemed enraptured. For that moment, the world was at his fingertips.

For more information, contact Playing to Win, 1449 Lexington Ave., New York, NY 10128, and Computers and You, Glide Memorial Church, 330 Ellis St., San Francisco, CA 94102.

Steven Levy is a Macworld columnist and the author of The Unicorn’s Secret: Murder in the Age of Aquarius (Prentice-Hall, 1988).
It takes quite a booklet to show you all the terrific ways Apple Desktop Media™ can help you express your ideas.

If you've ever worked with an Apple® Macintosh® computer, or watched someone working on a Macintosh, you know that it had to happen. The ability to command a whole world of communicating without leaving your chair.

To create what you need to get your ideas across with maximum impact. Not just in one medium, but in all media.

That's Apple Desktop Media™. And to show you what it's all about, we'd like to place something else on your desk.

An especially beautiful and informative booklet.

You can get a copy just by mailing in the coupon on the right.

But here's a little sampling of what it's about.

For the printed page, you probably already know how a Macintosh can help you produce better-looking memos and reports. And do them faster than ever before.

Now imagine incorporating the visual impact of high-quality graphics.

Even photographs. And retouching or modifying them right on screen. Even adding special effects. And still printing right from your desktop. In color or black-and-white.

Now imagine doing all of that for 35mm slides or overheads. With the final product just the way you want it.

Now imagine doing all of that in live media. Creating your own interactive demonstrations with HyperCard® Where individuals can choose just what they want to know more about.

Or having your message seen and heard with real animation. With characters that can walk or talk. Along with a full soundtrack.

But why go on?

Our fascinating booklet awaits you.

Send in the coupon or call our toll-free telephone number.

And see just how much impact you can generate without even leaving your chair.

The power to be your best™

Mail this coupon or call toll-free 1-800-732-3131, Ext. 200.

And all it takes to get the booklet is this.

Mail to: Apple Desktop Media™ Booklet
Apple Computer, Inc.
P.O. Box 751630
Memphis, TN 38175-9967

Please send me your booklet telling all about Apple Desktop Media™. Of course, the booklet is free.

Name ___________________________
Address _________________________
City ____________________________
State ___________________________
Zip _____________________________

Phone ___________________________

Offer expires October 31, 1989.
NO MATTER WHAT YOU FEED YOUR SCANNER, ACUTEXT CAN READ IT.
Finally artificial intelligence comes to OCR.

Introducing AccuText™ document scanning software by Datacopy. The first Optical Character Recognition software that truly allows you to watch your p's & q's.

Unlike other products, Datacopy's AccuText is one of the first true applications of artificial intelligence. It actually thinks and learns as it works.

Scan thousands of typestyles and AccuText will recognize them.

Scan a poor-quality photocopy or facsimile and AccuText will decipher it.

And when you show AccuText a document, it will reconstruct its format automatically—headlines, italics, and underlines. Spacing, linefeeds, and indents. Even justification and tabs.

Plus, the built-in 50,000 word lexicon insures that your input will always form legal words in their intended sequence. Which means that amiable won't become amiable. All of which means that the proofreading normally associated with scanning is virtually eliminated.

What's more, AccuText is compatible with the leading scanners—Datacopy's complete line of scanners, Hewlett-Packard's ScanJet™ and ScanJet Plus™, the Apple Scanner, and others.

The best part is that AccuText transfers all of your information into your current word processing, desktop publishing or spreadsheet programs.

If all of this sounds too good to be true, pick up the telephone and dial (800) 821-2898. We'll tell you all about AccuText from A-Z and where to find your nearest dealer.

Give us a call. And give your current software a little R & R.
Our new Mac II modem has great inner strength.

From the moment you slip Ven-Tel's new Mac2400E™ internal modem into your Mac® II, you'll see that it's quite a bright performer. Using MNP™ Level 5 data compression to send and receive at a sharp 4800 bps, the Mac2400E greatly reduces telephone time. Which, of course, nicely reduces telephone bills.

Plus, the Mac2400E supports both X.PC and MNP Level 5 error correction protocols. So you can rest assured that the integrity of your data won't be dimmed.

In the unlikely event the Mac2400E doesn't perform, it's covered by our free, five-year warranty. However, before it comes to that, just call our 800 Help Line. Ven-Tel's technical staff can probably shine a little light on the problem and get you going again quickly.

So don't just put any modem in your Mac II. Go with the one that outshines all the rest.

For complete details about our new Mac2400E internal modem, call 800-538-5121.

MNP is a trademark of Microcom, Inc.
The Mac2400E is a trademark of VenTel, Inc.
Mac II is a registered trademark of Apple Computer, Inc.

Circle 469 on reader service card
Recycled machines are big business. The total used-computer market for 1989 is expected to reach $1.8 billion, according to the National Association of Computer Dealers. Most computers are sold privately, but there are other sources.

Sun Remarketing and Maya Computer specialize in used Macintoshes and peripherals. Sun was founded in Logan, Utah, in 1983. The company resells and services used Macs and discontinued Apple computers. Two-year-old Maya Computer, based in Waitsfield, Vermont, is similar but also lists sales through online information services.

Brokerages in Boston and New York offer yet another way to buy and sell used computers. The Boston Computer Exchange, established in 1982, acts as a broker between buyers and sellers nationwide. It is listed on CompuServe, or you can call directly. The seller is charged a flat 10 percent commission on each transaction. Buyers don’t receive a warranty but have 48 hours to make sure the equipment works before the exchange pays the seller.

New York’s Computer Brokerage Services, which began business in 1987, is virtually identical in operation to the Boston Computer Exchange, but is smaller.

I’ve heard favorable reports about online classifieds, but be careful. Make sure you can return your purchase if it doesn’t work. A classified ad in the local newspaper got one satisfied Macworld editor her Mac Plus. For other leads check the Sybex Computer Blue Book, compiled by the National Association of Computer Dealers. The $12.95 Blue Book includes suggested prices for personal computers and peripherals. It also lists a directory for used dealers.

Conventional wisdom seems to be that used Pluses are a good buy. “It’s usually cheaper to buy a used Plus than to buy a used older machine and then upgrade,” says Dave Etchells, president of Perspect System, of Venice, California. Then again, sometimes buying a new Plus is not much more expensive than a used one. A used Plus can range from $900 to $1100; new ones sometimes retail for a street price of $1300. (“Price Parade” lists used Mac prices at selected dealers.) If you’re planning to add an accelerator or large display board later, an SE may be worth the extra cost. You may also be able to get a bargain on a used Mac II; sources say it’s a buyer’s market now.

Once you’ve found a machine, carefully check it out for signs of neglect or worse. Look at the outside of the case for dirt or an excess of dust in the ventilation slots. Nicks or marks at the back may indicate that a compact model has been opened without the benefit of Apple’s official gadget. Has the owner opened the machine? Why? Has the memory been upgraded? SIMMs are preferable to other memory upgrades because of their construction and low power consumption, according to Marc Duisenberg, also known as Dr. SIMM at ComputerWare in Palo Alto, California.

Does the machine have a fan? Heat is the biggest enemy of Mac Pluses and earlier models. Ask how old the computer is, how long the owner has had it, and if the power supply has been replaced, advises Duisenberg. “On a Plus and a 512, the power supply is almost guaranteed to need replacement. It’s almost like a time bomb.” Steve Sawyer, managing partner of CJS Systems in Berkeley, California, says between 30 and 50 percent of older Macintoshes suffer power-supply failures.

(continues)
GOOD NEWS FOR SUITCASE USERS

HOW TO JUGGLE THE MOST FONTS FOR THE LEAST MONEY

ALSoft's NEW MasterJuggler 1.5 gives you amazing resource handling power with unprecedented access to an unlimited number of fonts, DA's, F-Keys and sounds. • Now, you can open up to 120 resource files instantly— that's 20% more files than with Fifth Generation's Suitcase™. • MasterJuggler 1.5 also has FontDirector™, the remarkable new feature which automatically eliminates all font NFNT numbering conflicts without resorting to utilities which modify your fonts. Suitcase can't even touch that. Not at any price. • Plus, only ALSoft's new MasterJuggler 1.5 lets you handily open applications or documents and switch between multiple applications from within any application. But just because you have Suitcase, doesn't mean you have to be stuck holding the bag.

HOW TO GET THE NEW MASTERJUGGLER 1.5 PACKAGE

<table>
<thead>
<tr>
<th>IF YOU NOW OWN ANY VERSION OF:</th>
<th>SEND TO ALSOF</th>
<th>COST</th>
<th>S&amp;H</th>
<th>LIMIT 1 PER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitcase</td>
<td>Photocopy</td>
<td>$25.00</td>
<td>$3.00</td>
<td>Customer</td>
</tr>
<tr>
<td>Font/DA Juggler Plus</td>
<td>manual</td>
<td>$25.00</td>
<td>$3.00</td>
<td>Customer</td>
</tr>
<tr>
<td>MasterJuggler</td>
<td>cover</td>
<td>$25.00</td>
<td>$3.00</td>
<td>Customer</td>
</tr>
<tr>
<td>First time buyer</td>
<td></td>
<td>$89.95</td>
<td>$3.00</td>
<td>Unlimited</td>
</tr>
<tr>
<td>1.5 Update Only*</td>
<td>Registered</td>
<td>$10.00</td>
<td>$3.00</td>
<td>Registered</td>
</tr>
</tbody>
</table>

Whether you're in a large network, or you're one person juggling hot projects with a Mac and a mouse, the new MasterJuggler 1.5 will make a big difference.

ALSoft, Inc.
P.O. Box 927, Spring, TX 77383-0927
713/353-4090

Circle 202 on reader service card.

And a new power supply doesn't come cheap. Having the board replaced by an Apple-authorized dealer can add up to $250 to the cost of the machine. So try to find a machine that has an upgraded power supply and add a fan, if there's not one already, to protect your investment.

Look at the screen with the machine turned off to check for phosphor burns. If you can see a negative image of the menu bar, you've got burned phosphor, and the CRT may need to be replaced. Now fire up the computer. Take a look at the screen again. Some older SEs suffer from screen jitters as well as infamous loud fans. Apple will repair SEs with screen jitter at no charge, provided the serial number precedes F749xxxx. Does the video display suffer an intermittent ragged right-hand edge or momentary screen blackouts? The power supply may have a solder-joint problem. Etchells says you can check by gently but firmly rapping the left side of the case while the computer is on. Waverering, lines running down the screen, and a shifting display are also solder-joint symptoms.

Take the machine for a test drive with your favorite program. Let the computer warm up to full operating temperature, which takes 15 to 20 minutes. Plug in and test everything: mouse, keyboard, hard drive, floppy drives. Does the Macintosh format, copy disks and folders, and print? Can the hard disk be formatted? Problems (continues)
Now you can feed high-resolution four color artwork directly into your computer system, and get color reproductions that will astound you with their accuracy.

The new Sharp JX-450 makes it possible—a desktop phenomenon that marks a quantum leap in publishing and presentation graphics systems.

Sharp's resolution of 300 dots per inch provides scanning equal to conventional console types, and gives accurate, finely detailed images with every nuance captured. Also, 64 shade gradations for each element seize the subtlest details, and yield a color tone capacity of over 260,000 shades. Even when you use it with a black or white Mac system, it gives superior grey gradations and middle tones.

Scanning capacity is up to 11"x 17"—enough to scan a two page spread. It will also scan 35mm and overhead projection film with an optional mirror unit. Picture, if you will, how a two-page spread of finely colored images could enhance and dramatize your presentations.

All this, in an attractive desktop size.

To create exquisite, economical hard copies of your color graphics, Sharp also offers the companion JX-730 four color inkjet printer.

Once again, Sharp shows its true colors. For more information: 1-800-BE-SHARP.
Multiple choice.

SuperMac standard graphics subsystems. A complete family of graphics cards and monitors for your business and your budget.

The first. And still champion.

When Apple® introduced the first color Macintosh®, SuperMac® was first with a large display. The SuperMac 19" color monitor, combined with our 8-bit Spectrum color graphics card, extended the performance of the new Mac®. And enabled new users to work more effectively with the sophisticated new wave of color software.

Today, SuperMac gives you even more ways to improve your work. With a new generation Spectrum/8." And a complete family of color, grayscale, and monochrome subsystems. So you can choose the right graphics card and monitor for your work—and your budget.

And take full advantage of desktop publishing and presentation programs. Databases and spreadsheets. On any Macintosh II or SE system.

The Spectrum/8 (Series II) card for the Macintosh II. Get 256 colors or shades of gray on the most popular monitors. Including ours.

The Spectrum/8 supports all of Apple's standard graphics modes—1, 2, 4, and 8 bit. With up to 256 colors or shades of gray on a 1024 x 768 pixel display, the full area of SuperMac's 19" monitor. For sharp, brilliant images that look just the way they'll print.

And its unique Virtual Desktop™ gives you the same area on smaller monitors, like Apple's 13" color or 12" monochrome displays. Just move your mouse, and hardware pan allows you to instantly view any part of an image that can't be displayed on screen at once. And hardware zoom gives you 2x magnification with a single keystroke.

And when 256 colors aren't essential, the Virtual Desktop lets you work in 2-, 4-, and 16-color modes. So you can reduce the number of colors on screen to enlarge your display up to 4096 x 1536 pixels.

The Spectrum/8 works with SuperMac's 16" and
19" high-performance color monitors, based on Trinitron® technology. With our standard 19" color and grayscale displays. Plus Apple's 13" color and 12" monochrome monitors.

It's the only card that does it all. In color or grayscale. For large screens or small.

SuperView for the Macintosh II family and Macintosh SE. To make the biggest projects as simple as black and white.

Designed exclusively for our 19" monochrome monitor, SuperView provides a display nearly five times larger than the Macintosh SE's built-in screen.

So you'll have all your work, like large databases and spreadsheets, right before your eyes. Exactly like it will print.

And SuperView's new software provides dual-screen, zoom, and projection screen modes to help you get the most out of your SuperView/Mac SE monitor combination. Plus big cursors and menus, and a built-in screen saver to make small work of even your largest tasks.

Now there's a Spectrum/8 (Series II) designed just for the Mac SE/30.

We're first again. Supporting Apple's first compact color machine, with the Spectrum/8 for the Macintosh SE/30. Delivering the same high-performance capabilities we pioneered for the Macintosh II. Including the ability to support multifrequency monitors, and industry-standard NTSC monitors and projection equipment.

The choice is yours, at your authorized SuperMac dealer.

See your authorized SuperMac dealer today. And choose the SuperMac standard graphics subsystem that's right for your Mac, your business and your budget.

Use hardware pan to move instantly to any part of an image. Even if it doesn't fit on screen. And zoom to see your work at up to 2x magnification.

The first. And still champion.

SUPERMAC TECHNOLOGY

4850 Platte Avenue • Sunnyvale, CA 94086
408.245.2202

© 1989 SuperMac Technology All Rights Reserved SuperMac, Spectrum/24, Spectrum/8, SuperView and Virtual Desktop are trademarks of SuperMac Technology. Apple, Macintosh and Mac are registered trademarks of Apple Computer, Inc. All other brand and product names are trademarks of their respective holders.
Now anything you write, from a business letter to an annual report, can be stronger and clearer. With Sensible Grammar™, a professional proofreading program that uses artificial intelligence to check your punctuation, usage, phraseology and more.

Sensible Grammar scans your work for potential errors and automatically displays the sentences in which they appear. It explains what’s wrong and even suggests corrections. Making changes is easy—a simple click of the mouse, and you can do anything from inserting proper punctuation to rewriting entire sentences using the built-in sentence editor. And your formatting information remains unaffected.

Sensible Grammar compares your text against a library of over 4500 phrases to identify informal, vague, racist, sexist, exist and other faulty language. It catches embarrassing typographical errors like misused capitalization and repeated words, and alerts you to mismatched verbs and pronouns, needlessly long sentences and more. It even provides a readability analysis.

Sensible Grammar works with WordPerfect, Microsoft Word, Works, and Write; Apple/Claris MacWrite, TlMaker WriteNow and text files. And it costs just $99.95.

So get Sensible Grammar. And be the most effective communicator you can be.

Also available: Bookends Extended,™ the reference management database and bibliography preparation system ($99.95).

---

**PRICE PARADE**

<table>
<thead>
<tr>
<th>Warranty</th>
<th>Mac Plus</th>
<th>USED PRICE</th>
<th>TRADE-IN VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-hour</td>
<td>$900</td>
<td>$2175</td>
<td>$2295</td>
</tr>
<tr>
<td>6 months</td>
<td>$1050</td>
<td>$2300</td>
<td>$2600</td>
</tr>
<tr>
<td>90 days</td>
<td>$1095</td>
<td>$2200</td>
<td>$2450</td>
</tr>
<tr>
<td>30 days</td>
<td>$1075</td>
<td>$2195</td>
<td>$825</td>
</tr>
<tr>
<td>6 months</td>
<td>$1195</td>
<td>$2375</td>
<td>$3000</td>
</tr>
<tr>
<td>90 days</td>
<td>$999</td>
<td>$2300</td>
<td>$2550</td>
</tr>
<tr>
<td>30 days</td>
<td>$1090</td>
<td>$2250</td>
<td>$3000</td>
</tr>
<tr>
<td>90 days</td>
<td>$1095</td>
<td>$2495</td>
<td>$2695</td>
</tr>
</tbody>
</table>

*Includes CPU, floppy drive, keyboard, and mouse.

Used computer prices change almost daily, depending on supply and demand. The SEs listed include a 20MB hard drive, keyboard, and mouse; floppy-drive models are less expensive. The Mac IIs listed include 1MB of RAM, a floppy drive, keyboard, and mouse but no monitor. The suggested retail price of Pluses, SEs with 20MB drive, and Mac IIs (with extended keyboard) are $1799, $3769, and $5098, respectively. Many dealers offer new machines for much less. At press time, MacHeaven was selling a Mac II configuration with a floppy drive, 40MB hard drive, keyboard, and mouse for $3195. Sun Remarketing listed a similar configuration, plus a monochrome monitor, for $4995. Computer Brokerage Services is a clearinghouse for individuals who set their own prices, with some interesting results. A Mac II CPU with a 40MB hard drive was listed for $2640, for example, only $40 more than the low-end model included in the chart.

With 800K internal floppy drives seem fairly common, though less so than problems with power supplies. The older 400K floppy drives are beginning to gum up after all these years, according to Echells, so note if the machine is sluggish in ejecting disks, particularly in cold temperatures. If that’s the case, floppy drive replacement may loom in the near future. Be sure to test the SCSI port—check ahead of time to see if the owner has an external drive you can use, or borrow one.

BMUG offers a disk with four applications for testing a Mac, including an explanation of how the tests work and what they mean. Ram Test tests the RAM for defects. SCSI Evaluator tests a hard disk drive for bad sectors. Test Pattern Generator ($10 shareware) checks to see if the screen matches the standard sizes and will also test the sound chip. Speedometer ($25 shareware) compares the speed of the Mac it’s testing with other kinds of Macs. Send a request for the Test Disk with check or money order for $4 to BMUG, 1442A Walnut, #62, Berkeley, CA 94709. (Your local user group may have such a disk as well.) And don’t forget to pay the shareware fees!

(continues)
Admit it. Aren’t you tired of rolling your mouse around, running into papers or off the edge of the desk, knocking over coffee cups with its tail? Wouldn’t you love an easier way to do things? We thought so. That’s why we developed the Turbo Mouse.

It takes half the space. You move only the ball, not the whole mouse, so there’s no rolling room required.

It’s twice as fast. Fly across the biggest screen with automatic acceleration. It senses your working speed and moves the cursor further when you roll faster.

It’s twice as smart. Its 200 CPI resolution is twice that of a mouse. It lets you use one button as a click, the other as a click lock. And with a Mac SE or Mac II, it will even perform one command when you press both buttons at once.

It’s perfect for any Mac. For Mac or Mac Plus, choose Turbo Mouse Plus. For Mac SE or Mac II, Turbo Mouse ADB. Both are $169.95.

Call 800-535-4242 or 212-475-5200 for a dealer near you. Or write to us at Kensington, 251 Park Ave. South, New York, NY 10010.
Network nitty-gritty.
If you depend on Apple, 3Com, Novell, or TOPS for your networks, then count on the PhoneNET System to keep them working.

Let's get down to basics. The meat and potatoes. The nitty-gritty. No matter whose network services you buy, if they're not wired right, they'll never work right.

The PhoneNET System is a network wiring system that makes networks work in the first place. A combination of hardware components and network management software that runs your network over ordinary twisted-pair telephone wire.

It doesn't matter whose equipment you use, either. The PhoneNET System works with IBM PCs and Macintoshes, as well as, NeXT, Sun and DEC computers.

And PhoneNET is the only fully-integrated line of products to build and manage everything from small networks to large internets.

In fact, with more than 750,000 units installed, the PhoneNET System is the industry standard for wiring networks together over telephone wire.

**PhoneNET family planning.**

The PhoneNET System is modular. You can start with a small, one-room network and easily expand to multiple floors or several buildings.

Here are the nuts and bolts of the most reliable network hardware you can buy.

The PhoneNET Connector connects each device to the network, whether it's a small network or a branch of a larger one.

The PhoneNET StarController is a central "hub" that repeats network signals and sends them over multiple branches. It comes with StarCommand software to view network load and test wiring.

And for long distances, the PhoneNET Repeater is the reliable way to run network wiring over several miles.

Now for the software.

Farallon's network management tools include StarCommand, TrafficWatch, and CheckNET. Together, they help you monitor the health of the network, troubleshoot, analyze traffic, and generally help optimize the performance of your network.

**LocalTalk or Ethernet? You can have both.**

You no longer have to sacrifice economy for speed. Sure, the PhoneNET System provides an affordable way to run LocalTalk. But sooner or later, you may want to add more speed to certain parts of the network.

No problem. Farallon's new products support industry-standard 10 Mb Ethernet over telephone wire, so you can increase the speed of those sections of the network which require more performance.

And if you're wondering how we'll fit into your long-range plans, you'll be glad to know the PhoneNET System was designed right from the start to work with ISDN.

All of which makes investing in the PhoneNET System now such a smart move for today and tomorrow.

We do the nitty-gritty.

The bottom line is, networks can be just an expensive pain in the neck if they're not wired right. So, if you're thinking about installing a new network or expanding the one you have, give us a call. Because nobody knows the network nitty-gritty like we do.

For the Farallon dealer nearest you, call (415) 849-2331.

PhoneNET is a registered trademark, and PhoneNET StarController, PhoneNET Repeater, PhoneNET CheckNET, and TrafficWatch are trademarks of Farallon Computing, Inc. Other brands are trademarks of their respective holders. © 1989 Farallon Computing

Circle 150 on reader service card
A obscure bug in the Radius Two Page Display software caused William R. Gaskill’s Mac to freeze on start-up. But finding this bug was no easy matter. First Radius sent Gaskill new software. Then the local dealer replaced the Accelerator 16 board he was using and the display video board. When there was still no improvement, Radius asked Gaskill to ship his Mac to the company. Three days later he was phoned with the bug report. Radius said it would fix the problem in the next software release; in the meantime, the easy workaround is to turn on any additional feature in the display control panel. “Radius support came through with flying colors,” writes Gaskill. “I received my Mac the next day, with a personalized note from Radius support thanking me for my persistence and understanding in helping them identify the problem.”

Tech types who plan on buying Mac IIs should ask to pop the chassis and remove the hard disk mounting plate to access the SIMM sockets. Carefully check the small plastic clips that secure the SIMMs on each socket. “The clips are easy to break,” says Duisenberg, “and if they are broken the SIMMs will not be able to snap in place.” Loose SIMMs may show up as bad memory. It’s a problem you may not discover until you add more memory to the machine. Worse yet, it’s a tricky repair job. Mike McCord, owner of Micro-Doc in Eugene, Oregon, confirms that changing the clips is a lot of work—too much work for most Apple dealers, who are likely to sell you a new system board instead. Still, Mac IIs are good machines. “We seldom see them for repairs,” says McCord.

Used-computer dealers generally offer warranties, but also try asking for one from a private seller. If you can’t get one, make the purchase contingent on a clean bill of health from an experienced service center (CJS Systems, for example, charges $30 for a half hour of diagnostics). If the seller won’t pick up the cost, pay for it yourself. Why bring home a lemon?

**USER GROUP QUEST**

Apple has a special program to help approved user groups purchase computer equipment at a worthwhile discount from a short list of Apple products. It’s a one-time-only thing.

Getting a system is almost as difficult as finding the Holy Grail. In order to qualify, a user group must be in good standing with Apple for one year or longer, operate on a not-for-profit basis, provide a certain level of member services, and meet other stringent requirements. According to Ellen Leanse, manager of Apple’s User Group Connection, the group must also outline a specific plan regarding the use and benefits (such as a bulletin board system) of the machine and provide contacts to allow Apple to check on the system’s use. And a local authorized Apple dealer or other Apple representative must cosign the application package, vouching for the legitimacy of the group and the intended service. (Get the message? No knaves need apply.)

The pure of heart who think they qualify should write to the User Group Connection, Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014.

**IT’S HOEDOWN TIME**

The Pemi-Baker Computer Users Group in Plymouth, New Hampshire, will hold its annual barbecue on August 19, beginning at 10 a.m. A used-computer market and demos will enliven the proceedings. Call Henry Ahern or Cindy Downing at 603/536-3880 for the lowdown.
Colorful choice.

PixelPaint 2.0, the best value for your 8-bit color Macintosh. Or PixelPaint Professional, the most powerful graphics program for any color Mac.

The first. And still champion.
PixelPaint—The first color paint program for the Macintosh.
Now there are two new SuperMac-color paint programs. For creating superior color graphics with ease. PixelPaint 2.0, to get the most out of your 8-bit color Mac. And PixelPaint Professional, for the highest quality graphics in 8, 16, 24 or 32-bit modes.

PixelPaint 2.0. Excellent performance. Excellent value.
PixelPaint 2.0 lets you work easily with tools you use every day—like pens, brushes, lines and shapes. And gives you versatile tools for precision work—like masks and a PANTONE® Color selector. You can even make your own color separations.
You’ll get the most out of 256 colors on your 8-bit system. With tools like our PixelScan® scanning utility. And advanced computer effects like dithering, for smooth blends of up to 256 colors.

PixelPaint Professional. Exceptional graphics on any color Mac.
We’ve revolutionized the features we pioneered with PixelPaint. To take advantage of the millions of colors available in 16, 24, and 32-bit modes. And to dramatically improve how you work in 8-bit mode.
These new true color tools work easily and naturally. Mix colors on screen like paint on a canvas. Add transparent tints and shadows. And use real anti-aliasing for smooth shapes and blends. To create photographic-quality images. For the first time on a personal computer.

Make the right choice.
PixelPaint 2.0 and PixelPaint Professional. See for yourself at your SuperMac software reseller. (And if you already own a color Macintosh paint program, ask us about our Software True Color TradeUp™ offer.) Then choose the one that’s right for your business—and your budget.

PixelPaint Professional delivers the best possible graphics on any color Macintosh. Its revolutionary true color tools work naturally, to let you create and enhance photographic-quality images.

PixelPaint 2.0 gives you outstanding performance and value on your 8-bit, 256-color system. With easy-to-use tools, and a PANTONE selector for specifying industry-standard colors.

The first. And still champion.
Who says you can't get no satisfaction?

Many of the products we carry come with a 30 to 60-day money back guarantee from the manufacturer. And every piece of hardware we sell comes with our own 30-day money back guarantee. If you're not satisfied, send it back for a complete credit or refund (just be sure to keep your original packaging).

Now are you satisfied?

Software

3G Graphics - Images W/Impact
Business 1.1 .................................. 65.
Graphics & Symbols 1 ..................... 58.
A. Bonadio & Associates
Expressionist 2.3 .......................... 78.
AClUS
4th Dimension 1.06 ................. 388.
Adobe
Illustrator 68 .............................. 297.
Streamline ................................. 248.
Adobe PostScript Fonts ..................... Call.
AEC Management Systems
AEC Information Manager ............. 415.
Affinity
AllTim File ................................. 42.
Tempo II .................................. 79.
Aldes
Freshhand ................................. 348.
PageMaker 3.0 .............................. 387.
Persuasion ................................. 348.
Alp Systems
Macroid 3.2 ................................. 114.
Alsot
DiskExpress 1.5 .......................... 45.
Master Juggler ............................. 62.
MultiDisk ......................... 45.
Ashton-Tate
eBASE Mac .............................. 294.
Full Impact ............................... 248.
FullWrite Professional 1.1 ............ 204.
Bedford
Simply Accounting ...................... 204.
Berkeley System Design
Stepping Out 2.01 ..................... 51.
Blith Software
Onnis 5 .................................. CALL.
Bootstrap Software
ResumeWriter - Professional ............ 60.
ResumeWriter - Student ................. 18.
Borland
Reflux Plus ............................. 108.
Sidelock 2.0 ............................. 57.
Turbo Pascal 1.1 .......................... 57.
Turbo Pascal Tutor 1.0 ................. 45.
Bright Star Technology
Hyper Animator 1.5 ..................... 77.
Brander unb
PosterMaker Plus .................... 35.
Print Shop ............................... 35.
Caere
OmniPage 1.0 ............................. 559.
Casady & Greene
QuickOEX ............................. 31.
CE Software
CalendarMaker 3.0 ........................ 26.
DeskTop 3.04 + Laser Status & Widgets 25.
QuickKeys 1.1 ............................. 51.
QuickMail 2.0 (1-5 Users) .......... 149.
QuickMail 2.0 (10 Users) ............ 198.
Central Point Software
Copy II Mac (Version 7.2) ........... 22.
PC Tools Deluxe ......................... 45.
Chang Labs
C.A.T ........................................ 228.
Check Mark Software
Cash Ledger ................................ 125.
MultiLedger Ver. 1.3 ................. 255.
Payroll ................................. 187.
Claris
Clare Cad ................................. 62.
FileMaker II .............................. 228.
MacDraw IV .............................. 365.
MacPaint 2.0 .............................. 59.
MacProject II ............................ 389.
MacWrite II ............................... 179.
SmartForm Designer .................. 307.
Connect
MacNet ................................. 39.
Cricket Software
Cricket Color Paint ..................... 169.
Cricket Draw ............................. 167.
Cricket Graph 1.3 ....................... 114.
Cricket Paint ............................. 94.
Cricket Presents ......................... 285.
Pict-O-Graph ............................ 89.
DataViz
MacLink Plus W/Cable .............. 135.
Deneba Software
Big Thesaurus ........................ 53.
Canvas 2.0 ................................ 158.
Coach Professional .................... 115.
Comment 2.0 ........................... 54.
Di( Multimedia
Di(Click Software
We'Paint - bit mapped clip art
1 & 2 Classic Clip Art • 3 & 4 'For Patinating'
5, 6 'Animal Kingdom' • 7, 8 'Special Occasions'
9, 10 'Posters/Advert' • 11, 12 '3rd Revolution'
13, 14 'Old World Almanac' • 15, 16 'Indian Life'
17 & 18 'All The People' .................. each set 43.
World Class Fonts
5 & 6 (Originals) • 3 & 4 (The Stylish)
5 & 6 (Giants) • 7 & 8 (Tripples)
each two volume set ............... 43.
World Class LaserType
Vol 1 & 6 ........................... each 43.
Electronic Arts
DeskTop Plus .......................... 31.
Studio Eight ........................... 308.
Studio One .......................... 56.
Thunder II ............................... 49.
Emerald City Software
SmartArt 1 ........................... 89.
Farallon
PhoneNet Dim B (10 Pack, Mac. SE.) 224.
PhoneNet: DB 8 or DIM 8 ........ 34.
Screen Recorder ...................... 132.
Star Controller ........................ 1145.
Timbuktu Remote ..................... 194.
Timbuktu Single User .............. 64.
Fifth Generation
PowerStation ........................ 29.
Pyrol ................................. 14.
Surfcase II ............................ 44.
Foundation Publications
Comic Strip Factory .................. 36.
Comic Strip vol I - (File Days) .... 22.
Fox Software
FoxBASE+ 1.1 ........................... 204.
FoxBASE+ Multi User V.1.1 ........ 314.
FreeSoft
Red Ryder 10.3 ......................... 53.
Generic Software
Generic CADD Level 1 ............. 88.
Hayes
Smartcom II ........................ 87.
HJC Software
Virex ................................. 65.
Icon Simulations
HyperTMON ........................ 59.
ION Cue 1.3 .............................. 35.
TMON ................................ 88.
Individual Software
101 Macros For Excel .......... 36.
101 Scripts & Buttons For HyperCard .... 36.
Informix
Wing! ................................. 269.
InfoSphere
Liaison ......................... 198.
Innovative Data Design
Dreams ............................. 269.
MacDraft 1.2b .......................... 144.
Insight Development
MacPrint ............................. 75.
Insignia Solutions
Soft PC ............................. 245.
Intuit
Quicken ............................. 31.
Jam Software
SmartAlarms Single User .......... 55.
SmartAlarms Multiuser ............ CALL.
Kent Marsh
MacSafe or Night Watch ........... 87.
LaserWare
LaserPaint Color II ............... 369.
Letraset
ImageStudio ......................... 274.
LetraStylo ............................. 288.
ReadySetGo! 4.5 ............ 274.
ReadySetGo! (A.K.A. Standout!) .... 169.
Mainstay
MacFlow .............................. 114.
MacSchedule .......................... 114.
Ncryptor ............................. 28.
Think N Time ......................... 57.
Typenow ................................ 27.
V.P. (Visual Interactive Programming) .... 109.
Meca
Managing Your Money 2.0 .... 124.
Mediageneic
Focal Point II ......................... 118.
Focal Point Business Class ...... 69.
QuickLetter ...................... 78.
Reports 1.2 .......................... 69.
Micro Planning Software
Micro Planner Plus 6.1e .... 325.
Microlytics
G0fer .................................. 43.
WordFinder ............................ 32.
Microseeds
INIT Picker ........................... 28.
RedX ................................. 54.
Screen Gens ........................... 45.
Microsoft
Excel 2.2 ............................. CALL.
File 2.0 .................................. 128.
PowerPoint 2.01 .................... 249.
QuickBasic .......................... 65.
Word 4.0 .................................. 249.
Works 2.0 ............................. 188.
Write .............................. 78.

SIMMs
Do it yourself memory upgrade? No problem! Each set of SIMMs comes with a complete installation manual. Call for current prices.

Osicom
High-performance hard disks at an affordable price! Pre-formatted with current system software. Just "plug and play". MacBest .................. see prices

Zedcor
Full featured bit-mapped & object oriented graphics program in a 30k (!!) DA. Great for DTP
DeskPaint/Draw .............. 65.

Zedcor Specials
DeskPaint
Pocket sized if you have big pockets or 800k happy disk drive in a 8" x 4" x 1" case. Doesn't take big pockets to attract it.
Systemgate 800k ........ 155.
"Savings and service? Come on."

They said it couldn't be done—combining the absolute lowest prices with the absolute highest levels of service. Service that includes telephone help with product questions. $3 overnight delivery. Faxed orders. And cheerful acceptance of company POs.

Then they called MacZone. And you know what? The doubters were converted to believers—and customers.

Now it's your turn. Check out the low, low prices in this ad, starting with this page of sizzling summer specials. Then give us a call. Ask us your toughest product question. Hand us an order (if it's for $398 or more, we'll give you an Ergotron 360 mouse cleaner free*).

See? Savings and service do go together. At least they do when you enter the MacZone.

---

**Abaton Quick Step Printer:** $3,295.
Uses the Crystal Print print mechanism, the Eddy Award winner for best new output device of 1989. And it's the fastest Post-Script-compatible printer in sheer processing speed. Full one-year and 90-day on-site warranty.

**Taxan Monitor:** $1,395.
Gorgeous 19", two-page display monitor, 72 dpi, runner-up for Eddy Award in the display category. Includes interface card and high-quality polarizing anti-glare screen for easy viewing in any lighting.

**S.U.M.:** $62.
S.U.M. stands for Symantec Utilities for the Macintosh, and it's the file recovery program for the Mac. If you believe in being prepared for anything that can happen, this one belongs in your disk case.

**MultiDisk:** $41.
The top-of-the-line disk partitioning program, from the hard disk experts who brought you Disk Express. Create multiple volumes on your hard disk—and resize partitions without losing their contents.

**Studio 1:** $96.
At last—animation made easy. Simply create an object, define a path, and this magical program does the rest. Create spinning titles in seconds. It's simple, fun, fast—and cheap!

**Abaton Scanner:** $1,495.
If you're serious about scanning, this is your scanner. 8 bit. 256 gray shades. 300 dpi resolution. And now at a fantastic price. It even comes with Digital Darkroom and a full one-year and 90-day on-site warranty.

**Ergotron 360 Mouse Cleaner:** FREE!
Order at least $398 worth of products and get this handy mouse cleaner. You'll be surprised at how much better your mouse performs after a good cleaning.

---

1-800-248-0800
Canada: 800-248-0344 FAX (206) 881-3421
Our savings are huge. Our advice is free.

Circle 70 on reader service card
Everything we sell comes with special delivery.

It's our way of standing behind our hard drives. If a drive you buy from us goes down during its warranty period and we can't fix it over the phone, we'll ship a Zoner Loaner drive to you overnight. Now you know why we say our service is as good as our savings.

MacBest 170 External.................. 1695.
MacBest 300 External.................. 2275.
MacBest 30 Internal Mac SE ........... 425.
MacBest 45 Internal Mac SE .......... 430.
MacBest 60 Internal Mac II .......... 585.
MacBest 60 Internal Mac II .......... 750.
MacBest 90 Internal Mac II .......... 995.
MacBest 150 Internal Mac II ......... 1395.
MacBest 170 Internal ................. 1595.
MacBest 300 Internal Mac II .......... 1975.

PLI (Peripheral Land, Inc.)
Infinity 40 Turbo Removable.......... 1235.
Infinity 40/40 Turbo Removables...... 2195.
TurboFly 1.4......................... 325.
Quantum
Quantum 40 (SE, II, Ix, Internal) ... 430.
Quantum 80 (SE, II, Ix, Internal) ... 750.
Quantum 80 (Ixx Icass)................ 855.
RaserOps
ColorBoard 104 (24 Bit Color) ...... 3895.
ColorBoard 108....................... 1179.
ColorBoard 108+........................ 1249.
ColorBoard 108 SE/30 ................ 1439.
RaserOps/ Thrivin 19.................. 4295.
Seagate
Zone 30-SE/II (SE, Ix, Internal) ..... 425.
Zone 45-SE/II (SE, Ix, Internal) ..... 475.
Zone 60-II (SE, Ix, Internal) ......... 510.
Shiva Corporation
Net Serial................................ 289.
NetBridge begin10...................... 269.
Netmodem V2400....................... 450.
Sony
13" Color Monitor (II, Ixx, or Icx) ... 585.
SummaGraphcs
Bit Pad Plus (12 X 12 Tablet) - $48.
Supra Corp.
Supra Monitor 2400 Baud.................. 145.
Syquest
Infinity 44 Cartridges Unformatted.. 115.
Telebit
T-1000 9600 Bps Modem.............. 699.
T-2000 19,200 Bps Modem................ 1399.
Trailblazer + 18,000 Bps Modem...... 1399.
Thunderware
Lightning Scan......................... 405.
ThunderScan 5.0....................... 405.

Accessories
Abaton
Pro Point ADB (SE & II)............... 48.
Scanner 300 GS (8 Bit) .............. 1495.
Scanner 300S (4 Bit) ................ 1198.
American Power Conversion
Ups 1103C......................... 325.
Bantam Books
Mastering Wings........................ 22.
Complete HyperCard Handbook........ 22.
C-Enterprises
AB Box (Plus, SE & II)................. 36.
ABCD Box (Plus, SE & II)............. 62.
DataDesk
Mac 101 Keyboard (for any Mac) .... 144.
Datashield
MacDirector............................ 114.
Ergolinen
MacTilt (for any Mac except II, Ixx, or Icx) ... 68.
Mouse Cleaner 360°.................... 14.
Golden Ribbons
Imagewriter Ribbons - Black ....... 4.
Kalmar Designs - Rolltop Disk File
Teakwood (Holds 135 Disks) ....... 31.
Teakwood (Holds 90 Disks) ......... 21.
Teakwood (Holds 45 Disks) ......... 14.
Kensington Microwave
System Saver Mac Fan ............... 64.
Turbo Mouse (for any Mac) ........... 105.
Kraft
Joystick (for any Mac) ............... 49.
Mac Packs - Gray, Navy, or Wine
Imagewriter Bag .................. 49.
Plus/SE Bag ................................ 68.
SE Bag (Extended Keyboard) ....... 74.
Mac Zone
7 Outlet Noise & Surge Protector ..... 24.
800 Disk Drive ....................... 155.
Mouse Pad - Black, Blue, Gray, Red .. 6.
Mac Tool Kit w/Grounding Strip...... 15.
Maxell Disks
C6-600 Ox 150mcg Tapes............. 32.
Microsoft Press
Excel In Business .................... 20.
Working With Word ................... 19.
Mobius
Fanny Mac ........................... 59.
MSC Technologies
A+ Mouse (512k & Plus) ........... 65.
A+ Mouse ADB (SE & II) ............ 85.
Orange Micro
Grapper C/Mac/Gs.................... 78.
Grapper Mac LG ..................... 102.
Grapper Mac LS ..................... 102.
Grapper Spoiler ..................... 39.
Scanco
Mac Table & Cabinet (optional) ..... 445.
Sandy - Blank Media
High Density - 10 Pack (1.44 Meg) .. 36.
High Density - Bulk (Min. 50) ... 3.25.
Double Sided - 10 Pack ............ 14.
Double Sided - Bulk (Min. 50) ... 1.29.
Single Sided - Bulk (Min. 50) ... 1.20.
30 Meg DC-3000 Tape Cartridge .. 23.
TEAC
150 Meg Backup Tape (Ct-600H) .... 32.
600 Meg Backup Tape (Ct-600H) .... 22.
Williams & Macias
Labels, 216 (ImageWriter) ......... 18.
Labels, 216 (LaserWriter) ........... 20.
myDiskLabeler (ImageWriter) ....... 30.
myDiskLabeler (LaserWriter) ...... 33.
Slycky Business.................... 35.

Ordering Information
Our phone lines are open Monday - Friday: 8AM to 8PM EST. Saturday: 8AM to 8PM PST. Products ordered before 7:30pm EST (4:30pm PST) shipped the same day.

We accept: VISA. MASTERCARD. AMERICAN EXPRESS & DISCOVER. No exchange added.

- If we must ship a partial order, we may charge freight on the shipment that completes the order (U.S. only)
- Personal and company checks under $1,000 are accepted immediately.
- If you are unable to send us a credit card, we will hold your order for 15 days. If you have any questions about our products or services, please contact us at 800.885.1355.

Shipping Information
Form generator OA lets you create and fill out forms on screen. Data can be easily exported to other programs.

Best Data
Smart One 2400 baud modem with cable and communication software
with QuickLink 145
with Radiyder 183
You’re in good company when you enter the Zone.

Join the companies, government agencies, school systems, universities, and other institutions who have started saving with MacZone. We not only have the products, but also the knowledge to help make sure you get the right ones.

Order the easy way—fax us your P.O. at (206) 881-3421.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk Fit 1.5</td>
<td>53.</td>
</tr>
<tr>
<td>Network Disk Fit</td>
<td>198.</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>78.</td>
</tr>
<tr>
<td>SuperSpool 5.0</td>
<td>53.</td>
</tr>
<tr>
<td>MacMoney 3.1</td>
<td>60.</td>
</tr>
<tr>
<td>backFax</td>
<td>126.</td>
</tr>
<tr>
<td>Curator</td>
<td>74.</td>
</tr>
<tr>
<td>SmartScrap &amp; The Clipper 2.0</td>
<td>45.</td>
</tr>
<tr>
<td>Super Glue 1.05</td>
<td>48.</td>
</tr>
<tr>
<td>Prototyper 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>Digital Darkroom</td>
<td>249.</td>
</tr>
<tr>
<td>SuperCard</td>
<td>198.</td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td>96.</td>
</tr>
<tr>
<td>SmethersBarnes</td>
<td>CALL</td>
</tr>
<tr>
<td>Prototyper 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>Software Ventures</td>
<td>CALL</td>
</tr>
<tr>
<td>Microphone 1.5</td>
<td>109.</td>
</tr>
<tr>
<td>Microphone II V 3.0</td>
<td>221.</td>
</tr>
<tr>
<td>Solutions</td>
<td>CALL</td>
</tr>
<tr>
<td>backFax</td>
<td>126.</td>
</tr>
<tr>
<td>Curator</td>
<td>74.</td>
</tr>
<tr>
<td>SmartScrap &amp; The Clipper 2.0</td>
<td>45.</td>
</tr>
<tr>
<td>Super Glue 1.05</td>
<td>48.</td>
</tr>
<tr>
<td>Desk Fit 1.5</td>
<td>53.</td>
</tr>
<tr>
<td>Network Disk Fit</td>
<td>198.</td>
</tr>
<tr>
<td>PixelPaint 2.0</td>
<td>198.</td>
</tr>
<tr>
<td>Sentinel 2.0</td>
<td>98.</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>SuperPaint 5.0</td>
<td>96.</td>
</tr>
<tr>
<td>Survivor Software</td>
<td>CALL</td>
</tr>
<tr>
<td>Microphone 3.1</td>
<td>60.</td>
</tr>
<tr>
<td>Symantec Jost Enough Pascal</td>
<td>48.</td>
</tr>
<tr>
<td>Lightspeed C 0.1</td>
<td>159.</td>
</tr>
<tr>
<td>Lightspeed P 2.0</td>
<td>159.</td>
</tr>
<tr>
<td>MacOS2 15</td>
<td>49.</td>
</tr>
<tr>
<td>More II</td>
<td>49.</td>
</tr>
<tr>
<td>S.A.M. (Symantec Availability for Macintosh)</td>
<td>65.</td>
</tr>
<tr>
<td>S.U.M. (Symantec Utilities for Macintosh)</td>
<td>64.</td>
</tr>
<tr>
<td>Symmetry ActivaLEgend</td>
<td>64.</td>
</tr>
<tr>
<td>HyperDA 1.1</td>
<td>34.</td>
</tr>
<tr>
<td>T/Maker</td>
<td>109.</td>
</tr>
<tr>
<td>T/Letter</td>
<td>109.</td>
</tr>
<tr>
<td>TML Systems TML Pascal II 3.0</td>
<td>56.</td>
</tr>
<tr>
<td>TML Pascal II 3.0 (w/PMW 3.0)</td>
<td>114.</td>
</tr>
<tr>
<td>TOPS</td>
<td>CALL</td>
</tr>
<tr>
<td>TOPS (DOS Version)</td>
<td>117.</td>
</tr>
<tr>
<td>TOPS (Mac Version)</td>
<td>145.</td>
</tr>
<tr>
<td>Traveling Software</td>
<td>CALL</td>
</tr>
<tr>
<td>LapLink Max 2.0</td>
<td>81.</td>
</tr>
<tr>
<td>True Basic</td>
<td>CALL</td>
</tr>
<tr>
<td>True Basic Version 2.0</td>
<td>57.</td>
</tr>
<tr>
<td>True Basic Graphics Toolkit</td>
<td>CALL</td>
</tr>
<tr>
<td>U.S. Micro Labs</td>
<td>CALL</td>
</tr>
<tr>
<td>WordPerfect Corp</td>
<td>CALL</td>
</tr>
<tr>
<td>WordPerfect 1.0.2</td>
<td>184.</td>
</tr>
<tr>
<td>Xerox (Datacopy)</td>
<td>CALL</td>
</tr>
<tr>
<td>Zenker Inc</td>
<td>CALL</td>
</tr>
<tr>
<td>DeskPaint/DeskDraw 2.0</td>
<td>65.</td>
</tr>
<tr>
<td>ZBasic 5.0</td>
<td>96.</td>
</tr>
<tr>
<td>Entertainment</td>
<td>CALL</td>
</tr>
<tr>
<td>Access Software</td>
<td>CALL</td>
</tr>
<tr>
<td>World Class Leader Board</td>
<td>CALL</td>
</tr>
<tr>
<td>Acclaimation</td>
<td>CALL</td>
</tr>
<tr>
<td>4h and Inches, Hardball, or Mean 18</td>
<td>CALL</td>
</tr>
<tr>
<td>Brackenbuck</td>
<td>CALL</td>
</tr>
<tr>
<td>Ancient Art of War</td>
<td>CALL</td>
</tr>
<tr>
<td>Ancient Art of War at Sea</td>
<td>CALL</td>
</tr>
<tr>
<td>Autoduel, Lode Runner, Moebius, or Shuffelpuck Cafe</td>
<td>CALL</td>
</tr>
<tr>
<td>SimCity</td>
<td>CALL</td>
</tr>
<tr>
<td>...U.S.A. is Carmen Sandiego?</td>
<td>CALL</td>
</tr>
<tr>
<td>...World is Carmen Sandiego?</td>
<td>CALL</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td>CALL</td>
</tr>
<tr>
<td>Ferrari Grand Prix</td>
<td>CALL</td>
</tr>
<tr>
<td>F-51 Mustang Flight Simulator</td>
<td>CALL</td>
</tr>
<tr>
<td>Casady &amp; Greene</td>
<td>CALL</td>
</tr>
<tr>
<td>Crystal Quest 2.2</td>
<td>CALL</td>
</tr>
<tr>
<td>Crystal Quest 2.2 w/Critter Editor</td>
<td>CALL</td>
</tr>
<tr>
<td>Centon</td>
<td>CALL</td>
</tr>
<tr>
<td>Casino Master B &amp; W</td>
<td>CALL</td>
</tr>
<tr>
<td>Casino Master Deluxe Color</td>
<td>CALL</td>
</tr>
<tr>
<td>Data East</td>
<td>CALL</td>
</tr>
<tr>
<td>SuperHangOn</td>
<td>CALL</td>
</tr>
<tr>
<td>Discovery Software</td>
<td>CALL</td>
</tr>
<tr>
<td>Arkadon</td>
<td>CALL</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td>CALL</td>
</tr>
<tr>
<td>Chessmaster</td>
<td>CALL</td>
</tr>
<tr>
<td>Chuck Yeager's Advanced Flight Trainer</td>
<td>CALL</td>
</tr>
<tr>
<td>Mediagenic</td>
<td>CALL</td>
</tr>
<tr>
<td>Cosmos Cosmo</td>
<td>CALL</td>
</tr>
<tr>
<td>Manhole</td>
<td>CALL</td>
</tr>
<tr>
<td>Might &amp; Magic</td>
<td>CALL</td>
</tr>
<tr>
<td>Quarterstaff</td>
<td>CALL</td>
</tr>
<tr>
<td>Shanghai</td>
<td>CALL</td>
</tr>
<tr>
<td>Universal Military Simulator</td>
<td>CALL</td>
</tr>
</tbody>
</table>

Hardware

Abaton/Gume Quick Step/Crystal Print Publisher (Liquid Crystal Shutter Printer) 3295.

Best Data

Smart One 2400 Baud Modem 145.

CMS TapeStack 60 (SCSI Tape Backup) 725.

CMS (Ext. SCSI Hard Disk) 150.

Conner Zone 100-SE/II (Mac SE & II) 995.

Daystar Digital 16MHz 68030 Accelerator SE 975.

Dolphin Flipper 44Meg Removable 1075.

Dove SCS! Port Adapter 125.

Falcon 2.0 GTX Tracktor 31.

For The Record 28.

For The Record 28.

Gato, Orbiter, PT 109 each 26.

Hunt For Red October 33.

InBox Personal Connection 2.2 35.

InBox 2.2 Starter Kit 35.

Leprechaun 36.

MacStack 20 529.

MacStack 60 545.

MacStack 80 699.

MacStack 100 799.

MacZone Zone 40 External 745.

MacRacquetball 36.

MacGolf Classic 36.

Miles Computing 32.

Mindscape Music 32.

Microprose Flight Simulator 1.0 32.

Microprose Flight Simulator 1.0 32.

Microprose Flight Simulator 1.0 32.

Microprose Flight Simulator 1.0 32.

Miles Computing 32.

Miles Computing 32.

Miles Computing 32.

Nola Press products, but also the knowledge to help make sure you get the right ones.

Order the easy way—fax us your P.O. at (206) 881-3421.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk Fit 1.5</td>
<td>53.</td>
</tr>
<tr>
<td>Network Disk Fit</td>
<td>198.</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>78.</td>
</tr>
<tr>
<td>SuperSpool 5.0</td>
<td>96.</td>
</tr>
<tr>
<td>SmethersBarnes</td>
<td>CALL</td>
</tr>
<tr>
<td>Prototyper 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>Software Ventures</td>
<td>CALL</td>
</tr>
<tr>
<td>Microphone 1.5</td>
<td>109.</td>
</tr>
<tr>
<td>Microphone II V 3.0</td>
<td>221.</td>
</tr>
<tr>
<td>Solutions</td>
<td>CALL</td>
</tr>
<tr>
<td>backFax</td>
<td>126.</td>
</tr>
<tr>
<td>Curator</td>
<td>74.</td>
</tr>
<tr>
<td>Super Glue 1.05</td>
<td>48.</td>
</tr>
<tr>
<td>Desk Fit 1.5</td>
<td>53.</td>
</tr>
<tr>
<td>Network Disk Fit</td>
<td>198.</td>
</tr>
<tr>
<td>PixelPaint 2.0</td>
<td>198.</td>
</tr>
<tr>
<td>Sentinel 2.0</td>
<td>98.</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>SuperLaserSpool 2.0</td>
<td>CALL</td>
</tr>
<tr>
<td>SuperPaint 5.0</td>
<td>96.</td>
</tr>
<tr>
<td>Survivor Software</td>
<td>CALL</td>
</tr>
<tr>
<td>Microphone 3.1</td>
<td>60.</td>
</tr>
<tr>
<td>Symantec Jost Enough Pascal</td>
<td>48.</td>
</tr>
<tr>
<td>Lightspeed C 0.1</td>
<td>159.</td>
</tr>
<tr>
<td>Lightspeed P 2.0</td>
<td>159.</td>
</tr>
<tr>
<td>MacOS2 15</td>
<td>49.</td>
</tr>
<tr>
<td>More II</td>
<td>49.</td>
</tr>
<tr>
<td>S.A.M. (Symantec Availability for Macintosh)</td>
<td>65.</td>
</tr>
<tr>
<td>S.U.M. (Symantec Utilities for Macintosh)</td>
<td>64.</td>
</tr>
<tr>
<td>Symmetry ActivaLEgend</td>
<td>64.</td>
</tr>
</tbody>
</table>
No Mac is an island.

Especially if you're hooked up with a copy of WordPerfect®.

Because with WordPerfect, the Mac not only stands alone, but works as part of a greater business team.

Macintosh, MS DOS, VAX, DG, and UNIX systems are all trying to connect. And WordPerfect offers more common ground than any other word processor.

Through your network, WordPerfect makes it easier to use the same document on different machines. That's because WordPerfect shares compatible file formats on these different systems.

So once you've transferred a file, you'll find that most of your format settings—like columns, margins, bold, and underline—remain intact from system to system.

And because the WordPerfect commands and functions are similar from one computer to another, you'll feel comfortable using WordPerfect no matter what system you're on.

So if you need to share your work, putting WordPerfect on your Macintosh is a smart decision. Because with WordPerfect, you'll never work alone again.

Unless you want to.

WordPerfect Corporation
1555 N. Technology Way Orem, UT 84057
Tel (801) 225-5000 Telex 820618 FAX (801) 222-5898

WordPerfect is a registered trademark of WordPerfect Corporation. All other brand and product names are trademarks or registered trademarks of their respective companies.

Circle 126 on reader service card
For some time I've been hearing about how great it is to prepare presentations on the Macintosh. The desktop presentation market that Apple and others crow about is not yet ready for prime time. To be quite blunt, my experience with the current crop of products shows them to be a long way yet from state-of-the-art, as well as missing many of the things that I need.

Even the best programs (Microsoft's PowerPoint and Cricket Presents 2.0) keep forcing compromises on me. My definition of a good tool is one that doesn't force me to compromise. I used PowerPoint, Persuasion, Cricket Presents, Stand-Out, More II, and MacDraw II 1.1 to create the same presentation (the same text, same coloring, same graphics, same notes, and same slide order). My conclusion: not one of this current crop is a precision tool.

**OUTLINES ARE TOO RIGID**

Although I don't use outlines for my writing, I do use outlines to structure my presentations. Thus, the built-in outlining facilities of More II and Aldus Persuasion should thrill me no end. Well, they don't, for a reason that isn't obvious until you have really tried to use them.

A good presentation uses cues and reminders to help the audience follow along. What happens if, on a subtopic slide, I want to have both the topic and subtopic as headings? Suddenly, the presentation program begins to get in the way—the six I looked at want to collapse text slides into two levels from the outline. I often mix graphics—only slides in with my outline topics, after a graphic I repeat the previous text slide to pick up where I left off. Short of retyping text or using the Clipboard to make a copy of a slide and positioning it manually, there's no way of repeating a slide directly from the outline. Changing an outline to add a new level sometimes forces you to go back and change slide styles. And, except in Persuasion, when you are working with the slide images changing slide order or changing text directly on a slide doesn't change the outline. Whew!

What I also need is the ability to control where certain levels of an outline appear on a slide. For example, I might want topic A to appear at the top of a slide for subtopic a, and subtopic 1 to be the title of the slide. The current features of these presentation programs seem mostly hardwired when it comes to placing outline levels into a slide. I've been able to get the desired result with some presentation products, but not without a lot of extra work and repetition. Indeed, after seeing a presentation from a company with a presentation program, I asked the presenter how he had managed to do what I was trying to get his product to do. "We cheated," he said. "We figured out what all the slides should say first, then we went back and created the outline that would get them to say it." So much for using outlines to design the presentation.

**MASTER THE POSSIBILITIES**

Next on my gripe list is the way several products handle the creation of a master slide. The master slide is basically a template that you place on every slide. Some programs also let you set the background color and text styles.

PowerPoint, for example, lets you build a template and create text styles that will be used in the template. Fine. Say I'm halfway through creating my presentation and I decide that the text size I specified in the template is too big. I can change the style for all new slides, but the ones that I've completed will have to be changed by hand. Not so fine.

For one presentation I wanted a graduated background with the darkest area in the lower-left corner and the brightest in the upper right, but with More II, Cricket Presents 1.0, and StandOut I had to settle for a solid color. (Note that even if a program supports graduated colors, the output device you use may not.)

PowerPoint normally has you work in a 66 percent reduced mode, which lets (continues)
you see the entire slide on the Mac II's 13-inch color monitor. You can work at full size, but full-size slides spill off the regular screen by just enough to frustrate your efforts to align objects to the edges. But in the reduced view, PowerPoint does funny things with lines and text: you can't tell whether two lines match up exactly. It was no end of trouble to create 1-point lines that run across a slide and connect to the 1-point lines in a graphic (see "Fine Lines"). I'd create a line in reduced mode, pop to full size to get the alignment right, then go back to reduced mode to get an idea of how it looked. After an hour of playing this game I longed for an E-Machines T16 Monitor so I could work in full size all the time.

Using Cricket Presents to create a master slide was relatively simple, although I wish it allowed me to set margins that I could align objects to. More II was simply frustrating. This outlining program has all kinds of presentation features hooked into it, but the hooks are often in the strangest places. Of the six programs I looked at, More II was the most time-consuming to work with. On the other hand, as an outliner, it is definitely the best I've seen to date.

Then there's Persuasion. The predesigned templates Aldus supplies are nicely done, but they're all labeled with letters (for example, Template A), so you'll need to turn to the manual to find examples of the one you want. And creating a new template taxed my patience. For the life of me, I couldn't figure out how to get this program to do what I wanted it to do. The manual is well written, but I read it three times and still didn't get the flash of insight that would enable me to accomplish my goal.

COLOR ME FRUSTRATED

When I needed to print out copies of my presentation on a laser printer, I discovered a surprise—virtually all of the color combinations I had selected, in virtually all of the programs, produced Rorschach-like blotches when printed. I hadn't given any thought to the fact that the printer was mapping colors to gray scales, so it shouldn't have been surprising that I got unsatisfactory results. I was shortsighted, but so is everyone once in a while. So the question is, what facilities do the programs offer for rectifying the problem?

PowerPoint, fortunately, has a fast and

INTRODUCING SYMANTEC ANTIVIRUS FOR MACINTOSH (SAM).

A virus. It sneaks in on a floppy, by modem or over your network. At first, you see nothing. Or maybe a few glitches. Then it spreads, replicating in every file, in every folder. Destroying irreplaceable data. Permanently. Left unchecked, it could ruin all of your hard disk data. And shut down an entire network.

Protect yourself with SAM. SAM is the only virus protection that scans every floppy you insert, and every file you get electronically. It's the only way to eliminate viruses before they enter your system. Before they can do any harm.

SAM destroys the nVir, Scores, Hpat, INIT 29, and ANTI viruses. And with an advanced scanning algorithm that detects software variations, it keeps new, unnamed viruses from sneaking in. SAM checks
simple method of respecifying colors. This meant that I could go back and respecify all the colors and then reprint the whole thing. (PowerPoint has a gray-scale option in the Print dialog box, but colors that don't translate well to black and white still print out looking muddy.) With the other five programs I often found myself redoing colors by hand, sometimes slide by slide. The companies I've talked to have suggested I create a black-and-white palette for laser printer-generated presentations, but that means taking the time to do the presentation twice. Other alternatives they've suggested are buying a color printer or a film recorder. Well, neither of these choices is practical as a proofing device. Most color printers I've used have trouble matching screen colors; and film recorders aren't so hot either (see “From Slide to Screen,” Macworld, July 1989).

All in all, it's frustrating even to attempt a presentation with an eye to keeping the quality at a professional level. The software never quite does what you need it to do, and the output can be extraordinarily bad.

SUCCEED DESPITE THE SOFTWARE
But what do you do if you must make the best of this still-emerging technology? Here are some recommendations that may make your task a little easier.

• Keep your presentation files small. If you've got a 100-slide presentation to create, break it up into five or so shorter presentations. It'll be easier to organize, easier to batch to a film recorder, and you won't find yourself having to scroll through screens of images to find (and move) the one you're looking for.

• Keep your master slides simple. If you are tempted to create a custom template, think again. Both PowerPoint and Persuasion include some very professional templates; use one of those as your starting point and make as few changes as possible.

• Keep your color scheme simple and select colors that will translate to black and white. Bright yellow and dark violet, for example, have quite different gray mappings. If you use a dark background (as most presenters do), use white and light colors for the text and for objects such as charts and graphs. Better yet, use PowerPoint, which allows you to change the entire color scheme in a single command.

• Use only one typeface—Helvetica. And forget about anything less than 18 points in size (the folks in the back of the audience can't read smaller type). The injunction against other fonts is because only Helvetica seems to image correctly on all the film recorders out there. The serif faces (like Times) don't always look right, while Helvetica looks fairly presentable even if the recorder doesn't have high-quality fonts. Use italics and boldface judiciously for variation.

• Prepare and place all graphics first. Every time I complete text for a presentation and then go back and add graphics, I run into the same problem: the text takes up too much room and the graphic seems too small. If your graphic is there for a reason, it should make its point all by itself. So place it first and in a manner that allows it enough space. Then, if there's room, add text. In fact, I've stopped mixing text and graphics on one slide.

(continues)
There's only one way your network computing needs should be served. Your way. In your environment. Since you've chosen Macintosh, you should also choose a network solution that won't change the way you (or your Mac) work.

NetWare® for Macintosh™ helps you get the most out of your Mac. It lets you share information with DOS, OS/2 and other computing environments throughout your organization, and beyond. So you can communicate with the masses without learning another language. And without compromising the functionality or elegance of the Macintosh user interface.

Now you can share common word processing, spreadsheet and database applications with Marketing, Accounting and Engineering. Instantly. Just point and click to open a file on the file server, because PC and Macintosh files can coexist in your network folders.

NetWare for Macintosh is fully compatible with the AppleTalk Filing Protocol. So it supports all Mac software, printers and peripherals. And it will...
continue to be compatible with future Macintosh developments, too.

But enhanced connectivity is just the beginning. NetWare for Macintosh also delivers the power of NetWare, today's network computing standard. It adds sophisticated security and network management features to complement existing AppleShare capabilities. And you have access to the only fault tolerant server in the Macintosh arena to protect your work during a server or power failure.

NetWare for Macintosh makes it easy (and affordable) to tap into your company's enterprise-wide network. So you can communicate with everyone else — without working like them.

Choose the network solution that's serving the needs of four million users worldwide. Ask your Novell Gold Authorized Reseller about NetWare or call 1-800-LANKIND.

For network solutions, you should be seeing red.

Circle 347 on reader service card
Project your Mac® or Mac II® information onto a wall or screen with a PC VIEWER LCD projection panel and an overhead projector. To find out how you can be sure that everyone gets a clear view of your next presentation, call for a free detailed brochure and the dealer nearest you.

IN FOCUS SYSTEMS INC.
1-800-327-7231

IN FOCUS SYSTEMS INC.
PC VIEWER and Memory Module are trademarks of In Focus Systems, Inc.
Mac and Mac II are registered trademarks of Apple Computer, Inc.

Need A Mac... or II?

* DAY * WEEK * MONTH * SEMINARS *

MAC II CX
MAC II X
MAC II
MAC SE/30
MAC SE

LASER II NT
LASER II NTX
SCANNERS
DESKTOP
PUBLISHING

REN T-A-MAC, INC

NATIONWIDE 1 800 GET-A-MAC

SAN FRANCISCO (415) 543-3933
DALLAS (214) 991-4060
BOSTON (617) 742-4442
WASH D.C. (202) 785-8164

LOS ANGELES (213) 651-2011
CHICAGO (312) 228-1500
NEW YORK (212) 986-5454
VIRGINIA (703) 548-3111

Thom Hogan is the president of Macreations, a Macintosh software developer, and publisher of The Macintosh II Report. His reference book, Programmer's Macintosh Sourcebook, was recently published by Microsoft Press.

If I have four lines of text on a slide and one of them needs a graphic to develop my point, I'll put the graphic on the next slide, then repeat the text slide after it so that I can pick up where I left off.

- Keep it simple. Most people don't understand at first how simple a slide presentation should be. Use text slides merely to keep the audience focused on what you're saying. One of the best professors I encountered in my many years of studying always handed out an outline of his lecture/presentation before each class. Because we knew the structure of his remarks, it made it much easier to capture the details—which, of course, could only be garnered by listening to what he was saying. The point is this: if the presentation doesn't really require your presence, you've developed a film strip, not a set of slides to accompany your remarks. Weak or unsure speakers tend to make the slides carry the presentation. That's wrong. You're the one with the expertise or knowledge, so you're the focus of the presentation. The slides are just there to underscore, demonstrate, and organize.

Of course, you shouldn't have to use an inadequate product. If you decide to hold off on buying any presentation product until they improve, you'll be sending a message to the companies to get their act together. There are signs that many people may already be sending that message. Several companies have expressed dissatisfaction with the number of copies they're selling. I think I can tell them why: they've invented the crayon. When they get around to inventing oil paints and a few more brush sizes, maybe the market will pick up and users will be more enthusiastic. Now then, whether any of the software companies working on these products is aware of the limitations they're imposing on users is another story altogether.

See Where To Buy for contact information.
Pinnacle Micro delivered the first removable, erasable, optical storage systems for the Macintosh.

The REO-650 is a single drive, SCSI system. The REO-1300 is a dual-drive system. Up to 1.3 gigabytes of facts and figures at your fingertips.


You can write, erase and rewrite data... file by file... a million times or more.

Interface kits give you the flexibility to use Pinnacle drives with the workstation of your choice: Macintosh. Sun. HP. IBM-XT, AT, PS/2 and compatibles.

Software provided with each kit supports a host of working environments: UNIX, Xenix, Novell Netware 2.1, and many more.


Call today for the location of your sales representative or authorized dealer.

(800) 553-7070
Over The Years, We’ve Developed The Best Image In Monitors.

We made the first RGB color monitor for Apple* computers. And the only 19-inch, multi-scanning monitor to meet both Apple and IBM* standards.

Now, we have a family of high-resolution, monochrome and color monitors for the Macintosh~

The 19-inch Crystal View II for the Macintosh II, Iicx, Ilx. A high-resolution, monochrome monitor that handles larger spreadsheets, dual pages, or B-size CAD drawings without shrinking or scrolling. And it has our unique Vision Enhancement Filter that eliminates glare by 99% and increases contrast 1600%.

For the Macintosh SE and SE-30, we have the 19-inch Crystal View SE. A high-resolution, monochrome system with all the features of the Crystal View II.

Next, the Ultra Vision 1000. A 19-inch high-resolution, multi-scanning color monitor that gives you the widest frequency range of any monitor its size. Ultra Vision 1000 also features our exclusive Dynamic Beam Focusing to eliminate distortion and maintain precise focus to the corners.

PRODUCT  
Ultra Vision 1000  
Crystal View SE/SE-30  
Crystal View II  

Regardless of which Taxan monitors you choose, ours not only look better, they make you feel better with special non-glare filtering, superior brightness, and focus across the entire screen.

That’s important. OSHA found that 91% of the people using computer displays suffer from eye strain. And state and local governments are responding with new work rules. With Taxan, the leader in meeting these new health requirements, you’re already protected.

So call 800-544-3888 for sales information and your nearest authorized Taxan dealer. Taxan USA Corporation, 161 Nortech Parkway, San Jose, CA 95134. (408) 946-3400.

See why, in Apple monitors, one brand is visibly better.

Complete Monochrome Display System for $1695.

Taxan is a registered trademark of Taxan USA Corporation. Apple and Macintosh are registered trademarks of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corporation. Illustration created with Adobe Illustrator 88. Courtesy of Adobe Systems. © Adobe Systems Incorporated. Second image courtesy of T/Maker, Inc.

Circle 24 on reader service card
Steve Edelman grew up in Orlando, Florida, the “mildew capital of the world.” He graduated from Cornell University with a degree in electrical engineering. After graduating he worked briefly at NCR, then left to make S-100 computers at Ithaca Audio, the first company he founded. His second company, SuperMac Technology, has annual revenues of over $40 million. Now chief scientist at SuperMac, he is credited with having led the company out of a disastrous relationship with Scientific Microsystems (SMS) and back to the mainstream of Macintosh developers.

How did you become involved with personal computers?

In 1974 I was reading a newsletter, written by Hal Chamberlain, called the Micro 8 Newsletter. I became involved with Hal and built my own CPU. It had a hand-etched PC board, a hand-bent metal case, a hand-wired transformer, a block of aluminum I machined to make a paper-tape reader, and 1K of memory (later expanded to 4K). By the spring of my senior year in college it finally ran. I was hooked.

How did Ithaca Audio become Ithaca InterSystems?

In 1977 I started the company in earnest. I rounded up venture capital funds, but by 1980 after a fight with the venture capitalists I decided to leave. It was an amicable parting. The company lasted until 1986.

Are many of the companies from that milieu left?

It’s sad. Recently the last S-100 company, Cromencro, took down the sign in front of its building. It’s the passing of an era. Imsai, Vector Graphics, Godbout, MITS—all gone now.

When did you start developing for the Macintosh?

In late 1984. The first thing we did was to decide that the original Mac was not the machine that we would eventually develop for. So during the first year we decided to set up a company and gather people. In 1985 Apple dealers had a policy of swapping 128K boards for 512K boards. At Stanford then there were thousands of 128K boards available that didn’t have to be sent back to Apple. So we bought them and upgraded them to 512K motherboards and sold them to retailers. Those boards were the float needed to start a business. I started SuperMac on $100,000—$50,000 from me and $50,000 from my father.

The DataFrame was our major product through August of 1986. Our arch-competitor was GCC (in the 20-megabyte drive market). In the spring of 1986 we heard that the Macintosh II would ship. I decided to build a workstation monitor. I approached a Japanese vendor, who sent two representatives to us. I said that I wanted to buy 1000 units per month. These two chattered away for a while and then asked me if I would repeat what I had said. I told them and they chattered away some more. Then they said there must be some mistake, that they didn’t ship that many monitors to IBM.
Mac Image Processing
That Measures Up

Scientific • Medical • Defense • Research • Industrial

- Mac II application for image capture, enhancement and analysis with either frame grab or PICT and TIFF image files.
- Feature extraction, gray scale, edge, vectors, area, convolution and morphology are a few techniques.
- Distance and location measurements in REAL WORLD units.
- Three levels of user interface:
  1. Click and drag for over 70 image analysis and measurement tools. Interactive and automatic sequencing.
  2. MacRAIL™ Developers Kit – An interpretive language to add your own algorithm or access our extensive imaging library. Easy interface to Apple graphical presentation format.
  3. C Libraries – For the professional imaging programmer.

Image Processing Workshop
Introduce concepts and terminology in a hands-on clinic. Participants will set up and implement practical applications using a menu driven package. $1,100/student; 3 days.

Image Analyst

Tektronix, and Hewlett-Packard combined. They inferred that I was a lunatic, and I couldn’t tell them about the Mac II. Now we sell over 1000 monitors a month and the total market is well over that.

A deal with Barneyscan was announced. What happened to that?

The original plan was for SMS to license that product. The problem was that as SMS got in deep trouble there were no resources to put in the product. We had to tell the company to go elsewhere for venture capital funds. They have a great product, a slide scanner.

What went wrong at SMS?

I started the business in 1985 and by mid-1986 we were at $10 million annually and a run rate of $2 million per month with no debt. We just exploded. We could have sought venture capital, but in the start of 1986 there was no venture capital for the Mac market. That left two choices: keep growth flat or sell the company. We couldn’t keep growth flat—how could we? The phones were ringing off the hook. Where we had one guy doing a job we needed a department. So we looked for a partner. It was not the wrong idea. We just chose the wrong partner. We thought that we saw in SMS a company with a large infrastructure, but without an exciting product line. We hoped to apply its know-how to our product line to continue to grow.

Why didn’t the merger with SMS work?

For two reasons. First, sometimes after a divorce, people remarry and the stepchildren fight. When we merged with SMS, SuperMac became a stepchild. So we got no resources. Before the merger SMS largely thought of itself as OMTI (its largest division), and unfortunately after the merger it still thought of itself as OMTI. This is a lesson to budding entrepreneurs—never underestimate the importance of corporate culture. Kmart can’t act like Nordstrom.

Second, soon after the merger the SMS product line came under unbelievable, brutal market pressure. Costs were not low enough to compete at the price the market demanded. Everyone was brutalized by Western Digital.

Western Digital is now in the Mac hard drive market?

Yes, it bought the Tandon drive line. Western Digital is a wizard at low costs, but you can’t run a Maserati on retread tires. The lowest price doesn’t always bring success.

When did you decide to add software to the product line?

In the fall of 1986 we decided that the hard disk should ship with backup software because people wouldn’t use the software if it didn’t come with the disk. After a short while we went to the guys who did DiskFit. I was impressed with that product and wanted to make it available. We already had some developers working on a spooler [that would speed up printing], and in the end we shipped the spooler first. We took out two ads and the products began to ship like crazy. It’s fair to say that we stumbled onto those products. By the spring of 1987 we split off the software group, made it a separate business. The products had no competition and they (continues)
Affordable CADD. And it's only the beginning.

The CADD stands for Computer Aided Design and Drafting. With a suggested retail price of just $149.95, Generic CADD Level 1 makes the power of real CADD affordable. And it's just part of a family of Generic CADD products that will make you more productive than ever before.

Standard Mac interface for ease of use.

Now you can produce accurate drawings with real world scale on the Mac Plus, Mac SE, or Mac II. You can edit multiple drawings in separate windows and cut and paste between them. CADD Level 1 is also multifinder compatible.

Symbol Libraries boost productivity.

From office furniture to specialized electronics symbols, our Symbol Libraries save you the time of redrawing repetitive elements every time you need them.

Add the power of real CADD to your Mac.

Move your Macintosh drawings into the real world. Call us at 1-800-228-3601 for your free CADalog or the name of your Generic dealer. And find out why we say that the only thing generic about us is the price.

1989 Generic Software, Inc. Generic CADD Level 1 is not copy protected and comes with a 60-day money back guarantee. Registered users get free technical support from Generic. Level I and Generic CADD are trademarks of Generic Software, Inc. Macintosh is a trademark of Apple Computer, Inc.

11911 North Creek Parkway South, Bothell, WA 98021

Circle 157 on reader service card
You need a gray scale scanner for your Mac. So you go to your ImageWriter.® Pop out the ribbon cartridge. Snap in ThunderScan.® Insert your artwork. And quicker than you can say Van Gogh, you’re already going.

ThunderScan lets you import quality images into all painting, drawing and desktop publishing programs. Contrast and brightness are fully adjustable. And now ThunderScan 5.0 loads TIFF files and lets you display and edit grays on your Mac II.

Priced at just $249, ThunderScan proves you can become an artist, with just a little change.

ThunderScan is compatible with the Macintosh 512K enhanced, Plus, SE and Mac II and all ImageWriter models except the IQ. Use on the Mac II requires our Power Accessory for Macintosh II. ThunderScan, Thunderware and its logo are trademarks of Thunderware, Inc. Macintosh and ImageWriter are trademarks of Apple Computer, Inc. ©1989 Thunderware, Inc.
Whatever Macintosh-PC setup you have, MacLink-Plus — at $195 — provides the very best solution for transferring and translating files and documents between the two.

If you want to connect a single Mac to a PC or laptop, MacLinkPlus provides everything you need — a direct connect cable (you can use a Hayes or compatible modem if you prefer) and software, including translators, for both the Macintosh and the PC.

If you have a DOS disk drive, then the MacLinkPlus library of over 40 translators is the solution to accurate conversion of your files.

Formats and styles are retained during the conversion and there's no need to preconvert to ASCII or print files. This library also makes MacLinkPlus the perfect enhancement to Apple's new Apple File Exchange utility.

And if you have Macs and PCs on a network or AppleShare server, etc., the MacLinkPlus file translation capabilities are worth the price alone.

So, if you want to be really well connected, the size of your wallet really doesn't matter. Just call (203) 268-0030 for your nearest DataViz dealer. Because as Macintosh Today recently said, "MacLinkPlus was one of the first data translators and it remains the champ."

DATAVIZ
35 Corporate Drive Trumbull, Connecticut 06611

System Requirements: Macintosh's Plus, SE and II. All IBM PCs and compatible systems.

Circle 40 on reader service card
AutoCAD® on the Mac®.
A new window of opportunity opens.
AutoCAD, the world-standard CAD software, now runs on your Macintosh® II.

Your designs reflect the quality of your thinking. And your drawings reflect the quality of your designs. Put AutoCAD on your Mac II and nothing gets lost in the translation.

AutoCAD's extensive set of drawing tools enhances your productivity. Its effectiveness is proven every day by over 175,000 architectural, civil, construction, aerospace, electrical, cartographic, facility, industrial, manufacturing and mechanical design professionals around the world.

AutoCAD has been refined through ten major upgrades. You get menus full of powerful, high-precision drawing and editing commands, numerous drawing entities, and a multitude of easy-to-use features. You can window, zoom, fillet, scale, layer, annotate and associatively dimension, hatch, stretch and scale. And a simple click can undo anything or everything.

AutoCAD on the Macintosh also supports the features that have made Apple the acknowledged leader in user interface design, offering pull-down, tear-off, and pop-up menus, complete support for Multifinder™ and the Mac windowing system, along with file dialog boxes to make access to your drawing files quick and easy. Clipboard support allows the transfer of AutoCAD drawings to a wide variety of Macintosh applications software.

A Better Perspective. AutoCAD is an advanced three-dimensional modeler that helps you solve design challenges on your Mac the way you would with physical prototypes. AutoCAD makes 3-D easy with user-defined construction planes, dynamic viewing and multiple viewports.

You can also model complex surfaces with AutoCAD using sophisticated tools such as tubulated cylinders, surfaces of revolution, ruled surfaces and Coons patches so you can represent surfaces accurately.

For even greater utility, AutoCAD provides entity handles that allow external applications to associate alphanumeric information, such as part numbers and capacity ratings, with graphical elements in the drawing. This associativity is creating an entirely new generation of useful third-party applications software.

A Reflection of You. AutoCAD is an open-architecture system including Auto.LISP™ an embedded programming language that lets you program AutoCAD to reflect your way of doing things. Add your own menus to enter your own commands, write macros, develop custom symbols and drawing functions, or program standard procedures for document production and management.

Hundreds of third-party programmers have used Auto.LISP to develop entire systems that make AutoCAD perfect for applications ranging from chemical engineering to technical publishing. Many of these programs run on the Mac II and more are on their way.

Maintain Your Standards. AutoCAD is the most extensively used, most broadly supported, widely taught design software in the world. AutoCAD is backed by over 1,400 highly-trained dealers and 150 Authorized Training Centers in 60 countries. We'll make sure you get what you expect from your CAD investment. That's what standards are all about.

Opportunity knocks just once. The CAD software you standardize on today will determine your productivity for years to come. To see a demonstration at the dealer nearest you, call Autodesk at 800/445-5415, extension 25, at your earliest opportunity.
left Radius there wasn’t a peep. We learned a lot about public relations and how to run a business from that.

How did you get such a leap on the competition with color monitors for the Mac II?

In the fall of 1986 we began working on a video card design. By December of 1986 we had a NuBus card in fabrication. We had never seen the machine, only the specifications on timing. Suddenly we got a machine and by pressing we got one wire-wrap up and running in the back room.

Apple called when they heard that and said they were amazed and could we do 100 more. Apple International bought one for each office; then each sales office in the U.S. wanted one; and then Apple called and asked us to bring a bunch to Los Angeles for the rollout. I’ll never forget the weekend before the rollout of the Mac II. I sat on the phone here in Mountain View [California], calling each sales office in the U.S. and the world checking the monitor to ensure that when Apple made the rollout, each monitor would work. At the last moment, the Friday before the announcement, the video ROMs were changed. We had to switch to new boot ROMs and revise the boards in the field, in real time over the weekend. We made it.

Motorola needs to make a cheap, plastic 68030 and migrate this down line

No. Why should we be? We were proud that Apple invited us to work with them and to participate in the rollout. There is one more part to the story. I called Ernie Beernink, one of the chief architects of color QuickDraw. I called him at his office at Apple at 11 p.m. and asked him for some help. He told me he would stop by the company on his way home. He came in at 3 a.m. and helped us fix our bugs. He is the unsung hero of the Mac II.

How can SuperMac compete with Apple in peripherals?

I believe that any market can be divided into two areas: core technologies and enabling technologies. Core is all of Apple’s engineering resources. Enabling technology is something that has to be there to support core technology. Mac is core; hard drives and Ethernet are not. Core products are what you want to do. Enabling products are what you do to protect your core. For Apple, the Macintosh is the core. If a company can make its business in enabling technology, Apple is happy because then Apple can put more money into the Mac.

What are your favorite products in the Mac market?

The Shiva Netmodem. It’s wonderful. The idea that ten slow modems can be replaced by one shared, fast modem is great. AppleLink, not because it’s perfect, but because it does things in a straightforward fashion. It’s made my life easier. Excel. I managed to run SuperMac to the $2-million-a-month level on Excel, the whole business, and never lost a single piece of data. I can’t say the same for our accounting package.

What are your reflections on Apple today?

Apple has figured out how to drive existing architectures forward while completing a changeover. Now IBM looks bad while it changes architecture. We’re at the crossroads where Apple will be able to push forward, evolve the Mac to the next stage, or be forced to scrap it in the next few years. And 1989 is a pivotal year in which we’ll learn if Apple has anticipated those areas that are important or if it’s in a reactionary mode. Apple can’t survive as a reactionary computer company. Sculley knows this.

(continues)
Get a FREE catalog of sound solutions.

Find out how to get sound computer solutions without paying for unnecessary bells and whistles. Just fill this out and drop it in the mail to receive our color catalog. Or call (800) 821-3221, ext. 366.

Name __________________________ Address __________________________
City __________________________ State ________ Zip __________
Phone __________________________ Company __________________________
Title __________________________
Sun Remarketing
P.O. Box 4059
Logan, Utah 84321
Read this, and paying for a new computer won't sound so great.

No one wants to pay for bells and whistles they don't need. But that's what most people do when they buy a new computer.

The vast majority don't need the latest technology — even for business. But they pay for it anyway. And end up with a bunch of high-priced extras that are unnecessary, such as music-making and color enhancements.

The truth is, the basic technology behind computers hasn't changed much since the PC and Macintosh were introduced several years ago. And the basic things people need computers for — communications, word processing, accounting — haven't changed much either. What's changed is the price.

A sound solution. A reconditioned Apple computer from Sun Remarketing has the performance, capacity, and power you need to execute all of your applications. The only thing it doesn't have is a big price tag.

Whether you need a single workstation or a whole network, Sun Remarketing offers a full line of Apple products from the Apple II to the Lisa and Mac Plus; along with the necessary software and peripherals to tailor a system to your own needs.

A no-risk guarantee. We're confident in the quality of our extensively-tested products. In fact, we're so confident that we offer an unsurpassed 30-to 90-day money-back warranty* on everything we sell. If you're dissatisfied for any reason, just send the product back to us for a replacement or full refund. You won't find a more comprehensive guarantee anywhere on reconditioned or out-of-production computer products.

Apple authorized. Sun Remarketing offers a lot more than just low-priced computer equipment. As the only company authorized by Apple Computer Inc. to sell and service their used and out-of-production computers, Sun Remarketing gives you selection, service and support that no other dealer of reconditioned Apple equipment can match.

Free catalog. You can't buy Sun Remarketing computer products in any store. But you can order them directly through our free catalog. Just mail the attached card or call our toll-free number today, and receive the new Sun Remarketing catalog with our complete line of Apple products.

Because you don't have to pay for unnecessary bells and whistles to get a computer solution with a nice ring to it.

For a free catalog call 1-800-821-3221, ext. 366.

© 1989 Sun Remarketing, Inc. P.O. Box 4059 Logan, Utah 84321, FAX (801) 563-3226 * Customer responsible for shipping cost.

Circle 186 on reader service card
Now you can treat any Group III fax machine in the world as a remote printer for your Mac. With the Abaton InterFax, you can print letters, reports, and memos in Los Angeles, New York, London, and Tokyo, even if your office is in Peoria.

And all your documents will look as good off the fax as they would off an ImageWriter. No blotchy letters, streaky lines, or dirty smudges like normal faxes. With the Abaton InterFax, even your fine print is perfectly legible. And the InterFax gets your fax out fast. MacWEEK rated it the fastest fax for the Mac. That's because the friendly InterFax software compresses your file first, then sends it out. So it takes less time to transmit.

You can also use the InterFax as a Hayes-compatible data modem to communicate with other asynchronous devices. Which makes it a great deal as well as a great tool. But that's not the only way it saves you money. With the InterFax, you can schedule when faxes are sent—like right before a telephone conference, or after hours when the rates are lower. And because the InterFax receives as well as it sends, you can screen faxes before you commit them to paper.

Since the InterFax works in background—with or without Multifinder—you can continue working in PageMaker, Excel, Word, or most other Macintosh applications while you're sending or receiving faxes. Which makes you even more productive.

If you want to know why The Macintosh Buyer's Guide rated the InterFax 9.3 (out of a possible 10), call Abaton at 1-800-444-5321. We'll fax or mail you more facts about the InterFax. Then you can start faxing (and printing) all over the world.
that the whole Mac way of printing raises issues. One result is that all applications developers haven’t always followed the rules, often for good reason. For example, Aldus Prep. At the time of PageMaker’s development, Apple’s software didn’t do what Aldus needed, so Aldus broke the rules. Other problems are created for spooling with Apple’s approach to printing. SuperMac’s approach to spooling solves problems without letting the consumer know. It’s pretty ugly on the inside but clean to the customer. Apple’s approach is simple inside but is ugly to the consumer [you get intermittent messages from the print monitor]. Once we solved the problem, it wasn’t an appropriate use of Apple resources to go through the pain and suffering of doing it themselves.

SuperMac has decided to bring low cost to sophisticated graphics and make them mainstream.

What is the next hot new peripheral category?

If you don’t count video, which is my area, then communications. IBM products are information machines. Databases are much more successful in the IBM market. The Mac is less a container of information than a window on information elsewhere: it’s a leader in communications. Most Macs are networked. But ISDN will blow open the Mac market. The Mac and ISDN were made for each other. The Mac plugs into a wall like a phone and can provide the communications that everyone wants.

Imagine that you are in charge of future CPU architectures at Apple. What are your plans and the challenges for the next ten years?

The most important realization is that people have a bottomless lust for power. Gassée says he wants someday to have enough power to simulate full-motion animation on the Mac. The question is, how to get that kind of enormous computer power on the desk. One answer is in parallelism.

Apple is the only personal computer maker with a shot at making multiple CPUs work. The reason? Unlike on other CPUs, applications on the Mac run on the Toolbox, a set of program routines. So if I were the chief designer of CPUs at Apple, I would figure out how to make the Toolbox of three years from now and make it run the highest percentage of CPU cycles so that applications would be just a series of macro calls to the Toolbox. Then I would have to make sure that I could break down the Toolbox code and run it on multiple CPUs transparent to the applications developer.

What is the future direction of SuperMac?

Advanced graphics systems.

That’s what Radius says. You’ll compete with them?

I’m not surprised that they’re saying the same thing. Radius has some good folks there; it’ll be healthy competition.

We’re seen as having a name for sophisticated graphics on the Mac. We’re different from others in that we have decided to bring low cost to sophisticated graphics and make them mainstream, not $4000 or $5000 video cards. We hope to drop these capabilities to under $1000 via VLSI. We designed our first chip [gate array] for a video card in 1986 and have done two more since.

In August of 1987 we showed a prototype of a 24-bit capability on a three-card set; six months later we had reduced it to a single card prototype for the Mac II. That’s where we’ll put our energy. There is a big promise of true color for 13-inch color monitors at low cost. You have to do it by allowing the user to roam the screen over a larger bitmap, but it’s possible.

How do you accelerate QuickDraw for the Mac?

I think you’ve misstated the question. I would ask how to make the Mac more responsive. It’s not clear that QuickDraw (continues)
Regardless of what world you live in, Tecmar delivers the dependable, cost-effective tape backup systems you’re seeking.

**Mac World**

Tecmar’s QT-Mac80™ and QT-Mac40™ are the proven choice for SCSI tape backup for the pure Mac environment, with network support for effective backup and archiving under TOPS® AppleShare® and Novell®. Including our exclusive QuickTurn™ Quality Service and two-year warranty, you couldn’t ask for a better Mac tape backup solution.

**Mixed World**

We’ve even bridged the gap between PC Bus, Micro Channel™ Bus and NuBus™ with our new QT-Mac150™ and NuLink™ interface board, which now, for the first time ever, give you a single-drive solution for mixed environments.

So get the best for both worlds. For the name of your nearest dealer, call us today at (216) 349-1009 or toll-free at (800) 624-8560. Tecmar, Inc., 6225 Cochran Road, Solon, Ohio 44139-3377.
Forms

Design and Draw.

Fill Out.

Store, Sort, Search, Retrieve,...

The Old Way.

Copyright © 1989 Shana Corporation. Informed, Informed Designer and Informed Manager are
Make an Informed Decision.

Paperwork. The essential inconvenience.
A three part challenge to communicate in business.
Whether it's invoices, travel expenses, office memos or
tax returns, Informed™* and Macintosh® computers can help
you change mountains of paperwork into well organized
forms of information.
It's a new way to draw, fill out, and manage forms.

Design and Draw. Informed Designer™ comes
packed with high performance drawing features. All to help
you draw crisp, professional looking forms in no time at all.
Grids, guides, rulers, tables, fields, combs, lines, ovals,
rectangles, arcs, polygons, type — plus a whole lot more.
With over 1/1000th of an inch accuracy.

Draw or scan. Make revisions in
minutes. No more
obsolete forms.

Fill Out. With Informed Manager™, filling out forms
becomes an effortless, error free task.
Add intelligence to your forms so they can think for
themselves. Eliminate repetitive typing with powerful
calculations, choices and automatic lookups. Create customized online help to answer common questions.
Just imagine the results. Assured accuracy on picture
perfect forms.

Store, Sort, Search, Retrieve. Since Informed
Manager is actually a database, you can organize and ma­
nipulate forms like never before. Search and sort at blinding
speeds. Print single forms or group them for batch printing.
And because forms are stored electronically, you print
less. The bottom line is less paper, less cost.

So, it's time to think about forms the new way. Just give
us a call. We'd be happy to tell you more.
Then form your own conclusion.

The New Way.

For more information, please call or write:

Shana Corporation
Advanced Technology Center
105, 9650 - 20 Avenue
Edmonton, Alberta Canada T6N 1G1
Tel. (403) 463 - 3530 FAX (403) 428 - 5376
AppleLink CDA0004 MacNet SHANA

trademarks of Shana Corporation. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 297 on reader service card
The BigBin is a motorized paper tray that replaces your LaserWriter II's old 200-sheet paper tray to give you 1,000 sheets of paper. That means you can print bigger jobs unattended. Satisfy the paper-hungry needs of a Macintosh network. And spend less time refilling paper.

**Sizable advantages** BigBin lets you load 1,000 sheets of letter-size paper. All at once. You can even add a kit that handles legal-size.

**Simple addition** BigBin is a simple addition to your computer system. Just replace your printer's paper tray with BigBin and plug it into the wall. It's fully approved by Apple Computer for use with Apple LaserWriter IISC, LaserWriter IINT, and LaserWriter IINTX. And BigBin is covered by a limited 90-day warranty.

Despite the big name, BigBin needs only about a foot of space in front of your printer, and it weighs in at only 14 pounds.

**To make the connection** BigBin is available exclusively through authorized Laser Connection™ dealers. For more information on how BigBin can maximize your paper handling, call Laser Connection at 1-800-523-2696 for the dealer nearest you.

And be sure to ask for a free copy of The Sourcebook™—our exclusive catalog filled with the latest laser printer products and enhancements.
is the gating item. Lots of the time the application kills you, not QuickDraw. PageMaker is slow but that's because you're rescanning a database. Even if you spent zero time on QuickDraw it might not be faster, especially at 1 bit per pixel, where QuickDraw is quite good.

What about the future of optical drives?

Most people will not pay a large premium for removable mass storage. Today, optical disks are expensive. The seek time is slow, so people who go for them are those who need to carry around large amounts of data, a UNIX operating system, large databases, or images. For the next two years, the rest of the world will continue to favor 10MB to 20MB floppies, which are about ready to be announced. There is going to be a hell of a horse race for storage on the Mac.

Will SuperMac stay in storage technology?

Graphics and mass storage. The reason is simple: high-performance graphics require high-performance storage. We look for the bottlenecks and try to solve them.

Now that you have finally raised venture capital funds, do you have any recommendations for other developers?

I should have done it earlier. Venture capitalists are good people so long as you are on or ahead of plan. Their job is to make changes, some of which are painful.

Would you do all of this again?

My advice to budding entrepreneurs is to take a long time considering the opportunities in front of you. There are more of them available than you could exploit in a lifetime. Your job is to pick the best opportunity for success and then get the resources you need to handle the basic points of your business: finance, marketing, sales. Pick the best venture capitalists, those committed to your market and your business, not just check writers, and go at it. Interviewed by Jerry Borrell
Hard Bargain.

The easy decision has already been made: you’re going to buy a hard disk drive. The more difficult question is which drive to buy.

Ehman would like to help make your decision easier by giving you an unbeatable bargain on a 30MB Hard Drive. The best hard bargain in the industry. Just $449 gives you Seagate technology and reliability, (the same drive that Apple uses), Ehman’s reputation for quality and an obsession with efficiency and service.

And now that we’re bundling our hard drives with “PC Tools Macintosh”, you’ll have all the utilities you need to maximize your efficiency on the Mac. After all, you bought a Macintosh computer to help make you more efficient. Ehman now helps you do it for less.

Ehman has been a leading manufacturer of quality Macintosh peripherals since 1985, giving us advanced technical design skills, manufacturing expertise, and back-up service from skilled personnel.

That’s a combination that’s pretty hard to beat. But if you’re still unconvinced that this is the best bargain you’ll ever find on a hard drive, we’ll give you 30 days to make up your mind. Purchase the drive, try it for 30 days and see if it isn’t everything you’ve always wanted in a hard drive. If it isn’t, you can return it to us with no questions asked. Add to that a two-year limited warranty and you’ve got an offer that’s hard to pass up.

So don’t. Call 1-800-257-1666, U.S., or 1-307-789-3830 Worldwide, from 9 a.m. to 9 p.m. EST Monday-Saturday. Overnight delivery via Federal Express. Visa, Mastercard, and American Express welcome.

**HARD DRIVE PRICES**

<table>
<thead>
<tr>
<th>Size (Mb)</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>$329</td>
<td>$399</td>
</tr>
<tr>
<td>30</td>
<td>$379</td>
<td>$449</td>
</tr>
<tr>
<td>45</td>
<td>$449</td>
<td>$529</td>
</tr>
<tr>
<td>60</td>
<td>$499*</td>
<td>$579</td>
</tr>
<tr>
<td>80</td>
<td>$599*</td>
<td>$679</td>
</tr>
<tr>
<td>45MB Removable Drive</td>
<td>$849</td>
<td></td>
</tr>
</tbody>
</table>

*Good on Macintosh II models only. SE Drives also available. All product names mentioned are trademarks of their respective holders.

Circle 452 on reader service card
32-Bit Color for QuickDraw—at Last

In a move that promises to accelerate the use of realistic color in graphics applications, Apple has finally released its version of QuickDraw for 16-, 24-, and 32-bit color graphics boards. The Color Extensions release, which Apple will provide to customers as a free upgrade through dealers and online bulletin boards, provides a standard way for applications to create and display graphics using over 16 million colors.

Since the previous version of QuickDraw was limited to 256 colors, few software applications could take advantage of 24-bit color, because each 24-bit graphics board manufacturer had a different display scheme. With the release of Color QuickDraw, however, hardware developers such as Radius, Truevision, RasterOps, SuperMac, and Mass Micro can now ship their new 16-, 24-, and 32-bit graphics boards. Applications developers including Letraset, SuperMac, Adobe, and Aldus are already working on versions of their programs that support the new standard.

In addition to the 24 bits of color information, the new QuickDraw allocates 8 bits for alpha, or transparency, information. Although Apple has not implemented routines that support transparency, the alpha information can be accessed by manufacturers who want to provide their own routines.

The new Color QuickDraw file format, tentatively being called Color PICT, offers significant economies in the size of color graphics files. Whereas 24-bit color documents could take up over 2MB of disk space, the new Color QuickDraw compresses image files using a technique called Run-Length Limited encoding.

Color QuickDraw does the best it can to maintain the color fidelity of an image, regardless of the bit depth chosen, using a technique called dithering, which approximates missing colors by combining existing colors in various patterns. For example, an 8-bit color graphics board can approximate the colors of a 24-bit image by blending combinations from its original 256-color palette. Color QuickDraw also does a much better job of displaying color images on a gray-scale display system. Whereas two different colors could look the same using the older QuickDraw, Color QuickDraw guarantees each color will be displayed as a unique shade of gray.

The upgrade, which works with System 6.03 or later versions, consists of three files: new General and Monitors files, plus a 32-bit QuickDraw file. Improvements to the Monitors CDEV make it easier to configure and identify monitors when setting up systems with multiple monitors. When installed, Color QuickDraw occupies about 80K of space in RAM.

The Color Extensions upgrade will also include the LaserWriter 6.0 extension, which properly translates Color QuickDraw images into color PostScript for printing. Color images will print in color when sent to a color PostScript laser printer like the QMS ColorScript 100, or...
What happens when Macintosh performance becomes a National priority?

You regain your spare time. And you gain top-speed Mac II performance.
Take a break. Go down to your computer dealer and check out Maccelerate.™ It's the SCSI/DMA controller board from National that boosts your Mac II throughput.
Maccelerate removes the I/O bottleneck and frees-up your CPU by automatically handling data transfer to your main or NuBus memory. It works for both internal and external SCSI devices. Existing or new. Even multiple SCSI busses on a single Mac.
The result?
Maccelerate can make A/UX processing five times faster.
Your Mac OS will perform at new levels.

And if you're using our NS8/16 memory expansion board, you'll get even better performance.
Maccelerate takes only minutes to install, and it's backed for five years by National.
Maccelerate. A new addition to our growing line of performance enhancement, memory, video and communications products for the Mac.
Because in case you didn't know, Mac perfection is a National priority.

Call us or your local National dealer. It could change the way you plan your days.
(800) 538-8510
In California (800) 345-4006
Outside U.S. (408) 562-4719
National Semiconductor,
Compatible Products Group,
750 Central Expressway, M/S 34-10,
Santa Clara, CA 95050-2627.
Dealer inquiries welcome.

Maccelerate is a trademark of National Semiconductor Corporation. Apple, Mac and Macintosh are registered trademarks, and A/UX is a trademark of Apple Computer. NuBus is a trademark of Texas Instruments, Inc.

Circle 196 on reader service card
they will be translated into
gray-scale halftones when
printed on black-and-white
PostScript printers. Laser-
Writer 6.0 is incompatible
with earlier versions, so all
network users must upgrade
at the same time.
—David Usbijima

Engineering a Coup

The Mac isn’t just for
artists anymore. It’s
also meant for
engineering types, whether
they’re building sports stadi-
ums or writing memos. That
was the message that Apple
put across at the Apple Com-
puter Engineering Forum in
Seattle, using as springboards
Apple’s introduction of a
large-screen monitor and the
Mac IIcx in conjunction with
the release of AutoCAD for
the Mac. The forum boasted
more than 40 vendors and
dealers offering a multitude
of new products—ranging from
Architectronics’s Building
Code Analyst to AutoDesk’s
AutoCAD—which cover the
whole gamut of engineering
tasks from word processing to
signal processing.

Also on display was a sim-
ulated engineering office of
networked Macs that showed
applications for technical pub-
lishing (Interleaf Publisher,
PageMaker), and connected
to software for drafting (Auto-
CAD, Generic CADD), presen-
tation (Microsoft Chart),
analysis and modeling (MCAE
from Inertia), budgeting
(Excel), conceptual design
(Claris CAD), and word pro-
cessing (Microsoft Word).

The most interesting thing
about the Engineering Forum
is that it could have been suc-
cessfully held at all. After all,

the situation for engineering
software on the Mac is very
similar to that experienced by
general business software just
a year and a half or two years
ago. But, although the skeptics
still remain, big-gun applica-
tions are arriving that may
well engineer a coup for
Apple.
—Steve Roth

A New Chartmaker and a New Word Processor

Access Technology
has a new charting
program for business
and science applications that
promises a lot of bells and
whistles for only $195. Tentative-
ly named DeltaGraph, it
divides the data matrix into
pages to allow easy organiza-
tion of lots of data points and
lets you select data at random
for plotting. It performs about
40 functions on data that you
enter or import in one of sev-
en formats. The functions run
the gamut from simple arith-
metic operations to curve
smoothing, standard deviation,
ascenting or descending sorts,
and regression.

To plot the resulting data,
you select from about 30 chart
types ranging from typical pie
and bar charts to contour
charts, Gantt charts, and histo-
grams. Once you have graphed
the data, you can refine the
layout of the chart with a pa-
ette of drawing tools similar
to those in MacDraw II; you
can add graduated fills or
even scale charts down to fit
several on each page. You
can also adjust the look of
any 3-D chart by changing
elevation, perspective, or van-
ishing point. Finished graphs
can be exported in Illustrator
1.1, EPS, or PICT formats.

Access also has a basic
word processing program,
code-named Taste, scheduled
to ship in mid-fall. Features
include mail merge, column
handling, and color for char-
acters and background. In
addition, the $125 word pro-
cessor comes with enough of
DeltaGraph’s drawing tools to
do a little page makeup.

For further information,
contact Access Technology in
Monterey, California, at
408/648-4000.
—Nancy E. Dunn

(continues)
More Choice
E-Machines™ gives you more with a complete family of monochrome, gray scale, color, even stereo 3D displays. More choices in full page screen sizes. More compatibility with all Mac models.
QuickView™
Only E-Machines gives you QuickView™ special features that let your Mac do more. Features like definable virtual screens with panning, multiple viewing resolutions, tracking menus, virtual screen previewing, software controls for brightness and contrast, plug-in memory upgrades for more room and more image definition.

MoreCare™
E-Machines leads the industry in quality, warranty and support with MoreCare™. By getting the details right we build in quality. And, we back our display systems with unsurpassed service, a full year warranty and the industry's only available extended warranty.

More Innovation
Look to E-Machines when you want more innovative display power than you can get from Apple, or anywhere else.

To find out where you can buy an E-Machines display, write to us at 9305 SW Gemini Drive, Beaverton, OR 97005, or call us at 503-646-6699.
Remote Control Steals the Show

For giving slide presentations on the Mac, a $345 remote keyboard emulator called SilentPartner will free you from the keyboard and mouse.

Presentation Electronics' SilentPartner (due to ship this summer) is not the first handheld remote device to hit the Macintosh market. Kodak introduced its DataShow Presentation Remote last fall. Both products give you the freedom to walk around a room while operating the Mac as far as 35 feet away, and both work by sending the computer a signal that makes it respond as if you've pressed a particular key.

Kodak's $245 DataShow Presentation Remote is an 18-key device that comes with a set of preprogrammed keyboard equivalents. It lets you move forward and backward in a presentation, or access a particular slide out of sequence. It requires the Apple Desktop Bus (ADB), so DataShow Presentation Remote only runs with an SE or a Mac II. The device works with ReadySetShow, Cricket Presents, More II, Microsoft PowerPoint, Aldus Persuasion, and HyperCard—but not with any other software.

SilentPartner's salient feature is its flexibility. Twenty of its 23 keys can be programmed with macros that can be up to 78 keystrokes long. You can choose among three 20-key virtual keypads, giving SilentPartner a total of 60 programmable buttons. It does not require the ADB, so it will work with any model of Mac. Its built-in nonvolatile memory retains its programming when shut off, and it is compatible with all Macintosh software.

SilentPartner comes with a template of buttons preprogrammed for a selection of common applications. It also includes menu-driven software that lets you easily reprogram buttons and create, store, and download new templates.

For further information, contact Kodak in Rochester, NY, 800/445-6325, and Presentation Electronics in Sacramento, CA, at 916/446-3402.

—Mary Margaret Lewis

HyperCard Book Roundup: The Sequel

Since our last look in the February 1989 issue, good books on HyperCard continue to appear. All of them—with different approaches—offer to advance your HyperTalk expertise and guide you in building snazzy stacks. Check these out for your library:

HyperTalk, by Lon Poole. Macworld contributing editor Poole's book is a compact, powerful collection of HyperTalk commands, control statements, functions, properties, constants, and system messages, arranged alphabetically for quick reference, with clear explanations and examples (Microsoft Press, 206/882-8080).


XCMD's for HyperCard, by Gary Bond. Written by a member of Apple's HyperCard development team, this book is aimed at programmers who are familiar with Inside Macintosh (volumes 1-5). It fully explains how to create and use external commands and functions (XCMDs and XFCNs), with several hundred examples in both MPW Pascal and Lightspeed C (MIS Press, 503/222-2399).

HyperCard Made Easy, Second Edition, by William B. Sanders. Here both the novice Macintosh user and the experienced programmer will find a concise but thorough explanation of practical stack building. Extensively illustrated with screens and dialog boxes, the book includes many new or revised sections that specifically address HyperCard 1.2 (Scott, Foresman Macintosh Books, 312/729-3000).

HyperCard: The Complete Reference, by Stephen L. Michel. Intended for everyone from beginner to expert, this entry in the total-HyperCard book field starts you out using the Home Card and the Address Stack, proceeds all the way to XCMDs and XFCNs, and gives numerous tips and sample scripts along the way (Osborne McGraw-Hill, 415/549-6110).

Dr. Dobbs' Essential HyperTalk Handbook, by (continues)
What does the MaxStream™ have in common with the Concorde, a supertanker and the Golden Gate Bridge? Plenty, when you’re talking about performance.

With speeds up to 6.75 megabytes per minute, it’s the fastest tape backup available. It quickly reduces even the longest, most mundane backup chore into a simple, effortless task.

But don’t think that means you give up accuracy for speed. Built-in error correction and data verification guarantee that the data you put on tape will be exactly the same when you restore it – all 150 megabytes.

That’s right. MaxStream packs a whopping 150 megabytes on a single industry-standard DC600™ 1/4” cartridge. With that kind of capacity, it’s like a supertanker for data. (There’s also a 60 megabytes version for smaller applications.)

Either one is perfect for backing up high-end applications like graphics, imaging, database or CAD programs.

And of course, MaxStream works with every popular network. It’s the one drive you can trust for backing up all the valuable data on a server.

LAN administrators will also appreciate MaxStream’s software. It lets you back up an entire network at pre-programmed times, instead of having to rely on users to back up their data individually.

Even if you’re not on a network you’ll like our full array of backup and restore features as well as scripting, which allows for automatic, unattended backups. You can run an entire backup at night, or while you’re at lunch.

MaxStream also bridges the gap between Macs and IBM PCs® by letting you use the same DC600 cartridge with both systems. With Archive’s Universal Tape Format™ a tape from one of Archive’s tape subsystems can be read and used by the other and vice versa.

MaxStream works with the Mac Plus, SE, II and IIX®. It plugs into the standard SCSI port, and comes with everything you need – cables, software, DC600 cartridge and manual.

Just as important, when you go with MaxStream, you’re getting backup and support from the company that pioneered streaming tape technology back in 1980. Today, there are over one-million Archive tape drives in use throughout the world.

If you’re looking for backup that combines speed, capacity and connectivity, it’s time to look into MaxStream. For complete information call 1-800-237-4929. Or write Archive Corporation, Data Storage Division, 1650 Sunflower Ave., Costa Mesa, California 92626.

Why trust your data to anyone else?™

Circle 3 on reader service card

Archive is a registered trademark and MaxStream, Universal Tape Format and Why trust your data to anyone else? are trademarks of Archive Corporation.
Macintosh Plus, SE, II and IIX are registered trademarks of Apple Computer, Inc. IBM PC is a registered trademark of International Business Machines. DC 600 is a registered trademark of 3M Corp.
12 issues
just $24.

BUSINESS REPLY MAIL
FIRST CLASS  PERMIT NO. 1262  BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666
Be a Mac master.

YES! Send me 12 issues of MACWORLD for $24. Save me almost 50% off the annual cover price of $47.40

YES! YES! Send me 24 months of MACWORLD for $37.90

12 issues for
$47.40
Now only
$24.00

Name

Company

Address

City State Zip

Payment enclosed.  Bill me later.

Basic subscription rate for Macworld is $30 for 12 issues. The annual cover price is $47.40 (12 issues). This rate limited to U.S.A. and its possessions. Please allow 6-8 weeks for delivery of your first issue.

Exploring HyperCard, by Steven Anzovin. An accessible, generously illustrated HyperCard guide, this book starts out by going all the way back to Vannevar Bush and his seminal 1945 essay, “As We May Think,” for historical context, then thoroughly explores HyperCard tools, scripts, and stack building. A solid chapter on special effects, a HyperTalk glossary, and a resource index are also included. (Compute Books, 919/275-9809).

—Felicity O’Meara

When a Keyboard Isn’t Enough

Once in a while a product comes along that defies categorization. In the case of Gestures, developed by Evergreen Technologies, we’re talking about software that isn’t even intended for consumers. Rather, it’s a technology that Mac hardware and software designers can include in their products to gain a competitive edge.

Gestures interprets symbols and commands by observing the motions of any input device—mouse, trackball, stylus on a tablet, or finger tracing on a touch screen. The symbols could be just about anything: characters difficult to enter from a conventional keyboard, such as math symbols, musical notes, or letters from non-Latin alphabets; a gestural shorthand for repetitious information; or even physical commands, such as crossing out to delete a paragraph. Gestures works by observing the motion from the input device and comparing the direction, speed, and geometry of that motion to those attributes in the list of symbols it knows. Of course, that dictionary of symbols is tailored to the application. Equally important, the software can learn infinite variations on any symbol so individuals need not conform to the machine’s idea of what, say, a handwritten / looks like.

Jeffrey Siegel, president of Evergreen Technologies, thinks that musical input, education, filling out forms, and CAD are some of the many obvious applications for this technology. For example, Siegel suggests Gestures could bring CAD a little closer to the traditional drafting process. “If you’re an electrical engineer working with a CAD program, you could draw a little squiggle that turns into a resistor, instead of dragging a resistor symbol from a palette every time you need one.”

Gestures could also lead to shortcuts that would work with any Mac application, the way CE Software’s QuickKeys lets you substitute a single key for a whole sequence of commands and selections. A HyperCard XCMD version of Gestures is also available.

Expect to see demonstrations of commercial products incorporating Gesture’s capability as early as the Macworld Expo in Boston in August. In the meantime, interested developers can learn more by contacting Evergreen Technologies, Germantown, Maryland, 301/330-8571.

—Nancy E. Dunn

Mac Font Update

The summer of 1989 is seeing a boom in PostScript fonts and font-related software. Adobe is in for some competition as other companies gear up for mass production of fonts. Kingsley/ATF recently released its first four families of PostScript typefaces, to be followed by more later in the year. Image Club plans to release a compact disk containing 600 faces licensed from ITC and other established type companies. In a unique marketing scheme, the fonts on the CD will be locked; buyers will contact Image Club for codes to unlock the (continues)
You Could Buy From A Dealer. When you're ready to upgrade your Macintosh system with peripherals, buying from a dealer is one option. The dollar figures shown here are actual suggested retail prices. Dealers may offer you their "courtesy" discounts, but any way you cut it, you're going to pay more.

$2,519

$1895.00
DATADSK MAC-101 Keyboard. The most popular third-party keyboard on the market, light to the touch, heavy on the price.

$429.00
Apple 800K External Floppy Disk Drive. If you absolutely have to have the little Apple logo on it to match your other hardware, buy it. But it's a lot to pay for a little apple.

$195.00

But You Can Do Better With Ehman. Ehman doesn't have a fancy carpeted showroom and an expensive sales staff. We don't have mark-ups as high as 50% either. What we do have is high-quality peripherals, technical support, and customer service, all at less than half the cost of a dealer.

$1,097
Ehman 45MB Removable Hard Drive. Just introduced, it also has award-winning SyQuest technology, and the best features of the Mass Micro except one. The high price.

$849.00
Ehman 800K External Floppy Disk Drive. Also recently introduced, it utilizes proven Fujitsu technology for quiet performance and reliability. It will save you lots of time, and nearly 300 bucks.

$99.00
Ehman Extended Keyboard. This critically acclaimed keyboard has tactile feedback, positive response keys, a two year warranty, and all the functions you want in an extended keyboard, plus one. A functional price.

For the best value go direct to the source. Call Ehman's toll-free number, 1-800-257-1666, U.S., or 1-307-789-3830, world-wide. Overnight delivery via Federal Express, Visa, MasterCard, and American Express welcome. Ehman has been manufacturing quality peripherals since 1985 and backs every item with a 30 day hassle-free return policy and a 2-year limited warranty.
The new 44MB Bernoulli sets new standards in performance and capacity for Macintosh power users—users who want the growth and flexibility of removable storage. Because now Bernoulli offers 22ms effective access time and unlimited storage growth, 44 megabytes at a time.

But performance and capacity are just the beginning. Bernoulli reliability is second to none. Bernoulli’s unique design resists head crash, a fundamental problem of conventional hard disks. Bernoulli Disks can also withstand over 1000 Gs of shock. In fact, they’re the only removable disks that can take a fall from a desktop without data loss. And Bernoulli Disks and Drives provide product life equal to or better than conventional alternatives.

Backup is easy and fast. Bernoulli lets you make disk-to-disk copies in as little as 3 minutes for 44 megabytes. And since Bernoulli Disks are removable, you can organize your projects on individual disks and keep all of them under lock and key.

Now your data can really go places, too. Bernoulli lets you share files between your Mac and PS/2’s, PCs and compatible computers,* and with Bernoulli’s ruggedness you can send disks across the office or around the world without concern. And whether for growth or sharing, the 44MB Bernoulli lets you add additional storage for under $3 per megabyte.**

Those are a few reasons why Bernoulli is the overwhelming leader in removable mass storage, with over 400,000 drive systems and 2.75 million disks in use worldwide. More important, 95% of those users recommend Bernoulli. So see your nearest Iomega Authorized Reseller, or call 800-422-8828 for complete benefits and specifications.

Never ending storage solutions.

*Mostly possible with Iomega’s Bernoulli E-Exchange software. **Based on $35 U.S. retail price per 44MB disk. Bernoulli and Bernoulli Disk are trademarks of Iomega. Macintosh is a registered trademark of Apple Computer, Inc. IBM is a trademark of IBM.

Circle 260 on reader service card
fonts they need, paying only for those they use. The Font Company recently released 70 families licensed from URW and plans to offer the entire URW type library by year’s end. The Font Company’s faces are also offered as EPS outlines for use in Illustrator or FreeHand. Bitstream’s MacFontware offers a multiprinter solution with bitmapped fonts in the correct sizes for QuickDraw printers, as well as PostScript outlines for PostScript printers. Specialty fonts of note include Bear Rock Software’s Code 39 and UPC-A bar-code fonts; four musical notation fonts from Coda Music Software; and augmented versions of several LaserWriter favorites from EmDash, which offers tailored versions of Times, Helvetica, Courier, and Avant Garde, each of which provides fractions, superior numerals for prices, and several styles of bullets.

Some new digital type foundries will be joining Altsys’ classic Fontographer. Kingsley/ATF’s ATF Type Designer I is expected to ship this summer, while Letraset’s program, code-named Fred, is due out late this year. Expect Letraset’s program and a future version of Fontographer to support Apple’s new font format. If you’re not up to designing a font from scratch, Altsys’ The Art Importer converts Mac graphics in any of several formats into PostScript characters that can be keyed in.

Finally, in the special-effects department, joining Letraset’s LetraStudio and Broderbund’s TypeStyler are Emerald City Software’s Smart Art and Linographics’ LaserOptics. In addition, you can add effects to Postcraft International’s Laser FX with Laser FX-Pak expansion packages.

For further information, contact Altsys Corporation in Plano, Texas, at 214/424-4888; Bear Rock Software in Placerville, California, at 916/622-4640; Bitstream in Cambridge, Massachusetts, at 617/497-6222; Broderbund Software in San Rafael, California, at 415/492-3200; Coda Music Software in Bloomington, Minnesota, at 612/854-1288; EmDash in Northfield, Illinois, at 312/441-6699; Emerald City Software in Atherton, California, at 415/368-8303; The Font Company in Phoenix, Arizona, at 602/996-6606; Image Club Graphics in Calgary, Alberta, Canada, at 403/262-8008; Kingsley/ATF Type Corporation in Tucson, Arizona, at 602/325-5884; Letraset USA in Paramus, New Jersey, at 201/815-6100; Linographics in Orange, California, at 714/639-0511; or Postcraft International in Valencia, California, at 805/257-1797.

—Efray Fenton

### Radius Strikes a Color Chord

To support the color capability of the Mac II family, Radius has begun shipping its DirectColor series of 16- and 24-bit display boards. The boards are capable of showing two pages of photorealistic color on appropriate monitors and are compatible with Apple’s recently unveiled 32-bit QuickDraw.

The DirectColor boards have a full chunky architecture for faster throughput and support the NuBus’ block-transfer mode, which permits data transfer at up to 37.5MB per second. The block-transfer capability is intended to work with any future graphics input board that can act as a bus master and also support the block transfer mode. Radius declined to confirm whether it currently has any plans for such a product.

Both boards offer 1152-by-882-pixel resolution, a palette of 16.7 million colors, and a 72Hz refresh rate that eliminates flicker. The 16-bit board can be upgraded to 24 bits by adding 1MB of video RAM for a total of 3MB.

The Radius DirectColor/16 Interface has a suggested list price of $3695, while the DirectColor/24 Interface lists for $4995. Radius also announced a Mac SE/30 version of its monochrome display board for its Two-Page Display monitor. The display and board together will retail for $2100. For more information, call Radius in San Jose, California, at 408/434-1010.

Screen output from Radius’ DirectColor/24 Interface, a 24-bit board compatible with 32-bit QuickDraw.

### Speeding Up SCSI Transfers

Designed to speed Mac II file transfers to and from your SCSI hard disk, tape drive, or optical storage device by as much as 500 percent, Golden Triangle’s Pronto board supports both internal and external drives.

(continues)
Fast Statistics.

Because you don’t have time to waste.

You don’t have time to read a 1000 page manual, to play games, to wade through a pile of confusing menus.

You have lots of data. You need graphs, tables, financial projections, surveys. The report is due tomorrow and the stat package you thought had everything can’t do the job.

Now you can do it. The company that brought professionals the best statistics package on the Macintosh introduces the easiest: FASTAT.

Designed just for the Macintosh, FASTAT makes high-powered, accurate statistics easy.

You can do dependent and independent t-tests, time series analyses, factor analysis, two-way and n-way tables, correlations, nonparametric tests, regressions, analysis of variance and covariance, exploratory data analysis — even if you’ve never done them before.

You can also create full-featured graphics such as X-Y plots, bubble plots, line plots, histograms, box-plots, stem-and-leaf diagrams, autocorrelation and time series plots, as well as state-of-the-art displays, like scatterplot matrices.

Some of the graphs are only a click away. Click on a variable name, and you get a histogram or a box plot of the variable. Click on a regression output or a cell in a correlation matrix, and you get a scatterplot of the variables.

Need to customize a graph? With FASTAT’s MacDraw-like tools you can color, draw, add text, and move things.

Need help understanding a statistic? FASTAT’s “pop-up tutor” tells you what the numbers mean.

Need reports? FASTAT’s built-in text editor lets you scroll through results, cut and paste, change fonts, add explanatory notes, and save your work.

For $195, you can stop wasting time.

Systat. Intelligent software.

Call or write for further information:
SYSTAT, Inc.
1800 Sherman Avenue, Evanston, IL 60201
312 864.5670 FAX 312 492.3567

System requirements: 1 megabyte of memory and hard drive. Mac II version available. Unlimited free technical support.

Dealers circle 492 on reader service card
End users circle 491 on reader service card

*MacWeek September 13, 1988
**Suggested Retail Price
Golden Triangle’s pronto board accelerates SCSI transfers.

Pronto uses synchronous (clocked) SCSI, which is faster than the asynchronous SCSI native to the Mac. This NuBus board also uses a byte-packing algorithm and cache memory to sling data around your system.

To install Pronto, you simply plug it into the NuBus; operation is transparent. Available now, the board has a suggested list price of $745. For further information, call Golden Triangle Computers in San Diego at 619/279-2100.

New CAD on the Block

With the Macintosh II gaining acceptance in architecture, engineering, and construction firms, more and more software for those professions has come on the market. The latest entry is MicroStation Mac from Intergraph, a Fortune 500 firm that pioneered CAD software on minicomputers. At $3300, the program offers unlimited drawing size, 450 tools and functions, numerous input and output alternatives, and Oracle databases for graphics and for basic administrative tasks such as tracking materials and billing. (Support for Ingres and Informix database managers is planned.) At the same time, MicroStation Mac provides an entry-level door to Intergraph’s VAX-based Interactive Graphics Design Software (IGDS), as well as transparent file portability between MicroStation versions for the Mac, IBM PC, and UNIX workstations.

MicroStation Mac can simultaneously display two- and three-dimensional drawings, with both wire-frame and shaded models in the same drawing. The program works concurrently on up to six monitors, with as many as eight active windows showing different views of the design at the same time. An unlimited undo/redo capability lets designers backtrack for any number of steps.

This power doesn’t come at the expense of ease of use. Though MicroStation Mac’s many features take some time to learn, the program resembles other Mac programs in its use of tool palettes. The program lets you enter commands from the keyboard in an optional command window, but you can stick to the mouse without sacrificing any power.

MicroStation Mac brings high-end architecture, engineering, and construction CAD functions to the Mac II family and the SE/30.

MicroStation Mac works on the Mac SE/30, Mac II, or Mac IIX. The program requires at least 2MB of RAM (4MB is recommended), and hard disk capacity of at least 40MB. For further information, contact Intergraph in Huntsville, Alabama, at 205/772-2194.

—Nancy E. Dunn

CD ROM Starts Spinning in the Mac World

When Apple announced its CD ROM drive a little over a year ago, there were few titles for it and little real benefit to the user. With many of the obstacles to acceptance now gone, however, CD ROM is fast becoming a viable medium for the distribution of software, graphics, and data.

For example, a mastering technique already demonstrated by Discovery Systems allows CD ROM developers to produce disks that will work with either a Mac or an IBM PC. The company’s sampler combines music with a HyperCard stack of lyrics and images that play along with the music. On a PC, the disk provides a music-selection menu, which is used to control the playing of the songs on the disk.

Toshiba has announced a CD ROM subsystem that can be used on either a Mac or a PC, allowing a dealer to stock a single unit. This approach permits economies of scale that should eventually reduce the cost of CD ROM drives. Further, a SCSI adapter from CSM should also help break down barriers to acceptance by allowing a PC to use a Mac CD ROM.

The number of CD ROM software titles continues to grow. A pair of three-pack bundles being distributed by Ingram Micro D combines VideoWorks from MacroMind, BMUG PD-ROM (Public Domain Read-Only Memory) which includes both public domain software and shareware from BMUG (Berkeley (continues)
Best Performer!

FoxBASE+/Mac: The Most Celebrated Mac DBMS
Now Includes a Powerful Report Writer!

New FoxBASE+/Mac Version 2.00 is here—and stealing the show! In its first year, FoxBASE+/Mac won more awards—both in the U.S. and Europe—than any other DBMS ever created for the Macintosh! And Version 2.00 is faster and more powerful than ever—packed with innovative new features and language enhancements!

New FoxReport!
FoxReport lets you create virtually any columnar or free-form report—without any programming! FoxReport includes:

- **Page Layout**
  Designate many layout settings for your report: number of columns, left margin setting, column width, space between columns, measurement size for each page, and more!

- **Report Layout Window**
  Define the different areas within your report, using FoxReport's new "band" system. Start with the default bands: Page Header, Body, and Page Footer, then bring in other bands like Title, Summary, Column Headers and Footers, etc.

- **Object Menu**
  Control the Type Font, Sizes and Styles of text objects. Fill and Pen options let you change the color and shading of almost every object!

- **Page Preview**
  "What-You-See-Is-What-You-Get" design ensures that the report on your screen is exactly as it will appear in print!

- **Label Generator**
  Create labels of almost any size and configuration. You can even include pictures anywhere on the label space!

**New Features!**

- **Enhanced XCMD/XFCN Support**
  Load up to 16 external XCMD's and XFCN's, then access them directly from within FoxBASE+/Mac 2.00 programs!

- **Language Enhancements**
  Other features include: support for custom hierarchical menus, new commands to help handle resources, new system functions to improve filename and screen management, and much more!

**Perfect Connectivity!**
FoxBASE+/Mac 2.00's Multi-User version allows complete data and application sharing between networked Macs and PCs (when used with FoxBASE+/LAN). It also runs on the most popular network systems: AppleShare, Novell and 3Com!...And It's Faster Than Ever!

**Order or Upgrade Now!**
FoxBASE+/Mac Version 2.00 is the new Leader of the Mac! And at only $495 ($695 for Multi-User), it's a phenomenal bargain! If you're already a FoxBASE+/Mac registered user, you can upgrade to Version 2.00 for just $75!

To order your copy (or ask for a FREE demo disk), call (419) 874-0162. Or visit your local quality software dealer.

After all, when it comes to the Macintosh, Nothing Runs Like a Fox!

---

**Fox Software**

Fox Software, Inc. (419) 874-0162, Ext. 650
134 W. South Boundary
Perrysburg, OH 43551
Fax: (419) 874-8678
Telex: 6503040827 Fox

Circle 152 on reader service card
Macintosh user group), and Optical Media International's Universe of Sounds CD ROM database of sound effects, into one $249 retail package. A second package combines clip art from Comstock Desktop Stock Photography; Multi-Ad Services' ProArt Trilogy Clip Art; and Xiphias Corporation's National Directory, a listing of telephone and fax numbers for many major companies.

Development tools announced by Apple and others will reduce the cost of developing CD ROM disks for the Macintosh. Apple has also announced HyperSource, a mastering system that automates the creation of graphic databases and puts graphics and reference information into a HyperCard stack. In addition, Apple has unveiled its HyperCard CD Audio Toolkit, which provides extensions that allow stack control, interaction, and random access to audio tracks on any compact disk. Apple has reduced the cost of disk production, and this should clear the way for a large number of titles to become available very soon. This, in turn, could make connecting a CD ROM unit to your Mac a necessity. For more information, call BMUG in Berkeley, California, at 415/849-9114; Comstock in New York City, at 212/353-8086; Discovery Systems in Dublin, Ohio, at 614/761-2000; Ingram Micro D in Santa Ana, California, at 714/540-4781; MacroMind in Chicago, at 312/871-0987; Multi-Ad Services in Peoria, Illinois, at 309/692-1530; Optical Media International in Los Gatos, California, at 408/395-4332; Toshiba America in Irvine, California, at 714/583-3000; or Xiphias Corporation in Marina Del Rey, California, at 213/821-0074.

—Mark Brownstein

Statistics, Anyone?

SAS Institute, creator of a very popular data-management and statistical-analysis program for mainframes and minicomputers, has introduced a Mac program that performs some of the same tasks. While it's not a Mac version of SAS, JMP (pronounced jump) lets nonstatisticians graphically explore data to discover relationships that wouldn't be apparent in spreadsheet form.

This approach is not new to the Mac; several other programs encourage graphic data exploration, and Odesta's DataDesk Professional shares many of JMP's features (see "Picturing Statistics," April 1989). Like DataDesk, JMP lets you plot data as a three-dimensional cluster of dots that you can spin on screen and examine from all angles to look for data that depart from the norm.

JMP's innovations include the capability to generate leverage plots and mean circles plots from x/y graphs. In addition, the software will allow importing and exporting files in the SAS transport format, which provides data compatibility with the company's flagship product.

Site licenses for JMP will cost under $500 for one workstation, and discounts will be available for volume installations. JMP is scheduled to ship this fall. For further information, contact the SAS Institute in Cary, North Carolina, at 919/467-8000.

—Nancy E. Dunn

Hope for Desktop Color Separations

Despite the explosion of new hardware and software for desktop publishing, techniques for preparing color photographs and graphics for printing on the Mac have so far not met the standard set by more traditional methods. But there's hope on the horizon, in the form of new software developed in Spain.

Marcel Coderch, director of research and development for Grupo Anaya in Madrid, says the publishing company has developed a program that converts the Mac's RGB color to printer's CMYK color with such precision that printed... (continues)
But Your Excellency, we've found a better way to put the world at your command.

We call it CompuServe. The world's most powerful network of people with personal computers. We put you in command of a bigger world of communication, information, and entertainment than the Little Emperor ever dreamed of. With just a few keystrokes on your personal computer.

To join forces with us, call 800 848-8199.

CompuServe®

Circle 57 on reader service card
image clarity and color gradations rival the output of high-end systems such as Scitex.

In addition, the software appears to completely eliminate the moirés that have troubled printers ever since color lithography was invented. These wavy patterns result from very slight misalignment of the screens used to produce the cyan, magenta, yellow, and black dots. Gorder's method does away with the screen rotation that traditionally produces the regular array of dots, thereby forestalling the chance to create moirés.

Mac Product developers, such as Barrystan of Berkeley, California, are currently testing the software, and Grupo Anaya is considering how to distribute it. It may be sold to consumers and printing technicians, or it may be licensed to Mac software and hardware manufacturers.

For further information, call Grupo Anaya in Madrid, Spain, at 011/341-742-9389.
—Nancy E. Dunn

Survey Says: The '030

For this month's survey, we took a look at which Macintosh models our readers are currently using, and at what percentage of them say they will buy one of Apple's new 68030-based machines.

As Apple and many pundits have predicted, the Macintosh IIx looks to become one of the most popular Macs ever. Twenty-three percent of those responding to our survey said they expect to buy at least one IIx in the next 12 months. However, the six-slopped members of the Mac II family fared less well, according to our version of Family Feud. The IIx and the 68020-based Mac II each garnered only a 7 percent intent to purchase. Only 7 percent of readers who plan to buy a Mac in the next year say they anticipate using more than 3 slots.

In Apple's compact line, the SE/30 leads the way, tallying 18 percent of respondents who plan to purchase, while 12 percent said they would buy an SE. Only 6 percent spoke up for the Mac Plus, adding some credence to industry rumors that the once-popular and widely installed machine may be headed for Mac Valhalla.

When you total the percentage of respondents who said they would buy an '030-based Mac system in the next 12 months, you come up with a whopping 48 percent—indicating, if there was any doubt, that Mac users care very much about performance. In fact, in a separate question on the survey, 24 percent of SE and II-Series users said they intend to buy a 68030-based accelerator board. Interestingly, 46 percent of readers polled said they had no plans to buy any Mac in the next 12 months.

Incoming Faxes

Two or more companies have decided to offer facsimile modems for use with the Mac. Ricoh Corporation, known for its copiers and facsimile machines, will shortly be shipping the DXI fax modem for the Mac, and Orchid Technology has announced its own MacFax modem.

The 9600-bps Ricoh DXI includes two phone jacks and software that let you use a regular fax machine as a scanner for the Mac. DXI software also serves as a phone-line management tool—you can preset the device to answer the phone (voice or fax) and to direct faxes either to a regular fax machine for hard copy or to the Mac's hard disk for storage. Also, the fax software can be used in a stand-alone mode, supporting Mac-to-Mac file transfers at speeds of up to 57,600 bps.

Orchid Technology's MacFax is also a 9600-bps fax modem, but the functions of a 9600-bps data modem are included in the same unit. Bundled with BackFax software from Solutions International, the MacFax is capable of receiving and sending faxes in the background on the Mac and can also exchange Mac files with Apple's AppleFax modem. For more information, call Orchid in Fremont, California at 415/683-0300 or Ricoh's Systems Facsimile Department in West Caldwell, New Jersey, at 201/882-2535.
—Dave Kosier
Visit us at the Macworld Exposition in Boston, MA August 9-12, Booth 1540 Bayside Exposition Center

Hold on to your hats! Hold on to your feet! And hold on to your original packaging and documentation! Because, MacConnection is now offering 30 and 60 day money-back guarantees on products from selected companies. (Look for the companies which are marked with a ★ and listed in red.) If you are dissatisfied with your purchase of these products for any reason, just call for a hassle-free return authorization.

We only carry the latest versions of products. Version numbers in our ads are current at press time. Also, all of the software we sell is not copyright-protected, unless indicated otherwise by (CP).

The four-digit number next to each product is the product’s ITEM NUMBER. Please refer to this number when ordering. Thank you.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1616</td>
<td>Professional 3-Pak</td>
<td>$359</td>
</tr>
<tr>
<td>1618</td>
<td>Retail Business 3-Pak</td>
<td>$359</td>
</tr>
<tr>
<td>4502</td>
<td>Dac Easy Light 1.0</td>
<td>$42</td>
</tr>
<tr>
<td>2425</td>
<td>Quicken 1.5</td>
<td>$32</td>
</tr>
<tr>
<td>5207</td>
<td>atOnce! 1.0</td>
<td>$295</td>
</tr>
<tr>
<td>2768</td>
<td>Managing Money 2.0</td>
<td>$325</td>
</tr>
<tr>
<td>2769</td>
<td>Business Sense 1.2</td>
<td>$279</td>
</tr>
<tr>
<td>2971</td>
<td>McMax 2.0</td>
<td>$175</td>
</tr>
<tr>
<td>5101</td>
<td>Grant Manager 1.75</td>
<td>$249</td>
</tr>
<tr>
<td>2981</td>
<td>WillMaker 3.0</td>
<td>$32</td>
</tr>
<tr>
<td>2986</td>
<td>Timestips III 1.1</td>
<td>$169</td>
</tr>
<tr>
<td>3978</td>
<td>Components GL 1.0</td>
<td>$389</td>
</tr>
<tr>
<td>3324</td>
<td>Project Billing 1.55</td>
<td>$389</td>
</tr>
<tr>
<td>4378</td>
<td>Legal Billing II + 2.56</td>
<td>$589</td>
</tr>
<tr>
<td>4386</td>
<td>Legal Billing II + 2.56</td>
<td>$589</td>
</tr>
<tr>
<td>3471</td>
<td>MacInUse 2.0</td>
<td>$42</td>
</tr>
<tr>
<td>3473</td>
<td>TaxView Planner 1988-92</td>
<td>$64</td>
</tr>
<tr>
<td>3289</td>
<td>MacMoney 3.02</td>
<td>$61</td>
</tr>
</tbody>
</table>

Accounting & Finance

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3976</td>
<td>Aatrix Payroll 3.05</td>
<td>$99</td>
</tr>
<tr>
<td>4321</td>
<td>Aatrix TimeCard 2.0</td>
<td>$109</td>
</tr>
<tr>
<td>4320</td>
<td>Aatrix TimeMinder 2.1.2</td>
<td>$159</td>
</tr>
<tr>
<td>3958</td>
<td>Aatrix Payroll PLUS 3.1</td>
<td>$159</td>
</tr>
<tr>
<td>4977</td>
<td>Simply Accounting 1.04</td>
<td>$209</td>
</tr>
<tr>
<td>1613</td>
<td>Rags to Riches Ledger 3.1</td>
<td>$119</td>
</tr>
<tr>
<td>1614</td>
<td>Rags to Riches Payables 3.1</td>
<td>$119</td>
</tr>
<tr>
<td>1617</td>
<td>Rags to Riches Receivables 3.1</td>
<td>$119</td>
</tr>
<tr>
<td>1622</td>
<td>Rags to Riches 3-Pak</td>
<td>$289</td>
</tr>
<tr>
<td>1612</td>
<td>Inventory Control 2.6</td>
<td>$239</td>
</tr>
<tr>
<td>1615</td>
<td>Professional Billing 2.9</td>
<td>$239</td>
</tr>
</tbody>
</table>

Numerics & Databases

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4482</td>
<td>Atrax Concepts</td>
<td>$60 MBG</td>
</tr>
<tr>
<td>4481</td>
<td>StatView SE + Graphics 1.03</td>
<td>$225</td>
</tr>
<tr>
<td>1346</td>
<td>Trapeze 2.1</td>
<td>$149</td>
</tr>
<tr>
<td>1010</td>
<td>4th Dimension 1.0.6</td>
<td>$349</td>
</tr>
<tr>
<td>4024</td>
<td>Full Impact 1.0</td>
<td>$249</td>
</tr>
<tr>
<td>4318</td>
<td>Onsight 3 Plus/Express 3.3</td>
<td>$399</td>
</tr>
<tr>
<td>1508</td>
<td>Reflex Plus 1.0</td>
<td>$189</td>
</tr>
</tbody>
</table>

Abacus Concepts  60 day MBG

StarView SE + Graphics 1.03—Remarkably powerful yet easy-to-use statistical analysis program with presentation quality graphics for the Mac or SE. Prints your graphs in color. $225.
Electronic Arts

Studio/1 1.0—For the first time...easy, incredible animation. Create an object, define a path, and Studio/1 does the rest. Automatically move and rotate objects in full 3D. Create spinning titles in seconds. Great for animated clip art...$99.

GRAPHICS & DESIGN

★ Aegis Development ... 60 day MBG
4956 Showcase FX 1.0 ... 199.
★ Altoids ... 30 day MBG
4830 KeyMaster 1.0 ... 52.
1194 FON Tastic Plus 2.0 ... 52.
Bright Star Technology
3962 HyperAnimator 1.5 ... 99.
Broderbund Software
4065 PosterMaker Plus 2.5B ... 35.
1427 Print Shop 1.3 ... 35.
4501 Drawing Table 1.0 ... 75.
★ Casady & Greene ... 60 day MBG
1575 Fluent Fonts 2.0 ... 27.
★ Challenger ... 30 day MBG
1610 Mac3D 2.1 ... 119.
Claris
1123 MacPaint II 2.0 ... 99.
1117 MacDraw II 1.1 ... 309.
4815 SmartForm Designer 1.0 ... 309.
4814 Claris CAD 1.0 ... 629.
Cricket Software
4346 Cricket Paint 1.0 ... special 65.
1667 Cricket Draw 1.1 ... special 139.
5086 Cricket ColorPaint 1.0 ... 179.
★ Dereba Software ... 30 day MBG
1769 Canvas 2.0 ... 159.
★ DreamMaker ... 60 day MBG
4088 MacGallery (MacPaint format) ... 27.
DubLI-Click Software
World-Class LaserType Vol. 1-6 ea ... 45.
World-Class Fonts! ... ea ... 45.
WetPaint Clip-Art ... 89.
Electronic Arts
5289 Studio/1 1.0 ... 99.
4315 Studio/1 1.0 ... 309.
★ Emerald City ... 30 day MBG
5168 Smart Art 1.0 ... 89.

Microsoft ... 30 day MBG
4976 PowerPoint 2.0—Create powerful presentations in less time and with less effort. Persuasively present your thoughts on overheads, full-color 35mm slides, flipcharts, and audience handouts. Includes Geographica support...$255.

PUBLISHING & PRESENTATIONS

Adobe Systems
1138 The Collector's Edition ... 79.
4816 The Collector's Edition II ... 139.
1142 Newsletters/Publishing Pack 1 ... 249.
4566 Forms and Schedules Pack 2 ... 299.
4566 Presentations Pack 3 ... 299.
1137 Adobe Illustrator 88 1.6 ... 299.
MacConnection carries the entire Adobe Type Library (volumes 1-95). Listed below are Adobe's newest typefaces at press time.
4829 82 Antique Olive ... 125.
5210 83 Life ... 95.
5239 84 Concorde ... 125.
5249 85 Gothic 13 ... 95.
5241 86 Cochín ... 125.
5242 87 ITC Bauhaus ... 125.
5243 88 Sabon ... 125.
5244 89 Hiroshige ... 245.
5245 90 Arnold Bocklin ... 125.
5246 91 Dom Casual ... 95.
5247 92 Post Antiqua ... 95.
5248 93 Folsom ... 125.
5249 94 Lino ... 95.
5250 95 VAG Rounded ... 125.
Aldus
1330 Freehand 2.0 ... 349.
4751 Persuasion 1.0 ... 385.
1331 PageMaker 3.01 ... 389.
And visit us at

Borland International
Turbo Pascal 11.1 ............................ $68.
Broderbund Software
5237 Whole Earth Catalog (CD-ROM ver.) 89.
★ Digital ..... 60 day MBG
5166 SmallTalk/V Mac 1.0 ................ 129.
★ DreamMaker ..... 60 day MBG
4115 MacGallery (HyperCard format) ...... 27.
★ Hyperpress Publish. ..... 30 day MBG
4233 Icon Factory 1.0 ..................... 29.
5089 Script Library 1.0 .................. 29.
5090 Silver Screen 1.0 ..................... 42.
4265 Script Expert 1.0 ..................... 46.
Individual Software
4719 101 Scripts & Buttons Hypercard 1.0 37.
★ Marx Software ..... 60 day MBG
4068 Aztec C 3.6B .......................... 65.
4317 Aztec SDB ............................. 65.
4316 Aztec C UniTools ..................... 65.
4069 Aztec MPW C 3.6B .................. 99.
4075 Aztec C + SDB 3.6B .............. 99.
★ Microsoft ..... 30 day MBG
4471 QuickBasic 1.0 ........................ 65.
★ OWL International ..... 30 day MBG
3062 Guide 2.0 ............................. 99.

ABBOTT SYSTEMS ..... 30 day MBG
CanOpen 1.0-The one program to open all your files. You can search and retrieve text, pictures and sounds from anywhere. It even works with corrupted files! ................ $65.

★ Silicon Beach ..... 60 day MBG
5100 SuperCard 1.0 ........................ 129.
★ SmethersBarnes ..... 30 day MBG
1478 Prototyper 2.0 ........................ 149.
★ Symantec ..... 30 day MBG
4644 Just Enough Pascal 1.0 .......... 49.
3421 Think's Pascal 2.0 ................... 65.
3420 Think's C 3.01 ....................... 149.
★ Trenchware
1338 Report II 1.0 .......................... 69.
4638 Focal Point II 1.0 ................... 119.
★ TML Systems ..... 30 day MBG
3548 TML Source Code Library II 1.1 .... 42.
4989 TML Pascal II 3.0 (w/o MPW 3.0) .... 59.
3549 TML Pascal II 3.0 (w/MPW 3.0) ...... 115.

Trendware
5203 Stack Cleaner .......................... 29.
5202 HyperTools #1 1.02 .................. 52.
5199 HyperTools #2 1.03 .................. 52.
★ True BASIC, Inc.
3587 True BASIC 2.0 ........................ 59.
★ Zedcor ..... 60 day MBG
3985 ZBASIC 5.0 ............................. 99.

UTILITIES
★ Abbott Systems ..... 30 day MBG
5236 CanOpen 1.0 ........................... $65.
★ Affinity Microsystems ..... 60 day MBG
1014 Affinity 1.1 ............................. 45.
1016 Tempo II 1.02 ............................. 89.
★ Berkeley Systems ..... 30 day MBG
1541 Stepping Out II 2.01 .................. 52.
Beyond, Inc.
4203 MenuFonts 2.0 ........................... 29.
★ Casady & Greene ..... 60 day MBG
2269 QuickDex 1.4A ........................... 32.
★ CE Software ..... 60 day MBG
1727 CalendarMaker 3.0 ................... 27.
1728 DiskTop 3.0 ............................. 27.
4689 MockPackage Plus Utilities 4.4 .... 27.
1729 QuickKeys 1.2 ............................. 53.
Central Point
5040 Copy II Mac 7.2 .......................... 24.
5041 PC Tools Deluxe Mac 1.1 ............. 46.
★ Dantz Development ..... 30 day MBG
5255 Retrospect 1.0 ........................... 169.
Dubi-Click Software
1824 Calculator Constructor Set 1.04 ... 35.
Electronic Arts
1843 Disk Tools Plus 1.01 (Battery Incl.) ... 31.
★ Fifth Generation ..... 60 day MBG
4257 PYRO*3.3 (screen saver) .......... 15.
3954 PowerStation 2.5 ....................... 35.
3956 Suitcase II 1.2.2 ....................... 45.
5178 FastBack II 1.0 .......................... 109.
★ FWB Software ..... 30 day MBG
2232 Hard Disk Partition 2.0 ............. 41.
4683 Hard Disk Deactivate 1.0 ............ 53.
★ HSC Software ..... 30 day MBG
4803 VRex 1.4I ................................. 69.
★ ICOn Simulations
4084 On Cue 1.3 ............................... 35.
★ Ideaform
2419 DiskQuick 2.10 ......................... 27.
2420 MacLabeler Plus 3.0 ................. 42.
2591 The NightWatch 1.03 .................. 87.
2592 MacSafe 1.08C ......................... 87.
★ Lundeen & Assoc. ..... 60 day MBG
2683 WorksPlus Command 2.0 ............. 57.
Dantz Development ..... 30 day MBG
Retrospect II 1.0-Allows backup and archive to any Mac storage media, including disks, tape, file servers, and optical disks. Features compression, DES encryption, automatic file selection, browsers, and calendared operation ................ $169.
the Macworld Expo.

**MEDIAGENIC**

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td>4591 Open It! 1.0</td>
<td>$49.</td>
</tr>
<tr>
<td>2732 Gopher 1.0</td>
<td>47.</td>
</tr>
<tr>
<td>4848 INITPicker 1.0</td>
<td>27.</td>
</tr>
<tr>
<td>4210 Screen Gems 1.0</td>
<td>42.</td>
</tr>
<tr>
<td>2913 RedBag 1.5</td>
<td>52.</td>
</tr>
<tr>
<td><strong>Olduvai Software</strong></td>
<td></td>
</tr>
<tr>
<td>4503 MultiClip 1.0</td>
<td>51.</td>
</tr>
<tr>
<td>3031 Icon-It! 1.1</td>
<td>39.</td>
</tr>
<tr>
<td>3784 myDiskLabeler w/LaserWriter 2.9.1</td>
<td>34.</td>
</tr>
<tr>
<td>3379 Network DiskFit 1.5</td>
<td>199.</td>
</tr>
<tr>
<td>3381 Sentinel 2.0</td>
<td>89.</td>
</tr>
<tr>
<td>3382 SuperLaserSpool 2.0</td>
<td>79.</td>
</tr>
<tr>
<td>3377 DiskFit 1.5</td>
<td>53.</td>
</tr>
<tr>
<td>3378 Multi-User SuperLaserSpool 2.0</td>
<td>199.</td>
</tr>
<tr>
<td>3376 ImageWriter Label Pack Qty. 216</td>
<td>16.</td>
</tr>
<tr>
<td>3788 FInds 2.0</td>
<td>36.</td>
</tr>
<tr>
<td><strong>XTree</strong></td>
<td></td>
</tr>
<tr>
<td>5177 XTreeMac 1.0</td>
<td>52.</td>
</tr>
<tr>
<td>3783 MyDiskLabeler w/Color 2.9.1</td>
<td>29.</td>
</tr>
<tr>
<td>3788 Findswell 2.0</td>
<td>36.</td>
</tr>
<tr>
<td>4976 Sticky Business 1.0.4</td>
<td>99.</td>
</tr>
<tr>
<td>4504 Acta Advantage 1.0</td>
<td>65.</td>
</tr>
<tr>
<td>4255 Super Studio Session 2.0</td>
<td>69.</td>
</tr>
<tr>
<td>4693 Quick Letter 1.0</td>
<td>75.</td>
</tr>
</tbody>
</table>

**WORKING SOFTWARE**

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td>HJC Software</td>
<td>30 day MBG</td>
</tr>
<tr>
<td>Virex (Classic version) The first comprehensive solution to the threat of Mac computer viruses. Detects both their presence and repairs infected programs. Combats all known Mac viruses. Excellent update services are available.</td>
<td>$69.</td>
</tr>
</tbody>
</table>

**WORD PROCESSING**

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td>3792 Spellwell 2.0.G</td>
<td>$45.</td>
</tr>
<tr>
<td>4693 Quick Letter 1.0</td>
<td>75.</td>
</tr>
</tbody>
</table>

**MUSIC & EDUCATION**

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Deneba Software</em> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>4700 BigThesaurus 1.0</td>
<td>59.</td>
</tr>
<tr>
<td>1767 Comment 2.0</td>
<td>59.</td>
</tr>
<tr>
<td>1768 Coach Professional 3.0C</td>
<td>115.</td>
</tr>
<tr>
<td><strong>Electronics Arts</strong></td>
<td></td>
</tr>
<tr>
<td>1543 Thunder II 1.0 (Batteries Included)</td>
<td>52.</td>
</tr>
<tr>
<td><strong>Lundeen &amp; Associates</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>2684 WorksPlus Spell 2.0</td>
<td>46.</td>
</tr>
<tr>
<td><strong>Microlytics</strong> 60 day MBG</td>
<td></td>
</tr>
<tr>
<td>2733 Word Finder 2.0</td>
<td>36.</td>
</tr>
<tr>
<td>4870 ElectronicWordFinder 2.0</td>
<td>79.</td>
</tr>
<tr>
<td><strong>Microsoft</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>2885 Write 1.0</td>
<td>79.</td>
</tr>
<tr>
<td>2882 Word 4.0</td>
<td>255.</td>
</tr>
<tr>
<td><strong>Niles &amp; Associates</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>5048 EndLink 1.0</td>
<td>59.</td>
</tr>
<tr>
<td>4602 EndNote 1.1.1</td>
<td>82.</td>
</tr>
<tr>
<td><strong>Prefered Publishers</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>4781 Mلالية 1.0</td>
<td>59.</td>
</tr>
<tr>
<td><strong>Sensible Software</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>4692 BookEnds 1.0E</td>
<td>53.</td>
</tr>
<tr>
<td>3375 Sensible Grammar 1.1D</td>
<td>53.</td>
</tr>
<tr>
<td><strong>Symantec</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>3422 More II 2.01</td>
<td>255.</td>
</tr>
<tr>
<td><strong>Symmetry</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>4504 Acts Advantage 1.0</td>
<td>65.</td>
</tr>
<tr>
<td><strong>T/Maker</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>3639 WriteNow 2.0</td>
<td>109.</td>
</tr>
<tr>
<td><strong>WordPerfect</strong> 60 day MBG</td>
<td></td>
</tr>
<tr>
<td>3800 WordPerfect Mac 1.0.2</td>
<td>185.</td>
</tr>
</tbody>
</table>

**MUSIC & EDUCATION**

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ars Nova</em> 60 day MBG</td>
<td></td>
</tr>
<tr>
<td>1215 Practica Musica 2.1</td>
<td>75.</td>
</tr>
<tr>
<td><em>Bogas Productions</em> 60 day MBG</td>
<td></td>
</tr>
<tr>
<td>1481 Studio Session 1.2 SE</td>
<td>49.</td>
</tr>
<tr>
<td>4255 Super Studio Session 2.0</td>
<td>69.</td>
</tr>
<tr>
<td><strong>Bright Star Technology</strong></td>
<td></td>
</tr>
<tr>
<td>1402 Alphabet Blocks 1.0</td>
<td>32.</td>
</tr>
<tr>
<td>3961 Talking Tiles 1.0</td>
<td>69.</td>
</tr>
<tr>
<td><strong>Broderbund Software</strong></td>
<td></td>
</tr>
<tr>
<td>4314 TypeIt! 1.0</td>
<td>20.</td>
</tr>
<tr>
<td>1423 Dann Sess 1.1 (CP)</td>
<td>30.</td>
</tr>
<tr>
<td>1422 Geometry 1.2 (CP)</td>
<td>59.</td>
</tr>
<tr>
<td>4067 Calculus 1.2 (CP)</td>
<td>59.</td>
</tr>
<tr>
<td><strong>Coda Music Systems</strong></td>
<td></td>
</tr>
<tr>
<td>4367 MacDrums 1.01 (CP)</td>
<td>31.</td>
</tr>
<tr>
<td>4483 Perceive 1.0</td>
<td>50.</td>
</tr>
<tr>
<td><strong>Davidson &amp; Associates</strong></td>
<td></td>
</tr>
<tr>
<td>1734 MacMath 1.0</td>
<td>27.</td>
</tr>
<tr>
<td>4978 Speed Reader II 1.0 (CP)</td>
<td>36.</td>
</tr>
<tr>
<td><strong>Electronic Arts</strong></td>
<td></td>
</tr>
<tr>
<td>4619 Movis Beacon Typing 1.2B (CP)</td>
<td>33.</td>
</tr>
<tr>
<td>1846 Deluxe Music Construction Set 2.5</td>
<td>84.</td>
</tr>
<tr>
<td><strong>First Byte</strong></td>
<td></td>
</tr>
<tr>
<td>5234 The Puzzle Storybook (ages 3-6)</td>
<td>27.</td>
</tr>
<tr>
<td>5233 Dinosaur Discovery Kit (ages 3-5)</td>
<td>27.</td>
</tr>
<tr>
<td>3941 SmoothTalker 2.1</td>
<td>33.</td>
</tr>
<tr>
<td><strong>Great Wave</strong> 30 day MBG</td>
<td></td>
</tr>
<tr>
<td>2277 TimeMasters 1.0</td>
<td>22.</td>
</tr>
<tr>
<td>2276 KidsTime 1.2</td>
<td>26.</td>
</tr>
<tr>
<td>4334 NumberMaze 1.0</td>
<td>27.</td>
</tr>
<tr>
<td>2273 ConcertWare + 4.0</td>
<td>39.</td>
</tr>
<tr>
<td>2271 ConcertWare + MIDI 4.0</td>
<td>79.</td>
</tr>
<tr>
<td><strong>Learning Company</strong></td>
<td></td>
</tr>
<tr>
<td>2670 Reader Rabbit 2.1 (CP)</td>
<td>32.</td>
</tr>
</tbody>
</table>

**Software Ventures** 30 day MBG

<table>
<thead>
<tr>
<th>Program</th>
<th>MBG</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicroPlant II 3.0 The newest version of the top telecom software adds ZMODEM; on-screen color icons; and color and sound support for XCMDs and XFCNs.</td>
<td>$219.</td>
</tr>
</tbody>
</table>
Want it sooner?

Deneba ... 30 day MBG
Canvas 2.0—The only object-oriented drawing program to receive a 5 mouse rating from MacUser magazine. Includes continuous multi-point Bezier curves, and instant auto-trace conversion of bitmapped images ... $159.

ENTERTAINMENT

Access Software
4655 World Class Leader Board Golf ... 28.
4475 Quarterstaff (CP) ... 28.
4498 MacDuell ... 28.
5127 Manhole CD ROM ... 28.
4592 Zork Zero (CP) ... 28.

Broderbund Software
4099 Shufflepuck Cafe (CP, air hockey) ... 24.
4229 Where/Where Carmen Sandiego? (CP) ... 27.
5233 Where/Where USA Carmen Sandiego? (CP) ... 27.
4986 Air Duel (CP) ... 27.
4986 SmCity (CP) ... 27.
1421 Ancient Art of War (CP) ... 27.
4540 Ancient Art of War at Sea (CP) ... 27.

Bullseye
1544 Ferran Grand Prix (CP) ... 32.
4074 PS1 Mustang Flight Simulator (CP) ... 32.
2208 Crystal Quest 2.0 2C ... 26.
4119 Crystal Quest w/Critter Editor 2.0 2C ... 42.

**Simon & Schuster ... 60 day MBG
3305 Typing Tutor IV 1.2 ... 35.
**Microsoft ... 30 day MBG
2866 Flight Simulator (CP) ... 33.

Mindscape
1842 Chessmaster 2000 (CP) ... 32.
4064 Chuck Yeager Flight Simulator (CP) ... 32.
4588 Life & Death (CP) ... 32.
4945 The Hunt for Red October (CP) ... 32.

Perry
2037 Sub Battle Simulator ... 29.
4660 Sub Battle Simulator for Mac II ... 29.

MicroProse
4697 Pirates! (CP) ... 39.

PC@A
3144 MacGolf 2.0 (CP) ... 35.
4320 MacGolf Classic (CP) ... 54.

Chang Labs ... 60 day MBG
Special—Rags-to-Riches Cl. 3, f-Thru August 31, 1989 place an order of $350 or more (any products) from MacConnection and you may also purchase this top-rated accounting module for only $19. Limit 1 per customer.

Electronic Arts
4321 Lunar Rescue (CP) ... 34.
4517 Road Racer (CP) ... 39.

SIerra On-Line
3397 Leisure Suit Larry (CP) ... 23.
3336 King’s Quest III (CP) ... 29.

**Siicon Beach ... 60 day MBG
3502 Beyond Dark Castle ... special ... 27.
3502 Apache Strike ... 32.
3503 Dark Castle ... 32.

**Simon & Schuster ... 60 day MBG
3303 MacTrek Kobaushy Alternative (CP) ... 24.

Sir-Tech
3347 MacWizardry (CP) ... 35.

**Softstream Int'l, Inc. ... 60 day MBG
4072 Mac-Man (w/adapter) ... 23.
4072 The Solitaire DA ... 23.
4072 Spellbinder ... 23.
4072 Colours & Billiards ... 38.

**Spectrum Holobyte ... 30 day MBG
4175 Solitaire Royale (for Mac SE) ... 20.
3464 Tetris ... 20.
4472 Tetris (color version) ... 24.
3462 PT-109 ... 26.

Dow Jones ... 30 day MBG
News/Renewal Membership Package—Allows offline set up of personalized reports to retrieve and analyze key data from Dow Jones News/ Retrievals.50+ databases. Includes five free hours of service ... $24.

**Abaton ... 30 day MBG
4589 InterFaX Modem ... 359.

**CE Software ... 60 day MBG
5174 QuickMail (1 user add-on) ... 45.
5174 QuickMail (5 user Pak) ... 175.
5173 QuickMail (10 user Pak) ... 259.

**CompuServe ... 60 day MBG
1876 CompuServe Information Service ... 24.
1873 CompuServe Navigator 2.1 ... 45.
1874 Standard Services/Navigator Bundle $99.

**DataViz ... 60 day MBG
1823 MacLink Plus/PC 4.0 ... 139.
4842 MacLink Plus/Translators 4.0 ... 115.

**Dove Computer ... 60 day MBG
4939 FastNet III ... 450.
4938 FastNet SE ... 450.
4937 FastNet SCSI ... 925.

**Dow Jones ... 30 day MBG
1785 Desktop Express 1.03 ... 95.
1786 Market Manager Plus 2.0 ... 189.

**Farallon Computing ... 30 day MBG
4208 Timbuktu 2.0 ... 65.
4207 Timbuktu 3.0 ... 195.
4867 Timbuktu 50-Pack w/Smartcom II ... 139.
2201 TrafficWatch 1.08 ... 139.
2203 PhoneNET PLUS (OIN-8) ... 325.
2204 PhoneNET Connector 10-Pack ... 325.
4869 PhoneNET Repeater ... 325.
2206 PhoneNET StarController ... 1199.

**Freesoft ... 60 day MBG
2219 Red Ryder 10.3 ... 54.

**Hayes
2300 Smartcom II 3.1 ... 88.
2307 Smartmodem 2400 ... 429.
5170 2400M (internal) ... 419.
5169 2400M (internal with Smartcom II) ... 459.
Dear MacConnection,

I have been dealing with your company almost since your first ads appeared. I knew you were good, but I think you've overdone it now.

About two weeks ago, on a Monday night, I called you from New Jersey to request that you send Filemaker II to my destination in California. Upon my arrival there the next day, I was surprised to find my package waiting for me, and it was in better shape than I was. Next time I'll send my luggage by United, and I'll fly MacConnection.

Raymond C. Andrews, M.D.
Imola, Italy

"Next time I'll fly MacConnection."
our overnight delivery.

**LaCie, Ltd.** 30 day MBG 4983 Maxiec Internal Drive Kit $59.
4982 Maxiec External Drive Kit 193.
**PCPG ... 30 day MBG**
3177 HD-WSI (Apple HD-20 to SCSI) 269.
3189 MacBottom HD 45 SCSI call
4658 MacBottom HD 84 SCSI call

**Verbatim ... 30 day MBG**
3772 3 1/2" DS/DD Disks 16.
3297 Sony 3 1/2" Apple DS/DD Disks 17.
2214 Fuji 3 1/2" DS/DD Disks 17.
2792 MAXELL 3 1/2" DS/DD Disks 17.

**Kensington ... 30 day MBG**
2589 Universal Printer Stand $15.
2545 Universal Copy Stand 22.
4971 Modem/FAX Protector 20 25.
4973 Power Tree 20 27.
4974 Power Tree 50 54.
2559 Apple Security Kit 34.
2556 Maccosstores Anti-Slip Grip 33.
2568 Maccosstores SuperBase 34.
2585 Printer Muffler 80 43.
4070 System Saver SE 52.
4658 MacBottom HD 84 SCSI call
2004 Mouse Cleaner 360° 15.
2381 MacLuggage Macinware SE 75.
2381 MacLuggage Macinware Plus 64.
2391 MacLuggage Macinware SE 75.

**ACCESSORIES**

**Avery ... 50 day MBG**
4864 3 1/2" Disk Labels (Qty. 250) 13.
4865 3 1/2" x 10 1/2" Address Labels (Qty. 3750) 15.
4811 8 1/2" x 11" Transparencies (Qty. 50) 22.
4807 1" x 2 5/8" Laser Labels (Qty. 3000) 24.
**Computer Coverup ... 60 day MBG**
1723 ImageWriter II Cover 8.
1728 ImageWriter II G Cover 8.
1725 Mac SE Extreme KeyBoard Cover Set 10.
4657 LaserWriter II Cover 10.
**Ergotron ... 60 day MBG**
2004 Mouse Cleaner 360° 15.
3992 The Muzzle (covers power outlet) 62.
2000 MacTill SE 68.
**Goldstein & Blau ... 30 day MBG**
**I/O Design ... 60 day MBG**
2379 MacLuggage Imageware II 49.
2376 MacLuggage Macinware Plus 64.
2391 MacLuggage Macinware SE 75.
**Kalmar Designs**
2531 Tekwood Pulpit Case (holds 45 disks) 14.
2532 Tekwood Pulpit Case (holds 90 disks) 21.
2533 Tekwood Pulpit Case (holds 135 disks) 31.

**Farallon Computing ... 30 day MBG**
4623 Solid Oak Disk Case, made by New England craftsmen (holds 90 disks) 29.
**Mobius Technologies ... 60 day MBG**
4470 Fanny Mac GT 60.
**Moustrak ... 60 day MBG**
2694 Moustrak Pad (standard 7" x 9") 8.
2692 Moustrak Pad (jumbo 9" x 11") 9.
2693 Moustrak Pad L/F (9" x 11") 10.
2669 Moustrak Designer Series ea. 12.
**Ribbons**
3255 ImageWriter II Ribbon 4.
3261 ImageWriter II 4-color Ribbon 9.
3360 ImageWriter LO Black Ribbon 17.
**Simon & Schuster ... 60 day MBG**
**Sopris Softworks ... 60 day MBG**
4016 MacPlus Cover (navy) 15.
4171 Mac SE Std. Keyboard Cover (navy) 15.
4019 Mac SE & Ext. Keyboard Cover (navy) 15.
4017 ImageWriter II Cover (navy) 11.
4168 ImageWriter LO Cover (navy) 13.
4018 LaserWriter II Cover (navy) 17.
4012 High Trek ImageWriter II carry case 49.

**Targus ... 60 day MBG**
3618 ImageWriter II Carry Case 49.
3617 Mac Plus/SE Carry Case 59.
5015 Mac SE & Ext. Kybd. Carry Case 75.

**OUR POLICY**

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- Upon receipt and approval, personal and company checks now clear the same day for immediate shipment of your order.
- Corporate PO's accepted subject to credit approval.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices subject to change without notice.
- To order, call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

**SHIPPING**

**Continental US:** Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders ship by UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now $3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.

**Hawaii, Alaska and Outside Continental US:** Call 603/446-7711 for information.
HERE COMES
Shelve your crystal ball, dump your tea leaves, and fire your astrologer. You no longer need to divine where Apple is heading with the next version of Macintosh system software, System 7.0. Even though System 7.0 won't be available until some time next year, we thought you might want a preview. Coincident with the Apple Worldwide Developers' Conference held in May, Apple marketing people introduced the major new technologies that Apple engineers have promised for System 7.0. Those technologies will incorporate:

- virtual memory and 32-bit addressing
- an enhanced Finder
- interapplication communication
- a new print architecture
- remote database access

In addition, System 7.0 will include tear-off menus, MultiFinder refinements, 32-bit QuickDraw (which has already shipped), and a Communications Toolbox (due to ship later this year). Other projects likely to be part of System 7.0 include sound-system improvements, file system enhancements, refinements to the system software that let it adapt more easily to international markets, and a one-button installer.

You'll be able to use System 7.0 on a Mac Plus, SE, SE/30, II, IIx, or IIcx. On all those machines it requires at least 2 megabytes of RAM. Apple plans to move the entire Macintosh product line to System 7.0 and recommends that all users upgrade to 7.0.

Because System 7.0 is a work in progress, the descriptions Apple has provided of it are necessarily incomplete and subject to change. Apple has committed to the major features described here, but it may add more features or change how some of the ones described here work. You should expect changes in menu wording, icon design, and other implementation details. The complete feature set of System 7.0 will be announced later this year, as will availability. When System
7.0 does ship, you will be able to get it from user groups, online information services, and some dealers for roughly the cost of copying it. You will also be able to buy a system update package with manuals from a dealer; current cost of the update package is $49. The real cost of upgrading to System 7.0 will be upgrading your Mac to 2MB, if you haven’t already done so. Learning what the system software upgrade will include should help you decide whether you want to spring for the additional RAM.

**Outline Fonts and Line Layout**

Outline font technology delivers smoothly scaled fonts at any size. That’s why a LaserWriter II’s PostScript fonts look sharp at any point size. But Macintosh screen fonts have always been bitmapped fonts. They look great at the specific sizes installed in the System, but lumpy when scaled to other sizes (see “Lumpy and Smooth”). Furthermore, printing devices that use screen fonts—like the ImageWriter, Fax modem, and LaserWriter IISC—require double, triple, and quadruple sizes for best results. Those large bitmapped fonts take up lots of disk space.

System 7.0 will eliminate all bitmapped font problems by using Apple’s own outline font technology for any display screen or printing device (see “Inside Outline Fonts”). Even PostScript printers will be able to print Apple outline fonts (in addition to PostScript fonts), as described in more detail later. The Apple technology will work with most existing application programs. However, applications that only offer a limited choice of font sizes won’t benefit as much as those that offer a way to directly specify a point size (including fractional point size). Your existing bitmapped fonts will also work with System 7.0, although you won’t be able to convert them to outline fonts.

A standard set of outline fonts will come with System 7.0. More fonts will be available from many vendors, including Agfa Compugraphic, Bigelow & Holmes, Bitstream, Casady & Greene, The Font Bureau, ITC, Kingsley/ATF Type Corporation, Monotype Typography-USA, and URW. In addition, printing devices from GCC Technologies, Hewlett-Packard, Mirus Corporation, and Tektronix will work with the new outline fonts.

In addition to outline fonts, System 7.0 will also include line-layout features. Any application will be able to use the line-layout features to incorporate typographic text positioning such as kerning, justification, and ligatures. Line layout will also make it easier for applications to display and print languages that don’t use the Latin alphabet, like Japanese and Arabic. Existing applications must be revised to take advantage of the line-layout features.

**Finder 7.0, Menus, and MultiFinder**

Aside from fonts, the Finder is the most visible piece of Macintosh system software. It’s being extensively revised for System 7.0. Highlights include the integration of Font/DA Mover functions, built-in file search, multiple icons for a single file, document templates, custom disk and folder window views, and a configurable Apple menu. For details on these and other capabilities, see “Finder 7.0 Close-Up.”

Finder 7.0 and all other applications running with System 7.0 will offer tear-off menus, like the Tools palette in HyperCard. Hierarchical submenus will also be tear-off. The menus will disappear when you switch to another application using MultiFinder and reappear when you switch back. Detached menus will disappear completely when you quit an application unless the application has been revised to restore the menus’ position the next time the application is opened.

System 7.0 will still use MultiFinder for multiprogramming. (It will let you open multiple applications concurrently and run one or more of them in the background.) MultiFinder 7.0 will work in basically the same way as today’s MultiFinder, but it will be enhanced somewhat. It will list open applications at the top of the Apple menu instead of at the bottom. In addition, it will automatically start multiple background applications that you have put in the new Background Folder, which will be in the System Folder. With MultiFinder 7.0, desk accessories will appear in separate layers, like applications, not in one common layer.

The big news is that you will be able to temporarily hide, or set aside, all the windows of any or all open applications. (You won’t, of course, be able to set aside the foreground—currently active—application.) Hiding windows reduces unsightly window buildup and provides smoother operation. Rough operation results when
INSIDE OUTLINE FONTS

Outline fonts will store individual characters as mathematical definitions of lines and curves, rather than as a pattern of dots (a bitmap). When you ask for a character in any size, the Macintosh will enlarge the outline to that size and fill it with dots.

At small sizes, however, simply scaling the font outlines will result in text with problems, such as an unwanted dot on the edge of a curve. These imperfections happen because the outline doesn’t precisely fit the grid of small point sizes, especially if the dots are relatively large (as they are on the Mac’s screen). The font designer will provide a set of instructions, also known as hints, that will tell the Macintosh how to modify character outlines so they fit the grid. This process is called grid fitting. Apple is openly publishing the font format and the instructions that can be used for grid fitting. The diagram below illustrates how System 7.0 will use its outline fonts to display and print text in any size on any type of output device.

Using one system font for all sizes, the application tells the system what size to display or print the character G (A). Depending on the resolution and size of the G, grid fitting instructions are automatically applied to make best use of the available dots (B). If no grid fitting is needed, the outline G is sent directly to any output device (C). When printing with a PostScript font, the application and the system software together generate a PostScript derivative of the document for output on a PostScript device (D).

A 10-point G requires grid fitting on a 72-dpi device...

A 72 pt. G at 72 dpi

...but at 144 dpi the same character undergoes grid fitting at 5 points.

A 72 pt. G at 144 dpi

Likewise, on a 300-dpi laser printer, the character is grid-fit at 2.5 points.

A 72 pt. G at 300 dpi

On a 2540-dpi Linotronic, grid fitting is virtually unneeded since it would only be used to modify characters smaller than a single point.

A 72 pt. G at 2540 dpi
the foreground application must pause while applications whose windows are not hidden update the contents of those windows. The pause may be especially onerous when you are using virtual memory (described in more detail later), because the system may have to bring applications into physical memory from disk in order to update their windows.

**INTERAPPLICATION COMMUNICATION**

The Mac has always had static information interchange between applications via the Clipboard. For example, you can paste a graphic created in a drawing application into a word processing document. But if you later change the graphic, you must again copy and paste it to the word processing document. System 7.0 will implement methods for a dynamic information interchange, called **live copy/paste**, that will eliminate repetitive copying and pasting. The process will essentially let you paste a live copy of information from one document into another document of any type. If you change the source document, you can update the live copy with-

**FINDER 7.0 CLOSE-UP**

Finder 7.0 will extend its predecessors' basic, direct-manipulation interface—click and drag—to some brand-new functions and to the functions of some formerly separate system utilities. Instead of having to use the Font/DA Mover utility to install fonts and desk accessories, you will simply drag their icons to the System file (A). Similarly, you will install applications, documents, folders, and so on, in the Apple menu by dragging their icons to a specially marked folder. Dragging a document to a printer icon, which you will place on the desktop using the Chooser, will cause the printer to print that document (B).

In System 7.0, for the first time in the history of Macintosh, the Finder will live up to its name. You will be able to search for any information that appears in any text view, or for ranges such as everything modified between two dates. Finder 7.0 will locate the first item matching your criteria, open the folder that contains the found item, highlight the item, and scroll the folder window to show the item. An option will let you continue to search for items that meet the criteria you have set up.

To organize your disks so you can find items on them more easily, you will be able to create aliases for icons. An alias is an icon that represents another icon and behaves just like the icon it represents (C). You can put aliases in any folder on any disk or network file server. For example, you could organize original icons by subject, and arrange aliases to them by date in other folders.

In Finder 7.0, double-clicking on any icon will do something worthwhile. As always, double-clicking on applications, documents, folders, and the Trash Can will open them. Additionally, double-clicking on the appropriate icon will open a DA, show a font sample, play a sound, open a control panel device, or show a printer's status. The System file will open like a folder, when you double-click on it, to show items installed in it.

Views of open disks and folders will be customizable in Finder 7.0. You will be able to adjust the position of icon names in an icon view and determine the content and arrangement of information that appears in a text view. Text views will have horizontal scroll bars so you can see all the information without zooming the window. If you do zoom a window, Finder 7.0 will enlarge it only enough to show its contents. When you are selecting icons in a window, dragging past the edge of the window will automatically scroll the window. You will also be able to select items in a window by typing, as you can today in a standard Open dialog box.

Finder 7.0 will have other assorted new attributes. One of them will let you make a template, called stationery, from any document. When you open stationery, Finder 7.0 will make a copy of it and open the copy. You will also be able to tear off any menu (D). Another feature will provide help on any icon or menu item (E). Additionally, Finder 7.0 will empty the Trash Can only on your command or at a time you set. In the future, you will be able to extend Finder 7.0 with other integrated functions such as electronic mail and backup. The final version of the Finder will differ from the representation below.
out going through another copy/paste operation (see “How Live Copy/Paste Works”).

Live copy/paste and the Clipboard are parts of a larger framework for information interchange in System 7.0. Apple's framework, called `interapplication communication` (IAC), goes beyond the basic application-to-application communication, called `interprocess communication` (IPC), that other computer systems provide. IPC lets an application send messages to other applications that are running at the same time on the same computer. A part of Apple's IAC called `program-to-program communication` (PPC) adds network messaging and delayed messaging to IPC. This means that PPC will store messages sent to an application not currently running, and will forward the messages when the application is next started. PPC will also dispatch messages across a network to applications running on other Macs.

Additionally, Apple's IAC will include a standard set of messages called `AppleEvents`. Using AppleEvents such as `Open Document, Print, and Move Window`, one application can control some actions of other applications. For example, a telecommunications application working in the background under MultiFinder could use AppleEvents to send data from a remote computer to a database or charting application running in the foreground. AppleEvents also makes user scripting possible, although that is not provided with System 7.0.

Apple's IAC is not the first such technology for the Macintosh. For example, UserLand IPC lets programmers add inter-application messaging to programs now. It has no user-level component like live copy/paste, but it requires less memory than System 7.0.

Unlike most of the other System 7.0 features described so far, live copy/paste won't work in existing applications. These applications will have to be revised to take advantage of any IAC features.

**NEW PRINT ARCHITECTURE**

System 7.0 will offer a new print architecture designed to further standardize and simplify the process of printing. A new, modular Print dialog will keep printing simple on the surface yet offer full control over printing options in control panels that appear at the click of a button (see “New Print”). In addition, the new print architecture will provide background printing for any printer, improved color printing, and automatic conversion of color to halftone (gray scale) as needed. You will be able to define custom page sizes and mix different page sizes and orientations in a single document. For example, page 1 might be an 8½-by-11-inch letter, page 2 a landscape-oriented spreadsheet, and page 3 an envelope.

PostScript printers will still offer some advantages over other printers, notwithstanding Apple's outline font technology. For instance, PostScript printers can be shared on an AppleTalk network. In addition, they process page images themselves, instead of loading the already burdened Mac CPU. PostScript printers will be supported as they are today. System 7.0 will always display Apple-format outline fonts on the screen, and the PostScript device will continue to use PostScript fonts that match the Macintosh fonts. If there are no matching PostScript fonts, the Apple-format outline fonts will be used at the printer's resolution. Apple is working on methods for correlating its font technology and the PostScript font technology. In addition, Adobe has announced plans to offer a utility that translates Apple outline fonts to PostScript outline fonts.

To use the new print architecture, you will need to replace the printing resource, often called a `driver`, in the System Folder for each printer you use. Apple will supply replacement drivers for all its printers with System 7.0. Drivers for other printers must be revised by their manufacturers. You will be able to use the new LaserWriter driver on the same network with other Macintoshes that use today's LaserWriter 6.0 driver.

**VIRTUAL MEMORY AND 32-BIT ADDRESSING**

For years, mainframe computers and minicomputers have transparently treated
part of a hard disk as additional memory. System 7.0 will bring this technique, known as virtual memory, to the Macintosh. Virtual memory will let you run more applications with MultiFinder and work with larger amounts of information than does physical memory alone. You need buy only as much RAM as you need for average use, not for peak use.

To use virtual memory, the Macintosh will need memory-management hardware—either a 68030 CPU or a 68020 CPU in conjunction with a 68851 PMMU. A Mac Plus or Mac SE, both of which have the 68000 CPU, will not be able to use virtual memory. In addition, the Mac will need a hard disk with at least as much free space as you want to use for virtual memory. Most applications will work with virtual memory without being redesigned.

Virtual memory works by keeping the most active application and document segments in physical memory. Less-used segments of open applications and documents are kept in a special file on the hard disk. When an application needs a segment not currently in physical memory, the system software automatically swaps the least-used segment in physical memory with the needed segment on disk. Under MultiFinder, this swap will generally occur when you switch applications.

System 7.0 will allow the Mac II family and the Mac SE/30 to use 32-bit memory addressing. This will extend their memory capacities beyond 8MB to 128MB of physical RAM and up to 1 gigabyte of virtual memory. Only applications that are designed to work with 32-bit addressing can take advantage of the extended memory.
New Print
The new Print dialog will be modular. Shown here is a prototype of the general panel, in which you will choose a printer from a pop-up menu and set other options that might apply to any print job. Clicking an icon at the left will bring up another panel, in which you might set options particular to a specific printer or application. The final version of the print dialog will differ from the prototype above.

(Apple calls these applications 32-bit clean) will be able to use the additional memory capacity. Without 32-bit addressing, virtual memory will be limited to 14MB.

**Other Enhancements**

There will be even more new features in System 7.0 than 32-bit addressing, virtual memory, the new print architecture, interapplication communication, MultiFinder enhancements, Finder 7.0, line layout, and outline fonts. Another new feature will be a simplified CL/1 database-accessing language. Any application will be able to use it to give you easy access to large databases such as Oracle, Sybase, Ingres, Informix, RDB, and Vax-RMS running on other computers. For example, you might use a single menu command named Get Data to place information from a remote corporate database into your document.

System 7.0 will also make it easier for developers to add sound to applications. You will be able to compress sound at a ratio of 5:1 or 6:1 to save disk space, and any Macintosh using System 7.0 will be able to expand the compressed audio in real time. Multiple audio channels and a multichannel mixer will enable applications to play combined sounds, such as a voice over music. System 7.0’s MIDI-management tools will provide a standard method for integrating electronic musical instruments with the Mac. In addition, a real-time event sequencer will let you synchronize audio with graphics and animation.

System 7.0’s improvements to the Mac’s file-handling abilities will expedite working with disks. The new file system will assign every file a unique file ID number so an application can always find needed files even if you have moved them to a different folder. A speedup in the directory search method will enable Finder 7.0 and other applications to locate files quickly. For example, a typical time to search an entire 80MB hard disk is 3 seconds. Finder 7.0 will use another new file system tool, the Desktop Manager, to keep track of icons and comments on hard disks and other storage devices larger than 1.4MB. It will handle thousands of items without bogging down. The new file system will also provide a platform for directly accessing files from other filing systems, such as MSDOS, OS/2, and ProDOS. With additional software, the Finder and other applications will be able to make foreign disks look and act like Macintosh disks.

**More to Come**

System 7.0 will offer an impressive list of new technologies, but it won’t answer everyone’s prayers. System software constantly evolves. Another version will be along in a couple of years, and it won’t have every feature either.

It’s much too soon to definitively list System 7.0’s omissions. But likely to be missing are QuickDraw extensions for handling text rotation, bezier-curve drawing, and other graphic effects. Outline fonts and line layout will take the Mac display only part of the way to matching PostScript. Likewise, AppleEvents’ messages will supply a basis for user scripting, but the scripting language will still be missing. For example, a user script could periodically send messages to start a telecommunications application, get new stock prices from a remote database, paste the prices into a spreadsheet, and save the spreadsheet. Additionally, MultiFinder’s new ability to set aside all of an application’s windows will help you manage the window but will not be a help in managing multiple windows in an application. If we can have system-wide tear-off menus, why not a system-wide window menu? And anyone who has ever used HyperCard knows documents can be too big for one 800K floppy disk. The Finder, though, still won’t be able to compress and decompress files on disk or split a large file across multiple floppy disks.

Almost certain to be left for a later version are complete multiprocessor and multiprogramming capabilities. The new MultiFinder will provide basic capabilities, but it won’t protect one application against damage by another. Furthermore, you won’t be able to prioritize applications, nor will an inactive application be able to preempt the foreground application to take care of urgent business. Additionally, System 7.0 will not offer standard methods for developers to integrate coprocessors for graphics, signal processing, direct memory access, and so on.

Please remember, what you read here describes System 7.0’s major new features. The exact feature set and details of the user interface won’t be disclosed until later this year. Taking full advantage of all the new features will require lots of work on the part of third-party developers. Before that can happen, Apple must work hard to make System 7.0 real. What can you do in the meantime? Start saving money to buy more memory.

See Where to Buy for contact information.

Lon Poole, alias Patones, is a Macworld contributing editor and author of Mac Insights (Microsoft Press, 1987) and HyperTalk (Microsoft Press, 1989). He has been informing users about Mac system software since 1984, alias the old days.
One of the best things about running an art contest is that it gives us a chance to see what people in the graphics community are really doing with their Macs. In comparing this year’s entries to last year’s, it’s clear that Mac users haven’t lost their passionate enthusiasm for their machines, nor their ingenuity in inventing creative ways to put Mac technology to use. Some new trends are starting to emerge, however.

As expected, the ’89 entries are much more technically accomplished. Hardware and software capabilities that people were only experimenting with last year have become commonplace. Color, for example, is everywhere—despite the continuing lack of affordable ways to produce quality output.

The types of work coming in have begun to change as well. Graphic Design remains the most popular category, but the dominance of printed media is declining. Just as the pundits predicted, the Mac is moving in the direction of electronic and multimedia work. Ten times more animation came in this year than last, one piece even arriving on CD ROM. There were sound pieces; a complete multimedia presentation involving animation, video, slides, and music; and despite our separate SuperStacks HyperCard contest, HyperCard entries of all kinds.

But by far the most dramatic difference between this year’s and last year’s contest was the sheer number of entries: thousands compared to hundreds. Judging this mountain of Mac art and assigning awards in eight categories required a panel with a mix of aesthetic and technical expertise—as well as stamina. Julie Lazar is the curator of media and performing arts at the Museum of Contemporary Art in Los Angeles, where she exhibits and commissions works in interdisciplinary and new art forms. Rob Riley presides over a similar corner of the art world at the San Francisco Museum of Modern Art, serving there as curator of media. Design consultant Christopher Burg, a former art director of Macworld, lent the panel his graphic-design and Macintosh expertise. Carl Rosendahl is the president of Pacific Data Images, a top producer of computer animation for television and film. And Lynn Hershman, credited with creating the first video art disk, contributed a computer artist’s perspective. Hershman also directs the Inter-Arts Center at San Francisco State University.

One final observation about this year’s contest entries is worth making: although people are clearly much more comfortable now with computer graphics technology, the Mac isn’t yet at the point where it’s taken for granted as just another medium. Perhaps the most telling evidence of this is the large percentage of entries that take the computer explicitly as their subject. Look at the winners on the following pages: an illustrated adventure takes a small boy inside the computer, ceramic tiles incorporating Mac screens celebrate great moments in electronics, books explore the effects of technology on architecture and publishing, an animation called Computer Graphics tells a modern parable of the creative process, a piece of techno-folklore depicts a Mac gremlin haunting halls of silicon, and so on. Doubtless some of these works simply embody the self-reflection so ubiquitous in the arts today. But more commonly I think they evince a genuine fascination with the computer, or at least a sense that Mac art is still something apart. Perhaps because the computer continues to leave its traces in what it produces, computer art appears technological and therefore especially apt for talking about technology.

When this perception changes and the computer becomes just another art-room fixture, the concept of a Macintosh art competition may start to sound arbitrary. Until then, however, Macworld will continue to encourage and celebrate the best in Mac art through the Macintosh Masters contest. On behalf of Macworld, I’d like to thank the sponsors and all of the artists who submitted their work this year for making the contest possible, and to invite everyone to participate next year in Macintosh Masters III.
First Place and Grand-Prize Winner (A) Implementing Architecture Designer Pattie Belle Hastings created this hand-bound, limited-edition art book for the Architecture Society of Atlanta and Nexus Press. Five scholarly essays on architecture and technology open vertically from the panels of the accordion-fold game board. An “Inter-Text” on the history of technology covers the board panels and knits the collection together. Throughout the essays, Hastings achieves a textural quality by interspersing pages of semitransparent vellum with patterned pages.

Hastings (shown below, left, with a different project) laid out Implementing Architecture in PageMaker, having scanned in much of the line art (the background textures were created traditionally). “We were working with very limited funds, but managed to pull off this very complicated piece,” she observes. “We couldn’t have done it without the Macintosh.” Hastings also emphasizes that she couldn’t have done it without the rest of the project team that included Rob Miller (editor), Michael Goodman (project director), JoAnne Paschall (press director), and Stan Sharshal (production).

The Tektronix Color Image Printer Hastings won as a grand prize will come in handy for her next book, which uses color imagery extensively. She selected the Adobe Collector’s Edition, Volumes I and II, as her prize for placing first in Graphic Design.
GRAPHIC DESIGN (continued)

Second Place (B) *The Influence of Technology on Graphic Design* Charles Altschul wrote, designed, and produced this laser-printed book as his master's thesis in fine arts at Yale. He laid out the pages in QuarkXPress and used a variety of programs—including ImageStudio and Adobe Illustrator—to enhance the book's many scanned images.

Third Place (C) *Stone Letterform Calendar* Min Wang built up the rich textures and colors of this Adobe Illustrator 88 calendar through trial, error, and multiple applications of Kroy Kolor. The Kroy processor uses heat to transfer colored media from an acetate backing to the black portion of any laser printout. Wang discovered that he could cause the acetate to crinkle in the processor, adding an element of chance to his work and lending a physicality uncommon in digital pieces.

Honorable Mention (D) *The Adobe Playing Card Deck* Five designers used Illustrator 88 to produce this playful deck: Gail Blumberg and Joss Bratt Parsey designed the diamonds, Russell Brown illustrated hearts, Spades were created by Ruth Kedar, and Paul Woods did the clubs.
Matrix

Matrix responds well to algorithmic manipulations because its forms are harmonious with the grid on which these effects are based. Classical elements are adapted to a digitally economical format, ensuring legibility for text applications.

BUSINESS AND INFORMATIONAL GRAPHICS

First Place and Grand Prize (E) Signs of Type Informational Graphics is a category for art that tells a story. Zuzana Licko created a HyperCard fonts catalog to tell about her company, Emigre Graphics, and its designs. In addition to displaying Emigre fonts, Signs of Type uses animation to show such things as how well a font responds to stretching, or to emphasize a face's characteristic qualities. All fonts were designed in Fontographer; Licko used MacDraw and MacPaint to create the stack screens. Licko won a Truevision NuVista 32-bit color board as her grand prize, and selected a copy of Aldus FreeHand for winning in the International Graphics category.

Second Place (F) The Stat Store Publishing Promotion. Alexander Isley incorporated examples of The Stat Store's publishing services—electronic design and production, laser and Linotronic typesetting, image and OCR scanning—into the design of this mailer. Stat Store staff members E-Ping Nie Medalia and Serge Lazarev created the artwork. QuarkXPress 2.0 and Illustrator 88 were used to print separations directly to Linotronic film.

Third Place (not shown) RGBVideolink Demo Robert Haydock.
FINE ARTS

First Place (G) Voltaic Pile, Transistor, Silicon Chip: Three Memorable Moments in the History of Electronics

Ceramics artist Brad Yazzolino thinks of his works as "visual time capsules" and enjoys the irony of fixing screen images, ephemeral as they are, in the abiding medium of ceramic tile. Yazzolino used SuperPaint and MacPaint to design the patterns and screenshots in this 39-inch piece. He transferred the designs to tile by means of silk screen, hand painting, and airbrush. The central panel shows the ENIAC, the first all-electronic computer. At bottom are pictures of vacuum tubes and the cover of Robert Boyle's 1675 classic book on electricity.

Future works by Yazzolino will feature graphics produced in Digital Darkroom, which he selected to be his prize.

Second Place (H) Progression Insets show the history of this digital painting, which was created for a book on creativity and the collaborative process. Darrel Anderson began by making a low-resolution, gray-scale scan of an oil painting by his partner, Richard Berry. Using paint software he wrote himself, Anderson next added color and reworked the piece according to his own creative promptings.
ANIMATION/VIDEO

First Place (1) *Computer Graphics* To achieve the whimsical, hand-drawn quality of the cartoons in this decidedly ambivalent parable on life with computers, Robert Haydock drew his basic outlines on paper and then scanned them. He added color in PixelPaint and animated the piece in VideoWorks II. Haydock selected Microsoft Excel for his software prize.

Second Place (2) *The Eye* Eric Mattson and Alain Mongeau videotaped this, their first VideoWorks animation, directly off the screen. They produced the 11 megabytes' worth of images and almost 3MB of sound using MacPaint, SuperPaint, scanned imagery, and SoundWave software.

3-D/IMAGE SYNTHESIS

First Place (K) *Platinum Toad* Darrel Anderson wrote his own modeling, rendering, and animation software to create this impressive 3-D motion study. The Toad's realistic movement is a result of the modeling software's integration of hierarchical motion with object reformation; together, these yield objects that not only move in relation to one another but also flex. The smooth, partially metallic look of the graphics results from their having been rendered at a large size and then shrunk intelligently using a pixel-averaging algorithm. Anderson, who is working on a book (see Fine Arts category), selected PageMaker as his first-place prize.
WILD CARD

First Place and Grand Prize Winner

The Trompe Bone of Chris Schiff

A piece of radio art is this year's Wild Card winner. To create his 26-minute sound collage, Doug Kahn recorded some 15 hours of material, mostly the conversations of his friend, composer Chris Schiff. Kahn next used an Impulse Software audio digitizer to record a first cut of the original material onto approximately 80 double-sided floppy disks, each of which held one 30- to 40-second snippet. Kahn used Impulse's SoundCap editor to bend and blend the snips, and then rerecorded a final mix on audiotape.

Kahn, who created Trompe Bone on a 512K system, is excited about the potential computers offer to “create an artistic form based on all of the possibilities of sound.” The Mac II he earned as a grand-prize should certainly give him more possibilities to explore. As his prize for winning in Wild Card Kahn also selected a copy of Microsoft Word 4.0.

Second Place (M) Datafall Vernon Reed used an ImageWriter printer to forge this piece of Mac jewelry. After designing the brooch in SuperPaint, Reed passed a sheet of soft silver foil through the ImageWriter, where the print head hammered out the relief pattern. Reed next treated the silver to harden it, electroplated it with 24-karat gold, and bead-blasted it to obtain a satin finish. An onyx bead and a pearl complete the design.

TECHNICAL ILLUSTRATION

First Place (N) Santa Fe Daryl Hutchinson scanned a photograph of this Santa Fe Super Chief diesel train into Illustrator 1.0, where he used it as a template to create this rendering. For coming in first in this category, Hutchinson won a selection of four Adobe fonts.

Second Place (not shown) Dior Glasses Lydia Kinata.
First Place (O) Voyage Pepe Moreno began this cover for a proposed book in ImageStudio, using the blending tools to paint his basic shading and shapes in grays. Moreno next used PixelPaint's Color Editor to substitute color for gray values, and then brought desired portions of green, red, and blue versions into Studio/8 for assembly and final editing. Moreno will receive Adobe's image-processing program, hitherto known as PhotoShop, as soon as it's released.

Second Place (P) Connectivity Scott Campbell used FreeHand 2.0 to produce this illustration for an article about cabling for networks.

Third Place (Q) Pumpkin Head "As soon as I started to work on this project, strange things began to happen," writes Brad Parker of his winning entry. Despite mysterious hardware deaths, unstable software, suspicious pet behavior, and ominous atmospheric phenomena, Parker managed to complete a PixelPaint rendering of this Mac prankster—and, one hopes, to exorcise it from his system.

MACINTOSH MASTERS II WAS MADE POSSIBLE BY SUPPORT FROM THE FOLLOWING COMPANIES: ADOBE SYSTEMS, APPLE COMPUTER, ALDUS, LETRASET, MACROMIND, MICROSOFT, SILICON BEACH SOFTWARE, SUPERMAC TECHNOLOGY, TEKTRONIX, AND TRUEVISION.
EIGHT
OBJECT-ORIENTED
DRAWING
PROGRAMS
LAY THEIR CARDS
ON THE TABLE

by Steve McKinstry

Not so long ago, you could mosey down to your local software saloon, yell "Draw," and a feller would slide you a box of MacPaint, MacPaint, or MacPaint. Then QuickDraw showed its interface, brandishing object-oriented drawing tools. At first, the townfolk laughed. The straitlaced stranger couldn't lasso a pixel if his life depended on it. But drawing programs soon showed their stuff.

Because object-oriented drawing programs store images as geometric descriptions rather than as maps of pixels, file sizes are much smaller; image resolution is no longer dependent on the screen's dots-per-inch ratio; and images and type print without jaggies. Nowadays, many Mac artists consider object-oriented programs to be the only game in town.

In this article, we'll look at two kinds of object-oriented programs. Some, like MacDraw II, SuperPaint, Canvas, Drawing Table, and DeskDraw, use QuickDraw for both the screen description and the printer description of a drawing. Others, like Cricket Draw, Adobe Illustrator 88, and Aldus FreeHand, use QuickDraw for screen display and the more refined PostScript page-description language for printer output.

Choosing the smoothest draw is tricky. Not all object-oriented programs draw images in the same way. While all of the programs reviewed let you use the mouse to create free-form shapes or enter a series of points to create polygons, some let you work with bezier curves—in which you choose the beginning and end points, as well as the direction and shape of the curve. Some can automatically trace bitmapped images and turn them into object-oriented graphics. Others let you divide your work into various layers. We'll also look at the ways in which programs handle typography, color, and printing.

THE ZEDCOR KID

DeskDraw weighs in at a compact 96K, but this desk accessory from Zedcor packs a wallop. While it lacks some functions such as the layering, color dithering, autodimensioning, and bezier curves found in more sophisticated programs, DeskDraw does offer a 24-by-24-inch-maximum workspace and, in version 1.4, eight QuickDraw colors. In conjunction with its companion program, DeskPaint, DeskDraw offers excellent autotrace features (see "Traces of DeskDraw"). A unique Forms Trace feature enables DeskPaint to autotrace straight lines from an imported scanned image and then paste the image into DeskDraw with editable object-oriented lines.

DeskDraw is limited to free-form and
polygon drawing tools, but you can easily add or delete points anywhere on a path with ⌘-Click. Polygons can be smoothed, unsmoothed, reshaped, and filled; but once formed, they can't be split, joined, closed, or opened. Files are saved as PICT and can be opened for additional editing in other programs with more features.

DeskDraw can't compete with all the features in the larger, stand-alone programs, but it may do the trick if you need a lean, clean drawing program that is always as close as your menu bar. This DA is ideal for creating quick-and-dirty images while you are in an application, and for functioning as a pony express to transfer images to other programs.

**The Brøderbund Bunch**

Drawing Table is the newest entry in the object-oriented stable. The program includes an integrated multiwindow management system that makes it easy even for greenhorns to keep their designs straight (see “Drawing Table's Open Windows”). Among other innovations are a Duplication tool that lets you copy elements across multiple windows without using the Clipboard and the ability to save a group of open windows as a Project file that will reopen in the same configuration.

The program is a strange mixture of oversight and brilliant coups. You can bind text to a path, for example, but you can't mix fonts, sizes, or styles in the same text block; and there is no leading other than single, double, or one-and-one-half spacing.

None of the tools have automatic scrolling, and almost every function is dialog-box driven. There are few ⌘-key equivalents and no hierarchical menus. You can double-click on a tool or object, however, to bring up an Attributes dialog box that lets you change color, pattern fills, line fills, and line weights. Double-clicking on a type block lets you change font, size, style, and color.

In Drawing Table, you are limited to...
the eight QuickDraw colors, and no custom mixing is possible. You can, however, choose foreground and background colors for patterns and tints, which provides for many color combinations. There are no layering, skewing, or distorting tools, nor are there separation controls. Line weights are entered in fractions or decimals that bear no resemblance to points. For example, a 1-point line is entered as 1/72 or .013.

Drawing Table's manual is well organized and, like the program itself, seems to have been designed with the novice in mind. Professionals may find Drawing Table too structured and simple for their needs, but for the amateur, the program opens up a world of graphic possibilities.

The Silicon Beach Posse

When SuperPaint first arrived, it blew the competition away by being the first graphics program to offer both bitmap and object-oriented drawing tools. SuperPaint still offers the simplest interface between the two modes—too simple for some, perhaps. The program is limited to a single layer for drawing and another for painting.

Among the many new features in version 2.0 are bezier curves, a larger drawing area, a dashed-line editor, customizable arrowheads, and a Multigon Tool that lets you set the number of sides for a shape. You have access to the eight QuickDraw colors, but colored images must be viewed using a special preview mode, and there is no separation utility for printing with color.

SuperPaint's AutoTrace feature enables you to trace a template in the paint layer. The template can be hidden while you're drawing, but will print if you leave it in the document. To distinguish it from the tracing line, you can fill it with a lighter pattern using bitmap editing tools (see "Drawing the Lines with SuperPaint").

Polygons can be reshaped but not smoothed. To split a polygon, smooth it, or add and delete points, you must convert the image to bezier format, a process that involves several steps not covered in the hefty, but poorly indexed, manual. Bezier curves start out as free-form paths whose handles show only in the editing mode. Still, SuperPaint offers a great deal of control over points, and you can export bezier paths directly to Illustrator 88, although you will lose things like non-bezier polygons, lines, and text.

SuperPaint offers strong text-handling features. The program lets you mix fonts and sizes in a text block, specify custom leading and point size, and rotate blocks of text in 1-degree increments. There are limitations, however. You can condense or expand type by dragging it with the mouse or selecting the Scale command, but the program doesn't support fractional point sizes, tracking, or kerning.

SuperPaint's multiwindow environment lets you tile, stack, overlap, or hide windows and use floating palettes of patterns and tools. You can fill shapes with standard PostScript gray fills, and the program's SuperBit editing uses virtual memory to create images that match the resolution of your output device.

While SuperPaint lacks dimensioning and multiple drawing layers, it may be suitable for users who need a strong bitmap environment. The program does have one of the smoothest drawing interfaces of those I reviewed, and it has built-in QuickSwitch routines. This will particularly appeal to those using Microsoft Word 4.0, since SuperPaint will ship with each new copy of that program. A direct link between the two programs allows images created in SuperPaint to be quickly updated while in Word 4.0.

QuickDraw MacDraw II

After receiving a lot of press as the first object-oriented program to harness the power of the LaserWriter, MacDraw quickly became the drawing program of choice for newspaper computer graphics. MacDraw II added refinements that allow the veteran program to hold its own with the new guns. Layering, variable line
weights, easily reversible type, custom arrowheads, a dashed-line editor, a library to store images, and fractional character widths are all recent enhancements. Layers can now be named, reordered, shown, or hidden; but it is still difficult to tell which layer an individual object inhabits because once you've clicked to a lower layer, those above it are hidden.

MacDraw II 1.1 has a well-designed align-and-distribute feature as well as nudge keys that move objects in 1-point increments. You can save your settings in a Stationery document—a template that you use to open new, untitled clones. Color is another major enhancement (see "Dithering MacDraw"). MacDraw II can print four-color separations with registration marks, the first program to accomplish this feat with QuickDraw colors. It also includes a spelling checker and the ability to post notes.

But MacDraw does not offer an autotrace tool or bezier curves, and drawing with MacDraw's polygons is cumbersome at best. MacDraw's polygons were the touchiest of any reviewed. Text cannot be scaled with a drawing, and there are no dialog boxes for defining increments for scaling, moving, or rotating objects. Also missing are basic 3M-key equivalents for often-used features such as Ungroup.

Finally, although MacDraw II 1.1 saves memory by loading only the fonts and sizes you use most often, opening two full-color images in the program would require nearly 1 megabyte of RAM. Still, with its layering controls and color-separation abilities, MacDraw II is a well-proven solution for those in need of a good QuickDraw program.

The Canvas Gang

Like SuperPaint, Canvas rode into town with both guns blazing—bitmaps in one hand and object-oriented draw tools in the other. In addition, Canvas packs an unexpected bonus, a smaller version of itself disguised as a desk accessory. SuperPaint's interface between the two modes may be smoother, but an impressive body of features and tools makes Canvas the top gun.

The outstanding manual offers many cross-references, examples, and handy tips. (If only there were a quick-reference card.) The program itself is equally well organized. To select and edit elements such as patterns, pens, color, scaling, alignment, and rotation you use a combination of 3M-key shortcuts and dialog boxes called Managers. To bring up the Alignment Manager, for instance, you click on the alignment tool while several objects are selected.

You can autotrace bitmap areas selected with the marquee, but you have no control over points or line tracing sensitivity. Of all the QuickDraw programs tested, Canvas had the easiest polygons to create and edit, and Canvas offers the only polygon that can be continued from an end point after you've deselected it. The program's bezier curves work much like those in Illustrator 88 and FreeHand, even if they do lack the editing control of the PostScript competitors.

Canvas had the most-functional rulers I tested and it definitely wins in the zoom department. Although the maximum enlargement is set at 32x in either direction, I stopped at 13x after a 1-point line filled the screen and became uneditable. The tools were still active, however. Dynamic autodimensioning is another plus.

Canvas offers better layer control than MacDraw. You can gray out layers, print individual layers, and send objects to layers without having to cut and paste. The layer name is always shown and can easily be accessed from the Information Manager status bar. But only one layer can be active at a time, and there is no way to tell which layer an object is on without giving each layer its own color.

You have 16.7 million colors available in Canvas, and you can create custom color libraries from Apple's Color Picker (see "Framing the Canvas"), but Canvas has no facilities for printing CMYK (cyan, magenta, yellow, black) separations, and
# DRAWING FEATURES ROUNDUP

<table>
<thead>
<tr>
<th>Feature</th>
<th>Canvas</th>
<th>SuperPaint</th>
<th>MacDraw II</th>
<th>Drawing Table</th>
<th>DeskDraw</th>
<th>Cricket Draw</th>
<th>Illustrator 88</th>
<th>FreeHand</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company</strong></td>
<td>Denebo Software</td>
<td>Silicon Beach Software</td>
<td>Claris</td>
<td>Broderbund Software</td>
<td>Zedcor</td>
<td>Cricket Software</td>
<td>Adobe Systems</td>
<td>Aldus</td>
</tr>
<tr>
<td><strong>Version</strong></td>
<td>2.0</td>
<td>2.0</td>
<td>1.1</td>
<td>1.0</td>
<td>1.3 (1.4 soon)</td>
<td>1.1.1</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>List price</strong></td>
<td>$299.95</td>
<td>$199</td>
<td>$399</td>
<td>$129.95</td>
<td>$129.95</td>
<td>$295</td>
<td>$495</td>
<td>$495</td>
</tr>
<tr>
<td><strong>Maximum no. of windows</strong></td>
<td>limited to memory</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>limited to memory</td>
<td>limited to memory</td>
<td>limited to memory</td>
<td>limited to memory</td>
</tr>
<tr>
<td><strong>Maximum drawing area</strong></td>
<td>81 sq. ft.</td>
<td>72 x 72 in.</td>
<td>100 x 100 in.</td>
<td>42 x 42 in.</td>
<td>24 x 24 in.</td>
<td>8.5 x 14 in.</td>
<td>7 ft. x 7.3 ft.</td>
<td>40 x 40 in.</td>
</tr>
<tr>
<td><strong>Move/Hide palettes</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Multiple levels of undo</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Selection tool/autotrack</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Drawing tools/autotrack</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Auto tracking tool</strong></td>
<td>bitmap to polygon</td>
<td>•</td>
<td>bitmap to polygon</td>
<td>•</td>
<td>in DeskPaint</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Adjust tracing sensitivity</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Masking shapes</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Polygon path tools</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Reshape/smooth polygon</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Add/remove polygon vertex</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Cut polygon</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Continue path from end point</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Bezier path tools</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>1</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Erase while drawing</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Continue path</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Select/move multiple points</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Cuto path</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Custom arrows</strong></td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>3 in v.1.4</td>
<td>3</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Show in-line measure</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Colors available</strong></td>
<td>16.7 million</td>
<td>8 QuickDraw</td>
<td>8 QuickDraw</td>
<td>8 QuickDraw</td>
<td>8 QuickDraw</td>
<td>8 QuickDraw</td>
<td>CMYK, 700 PMS</td>
<td>CMYK %</td>
</tr>
<tr>
<td><strong>Color-mixing method</strong></td>
<td>Color Picker</td>
<td>dithering</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Gradient fill</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Mix fonts, sizes, &amp; styles</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Bind text to path</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Edit fill &amp; stroke</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Kerning</strong></td>
<td>fractional widths</td>
<td>•</td>
<td>fractional widths</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Leading</strong></td>
<td>custom space</td>
<td>•</td>
<td>1, 2, 1.5 lines</td>
<td>•</td>
<td>1, 2, 1.5 lines</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Measuring system</strong></td>
<td>in, p, pt, cm</td>
<td>in, p, pt, cm, px</td>
<td>in, p, pt, cm, px</td>
<td>in, p, pt</td>
<td>in, p, cm, px</td>
<td>in, p, pt, cm</td>
<td>in, p, pt, cm</td>
<td>in, p, cm, pt</td>
</tr>
<tr>
<td><strong>Snap to ruler</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Maximum no. of layers</strong></td>
<td>limited to RAM</td>
<td>1 Draw, 1 Paint</td>
<td>limited to RAM</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td><strong>Reorder layers</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Name layers</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Print layer individually</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Color separation</strong></td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

Note: These comparisons cover only the object-oriented tools of a program unless otherwise noted.

1 in = inches, p = pixels, pt = points, cm = centimeters, c = centis, di = decimal inches, m = millimeters, px = pixels.

2 "A=Point, B=PIT, C=PICT2, D=TIFF, E=EPS, F=PostScript," = via Clipboard, 1 = template, △ = place.
overlapping areas are not masked out when printing individual layers. And there are problems with type control: Canvas has no leading option, and you can enter only whole numbers into the custom point sizes (a problem that plagues QuickDraw programs). Once you've applied scaling or a special effect (rotate or flip, for example) to text, it's imaged as a bitmap. To edit the text you can choose Restore Original or, in some cases, simply click on the bitmap, but both methodologies remove all effects. If you scale type first, you cannot apply special effects.

Canvas will win many converts, however. It is a precise, full-featured program that will appeal particularly to people who need well-designed drafting tools.

**The Cricket Clan**

As the first drawing program to take advantage of PostScript and the LaserWriter, Cricket Draw amazed everyone with its speed and sophistication. After working with MacDraw or SuperPaint, we were wowed by Cricket Draw's blended fills, binding text, rotation, and a host of other innovative features that now seem commonplace amongst PostScript programs. The program hasn't changed radically in recent years, but it is still a good program with features others don't offer—a PostScript editing window, special starburst and grate tools that can be customized for unique shapes, a nice transfer mode for regulating the frequency and angle of screens, very quick dialog boxes, and automatic shadow-box generation.

Cricket Draw's polygons are much like those of its QuickDraw cousin, MacDraw II, but they are easier to use. You can't add points to an existing line, but you can add new vertices by Option-clicking on an existing one and then dragging it to its new position. You delete vertices and open and close polygons by using simple key commands.

You can regulate nudge-key movement for controlling free-form drawing and creating polygons, but there are no autotrace settings and only one bezier curve for creating single arcs that can't be joined to others (see "Hide and Seek with Cricket"). Using a keyboard shortcut you can increase or decrease type size in 1-point increments; and a Status box shows height, width, length, angle, percentage change in height and width, and current zoom field. You can bind text to a curved path, but you won't be able to see it or edit it on screen.

Cricket Draw is showing its age. It has no hierarchical menus, text must be edited at actual size, leading is unavailable, and there is no fill or stroke for text. There is only one bezier curve and it can't be joined to other line forms. You have access to only the eight QuickDraw colors and you cannot create color separations. But at a good $800 less than Illustrator or FreeHand, Cricket Draw does offer PostScript features at QuickDraw prices.

**El Adobe Grande**

Adding double-handled beziers to established PostScript routines, Adobe Systems created Illustrator, a drawing program that quickly found itself on many Most Wanted lists. Illustrator 88 version 1.8 upped the ante. Enhanced features were balanced by the need for 2MB of memory and a hefty budget.

Illustrator 88's strong points are its tools for precision drawing control and its ability to handle type and color. Other drawing programs now incorporate bezier curves, but Illustrator 88 beats them all with refinements such as the ability to snap to a point, a ruler with tick marks every 1/8 point, and zoom levels of up to 32x. Illustrator 88 barely edged out DeskDraw for best autotrace abilities; it can't force a straight line from a slanted one, but lines are in PostScript format, not PICT. Because sensitivity is adjustable, you can avoid picking up unwanted vertices and it's easy to choose the lines you want to autotrace—you just click on them.

Although Illustrator 88 traces only one side of a line at a time, the release of Adobe's Streamline, a separate autotraicing utility, should solve this problem.

Some programs have menus that appear to be more generous, but Illustrator 88's type and object controls have been hoiled down to a few simple menus with many functions hidden behind subtle mouse and keyboard commands. To size a rectangle automatically, for example, you choose the rectangle tool and click anywhere in the drawing area to bring up a dialog box that lets you enter height, width, and curved-corner radius.

With the advances in typographic controls in QuickDraw programs, Illustrator's PostScript lead is getting narrower, but the program is still ahead of the pack. You still can't bind text to a path or justify blocks of text. Fonts and sizes cannot be mixed in the same block, and there's a 256-character limit.

Layering is limited to Send to Front and Send to Back; there's no way to hide individual layers other than grouping and hiding selected objects. Masking—the process of nesting one image inside ano-
Dithering MacDraw

Color in MacDraw is limited to the eight QuickDraw colors, but they can be mixed through dithering for a variety of effects and patterns. Colors can’t be loaded from other programs, but mixed colors can be saved in a Stationery document.

Seeing Double with Illustrator

To see changes in color, you must use a second window called New View. Notice that Illustrator’s tight control over steps results in a smooth blend.

Custom colors remain resident in the document in which you create them, but you can save the document as a template if you don’t want to recreate the colors.

While Illustrator 88 doesn’t generate separations, Adobe Separator, which comes with the program, does. In order to separate PMS and custom colors into four-color plates, you must first convert them to process colors. You can also output to negative or positive film on a linotronic typesetter. With its manual, Illustrator provides a prepress primer and an excellent color guide as well as a breakdown of CMYK color combinations, printed from Illustrator 88 separations.

Another program supplied with Illustrator 88 is Drawover, a conversion program that turns PICT files from any QuickDraw program into Illustrator format. Although patterns, text, and color are lost, the converted lines can be imported as bezier curves.

The Aldus Band

While Illustrator frightened most of the QuickDraw gang back to the ranch to look for more firepower, a lone ranger was preparing to take it on. Adobe may have given us PostScript, but Alsys of Plano, Texas, came up with EPS formats. When Alsys turned its drawing package over to Aldus, FreeHand emerged as a formidable contender, bearing the same price tag as Illustrator 88 and offering similar features. The two have been duking it out ever since.

FreeHand 2.0 attacked Illustrator at its weakest points. FreeHand has a customizable sheet size up to 40 inches by 40 inches and a pasteboard where objects can be stored. A bleed size can also be figured into the page setup. FreeHand understands that to err is human; and to forgive, it gives us Undo. In fact, you can select up to 99 consecutive undos. All other programs offer just 1. This is a great feature, even if it does eat up considerable memory.

FreeHand’s scaling, reflecting, skewing, and rotating tools are similar to those of Illustrator, but FreeHand generally offers more options in the dialog boxes. And you can toggle between the arrow tool and any other tool using the ⌘ key or the number keys.

Masking is simple. Just position the object to be nested over the object that will mask it. Cut the object to be nested, select the mask, and choose Paste Inside from the Edit menu. You can group and mask several items in this manner. Cut Contents reverses the process.

Best of all, you can work in color-preview or wire-frame modes. This makes a heavy demand on memory, but is a more natural process than Illustrator’s. To help keep things in order, you can create up to 200 layers and work on all of them at the same time. Clicking on an object registers its layer position in the status line, and you can send an object to any other layer. Despite the fact that you cannot name or reorder layers, FreeHand’s layering controls offered the most functionality of any I reviewed.

There’s full support for CMYK color, plus over 700 PMS colors that can be selected and converted to CMYK values. You make separations from within FreeHand, and you have control over printing, registration marks, plate names, negatives, inks, and screen angles. When you create your own CMYK colors, you can save them in a style menu and apply them to other text, lines, and objects. Using a special format, you can save these colors as libraries or templates. Color blends for
complex or unusual shapes are similar to those in Illustrator 88, but you can't specify the number of steps. For simple gradations, you merely choose two colors and the direction of fill. Besides custom color fills, there are custom pattern, radial, or PostScript fills (see "Grading FreeHand"). FreeHand comes with several preprogrammed PostScript fills and a PostScript window for creating more.

It is in its robust typographic controls that FreeHand really shines. You create type in a dialog box; fonts, sizes, styles, and color can be mixed in the same text block. Each block holds up to 30K and can show a representation of the type you've selected or a default style. There are also controls for manual kerning, letter and word spacing, horizontal scaling, justification, baseline offset, and custom point sizes, with leading in any fraction of a point. In addition, type can be edited when it's scaled, rotated, skewed, reflected, or bound to a path.

FreeHand's autotrace, free-form, and bezier tools lack the fine control found in Illustrator. FreeHand paths are hard to join and handles are difficult to grab. But unique Highlight and Contrast controls let you adjust TIFF scans for clean tracing, and FreeHand offers more control over the points that make up its bezier lines. Points can be defined as curves, connectors, or corners that can be changed at any time from the Element Info dialog box; paths can be automatically closed or opened from the same box. Points can be erased as you draw and lines can be continued by selecting the end point and renewing the path.

**The Final Roundup**

I suppose you're itching to find out who I think is the fastest draw. It's a tough call. For mechanical drafting and architectural applications, Canvas would be my choice. It features excellent measuring tools and the highest degree of precision this side of CAD. Its color and layering are well suited for impressive color slides and for printing color-keyed layers, for example to show plumbing and electrical levels in a building.

While Canvas provides an inexpensive QuickDraw solution, Illustrator offers technical illustrators and designers a superior selection of precision drawing tools along with full color control and separation abilities for printing.

For the artist doing small black-and-white newsletters, technical documentation, or graphics requiring a bitmap environment, SuperPaint's drawing and type tools come with an easy-to-use interface. Cricket Draw is also a good choice, if you need an inexpensive PostScript program.

MacDraw is the QuickDraw compromise for graphic artists working in the print media. SuperPaint and Canvas challenge it in several areas, including price, but MacDraw is already used in many networked media arenas; it can create simple, quick separations; and it does have that all-important spelling checker. If Canvas offered true CMYK separations, it would outdraw MacDraw, but PostScript programs would still leave them both in the dust. Although Illustrator 88 stands out, FreeHand can be a better choice in this environment, offering superior layering, color, typography, and point control. When facing a tight deadline, FreeHand is the better choice.

Drawing Table is a good choice for nonartists needing to create decent images. The price is right, and the program's innovative features and multiwindow environment make it easy to use.

And what do I use? I use several. Illustrator is best for the initial stages of a line drawing. I may then import a drawing to FreeHand to take advantage of that program's abilities. I use FreeHand or Adobe Separator to do the separations, or I export the image to a desktop publishing program. DeskPaint and DeskDraw are great for all kinds of utility functions, from editing templates to autotracing.

What if I were forced at gunpoint to choose just one? It would be FreeHand. But that's today. There's always faster on the draw tomorrow.

---

**Steve McKinstry** is the design director of Media Design, a consulting and design service that specializes in publication design and illustration on the Macintosh. He lives in Anacortes, Washington, and has an office in San Francisco. He is a former director of design and graphics for Macintosh Today, the Chicago Tribune, and the Seattle Times.
The MegaScreen 2008 (left) and the E-Machines T19 (right) are both top picks. These monitors combine top-notch image quality with high vertical refresh rates so that images are not only visually accurate and appealing but stable as well.
Not everyone can make it on the big screen. An actor must be larger than life and radiate that unfathomable essence called star quality. If you own a Mac II, you too can make it on the big screen—not as a celebrity, but by creating brilliant color images that add unsurpassed glamour to your day-to-day computing.

Macworld tested 12 color display systems for star quality. We included only systems that combine an 8-bit video board with a monitor. We excluded 24-bit displays, as well as color solutions for the Mac SE and SE/30. Our evaluations included 19-inch and 20-inch monitors from E-Machines (T19 and C20), MegaGraphics (MegaScreen 2008), Moniterm (Viking 21), PCPC (PCPC II), Radius (Color Display System), RasterOps (1948H and 1948S), and SuperMac (SuperMac 19" Color Monitor), as well as two 16-inch monitors from E-Machines (TX, T16). The smallest monitor of the lot, the Apple 13-inch color monitor, was included mostly as a point of comparison because it's familiar to many users. We also looked at a 19-inch Taxan Ultra Vision 1000 with the new Taxan ColorVision II board but did not include it in our final evaluation because although the board is now shipping, it was still a preproduction unit at the time of our tests.

**The Auditions**

Image quality is by far the most important criterion in selecting a monitor. It's also the most difficult to judge. Display systems offer various different hardware and software features (see "Color Monitors at a Glance"), but most people choose a monitor based on how well it displays color images. To determine which color systems produce the best images, we used a combination of objective and subjective tests. It's important to keep each in its place.

Image quality is determined by several diverse characteristics. Although many of these characteristics can be measured objectively, such measurements won't tell you which color display produces the best color images. Objective tests provide useful background, but subjective tests are better for providing an overall quality evaluation.

We conducted the objective tests in our lab using instruments such as the Klein Convergence Meter and the Minolta Color Analyzer to measure misconvergence, brightness, tracking, linearity, color range, and color purity. The results of these tests are shown in "Color Monitors at a Glance" and "Image Objectives." Each monitor had a 30-minute warm-up period before we took any measurements. Using several other procedures and test-pattern software, we tested for distortion, focus quality, pin cushioning, ghosting, and voltage regulation. The results of these tests are discussed in this article.

Ultimately, a monitor generates images for human viewing—a highly subjective activity. A gathering of 12 Macworld staffers rated the monitors for several characteristics (see “Search for the Right Image”). We also judged how well the monitors held up when displaying images that users might view during day-to-day use, including images produced by color paint programs, gray-scale editing programs, and CAD programs.

**Sizing Up Images**

One of the main reasons for purchasing a large color monitor is size—not because it lets you intimidate your colleagues, but because it displays large color images. With the exception of the 13-inch Apple display, the monitors examined here let you view a relatively large image on screen without scrolling. The 19-inch monitors are physically daunting, weighing as much as 97 pounds and taking up a lot of desk space. I recommend purchasing a monitor stand from a vendor such as Kensington to make the best possible use of your desk space. The two 16-inch monitors from E-Machines are a good compromise for people who find a 19-inch monitor too big.

The amount of detail you can view at once is determined by a monitor's resolution. Resolution is the maximum number of lines (down) and pixels (across) you can view on screen. It's also important to consider the monitor's pixel density (measured in dots per inch or dpi). Many monitors display 72 dpi—the dot density of the original Mac. Monitors with higher pixel densities can display a large image...
in a smaller area while retaining detail. However, the image is necessarily smaller, making text and detail more difficult to read.

The Radius Color Display System displays 82 dpi, making the text a bit too small for me to accept for word processing but probably adequate for text details in other applications. At 75 dpi, the density of the E-Machines T19 and C20 will be slightly higher than 72 dpi, but will be quite acceptable to everyone but purists. E-Machines' TX compresses the same high-resolution image onto a 16-inch monitor, yielding a dot density of 87 dpi. Most people won't find this monitor acceptable for text-intensive applications like word processing and spreadsheets, but it provides an interesting trade-off for applications where image detail is more important than image size. E-Machines' T16 has the same size screen, but with a dot density of 75 dpi it doesn't cram as much detail in the same space.

**One Bright Spot**

A monitor's brightness can affect the color in an image. Furthermore, different people prefer different brightness settings. Some, like me, prefer to work with a very bright display. The amount of brightness you require will also depend on the lighting in your work space. Here are some general guidelines. If the room is dark you can get away with a measurement of 10 foot-lamberts. A room of average brightness will require 20 foot-lamberts; a room with a lot of windows will require 30 foot-lamberts (see “Color Monitors at a Glance”).

If you work near a window or an otherwise brightly lit space you may spend more time looking at your own reflection than your work on screen. Most monitors have some type of screen etching or antiglare coating to minimize glare; but these features cannot overcome poor monitor positioning or high-glare envi-
<table>
<thead>
<tr>
<th></th>
<th>Radius</th>
<th>RasterOps</th>
<th>RasterOps</th>
<th>SuperMac 19&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCPC</td>
<td>Color Display System</td>
<td>194BH</td>
<td>194BS</td>
<td>Color Monitor</td>
</tr>
<tr>
<td>PCPC II</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Sony Trinitron</td>
<td>10.7</td>
<td>10.7</td>
<td>10.7</td>
<td>10.7</td>
</tr>
<tr>
<td>14.2 x 10.7</td>
<td>0.30</td>
<td>0.30</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

because of its exceptionally good edge focus. Good focus is, of course, more difficult to accomplish in larger monitors. However, several other monitors did almost as well as the Apple display: the E-Machines TX, the E-Machines T19, the MegaScreen 2008, the PCPC II, and the SuperMac. The Monitorm Viking 21 was judged to have the worst edge focus; the E-Machines C20 was judged to have the worst focus at center.

Poor focus can partly be a result of misconvergence, the degree to which the red, green, and blue beams are out of alignment. Serious misconvergence results in lines and text that have a discernible color shadow. We used a Klein Convergence Meter to measure the misconvergence of the red and blue beam from the green beam, both horizontally and vertically from center and from each of the screen's four corners (see "Color Monitors at a Glance" for measurements). Misconvergence becomes a concern when the color shadow's width is greater than 0.05 millimeters at the corners and 0.03 millimeters at center.

## Tracking Down Tints

There were obvious differences in the overall color of the screens. Some had a greenish cast, some looked pink, some looked brown. Each monitor's idiosyncratic tint is determined by the type of phosphor it uses and its tracking ability. Tracking is the balance between the voltage intensities of the three color beams. You can detect tracking problems by examining a blank background at different gray levels. Gray levels are different intensities of white; color monitors produce white by evenly balancing the intensity of each of the color beams. A significant variation between the beams means that colors won't be mixed evenly and that the gray level will be colored in some fashion. The overall color bias of the screen becomes more pronounced at darker gray levels.

We examined the monitors for tracking deviations at both 25 and 50 percent gray levels (for objective test measurements see "Image Objectives"). The Radius Color Display System was the clear

---

**Clarifying Focus**

Most of the editors who participated in the subjective tests rated focus as the most important consideration in selecting a monitor. This is no surprise from a group that works with text most of the day; clear focus makes it easier to see and interpret graphics details and text (especially in sizes smaller than 14 points). Focus is also important for CAD and other applications where interpreting small details is essential (although one art department staffer weighted tracking and purity more heavily than focus because she doesn't often work with text).

In the subjective tests we rated each display for the quality of the focus at the center of the screen and along the edges. The Apple monitor rated the highest

---

**ENVIRONMENTS.** Some monitors also come with stands that let you tilt or swivel the monitor to adjust the best possible position.

Most monitors have contrast controls, and some have brightness controls. All E-Machines monitors come with a handy software utility for this purpose. Some monitors provide a degaussing button to remove a magnetic disturbance called Gauss effect. Sony monitors automatically degauss on start-up.

---

**Tracking Down Tints**

There were obvious differences in the overall color of the screens. Some had a greenish cast, some looked pink, some looked brown. Each monitor's idiosyncratic tint is determined by the type of phosphor it uses and its tracking ability. Tracking is the balance between the voltage intensities of the three color beams. You can detect tracking problems by examining a blank background at different gray levels. Gray levels are different intensities of white; color monitors produce white by evenly balancing the intensity of each of the color beams. A significant variation between the beams means that colors won't be mixed evenly and that the gray level will be colored in some fashion. The overall color bias of the screen becomes more pronounced at darker gray levels.

We examined the monitors for tracking deviations at both 25 and 50 percent gray levels (for objective test measurements see "Image Objectives"). The Radius Color Display System was the clear
Macworld Labs performed several objective tests to measure different facets of image quality. The charts below show the results of tests performed to measure tracking, gray linearity, and purity for each monitor. Keep in mind that the results of objective tests don’t always agree with subjective impressions. While objective tests provide useful background, it’s important not to take the results out of context when making a purchasing decision.

**Image Objectives**

**Tracking**
The top chart shows the results of our tracking measurements. Tracking is the balance between the voltage intensities of a monitor’s three color beams. Each of the three small circles shows the balance between the red, green, and blue beams at a different brightness level. The measurements were indexed to show the relative differences between the intensities of the three beams. In each circle one of the three color segments has no width, that color has the weakest beam and is the starting point for assigning the color contributions. The width of the other two color segments in each circle indicates the degree to which those beams overcontribute to the color mix. The wider the color segment, the worse the overcontribution.

**Gray Linearity**
The middle chart demonstrates the gray linearity of each monitor. Perfect linearity is represented.

<table>
<thead>
<tr>
<th>Tracking</th>
<th>Gray Linearity</th>
<th>Purity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Color High-Res.</td>
<td><img src="Example" alt="Gray Linearity" /></td>
<td>0 17 18 22</td>
</tr>
<tr>
<td>E-Machines TX</td>
<td><img src="Example" alt="Gray Linearity" /></td>
<td>0 10 17</td>
</tr>
<tr>
<td>E-Machines T19</td>
<td><img src="Example" alt="Gray Linearity" /></td>
<td>0 10 17</td>
</tr>
<tr>
<td>E-Machines C20</td>
<td><img src="Example" alt="Gray Linearity" /></td>
<td>0 10 17</td>
</tr>
<tr>
<td>MegaGraphics MegaScreen 2008</td>
<td><img src="Example" alt="Gray Linearity" /></td>
<td>0 10 17</td>
</tr>
</tbody>
</table>

**Gray Linearity**

Although color monitors can display gray-scale images, these images are usually inferior in quality to those displayed by dedicated gray-scale monitors. Gray-scale monitors are generally more accurate because they use only a single beam at different voltage intensities to produce gray levels. To accomplish the same result, a color monitor must combine three

favorite in the tracking tests. Most editors went out of their way to comment on the excellent quality of this monitor’s grays. The PCPC II was a clear second place; the E-Machines T19 came in third.

The RasterOps 1948H and the E-Machines C20 were described by most people as green, and some people did not like this color. The PCPC II, MegaScreen 2008, E-Machines T19, and SuperMac monitors were all described favorably as slightly blue or blue gray, with the SuperMac graduating to an obvious teal at 25 percent. The RasterOps 1948S was brown, and a few editors disliked this color. The Viking 21 was described as yellow brown—another unpopular color.

The Apple monitor, the T16, and the TX were described by all editors as pink at 50 percent and plum or mauve at 25 percent. The particularly strong red bias of the T16 turned out to be a misadjustment that had occurred in shipping. And after being adjusted, the T16 produced an entirely acceptable gray. Monitors can suffer serious adjustment problems during shipping. If you notice a problem, it’s worth asking your dealer to re-adjust the monitor to meet the manufacturer’s specifications. (Some manufacturers, such as E-Machines, prefer to have the monitor sent back to them in case there are any serious problems due to an out-of-spec monitor.)

**Gray Linearity**

Although color monitors can display gray-scale images, these images are usually inferior in quality to those displayed by dedicated gray-scale monitors. Gray-scale monitors are generally more accurate because they use only a single beam at different voltage intensities to produce gray levels. To accomplish the same result, a color monitor must combine three
by a white line that divides each rectangle diagonally at 45 degrees. The red line illustrates the monitor’s actual linearity; the closer it follows the white line, the better the gray linearity. The horizontal axis represents intended brightness level and the vertical axis indicates actual brightness level climbing from minimum brightness in the lower left to maximum brightness in the upper right. To create the line chart we interpolated tracking values at several gray levels.

Purity

Purity, shown in the bottom series of charts, is the color variation between different areas of the screen. We tested for color variation by measuring the red, green, and blue beams at the center and each of the four corners of each screen as it displayed a background color of 100 percent white. We then indexed each measurement by taking the root-mean-square of the deviation from whiteness. For each monitor the indexed number appears at the center of the screen and each of the four corners. The greater the deviation from whiteness, the larger the number. Individual measurements are not as important as the degree to which these measurements vary among locations on a single monitor. The coloring within each chart is a representation of the screen’s purity variations, not an accurate depiction. The coloring and the blending have been enhanced and simplified for legibility.

We measured all the monitors for purity variations at the center of the screen and at each of the four corners (see “Image Objectives”). We also examined the monitors for purity variations by viewing a screen displaying a white background at full brightness. The best performers were the E-Machines T19, the MegaScreen 2008, the PCPC II, and the Radius Color Display System. The T19 received the most effusive compliments, with comments like “luminous” and “very good—five stars!” The Viking 21 was the only monitor with a serious purity problem. The Viking 21 was labeled by many
Macworld Labs measured the red, green, and blue color coordinates for each monitor and plotted them on this composite chromaticity chart. Since most of the monitors we tested had a similar color range (produced a similar degree of saturation), we show only the outside and inside boundaries of the color range for all tested monitors. The Sony monitors all fared well in the red spectrum. Overall, the SuperMac monitor had the widest color range and the E-Machines C20 had the smallest.

**COLOR IMAGES**

Isolating a monitor's imaging characteristics is important, but in the end color monitors are used to display real images. To balance our evaluation we looked at images from color paint and CAD programs and rated the quality of the display for color range, vividness, and general appearance. Each monitor's contrast and brightness were adjusted to optimize image appearance.

The results show that testing for specific characteristics such as purity, tracking, and focus do not always correlate with users' responses to real images. The best examples of this were the two RasterOps monitors. Both had comparatively unimpressive results in the clinical tests, but did exceptionally well when displaying actual images. Editors who had commented negatively on the heavy tracking bias toward brown on the RasterOps 1948S (Sony) and the bias toward green on the 1948H (Hitachi) were nevertheless favorable about the quality of the color images. The RasterOps 1948S monitor was especially impressive because it outperformed more accurate monitors when displaying color paint images. It did not do as well when displaying CAD images, reflecting the monitor's weaknesses in tracking, purity, and focus. Conversely, the SuperMac monitor did only a reasonable job of displaying paint images but did much better on the CAD images because of its sharp focus.

The Apple monitor did well on all types of color images despite the screen's pinkish quality. Once again, the T19, MegaScreen 2008, PCPC II, and Radius monitors gave strong performances in the display of all types of color images (with the Radius monitor being somewhat weaker with CAD images because its focus is not quite as good). This versatility parallels these monitors' strong showings in the clinical tests. Although the editors were not as critical when they were looking at real color images as when they were looking for tracking and purity performance, they did single out two monitors, the E-Machines C20 and the Viking 21, as being "flat," "weak," "washed-out," and "dull."

**IMAGE STABILITY**

A beautifully rendered color image may move you, but it shouldn't move itself. It's annoying and fatiguing to look at a screen when images are subject to flicker, ghosting, voltage shrinkage, and other instabilities. With flicker, the screen flickers rapidly like a cheap movie projector. The key measurement for flicker is the monitor's vertical refresh rate. According to a research study performed for IBM by Watson Laboratories, 50 percent of all people can detect flicker at a vertical refresh rate of 60 hertz, while fewer than 10 percent can see flicker at a rate in
### SEARCHING FOR THE RIGHT IMAGE

<table>
<thead>
<tr>
<th>Focus</th>
<th>Tracking</th>
<th>Gray-scale Image</th>
<th>Purity</th>
<th>Color Images</th>
<th>Flicker</th>
<th>Quality Total</th>
<th>Price-Dependent</th>
<th>Price-Independent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>1.3</td>
<td>3.6</td>
<td>1.9</td>
<td>3.4</td>
<td>1.9</td>
<td>1.4</td>
<td>2.3</td>
<td>3.0</td>
</tr>
<tr>
<td>CDX</td>
<td>3.1</td>
<td>2.3</td>
<td>4.1</td>
<td>3.0</td>
<td>3.9</td>
<td>1.3</td>
<td>3.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Megascree 2008</td>
<td>1.5</td>
<td>2.2</td>
<td>1.8</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>1948H</td>
<td>2.5</td>
<td>4.12</td>
<td>2.8</td>
<td>3.3</td>
<td>2.5</td>
<td>2.7</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>1948S</td>
<td>2.3</td>
<td>3.2</td>
<td>1.9</td>
<td>2.6</td>
<td>1.8</td>
<td>3.5</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>PCPC II</td>
<td>1.5</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>3.0</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Radius CDS</td>
<td>2.7</td>
<td>1.1</td>
<td>1.4</td>
<td>1.8</td>
<td>1.9</td>
<td>1.2</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>SuperMac</td>
<td>1.6</td>
<td>2.5</td>
<td>2.3</td>
<td>2.6</td>
<td>2.4</td>
<td>2.6</td>
<td>2.3</td>
<td>2.6</td>
</tr>
<tr>
<td>T19</td>
<td>1.5</td>
<td>2.0</td>
<td>2.0</td>
<td>1.6</td>
<td>1.8</td>
<td>1.2</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>TX</td>
<td>1.6</td>
<td>3.2</td>
<td>2.5</td>
<td>3.3</td>
<td>2.7</td>
<td>1.2</td>
<td>2.4</td>
<td>3.5</td>
</tr>
<tr>
<td>Viking 21</td>
<td>3.1</td>
<td>3.6</td>
<td>2.2</td>
<td>4.4</td>
<td>3.5</td>
<td>3.4</td>
<td>3.4</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Several sample images were used to test editors' subjective impressions of image quality. For each test, editors rated individual monitors on a scale of 1 to 5, with 1 representing the best and 5 the poorest image quality. Each number in the table is the average response in that category. (The T16 monitor is not included because it suffered from a shipping misadjustment.)

the range of 70 to 72 hertz.

The editors that were sensitive to flicker had strong adverse reactions to the monitors with lower vertical refresh rates. As a result, there was a wide disparity in the ratings between monitors with and without high refresh rates. Most editors who were susceptible to flicker eliminated monitors from consideration simply on this basis, even if they rated the monitor high in other areas. This was especially noticeable for the PCPC II, which received the highest overall rating on image quality if the flicker rating is not taken into consideration. Other monitors with poor flicker ratings included the Moniterm, both RasterOps units, and the SuperMac monitor, all of which have low vertical refresh rates. All the monitors from E-Machines had exceptionally stable images, as did the Apple, MegaScreen 2008, and Radius monitors.

Jitter, swim, and drift—if it sounds like a dance that’s because it is. If you’ve ever seen a computer screen where the entire image seemed to be rapidly shaking in one direction or another, you’ve been subjected to jitter. Jitter occurs when the beam changes position at 1/2-second intervals. The less-noticeable swim and drift occur when the beam moves at approximate 10-second and 1-minute intervals, respectively. We didn’t test for these problems, so when you shop for monitors sit in front of the screen for a while and see if it’s trying to dance.

In our tests, we found that most monitors exhibited acceptable levels of ghosting and voltage shrinkage. Ghosting occurs when a rapidly moving image leaves a momentary impression in a previous location. Voltage shrinkage occurs when the entire screen makes rapid swings between dark and light, so that the entire image momentarily contracts and expands. In practice, voltage shrinkage is nothing more than an annoyance, except with applications such as animation, where objects and backgrounds are constantly changing in real time. All the monitors had slightly detectable voltage shrinkage, but the only monitor with a

---

**Runners Up**

The Radius Color Display System (left) and PCPC II (right) were among the best color displays. The Radius monitor produced beautiful images but had a noticeable moiré and only average face. The PCPC II is the best bet for people who are not sensitive to flicker, because this monitor is comparatively inexpensive and scored the highest overall on image quality.
serious voltage shrinkage problem was the RasterOps 1948S.

Even if a screen image does not move, it may bend. When straight lines curve on screen, it is called pincushioning. Most monitors exhibit some minor pincushioning. Serious pincushioning makes it difficult to create accurate line drawings; it distorts the size and shape of objects on screen. This is especially troublesome in graphic design and CAD applications, which require accurate visual feedback.

We used a test pattern that displayed a grid of lines with circles superimposed in of the center and corners of the screen. All the monitors were fairly accurate and free from distortion.

**Recommendations**

It's impossible to make color monitor recommendations without talking about price. Most of these monitor and video board combinations cost between $5000 and $7000, making a color monitor one of the most expensive peripheral purchases you are likely to make.

At about $1650, the Apple 13-inch color monitor may be the only product most users will be able to consider. You can't see anything but small images on the Apple monitor, but the image quality is excellent. For a little more than twice as much, the E-Machines T16 provides a 60 percent larger image without demanding the desk space of the larger 19-inch monitors. The T16 is an appealing option for users who need increased screen area but just can't justify spending more on the display than they did on the Mac II CPU. If I wanted a color monitor larger than the Apple and I could live without a 19-inch monitor, I'd buy the T16.

The next set of monitors cost about $5000. Two Hitachi-based monitors, the RasterOps 1948H and the E-Machines C20, provide a full-blown 19-inch display and cost less than any of the Sony Trinitron–based systems of the same size. Of the two, I much prefer the 1948H, which was about $500 less than the C20 and did a better job of displaying color and gray-scale images. The C20 was flicker free and outperformed the 1948H in the objective tracking test, but this seemed irrelevant considering the monitor's poor focus. Neither monitor is particularly suitable for CAD or word processing applications. Personally, if I wanted a 19-inch color display I would spend the extra money for one of the top-quality Sony Trinitron–based monitors.

Another alternative in the $5000 range is the E-Machines TX. The TX provides a detail of a 19-inch monitor in only 16 inches. However, I wouldn't want to look at numbers or text on this monitor for long because of the highly condensed image size. The quality of the TX is very good, and it is an acceptable alternative for applications where maintaining actual size is not important.

The remaining monitors are priced between $5500 and $6200. At this price, quality should be the key guide. There's not much to say about the Viking 21. It had the worst image quality of the bunch, and we rated it lowest overall. The SuperMac and RasterOps 1948S are both good monitors, but unlike the very best monitors we examined, each is better suited for some applications than others. The SuperMac is better for CAD and business applications, whereas the RasterOps monitor is better for screen presentations, color illustrations, and scanned gray-scale images.

Of all the 19-inch monitors, four stood above the rest. They produced the most accurate color images and gave an excellent overall performance. The PCPC II had perhaps the best image quality of all, but editors sensitive to flicker simply rejected the PCPC II on the basis of this single criterion. Some editors were swept away by the Radius Color Display System and made it their first choice because of its superlative tracking and gray scale. On the other hand, this unit did not score well on focus, and its high dot density resulted in a shrunken image. It also had a disturbing moiré that occasionally reared its ugly head. The two best monitors were the E-Machines T19 and the MegaScreen 2008. Both monitors had rock solid images and gave top-flight performances in all of our tests. Both are reasonably priced considering their outstanding quality. If you've decided to give up the silver screen, these two color monitors are the brightest stars.

See Where to Buy for contact information.
YES! Please send my FREE copy of 101 Best Desktop Publishing Tips and begin a one-year subscription (12 issues) to Publish! at the low introductory rate of just $23.95 (that's 40% off the regular subscription rate).

Send no money now. We'll bill you later.

Publish! Publish! Publish!

Name ____________________________

Company ____________________________

Address ____________________________

City ___________________ State _______ Zip _________

Please allow 6–8 weeks for delivery of your first issue. By regular subscription, Publish! is $39.90 for 12 issues.

A PCW Communications, Inc. Publication
Good tables are hard to find. They're even harder to make. We're not talking about the four-legged variety here. It's the row-and-column tables comparing everything from soup to nuts that drive desktop publishers crazy.

Applications that shine at gathering and organizing information generally lack the sophisticated typography, graphics, and color features needed for polished tables. If you transfer data from a spreadsheet or a database to a word processing, page-layout, or graphics program, your neat rows and columns disintegrate into an unwieldy mess. Even if you adjust the ruler tabs to accommodate your columns, changing an entry or pasting in a new line can throw your table back into chaos.

It is possible to create effective tables on the Mac, however. You may have to use more than one application, but careful planning and care in formatting will result in tables with a professional look.

The secret to keeping your data ducks in a row as you move table information from one application to another is to understand and work with the transfer formats. Spreadsheets store information in cells that are arranged in horizontal rows and vertical columns. Databases arrange information in records subdivided into fields. Word processors and desktop publishing programs create columns using tabs and carriage returns.

All of these formats can be translated into a common language—ASCII, sometimes called text-only format. When saving a document in ASCII format, you are asked to define the delimiters (commas, quotation marks, or tab-and-return markers, for example) that will separate columns and fields from rows and records. While most applications—including many PC programs—can open ASCII files, keep in mind that font, size, and style attributes will be lost in the translation.

What follows are step-by-step strategies for creating three types of tables. Table Plan 1 will appeal to spreadsheet and/or database users. It shows you a relatively painless method for transferring information from Microsoft Excel and FileMaker II to PageMaker for final presentation. Table Plan 2 shows off Microsoft Word 4.0's ability to create tables within a text document—a one-application solution. And Table Plan 3 illustrates how a table created in Word 4.0 can take advantage of QuarkXPress' advanced typographical and color-separation abilities.
The first table plan illustrates how information gathered and organized in spreadsheet and database programs can be formatted and combined with other elements in a page-layout program for final presentation.

There are several advantages to using a spreadsheet like Excel to organize data for a table. You can enter and view information in a straightforward manner; you can insert, delete, and move columns or rows easily; and you have the ability to define complex calculations.

A database like FileMaker II, on the other hand, allows you to view and enter information using a variety of user-defined formats; it can even insert autogenerated serial numbers and the current time and date. Best of all, you can import, search, sort, and export selected information quickly and easily.

Finally, transferring table data into a desktop publishing program like PageMaker 3.0 enables you to refine the formatting, add graphics, and integrate the elements. This is preferable to importing a table created in another application as a PICT image, because with a desktop published table, you can make last-minute changes and maintain type and color control right up until print time.

### Table Plan 1 Step-by-Step

1. To begin, I defined several fields in FileMaker and entered data on nut sales for a fictional business, the Soup & Nut Company. Although FileMaker has powerful layout and formatting features, I bypassed them for a simple setup since all these niceties would disappear when I sent the information to another program. Formatting the font, style, color and dimensions in FileMaker slows the process; it’s best to apply formats after the table information has solidified (see Figure 1a).

2. At this point, I could have exported information directly to a page-layout program, but I decided to transfer selected product and packaging information from the database to Excel so that I could combine the data with information from an existing spreadsheet and calculate totals.

   I chose FileMaker’s Output To command under the File menu, named the file, and clicked New. In the subsequent dialog box, I moved fields from the Field List to the Output Order list in the order I wanted to export them. I chose to export the file as Text, with tabs dividing the fields and hard returns dividing records, and I clicked the Formatted button to ensure that the number and date formats would mirror those in the database (see Figure 1b).

3. In Excel, I opened the transferred file and found the data already organized into rows and columns. I then pasted in quarterly sales figures from another Excel file and calculated total unit sales for each product. After moving the Total Cases column, I totaled the annual sales in a new cell using Sum from the Paste Function in the Formula menu.

4. Next, I prepared to transfer the table to PageMaker using Excel’s SaveAs command in the File menu. Because I exported using Text format, fields were still divided by tabs with records divided by carriage returns (see Figure 1c).

   **Additional Tip**

   In files transferred from Excel formulas appear in quotes. To delete these or to remove hidden tab stops or extra blank rows, you may want to transfer the file to a word processing program that lets you...
see invisible paragraph markings. Delete the unnecessary items using the Find and Change option.

5. In PageMaker, I created a template for the table in order to speed up production and to maintain a consistent design style for subsequent tables. This template defined elements such as borders, screen tints, and reverse bars and rules. (I look forward to being able to create a template in Adobe Illustrator and import it as an encapsulated PostScript [EPS] file, complete with CMYK [cyan, magenta, yellow, and black] color information for separations using PageMaker's soon-to-be-released Color Extensions.) I then stored the template on the pasteboard outside the page area so that I could copy and paste the template into position as needed (see Figure 1d).

6. In PageMaker, I chose the Place command from the File menu and selected the file prepared in Step 4. The information looked disorganized because no tabs had been set for column separation. Also, the text defaulted to the font and size last set in PageMaker.

Using the Define Styles command under the Text menu, I was able to name individual styles for various elements in the table—Head, BodyTxt, Total, and so forth—and assign them Type, Paragraph, Tab, and Color attributes. I then applied the styles to the appropriate table elements (see Figure 1e).

7. To adjust the columns of type, I selected all the text and used PageMaker's Indents/Tabs function under the Type menu. I positioned the tab ruler at the start of the first column of type, cleared all existing tab stops, and added new ones. Right, left, centered, and decimal tabs can be set for the alignment of each column. I spaced the tabs roughly where the column breaks were most likely to fall and clicked OK to see how the columns were lining up (see Figure 1f).

8. After dragging the table template from the pasteboard onto the active page, I adjusted the leading between rows of type for a proper fit using the Type specifications dialog box. You can define leading in the style sheet or between selected rows. This is helpful when adding graphic elements, such as rulers or bars, for definition (See Figure 1g).

Additional Tip
Because both PageMaker and Word apply styles to all text between two hard returns, whenever you tag a table row with a style, all the type in it changes. To assign a style to a column or cell you must apply changes individually, attribute by attribute.

9. To make final adjustments to the columns, I used the tab rulers and put in a decimal tab setting to align dollar amounts flush right.

10. Finally, for better definition between rows and columns, I added the remaining graphic elements—rules, bars, and screens. You can adjust the depth of the template by dragging template elements to the proper position (see Table 1).
TABLE PLAN #2

Microsoft Word 4.0 offers special table-creation tools that enable you to create and display tables from within one program. You can organize information in columns, rows, and cells—just as in a spreadsheet—but you maintain advanced formatting controls over type. You can even wrap text automatically within a cell, and the entire row adjusts to the new cell depth. You also have access to search and replace functions, and you can check spelling and use style sheets. Word 4.0 includes a new hotlink feature that lets you access information in other programs such as Excel, MacPaint, and MacDraw. Word 4.0 ships with a special version of SuperPaint 1.1 and lets you quickly update graphics originally created in SuperPaint.

While Word 4.0 can sort data alphabetically and numerically, and it does have limited calculation controls, you should not expect Word 4.0 to perform the file-management tasks best left to databases and spreadsheets. Also, Word 4.0’s formatting features may not be sophisticated enough for all publishing needs. Compared with desktop publishing programs, Word 4.0 offers limited tools for adjusting line weights, screens, reverses, color, and graphics.

**LITTLE-KNOWN FACTS ABOUT NUTS**

<table>
<thead>
<tr>
<th>NUT</th>
<th>DESCRIPTION</th>
<th>PREPARED BY THE SOUP &amp; NUT COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds</td>
<td>Grown in California. Large trees are</td>
<td></td>
</tr>
<tr>
<td></td>
<td>related to the peach and produce a fruit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(apricot) that surrounds the nut inside.</td>
<td></td>
</tr>
<tr>
<td>Brazil Nuts</td>
<td>Native to the Amazon jungles of Brazil.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large trees up to 125 feet tall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>produce a hard-shelled woody fruit</td>
<td></td>
</tr>
<tr>
<td>Cashews</td>
<td>Native to Central America. Small trees</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and bushes that produce a &quot;cracker&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;snack&quot; with the outside skin</td>
<td></td>
</tr>
<tr>
<td>Chopped Walnuts</td>
<td>Chopped fine, ready for baking. The</td>
<td></td>
</tr>
<tr>
<td></td>
<td>English walnut is harvested in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>California and Oregon for its valuable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>nut. The nut is hard-shelled and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deeply ground.</td>
<td></td>
</tr>
<tr>
<td>Hecialnica</td>
<td>Native to America and Europe. Also</td>
<td></td>
</tr>
<tr>
<td></td>
<td>called filberts, nuts are</td>
<td></td>
</tr>
<tr>
<td></td>
<td>shaped like small trees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A horn surrounds the nut during</td>
<td></td>
</tr>
<tr>
<td></td>
<td>growing, but is lost after the first</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fruit is released from the nut in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dashing.</td>
<td></td>
</tr>
<tr>
<td>Honey RoastedCashews</td>
<td>Premium cashews toasted in a light</td>
<td></td>
</tr>
<tr>
<td></td>
<td>honey glaze.</td>
<td></td>
</tr>
<tr>
<td>Macadamia Nut</td>
<td>The Macadamia tree is native to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Australia, but has been</td>
<td></td>
</tr>
<tr>
<td></td>
<td>commercially cultivated in Hawaii.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A large, smooth, seed, rich in oil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>with a sweet flavor.</td>
<td></td>
</tr>
<tr>
<td>Pecan Nuts</td>
<td>Native to Mediterranean region, every</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tree is either male or female</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and requires the opposite sex needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for pollination. Nuts grow in light</td>
<td></td>
</tr>
<tr>
<td></td>
<td>clusters. Seeds are smooth and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>round and tend to open at the end.</td>
<td></td>
</tr>
<tr>
<td>Smoked Almonds</td>
<td>Premium whole almonds with</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hickory-smoked flavor.</td>
<td></td>
</tr>
<tr>
<td>Spanish Peanuts</td>
<td>The peanut is native to the Americas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and is harvested chiefly in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>southern states. Peanuts grow below</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ground at the root end of small</td>
<td></td>
</tr>
<tr>
<td></td>
<td>peanut plants and produce more</td>
<td></td>
</tr>
<tr>
<td></td>
<td>peanuts than any other crop.</td>
<td></td>
</tr>
</tbody>
</table>

When table Plan 1, changes affected all the text between hard carriage returns—usually everything in a single row. With Word 4.0,
I could apply styles to single cells or to sets of cells without affecting adjoining cells.

I could have controlled border treatments and position placement by style sheets, but instead I used the Cells command under the Utilities menu to adjust the look of my table. The Cells dialog box is similar to the Insert Table box, and its options let you reset column width, the space between rows, and row height and alignment. The Borders button brings up its own dialog box with Word 4.0's limited line and placement choices (see Figure 2f).

7. To refine the columns that describe the nut processing methods, I used the Change command under the Utilities menu to delete the word No. Next, I typed Yes in the Find What box and the number 3 (the Zapf Dingbat keyboard equivalent for a check mark) in the Change To box. I then applied a style for Zapf Dingbats to these cells.

8. I would have liked to make slanting column heads in order to fit in a full word processing method. But Word 4.0 cannot rotate type to an angle, so I created a two-letter code for each one. Then I wanted to add a legend explaining the codes, so I inserted an extra row at the top of the table and merged the cells into a single cell using the Table command under the Edit menu (see Figure 2g).

9. After typing the legends, I cut and pasted the merged row at the base of the table. I created another merged row at the top and typed in the title information.

10. To replace the packaging information in the second column with small icons representing cans, bags, and jars, I again used the Change command. The icons had already been created in SuperPaint and saved in the Scrapbook. I copied the icons one at a time to the Clipboard and used the Change All command to replace the text in the table with its graphic equivalent by using Alt to signify the Clipboard image (see Figure 2h).

Additional Tip
Images created in SuperPaint can be quickly updated using Word 4.0's Edit Link command.

11. Finally, after tweaking the column spacing for width and the leading for depth, I turned the paragraph marks and table grid lines off to see how the table would look when printed (see Table 2).
TABLE PLAN #3

There are several reasons why you might choose to organize the information for a table using Word 4.0. Word processors are familiar to most Mac users, and many tables don't need the sophisticated sorting and calculating tools found in databases and spreadsheets. Inputting and revising data are quite simple with Word 4.0, and style formatting information stays intact when you transfer a file to a desktop publishing package for final formatting.

Because Word's design and graphics tools are too limited for producing some tables, it makes sense to combine Word 4.0 with a professional desktop publishing program like QuarkXPress. For this table I chose XPress because it includes text-organization tools that enable you to show paragraph markings and to search and replace text attributes. Also, XPress offers professional control over type and color, and you can send the page geometry directly to large prepress systems such as Scitex.

**BEST RATED SOUPS**

It was a good year for exotic soups at the Soup & Nut Company. When our consumers asked, "what's in that soup anyway?" Below is a list of main ingredients with a rating consumers gave our value in a recent survey. To the right is an alphabetical breakdown of popular ratings.

<table>
<thead>
<tr>
<th>SOUP</th>
<th>MAIN INGREDIENTS/RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alsatian Soup</td>
<td>Alsatian wine &amp; dry white wine</td>
</tr>
<tr>
<td>Atlantic Soup</td>
<td>Atlantic salmon &amp; mussels</td>
</tr>
<tr>
<td>Bolognese Soup</td>
<td>Bolognese sauce &amp; tomato paste</td>
</tr>
<tr>
<td>Carbonara Soup</td>
<td>Carbonara sauce &amp; cheese</td>
</tr>
<tr>
<td>Cappuccino Soup</td>
<td>Cappuccino espresso &amp; milk</td>
</tr>
<tr>
<td>Chianti Soup</td>
<td>Chianti wine &amp; black olives</td>
</tr>
<tr>
<td>Chicken Soup</td>
<td>Chicken broth &amp; carrots</td>
</tr>
<tr>
<td>Chinese Soup</td>
<td>Chinese ginger &amp; soy sauce</td>
</tr>
<tr>
<td>Corned Beef Soup</td>
<td>Corned beef &amp; mustard</td>
</tr>
<tr>
<td>Cream of Chicken Soup</td>
<td>Cream of chicken &amp; cream</td>
</tr>
<tr>
<td>Cream of Mushroom Soup</td>
<td>Cream of mushroom &amp; cream</td>
</tr>
<tr>
<td>Cream of Tomato Soup</td>
<td>Cream of tomato &amp; cream</td>
</tr>
<tr>
<td>Cream of Vegetable Soup</td>
<td>Cream of vegetable &amp; cream</td>
</tr>
<tr>
<td>Creamy mushroom Soup</td>
<td>Creamy mushroom &amp; cream</td>
</tr>
<tr>
<td>Creamy Vegetable Soup</td>
<td>Creamy vegetable &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
<tr>
<td>Creme Brulee Soup</td>
<td>Creme Brulee &amp; cream</td>
</tr>
</tbody>
</table>

1. After using Word 4.0 to organize my information, I carefully edited the table and created style sheets for the rows and columns. I waited to format graphic elements such as borders, position, or dingbats, however, until I transferred the table to XPress (see Figure 3a).

2. Next, I selected the entire table and opened Table to Text, from the Document menu. I chose the Tab Delimited option to create a file with tabs separating column elements and carriage returns dividing rows (see Figure 3b).

3. Because Word 4.0's special formatting is lost when transferred to QuarkXPress, I saved the file in Word 3.0 format. Note that individual cell and column formatting is lost, and lines no longer wrap (see Figure 3c).

4. Because XPress has no pasteboard, I had to be sure to give myself elbow room by creating extra workspace for the table. The working area shown in Figure 3d measured 16 by 16 inches. If a table incorporates a large graphic, it is important to size the graphic before you insert it into the table. I created a parent text box inside the workspace, located the text file from Word 4.0, and used Place to import the file into the text box. Choosing Show Invisibles let me see where paragraph marks would fall, and I stretched the text frame width until rows of text no longer wrapped.

5. When you create a style sheet in XPress, you can apply many typographical effects such as kerning, horizontal scaling, and CMYK color separations. I used XPress' Find/Change feature to change the word Yes in Franklin Gothic font to a check mark—the number 3 key in Zapf Dingbats (see Figure 3e). To assign color, you need to select and change check marks individually.

6. In XPress, setting tabs for the columns requires that you distinguish between columns that will wrap and those that won't. Text that will wrap must be cut and pasted into a columnar format, so you must first determine rough tab settings for the various columns. In this case, the first two columns will be wider and they will contain text that wraps, so I set tabs for
these columns that allowed text to temporarily extend into subsequent columns.

I then formatted final tabs for the narrowest columns—those, like the Yes and No columns, that wouldn’t need to wrap (see Figure 3f).

**Additional Tip**

Both PageMaker and XPress have a limit of 20 tab stops, which allows for 21 columns. Larger tables with more columns need to be built in two parts. To do this, make two copies of the file in Excel or Word 4.0, delete the second half from one and the first half from the other. If you’re working in Excel, save the document as text first so that text entered as numbers won’t recalculate when you delete columns.

7. Lines of text that wrap prove to be the most difficult problem in formatting a table like this one. Because each wrap requires a new row, I added extra hard returns below each row that would contain wrapped text when I set columns to a narrower measure (see Figure 3g).

Starting with the longest line of text in a row, I highlighted and cut the portion of text that extended beyond the point where I wanted the column to end. I was careful not to cut the tab stops at the end of the line (see Figure 3h).

In the next row created by one of the hard returns, I tabbed over to the appropriate column and pasted the cut segment. If the second line of text was still too long, I repeated the process on subsequent lines until all the text appeared in the column (see Figure 3i).

8. I then readjusted the Tab settings and edited the text as needed to fit. I applied style sheets for text in individual cells. As in Table 1, text that required a format unlike the row style had to be selected individually and changed attribute by attribute (see Figure 3j).

If you need to make major content revisions that will dramatically change rows
TABLE EDITORS TO THE RESCUE

Tables can be troublesome to create, but the authority and visual impact they add to a document or presentation make the effort worth it. Two products that promise to take some of the drudgery out of table making—TableTools from Mansfield Systems and Tycho from Macreations—should be on the shelves by the time you read this.

TableTools offers an environment optimized for the creation of comparison and catalog tables. The program’s most unique feature is its From Within Shuttle. While under either MultiFinder or the Finder, you can shuttle back and forth between TableTools and MacDraw, Adobe Illustrator, MacPaint, FullPaint, or CricketGraph; and you can edit data or graphics created in those applications. Linked to Excel, TableTools can compute numerical data in its own documents, preserving all Excel formulas and number formatting.

Like a page in a document, each cell can contain wrapping text, paragraphs, and graphics. You can position elements anywhere in a cell, and there are tab and leading tools to facilitate text formatting. Because discontinuous text selection is possible, font, size, and styles can be changed in multiple locations at once. You can dress up your tables with a variety of patterns. Tables can be as large as 128 columns by 512 rows, and there are 254 text style sheets and 254 style sheets for each of the table dimensions—rows, columns, and cells. Finally, you can print your new table as is, or you can incorporate it into a page-layout document. TableTools will sell for $395.

Tycho is also designed to facilitate the creation of desktop published tables. Besides offering excellent control over borders, grids, and shading, Tycho lets you create tables of any size; and it includes full 256-color support, complete with the ability to load and save palettes from other programs. It’s easy to create angled column headings, and footnotes appear automatically at the end of the table. In addition, you have access to 256 built-in dingbats. The Settings option lets you define type styles globally or for any individual type element within a cell, and you can load and save table styles.

Table information can be imported from any SYLK or comma-delimited text file, and MacPaint and PICT images can be embedded as graphics. Like Excel, Tycho lets you insert and delete columns and rows and provides Fill Down and Fill Right features. A Swap option lets you switch two adjacent table elements. While the program does not have hot links to other applications, you can export table information to other programs for editing, using SYLK, tabbed text, or comma-delimited formats. You can also save a table as a MacPaint, PICT, or proprietary Tycho file. To allow anyone to look at Tycho files, Tycho Table Viewer will be distributed free as public domain software. Tycho will retail for $99.95.

and columns at this stage, it is easier to transfer the text back to Word 4.0 and edit it as a table. To do so, highlight the text in XPress and use Save Text in the File menu to save it in Microsoft Word 3.0 format. Open the file in Word, highlight the text, choose Insert Table from the Document menu and convert to tab-delimited format. After editing, transfer the file back to XPress as outlined in steps 2 and 3.

9. Finally, after placing the graphic elements in position, I applied XPress’ CMYK color percentages to the text and combined it with four-color graphics created in Illustrator 88 and FreeHand (see Table 3). Since XPress doesn’t rotate type, I had to rotate some table headings in Illustrator 88 and import them. All graphic treatments, such as the rules, the large soup can in the background, and the small can icons were handled with XPress tools, FreeHand, or Illustrator 88 files. The finished table was separated with the rest of the page direct to four-color film on a Linotronic typesetter.

See Where to Buy for contact information.

Steve McKinstry, who lives in Anacortes, Washington, with an office in San Francisco, is a consultant and designer specializing in converting publications to desktop. His award-winning illustrations have appeared in Communications Arts, Print, and Society of Newspaper Design Annuals. He also created, as cover art for U.S. News and World Report, the first artwork produced entirely on the Mac for a national news magazine.
With the demands of today's software, you need memory products that exceed your existing system memory and enhance the sophisticated features of your Macintosh®.

That's why we developed our Xceed™ Memory Expansion Kits — to provide maximum speed and performance for memory-hungry operating systems, power spread sheets and graphics programs, and to add flexibility when running software programs such as MultiFinder™.

Xceed Memory Kits provide an additional 1 to 8 megabytes of RAM for your Macintosh Plus, SE, SE/30, II, IIX or IIcx. They feature fast, low power CMOS* SIMM modules populated with superior quality DRAMs. Plus they're backed by our comprehensive service and warranty program.

So contact us today at 1-800-642-7661 for the name of your nearest Micron dealer. And start Xceeding your memory limits.

Micron. Working to improve your memory.

OEM standard and custom inquiries welcome.

*256K SIMM modules are NMOS technology.

Xceed is a trademark of Micron Technology, Inc. Macintosh is a registered trademark, and MultiFinder is a trademark of Apple Computer, Inc.
For heavy users of the English language.

Anyone can create side-by-side paragraphs without having to worry about tabs. And we'll always find the right word—the thesaurus boasts 220,000 of them.

Chapter 4

Documents 10,000 pages and longer won't intimidate Word. And Word Count gives authors an exact count of characters, words, lines and paragraphs.

Our formula type-setting feature can handle symbols and notations so you technical writers won't have to rely on a typesetter.

Absolute positioning of graphics and text is the absolute best if you're involved with page layout. The text wraps around any object as you type.
The expression that you can't please all of the people all of the time just got redefined.

In developing Microsoft® Word version 4.0, we took input from the over 400,000 Word users who made Word the best-selling Macintosh® product in history. Added startling, cutting-edge technology. And the result is a gracious, easy-to-use word processing program with features as dynamic and diverse as its users.

Unleash those features, and you push the envelope of word processing. You can set up tables automatically, without worrying about tabs. Reformat an entire document with one command. And choose from four editing views—including one that shows you exactly what your document looks like, so you can organize and revise your documents without any guesswork.

What's more, Word is completely customizable—any command can be placed on any menu or assigned any keyboard command. And, software fans, the best-selling word processing program for the Macintosh now comes with the best-selling paint and draw program for the Macintosh—SuperPaint by Silicon Beach Software™.

And keep in mind Microsoft Word is part of an entire line of Microsoft products that work seamlessly together, so you can do more with your Macintosh.

Microsoft Word 4.0 can emphasize, articulate, clarify and organize your words. In fact, practically the only thing it can't do is think for you. Yet.

Microsoft
Making it all make sense.
Don’t let the modest 2.0 appended to its name fool you: SuperPaint has been substantially revitalized. Silicon Beach wasn’t content to merely give the oldster a facelift, but added enough muscle to keep SuperPaint a major player in the Mac graphics game.

If you have never worked with SuperPaint, a basic description is in order. Before SuperPaint came on the scene, Mac drawing programs were divided into two camps: bitmapped graphics (like MacPaint) and object-oriented graphics (like MacDraw). SuperPaint offers the best of both worlds: bitmapped drawing tools in one layer and object-oriented tools in another. The two transparent layers overlap, allowing you to work in the paint layer while viewing the drawing layer or vice versa. You switch from one layer to another by clicking on an icon, and you can easily transport elements of a drawing from one layer to another.

The new version offers the same setup, with yet another illustration technique added to the draw layer: bezier curves like those found in FreeHand or Illustrator 88. With SuperPaint’s new Freehand Bezier tool, you draw a line or shape as you would with the standard pencil tool. The result isn’t a static line, however, but a path made up of control points and handles that enable you to fine-tune your drawing. SuperPaint 2.0 features two types of control points, hinge points for corners and smooth points for curves. As in PostScript drawing programs, you can add or delete points, drag a point or its handles to reshape a path, or snap a path into separate segments.

Your Trace or Mine?
Transforming your shaky freehand lines into smooth bezier curves is great, but SuperPaint 2.0 doesn’t stop there. Feed the program a bitmapped image and it will redraw the image for you. The new AutoTrace command converts a bitmapped graphic in the paint layer into paths made up of polygons or bezier curves that appear in the draw layer. These paths can be edited just like beziers or polygons you draw from scratch. AutoTrace does a fine job of tracing shapes and lets you adjust tracing precision, but I found SuperPaint’s autotrazed shapes harder to edit than those autotrazed in FreeHand.

While AutoTrace is the most spectacular of SuperPaint’s new features, several less glamorous but more practical features will be appreciated by many artists. My biggest disappointment with the original version was its inability to mix type styles in a block of text. The new version rectifies this flaw, allowing you to mix fonts, sizes, and styles at will. You can also rotate and scale text in the draw layer, options lacking in the earlier version.

Another of my favorite 2.0 enhancements is the ability to draw in landscape mode, a horizontal rather than a vertical layout. Now you can create an illustration in landscape mode, rather than going through the cumbersome process of rotating an image and printing it in the landscape orientation.

Other improvements include a grabber tool to move an image around the screen, a Multigon tool to create various regular polygons, separate controls for vertical and horizontal scaling, a hairline line width, and a blended fill option. (Oddly enough, the blended fill can be applied from top to bottom, diagonally, and radially, but not horizontally. And while I’m picking nits, a hairline is a nice addition, but I’d like to see adjustable line widths, rather than just the program’s default widths.) While the original SuperPaint offered only a one-size, one-density spray can, the new version features an adjustable airbrush, de rigueur in any modern paint program. And those who use SuperPaint for diagrams, flowcharts, and technical drawings will appreciate the addition of editable arrowheads and dashed lines.

The current version also adds two new paint modes, which affect the way the white and black portions of a drawing interact. Like the original release, SuperPaint 2.0 features Paint on Black, in which the current paint pattern appears only on black portions of an existing
The figure with a fan was created in the paint layer and then copied to the draw layer where it was colored with object fills. The other elements are draw objects. While SuperPaint supports only the eight original QuickDraw colors (those available on an ImageWriter II), achieving a far wider range of colors is possible by choosing patterns and by assigning different foreground and background colors to those patterns.

The new Invert mode reverses the white and black portions of a drawing against a black background, while the Transparent mode lets the background show through white areas.

Version 2.0 offers not only new tools and painting modes, but new options for selecting an area of a drawing. In addition to the standard selection rectangle and lasso, SuperPaint 2.0 provides an oval-shaped selection tool, a polygon selection tool, a freehand selection tool, and a freeform selection tool that includes the surrounding background rather than shrinking around a selection the way the lasso does. (I found little use for the oval selector, but I suppose a little variety doesn't hurt.)

Plug In, Click On, Try Out

SuperPaint 2.0 presents an innovation called plug-in modules, custom tools or commands that you can add to the program. The program comes with 22 plug-in tools; Silicon Beach is soliciting additional tools from the Mac programming community (see "Plug 'Em In"). Although you have to be a programmer to create custom tools or commands, anyone with the brains of a sea slug can install custom tools simply by dragging them into a folder. The tools that come with the program range from the whimsical (a cloud that spatters raindrops, a swirling cyclone that scatters pixels) to the indispensable (an adjustable airbrush, a calligraphy pen, a water droplet for blurring edges).

SuperPaint 2.0 ventures into the world of color, but not very far. You can assign colors from a palette of 8 hues, either the standard System colors or a set of ImageWriter II colors. You can preview your colors if you have a color Mac II, but you don’t need to have a color monitor to assign colors. Colors can be assigned to multiple objects in the draw layer, and the 8 basic colors can be combined as foreground and background colors for additional hues. An illustration in the paint layer, on the other hand, can only be “colorized” with a single color that affects all black pixels. SuperPaint’s color is a plus, but it’s disappointing if you’re used to the 256 colors available in a color paint program.

SuperPaint’s multitude of new features do not slow its performance. The tools perform smoothly and quickly; and I didn’t run into any of the bugs or glitches one often finds in new releases. My drawings printed without a hitch; paint and draw objects that lined up onscreen lined up on the printed page as well.

Painting the Blues

SuperPaint 2.0 is better than its predecessor, but it’s also bigger. While version 1.0 took up only 160K, the new version occupies 500K. This added bulk is no big deal in the Age of Hard Disks, but perhaps a few tools could have been trimmed away; for example, I see no need for keeping the original spray can around with the spilly new airbrush on hand.

And although most of the new features are essential enhancements, the addition of so many new tools and commands undermines a major component of the original SuperPaint’s appeal: the fact that its lean, clean interface made the program extremely easy to learn. The current version has a 400-page manual that, although competently written, is somewhat daunting by virtue of its bulk.

On the whole, however, the program is still a shining example of a good user interface.

If you’re familiar with the earlier version, you may be momentarily discommoded when you find that a few familiar keystroke shortcuts are different in version 2.0. For example, I was dismayed to press the familiar Shift-E, which used to transfer a selection from one layer to the other, to find myself zooming in on the drawing in the new version. I also missed a few other keyboard shortcuts I’d grown accustomed to using—the Nudge commands, which move a selection up, down, or sideways in 1-pixel increments, are now inconveniently located in a submenu, as are the shortcuts for assigning text styles.

Complaints aside, however, I think Silicon Beach has done a wonderful job of souping up SuperPaint. It’s always been my favorite general-purpose graphics program, and continues to have a place in my heart and on my hard disk. I like the program’s seamless integration of bitmap and object-oriented drawing tools and its friendly interface. Granted, it doesn’t fill all my graphics needs—I still use PixelPaint or Studio/8 for color paint work and FreeHand for PostScript graphics—but for plain old drawing and painting, you can’t beat SuperPaint.

-Erbert Fenton

See Where to Buy or circle 795 on reader service card.
AGFA COMPUGRAPHIC
P3400PS

400-dpi PostScript Printer

Pros: Fast and compact; includes 73 Adobe fonts; excellent print quality and paper-handling features.

Cons: Expensive; blacks could be darker.

Company: Agfa Compugraphic Division.

Requires: Mac 512K; LocalTalk.

List price: $12,500.

There are laser printers, and there are laser printers. The former category includes LaserWriters and their competitors—office workhorses that print at 300 dots per inch. The latter category includes a handful of printers that cost over $10,000, but print at between 400 and 600 dpi—shy of typeset quality, but close enough for many newspapers, in-house publishing departments, and service bureaus.

The Agfa Compugraphic P3400PS is in this second group. The P3400PS is the successor to Agfa's CG-400-PS, which was the first mass-produced laser printer to offer more than 300 dpi. The P3400PS provides the same 400-dpi resolution as its predecessor, but it does so in a smaller package that costs $17,495 less.

The P3400PS' primary competitor is Varityper's VT600, which costs $4500 more but offers 600-dpi resolution. You might think its superior resolution makes the VT600 the better buy. It ain't necessarily so. The P3400PS has a number of other assets that make it preferable for certain applications.

It's Big, but Beautiful

Weighing 208 pounds, the P3400PS travels by freight and arrives strapped to a wooden palette. Once the machine is unshackled, however, setup is simple. Remove the obligatory packing spacers and install the imaging unit, which contains the printer's drum and its developer and toner powders. (Tip: Tighten the screw on the toner compartment completely. This reviewer didn't, causing the imaging unit to jam upon installation, which required an embarrassing service call.)

The P3400PS is built by Agfa, but its engine is from the mind of Minolta. The P3400PS' Minolta SP-100 engine prints at 400 dpi and handles paper sizes up to 8 1/2 by 11 inches. It has a rating of 12 pages per minute with a duty cycle of 10,000 pages per month. The Varityper VT600 is also rated at a speed of 12 pages per minute, but it has a duty cycle of only 3000 pages per month.

Controlling the P3400PS' brain is the Adobe Atlas Controller, which contains a 68020 microprocessor, 4MB of RAM, and a 20MB hard disk. The hard disk contains 73 Adobe fonts, including the 35 fonts present in most PostScript printers as well as such eminently usable faces as Korinna, Souvenir, Helvetica Light, Helvetica Black, Garamond, Optima, Lubalin Graph, and Lucida, to name a few.

Like the VT600, the P3400PS provides RS-232C serial, Centronics parallel, and LocalTalk connection ports. But unlike the VT600, the P3400PS provides emulation modes that allow the printer to imitate the venerable Diablo 630 and Hewlett-Packard's LaserJet Plus.

The P3400PS' paper-handling skill is another of its strengths. The VT600's single paper tray holds 200 sheets. The P3400PS boasts two trays, each holding 250 sheets. You can mix and match paper types and sizes, putting letterhead in one tray and second sheets in another, or legal-size sheets in one and letter-size sheets in the second. Better still, you can configure the printer to treat both trays as one 500-sheet tray: when the first tray is empty, it automatically switches to the second.

A Sharp Performer

If you think 400-dpi output is only marginally better than 300 dpi, think again. A 300-dpi printer produces 90,000 dots per square inch; the P3400PS lays down 160,000 dots per square inch. The difference is significant: italic type suffers less from the jaggies than with 300 dpi, and the subtle curves of typefaces such as Optima are rendered more accurately. And the extra resolution allows the P3400PS to produce halftones with more lines per inch. Thus, gray-scale scanned images print better.

Even so, the P3400PS' output doesn't compare to the 600 dots-per-inch output of a VT600. The VT600 prints 360,000 dots per square inch, making its output more than twice as sharp. The VT600 also produces richer, more dense black areas.

Under the loupe, the VT600's print quality beats the P3400PS, but on the test track, the opposite occurs. Because the VT600 must manipulate more memory to create its images, its print speed is slightly slower than that of the P3400PS, even though their controllers are very nearly identical.

But minor performance differences shouldn't influence your decision when it comes to purchasing a five-figure printer. Print quality, paper handling, built-in fonts, and price are more important issues. Varityper's VT600 produces sharper copy than the P3400PS does, but it loses in every other category. Therefore, the P3400PS isn't as good a typesetter as the VT600, but it's a better office printer. It straddles the fence between office workhorse and typesetter; it performs the former job superbly, and the latter reasonably well.

The bottom line: If you need the sharpest possible laser copy and you can afford to spend $17,000 to get it, buy the Varityper, but note that you'll need to spend more to equip it with the same fonts that are included in the P3400PS. But if 400-dpi output meets your needs, you should buy the Agfa Compugraphic P3400PS. The $4500 you'll save will pay for quite a bit of Linotronic output for those times when 400 dpi isn't enough.—Jim Heid

See Where to Buy or circle 755 on reader service card.
The new SUITCASE II is really packed. Now you can have up to 99 suitcase files full of fonts and DAs, or files containing FKEYs and alert sounds, that you can access at any time—and you don’t have to install them in your System file. Plus you can see in the menu what a font will look like before you use it. By merging PostScript fonts into one family, SUITCASE II unclutters your font menus. And by compressing fonts and sounds, SUITCASE II saves you precious space on your hard disk. So, whether you’re a new Mac user or a dyed-in-the-wool Mac enthusiast, you need SUITCASE II.

MacUser said, “If you can only buy one program for your Mac...buy SUITCASE,” and gave us five mice, their highest rating. And they awarded us BEST NEW UTILITY PROGRAM. Since then, we’ve picked up the MacWorld WORLD CLASS AWARD and a MacGuide GOLDEN GAVEL, even before SUITCASE II was released.

When it comes to performance, praises and prizes, it looks like SUITCASE II has it in the bag.

End users circle 250 on reader service card
Dealers circle 364 on reader service card
THE ART IMPORTER 1.0
Font Creator

Pros: Easy to use; imports from all major draw programs; allows inclusion of PostScript and PICT in programs that don’t support those formats.

Cons: Can’t set up kerner pairs; generates poor screen fonts.

Company: Altsys Corporation.

Requires: Mac Plus; PostScript printer; Font/DA Mover 3.8. List price: $59.95.

With PostScript, the distinction between type and graphics is a fine one. The first real curve-capable drawing program for the Mac, for instance, was Fontographer—Altsys’ typeface-building program. Now its latest program, The Art Importer, has blurred that distinction even more. The Art Importer lets you turn up to 16 PICT or EPS graphics into a PostScript font (see “Made to Order”). You can create the graphics with your favorite drawing programs—Illustrator, FreeHand, Canvas, MacDraw, SuperPaint—then paste or import them into The Art Importer. When you use these special characters, they flow with your text and can be resized just like standard characters.

When you finish designing your character set, The Art Importer creates a PostScript font and accompanying screen fonts in your choice of sizes. Install the screen fonts, put the downloadable PostScript font in the System Folder, and you can use those graphics in any program with a font menu—even if it doesn’t support PostScript or PICT directly. Just select the font and hit the right key.

Bear in mind, though, that you cannot include any bitmaps—bilevel or gray scale—in an Art Importer PostScript font. PostScript doesn’t allow for it, so The Art Importer doesn’t either.

The Art Importer can, however, import color EPS images from FreeHand (including patterns and gradations) and color graphics from Illustrator, but the screen fonts aren’t in color. You can then use these imported graphics as special fonts within a block of text, and FreeHand can separate them properly and print them on color PostScript printers. PICT images can also be imported into The Art Importer, but only the patterns will come in, not the colors.

Fonts within Fonts
You can even include characters from downloadable PostScript fonts within the fonts you create with The Art Importer; for instance, you can place a label or some text within a graphic for a special effect. But you’ll have to download those embedded fonts in advance or precede the Art Importer character with a single character (even a space) formatted in the embedded font so that the application you’re using will download it automatically. You can use nested EPS graphics (EPS within EPS graphics—tricky to begin with) within Art Importer fonts, but this makes printing very slow and sometimes impossible.

The Art Importer prints sample sheets of a typeface with either a key map or a string of characters. The key map is a handy reminder of which graphics go with which characters, but if you don’t have one you can use Apple’s Key Caps DA. The Art Importer’s screen fonts are hard to read, so it’s often hard to tell what graphic they represent. You might well want to buy FontSizer from U.S. MicroLabs, which uses the brains of a PostScript printer to build higher-quality screen fonts.

The Art Importer lets you edit its screen fonts in FatBits mode so they’re more recognizable. You can adjust the position of the character within its character matrix so you can have it descend below the baseline or sit off the line, as with a superscript (see “Fine Tuning”). You can also adjust the width for each character—even reducing it to zero so the following character lies on top of it—but you can’t create kerning pairs or adjust ascender or descender limits. Plan on spending some time adjusting character spacing and positioning to make your graphic characters look right within a line of text, and consider buying a kerning pair editor as well.

Because you can’t modify Art Importer fonts while they’re installed, a resource manager such as Suitcase or MasterJuggler is a virtual necessity. You’ll need to test your Art Importer fonts with your software, then go back to tweak character spacing and positioning, then test again. By using a resource manager you can install and reinstall your fonts on the fly without resorting to Font/DA Mover.

Art Importer fonts are numbered using Apple’s new NFNT numbering scheme (you choose the number), so programs that don’t support that scheme—generally older programs—won’t be able to use its fonts. I found, however, that most programs handle them fine.

If you’re looking for a complete typeface-manipulation tool—including the ability to exceed 16 characters in a font and build kerning pair tables, you’ll need Altsys’ Fontographer/Fontastic combination or one of the new breed of PostScript font editors. For logos, signatures, dingbats, and other special characters, though, The Art Importer is a natural. It’s easy to use, it’s compatible with the most important object-oriented file formats so you can stick with your favorite drawing program, and it’s inexpensive.—Steve Roth

See Where to Buy or circle 758 on reader service card.
PSI. Showing That The Best Things
Do Come In Small Packages!

Like Our Brand New
4 MB SIMM.

<table>
<thead>
<tr>
<th></th>
<th>PSI</th>
<th>NATIONAL SEMI</th>
<th>CHIP MERCHANT</th>
<th>MICRON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses Standard SIMM Socket?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Surface Mount?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Lifetime Warranty?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Length Under 4 1/4 inches?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

- Total MacII*, IIx Memory Capacity 16, 17, 20, 32 MB
- Uses Standard SIMM Socket
- Surface Mount
- 120ns and Faster
- RAM Disc Available for MacOS

*MacII Requires SuperDrive Upgrade

PSI: Clearly The Best Modules In Memory.

Circle 436 on reader service card

2005 Hamilton Avenue Suite 220
San Jose, California 95125
(800) 622-1722 Toll Free
(408) 559-8544 in CA
(408) 559-8548 FAX
INTERSECT CDR-77
CD ROM Reader

Pros: Well-engineered, sturdy hardware; slightly faster and less expensive than most CD ROM drives.
Cons: Poor software; scanty documentation.
Company: NEC Home Electronics.
Requires: Mac SE. List price: $999.

The Intersect CDR-77 reader from NEC adheres perfectly to current trends in the Mac CD ROM (compact-disk read-only memory) industry: it’s less expensive than its predecessors, reads both data and audio CDs, and lets you have a potential 500 megabytes of data online at one time. Unfortunately, it also suffers from the same technological failings as its forebears. Like other CD ROM players, it’s sluggish; it’s useless for storing your own data (CDs are prerecorded and not erasable); and it’s hampered by the limited number and high price of commercially available CDs.

Beginning to CD Light
Intersect CDR-77 looks like a cross between an external floppy drive and a shoebox; it’s longer than the Mac, though, so it doesn’t look quite at home sitting beside one. Its front panel is precisely the same as that of other CD ROM readers: there’s a volume knob and a headphone jack (for listening to audio CDs), an eject button, and the disk slot. On the back you’ll find the power switch, RCA jacks for hooking the reader up to your stereo, and the SCSI port for connection to your Mac.

You can play an audio CD only if the Mac is connected and turned on. First you need to open up the Mac interface kit provided with the drive. From the floppy disk contained therein, you copy several INITs into your System Folder and turn the Mac off. The Mac gets turned on again only after the CD reader is up and running. You must place the CD in the Intersect’s removable plastic cartridge tray before inserting it into the machine. (Contrast this arrangement with cartridge-less systems like the Toshiba CD ROM reader, whose laser lens becomes covered with dirt, and hence unusable, after just a few months of use.)

If you’ve performed the steps correctly, an icon representing your CD will appear on the desktop; the Mac displays the CD’s contents exactly as it would those of a huge floppy disk. You will notice, however, that programs and files on the CD take a long, long time to open (a program that took 6 seconds to launch from a hard disk took 15 seconds from a floppy and 27 seconds from the Intersect).

Ironically, the Intersect ranks among the faster CD ROM readers on the market; even so, its 500-millisecond average access time is roughly 25 times slower than that of a typical hard disk.

Except for its startling slowness, however, the NEC drive acts precisely like a locked floppy disk: you can rearrange files and folders in its window, but these changes won’t be remembered the next time you load the disk. And you can eject any CD by dragging its icon to the trash.

In the Big CD
The Intersect has one significant problem: its audio software, which comes in the form of INITs, files, and miniapplications (see “Tears for the Tracks”).

The only way to play an audio disk is by double-clicking the NccdPlay application—a tiny program that simply starts your CD playing and then quits back to the Finder. The CD plays from beginning to end; you have no options for playing specific tracks, repeating tracks, fast-forwarding, or even pausing the play. As a matter of fact, the NecCdPlay program can’t even stop the playback; for that you’ll need the other program included with the drive—called, of course, NecCdStop.

This system is colossally inconvenient—you’ve got to quit whatever program you are in and launch a second program just to stop playback (if you harbored fantasies of slipping on a little Mozart while you’re crunching this quarter’s sales figures, forget them). The Intersect’s audio software looks even worse when compared with the desk-accessory controls provided with CD readers from Apple and other companies, which give you complete control over the playback of individual tracks on an audio CD.

Six-Month CD
The Intersect CD reader appears to have been designed with IBM PCIs in mind; unlike the Mac version, the IBM version of the audio software lets you specify which tracks to play. Also, the documentation provided with the Mac interface kit is a barren leaflet with little useful information. It’s a shame, too; the reader itself is a well-engineered piece of equipment.

NEC is reportedly hard at work improving this product’s software. Once this has been accomplished, the Intersect CDR-77 will have a better chance at holding its own in the market, since it’s priced about $200 lower than most drives.

(continues)
RasterOps: First with color for the SE/30. Our brilliant, 8-bit ColorBoard 108+/SE30 with built in Pan and Zoom lets you use affordable smaller displays, including Apple's 13" or equivalent, sliding around a "virtual" 19" display as will. Or power large displays, like our 19" Trinitron. Naturally, you get 100% application software compatibility.

$1995 (suggested retail) gets you our razor sharp 19" monochrome display system or for $795 get the ClearVue board that supports the Apple 15" Portrait Display! Either way, you get the dual-screen ZOOM, and a boost for your 8MHz SE with the FREE 16MHz accelerator!

Don't wait to see what your SE can be. Get RasterOps. For accurate color on your choice of monitor that fits your budget. And razor-sharp large screen monochrome. Because RasterOps leads the industry in high quality, high performance graphics for the Macintosh®. Color or monochrome, we offer the best solution for your SE.

“We’re Changing The Way People Look At Computers”

So call now, for our brochure and the name of your nearest RasterOps dealer.

Hotline: 1-800-952-6300, Dept. X21
At present, both CD ROM drives and disks are still very expensive and limited in number. With the introduction of eraseable optical disks for the Mac, some consider CD ROM's future even fogger. If you’re set on a CD ROM reader, however, consider the Intersect only after calling NEC to find out to what extent its software has been updated.—David Pogue

See Where to Buy or circle 771 on reader service card.

LIAISON 2.0

Software that Bridges Networks

Pro's: Excellent low-cost method for bridging LocalTalk and EtherTalk networks; supports modern sharing; includes dial-in support for remote access; good security control, including callback support; maintains log of all calls. Cons: Can interfere with foreground tasks during heavy network activity; no site license available; serialized copy-protection scheme. Company: Infosphere. Requires: Mac Plus, modem or Ethernet interface board for Ethernet. List price: $295.

Prior to Infosphere's introduction of Liaison, the only way to bridge AppleTalk networks to form large internetworks was with hardware. Now Liaison has dramatically reduced the cost of bridging networks by offering a software-only solution.

Starting Liaison
Liaison installs as a Chooser-selectable device. Once you copy the Liaison INIT file into the System Folder and restart, Liaison senses what network interfaces (LocalTalk, EtherTalk) are available and chooses a default configuration.

To customize the Liaison configuration, select Liaison in the Chooser and change the appropriate parameters. You can tell Liaison to bridge two LocalTalk networks (one on the printer port, one on the modem port), to bridge LocalTalk and EtherTalk, or to provide shared access to a modem attached to your Mac. As other network interfaces, such as Arcnet and Token-Ring, become available for the Mac, Liaison will be able to bridge LocalTalk to those networks as well.

Liaison can act as a bridge between the built-in LocalTalk port and an EtherTalk interface board in a Mac II. This bridge can be useful if you need an inexpensive way to make a LaserWriter available to Ethernet Mac users because any device attached to the LocalTalk network that's attached to a Mac SE or II will also be seen by EtherTalk users.

The beauty of this setup is that you don't need to devote a Mac to acting as the bridge. Liaison runs in the background, and even with heavy-duty use of a LaserWriter through the bridge, it's unlikely that you will notice Liaison's activity if you use a Mac II. If you use an SE as the bridge, your other programs slow down some—not as much as when Apple's PrintMonitor runs under MultiFinder, however.

You can ask Liaison to assign a higher priority to foreground tasks if the background activity bothers you. In most cases, you should install the most heavily used Liaison bridges as tasks on a file or mail server, rather than on an individual's workstation.

What's Your Name?
Liaison can check any other bridges on your network, learn what network numbers and zone names have been assigned, and add them to its own database. That database, a part of any bridge, is an important part of bridge operation on AppleTalk networks.

Although I had no problems using Liaison with the Hayes InterBridge and the Shiva NetBridge, Liaison does have problems automatically assigning a network name to a dial-up network. Your best bet in this case is to assign the name manually. Another problem to watch for is when Liaison is asked to get the network name and number from another bridge (set the zone name to *). If Liaison is the first bridge to start up on the network, it stays inactive because it doesn't know how to select a default name. So try to ensure that other bridges on your internetwork start first.

Building Bridges
Liaison has a great deal of built-in versatility. Not only can it function as a bridge between two LocalTalk networks, between two FlashTalk networks, or between LocalTalk or FlashTalk and an installed Ethernet board, but Liaison can also function as a bridge between a network and a modem that's attached to the

Bridge Styles
Liaison supports three types of bridging, as shown in this drawing. A personal bridge can provide access to a half-bridge for a single Mac, but not for the entire network (top). If two half-bridges are connected via modem (middle), users of both networks can communicate with each other. A full-bridge doesn't require the use of modems and allows users to link two networks together to form a larger network (bottom).
Unique.

Suddenly, everyone's a publisher. Your reader has stacks of newsletters, reports and publications that will go unread. You need to be sure that every publication you create works as hard as you do to get your message through.

You need a new tool that can create unique and effective publications, within budget and on time. One that doesn't require a Ph.D. to operate.

QuarkXPress® 2.1 is fast, powerful page design software created specifically for graphic designers. With commercial-quality typography, professional color support, and integrated word processing, QuarkXPress blends simplicity and productivity into a potent, unique design tool. Designers wouldn't have it any other way.

MacUser magazine calls QuarkXPress “the most powerful page layout package for the Macintosh.”

Let the unique power of QuarkXPress give you new creative options and a business advantage.

800-356-9363
Ask for Department A.
Inferior

There are a lot of “generic” removable storage systems that work today but break tomorrow. There will probably be a lot more.

There are a lot of mass storage companies that are here today but gone tomorrow. There will undoubtedly be a lot more.

There are a lot of removable storage systems that are unreliable, dangerous and just plain inferior. There will frightfully be a lot more.

Superior

But of all the removable storage systems, there is one that stands superior — The PLI Infinity 40 Turbo.

Only the Infinity 40 Turbo combines unlimited storage with four time-saving, performance boosting software applications ($436 retail value).

And you can rely on PLI’s experience and support. PLI has been making quality drives since 1985.

The PLI Infinity 40 Turbo — Don’t settle for less!

Peripheral Land Incorporated
47421 Bayside Parkway, Fremont CA 94538
(415) 657-2211 • FAX (415) 683-9713

Circle 81 on reader service card
bridging Mac's serial port (see "Private Lines"). Liaison's security features allow you to control access to either the bridging node or the entire network on a user-by-user basis. In addition to controlling access on a zone or network basis, Liaison has also introduced the concept of hiding up to three zones from dial-in users. This lets you prevent remote users from seeing your more sensitive zones, such as accounting or R&D.

Should you choose to install Liaison as a half-bridge to support dial-in users, you can store the phone number of each remote user as a part of account information. When a remote user calls the Liaison half-bridge, Liaison answers the phone call, the user enters the proper account name and password, and Liaison disconnects the call. Liaison then initiates a call of its own back to the remote user to establish a usable link to the network.

Two copies of Liaison can serve as half-bridges for connecting to Liaisor-controlled modems to link two networks. Previously, linking networks with half-bridges was possible only with the Hayes Interbridge, which goes for nearly three times the price of Liaison. (The new TeleBridge from Shiva, which sells for $499, also has this capability.)

In addition to supporting half-bridges and full-bridges (see "Bridge Styles"), Liaison also introduces the concept of a personal bridge, which allows you to initiate a connection from your own Mac to a half-bridge running under Liaison. While a single Liaison package can only be used for a full-bridge or a half-bridge on one Mac, Infosphere allows you to make as many personal bridges as you need from a single distribution disk. To do so, you simply copy the Liaison INIT, rather than the Liaison INIT, to your System Folder. Of course, you'll still need to install Liaison on a Mac that will serve as the half-bridge to that network. Users of personal bridges then dial that half-bridge. Think of it as Infosphere's software answer to the Shiva's NetModem and Solana's R-Server: all of your remote sites will use Liaisonet to dial your home office, which is running Liaison on a Mac connected to a modem.

**Say "I Do"**

Although I've not tested Liaison under extremely heavy traffic conditions, it's conceivable that Liaison, being a software-only product running in the background on a Mac, will not be able to compete with a dedicated hardware box designed for the same task (such as the Kinetik FastPath for EtherTalk bridging or the Shiva NetModem for modern sharing). If you're looking for a gateway to connect LocalTalk to another network, such as TCP/IP, you're stuck with using hardware. However, in most cases, Liaison provides enough power and speed to suit anyone's everyday needs for bridging networks. And at a price of $295 it's a bargain.

—Dave Kostur

See Where to Buy or circle 773 on reader service card.

---

**McMax 2.0**

**Programmable Relational Database**

**Pros:** Fast; highly dbase compatible; unlimited distribution of run-time applications. **Cons:** Still fairly austere by Mac standards; no design aids.

**Companies:** Nantucket Corporation. **Requires:** Mac. **S12KE. Second disk drive or hard disk recommended.**

**List price:** $295 (includes run-time version).

The original version of McMax was one of the first Macintosh database programs to show respectable speed. In most benchmarks, it simply zipped past rivals like 4th Dimension and Double Helix II. The problem was that compared to those programs, it hardly seemed like Macintosh software. Basically a 9-point Monaco alphanumeric data engine, McMax made it appear that the Mac was being used as a terminal connected to a particularly efficient IBM PC AT running dBase III. McMax's main attraction clearly was to dBase programmers who wanted to preserve their investments in programs and training.

The new version will still appeal mainly to applications developers who are already versed in dBase as a language. If you simply want to store and retrieve data, simpler flat-file programs (Microsoft File, FileMaker II, for example) are a better choice. If you need to develop one or two relational custom databases, it's easier to design them in Double Helix II or even using 4th Dimension's skeleton application generator. What you get with McMax—and with FoxBase+/Mac—besides standard relational database capabilities is the ability to create applications that don't bog down on large data files.

**McNew, McWonderful**

McMax users generally expect to see screens in which applications are operated through menu choices, and in which text can be enlivened by style and size variations. The omission of these features in the original McMax caused loud complaint. Fortunately, they have been included in version 2.0 (see "New Look for McMax"). The command @5,10 SAY "McNew" STYLE 3, 4, 0, 16, 341, for example, writes the name of your favorite magazine in 16-point Geneva, underlined, in green, starting at line 5, column 10 on your screen. There are no input screen graphics or PICT-type fields, though.

Actually, Nantucket has gone beyond mere feature tinkering in this version. McMax 2.0 includes a straightforward way to program not just the main menu bar in an application, but hierarchical submenus as well. In writing a program for end users, it is thus possible to limit operations to a set of neatly structured choices, resulting in thoroughly debugged (McMax also has a built-in debugger), crash-proof, and easy-to-document custom database programs. McMax 2.0 also supports HyperCard XCMDs and XFCNs, so you can import data manipulation utilities originally written for HyperCard.

(continues)
"A superb presentation tool... Swivel 3D raises the standard of 3-D graphics on the Macintosh." Joost Romeu, MacWeek

"It's a speed-demon. It's your basic $395 must-have." Salvatore Parascadolo, MacUser

"Creating objects with complex surfaces couldn't be easier...only Swivel 3D lets you cast shadows on images." David Peltz, MacWorld

"An amazing 3-D visualization tool that is easier to use than any of the 3-D packages...." Laslo Vespreni, MacWeek

"The most intuitive interface ever created for moving around in a computer environment.... A visualization tool that will keep you up around the clock — with a smile on your face." Jack Davis, Verbum

Paracomp Redefines the Graphics Standard

Swivel 3D, the essential Graphics Tool

Swivel 3D lets you create stunning graphics never before possible. By simply rotating, scaling and casting shadows, Swivel 3D generates a limitless amount of images from a single 3D drawing. Explore presentation ideas quickly — you have the power to produce your best graphic presentations and animations.

Create beautiful illustrations by combining the visual power of Swivel 3D's images with the special effects found in today's graphic applications. Swivel 3D's presentation images can be easily moved to popular paint and draw programs. For animation, Swivel 3D pastes a series of color animation frames to the Scrapbook which you can easily import into VideoWorks or Hypercard.

Swivel 3D is the first and only program to feature Linking. Linking allows you to create realistic images with wheels, doors, levers, arms, legs, and objects that move.

An extensive library of images, shapes and alphabets, is included. Swivel 3D is a powerful graphics program for anyone involved in animation, business presentations, and graphic design — it is the essential tool for all of your graphic needs.

Paracom 1, Inc.
123 Townsend Street, Suite 310
San Francisco, CA 94107, 415-543-3848

Paracomp is a trademark of Young Harvill/VPL Research, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.

Circle 213 on reader service card
Additional user-defined features, called Reads, allow manipulation of user-provided input down to the level of individual fields. (The term is slightly misleading; ordinarily the intended user of this feature is you the programmer, rather than the end-user of the application.) Basically, rather than simply reading in data in the order it's supplied, the Get command, which specifies a whole record, lets you manipulate data as it is being entered. The Get function can be used to do simple data comparisons such as range validation or arithmetic on entered quantities. Procedures with Reads can involve all kinds of data (including choices specified by buttons), and Nantucket provides several pages of expandable examples.

Please note, however, that the use of any of these enhancements is a matter of line-by-line programming. There are no design aids to assist in laying out your colorful, multifont data input screens—you experiment with layouts at the command-line level. Likewise, McMax does not offer you, the programmer, a series of menu choices to specify the creation of applications menus for the end user. Once more it's a matter of straight programming, just as it would be in C or Pascal. One advantage, however, is that database command sets are a more efficient language for database creation. The other advantage is a speed/comfort trade-off as extreme as a rocket sled versus Cleopatra's barge. McMax offers you almost no conveniences compared with a lush developer's environment like Double Helix II, but your applications can run 20 to 30 times faster.

Clone Race 2000

The real choice for most users with some dBase background is between FoxBase+/Mac and McMax. McMax claims to be "the fastest database for the Macintosh." Running a variety of benchmarks (a representative selection is shown in the table) proved this claim can be true in a particular context: executing program files using the fastest-executing McMax commands. For most ordinary database operations, such as indexing or locating records, FoxBase is two to four times faster. McMax showed a speed advantage over FoxBase, ranging from several percentage points to a factor of two, on short programs that read in database files and processed numeric fields using complex expressions. This advantage was not seen with programs that manipulate character fields; here FoxBase was slightly faster. All in all, complex McMax applications distributed with the unlimited run-time unit will be comparable in speed to FoxBase applications—even modestly faster or slightly slower, depending on program details.

Both programs run dBase .prg files ported from MS-DOS with no modification and use dBase files processed through Apple File Exchange software. A major advantage FoxBase has over McMax (besides better support for screen design) is network support, including the ability to manage data over a network with IBM PCs and Macs using a single FoxBase application.

Documentation for the two packages is comparable. FoxBase's technical support staff is significantly easier to contact than McMax's; Nantucket's primary focus is a PC program called Clipper, rather than McMax.

Like the original, release 2.0 is austere and very fast, and its extensions haven't interfered with its ability to run imported MS-DOS programs. While allowing you to program easy-to-use applications, it still presents you, the programmer, with a plain screen featuring the notorious dBase dot prompt as the starting point for your labors (an Assist menu item at least helps you get started with ordinary data-file manipulation). Although it calls for more hard work than most other Mac databases, it's the least expensive package for developing distributable custom database applications, and it has a certain minimalist charm.—Charles Seiter

See Where to Buy or circle 778 on reader service card.
How to avoid making backups.

Make Irwin® do it.
An Irwin tape backup system, that is. So go home early. Because an Irwin system will back up your data, your programs, your breakthrough ideas—all automatically.

- No complicated commands.
- No sloppy floppies.
- Our EzTape® software makes it easy to store whatever data you want. Whenever you want.
- It doesn’t matter whether you’re backing up a Mac or a PC.

An Irwin backup system works with them all. Along with all the popular local area networks. Providing up to 80 megabytes of reliable storage.

In fact, with its patented AccuTrak™ precision tracking technology, you can transfer data from a Mac to a PS/2 to a PC and back again. Something that would throw a floppy right off its track.

All in all, that’s why more people rely on Irwin minicartridge systems to do their backup than all others combined.

Just call 1-800-BACKUP1 for the dealer nearest you. Because the best way to make backups is to avoid it.
educational games, NumberMaze has a specific educational objective: to provide young learners (ages 5 to 12) with an entertaining tool for learning and practicing arithmetic.

Let Me Count the Ways
There are many math drill-and-practice Macintosh programs available for kids today: Math Blaster, Turbo Math Facts, MathTalk, and Math Wizard, for example, are all designed to make the learning process fun. But none of these programs taps the computer's potential as a thorough, flexible, entertaining, and patient electronic tutor the way NumberMaze does.

Like the others, NumberMaze couches math drill and practice in a game format, rewarding learners for correct answers. In NumberMaze, however, the student uses the mouse to maneuver the playing piece through a maze toward the castle in the corner of the screen. Simple enough, except that the maze is riddled with doors, gates, and walls that can only be passed by solving math problems.

Kids tend to tire of this type of activity quickly unless there's some variety: NumberMaze has variety aplenty. For starters, the playing piece changes from game to game: sometimes it's a clopping horse being lured by a mouse-controlled carrot, sometimes a buzzing race car following a checkered flag. In addition, correct answers trigger animated sequences, such as opening doors, lowering ladders, or disappearing bricks (see "Open the Door"). There are enough of these sequences to keep kids interested for many a game.

Even when the barriers start repeating, the game stays fresh because new elements are introduced. Some doors require keys that must be picked up in another part of the maze. In more advanced mazes, walls are invisible until the player bumps into them, or become visible when bumped into and then disappear a few seconds later. As the player progresses to more advanced levels, the maze becomes more complex, and maze passages become smaller.

Variety is important, but youngsters want rewards, too. NumberMaze reinforces each maze traversal with a new on-screen prize. And when a child successfully completes a math level, you can print him or her a certificate of completion.

But Is It Learning?
NumberMaze's flexibility is also apparent in its educational design. Unlike other math programs, it doesn't limit itself to a narrowly focused curriculum. It's designed to help with arithmetic problems from the simplest counting exercises for kindergartners to complex, multidigit long division for 12-year-olds.

This curriculum is carefully modeled on leading textbooks. Children can start with the easiest level and work their way up sequentially, skipping forward or backward if they need to. The disk also includes curriculum files for particular grade levels and a Custom Maze program for designing curricula for special needs. The excellent manual provides thorough instructions for customizing the program to suit your instructional needs.

For most students, the standard curriculum progresses at the right pace. NumberMaze carefully monitors each response, gives hints when needed, and keeps track of success rates in each category of problem. If a particular type of problem (for example, addition with carrying) is causing too many errors, the program provides more of those exercises.

NumberMaze is designed to be used in either the classroom or the home. Great Wave's licensing agreement makes it possible for up to fifty students to legally share the same copy, provided that no two students are using it at the same time. The program can record a student's progress in a password-protected file, and these files can be displayed or printed. NumberMaze even uses students' names to personalize the story problems.

Ask the Experts
I think NumberMaze is terrific, but don't just take my word for it. Listen to these testimonials from my no-holds-barred software-testing committee:

Six-year-old Chelsea: "What I liked best was that every time you got to the castle, you got something like a sword or a teddy bear."

Seven-year-old Johann: "It's a good way to learn math because you have to figure out all these math problems. The mazes are fun."

Nine-year-old Benji: "I think it's just a good game. It's neat how they have all these different scenes."

Nine-year-old Bethany: "It's a better way to learn math. I played it every day when I got home from school, and I never got bored with it from beginning to advanced levels."

Eleven-year-old Ben: "It's the best math program I've ever played. I play it almost every day, and I never get bored. It helps you along if you have trouble with a math problem. It lets you do almost all the work."

Why do kids like this game so much? Ben's last comment may hold the key. While most computer math games keep the computer firmly in control, NumberMaze lets the child take charge.

—George Beekman
See Where to Buy or circle 781 on reader service card.
Why Ralph Volk cancelled Linotype for a Varsityper PostScript Imagesetter

"I made head-to-head comparisons between Linotype® and Varsityper® PostScript imagesetters for the same jobs. What I found, more often than not, was that Linotype produced a 1 point miss or overlap at what looked like uniform intervals on the page. I'm told this banding is a result of their start/stop scheme and that it will only get worse as the equipment gets older. Whatever it is, the results are unacceptable for my work, particularly my color work. On the other hand, Varsityper produced flawless, high-quality output at speeds much faster than those other guys. And when I found out that I could get the Varsityper for substantially less money, there was no contest. . . . I said, buy the Varsityper!"

"My advice to anyone looking for a high quality PostScript imagesetter: Do yourself a favor. Consider Varsityper and make your own comparisons."


See for yourself. Just call and we will send you output samples from Varsityper imagesetters. You'll see the quality difference for yourself!

Give Varsityper a Call Today
1-800-631-8134
(In New Jersey 201-887-8000 x-999)

Circle 93 on reader service card

The #1 Supplier of Imagesetters with Adobe's PostScript Interpreter

MacSunSet is a registered trademark of Sun Graphics and Publications, Inc.
Linotype is a registered trademark of Linotype Corporation.
FASTAT 1.0

Statistics Program

**Pros:** Easy to use; includes graph-editing tools.

**Cons:** Not particularly fast. **Company:** Systat Inc.

**Requires:** Mac Plus, hard disk.

**List price:** $195.

From the point of view of a Macintosh user with modest statistical-computing requirements, there are three things wrong with Systat, the most comprehensive stats package. First, it's too comprehensive, including many esoteric tests only dimly remembered from college courses. Second, it's barely a Macintosh program, relying heavily on a BASIC-like command-line interface. Finally, it costs enough ($595) to warrant a professional designation.

Now, however, there's a version of Systat that offers a reasonable array of tests, a menu-driven interface, and an aggressive price. Systat, Inc. plans to distribute Fastat in cooperation with the publishers of standard college-level statistics textbooks.

**Passing the Tests**

You pass data sets to Fastat through a "spreadsheet-style" data editor (table-style might be more accurate) that can also open documents saved as Text in other applications, typically spreadsheets or databases. You can then invoke statistical tests or exploratory data graphs from menus that feature the names of the tests and icons that represent them.

Fastat's set of statistical tests would be respectable even for a program costing twice as much. Besides standard descriptive statistics (mean, standard deviation, and frequency distribution), you get regression and correlation analysis, ANOVA (one-, two-, n-way, and repeated measures), ANCOVA, four types of nonparametric tests (sign, Wilcoxon signed-rank, Friedman, and Kruskal-Wallis), factor analysis, and an assortment of operations on time series data (smoothing, seasonal decomposition, autocorrelation, and partial autocorrelation). Data sets can also be transformed through an extensive recode option, which is how you are expected to handle nonlinear regression, for example. Definitions of key statistical terms are available through a simple interactive help system.

These tests, based on algorithms perfected in Systat, have been thoroughly debugged for the numerical anomalies that sometimes plague new statistics packages. The real value of Fastat, however, is in its set of facilities for exploratory data analysis. While not as exploration oriented as Data Desk, Fastat nonetheless allows rapid graphing in a variety of styles, including scatterplots, boxplots, stem-and-leaf plots, histograms, 3-D display, and scatterplot matrices. Using Fastat's data-editing tools you can connect individual plot points to tables rows in the data editor (either from graph-to-table or from table-to-graph) and you can select point sets with a frame or lasso in a plot and save them to named subset files for further analysis. Without much effort, you can analyze data visually until correlations or other significant relationships become apparent. That, in fact, is the whole point of the new style of data analysis; you look at the data until you are sure that subsequent number-crunching-only analysis won't lead you astray.

**Slow but Steady**

Fastat is not an entirely accurate name for this program. You can learn to use it relatively rapidly, but its own operations are not notably speedy. Importing a 10,000-record test file took 40 minutes in Fastat, compared to just under 3 minutes for StatView SE+Graphics. Computing descriptive statistics on large files takes twice as long as it does in Exstatix and three times as long as in StatView SE+Graphics. If, however, your data sets generally run only to a few hundred records, you will find Fastat's computational speed acceptable.

Another operation that could stand improvement is graph enhancement. Although a palette of graph-enhancement tools can be popped up from the Goodies menu (see "Color by Numbers"), in actual practice, titling, sizing, and otherwise modifying basic graphs for use in a LaserWriter-printed presentation requires an annoying amount of tinkering to get accurate control of effects. If you hope to use a statistics package to generate presentations for a business or for statistical consulting, Fastat is not your best bet—its real strength is in combining a solid test set and exploratory graphics with modest presentation features.

**What Counts**

In addition to a strong showing on analytic basics, Fastat includes some useful extras. A Movie option lets you play back stacks of graphs—which can be an informative way of examining families of data sets. Another option allows you to use command files to automate repetitive operations. In a way this is a throwback to the original anti-Macintosh, noninteractive, command-line design of Systat, but it gives you an alternative to performing dozens of mouse-clicks over and over again on batches of related files. Neither of these options would be worthwhile unless the underlying graphing and analysis facilities were powerful; fortunately, Systat Inc. has loaded its junior product with enough power to satisfy all but professional statisticians.

If your statistics test requirements aren't particularly esoteric and if your presentations don't call for shaded 3-D Technicolor graphics, Fastat has everything you need and at a bargain price too.

—Charles Setzer

See Where to Buy or circle 764 on reader service card.
If you make presentations, you're no stranger to pressing deadlines. Or last-minute changes. If only there were a quick, easy way to create powerful presentation visuals.

There is.
With Aldus' Persuasion, you simply select a design, type your ideas into the text outline, and you're done. As fast as you can outline your thoughts, Persuasion's AutoTemplate technology converts them into a professional-quality presentation. Persuasion handles the design, so you're free to concentrate on the content.

Use the power of Persuasion to produce crisp black-and-white or color overhead transparencies. Generate 35mm slides with a desktop film recorder. Or send your file to Autographix, a nationwide network of slide bureaus, for overnight service.

Use the on-screen slide show to review your presentation, or to actually present your work.

Persuasion is today's only full-featured desktop presentations package for the Macintosh. And it's a snap to use, with automatic organizational charts, outlining, word-processing, drawing, and charting tools.

*Offer good in U.S. and Canada only and expires September 30, 1989. Aldus and the Aldus logo are registered trademarks, and Aldus Persuasion and AutoTemplate are trademarks of Aldus Corporation. Macintosh is a registered trademark of Apple Computer Inc. ©1989 Aldus Corporation. All rights reserved.
No wonder the reviewers are applauding Persuasion. According to InfoWorld, "This may be the product that does for desktop presentations what PageMaker did for desktop publishing." In its 12/88 Macintosh Ratings Report, Software Digest says, "Persuasion provides the best balance of features, usability, and performance to meet the needs of most users."

**Discover the power of Persuasion.**

To see how Persuasion can make your next presentation an instant success, visit your nearest authorized Aldus dealer. Or, call us at 1-800-333-2538, Department 2D2, for a FREE information packet.*

*Persuasion automatically produces speaker notes and audience handouts.
NETWORK FOR THE MAC 1.0
Integrates Mac and PC Networks

Pros: Full AppleShare support (using LocalTalk and/or EtherTalk). Cons: Costly; time-consuming to install; takes a long time to display folders containing many DOS files. Company: Novell.

Requires: Mac 512KE and IBM PC or compatible with the Intel 80286 or 80386 CPU; LocalTalk or Ethernet. List prices: NetWare for the Mac $200; Advanced NetWare 2.15 $2995; SFT NetWare 2.15 $4695.

NetWare provides disk fault tolerance, integrated power-failure notification, and advanced security features for DOS-based networks. The Macintosh version, NetWare for the Mac, additionally provides PC-to-Mac and Mac-to-Mac file sharing by providing complete AppleShare support. Most of these features are not available on other servers supporting Macs. Novell's NetWare for the Mac is an add-on to SFT (System Fault Tolerant) NetWare version 2.15 or Advanced NetWare version 2.15. NetWare for the Mac must be purchased separately. The initial release of NetWare for the Mac requires that your network contain an IBM-compatible workstation for system administration. When NetWare is ordered through a reseller, a fully functional server can be delivered to your doorstep. If you are new to NetWare, however, the large box containing over 20 manuals might seem overwhelming.

Installation requires four steps: (1) preparing the server's hard disks and configuring the server's operating system for the selected drives, network adapters, and server characteristics; (2) configuring the network shells for each network adapter type to be used by PC workstations in the network; (3) installing AppleShare 2.0.1 client software and the NetWare DA and copying the NetWare Control Center program onto a Mac (included with NetWare for the Mac), and (4) establishing directories, users, and access privileges from a PC workstation. The complete procedure will take about two days.

One thing to consider when adding Macs to Novell networks is the physical connections. Novell expects most Macs to remain on a separate LAN and connect through an internal server bridge, a Novell board. Novell does not currently support any other AppleTalk boards. The only restriction on the AppleTalk LAN is that it cannot be LAN A. Because most Novell networks use Ethernet, there is a potential problem with mixing LANs. Usually, if a Mac user generates a lot of network traffic, the inclination is to put that Mac on Ethernet also, to increase the network throughput and get the Mac off of LocalTalk. However, if you bridge the LocalTalk LAN into Ethernet through the Novell server, the Macintoshes with Ethernet boards cannot access any LocalTalk LAN resources, other than LaserWriters. In other words, they won't see network modems, mail servers, gateways, or serial devices that are on the LocalTalk network. The only way around this seems to be to bridge the LocalTalk LAN through an external bridge to the server, such as a Kinetics FastPath.

Using NetWare for the Mac

NetWare usually starts up when you simply turn on the machine. However, a keyboard entry is required to start NetWare for the Mac on the server. In the event the server accidentally shuts down or restarts, Mac users can access the server until someone enters the required keystrokes.

Once NetWare is loaded, you select it through the Chooser, like any other AppleShare server. User name and password are entered and NetWare's file cabinet icon appears.

The NetWare Control Center program is the beginning of Novell's goal to permit complete network management from the Mac. Currently the control center allows an administrator to easily assign trustee rights to directories and documents (a trustee is a user who has been given any rights to a folder). For example, with NetWare Control Center a manager can simply drag a user's name from a displayed list into the trustee list in a folder's rights window. Similarly, a manager can simply click on which rights to assign and revoke (see "Reading Your Rights").

The NetWare DA lets Mac users modify or view their own rights. While this DA doesn't seem to work across a bridge, it is an easy way to modify trustee rights. Those familiar with NetWare Rights or needing more options for trustees than AppleShare provides will probably use this DA rather than AppleShare's more limited Access Privileges/Get Privileges commands.

NetWare has more log-on security methods than AppleShare, such as defining account balances, permissible log-on times, and password expiration dates, as well as detecting intruders. Thus, a failed log-on attempt on a Mac may be due to an invalid password. A password longer than eight characters will prevent a Mac user from logging on.

One of the problems with this first version of NetWare for the Mac is that frequently, when an error dialog box appears, the Macintosh locks up.

Macs in a PC LAN

Following the AppleShare specs, NetWare truncates long Mac file names to the first eight characters. If a duplicate name exists...
THE FIRST GRAPHIC SPREADSHEET.
THE LARGEST, FASTEST AND MOST VERSATILE SPREADSHEET EVER.

WINGZ™

Wingz has more features than any Macintosh or DOS spreadsheet on the market, but is easy to use and learn.

—MacGuide

Wingz towers over Excel.

"Wingz is fast. Faster than Excel or Full Impact."

"The most extensive graphing capability of any current Mac program."

—MacWeek

If you use Excel, you'll be up and running with the $399 Wingz almost immediately — the learning curve is not an obstacle to upgrading to it.

"You get total control over visual elements of the spreadsheet . . . it produces graphs that are nothing short of awesome."

—Newsday

Wingz is a nice replacement for Excel.

"Go for the gold and purchase Wingz."

—InfoWorld

The most exciting piece of software I've ever used on the Macintosh...Wingz opens up virtually the whole of the Macintosh box of tricks.

"Wingz is as significant in its own way as MacPaint and HyperCard."

—MacUser U.K.

Available now for Apple® Macintosh® computers.

TO FIND A WINGZ DEALER NEAR YOU CALL (800) 331-1763, EXT. 1000

INFORMATION MANAGEMENT SOFTWARE FROM INFORMIX®

Copyright © 1989 Informix Software, Inc. Informix and HyperScript are registered trademarks and Wingz is a trademark of Informix Software, Inc. Apple, Macintosh, MacPaint and HyperCard are registered trademarks of Apple Computer, Inc. Microsoft is a registered trademark. Full Impact is a trademark of Ashton-Tate Corporation.

Circle 360 on reader service card
disk drives for use in the event that bad spots develop on a disk. NetWare performs read-after-disk-write verification. If it finds errors, NetWare marks that spot bad and places the data into the reserved cylinders. NetWare's other two disk-fault-tolerant features are disk mirroring and disk duplexing (see "A Folder of File Servers," *Macworld*, January 1989). The backup power protection consists of an uninterrupted power supply connected to the file server through a serial link. In the event of a power failure, the server is notified and shut down without any disk data corruption.

One of NetWare for the Mac's advanced features is print spooling, which is faster than the Mac's background printing. Print jobs can be held, delayed, redirected, and purged. When you send a print job with downloadable fonts to the queue, the server will store these fonts for current and future use. When the print job is released to the laser printer, the fonts are retained in the file server and can be used by the next print job, reducing the amount of information that must be sent to the server. Thus the Mac spends less time printing. DOS workstations can also print to the same LaserWriter queue.

**Backing Up the Network**
The Mac's concept of file structure, with data forks and resource forks, is not used in PC operating systems. A Mac user cannot currently back up a server; this is the weakest aspect of NetWare for the Mac. Novell ships a utility called Macbackup, which can be used from a DOS workstation to back up only the Mac files on a server. Several vendors are working on systems capable of backing up both file formats in one utility. One product, Cheyenne Software's NetBack, does currently permit complete backup of NetWare servers from a DOS workstation. This is an inexpensive method of adding Mac support for those who already have NetWare servers.

If you're trying to pick a dedicated server for a network of only Macs, then AppleShare is your best choice. Even if you have a small network of both Macs and PCs, you're probably still better off using AppleShare rather than NetWare.

But, if the added security features (such as log-on times and disk space limits) appeal to you, or NetWare's laser printer spooling will reduce your network traffic, then NetWare for the Mac will provide you with the most complete networking package for Macs and PCs. The entry price is a bit steep, but all of NetWare's features may well help you sleep better at night.  
—Steve Satz

See Where to Buy or circle 780 on reader service card.

---

**SMALLTALK/V MAC 1.0**

**Smalltalk Programming Language**

Pros: Compact, efficient, practical implementation; superior documentation and tutorial.

Cons: Subset of the full language.


**OBJECTWORKS FOR SMALLTALK-80 2.3**

**Smalltalk Programming Language**

Pros: Complete, definitive version from Smalltalk's originators. Cons: Too large for typical Macs; virtually demands previous Smalltalk background.

Company: PacPlace. Requires: Mac Plus; 2MB RAM; hard disk; 4MB or more recommended.

List price: $995.

---

Years ago at Xerox PARC (Palo Alto Research Center), a young entrepreneur named Steven Jobs was shown a demonstration of the programming language Smalltalk running on one of Xerox's own workstations. What impressed him was the language's mouse-directed user interface, featuring movable windows, scroll bars, pop-up menus, and more. Later, a group inside Apple was organized to produce a mass-marketable computer featuring this amazing, intuitive graphical interface. The Mac, son of Lisa, was the result.

Although Smalltalk itself is the premier language for object-oriented programming, few pioneers envisioned it...
THE FIRST GRAPHIC SPREADSHEET. THE LARGEST, FASTEST AND MOST VERSATILE SPREADSHEET EVER.

FREE WINGZ WEAR

FOR A LIMITED TIME ONLY.
Buy Wingz for the Macintosh® and get the Wingz World Tour black satin jacket free.*

For more information visit your Wingz dealer or call 1-800-331-1763, extension 1000.

*Available in the U.S. only, certain other limitations apply.
INFORMATION MANAGEMENT SOFTWARE FROM INFORMIX®

Circle 360 on reader service card
running on a personal computer (Xerox's version called for several megabytes of RAM at a time when memory upgrade meant taking a 48K Apple II up to 64K). Now, with multimegabyte Macs having become common, Smalltalk is finally available on the computer it inspired.

In languages such as Pascal or C, the programmer defines some data structures and makes a program from a list of procedures for data manipulation. In object-oriented Smalltalk, however, the objects that constitute data structures can be very complex (zoomable windows, rather than simple data lists) and the methods (analogous to procedures) that manipulate them become, along with the objects, part of the programmer's own extended version of the language. Objects with similar properties are further ordered into classes, and objects in subclasses can inherit properties. The key point in this scheme is that programming effort becomes reusable: methods designed to act on a given object can act on other objects in the same class and on objects in appropriate subclasses. Code reusability is one of the main reasons that object-oriented extensions of traditional languages are currently an area of intense commercial interest.

Smalltalk is furnished with such a large, rich set of classes and objects that programming a specific application is often simply a matter of writing a few lines of method code to manipulate existing objects. Smalltalk source code is the equivalent of five or six statements in Pascal or C. Furthermore, Smalltalk is remarkably friendly, despite the initial conceptual overhead, and it's one of the few languages with real entertainment value.

V, for Very Good

Smalltalk/V is the first serious attempt to deliver this development facility on a machine as humble as the Mac Plus. Digitalk's Smalltalk image (basically the machine-independent part of the language) fits in 600K of RAM, so it's usable in 1MB and workable for serious programming with 2MB. According to Kent Beck, of Apple's Vivarium project, this remarkable feat of compilation preserves about 80 percent of the functionality of the full (that is, Objectworks) version of the language.

is designed to present exactly the same interface as workstation implementations, right down to unapologetic references to red, yellow, and blue mouse buttons.

Although Mac users will find that this interface takes considerable familiarization for easy use, virtually all published literature on the language corresponds exactly to what you find on the Objectworks screen. Thanks to an 85 percent academic discount, it's not surprising that this version of Smalltalk is favored by government agencies, universities, and decision-systems programmers with significant contracts.

Two Variations

Smalltalk/V Mac is unquestionably the first Smalltalk "for the rest of us." Object-oriented languages will be a large part of the future of programming, and the Smalltalk/V tutorial is an exceptionally effective introduction. Most of the standard Smalltalk features that were omitted from Smalltalk/V can be coded as extensions and Smalltalk/V's conformation to the Mac interface will probably be welcomed.

Objectworks, in contrast, requires no extensions and accepts no deviations. It's not so much a Smalltalk for individuals as for organizations. ParcPlace offers support and training for entire campuses or corporations. Objectworks is the documented standard, with the advantages and limitations that role implies.

Both of these Smalltalk versions can be used to develop (with the cooperation of the respective language suppliers for run-time versions) reliable, deliverable applications for end users. Both offer friendly, interactive programming environments, with debuggers that operate at new, high levels of programmer-to-machine interaction. And they offer a perspective on programming that makes most other languages seem like boring variations on BASIC. If you have any sort of interest, not just in programming per se, but in what standard computing may become in a world of cheap memory and fast processors, you should contrive to get your hands on one of these implementations of Smalltalk.—Charles Seiter

See Where to Buy or circle 792 (Smalltalk/V) or 782 (Objectworks) on reader service card.
Dead or Alive

Surrender your hard drive to Microtech and get a reward. A rebate reward worth up to $200! With Microtech’s new STEP-UP™ EXPANSION PROGRAM, all you have to do is brush the trail dust off your old drive, send it in, and receive a rebate on the purchase of a new Microtech drive.* You can also purchase new Microtech drives at our list prices without a trade-in.

HOW CAN MICROTECH OFFER A DEAL THIS GOOD?
It’s simple. As one of the largest manufacturers of Macintosh peripherals, we understand your needs. We know you can’t afford to be left in the dust by advances in technology. That’s why we’ve developed the STEP-UP™ EXPANSION PROGRAM — a unique design philosophy that puts you on an easy, economical upgrade path... without throwing away your current investment.

WILL MICROTECH TAKE DRIVES FROM OTHER MANUFACTURERS?
You bet! Send us hard drives from Apple, SuperMac, CMS, Jasmine... anyone!** Working or not, we don’t care how they’re branded. Best of all, you’ll have the satisfaction of purchasing a new Microtech hard drive, like our NOVA 80, rated the fastest, least expensive drive by Macworld; or a Microtech R45 Removable Cartridge Drive. Of course, you’ll still be entitled to Microtech’s unprecedented five year warranty on NOVA hard drives, and two year warranty on the R45.* You’ll also be assured of the best service and support in the industry. How’s that for shooting the pants off the competition!

Look for Microtech’s exclusive STEP-UP™ EXPANSION PROGRAM with other Microtech products including Memory Expansion Boards, Accelerators, and Tape Backup Systems. It’s another reason to trust in Microtech to support all your Macintosh peripheral needs. Call now to receive more information on our STEP-UP™ EXPANSION PROGRAM, Microtech products, or to order a new Microtech drive.

For powerful, affordable solutions, call Microtech. We bear you.

29 Business Park Drive, Branford, CT USA 06405
1-800-325-1895
(203-488-7744 in CT)

Purchasing a Microtech Drive at our everyday low prices without a trade-in or receive a rebate of up to $200 for your old drive. Call Microtech at 1-800-325-1895 for more information!

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOVA 20</td>
<td>N/A</td>
<td>$20.00</td>
</tr>
<tr>
<td>NOVA 40</td>
<td>$569.00</td>
<td>$649.00</td>
</tr>
<tr>
<td>NOVA 80</td>
<td>$919.00</td>
<td>$1,019.00</td>
</tr>
<tr>
<td>NOVA 100</td>
<td>$999.00</td>
<td>$1,099.00</td>
</tr>
<tr>
<td>NOVA 150</td>
<td>$1,399.00</td>
<td>$1,499.00</td>
</tr>
<tr>
<td>NOVA 320</td>
<td>$2,699.00</td>
<td>N/A</td>
</tr>
<tr>
<td>MICROTECH R45</td>
<td>N/A</td>
<td>$1,099.00</td>
</tr>
</tbody>
</table>

*Some restrictions apply. Terms and conditions of STEP-UP Trade-In Program and warranties available upon request. Prices and availability subject to change without notice.
THE PROFIT CENTER 1.0

Business Planning and Projections

Pros: Easy to use; clearly organized.
Cons: Inflexible reporting capabilities; some bugs.

The Profit Center is a good place to start if you're considering becoming your own boss in a business where you have little or no experience. It gives you basic information, based on various averages, about what you can expect to make and spend. However, it's one thing to throw a bunch of numbers together and call it a business plan—it's another to compare those numbers with the realities of your marketplace. The Profit Center certainly can't replace sitting down with a competent professional who knows the business and the local market where you expect to launch your great enterprise—but it might just save you from some very costly mistakes.

Getting Down to Business
The program is straightforward and simple to use. You start by entering the name and location of your new enterprise. I called my potential money-maker Al's Big Burger and located it on a suburban strip in Anytown, U.S.A.

You select the type of business you want to start from a list of business types (if you can't find yours, there's a generic average business); the program then shows a breakdown of fixed and variable costs (see "Industry Ratios"). You then get a detailed breakdown of expenses and you can make any adjustments necessary. At this stage, professional advice can come in handy since there can be big differences between category averages provided by The Profit Center and your particular business.

Next you create a sales forecast, either by specifying your expected profit or the number of units you will produce annually at an average unit price. Then it's time to enter start-up costs, and the fun of entrepreneurship may begin to fade. By adjusting the numbers, or clicking on and dragging points of the graph that charted a monthly projection of my sales, I was quickly able to adjust the slope, my Ramp Up Curve, to reflect a slow start-up period for my burger business.

Next The Profit Center calculated my employees' wages, telling me how many people I should hire and at what rate of pay. After checking at my local bank, I completed the Loan Information screen and adjusted both the interest rate and terms of the loan to accurately reflect my bank's terms. That was it. I was ready to look at my results. Could I make it big in burgers?

The Good News and the Bad News
The program offers results in the form of both tables and graphics. You can analyze fixed costs, variable costs, cash flow, and break-even points (see "Breaking Into Burgers"). Mine didn't look bad. (They didn't look good, either, but at least I'm making money.) I had about $19,000 in draw and profit to show for my first year of operation.

To top everything off, the program will print all the tables and graphs into a formal proposal that you can then take into a bank when applying for a loan. After the loan's approved and you sign your store lease, you can get Transoft's The Business Image, a HyperCard stack of logos you can use as a source of inspiration, to start designing your logo. Use their Capital Ideas to find financing when it's time to expand, and when you give it all up and decide it's time to work for someone else, you can use Franchise Finder to locate a likely franchise to invest in.

Start-up Problems
I was not entirely happy with the reports produced by the program, since I couldn't produce my projected cash flow in an annualized format or see the data in income statements or balance sheets. And there was no export facility to reformat the data in a spreadsheet.

Transoft also needs to get rid of some of The Profit Center's troublesome bugs. The word debt is misspelled in the Sales Breakdown report. The sections labeled in the table of contents were off by one page toward the end of the proposal report. When I reopened the program, all my customized cost data had reverted to the default setting, causing me a lot of extra work reentering data. And most annoying of all, my Mac SE kept bombarding just after the program finished printing my proposal.

The Bottom Line
The Profit Center took a business about which I knew very little and gave me an idea of its viability. For $695 it could help you avoid a mistake that could cost thousands of dollars. If it leads you into a successful business, the program will quickly pay for itself. Although no substitute for good advice and experience, it is a good starting place for discussing venture ideas with bankers and accountants.

—Alan L. Slay
See Where to Buy or circle 786 on reader service card.
Kurta gives you an absolute alternative.

There are "relative" pointing devices—the mouse. And then there are "absolute" input devices—Kurta IS/ADB® Input Systems.

Unlike a mouse that makes you always start wherever you left off last, and makes you push it to the next position, the Kurta IS/ADB's are exact devices. When you move to the top of the tablet surface, the screen cursor moves to the top of the screen. The pointing device and the screen cursor are in direct "absolute" relationship. So your hand and eye coordination is intuitively correct and more natural. This "absolute positioning" makes it possible to correctly accomplish freehand drawing and tracing. Get your work done absolutely faster and more comfortably.

A total "Input System" with programmable menu-strip. Kurta IS/ADB's give you a built-in "menu-strip" featuring 11 to 23 function keys. They can be loaded with time-saving, sophisticated macro commands or with simple keyboard shortcuts you create with Apple® Computer's new Macromaker®. Kurta also gives you the option to put the macros in your hand. Because our IS/PENWORKS® for Macintosh® ADB lets you load the macros and shortcuts on 4-button or 12-button cursor keys. To execute a command, simply quick click on the function key or cursor key instead of going up and pulling down from the menu bar. Fast action, no window flashing, and exactly the same way every time.

Cordless cursors and pens with no equal. In addition to corded models, Kurta offers award-winning cordless 4-button cursors and 3-switch pens. There are six Kurta pointing devices in all, including the new Kurta 12-button cursor for maximum application control with instant touch.

Built-in software gives you automatic ADB drive. Only Kurta ships a software interface driver in every package that makes more than 98% of all software Kurta-compatible. Kurta's IS/PENWORKS drivers for the Macintosh ADB and serial ports feature Kurta's exclusive "dynamic scaling" to miniaturize/maximize the active area—whether you are enhancing CAD applications on AutoCAD® or VersaCAD® or others, working with desktop publishing packages, or creating graphic designs.

A time to compare, a time to act.

1-800-44-KURTA

"Nobody does it better." PC Magazine
1988 Hardware Product of the Year.

It only looks like a tablet.

KURTA
3007 East Chambers
Phoenix, Arizona 85040
(602) 276-5533

Kurta, Color Swish, IS/ADB, and IS/PENWORKS are trademarks and registered trademarks of Kurta Corporation. IS/PENWORKS software is designed and developed by Software® Santa Cruz, California. Software is a registered trademark of Software Corporation. VersaCAD is a registered trademark of VersaCAD Corporation. Apple, Macromaker and Macintosh are registered trademarks of Apple Computer Corporation. AutoCAD is a registered trademark of AutoDesk Incorporated.
Plotters for people who want more, but can’t afford expensive.

The truth is, some companies can buy any plotter they want. But most companies have to be concerned about budgets, as well as quality and performance. That’s why Zericon’s line of large format plotters are becoming so popular. They’re made with exceptional craftsmanship utilizing advanced manufacturing techniques right here in the USA. Now you don’t need a big budget to afford a great plotter.

$1695. - $2995.

Starting at $1695 for our ValueLine™ D size, to $2995 for our Designer series A-E model, we make a large format plotter that’s just right for your application. Zericon plotters are compatible with all popular CAD software packages. They accept media sizes from 8½ x 11” to 36 x 48”. With .002” repeatability, quality is assured for even the most demanding application. And where scale is important, our X & Y calibration feature offers precision for critical applications like PCB artwork. “Installation is a Breeze” because we include a custom configured cable tailored to your software and hardware combination.

Call us today.

We’ll send you a free sample plot, provide full information about our entire line of large format plotters and outline our customer service program, which includes complete product satisfaction or your money back within 10 days of purchase. We’d like to win you over as a Zericon customer. And we’ve got the plotters to do it. Call us today. Zericon, Inc., 40491 Encyclopedia Circle, Fremont, CA 94538.
In CA (415) 490-8380. FAX (415) 490-3906. (800) 727-8380

ZERICON
More plotter. Not more money.
SMARTSCRAP & THE CLIPPER 2.0

Scrapbook and Clipboard Utilities

**Pros:** Unlimited scrapbook files; visual table of contents; search capabilities; easy manipulation of scrapbook and clipboard graphics. **Cons:** None.

**Company:** Solutions International.  
**Requires:** Mac Plus.  
**List price:** $89.95.

Pens and pencils, staplers and staple removers, notepads, Post-it notes, paper clips, calculator, and pencil sharpeners all make my life much easier. But I am careful not to let too many of these accessories overflow my desk lest they interfere with the main task at hand. I carry this philosophy over to the Mac's metaphorical desk accessories. Once I get near the limit of 15 DAs, I start getting rid of those I haven't used in a few months.

Among the most useful DAs I've found are those that take the originals a step beyond, like Calculator+ and Notepad+ (included in Borland International's SideKick). I've now added SmartScrap & The Clipper to my list of essentials. The package actually includes two separate DAs.

So Long, Old Scrapbook

SmartScrap, a replacement for the Mac's Scrapbook DA, allows you to have an unlimited number of scrapbook files, which can be stored on any disk (not just on the start-up disk). To find a particular graphic or block of text, you can use the visual table of contents that includes all the pages in miniature, search by a name (or part of a name) that you can attach to each page of the scrapbook, and switch scrapbooks.

When you choose SmartScrap from the Apple menu, the Scrapbook you had open last reopens to its first page. A SmartScrap menu appears on the menu bar. The SmartScrap window takes up the entire screen and includes scroll bars and the shrink icon. Clicking on a special icon in the lower left-hand corner moves you quickly to the next or previous page. Other icons on the bottom scroll bar enable you to switch between the marquee and the lasso and display the control panel at the top of the window. From that control panel you can create and display a page name and the file's table of contents.

SmartScrap allows MacPaint-like lasso and marquee tools that allow you to select only part of a graphic. If you want a selection from an object-oriented graphic to remain object-oriented, you must use the marquee tool. Anything you select with the lasso automatically becomes a bitmap when you copy it to the clipboard, even if it was originally part of an object-oriented PICT file.

**Getting a Perfect Fit**

The Clipper DA allows you to perform precise manipulations of graphics that you've copied to the Mac's Clipboard. You must first copy something to the clipboard, then select The Clipper from the Apple menu and paste into The Clipper's window. At this point The Clipper's window is transparent, enabling you to place it in the specific spot on an underlying page where you'd like the graphic to go. The Clipper allows you to manipulate a picture by either scaling or trimming.

When you choose Show Contents from the menu, the graphic appears against the normal white background (you switch back to the transparent window whenever you like). To scale, you can simply choose Scale to Fit from the menu, and the graphic will fill the entire window. You can be more precise by choosing Scale from the menu; you choose the precise size of the graphic, in pixels, millimeters, picas, inches, or by using percentages of the original graphic. You can also scale each dimension (horizontal and vertical) individually, or scale just one dimension and let The Clipper automatically calculate the other dimension so that original proportions are maintained. Trimming works in a similar fashion: you can trim a graphic—cutting off one part of it—to fit The Clipper's window or manually choose coordinates for each of the four sides of the graphic.

Working with The Clipper requires some patience and practice, but it operates quickly and you can experiment endlessly on a particular graphic until you get it exactly the way you want.

SmartScrap & The Clipper take up about 77K of disk space. They support 256 colors on the Mac II, seem to be bug-free, and work well with Finder 6.1 and System 6.02. They also run flawlessly under MultiFinder.

These elegant DAs attack straightforward tasks efficiently and simply; I highly recommend them to anyone who uses graphics on the Mac.—Jeff Merron

See Where to Buy or circle 793 on reader service card.
For information that’s invaluable, errors are insufferable. And loss is unthinkable. If the data you deal with is too important to trust to ordinary diskettes, insist on Mitsubishi. Manufactured to the world’s highest standards. To protect the world’s most important data.

Kasei Memory Products Inc. (A Subsidiary of Mitsubishi Kasei America Inc.)
535 Independence Parkway, Chesapeake, Virginia 23320. Telephone (804) 547-5477 1-800-274-1704.

Circle 65 on reader service card
OVALTUNe 1.0

Graphics and Music Software

Pros: Excellent tutorial-oriented manual; wide variety of features and options; innovative user interface; supports color monitor and MIDI equipment.

Cons: Limited appeal; copy protected.


What can you say about a well-written, well-designed program that has a multitude of features (including sophisticated graphics and sound capabilities), an innovative user interface, excellent documentation—in short, one of the best-executed software products you've seen in quite a while—that still doesn't manage to capture your excitement? I find myself in just that dilemma with OvalTune from Intelligent Music. On the one hand, I want to rave about one of the finest pieces of software engineering I've ever seen. On the other hand, I wonder how many people are willing to lay down money for a software program that does nothing more than draw pictures (in color if you have a Mac II) and play funky music while you move the mouse. Because I'm of two minds, maybe a split review is best...

Gene: You know, Roger, when I first started using OvalTune, I didn't expect a whole lot. I figured it was just another play-music-with-your-mouse program that happened to create pictures as well. I wasn't prepared for a set of graphics functions rivaling some paint programs: shapes, patterns, colors, palettes, symmetry, color cycling, ink types (including matte and the various color inks), clipping, and so on. In fact, the first section of the manual—which, by the way, is one of the best I've ever used—focuses just on the graphics capabilities before really talking about how to make music.

Roger: I appreciate your enthusiasm, Gene, but I don't share it. I found the program hard to get into. Unlike most Macintosh programs, OvalTune was neither obvious nor easy to use right off the bat. Instead, I had to carefully work through the manual page by page to figure out how to use each feature. I'll admit the manual was well done, but it's frustrating to have to work so hard in order to do anything interesting.

Gene: Given the variety of features, it's not surprising that it takes a while to master OvalTune. Even so, the basic idea is simple: you move the mouse, and OvalTune draws images on the screen and plays music based on those mouse movements. And like the graphics, the music capabilities are surprising. OvalTune comes with a large number of sampled instruments and sounds. You can load multiple samples, assign them to different channels, and decide which channels are playing at a given time. You can adjust the mouse response so that movements affect velocity, duration, and melody sequence. You can set up rhythm patterns and have them play independently or synchronize them with your performance. And I could go on for some time about the user interface, with its use of mouse, keyboard, menus, pop-up windows.

Roger: Those are impressive features, Gene, but what about the music they produce? I may be old-fashioned, but most of the music sounded like Max Headroom playing New Wave rock. I thought it might have been my own lack of creativity, but the examples that came on the disk weren't much better. And it was also hard to get much volume out of the music unless I hooked up the external jack to my stereo.

Gene: Well, I can't vouch for your taste in music, but I did find that the music sounded great when hooked up to some MIDI equipment, for example a digital piano and a multitimbral orchestra box. OvalTune allows you to assign each of its 16 channels to either serial port or to a loaded sample sound so that you can use sampled sound and MIDI equipment simultaneously.

Roger: That's great—if you have MIDI equipment and a MIDI interface for your Mac. But the number of sampled sounds that can be played at the same time is constrained by the type of Mac you have; just as the number of samples you can load is constrained by memory.

Gene: On top of all this, OvalTune has a "videotape" facility that lets you record performances, save them to disk, and then play them back. You can record music and graphics separately or together, play them back separately or together, and have either or both playing while you are performing. I recorded one of my better performances so that I could play it back for my wife, and as the manual mentions, distribute it to others.

Roger: Yes, but Gene, your friends can't do anything with it unless they have OvalTune and all the same sampled sounds. In other words, it's not a self-contained performance but just a set of instructions for OvalTune. Though in all fairness I'll note that you can save just the music portion of a performance as a MIDI file that can be read by some other programs.

Gene: There's a lot more I could talk about, like keyboard input and presets, but I can see we're running out of time. OvalTune gets a thumbs-up from me for its all-around excellence in design, performance, and documentation.

Roger: And I'm afraid OvalTune gets a thumbs-down from me. I really wanted to like this program, but it took determination to work all the way through the manual, and I'll probably never use it again. While acknowledging Zicarelli's time and effort I still question how much demand there is for a software product like this, especially at $145. But I guess that's what the marketplace is for.

—Bruce Webster

See Where to Buy or circle 783 on reader service card.
If you want to videotape the output of your MAC™ II, then don’t get led down a path of misintentions. Consider what you truly need for desktop video: an easy, complete, available solution. You need one that includes real-time video capture and NTSC-compatible output. You need Truevision’s NuVista™ 1M videographics card and VIDI/O™ Box.

Unretouched screen displays of a television set displaying the output of a Mac II using a NuVista card with a VIDI/O Box, and an Apple RGB monitor displaying the same image. Mac is a registered trademark and QuickDraw is a trademark of Apple Computer, Inc. © 1989, Truevision Inc.
The NuVista 1 M, with its high-speed video memory, real-time capture, fully-integrated genlock and broadcast-quality display, is ideal for desktop video production. With the NuVista card, you can capture, store, manipulate and display images from a standard video source. The NuVista 1 M also functions as your regular Mac II video card and will run all QuickDraw™ based applications, today and tomorrow. And it only takes up one slot in your Mac II or Mac IIX.

To record your NuVista display onto videotape (VHS, Beta, Super VHS or ED Beta), just add the VIDi/O Box. It transforms the NuVista output into a high quality composite video or S-Video signal for sharp, clear videotaping. That's all there is to it. The NuVista card and VIDi/O Box are all the production equipment you need to transfer your Mac II graphics onto videotape. Simply, reliably, and economically. Today.

So before you get hyper, turn to Truevision, the world's leading supplier of videographics cards for personal computers. We've been helping people integrate graphics and video for years. And your Authorized Truevision Reseller can show you how, with the NuVista 1 M ($3370) and VIDi/O Box ($995). It's not hype, it's real TV from your Mac, and Truevision. Call us at 800/858-TRUE to obtain our fact-filled brochure about videographics, True color? True answers, or to locate the Authorized Truevision Reseller nearest you.
FastNet's intelligent Ethernet™ communications products put a network computer right on your Mac's desktop. For—
- network bridges
- network gateways
- terminal emulation
- shared peripherals
- high processor overhead activities...

FastNet thinks about it so you don't have to.

With their own 68000 microprocessors, FastNet intelligent communications products think about the future, too. FastNet II, FastNet AE, and FastNet SCSI offer you a platform from which you may expand your capabilities and develop new ones.

If you don't need the additional processing power that intelligent FastNet products provide, Dove also has several Macintosh™ Ethernet adapter solutions in the FastNet family. They support all types of full function networking applications and today's most popular protocols.

Dove Computer Corporation offers more Ethernet solutions for your Macintosh than anyone. Think FastNet. Call us toll free 1-800-622-7627.
MacProject II gets a new look this month. I also review programs that help you back up your hard disk, use MultiFinder even if you only have 1MB of RAM, and get skinny.

MacProject II 2.0
In my review of MacProject II from Claris Corporation (*Macworld*, August 1988), a major criticism was that the product didn't link resources and tasks closely enough. I complained that if you have one resource, say an employee, scheduled to work on two or more conflicting tasks, the program would show the conflict, but would not reschedule the project to relieve it. MacProject II version 2.0 corrects this shortcoming with resource leveling. You can assign a priority percentage—from 0 to 100—for each task. If a resource is scheduled to be used in conflicting tasks, the resource-leveling utility postpones some tasks, beginning with those that have the lowest priority ratings. If you select Interactive Leveling in the Preferences box, the program displays a dialog box with three possible solutions for each conflict. You can choose to reschedule the task (MacProject suggests the best date), decrease the percent of effort by the resource (for example, decide to use an employee only half-time on each task), or substitute a different resource.

Unfortunately, version 2.0 doesn't correct my second major criticism: it uses a nonstandard schedule chart that can be difficult to read with complicated plans. There are a number of minor enhancements, however, that when added together, do make the chart easier to read. For example, critical path activities, which cannot be delayed without delaying the entire project, used to be displayed in bold. Now they also have a drop shadow, which makes them easier to pick out in the jumble of activity boxes. You can also view multiple charts and save that view so that you can recall the same combination of windows later. In reduced mode, you can now cut, copy, paste, and add dependency activities. MacProject II 2.0 costs $499; you can upgrade from version 1.0 for $65 or from Apple's MacProject for $199. If you purchased version 1.0 after February 1, 1989, contact Claris for upgrade information.

In my original review, I summarized the differences between MacProject II and Micro Planner Plus (the other Mac project planner) as being that MacProject II was easier to learn and use; while Micro Planner Plus had resource-leveling ability and more-readable charts. Now MacProject II has resource leveling; its schedule chart is at least slightly more legible; and it is even easier to use and learn with its spelling checker and HyperCard-based help screens.

MF Launcher II 1.0
If memory limitations keep you from running the applications you want under MultiFinder, MF Launcher II from Impossible Dreams Software ($49.95, bundled with MFDetective 1.0) can help you better organize your RAM. The programs provide charts to show exactly how the Mac is using its memory. The main screen shows how much memory is available. You can use that number to determine if a particular application will fit in memory or decide how much memory to allocate to your applications.

The MFDetective chart is especially helpful when the problem is not a lack of memory but fragmentation. For example, if you open three applications, each of which requires 250K of RAM, one after another (we'll call them A, B, and C) and then you quit applications A and C, you now have 500K of free space. But the free space is discontinuous, or fragmented,
since application B stands between the two 250K areas of free space. You will not be able to open application D, which requires 500K of RAM because applications can only fit into continuous sections of free space. The solution is to quit application B and reopen it. That moves B up to the top of the memory ladder and combines the free space that had been on top of and below it into one continuous block of 500K. The MFDetective chart (see “Where Your Memory Is Going”) displays the amount of free space and which applications have to be reopened to defragment. MFLauncher also helps you run MultiFinder by replacing the Finder, which uses about 160K of memory. The entire MFLauncher program uses only 40K of RAM. In return for saving 120K of memory, all you lose is the Finder’s icon interface.

MFLauncher

If you’re trying to run MultiFinder with 1 megabyte of memory, MFLauncher is practically a must. If you have more memory but still sometimes find yourself squeezed, this can help.

HFS Backup 3.0

HFS Backup from Personal Computer Peripherals Corporation ($99 upgrade from 2.0 or MacBottom $35) is a hard disk backup utility that does all the things you would expect: it can back up and restore all files, selected files, or all modified files. But it also has some features not found in more basic backup software. For example, it can back up by class (all applications, all documents, or all System files). Or it can back up all files created by a specific application; all files whose names start with, end with, or contain a pattern of characters; or all files modified before or after a given date.

Most backup programs fill the destination volume to capacity, which prevents modified files from replacing older versions of the files during subsequent backups. HFS Backup allows you to reserve a “pad” of blank disk space next to each file (from 0 percent to 500 percent of the file size) so that new files can overwrite the older ones.

The most unusual part of HFS Backup is its ability to create a single volume in Finder format out of a set of floppies. Other backup programs allow you to save large files on multiple disks, but they use a special format that prevents the files from being opened without first restoring them to the hard disk. With HFS Backup, you place the first floppy of the set into the drive, and a special disk icon appears on the Finder. When you open files from this set, the program allows you to insert the correct disks.

It’s hard to think of anything that Personal Computer Peripherals has left out of its software. If you want a complete backup utility, HFS Backup has just about everything.

Two-Minute Nutrition Manager 1.0650

If you are really serious about tracking nutritional and caloric intake, the Two-Minute Nutrition Manager from DPEX ($99) can help you design and track a weight-loss plan. Once you set up the system, it can, in fact, take only two minutes of your time every few days. Setup, however, can take hours, so it might not be worth the time if you only want to lose a few pounds.

You begin by inputting your height, weight, age, sex, and activity level. The program then displays an ideal weight. You type in the number of pounds you want to lose each week, and the program specifies the caloric intake broken down by food group (milk products, fruit, bread, and so on) required for that goal.

The program comes with a database of about 2000 foods analyzed for calories and nutrients. You use this list to create recipes and meals (see “Planning Nutritious Meals”). The program calculates the total nutritional and caloric value for the recipe or meal. Even with this help, the process of combining foods into a satisfying variety of low-calorie, nutritional meals can take hours.

The final step is to assign meals. As you do, the program displays the total daily caloric intake of those meals (broken down by food group) and compares the total intake with the goal. You can also specify meal preferences using a rating system. The program then automatically assigns meals based on preference.

The Two-Minute Nutrition Manager has some other nice features. For example, it provides charts to compare actual weight with the goal; it can generate a weekly shopping list; and it comes with a journal to help you analyze the food actually consumed during the week.

For about the cost of an initial consultation with a nutritionist, this program will help you set up a professional weight-loss plan. You’ll have to put in some effort, and you’ll miss out on human encouragement, but the Two-Minute Nutrition Manager might be just the ticket for the do-it-yourself dieter.

See Where to Buy or circle 777 (MacProject II), 767 (HFS Backup), or 798 (Two-Minute Nutrition Manager) on reader service card.
Quality You Can Count On

SCSI Storage Systems For The Macintosh

20 MB to 1.2 GB - Internal and External - Fast as 10.7 ms
60, 150 and 320 MB Streaming Tape Backup Systems
45 MB Removable Cartridge Hard Disk Drives
AppleTalk and A/UX Compatible

Call for data sheets and the name of your nearest dealer. Dealer inquiries invited.

Manufactured By:
MicroNet Technology, Inc.
13765-A Alton Parkway • Irvine, CA 92718
TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: D1656 • Compuserve: 76004,1611

Distributed By:
CAL-ABCO
6041 Variel Avenue • Woodland Hills, CA 91367
Sales: (800) 469-2226 or (818) 704-9100 ext. 311
FAX: (818) 704-7733 • Canada: (800) 387-4345

Circle 275 on reader service card
Once one person starts using color, everyone will want to. Thankfully there's plenty to go around. Because there's the Phaser CPS Color Print Station. It's a 300-dpi thermal wax printer with a PostScript-compatible controller, which takes care of spooling and AppleTalk networking. The CPS also expands for more printers, memory and controller cards. Or if you already have a Tek 4693DX, just add a Phaser CPS controller and you add PostScript-compatibility. The Phaser family from Tektronix. Bringing you beautiful, living Teknicolor. Call for the dealer nearest you, 1-800-835-6100, Dept. 2C.

Raising Bunnies Can Be A Fertile Investment.

For just a small investment you can get started in the exciting world of rabbit breeding.

Bunny Medical
Bunny Entertainment
Bunny Food

Cost Breakdown:

Raising Bunnies Can Be A Fertile Investment.
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**

**Color PostScript RIP**

**ColorView 5913**

**GRI ProPlotter**
Large-format pen plotter for desktop-CAD users. Produces D-size engineering drawings (Size 4 architectural) and final drawings up to 22 inches by 34 inches on a variety of plotting media. $1995. Gerard Research, 415/651-0217.

**HP Scanjlet Files Output**

**HP Scanjet Plus**
Eight-bit flatbed scanner with 256 levels of gray, 1500-dpi resolution, and Mac desk accessories. Lets you adjust output resolution to avoid moiré patterns. Includes interface bit for DOS. $2190. Hewlett-Packard, 303/350-4444.

**HyperBoard**
Stand-alone data acquisition and process control board designed to extend functionality of HyperCard. Plugs in to the serial port, includes 32K RAM, and has on-board BASIC interpreter. $1399. HyperTrol, 303/938-1662.

**MacConnect Model NIA310**

**MacSprint II**
Cache card that increases the Macintosh II's performance by providing a 32K direct-mapped cache between the system main memory and the 68020 processor. $299. Orchid Technology, 415/683-0300.

**Maxi RD45 Series**
Series of 45MB internal and external removable Winchester disk drives. Internal sub-system $1325; external sub-system $1625; Mac Plus/SE/II interface kit $80. Sysgen, 408/263-4411.

**Pixelink Monochrome Monitors**
The 17-inch portrait monitor has resolution of up to 1280 by 1600 pixels; the 17-inch landscape monitor offers resolution of 1280 by 1024 pixels or 1600 by 1280 pixels; and the 20-inch landscape monitor offers resolution of up to 1600 by 1280 pixels. 17-inch portrait monitor $1795; 17-inch landscape monitor $1695; 20-inch landscape monitor $1795. Pixelink, 508/562-4803.

**Pronto**
Cache card that functions as a SCSI host adapter. Works with any internal or external SCSI device, supports asynchronous and synchronous SCSI data transfers. $745. Golden Triangle, 619/279-2100.

**REO-650 Disk System**
Removable, erasable optical 650MB disk system. Includes SCSI interface and software. $5995. Interface series II Twinax with S/3xLink or IBM 5250 software $1495-$3595; single port series with software $1195. KMW Systems, 512/338-3000.

**Series II Twinax**
Protocol converters that enable a Mac or an IBM PC connected to an IBM AS/400 to emulate an IBM 5251 or 5291 terminal. Multiport SERIES II Twinax with S/3xLink or IBM 5250 software $1495-$3595; single port series with software $1195. KMW Systems, 512/338-3000. (continues)
2400X Modem

SOFTWARE

ACE
Acts as a hard disk access manager with multilevel security; protects against known and future viruses. You customize security protocols and establish levels of security using passwords and encryption. $279; 5-site pack $895; 10-site pack $1495. Casady & Greene, 408/624-8716.

AudioCad
Loudspeaker CAD application that displays the frequency response of loudspeaker driver/box combinations you specify. Can overlay multiple plots. Has expandable driver library, and calculates vent and enclosure dimensions. $95. Carvin, 619/747-1710.

Cricket Color Paint
Color paint package with FreshPaint feature lets you treat any drawn shape as an object. Lets you save images as tools in a personalized tool palette and create custom color blends; contains a texture tool. $295. Cricket Software, 215/251-9890.

DiagramMaker
Integrated graphics and text program for the production of drawings and presentation graphics. Includes editable palette, object linking, background and foreground drawing, and the ability to keep connected objects joined when moving or resizing them. $125. Action Software, 919/942-1111.

DiskLock
Utility that write-protects Macintosh hard disks, floppy disks, and hard disk partitions for data security as well as security against virus infection. $45. GS Software, 703/860-5722.

Fusion
HyperCard card- and stack-management software. Merges all cards or a group of cards from one stack to another. Can also be used to delete a range of cards or entire stacks. $24.95. Reliable Innovation Every Time, 612/537-8910.
HeartWood
Genealogical stackware designed to create and maintain information on a family using text, pictures, and voice. Automatically creates family trees from both an ancestor's and a descendant's point of view. $65. HeartWood Software, 203/374-7481.

HyperComposer
HyperCard sound and music stack that lets you compose, edit, view, play, and print in two modes. Gives you the ability to import and export sounds for use in HyperCard stacks. $69.95. Addison-Wesley, 617/944-3700.

HyperProject
Object-oriented project management software that allows eight windows to be open simultaneously. Windows may be various views of a single project or several different projects. Supports full precedents diagramming, has customizable spreadsheet view and report generator, and incorporates simple CAD techniques. $59.95. Hyper-Project, 213/722-8709.

InfoLogic Envelope
Envelope-printing software that lets you use fonts in all sizes and styles; prints directly on the envelope. Stores names and addresses in HyperCard stack. $37. InfoLogic Software, 518/370-5510.

MacSearch
Software for researching available Mac software and associated prices. Also lists Macintosh trade shows, expositions, and seminars. Two-disk set. Subscriptions available. $12 plus $2 s/h. Master Manufacturing, 213/694-6861.

MacTracer

MacWisc-R
Software to help school psychologists analyze and generate hypotheses about students' performance on the Wechsler Intelligence Scale for Children—Revised. Lets you automatically graph scores. $29.95. B.H.C. Publishing, 609/799-2061.

MathCAD
Based on PC version of MathCAD. Lets you define variables and input text and formulas anywhere on the screen. Key computational features include comprehensive matrix arithmetic, trigonometric and inverse trig functions, hyperbolic functions, integrals, and derivatives. Does random number generation. $495. MathSoft, 617/577-1017.

MacLauncher II with MFDetective
Finder replacement utility for use with MultiFinder. Comes with utility that gives graphic (continues)

Now you can milk your Macintosh for all it's worth.

to your work: 256 colors for the Macintosh II and 8 colors for the Macintosh SE. For just $1,395. Plus $125 for an interface kit that connects cleanly and simply.

We'd like to hear from you. Just call 1-800-752-0900, Ext. 688C, for your nearest authorized HP dealer. We'll be happy to send you a sample color page. Complete with cows.

Circle 344 on reader service card
We invented IRMA™ to connect IBM® PCs and compatibles to mainframes. But when Macintoshes® arrived, our invention had to be reinvented. So out of IRMA technology, MacIRMA™ was born. With complete terminal emulation and file transfer functions. Plus IBM mainframe graphics and industry standard APIs. All of which should make it a necessity to add this to your DCA® file.
DCA Enhances Mac-to-Mainframe Offering

New MacIRMA Emulation Board Includes Background File Transfer

By Tara Sexton

Digital Communications Associates Inc. (DCA) last week expanded its Macintosh-to-mainframe connectivity options with a new version of its MacIRMA terminal emulation board.

The MacIRMA L2, which is compatible with the Apple Macintosh IIx, SE, SE 30 and Macintosh IICx, announced last week, offers a wide range of new capabilities, including background file transfer. The board features a high-speed serial interface for enhanced data transfer rates, as well as a 3270 protocol interface for compatibility with IBM mainframe systems.

DCA’s Mac IRMA Graphics permits users to access IBM mainframe graphics applications from the Mac II and Mac SE, cutting and pasting between those applications and Mac programs.

Mac-to-Mainframe Connectivity

Using the Mac as a Front-End Processor to an IBM Host

Using Digital Communications Associates' MacIRMA board and software, end users can create custom applications in which the Mac serves as a front-end processor to the host. An application might, for example, allow the Mac automatically compile source code, create print documents, or produce mailing labels. The Mac could then access the compiled code in a graphical interface, automatically send the results to a predetermined list of users, and perform any other task that the application requires.

DCA Unveils Graphics Emulation for the Mac

Let's Users Access IBM Mainframe Apps

By LAURIE FLYNN

Mac users are no longer locked out of IBM mainframe graphics applications after last week's announcement of a new software from DCA Inc.

The program, which is called Mac IRMA Graphics, is now available in four versions: Mac IRMA for the Mac II, Mac IRMA for the Mac SE, Mac IRMA for the Mac IIx, and Mac IRMA for the Mac SE 30.

The software enables Mac users to access IBM mainframe applications through a direct connection or a networked connection to an IBM mainframe server. Users can access IBM mainframe applications such as financial reports, spreadsheets, and word processors directly from their Macintosh computers.

Customer Representative
Marketing Information Group

1000 Almanor Drive
Alpharetta, GA 30001-0899
1-800-241-8762, Ext. 53
In Georgia 404-447-5900, Ext. 53

Circle 241 on reader service card
Diamond quality in SINGLE IN-LINE MEMORY MODULES for Mac Plus, SE, II, Iix

- 1, 2, 4, or 8 Megabytes
- Easy to Install
- Low Profile SMD CMOS
- Manufactured in USA
- Static Protected
- Nationwide Distribution
- Same Day Delivery

Expand your Mac memory by 1 to 8 megabytes with Diamond-Pac SIMM modules, the Mac's "best friend". The many facets of Diamond-Pac include state-of-the-art CMOS DRAM surface mount technology, 100% testing, "fail safe" installation instructions, and a lifetime guarantee. All combined to ensure your Diamond-Pac's are forever. Get the best quality SIMM modules, at competitive prices. Government & University PO's welcomed. Call Today.

AMERICAN MICRO DISTRIBUTORS, INC.
16897-D Algonquin, Huntington Beach, CA 92649
714/840-5560 MC VISA AMEX
FAX: 714-846-0570

Diamond-Pac is a trademark of AMDI
Mac is a trademark of Apple Computer Corp.
Circle 403 on reader service card.

NEW PRODUCTS

display of the Macintosh's memory and shows where each open application is located. $49.95. Impossible Dreams, 714/738-7752.

Multi-Ad Creator
Object-oriented page-layout software for the Mac that includes free rotation of grouped graphics and text, copyfitting, suggested layouts, and controlled duplication of objects. $995. Multi-Ad Services, 309/692-1530.

Physician's Medical Database
Physician's office manager for individual or group practices. Based on Double Helix II. Includes 30-day, 60-day, and 90-day delinquency billing, complete and YTD patient records, welcome letters, and Medicare listings. Full version $750; demo disk $60. Datadyne Systems, 914/381-5704.

Picture Book
Utility DA that manages clippings from any application. Stores clippings in multiple scrapbooks; opens unlimited windows and cuts and pastes across them. Clipboard editor lets you resize and crop images before pasting. Prints scrapbook catalogs or selected clippings. 512K min. memory. $49.95. Loop Software, 800/288-7631.

PicturePicture
Software that converts Lotus 1-2-3 or Symphony graph files into editable MacDraw PICT files. Compatible with various drafting programs. $99.95. Carl Carlson, 602/628-7389.

PathFinder
Stack-mapping utility for use with HyperCard. Runs in the background collecting information on your HyperCard session. Draws a map showing where you are and where you can go in the stack. $59.95. Silk City Software, 203/228-0091.
**Pro Plus Accounting**
Accounting software designed for small to medium-size businesses. Contains general ledger, accounts receivable, accounts payable, inventory control, and payroll modules. Individual module $350; set of all modules $995. Pro Plus Software, 602/461-3296.

**Real Estate Edge**
Software to help real estate brokers and agents “farm” regions through mass mailings. Program contains a word processor; prints envelopes, mailing labels, and shipping labels; imports and exports files; stores history of mailings. $295. Metropolis Software, 415/322-2001.

**Real Estate Power of Attorney**
Word processor designed to create, edit, and print legal documents for real estate. Uses structured data-input method to read real estate documents and find all locations where client-specific information is needed. Prompts for appropriate information. 1MB min. memory. $1495. Tronsoft, 805/564-3386.

**Scheme Express**
Implementation of LISP designed to operate like Lightship Software’s MacScheme but lower in cost. Runs with 0.5MB of memory. 512K min. memory. $69.95. Lightship Software, 503/643-6909.

**SimCity**
City planning simulation; creates a city in which you can zone land, balance budgets, install utilities, manipulate economic markets, and the like. 512K min. memory. $49.95. Maxis Software, 415/376-6434.

**Stabilizer II Budget System**
Budget system designed to stabilize cash flow by calculating a standard amount to save each month or pay period based on your expenses. $25. Scott McGillard, 1515 Arborview, Ann Arbor, MI 48103.

**StickyBusiness**
General-purpose labeling software for designing and printing labels, cards, and tags. Does measuring, calculating, and alignment of label forms in the printer. $179.95. Williams & Macas, 800/752-4400 or 509/458-6312.

**TeleFinder**
Communications software with automated dialing, procedure (continues).
At Jasmine, the state of the

- Put the revolutionary BackPac on your Mac Plus or SE, and gain extra power and storage without losing portability. 20MB: $649. 40MB: $799. 80MB: $1099. 100MB: $1299.
- The TalkBac 2400 Baud internal modem is Hayes AT-compatible, fits right into the back of the BackPac. $199.
- For reliable mass storage, the DirectOptical Drive features a removable, erasable cartridge with 300MB of storage on each side. $499.
- Only 12 ounces and about the size of a mouse, the stand-alone TalkBac 2400 Baud modem gives you greater performance per pound. $269.
- For the capacity of a hard drive plus the convenience of a floppy drive, the MegaDrive removable media system lets you store 10 or 20MB of data on a single, removable MegaFloppy disk. Awarded the 1988 World Class Award by Macworld. (20MB model shown at right.) 10MB: $699. 20MB: $999.
- We can't show you the InnerDrive, since it's already installed inside this Mac II. And since it's incredibly quiet and 33% cooler than most other drives, chances are you won't notice it even when it's running. (Also available for the SE.) 40/SE: $649. 40/II: $649. 80/SE: $949. 80/II: $949. 100/SE: $1099. 100/II: $1099. 140/II: $1499. (Mac II only)
- The DirectDrive XL free standing mass storage sub-system offers 1.4 gigabyte capacity and optional tape backup. Custom configurable and powerful enough for dozens of applications from CAD to LAN to desktop applications. $3999.

art is always a state of mind.

publishing. (Call for pricing.)

- With the DirectServe dedicated file server running your network, you’ll be able to share peripherals and send and receive files more economically than ever before. (Call for pricing.)

- The DirectDrive Series gives you more than more megabytes for your money: They’re thoroughly tested, incredibly fast, and come with 10MB of disk utilities and shareware. 20MB: $549, 40MB: $699, 80MB: $999, 100MB: $1199, 140MB: $1499, 300MB: $2795.

- With the amazing DirectTape backup system, backing up data is as easy as it is fast. Provides 40MB of storage for a single user, or an entire network. $699.

- The DirectPrint 300-dpi printer is PostScript page description language-compatible and uses liquid crystal shutter technology for a superior printed image. 1989 Eddy Award winner. $3495.

Jasmine

1-800-347-3228

Circle 102 on reader service card

DirectServe XL, DirectServe, DirectTape, and DirectPrint are trademarks of Jasmine Technologies, Inc. PostScript is a registered trademark of Adobe Systems, Inc. Macintosh is a registered trademark of Apple Computer, Inc.
MICROTEK Presents
The Self-Feeding Scanner
With A Real Appetite For Words.

It has often been said that a picture is worth a thousand words. Yet in business, it's words that we use to communicate with most often.

Which is why Microtek has developed the MS-II™ desktop scanner.

The Microtek MS-II scanner is the first desktop scanner designed specifically for Optical Character Recognition (OCR).

It will scan words into your computer with the same exact precision that ordinary scanners let your computer receive pictures.

The MS-II works with all of the most popular OCR software programs including OmniPage™, TrueScan™, Read-It™ and Read Right™. Simply choose the program that best meets your needs.

Then instead of having to tediously retype reports, financial statements and other already printed information, you can quickly scan them into your word processing, database or spreadsheet programs. Fifty pages at a time!

Of course, the MS-II also recognizes pictures and other graphics and scans them just as accurately. In up to 64 shades of gray.

Which means you can incorporate black and white halftone photographs for desktop publishing.

The MS-II works with virtually every kind of desktop computer. From Macintosh® to IBM® PC-XT/AT™, PS/2™ models and compatibles.

If you’re working with words, you owe it to yourself to see a Microtek MS-II in action. Call 1-800-654-4160 or in California, 213-321-2121 to find the Microtek dealer nearest you.

Do it today. Because we’re sure you'll agree that the MS-II’s appetite for words far exceeds your appetite for typing.

MICROTEK
Better Images Through Innovation.

Circle 158 on reader service card
language, and online mail that supports text, graphics, and all Mac files. Text-driven communications compatible with MCI Mail and CompuServe. Uses proprietary TeleFinder protocol. $145. Spider Island Software, 714/669-9260.

TestWorks
Test generation, test administration, and records management software. Program allows creation of roster of 100 student names with contact information and test scores. Exams are given using the Mac, and results are automatically updated in student roster. $195. TestWorks, 714/859-0235.

Treacyfaces
Typeface collection for the Mac. TF Habitat and TF Forever are the first two font families of the series, in four weights each: roman, italic, bold, and bold italics. Scalable to any size. Can be manipulated by a variety of page-layout and graphics-modification programs. 1MB min. memory. $70 per four-weight package, including PostScript outline font file and bitmap screen-font set. Treacyfaces, 215/896-0860.

Treacyfaces
Vector

VersaCad Drafter
Two-dimensional CAD drafting program for mechanical and architectural designers. Has floating point accuracy to 16 decimal points of precision; unlimited visual symbol libraries. Edits, groups, dimensions, pans and zooms, grids and snaps, and cuts and pastes. 1MB min. memory. $995. Versacad, 714/960-7720.

Visual Business No. 5
Presentation software that creates 2-D and 3-D charts and graphs with color-shaded backgrounds and a variety of text styles. Output Manager software rasterizer outputs to any film recorder or to color printers. 1MB min. memory. $295. Visual Business Systems, 201/527-2526.

Window Workshop
Desk with expandable application programs, MPW Tools, and MPW shell scripts related to the Mac II color window manager. Has an object-oriented customized ROM interface. $20. Amplified Intelligence, 916/737-1550.

WordMaker
Word processor that gener-
Open stacks without going out to get in

Need your stacks while working? Don’t leave your application to go into HyperCard. Use HyperDA, the stack-browsing desk accessory. Copy text or art to Clipboard, even print and dial—on any Macintosh at any time. HyperDA, $69.00 wherever you buy software.

MacKablit System
Heavy duty 10’ steel cable (7 x 19) secures and locks computer, printer, other equipment, up to 4 components. The unique MacKablit system includes 2 brackets that snap into existing slots on the Macintosh keyboard and computer. Additional hardware included for other Mac peripherals (disk drive, printers). The unique MacKablit system utilizes existing security slots on the keyboard and computer and existing screws in other peripheral equipment. The system includes 2 brackets for the security slots plus unique Kabit fasteners for peripherals. Cable passes through Kabit fasteners, preventing removal of screws.

Word Wrapper
Utility that transforms data from online services into files that can be formatted by Mac word processing programs. Converts hard carriage returns into spaces, recognizes paragraphs, and replaces designated number of spaces with "." Characters. 512K min. memory. $20. ITDC, 415/929-0924.

XTreeMac
Integrated disk-management utility that uses graphics to represent files on disk in a tree display. Contains features to make files “invisible” for security protection, has undelete function, and provides Deskpad work area where you may work with files without changing them. $99. XTree Software, 805/541-0604.

Secure-It, Inc.

EXCLUSIVE!
Proprietary components (Pat. Pend.) permit only your key to release MacKablit. When ordering multiple units, specify locks to be keyed differently or alike. Specify Mac, Mac Plus SE, or Mac II. Other Kabit systems for IBM, Apple, others.

Money back if returned in 30 days. Phone or send check.

MacWorld, 50

Prevent Macintosh Theft!

$39.95 + $3.00 shipping/handling
Quantity pricing also available for multiple purchases from schools, institutions, businesses, industries, etc. Send P.O.

Secure-It, Inc.
18 Maple Court
East Longmeadow, MA 01028
800-651-7692 413-525-7039
Dealer Inquiries Invited

Circle 239 on reader service card

Circle 302 on reader service card

New Products

ACCESSORIES

A Better Mouse Trap
Mouse storing pouch attaches to the side of the Mac with Velcro. $8.95. Peri-Peripheral Company, 206/486-3003.

Le Shield

BOOKS &VIDEOS

HyperTalk
HyperTalk guide that is part of the Microsoft Press Programmer’s Quick Reference Series. For new and seasoned HyperTalk script writers. More than 200 entries on syntax definitions, examples of common usage, and functional variances between versions of HyperTalk. $5.95. Microsoft Press, 206/882-8080.

MIDI Programming for the Macintosh
Book for programmers and musicians with varying levels of programming and MIDI experience who want to write Mac music software using MIDI conventions. Book $22.95; book and disk $37.95. M&T Books, 415/366-3600.

NEW PRODUCTS

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA, 94107. We reserve the right to edit press releases.
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.

RAINBOW TECHNOLOGIES
18011-A Mitchell South, Irvine, CA 92714 • (714) 261-0228 • TELEX: 386078 • FAX: (714) 261-0260
Rainbow Technologies, Ltd., Shirley Lodge, 470 London Rd., Slough, Berkshire, SL3 8QY, U.K., Tel: 0753-41312 Fax: 0753-43610
©1989 Rainbow Technologies. All product names are trademarks of their respective manufacturers.

Circle 106 on reader service card
Quicken (Intuit)
NEW Version 1.51
Forget Financial hassles with Quicken, the world's #1 selling finance software. It's the absolute fastest, easiest way to do your personal or small business bookkeeping. Quicken slashes the time you spend on your finances by automating all your routine financial tasks, from printing recurring checks without typing, to providing detailed tax deduction summaries instantaneously. Flexible, comprehensive financial reports on screen or on paper...income and expenses by category, budget vs. actual comparisons, and more. (finance) $32.

HYPERWARE
Activision
Focal Point II ........................................ 119.
Bantam
Complete HyperCard Handbook ......... 23.
Beacon Technologies
HyperCard International Version ... 195.
HyperCard King James Version ....... 159.
BrainPower
ArchTec ........................................ 179.
Bright Star Technology
HyperAnimate ...................................... 99.
HyperPress Publishing
Script Expert ...................................... 46.
ICOM Simulations
HyperTV .................................... 75.
MacroMind
VideoWorks II HyperCard Driver ....... 60.
Micrososs
HyperAtlas .................................... 64.
PowerUp
HyperHub II .................................. 29.
Silicon Beach
SuperCard .................................... 135.
Springsoft
Family Matters ................................ 28.
Symmetry
HyperTex ..................................... 35.
TimeWorks
HyperWorks Organizer ..................... 60.
Trendware Corporation
HyperTools #1 or #2 or ... ea 89.
Stack Cleaner ................................ 29.

UTILITIES
Affinity
Tempo II ...................................... 89.
ASD Software, Inc.
FileGuard ........................................ 129.
Berkeley System Design, Inc.
Stamping Out II ............................... 52.
CE Software
DeskTop 3.0 ................................. 27.
QuickKeys (macro programmer) ....... 52.
Caeer
OmniPage 1.0 ................................. 559.
Central Point Software
Copy II Mac (with MacTools) ............ 20.
PC Tools Deluxe For Mac ................. 45.
Design Software
MacsAll Plus .................................. 46.
Edison City Software
LaserJet 1.0 ................................... 187.
Fifth Generation
FastBack II .................................... 109.
PowerStation ................................. 32.
Pyro ........................................ 15.
Suitcase II ...................................... 45.
HJC Software, Inc.
Vires .......................................... 89.
ICOM Simulations
On Cue ......................................... 36.
Insight Development
Ken Marsh ...................................... 79.
Macsafe or NightWatch ................. ea 87.
LAC Ltd.
SilverServer ................................. 89.
Magic Software
POWERCRONS ................................ 29.
XPerience ..................................... 39.

DESK ACCESSORIES
Affinity
AffinFire ....................................... 46.
Casady & Greene
QuickDex ................................. 32.
Exodus Software
ExpressWrite ............................... 65.
Retriever .................................... 59.
Preferred Publishers
Database ...................................... 75.
Vantage ...................................... 99.
Solutions
SmartScript & The Clipper 2.0 ................ 46.
TempoI/O .................................. 49.

LANGUAGES
Digitalk, Inc.
Smalltalk on MAC .......................... 139.
Manx Software Systems
Axe or Uniteks .............................. ea 65.
Aztec C or SDP or C-MPW .......... ea 99.

DATABASE SOFTWARE
AcIus
4th Dimension ............................ 389.
AEC Managagement Systems
AEC Information Manager ............ 115.

Pixel Paint 2.0 (SuperMac)
The first and best selling color paint program for Macintosh color systems has now been enhanced. Equipped with a new set of powerful features for graphics, desktop publishing and color prepress work Comes with built-in Pantone color picker, color separations, with screen calibrating, and NoiseScan (new color scanning utility). Choose PixelPaint as your complete solution for color graphics. (graphics) $199.

Microsoft
QuickBasic ................................... 65.
Smethers Barnes
Prototyper ................................. 149.
Symantec
CAPP's Lightspeed C or Pascal ...... 49.
Lightspeed C 3.0 .......................... 169.
Lightspeed Pascal .......................... 95.
Zedcor
2Basic 5.0 .................................. 99.

COMMUNICATIONS
CE Software
QuickMail 2.0 ............................... 205.
CompuServe
CompuServe Navigator .......... 139.
DataVIZ
MacLink Plus w/Cable 3.0 ............ 139.
FreeSoft
HyperRider 10.3 ........................... 54.
Hayes
SmartCom II 3.1 .......................... 88.
Signia Solutions
Soft PO (Mac II) ....................... 249.
Lamir
Acknowledged ......................... 329.
Software Ventures
Microphone III .......................... 225.
Solutions
BackFAX (req. Apple Fax modem) ... 127.
Traveling Software
LapLink ..................................... 83.

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.
12 issues just $24.

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666
Be a Mac master.

☐ YES! Send me 12 issues of MACWORLD for $24. Save me almost 50% off the annual cover price of $47.40

☐ YES! YES! Send me 24 months of MACWORLD for $37.90

12 issues for $47.40

NOW only $24.00

Name __________________________________________

Company _______________________________________

Address _______________________________________

City  State  Zip __________________________________

☐ Payment enclosed.  ☐ Bill me later.

Basic subscription rate for Macworld is $30 for 12 issues. The annual cover price is $47.40 (12 issues). This rate limited to U.S.A. and its possessions. Please allow 6-8 weeks for delivery of your first issue.
FREE OFFER

The brand new edition of the popular POWER USER'S TOOL KIT - Version 2.0 is now available. Seventeen great programs on one handy disk compiled by Steven Bobker. It includes a complete virus detection and repair kit!

And it's FREE with any purchase. You pay only $1.50 postage and handling if you want the disk. The programs are shareware, so you can try the software free of charge. If you wish to continue, some authors ask that you send them a small fee ($5-$25). Many of the programs are absolutely free. All of the details are explained on the disk, which is yours to keep any way.

FREE CATALOG
You'll also receive our brand new 1989 catalog. Hundreds of new products, product reviews and updates. Plus answers to your questions about compatibility, copy protection and features. Take a look at the MacWarehouse specials and call us with your order to receive your free catalog and THE POWER USER'S TOOL KIT.

Under the Mac Drives (Cutting Edge)
NEW! Price breakthrough!
The Cutting Edge Under the Mac Drive hard disk drives are quiet and reliable with access times down to 20 ms making it almost three times faster than most. Push button external SCSI address switch and removable SCSI terminator allow easy daisy chaining up to 7 SCSI devices. Sizes available 20 meg to 100 meg. (See pricing) 20 meg only $439. 30 - 40 meg only $499. 800K Drive $149.

Studio 1 (Electronic Arts)
Animation made easy!
Make your presentations come alive with move and rotate objects in full 3D automatically. Scan your logo and make fly visual concept via animated storyboarding. Templates, animated clip art and HyperCard stacks included. Ideal for presentations, training demos, educational stacks, desktop publishing. Works on Plus, SE, Mac II (graphics) $109.

CHOOSE MacWAREHOUSE...
For price, quality and service you won't find a better source for your Mac needs. If you don't see it here, give us a call. Most likely we'll have it in stock. Our sales representatives are here to help!

Kerry, call me at:
1-800-255-6227
(1-800-ALL-MACS)

MacWAREHOUSE 1690 Oak Street
P.O. Box 1579 Lakewood, NJ 08701

Inquiries: 201-367-0440
Canada: 800-255-6447
FAX # 201-905-9279
MONDAY THRU FRIDAY
8 A.M. TO 11 P.M.
(Eastern Time)
SATURDAY 8 A.M. TO
8 P.M. (Eastern Time)
NOW OPEN SUNDAYS!
8 A.M. TO 8 P.M.
(Eastern Time)

I don't need to order right now, but please RUSH me my FREE copy of the brand new MacWarehouse Catalog.

NAME
ADDRESS
AP#
CITY
STATE
ZIP
Dollars and Sense
(Monogram)
Cash flowing in the wrong direction? Turn the tide with Dollars and Sense, the complete financial management program from Monogram Software. Balance sheet? Chart of accounts? Customized reports? They're just a few of the financial insights you can gain. Other features include: Automatic double entry accounting, check printing, "what if?" bill paying, and import/export from most popular spreadsheets. If you'd like to make a positive financial statement or just an assessment of your personal value - let Dollars and Sense take charge of your finances. (Finance) $81.

The Complete Page Scanner
(The Complete PC)
A versatile personal scanner for desktop publishing. Compact and flexible lets you scan any printed or written page, text, drawings, photographs, and other artwork, into your desktop publishing program. Scan at 200 or 300 dpi. Use SmartScan software (included) to resize, scale, rotate, crop, and edit your picture. Export to almost any paint or publishing program. (Input/output) $799.

Payroll PLUS or TimeMinder ..................................... 159.

Brown-Wadgh Publishing
MacLedgers ......................................................... 159.
Service Industry Accounting ................................. 209.

DAC
Dac-Easy Light .................................................. 42.
Inkjet Quicken 1.5 ............................................. 32.

MECA
Managing Your Money ........................................... 125.

Monogram
Business Sense .................................................... 279.
Dollars and Sense ............................................... 81.

ShopKeep Software
Bill-It ............................................................... 99.
Survivor MacMoney 3.02 ....................................... 61.

STATISTICAL ANALYSIS
Abacus Concepts
StatView II ....................................................... 339.
StatView SE+Graphics ........................................... 229.

BrainPower
StatView 512+ (requires 512k) ................................. 149.
D2 Software MacSpin 2.0 ....................................... 189.

Navigat! (Fair Tide Technologies)
Enter the world of Digital Chart Navigation. NAVIGATE! allows you to display the precise position of your yacht on a detailed chart. Displays land mass, shoal lines, buoys and many other navigation aids. Has full course planning and tracking features. Includes interface for a position sensor (LORAN, SATNAV, GPS) and one chart. Available in color or mono.

Navigat! mono (personal) $209.

Odesta
Data Desk Professional ........................................ 289.
Paracomp
Milo ................................................................. 159.
Select Micro Systems, Inc. ..................................... 219.

Wolfram Research
Mathematica (SE) .............................................. 450.

MUSIC AND SOUND
Altech
MIDI Interface ................................................... 59.
MIDI Basic ......................................................... 30.

Bogan Productions
Super Studio Session 2.0 ....................................... 75.

CoDa
MacDrums .......................................................... 32.

Electronic Arts
Deluxe Music Construction 2.5 ................. 84.

Elastic Engineering
Music Mouse ....................................................... 49.

Farakon Computing
MacRecorder (records sound) ................. 135.

Graphic Notes
Music Publisher ................................................... 375.

Impulse
Audio Digitizer w/SoundWave ................. 139.

Passport Designs
Master Tracks Pro 3.0 ......................... 259.

NoteWriter ......................................................... 189.

Resonate
Listen 2.0 .......................................................... 62.

EDUCATIONAL/PERSONAL
BrightStar
Talking Tiles ...................................................... 69.

Bootsware Software
RasmussenWriter Pro ............................... 75.

Davidson
Math Blaster ....................................................... 27.

Speed Reader II ................................................. 36.

Fair Tide Technologies
Navigat! ......................................................... 209.
### BUSINESS SOFTWARE

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashton-Tate</td>
<td>dBase Mac</td>
<td>$295.</td>
</tr>
<tr>
<td>Claris</td>
<td>FileMaker II</td>
<td>$229.</td>
</tr>
<tr>
<td>Fox Software</td>
<td>FoxBASE+Mac</td>
<td>$265.</td>
</tr>
<tr>
<td>Odeta</td>
<td>Double Helix II</td>
<td>$339.</td>
</tr>
<tr>
<td>GeoQuery</td>
<td>ProVUE Panorama</td>
<td>$205.</td>
</tr>
</tbody>
</table>

### Access Technology

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapeze 2.1</td>
<td>AEC Management Systems</td>
<td>$149.</td>
</tr>
<tr>
<td>FastTrack Schedule</td>
<td></td>
<td>$115.</td>
</tr>
<tr>
<td>AITECH</td>
<td></td>
<td>$385.</td>
</tr>
<tr>
<td>Full Impact</td>
<td></td>
<td>$249.</td>
</tr>
<tr>
<td>BreakThrough Productions</td>
<td></td>
<td>$245.</td>
</tr>
<tr>
<td>Market Master R/A</td>
<td></td>
<td>$289.</td>
</tr>
<tr>
<td>HyperPress Publishing</td>
<td></td>
<td>$299.</td>
</tr>
<tr>
<td>Intelligent Developer</td>
<td></td>
<td>$249.</td>
</tr>
<tr>
<td>WINGZ</td>
<td></td>
<td>$249.</td>
</tr>
</tbody>
</table>

### WORD PROCESSORS AND OUTLINERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldus</td>
<td>FullWrite Professional</td>
<td>$269.</td>
</tr>
<tr>
<td>Claris</td>
<td>MacWrite II</td>
<td>$239.</td>
</tr>
<tr>
<td>Cricket</td>
<td>Cricket Graph 1.3</td>
<td>$115.</td>
</tr>
<tr>
<td>Cricket Presents</td>
<td></td>
<td>$289.</td>
</tr>
<tr>
<td>HyperPress Publishing</td>
<td></td>
<td>$299.</td>
</tr>
<tr>
<td>Informix</td>
<td></td>
<td>$249.</td>
</tr>
<tr>
<td>MetaComet</td>
<td>Accu-Weather Forecastcr</td>
<td>$59.</td>
</tr>
</tbody>
</table>

### SPELLING CHECKERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deneta Software</td>
<td></td>
<td>$42.</td>
</tr>
<tr>
<td>Microsaurus</td>
<td></td>
<td>$54.</td>
</tr>
<tr>
<td>Spelling Coach Pro</td>
<td></td>
<td>$105.</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td></td>
<td>$52.</td>
</tr>
<tr>
<td>Thunder II</td>
<td></td>
<td>$52.</td>
</tr>
<tr>
<td>Microlytics</td>
<td></td>
<td>$53.</td>
</tr>
<tr>
<td>Word Finder 2.0</td>
<td></td>
<td>$33.</td>
</tr>
<tr>
<td>Sensible Software</td>
<td></td>
<td>$33.</td>
</tr>
<tr>
<td>Acta Advantage w/DA</td>
<td></td>
<td>$65.</td>
</tr>
<tr>
<td>T/Maker</td>
<td></td>
<td>$115.</td>
</tr>
<tr>
<td>Perfect Corp</td>
<td></td>
<td>$185.</td>
</tr>
<tr>
<td>Working Software</td>
<td></td>
<td>$185.</td>
</tr>
<tr>
<td>QuickLetter</td>
<td></td>
<td>$75.</td>
</tr>
</tbody>
</table>

### GRAPHICS

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>WordFinder 2.0 (Microlytics)</td>
<td></td>
<td>$59.</td>
</tr>
<tr>
<td>Excel 2.2</td>
<td></td>
<td>$255.</td>
</tr>
<tr>
<td>PowerPoint 2.1</td>
<td></td>
<td>$255.</td>
</tr>
<tr>
<td>Works 2.0</td>
<td></td>
<td>$189.</td>
</tr>
<tr>
<td>Nolo Press</td>
<td></td>
<td>$189.</td>
</tr>
<tr>
<td>For the Record</td>
<td></td>
<td>$189.</td>
</tr>
<tr>
<td>WallMaker</td>
<td></td>
<td>$32.</td>
</tr>
<tr>
<td>Power Up</td>
<td>FastForms Construction Kit</td>
<td>$89.</td>
</tr>
<tr>
<td>Swift</td>
<td>Bulk Mailer 3.3</td>
<td>$79.</td>
</tr>
<tr>
<td>Softview</td>
<td>FormSet</td>
<td>$55.</td>
</tr>
<tr>
<td>MacOnUse</td>
<td></td>
<td>$42.</td>
</tr>
<tr>
<td>Symantec</td>
<td></td>
<td>$255.</td>
</tr>
<tr>
<td>More II 2.0</td>
<td></td>
<td>$255.</td>
</tr>
<tr>
<td>Symmetry</td>
<td>KeyPlan</td>
<td>$339.</td>
</tr>
<tr>
<td>Mac Envelope 4.1</td>
<td></td>
<td>$59.</td>
</tr>
<tr>
<td>Vertical Solutions</td>
<td></td>
<td>$49.</td>
</tr>
<tr>
<td>FastLabel</td>
<td></td>
<td>$59.</td>
</tr>
</tbody>
</table>

### ProArt Professional Art Library (MultiAd Services)

Clip art from an Industry Leader. The ProArt Library contains over 5000 illustrations in each of the three volumes (Business, Holidays, and Sports). Created by talented illustrators, these useful, high-quality images will improve the appearance of your DTP projects. Floppy disk versions include a durable binder, with a pictorial index. $59.95 each CD-ROM version $99.95.

### FastLabel 1.2

End label headaches with FastLabel - the revolutionary way to print labels on the image writer and laserwriter. Performance is truly amazing. Creates labels. One step text loading from an commercial database. Save hours of your valuable time! (business) $49.

### XTreeMac

New from XiTree Company - XTreeMac simplifies disk management by disk contents within its unique Directory Tree. It finds, launches and retrieves deleted files, even after you've empted the trash. Copies or moves files from multiple drives simultaneously. Everything that Finder does, and more. (utilities) $52.

### Images Winmap

Business 1

Create professional presentations with over 1700 sharp, contemporary PostScript images. Contains computers, occupational and public symbols, and much more! (graphics) $59.

### Generic CADD Level 1

Easy to learn and use drawing tool gives you true CADD capabilities including 2D layers, floating point precision and Bezier curves. NEW FEATURES include zoom, direct PICT file support. Symbol Libraries also available. Great for beginners! (cadd/cam) $85.

---

**More for your Money...**

- WordFinder 2.0 (Microlytics)
- Microsoft Excel 2.2
- PowerPoint 2.1
- Works 2.0
- Nolo Press
- For the Record
- WallMaker
- Power Up
- FastForms Construction Kit
- Swift
- Bulk Mailer 3.3
- Softview
- FormSet
- MacOnUse
- Symantec
- More II 2.0
- Symmetry
- KeyPlan
- Mac Envelope 4.1
- Vertical Solutions
- FastLabel

**Contact:**

- Phone: 1-800-255-6227
- Fax: 201-905-9279
- E-mail: info@macwarehouse.com
- Website: macwarehouse.com

**Inquiries:**

- 361-367-0440
- 1-800-255-6447
- P.O. Box 1570
- Lakewood, NJ 08701

**Mailing Address:**

- 1090 Oak Street
- P.O. Box 1570
- Lakewood, NJ 08701

**Saturdays: 6 A.M. to 6 P.M. (Eastern Time)**

**Sundays:**

- NOW OPEN SUNDAYS! 8 A.M. to 8 P.M. (Eastern Time)
### 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.

### OVERNIGHT DELIVERY
**ONLY $3.00**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AutoSave II (Magic Software)</td>
<td>$39</td>
</tr>
<tr>
<td>POWERMENUS</td>
<td>$39</td>
</tr>
<tr>
<td>POWERCONIC</td>
<td>$39</td>
</tr>
<tr>
<td>MacEnvelope 4.1 (Sytrix)</td>
<td>$59</td>
</tr>
<tr>
<td>MacEnvelope</td>
<td>$59</td>
</tr>
<tr>
<td>HyperPress Publishing</td>
<td>$42</td>
</tr>
<tr>
<td>Milks Computing</td>
<td>$27</td>
</tr>
<tr>
<td>Puzzle Gallery</td>
<td>$27</td>
</tr>
<tr>
<td>Mindscaplace</td>
<td>$27</td>
</tr>
<tr>
<td>Balance of Power, Deja Vu</td>
<td>$30</td>
</tr>
<tr>
<td>Nemesis</td>
<td>$49</td>
</tr>
<tr>
<td>Go Master</td>
<td>$49</td>
</tr>
<tr>
<td>Populated Games</td>
<td>$30</td>
</tr>
<tr>
<td>MacGolf 2.0</td>
<td>$35</td>
</tr>
<tr>
<td>MacGolf Classic</td>
<td>$54</td>
</tr>
<tr>
<td>Road Racer</td>
<td>$35</td>
</tr>
<tr>
<td>Spectrum HolyByte</td>
<td>$35</td>
</tr>
<tr>
<td>Falcon 2.0</td>
<td>$32</td>
</tr>
<tr>
<td>PT 09 or Gato</td>
<td>$26</td>
</tr>
<tr>
<td>Solitaire Royale or Tetris</td>
<td>$20</td>
</tr>
<tr>
<td>The Software Toolworks</td>
<td>$49</td>
</tr>
<tr>
<td>Chessmaster 2100</td>
<td>$25</td>
</tr>
<tr>
<td>Life &amp; Death</td>
<td>$32</td>
</tr>
<tr>
<td>The Hunt for Red October</td>
<td>$32</td>
</tr>
<tr>
<td>Macware Carring Cases</td>
<td>$35</td>
</tr>
</tbody>
</table>

### MEMORY UPGRADES/ACCELERATORS

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MEG SIMMS</td>
<td>$197</td>
</tr>
<tr>
<td>FastNet 35 CI</td>
<td>$765</td>
</tr>
<tr>
<td>FastNet 2 II or III</td>
<td>$232</td>
</tr>
<tr>
<td>Mars trilogy 030 Accelerator</td>
<td>$999</td>
</tr>
<tr>
<td>Mars trilogy LAN 020 Multi-Function</td>
<td>$312</td>
</tr>
<tr>
<td>Boards</td>
<td></td>
</tr>
<tr>
<td>3 MEG SIMMS from FastNet 35 CI</td>
<td>$1,025</td>
</tr>
<tr>
<td>MacSnap 25</td>
<td>$398</td>
</tr>
<tr>
<td>MacSnap 45</td>
<td>$708</td>
</tr>
<tr>
<td>MacSnap 85</td>
<td>$1,566</td>
</tr>
<tr>
<td>MacSnap 524E</td>
<td>$1,677</td>
</tr>
</tbody>
</table>

### DISK DRIVES/BOARDS

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS</td>
<td>$35</td>
</tr>
<tr>
<td>MacStack 30 Meg</td>
<td>$569</td>
</tr>
<tr>
<td>MacStack 50 Meg</td>
<td>$569</td>
</tr>
<tr>
<td>MacStack 45 Meg</td>
<td>$569</td>
</tr>
<tr>
<td>MacStack 60 Meg</td>
<td>$629</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>$149</td>
</tr>
<tr>
<td>Under the Mac 20 Meg</td>
<td>$428</td>
</tr>
<tr>
<td>Under the Mac 30+ Meg</td>
<td>$499</td>
</tr>
<tr>
<td>Under the Mac 40+ Meg</td>
<td>$599</td>
</tr>
<tr>
<td>Under the Mac 65+ Meg</td>
<td>$649</td>
</tr>
</tbody>
</table>

### GAMES

- **Learning Company**
  - Reader Rabbit                                   | $32    |
  - MicroTech                                        | $59    |
  - Elementary Signer                                | $59    |
  - Finger Signer                                    | $39    |
- **The Software Toolworks**
  - Mavro Beacon Teaches Typing                      | $35    |
  - Voice & Video Instruction Videos                 | $35    |
  - HyperCard or Pagemaker 3.0                       | $35    |
  - Word 4.0 Video Tape                               | $35    |
- **Games**
  - Acces Software, Inc.                            | $35    |
  - World Class Leader Board                         | $28    |
  - Artworx                                          | $32    |
  - Daily Double Horse Racing                        | $19    |
  - Broderbund                                      | $27    |
  - Ancient of War At Sea                            | $27    |
  - Shuttlepuck Cafe                                 | $24    |
  - Where in the World is Carmen                     | $27    |
  - BullsEye                                         | $59    |
  - Ferrari Grand Prix or PS1                        | $32    |
  - Centron Software, Inc.                           | $49    |
  - BlackJack or CrapsMaster                         | $49    |
  - CasinoMaster (pack)                              | $49    |
  - Discovery Software                               | $49    |
  - Electronic Arts                                  | $49    |
  - Starlitz 1: The War Begins                       | $36    |
  - Chuck Yeager Adv. Flight Trainer                 | $32    |
- **HyperPress Publishing**                         | $42    |
- **Milks Computing**                               | $27    |
- **Puzzle Gallery**                                | $27    |
- **Mindscaplace**                                  | $27    |
- **Balance of Power, Deja Vu**                     | $30    |
- **Nemesis**                                       | $49    |
- **Go Master**                                     | $49    |
- **Populated Games**                               | $30    |
- **MacGolf 2.0**                                   | $35    |
- **MacGolf Classic**                               | $54    |
- **Road Racer**                                    | $35    |
- **Spectrum HolyByte**                             | $35    |
- **Falcon 2.0**                                    | $32    |
- **PT 09 or Gato**                                 | $26    |
- **Solitaire Royale or Tetris**                    | $20    |
- **The Software Toolworks**                        | $49    |
- **Chessmaster 2100**                              | $25    |
- **Life & Death**                                  | $32    |
- **The Hunt for Red October**                      | $32    |

### Macware Carring Cases (I/O Designs)

- The I/O Design family of carrying cases protects your Mac and its peripherals whenever you need to take them with you. The outer covering is made of rugged quality lightweight woven nylon with web strap reinforcement. The interior is padded to protect the equipment. Full line available (accessories) $75.

### Daily Double Horse Racing

- Spend a day at the race track. Histories of nearly 400 races. 1 to 4 players. $19. **GrafQuest**
  - Offers hours of entertainment for those who enjoy adventure games. Features interactive, digitized graphics and sound. (games) $19.

### Arkanoid

- The #1 Coin-OP Game has come to the Mac, offering the breathtaking animation, digitized sound and dazzling game play you’ve been seeking! Guaranteed to push you to the limit and beyond! (games) $27.

### Lunar Rescue

- An intense space adventure incorporating arcade-style action and free-market trading strategies. Transport vital supplies between lunar colonies, explore terrain, buy and sell commodities. (games) $34.
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. Comes with free macro software and manufacturer's two year warranty. (input/output) $145.

Smack-a-Mac
Stressed out by your computer? Get relief with Smack-a-Mac. Poke it...Punch it ... Pick it up and throw it ... or if your Mac is behaving well smack it with a kiss. Comes with users guide. (accessories) $9.

SmartOne Modem
Receive electronic mail, check out stock portfolios or flight reservations. Features include QuickLink, MacNet, Compuserve, auto dial and a two-year warranty. (modems) $149.

Basic Needs Hardtops
Printer and keyboard covers made from high impactABS plastic, fits right on the keyboard or printer, and provides solid protection against dust, spills and falling objects. Also ideal for guarding against damage by wash and transit. (accessories) $15.

Circle 78 on reader service card

FROM MacWAREHOUSE™

Fastkeys (SoundSight)
Speed up your computing by 50%! Bring the keyboard to your fingertips. Imagine simply pressing Fastkeys on your mouse, trackball or pad to perform everything from printing to deleting. Execute mouse operations INSTANTLY! Shift-Select is now a one hand operation as well as cut, paste, copy, quit, undo, open, close ... virtually anything you choose. (accessories) $39.

Basic Needs
Hard Top Keyboard ........................................ 15.
Hard Top Imagewriter ................................. 17.
Nylo-Nipost Dust Covers ............................... 14.
Utility Pac .................................................. 11.
Computer Friends, Inc. Macinkey (IW & IW II) .... 41.

Blanks Media
B.A.S.F. DDS/DD (box of 10) ......................... 15.
Sony DS/DD (box of 10) ................................. 16.

Input/Output
Cambridge North America
MacLite portable computer ...................... 799.
EPIC Technology
SMARTone 2400/1200 ................................. 149.
Hayes Smartmodem 1200 .............................. 299.
Smartmodem 2400 ...................................... 440.
Smartmodem 9000 (V series) ..................... 865.
Prometheus
ProfSMARTmodem 2400 SE Int. .................. 200.
ProfMode 2400M ......................................... 199.
Super
Super Modem 2400 ................................. 149.
US Robotics
Crupter Modems .......................... Call.

Accessories
Avery Labels (all sizes available) ............ Call.

Dolphin Subsystems
(Dolphin Systems Tech.)
The intelligent choice for Apple Macintosh mass storage. Integra zero footprint external hard drives from 20mb-100mb capacity. Flipper 4mb removable hard disk high performance (25ms) offers unlimited storage and convenient portability. Flipper 150mb high speed SCSI tape with FioxFile/ Image Backup. (disk drives) see line listings for prices.

I'm Kerry, call me at:

MacWAREHOUSE 1-800-255-6227

OVERTIME DELIVERY: ONLY $3.
If you're already a MacWarehouse customer you know that nobody beats our service. Our helpful telephone staff is standing by, seven days a week. Place your order by 7:00 pm Eastern time (weekdays) and it's processed immediately for overnight delivery. Call us toll free right now.
When it's time to buy a tape backup system for your Mac, you'll have a choice from roughly 15 different products, gadgets, novelties and doodads. Or, one sure thing.

Whether you have one Mac or a hundred, when it comes to choosing a tape backup system you can't afford to take chances.

The obvious choice is MaynStream, the one tape backup system synonymous with speed, performance, and reliability. Our consistent track record has made MaynStream theeditor's choice in personal computer magazines time after time.*

But let's face it, when we conceived our newest tape backup system we had to prove ourselves all over again. We found the best Mac engineers around and started from the ground up. The result? MaynStream. By Mac users, for Mac users.

With MaynStream you'll find familiar pull-down menus, easy to use commands, and a portable system that can be quickly moved from office to office. And doesn't it make sense that the manufacturer of the fastest PC tape backup would also make the fastest system for the Mac? With MaynStream that's a sure thing.

Call (800) 821-8782 to request a free demonstration disk and all the facts about the MaynStream family of tape backup systems.

• 60 to 2200 MB of data on one tape
• Effective backup speed up to 5 MB/min, transfer rate up to 14 MB/min
• Read-after-write error checking
• Password protection
• Built-in handle for portability
• AppleShare, TOPS and Netware compatible

* The "Editors Choice" of PC Magazine and leader of technical reviews and user preference surveys in PC Week, PC World, InfoWorld, and LAN Magazine

MaynStream

Maynard Electronics
We're backing you one-hundred percent.
460 E. Semoran Blvd., Casselberry, FL 32718 407/263-3500

Circle 263 on reader service card
Quick Tips

HOW TO

A

s I reported three months ago, you can hide a numeric value on an Excel 1.5 spreadsheet by setting the numeric format of its cell to a semicolon. What about hiding text? Geoff Wood of Stockport, England, suggests you select the cells whose values you want to hide, choose Number from Excel's Format menu, type [White]—that's the word White enclosed in square brackets—and press Return. That format writes characters in white "ink" to hide any value—text or numeric. The only values it won't hide are Excel's error values, such as #NAME? and #DIV/0!

Wood notes that there are other ways of hiding cells; for example, you can hide a column by setting its width to 0. Or use the following macro to move the worksheet window off the screen:

```
HideTopWindow
=MOVE(GET.WINDOW(5),0)
=RETURN
```

To move the window back, change the Move command to `MOVE(0,0).

GLOBAL PRINTER POWER

A U.S.-model ImageWriter II or ImageWriter LQ printer will work with an appropriate transformer in countries where the electrical power is other than 110V/60Hz. Apple doesn't recommend using 50Hz power, however, because it adversely affects print registration and forces the printer's internal motors to run hotter, possibly wearing them out. Instead, you can have the printer's power supply replaced with a universal model (Apple Service Part 915-0029 for ImageWriter II or 915-0031 for ImageWriter LQ). The universal power supply isn't sold in the U.S.; you can ask a dealer in another country to install one, however. After the universal power supply has been installed, you can use the printer anywhere in the world without a transformer or any other additional equipment. Teodoro S. Kaufmann of the University of Mississippi unearthed these parts numbers from information available to Apple service centers.

LUMPY TEXT

Q

When my fellow teachers and I choose Monaco 10 in Chariot Software's MicroGrade, the screen display is all but illegible (see "Scaled Font"). Printed reports look fine, and other sizes of the same font display and print fine. What can we do to fix Monaco 10?

Sandra W. Foster
Douglas, Arizona

A

Lumpy displayed text results when you choose an uninstalled font size. Monaco doesn't come in a 10-point size, so without a doubt it's not installed in your System file. What you see is not Monaco 10, but Monaco 12 scaled down to 10-point size. The other fonts that MicroGrade lets you choose (Monaco 9, Monaco 12, Geneva 9, Geneva 10, or Geneva 12) display fine because they are installed. You could fix Monaco 10, if it existed, by installing it in your System file using Apple's Font/DA Mover utility software. My advice: choose a different font.

Printed reports look OK because you're selecting the Draft quality option (or leaving it selected) in the Print dialog box. When an ImageWriter prints Draft quality, it uses its own built-in font, not the screen font. (An ImageWriter II has a Print Quality switch you can use to choose among its three built-in fonts.) If you select Faster or Best quality, the ImageWriter uses the screen font. Best quality deserves its name only when the font displayed is also installed at twice the size. For example, Geneva 10 calls for Geneva 20. The Mac reduces the double-size font to get the highest quality printing on an ImageWriter. Your System file probably has 18-, 20-, and 24-point Geneva, but not Monaco.

UNINSIGHTLY TEMP FILE BUILDUP

Q

Microsoft Word (presumably) adds to my System Folder from time to time files named Word Temp 1, Word Temp 2, and so on. Presently, 16 such files exist with sizes of 0K or 1K. Should I get rid of them?

(MACWORLD • AUGUST 1989 227)
QUICK TIPS

HOW TO

periodically expunge these files or are they tied to saved documents produced in Word?

James P. Hartman
Wayne, Pennsylvania

A

Many applications open temporary files in the System Folder and elsewhere. Word always opens a temporary file in the System Folder, and it uses the file to hold your typing. Word may open a second temporary file in the System Folder if memory is running low when you save a document. Word saves the contents of the Clipboard in the second temporary file in an attempt to free some memory. In addition, Word may open temporary files in the folder that contains the Word application and any folder that contains an open Word document. Word is supposed to delete all its temporary files when you quit normally. If the power goes off, Word quits unexpectedly (it crashes), or the Mac suddenly quits working (it bombs), then Word doesn't get a chance to delete its temporary files. You may be able to reconstruct your work from the temporary files. To try, press Shift while choosing Open from Word's File menu.

Sometimes Word versions 3.02 and earlier don't remove temporary files from the System Folder, and the files accumulate over time. Word 4.0 seems free of this carelessness.

You can safely delete Word's temporary files by dragging them to the Trash. If you're using Word with MultiFinder, the Mac will not let you delete temporary files that are in use at the time. (It complains, "That item is locked or in use, and can't be removed." When you click OK, the Mac puts the busy file back in the folder from which the file came.)

MYSTERY FILE

Q While using PacerLink to transfer a document from my Mac II to our mainframe computer, I noticed a strange file named InvisiHDMainBo3b on my Mac hard disk. This file does not appear anywhere on my Mac screen. I have no idea what this is or how it got there.

Jeff Wilson
Springboro, Ohio

A

That file was created by Apple's backup utility, HDBackup. Some applications create invisible files, which don't appear in the Finder's disk and folder.
windows or in the Open dialog boxes of most applications. File-transfer applications and a few others show all files, invisible or not. The file you found, and other similarly named files on your backup floppies, would be used during a restore operation.

**COPY PREVENTION**

Q. Is there a simple way to prevent unauthorized users from pirating applications by copying them from a Macintosh hard disk to floppy disks?

Hilliard K. Macomber
Cedar Falls, Iowa

A. You can't prevent everyone from copying an application and also allow anyone to open it, but there are a couple of ways to provide some security. Hard Disk Deadbolt from FWB (415/474-8055) can quickly lock most applications by encrypting them. No one can open or copy an encrypted application without supplying the correct password. You or a trusty who knows the password must unlock (decrypt) the application before your average user can open it and must relock (encrypt) the application when that user finishes. While the application is decrypted, anyone can copy it. This method of protecting applications against illicit copying is far from fail-safe.

Instead of temporarily encrypting an application, you can semipermanently make its icon invisible in the Finder. What can't be seen can't be copied. Invisible application icons can't be opened either, but you can always open the application by opening one of its documents. (Even though you can't see an application icon, the Finder knows where it is.) You can make any icon invisible using a utility such as DiskTop from CE Software (515/224-1995) or ResEdit from the Apple Programmer's and Developer's Association (800/282-2732).

Using DiskTop, first choose Preferences from the DiskTop menu and set the level to Technical. Click the Temporary button to get back to the file listing. Then locate the application you want to hide, select it, and choose Get Info from the DiskTop menu. You set the invisible option in the dialog box that appears (see "The Invisible Application"). Finally, click the Save button. That application's icon will not appear in the folder that contains it the next time you open the folder in the Finder. (If the folder is already open, close and reopen it.) The icon will still show up in DiskTop's file listing, and DiskTop can be used to copy applications, so you may want to remove DiskTop after hiding your application icons. To make an icon visible again, reinstall DiskTop and use it to turn off the application's Invisible option.

**CRICKET GRAPH CURVE FIT TIP:** I recently noticed that Cricket Graph 1.3 does not always correctly draw the line for the equation for a simple curve fit (see "Wrong Plot"). A line that should intersect the horizontal axis to the left of the axis's

---

**Introducing The Gravis MouseStick**
Here's the digital controller that towers above joysticks, mice and trackballs. For speed. For precision. For versatility. For technology. For durability. And just for fun!

**GRIFFING NEWS FOR MOUSE USERS!**
For precision, only the Gravis MouseStick features a true opto-mechanical digital output signal, resulting in an amazing 1200 point resolution. You can set to any screen size. Plus, fractional sensitivity modes for precise pixel by pixel control.

**For versatility, the MouseStick features three programmable microswitch buttons which can emulate any eight keyboard commands.**

**For technology, there's the Gravis MouseStick Processing Unit (GMPU). With 16K of ROM and powerful Control Panel Software, your programming options are virtually limitless, and can be upgraded to include new features!**

So for large-screen monitor CAD and DTP applications, or serious computer games, get a grip on the future with the incredible Gravis MouseStick. You'll discover that for serious work or serious play, the Gravis MouseStick really handles it!

---

**ADVANCING THE ART**

**Circle 401 on reader service card**
The Invisible Application

Setting an application's invisible option (here using DiskTop from CE Software) makes the application's icon invisible in the Finder, which prevents anyone from copying the application. The application can still be accessed by opening any of its documents.

right end point tends to pass through that end point. To work around this problem, use a first-order polynomial curve fit, which is mathematically equivalent to a simple curve fit. Jose Maria Delgadino
New Haven, Connecticut

Curiously, this anomaly occurs in version 1.3 but not in version 1.1. Cricket Software plans to fix it in the next version.

FOUND IN TRASH

TIP: The Find File desk accessory thinks items in the Trash are still in their former locations. If you can't find a file or folder where Find File says it is, check the Trash. Mike Peters
Stanford, California

FRACTIONAL INPUT AND OUTPUT

TIP: It's sometimes desirable to allow input of fractions, such as \( \frac{1}{2} \) or \( \frac{1}{3} \), and to produce them as output. For instance, a cutting order for a carpenter who uses a tape measure would be most handy if the cutting sizes were expressed in fractions.

To accomplish this in FileMaker, you need three fields: PP, RR, and SS. PP is a text field used for input of fractions and mixed numbers. RR is a calculation field that converts PP to a decimal value for use in any calculations involving other fields. SS is another calculation field that converts RR to a mixed fraction. Define field RR as follows.

\[
i f( \text{position}(\text{PP}, "/", 1) = 0, \text{NumToText}(\text{PP}), \text{if}(\text{position}(\text{PP}, "/", 1) = 0, 0, \text{TextToNum(\text{left}(\text{pp}, \text{position}(\text{PP}, "/", 1) - 1))) + \text{TextToNum(\text{middle}(\text{pp}, \text{position}(\text{PP}, "/", 1) + 1, \text{position}(\text{PP}, "/", 1) - 1)))}) / \text{TextToNum(\text{right}(\text{pp}, \text{length}(\text{pp}) - \text{position}(\text{PP}, "/", 1)))}
\]

The following definition of SS converts the decimal value in field RR to the nearest 1/6.

\[
i f(\text{RR} = \text{int}(\text{RR}), \text{if}(\text{int}(\text{RR}) = 0, \text{"\"}, \text{NumToText}(\text{int}(\text{RR})) & \text{"\"} \text{if}(2 * \text{RR} = \text{int}(2 * \text{RR}), \text{NumToText}(2 * (\text{RR} - \text{int}(\text{RR}))) & \text{"/2", if} (4 * \text{RR} = \text{int}(4 * \text{RR}), \text{NumToText}(4 * (\text{RR} - \text{int}(\text{RR}))) & \text{"/4", if} (8 * \text{RR} = \text{int}(8 * \text{RR}), \text{NumToText}(8 * (\text{RR} - \text{int}(\text{RR}))) & \text{"/8", \text{NumToText(\text{int}(16 * (\text{RR} - \text{int}(\text{RR}))) & \text{"/16")})})
\]

When entering the formula for field SS, select the Text option for the result of the calculation. Also, do not type any extra blank spaces in these long formulas. FileMaker allows only 256 characters per formula, and spaces count.

You could make the formulas simpler by breaking them up into subcalculations. For instance, you could define a field AA = position(PP, "/", 1) and use AA in the RR formula. However, keeping track of intermediate calculations is more confusing than dealing with the two messy calculations defined here. By the way, you can reduce the character count in these formulas by using single-letter field names instead of PP, RR, and SS.

Dennis Talley
Cardiff by the Sea, California

**Wrong Plot**

If Cricket Graph 1.3 draws the wrong line when you choose Simple from its Curve Fit menu (left), choose Polynomial and specify 1 as the degree of the polynomial (right).
Similar formulas work in other applications, such as Excel and HyperCard.

**CROOKED SCANS**

**TIP:** With most optical character recognition (OCR) software (other than OmniPage), crooked scans cause a multitude of errors. Crooked scans usually result from crooked source material, be it a book, photocopy, laser printer output, or typewritten page. If you are using a flatbed scanner, you can straighten a crooked source with tape. It is best to use removable tape or even Post-it notes to avoid damaging the source material. Align strips of tape parallel to one or two edges of the text, leaving the tape protruding past the edge of the page. Use the protruding tape to line up the page on the scanner.

Kim Baker
Mesa, Arizona

**THUMBSCREW WRENCH**

**TIP:** The overhang of the Jasmine BackPac hard disk at the back of my Mac Plus makes it nearly impossible to tighten the thumbscrews of the mouse plug. I nipped the pocket clip off the cap of a ballpoint pen to make the cap into a wrench that extends my reach 1 1/2 inches beneath the BackPac. You may have to experiment to find a pen cap small enough to grip tightly, yet large enough to break loose when the thumbscrew is tight.

Brad Reed
Botkins, Ohio

---

We pay from $25 to $100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld.

Lon Poole answers readers’ questions and offers advice in his monthly Macworld column. Many of the tips he’s compiled can be found in his book Mac Insights (Microsoft Press, 1986). More recently he has written the quick reference, HyperTalk (Microsoft Press, 1988).
CREATIVE TOOLS FOR BETTER DESIGN

MISCELLANEOUS
500 EPS/PICT Images
Volume 12 & 13 Great for ads, posters, self-promotional materials, entertainment, sports, transportation, wildlife, business and special occasions.

80 EPS Images
Volume 14 A treasure trove of sports, animation limited only to your imagination.

PEOPLE
200 EPS Images
Volume 15 A collection of sports action limited only to your imagination.

BUSINESS & INDUSTRY
100 EPS Images
Volume 16 Exciting graphics appropriate for promotions and external communications of agriculture, science, trades, transportation and food services.

MAPS
EPS World Maps
Volume 17 A complete world atlas featuring the USA, Europe, and the world.

DESIGN ELEMENTS
100 EPS Images
Volume 18 Headlines, borders, mantles, and frames for designers and constructors.

DESIGN LETTERS
20 Sets of Hot Type Letters in Illustrator format
Volume 19 The desktop publisher can change, stretch, modify, or color type to create perfect headlines and logos.

FOOD & ENTERTAINMENT
95 EPS Images
Volume 20 A collection of exciting images depicting food and fun.

OCCASIONS
80 EPS Images
Volume 21 A treasure trove of graphic images rendered with step-dotted shading for special occasions.

LIFESTYLE
80 EPS Images
Volume 22 A treasure trove of graphic images rendered with step-dotted shading for special occasions.

DIGITAL ART

Digit-Art MAC by Image Club is vector based PostScript clip art that can be used with any popular Macintosh applications such as PageMaker, NeatlySetGo, X-Press, InDesign, Freehand, and Illustrator. You can maximize your design with any PostScript laser printer including a Linotronic for typesetting sharpness. Image Club 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 equivalent to the very best in line art when reproduced on a PostScript printer. Digit-Art is also available on the ArtRoom CD-ROM and in diskette packages as featured above.

Digit-Art PC for PostScript printers is compatible with PageMaker, Ventura or any other program that will accept EPS format graphics. There is even a version of Digit-Art that will print on non-PostScript printers such as the Hewlett-Packard 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

CALL PHOTO ART CATALOG

VISIT US ON THE WEB AT WWW.IMAGECLUB.COM

DIGIT ART

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.
Getting Started with Troubleshooting

Diagnose and fix common ailments with this introduction to Mac troubleshooting.

by Jim Heid

The Mac is reliable, but not infallible. And when problems do occur, the Mac's friendly facade can even work against you by hiding technical difficulties behind error messages that provide few clues to the problem. At such times the Mac seems to say, "Sorry, something is wrong, but I won't bore you with the details."

This month's column is a guide to troubleshooting common hardware and software problems. I've organized symptoms into these three general categories: start-up and system problems, disk and Finder problems, and printing and network problems; and I've provided at least one suggestion for each. (The sections that involve Font/DA Mover and the Desktop file may not be relevant with Apple's new System software, version 7.0, which is due for release sometime in 1990. For more information on System 7.0, see "Here Comes System 7.0" in this issue.)

START-UP PROBLEMS AND SYSTEM CRASHES

You connected a hard disk, scanner, or some other SCSI device, but the Mac doesn't recognize it.

- Check all the SCSI devices to make sure they are connected properly, with the right number of terminators in the right positions. (See "A SCSI Primer" for details.) Then with the power off, disconnect and firmly reconnect all SCSI cables. Use the metal cable snaps to lock them into place.
- Make sure each device has a unique SCSI ID number. If two or more SCSI devices have the same number, one or more of them may not work.

The Mac won't start from a hard disk that was previously working.

- The disk's start-up information—its boot blocks—may be damaged. If the Mac crashes during start-up, bad boot blocks may be to blame. You can make repairs using a disk-repair utility such as 1st Aid Software's 1st Aid Kit or Symantec's Symantec Utilities for Macintosh (SUM). For details on disk problems and repair programs, see "Rescuing a Hard Disk," Macworld, January 1989.
- If a dialog box appears saying "Can't load the Finder!", a system crash may have damaged the Finder or the System file (or both). Start up with a floppy disk containing the latest System Folder, and copy its Finder or System file (or both) to the hard disk's System Folder.
- Note: After replacing the System file, you must reinstall any fonts and desk accessories you added (unless you have a backup copy of your current System file).
- The hard disk's driver software, which allows the Mac to recognize and access the hard disk, may be damaged. If your hard disk came with a diagnostic program, run it. Many hard disks allow you to reinstall the driver software without reinitializing (which would erase the contents of the disk).
- The crash may have corrupted the contents of the Mac's parameter RAM, the battery-powered memory that holds Control Panel settings, such as the time, date, current start-up device. Try resetting the parameter RAM: Start the Mac with a different disk, then hold down the , Shift, and Option keys while opening the Control Panel. A dialog box asks if you want to "zap" the parameter RAM. Click Yes, then restart.

You added a new INIT, desk accessory (DA), or font, and now the Mac crashes during start-up, when you try to use the INIT or DA, or when you try to start a program that was previously working properly.

(continues)
**A SCSI PRIMER**

One of the most error-prone steps in setting up a Mac involves connecting peripherals such as hard disks, scanning devices connect to the Mac's high-speed SCSI bus. (SCSI, pronounced scuzzy, stands for small computer systems interface; a bus is a set of wires that form a common pathway for data.) Every Mac from the Plus on has a SCSI connector, a 25-pin female receptacle called a DB-25. Every Mac from the SE on also has a 50-pin SCSI connector inside its case for use with an internal hard disk.

The SCSI bus lets you connect up to seven peripherals to one port through a technique called *daisy-chaining*. All external SCSI devices have two 50-pin connectors. You connect the first peripheral to the Mac's SCSI port; you then use Apple's Peripheral Interface Cable to attach a second peripheral to the first.

When setting up SCSI peripherals, follow these two rules:

- Give each device on the SCSI bus a unique ID number.
- Be sure to terminate the SCSI chain properly.

**SCSI Addresses**

SCSI ID numbers range from 0 to 6. A device's ID number acts as its address—when the Mac sends data to a device, it transmits the device's ID along with the data. All the devices on the SCSI bus constantly "listen" for data, but only the device to which the data is addressed responds.

Besides being an electronic house number, an ID number also specifies a SCSI device's priority. The higher the ID number, the higher the device's priority. When two devices vie for the Mac's attention at the same time—as might occur when a scanning program saves an incoming image on disk during a scan—the Mac turns its attention to the device with the higher ID number. The Mac, which is the first device in the SCSI chain, has a priority of 7.

Use the highest number (6) for an external hard disk. Use lower numbers for lower-priority hardware such as a scanner or tape-backup drive. You don't have to number devices sequentially; for example, you can use 6 for a hard disk and 3 for another device, skipping over numbers 4 and 5.

Usually, you specify a device's ID number by setting a switch on the device, although with some devices you change the ID by running a program. (Some users recommend avoiding the latter type of device; if address conflicts prevent the Mac from starting up, you may not be able to run the program to change the address.)

**Terminating the Chain**

For the SCSI bus to work properly, the Mac must know where the SCSI chain begins and ends. These vital boundaries are formed by terminators, special connectors that absorb the SCSI signals when they reach the end of the line.

The number of terminators you need in a SCSI chain depends on the number of devices you're using—one terminator for one device; two terminators for two or more devices. Some devices (such as internal hard disks) include built-in terminators; others don't.

The only specific termination guidelines I can offer are these: never use more than two terminators, whether internal or external; and never change a connection while any device (including the Mac) is on. Doing either may damage the Mac.

You can find numerous examples of how to use terminators in the Macintosh's manual. Check your peripherals' manuals to find out if they contain internal terminators so you'll know whether you need to add an external one.

---

**INITs**—small, system-modifying programs that load during start-up—can conflict with each other or with applications. First, remove the suspect INIT from the System Folder (start the Mac with a different system disk if necessary), then restart. If the Mac doesn't crash, blame the INIT. You can often cure INIT conflicts by renaming the offending INIT so that it loads in a different order (the Mac loads INITs in alphabetical order). If that fails, contact the INIT's developer.

- If the Mac acts up after you add a DA or a font, the System file (which holds both) may be damaged. Restart using a different system disk, and copy its System file to the damaged disk. Make sure you're using the latest version of Font/DA Mover (at this writing, version 3.8). If the problem persists, the DA or font may be damaged.

(continues)
“Our business was going through the roof, but our old accounting system was holding us down.”

“In the commercial roofing business, you have to be on top of things in the office, too. Accurate budgeting and planning are essential.

“But in the last five years, our business has really grown. And our stand-alone computers and simple accounting software system just couldn’t handle it. We decided to switch to the Macintosh. And fortunately, our dealer showed us the Great Plains Accounting Series at the same time. It was just what we needed!

“It was so easy to learn and use, we didn’t lose any time putting the system into place. And since it is fully-integrated and expandable, we’ve been able to add modules as our business required them.

“Adding Network Manager was easy—no data re-entry was necessary. And it gave us multi-user capability. Now, our people at eight different work stations can use Great Plains at the same time. And the customer assistance from Great Plains is excellent—the most responsive we’ve ever dealt with.

“We haven’t even begun to use all the capabilities that Great Plains provides us. And we feel good about that. Take it from me—after you’ve outgrown one system, you don’t make that mistake again.”

Tom Tjelmeland
President
T & K Roofing Company, Inc
50 employees
1988 Roofing Contractor of the Year

Macintosh is a registered trademark of Apple Computer Inc.
- When you run under MultiFinder, newly installed fonts and DAs don't always appear in the Font or the Apple menu (if this happens, try restarting the Mac). It's best to install Fonts and DAs from the Finder.

- If the Mac crashes only when you try to use the new DA, the DA itself may be damaged or improperly installed. Remove the DA, then reinstall it. If the problem persists, it may be that the DA's disk is defective, or the DA may not be compatible with your system configuration; contact the DA's developer.

You added a new INIT, but it isn't loading during startup.

- Make sure that the new INIT is stored in the System Folder, then restart.

- Don't press any keys during startup, and be sure the Caps Lock key isn't depressed; often you can bypass loading a particular INIT by pressing certain keys.

The Mac crashes when you start a program or open a DA, and the ID number in the bomb dialog box is 25 or 26.

- An ID=25 system crash indicates insufficient memory. Restart, then try one or more of the following: remove INITs; use the Control Panel to disable or reduce the size of the RAM cache; or use the Finder's Set Startup command to specify that the Mac not use MultiFinder. Restart again to allow the changes to take effect.

- An ID=26 crash indicates that the Mac's attempt to start the program was unsuccessful, perhaps due to corrupted data in memory or a damaged application file. Restart and try again. If the Mac still crashes, reinstall the application from its master disk.

**DISK AND FINDER PROBLEMS**

- When you copy files using the Finder, an error message says that some files couldn't be written or read and were skipped.

  - If the Mac couldn't write some files, the destination disk could be at fault. If you're copying multiple files, try copying one at a time. If that doesn't work, the destination disk may be magnetically or physically damaged. A temporary fix that usually works for me is to use the Finder's Duplicate command to duplicate a small file on the destination disk. This will cause subsequently copied files to be stored on a different area of the disk. But make sure you back up the disk as soon as possible and then erase it. If problems surface after erasing, the disk may be physically damaged. Throw out a damaged floppy; a damaged hard disk can be repaired.

  - If the Mac couldn't read some files, the source disk may be the culprit. If it's a floppy or removable hard disk, try ejecting and reinstalling the disk; it may not have been seated properly. If you have two floppy drives, insert the source disk in the other drive. If these techniques fail, the source disk may be damaged. Use a disk-repair utility to scan the disk for errors, a process called verifying.

  - When you double-click on a document, the Finder says it can't be opened because "the application is busy or missing."

- If you don't have the application that created the document, you can't open the document.

**NEW VERSION SuperClue II with GlueNotes**

- It also catalogs all of your graphics, in these standard file formats. So you can find the artwork you need easily by thumbnail sketch, name, or keyword.

- You can use the "SuperClue II" with GlueNotes to create an electronic printout of almost any graphic into any other.
file from the Finder, but you may be able to open it from within another application. For example, you can open MacWrite documents from within most word processors by using the word processor's Open command.

- The document may not be intended to be opened from the Finder (for example, a document that stores your working preferences or a spelling checker dictionary). If the document has a generic document icon, it probably can't be opened from the Finder (see "Generic Errors"). But again, you may be able to open it from within an application.

- The document, its application, or the disk's Desktop file, which contains information about the disk's contents, may be damaged (see "Desktop Details"). This is less likely than the previous situations, but it's possible. Every document file contains a 4-character signature that identifies the application that created it. If this signature is damaged, either in the document or in the Desktop file, the Finder won't know which application to open. Try rebuilding the Desktop file (as shown in "Desktop Details") or using a disk utility to examine the document's file signature.

- This usually indicates a damaged Desktop file. If you click OK, the Finder rebuilds the Desktop file.

When you insert a disk, the Mac tells you that it needs minor repairs and asks if it should perform them.

- Just say no—unless you want to erase the disk. If the disk has important data on it, click Cancel to eject it. Then try inserting the disk again and/or restarting the Mac; if the same message appears, the disk is sick. Use a disk utility to diagnose its ailments and, if possible, recover its contents. (Use the utility to copy those contents to a new disk.)

we'd better have them.

You want to incorporate a fully formatted, multi-page spreadsheet in your report. You use SuperGlue to make an electronic printout of it and, using normal cut-and-paste, simply "glue" it as an object-oriented graphic into your document.

SmartScrap picks up where the Apple scrapbook left off, with multiple scrapbooks, scroll bars, a visual Table of Contents, and Marquee and Lasso. The Clipper provides cropping and scaling tools to any program you're using.
MaclIx-Compatible

The MC2RAM/4 MB delivers up to 32 MB for the power-hungry MacIIX system running A/UX. Packed with 32 megabit SOJ DRAMs, the MC2RAM/4 operates with a PAL chip for logic control to store the 32-bit word required by the 68030 processor.

Mac II, SE, SE/30 & Plus-Compatible

The MC2RAM/1 series is Clearpoint's complete line of one megabyte Macintosh memory. • Version D features megabit DIP DRAMs for a high profile design recommended only for the Mac II and IIIx installations. • Version S1 uses megabit SOJ DRAMs and is compatible with all Mac systems. • Version S1-10 is customized to match the higher processing speeds of third party accelerator boards.

When you choose Empty Trash, the Finder says that the Trash couldn't be emptied. Or, when you throw away a document or application, the Finder says that the item is in use and can't be removed.

• These problems occur when you throw away a file that the Mac is currently using—or thinks it is. When you open a file, the Mac makes notations in memory to indicate that the file is in use. These notations may remain unchanged until you quit the application—even if you use the application's Close command. Try quitting the application, then throwing the document away. If that fails, hold down the Option key while dragging the document into the Trash. Then hold down Option again while choosing Empty Trash. If this fails, restart and then throw the file away. The restarting process should close the file properly. If you frequently encounter this problem with a specific disk, try rebuilding the disk's Desktop file.

The Mac asks you to insert a disk that you ejected long ago.

• When you use the Eject command, the Mac remembers that the disk still exists, and may ask to see it again. Dragging an icon to the Trash causes the Mac to forget the disk, thereby guaranteeing that you won't be asked for it again.

PRINTING AND NETWORK PROBLEMS

The Mac reports that it can't locate or access the printer.

• Verify that the start-up disk you're using is unlocked and that it contains at least 50K of free space. Many applications create temporary files during printing and can't print if the start-up disk is locked or nearly full.

• For Laser printers: Be sure the printer is on and that its paper tray contains paper and is properly seated. Use the Chooser to select the LaserWriter driver. If the printer's name doesn't appear in the Chooser window, the printer may not be warmed up, or you may have a LocalTalk wiring problem (see “Network Wiring”). Once the printer's name appears in the Chooser, select it, then use Page Setup to verify print settings, and try again.

Network Wiring

To avoid creating a circular network, never connect the last device in the network to the first (A). Other problems include loose connections and dangling unconnected cables (B). If you need to remove a device, either unplug its connector box (C) or insert a cable extender between the two dangling cables (D).
The Macs on your network have different versions of the LaserPrep and LaserWriter files. Each Mac on a network should have the same version (at this writing, version 5.2 is the latest).

You use TOPS, and some Macs occasionally lose contact with a server, causing TOPS to display the message, "Trying to connect to [server name]."

Check your network wiring.

Check to see if someone is using the server. Performing time-consuming tasks on a server—erasing a floppy, copying files, or installing a font or desk accessory—can cause time-outs. TOPS can usually reestablish the connection after the operation is completed. Avoid performing such tasks on a TOPS server that has published volumes (volumes that have been made available to other users on the network).

FOR MORE HELP

I've presented the most common Mac ailments here, but I haven't explored problems specific to a given product. Your best sources for that kind of help are manuals and firms' technical support hotlines.

But before you call the latter, be sure to compile the information the support technician will need to diagnose the problem. Take time before trouble strikes to write down your system configuration: the amount of memory, the System version (choose About the Finder), the names of any INITs and desk accessories you've installed, and a list of your peripherals. When a problem occurs, note the steps that caused it. And don't overlook local user groups, which can be superb sources of help. Chances are your problem isn't unique.

Jim Heid is a Macworld contributing editor who focuses each month on a different aspect of Mac fundamentals.
The power and performance of big system CADD...MicroStation Mac

Intergraph introduces MicroStation Mac — microCADD software merging the power of 2D/3D engineering design software with the ease of the Macintosh user interface.

Multiple-screen graphics
MicroStation Mac supports a maximum of eight separate views of a design. These are resizable and can be placed on any of up to six graphic screens, the maximum supported by the Macintosh. This allows for better display flexibility, resulting in more productivity and less design time.

Reference files
MicroStation supports 2D and 3D design and reference files so a user can attach up to 32 design files to the current file for reference. Reference files can reside locally or be accessed remotely over a network, thus allowing users working on the same project to view all the files simultaneously.

Fully Intergraph-compatible
Files are maintained in the same binary format on every platform so that MicroStation/IGDS files can be freely transferred between the VAX, PC, Intergraph workstation, and Macintosh with no translation required.

With over 450 commands and features to meet your design needs, MicroStation Mac exemplifies the most complete functionality of any CADD package available for the Macintosh, making MicroStation Mac your best choice for design needs.

For further information on MicroStation and the Intergraph Education Center and Reseller programs: in the U.S., call 800-345-4856; in Alabama only, call 800-345-0218; outside the U.S., contact an Intergraph sales office.
In the Macintosh page-layout arena, ReadySetGo, QuarkXPress, and PageMaker continue to be the three major players. ReadySetGo is favored by many desktop publishers because of its ease of use and its many popular features, including grid-based layout; pinpoint positioning of objects; style sheets; glossaries; and a built-in spelling checker.

With version 4.5, you'll find color text and objects, a wide array of grayscale-image adjustments, alignment guide lines, precise typographic control, and both on-screen and printed thumbnails.

This collection of tips, shortcuts, and tricks should help increase your proficiency and productivity with ReadySetGo 4.5, whether you're new to the program or an old hand. Special thanks to Laura Lamar of MAX, Mark Astman and Peter Plitteris of Letraset USA, David Kater, author of Mastering ReadySetGo (Sybex, 1988), and George Mattingly, coauthor of the forthcoming Guide to ReadySetGo (Scott, Foresman), for their contributions.

**COLOR AND TINT**

To apply a color to text or an object, select the text with the insertion pointer or one or more objects with the object pointer (if an object is selected, be sure that it is filled with black). Then open the Color Selector dialog box by selecting the Color command from the Text, Fill, or Pen menu, as appropriate.

If the color you want to apply is a Pantone color, you can select it quickly in the Color Selector dialog box by typing the Pantone number and then a period. If it has a standard Pantone name, you can type the first few letters of the name instead. Or you can scroll the color list to view and click on a shade from a range of Pantone colors (see “A Pantone Scroll Bar”).

You can also tint an object by filling it first with a shade of gray instead of black: select the object; choose the desired tint (from 10 percent to 90 percent) from the Fill menu; then, with the item still selected, pick the desired color as usual.

**CUSTOM COLORS**

After the first 2 colors in the Color Selector's list, the next 18 are user-defined, and they behave like a color style sheet. You can use the Custom Color and Custom Name buttons in the Color Selector dialog box to customize a selected color chip. All subsequent items as well as all previous ones colored with this chip will then display the new color.

**DUPLEXING RULES**

The Duplicate command is a convenient way to create regularly repeating elements, such as rules. For example, to create striped display text (as in the IBM logo), first draw a rule just below the top of the display text and select white as its pen color. With the new rule still selected, choose the Duplicate command.

In the Duplicate dialog box, set the horizontal offset to zero and the vertical offset to the desired distance between stripes, and specify a sufficient number of copies to span the height of the type. Click on OK and ReadySetGo does the rest. This technique can be used to add rules between lines of text in ornamental designs, business forms, and tables containing many columns of data (see “Repeating Rules”).

**SMART COPY**

Objects copied from one page to another always paste into precisely the same position as on the source page. Unless the design of the two pages differs, the contents of entire pages can thus be cut (using the Select All command) and pasted without further adjustment.

This “smart copy” feature makes it easy to get around the Insert Page(s) command's inability to duplicate text (it only duplicates text blocks), and to copy the contents of one master page onto another. It's also useful for chapter openers that use only some elements of the (continues)
Insurance
For
Fried
Apples?

When your surge protector fails will your insurance save you? SAFeware's computer insurance covers power surges, lightning, theft, fire, accidental damage and more! Full replacement of hardware, media and purchased software for as little as $39 per year.

<p>| Total Value, Hardware, |</p>
<table>
<thead>
<tr>
<th>Media &amp; Purchased Software</th>
<th>Annual Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to $2,000</td>
<td>$ 39</td>
</tr>
<tr>
<td>$ 2,001-$ 5,000</td>
<td>$ 69</td>
</tr>
<tr>
<td>$ 5,001-$ 8,000</td>
<td>$ 89</td>
</tr>
<tr>
<td>$ 8,001-$11,000</td>
<td>$109</td>
</tr>
<tr>
<td>$11,001-$14,000</td>
<td>$129</td>
</tr>
</tbody>
</table>

For immediate coverage, information and rates on higher coverages, call 1-800-848-3469 Locally 614-262-0559 On Compuserve, GO SAFWARE, The Insurance Agency Inc.

2929 N. High St., P.O. Box 0221, Columbus, OH 43202

Circle 293 on reader service card

Having
Problems
With
Your
Subscription?

Please let us know.

Phone toll-free 800/525-0643. From Colorado, Alaska, Hawaii and outside the U.S., please phone 303/447-9330.

CONDENSED TEXT

If you use the Condensed text style, you'll notice that the resulting word spacing is too loose. To tighten it up, select the condensed text and set the word spacing in the Type Specs dialog box (under the Text menu) at about 80 percent. Another alternative is to select the text, remove the Condensed style, and choose either the Track or the Auto Kern command from the Format menu. Track removes an equal amount of user-defined space between every letter pair in the selected text. Auto Kern (which appears when you press the Option key) removes varying amounts of space between each letter pair in the selected text according to the font's built-in kerning table.

TYPE EFFECTS

If you want to stretch or shrink text disproportionately, or create a point size larger than ReadySetGo allows, convert the text to a graphic image. To do so, select the text block with the object pointer (not the insertion pointer) and copy it. Then create a picture block, activate it with the cropping tool, and select Paste. Finally, press #M to open the picture block's Specifications dialog box and enter the desired scaling factors. This sort of text manipulation looks best, by the way, when used on serif typefaces with contrasting thick and thin strokes.

TURNING OFF HYPHENATION

The Hyphenation Specs dialog box can be used to turn off hyphenation for particular

Repeating Rules

To create repeating rules such as these, draw a rule above the first line of text and select the Duplicate command. In the Duplicate dialog box, specify a vertical offset equal to the leading and a number of copies equal to the number of lines in the text, then press Return.
Macintosh Training.

"They would gladly pay for applications training - if they could find it!" This a quote from a recent Mac business conference. Quality, cost effective, Macintosh training is the number one need of most Mac business users.

Over 5,000 companies have found MacAcademy to be their best source for Macintosh training. In fact, over 15,000 people have attended MacAcademy in the past 18 months.

The reason we have grown so fast is word-of-mouth advertising. A company will send one employee the first time and 35 the second. On a scale of 1 to 5 our graduates rate us a 4.5! MacAcademy is a 2 Day Macintosh Workshop that features 14 hours of training. Both basic and more advanced workshops are offered on the Mac, Excel, Word, Works, PageMaker, and HyperCard.

The full price for MacAcademy is only $249, which includes the 2 day course, materials, and even lunch.

We invite you to check our schedule below and plan now to attend a MacAcademy workshop near you.

As with any successful program we have recently seen our share of MacAcademy clones. In both cases they are groups who attended MacAcademy and are now attempting to duplicate our price, our advertising, and our format. According to people who made the mistake of attending, they haven't duplicated our quality of instruction. Don't settle for anything less than the original MacAcademy.

Corporate references are available upon request.

The Schedule.

<table>
<thead>
<tr>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin, TX</td>
<td>Minneapolis, MN</td>
<td>Hartford, CT</td>
<td>San Diego, CA</td>
<td>Chicago, IL</td>
<td>Orlando, FL</td>
</tr>
<tr>
<td>Dallas, TX</td>
<td>Detroit, MI</td>
<td>Boston, MA</td>
<td>Anaheim, CA</td>
<td>Indianapolis, IN</td>
<td>Tampa, FL</td>
</tr>
<tr>
<td>Atlanta, GA</td>
<td>Chicago, IL</td>
<td>New York, NY</td>
<td>Los Angeles, CA</td>
<td>Pittsburgh, PA</td>
<td>Miami, FL</td>
</tr>
<tr>
<td>Raleigh, NC</td>
<td>Cleveland, OH</td>
<td>Philadelphia, PA</td>
<td>San Jose, CA</td>
<td>Cincinnati, OH</td>
<td></td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>Columbus, OH</td>
<td>Washington D.C.</td>
<td>San Francisco, CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>Orlando, FL</td>
<td>Baltimore, MD</td>
<td>Sacramento, CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Orleans, LA</td>
<td>Miami, FL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Results.

"I've invested thousands of dollars and many hours in my equipment. I consider this the best money I've spent."

J. Lewis Sterling Heights, MI

"Awesome is the word I would use to describe your course. The presenters were all-knowing about all of the applications. This is a first class operation with first class employees who were patient, accommodating, intelligent, and easily available to answer questions."

J. Jergensen Farm Hills, MI

"I always dreamed of being computer literate but did not have the time or patience to dedicate myself. The great boost to my skills came when I attended MacAcademy."

Mr. M. Manjunath S.F., CA

"Bravo! What a fantastic learning experience! I really think that 2 days at MacAcademy should entitle every graduate a week's vacation just to absorb. Thank you. Thank you."

Cyndi Bancroft Plymouth, MA

"I can't believe how much I learned in such a short amount of time. Everyone who presented seemed to be having a wonderful time doing it. They were eager to share their knowledge and enthusiasm with us."

Gary Beyer Novato, CA

"I almost didn't come when I saw the price. It seemed too cheap. These two days turned out to be worth more than a $700 Mac course I attended."

George Lyman Oakland, CA

The Answer: MacAcademy

Call or write for more information or to make your reservations to attend the next MacAcademy presented in your area. Special company group rates are available. On-site corporate training is also available. All MacAcademy training courses may also be purchased separately on 2 hour VHS Training Videos for $49 each.

a division of Florida Marketing International, Inc.

477 S. Nova Rd. Ormond Beach, FL 32074 904-677-1918 FAX 904-677-6717


Circle 406 on reader service card
Wrong.

If you think you can't afford computer workstation furniture as up-to-date as your Macintosh, think again.

*Breakthrough prices.* The basic workstation (drawing A) costs less than $305. For under $635, you can set up the intermediate workstation (drawing B). And the full featured workstation (drawing C and photo) is less than $1300. Since the WorkManager™ System is modular, you can start small and add on as your needs—and resources—grow.

*Breakthrough design.* The WorkManager™ System has the ergonomics of high-priced designer furniture systems. The work surface is the perfect typing height for Mac keyboards, and features a comfortable beveled leading edge. A covered, recessed channel holds cables and surge protectors. Built-in sockets handle WorkManager™ accessories.

*Breakthrough construction.* Strong, lightweight structural components are molded of steel reinforced Resinite™ composite. Molded-in color makes surfaces highly scratch resistant.

*The WorkManager™ System.* For people who need workstations as advanced as their computers—from the people at MicroComputer Accessories, Inc.
words, such as personal names or your company name. To do so, simply enter the word, devoid of hyphens, in the exception list.

Also, don't forget that hyphenation can be turned on or off in a style sheet. For example, you can activate hyphenation for body copy and eliminate it for headings, subheads, and captions.

**WORKING WITH TABS**

Normally, the zero points of window rulers correspond to the upper-left corner of the page, whereas the zero point of a tab ruler corresponds to the upper-left corner of its text block. As a result, tab and window ruler markings usually don’t match. You can put them in sync and thus make it easier to estimate tab positions with the window ruler. Just drag the object pointer from the empty square where the two window rulers meet to the upper-left corner of the text block.

**POWER SEARCH (AND REPLACE)**

If you press the Option key when you select either the Find or Replace command, you get more powerful find and replace options. You can search for or replace styles, fonts, and font sizes in the current block, the current chain, or the entire document (see “Replacing a Style”).

Whether you use basic or power techniques, you can find and replace normally invisible characters. To search for or replace a tab character, type %t or %n (Option-D followed by t or n).

**THE END IS NEAR**

To find the end of a text chain, place the insertion point anywhere in the chain, press ⌘-A to select all its text, then press Option-Right Arrow. ReadySetGo will scroll to the last text block and place the insertion point after the last character.
guide lines. Guide lines can be made to run either over or under objects by selecting Top or Bottom from the Guides Draw pop-up menu in the Preferences dialog box. For most purposes, Top is the better choice.

SETTING UP A GRID
When creating a grid for a publication, it's usually a good idea to specify twice as many grid columns as there are text columns, to facilitate the creation of picture blocks that extend halfway across a column. The appropriate number of grid rows depends primarily on the design of the publication, and can range anywhere from one to a dozen or more.

Once the grid is in place, you can quickly confirm that the grid columns are the desired width by turning on the Snap To command and creating a full-column-width object with either the text, picture, or rectangle tool. Switch to the object pointer and double-click on the new object; the Specifications dialog box displays the width of the object to three decimal points.

PRESERVING DEFAULTS
If you commonly use the same grid structure or guide lines, don't overlook the new Save Defaults command in the File menu. You can preserve a wide variety of settings for use in any document, including grid structure, guide lines on the master pages, grid or guides on, view, settings in the Preferences and Page Setup dialog boxes, and so on.

STYLE SHEET SHORTCUTS
Using keyboard shortcuts to apply style sheets can save you a lot of time. To create the shortcut, simply add a slash and whichever single character you prefer after the name of the style in the Style Specifications dialog box. To apply the style using the shortcut, select the text to be styled, press %-H, and then, before the dialog box opens, type the one-character shortcut. (This technique works with glossary entries as well.)

CREATING A NEW STYLE SHEET
When you're creating a new style sheet, it's often convenient to base it on an existing style sheet or on already-formatted text. To do so, first place the insertion point within some model text formatted with either a style sheet or with individual format commands. (Do not select the text.) Then choose the Styles command. Click on the New button, and the attributes of the text surrounding the insertion point are entered automatically in the Style Specifications dialog box.

USING THUMBNAILS
You can print Thumbnails to get an overview of your document or use them on screen to edit page order. To rearrange pages, choose the Thumbnails command, select and drag the thumbnail page (or pages) until the pointer points to the new location between two other pages, and release the mouse button.

HOMEMADE THUMBNAILS
The contents of thumbnail pages are fixed, but you can easily create a "homemade" thumbnail page, or a pair of editable facing pages. To do so, open a new document, add text blocks, fill them with the

At only $995*

it's the most affordable
tape system you can own.
And we can back it up.

Sooner or later you'll need the security of data back-up. So the question is, which method? Removable disk media is too expensive. Floppies are too slow. And some systems/media are too volatile.

That's why the Braemar SX40 Data Cartridge Sub-system makes sense. There's no faster, safer method of back-up than cartridge tape. And now, the Braemar SX40 makes it affordable. Braemar is a leading manufacturer of tape-based systems for the OEM marketplace. In fact, we make many of the drives sold by our competition.

So obviously we can back our claim. And build it for less.

But the SX40 is available only from select dealers. So call the number below and we'll tell you where you can buy it and answer any questions you may have. Then you can start saving money, time... and your data!
(612) 890-5135 Fax (612) 890-0791

For the dealer nearest you call 1-800-328-2719

*Suggested retail price, Spring 1989 The SX40 uses the Micro Tape DC2000 Cartridge.
Special Instructions
The outer trim (solid) and bleed (dashed) lines for this can label are simply large rectangular objects. The bleed line rectangle is filled to hide all but the ends of the crop-mark lines. During the final print run, the Don’t Print option is turned on for the trim-line rectangle.

Horizontal stripe pattern opposite the 20 percent tint in the Fill menu (to simulate text), and choose the Half Size page view. Add picture blocks, change column width, and so on, and the striped fill rewraps accordingly. When the design is complete, delete the fill pattern and fill the text blocks with text.

Reducing Your Overhead
Too many large illustrations can slow down ReadySetGo. To minimize performance degradation, crop illustrations whenever possible before importing them (using a desk accessory such as SmartScrap or The Curator DA), rather than after.

Picture This
If you’ve misplaced a graphics file and can’t remember its name, select the picture block in which it appears and press §§-M. You’ll see a Specifications dialog box that lists the name of the corresponding graphics file and its format.

Don’t Print
The Don’t Print option is useful in a number of ways. It can speed up printing a test copy by suppressing text and graphics that don’t currently interest you. It can also prevent the printing of fold guides in a brochure, notes to your printer or editor, or trim marks for nonstandard page margins (see “Special Instructions”). To suppress printing, select the object that shouldn’t print, press §§-M, turn on the Don’t Print option in the Specifications dialog box, and press Return.

By turning on the Runaround option in the Specifications dialog box as well, you can use nonprinting, runaround rules to create a custom text-wrap around an illustration, such as one that allows text to extend a short distance inside the boundaries of the image.

Questions? Answers?
If you have a late-night or weekend question that just can’t wait, don’t forget that Letraset provides online technical support on GEnie at any hour, as well as toll-free telephone support during business hours. Just log on to GEnie, type LETRASET at the system prompt, and press Return to enter the Letraset Roundtable.

Importing Word Files
Microsoft Word files will pour into text blocks much more quickly if you save the files with Word’s Fast Save option turned off. If you don’t lose important formatting in the process, a time-saving alternative is to save the Word file in MacWrite format.

Share the Wealth
If you know of a shortcut or an undocumented technique that is not mentioned here, share it with other Macworld readers by sending it to QuickTips, Macworld, 501 Second Street, San Francisco, CA 94107. See Where to Buy for contact information.

In an effort to make your telephone purchasing a more successful and pleasurable activity, The Microcomputer Marketing Council of the Direct Marketing Association, Inc. offers this advice, "A knowledgeable buyer will be a successful buyer." These are specific facts you should know about the prospective seller before placing an order:

**Ask These Important Questions**
- How long has the company been in business?
- Does the company offer technical assistance?
- Is there a service facility?
- Are manufacturer's warranties handled through the company?
- Does the seller have formal return and refund policies?
- Is there an additional charge for use of credit cards?
- Are credit card charges held until time of shipment?
- What are shipping costs for items ordered?

Reputable computer dealers will answer all these questions to your satisfaction. Don't settle for less when buying your computer hardware, software, peripherals and supplies.

**Purchasing Guidelines**
- State as completely and accurately as you can what merchandise you want including brand name, model number, catalog number.
- Establish that the item is in stock and confirm shipping date.
- Confirm that the price is as advertised.
- Obtain an order number and identification of the sales representative.
- Make a record of your order, noting exact price including shipping, date of order, promised shipping date and order number.

If you ever have a problem, remember to deal first with the seller. If you cannot resolve the problem, write to MAIL ORDER ACTION LINE, c/o DMA, 6 E. 43rd St., New York, NY 10017.

© Direct Marketing Association, Inc. 1988
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.

AdWriter version 2.1 imports, and interactively rotates, graphics and can apply dashed lines to any polygonal image. Includes improved zoom features and supports em space, en space, and thin space units of measure. MycroTek, 9229 E. 37th St. N, Wichita, KS 67226; 316/681-0550, 800/835-2055. Free; $1995 new.

AntiToxin version 1.1 includes protection against ANTI virus, detects viruses on CD ROM disks, and has an option to check a disk or file without automatically re-pairing it. Lets users save as a text file reports of viruses found and files repaired. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; 818/991-6540. Free; $99.95 new.

Business Filevision version 1.5 has increased compatibility with MultiFinder and the Mac II, new file-handling routines, larger record and field size, and additional text-handling attributes. MARvelin Corp., 3420 Ocean Park Blvd., #302, Santa Monica, CA 90405-1319; 213/329-8000. Free; $99.95 new.

Empower version 2.05 gives users with security administrator status the option to prevent start-up of the Mac form internal or external floppy disk drives. Magna, 2540 N. First St., #302, San Jose, CA 95131; 408/433-5467. Free; $395 new.

Empower version 1.1 supports MultiFinder so that program continues to run in the background while...(continues)

Extend version 1.1 has a File I/O function to read, write, and format ASCII files to and from other applications or computers. Has serial port I/O functions to interact with Mac serial ports. Also includes rectangular and dot plots. Imagine That, 7109 Via Carmela, San Jose, CA 95139; 408/365-0305, 800/535-0900. $20 if originally purchased before September 1, 1988; free if originally purchased after that date; $495 new.

Ferrari Grand Prix version 1.6 is an updated version of the Formula 1 racing program. Runs on the Mac II, Illx, and SE/30. Bullseye Software, P.O. Drawer 7900, Incline Village, NV 89450; 702/265-2298. $10 with original disk; $99.95 new.

Full Impact version 1.1 has an X-Macro feature with sample files, source code in several development environments, and languages with header and linking commands to create XMacros. Ability to access foreign language dictionaries in French, Italian, German, Swedish, Dutch, and Spanish. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; 213/329-8000. Free; $99.95 new.

FullWrite Professional version 1.1 lets users access foreign language dictionaries from within a document. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; 213/329-8000. Free; $395 new.

MacClint version 1.1 supports MultiFinder so that program continues to run in the background while...(continues)
America is worth fighting for.

From the Atlantic to the Pacific, the Arctic to the Gulf, our land is constantly under attack from the polluters and despoilers. That’s why Sierra Club Legal Defense Fund attorneys are pursuing dozens of cases nationwide in defense of wildlife, rare habitats, the air we breathe and the water we drink.

Most of our support comes from individual contributors like you. Please help us win. Because America is worth fighting for.

I enclose my tax-deductible contribution to save what I love most about America. Send me your quarterly newsletters in return.

NAME

ADDRESS

CITY STATE ZIP

Sierra Club Legal Defense Fund
2044 Fillmore, San Francisco, CA 94115

another program runs in the foreground. Includes function prototype definitions for Inside Macintosh Volume 5 and has nominal support for Aztec C Compiler. Includes bug fixes. MMC AD Systems, Box 360845, Milpitas, CA 95035; 408/263-0781. Free; $99.95 new.

MacEnvelope version 4.1 now prints bar-coded envelopes and labels. Preview screen lets you see the envelope before printing and offers predefined layouts for laser labels and continuous labels. Synex, 592 Tenth St., Brooklyn, NY 11215-4502; 718/499-6293. $5 with disk for registered owners of version 4.0; $25 for registered owners of earlier versions; $89.95 new.

MacHerbal version 2.0 adds a Prescription Writer template, revised Chinese herbal database, auto-entry for patient data, and diagnostic and procedure codes and fees. Also has an enlarged diagnostic and procedural code file listing and new user guide. Summerland Press, P.O. Box 2001, Vineyard Haven, MA 02568; 508/693-5202. $49; $295 new.

MacMainFrame 3270/CUT version 2.1 supports MacMainFrame DX, external box-level system that allows remote and local IBM 3270 mainframe communications from any Mac. Supports IBM 3278 Model 2 emulation and Avatar’s proprietary file-transfer capabilities, IBM 3278/79 terminal emulation, and color. Avatar, 65 South St., Hopkinton, MA 01748; 508/435-3000. $100 for upgrade kit; $200 per copy for software-only package new; $1195 bundled with hardware.

MacProof version 3.2 is now format-compatible with PageMaker 3.0 and Microsoft Word 4.0. Revisions have been made in coverage of proper nouns, geographical and technical terms, and algorithms; change options; and documentation. Lexpertise Linguistic Software, Chateau De Vaumarcus, 2028 Vaumarcus, Switzerland; 800/354-5656 in the U.S. or 41 38 55 31 31 in Europe. $30; $195 new.

MathType version 2.0 automatically formats documents using rules of mathematical typesetting. Uses tab system for multiple-column alignment and contains a ruler with graduations in points, picas, inches, centimeters, and millimeters. Supports fractional point sizes and produces tables and matrices with solid, dashed, and dotted lines. Customizable user interface. Design Science, 6475-B E. Pacific Coast Hwy., #392, Long Beach, CA 90803; 213/433-0685; $35 if originally purchased before November 1, 1988; free if originally purchased after that date; $149 new.

Microsoft Word version 4.0 has increased layout capability, special table formatting to make it easier to do side-by-side paragraphs, lists, and forms. Absolute positioning for sidebars and graphics lets you lock selected material onto a specific page location and wrap text around it. QuickSwitch feature establishes a link between Word and graphics or charts created with other applications and dynamically updates changes. Microsoft, 16011 N.E. 36th Way, Box 97017, Redmond, WA 98075-9717; 800/426-9400. Free if earlier version originally purchased on or after May 1, 1988, $75 plus s/h if purchased before that date; $395 new.

PS1 Mustang Flight Simulator version 2.0.4 runs on the Macintosh II, IIx, and SE/30. Bullseye Software, P.O. Drawer 7900, Incline Village, NV 89450; 702/265-2298. $10 with original disk; $59.95 new.
Plain & Simple version 1.06 is compatible with Apple's ImageWriter LQ, Apple LaserWriters, and with System 6.0.2 and Finder 6.1 or earlier versions. Offers keyboard shortcuts for host commands listed in the File and Special menus. Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103; 701/281-0550. Free for users on technical support plan; $50 if not on plan; $395 new.

Prototyper version 2.01 has auto-centering for windows, an Undo command, and alignment tools; supports large monitors. Menu editor supports hierarchical menus and will open and close windows and enable or disable menus. SmathersBarnes, P.O. Box 639, Dept. 400, Portland, OR 97207; 503/274-2800. $79; $249 new.

Sniffer version 2.1 is a LAN-analysis tool for LANs that use ISO protocol software. Supports SNMP, CMOT, and ISODE high-level ISO protocols for use on top of TCP/IP networks. Network General, 1945A Charleston Rd., Mountain View, CA 94043; 415/965-1800. $50 if under warranty or extended maintenance, $350 if neither; $12,500-$24,000 bundled with analyzer base unit new.

Super 3D version 2.0 uses unique dithering technique for color support. Can import 2-D objects in PICT format and translate them into 3-D. Uses tweening, which automatically creates intermediate frames to simplify animation. Has math coprocessor support and lets you export animations from Super 3D in PICT format for playback in other programs. Silicon Beach Software, 9770 Carroll Center Rd., Ste. J, San Diego, CA 92126; 619/695-6956. $200; $495 new.

TextPert version 3.0 automatically recognizes fonts, includes Page Analysis feature to differentiate between columns, titles, illustrations, and captions; maintains column order, tabs, and tables during scanning. Reads typeset, proportionally spaced, and kerned text. Program can read text that has been skewed up to a 25-degree angle, and can read at a speed of 30-60 characters per second. CTA, 747 Third Ave., Third Fl., New York, NY 10017; 800/252-1442. Free; $995 new.

Thunder II checks for errors in spelling, capitalization, punctuation, and word doubles at a rate of 100 words per second. Corrects mistakes as you type. Appears automatically on the menu bar of the host application. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404; 415/571-7171. $30 with original disk; $79.95.

Virex version 1.4 has been updated to combat the MEV# and AIDS viruses. HJC Software, P.O. Box 51816, Durham, NC 27717; 919/490-1277. $15 if originally purchased before March 30, 1989; free if purchased after that date; $75 per year for subscription; $99.95 single copy new.

WordPerfect version 1.02 allows for absolute tab settings and lets you set tabs to within 1/n inch. Also supports A/UX operating system and eliminates screen flicker that occurred when text was entered in original version. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057; 801/222-5000. Free; $395.

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.
The Publisher desktop printer is fast. Blazing fast. Faster than any other page printer in its class. That means your best, your most complex PostScript® documents are in your hands in seconds. Not minutes.

Your imagination isn’t kept waiting or wanting. Because the Publisher delivers eye-dazzling, laser-crisp print from your PostScript applications. With graphics composed of fine lines, solid blacks and smoothly graduated grays. And layouts with precisely formed text. The result — elegant images not even Apple®’s top-of-the-line LaserWriter® IIx can match. New. The Publisher’s price will capture your imagination. Output, too. It’s amazingly low. You get the power of the LaserWriter IIx for less than a LaserWriter IIl. And that’s a very big difference.

Plus, whether your preference is for Macintosh™ or IBM™ — no matter. CrystalPrint Publisher will send you to new heights in either world.

Call 1-800-223-2479 for more information, or the location of the Qume dealer nearest you. Don’t wait. Let your imagination soar. See the Qume CrystalPrint Publisher today.
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 by phone.

Reader Service

Adobe Illustrator 88 Adobe Systems, Inc., P.O. Box 7500, Mountain View, CA 94039-7900; 415/961-4400, 800/833-6687.


Advanced NetWare Novell, Inc., 890 Ross Dr., Sunnyvale, CA 94089; 408/747-4000.

Agfa Compugraphic P3400PS Agfa Compugraphic Division, 80 Industrial Way, Mailstop 80-A-7C, Wilmington, MA 01887; 508/658-5600.


AppleColor High-Resolution RGB Monitor Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

The Art Importer Alsys Corp., 720 Avenue F, #109, Plano, TX 75074; 214/424-4888.

Canvas Deneba Software, 3305 NW, 74th Ave., Miami, FL 33122; 305/594-6965, 800/622-0827.


DeskPoint 2.0 and DeskDraw Zedcor, Inc., 4500 E. Speedway, #22, Tucson, AZ 85712-5305; 602/881-8101, 800/482-4567.

Digital Darkroom Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126; 619/695-6966.

Drawing Table Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101; 415/492-3200, 800/527-6263.

E-Machines C20, E-Machines T16, E-Machines T19, E-Machines TX E-Machines, Inc., 9305 S.W. Gemini Dr., Beaverton, OR 97005; 503/666-6699.

Fostat Systat, Inc., 1800 Sherman, Evanston, IL 60201; 312/864-5670.

FileMaker II Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/534-3535.

Fontographer Alsys Corp., 720 Avenue F, #109, Plano, TX 75074; 214/424-4888.

Frees The FreeHand Corp., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.


HyperCard Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

ImageStudio Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653; 201/845-6100.

ImageWriter II Printer Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

Intersect CDR-77 NEC Home Electronics (USA), Inc., 1255 Michael Dr., Wood Dale, IL 60191; 312/860-9500, 800/366-3632.

Kray Kolor Kray, Inc., 14555 N. Hayden Rd., Scottsdale, AZ 85256-3400; 602/948-2222, 800/521-4997.


MacDraw Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/534-3535.

MacDraw II Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/534-3535.

MacPaint Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/534-3535.

MacProject II Claris Corp., P.O. Box 58168, Santa Clara, CA 95052; 408/987-7000, 800/534-3535.


MFLauncher II Impossible Dreams Software, Inc., 915 Oakcrest St., Iowa City, IA 52246; 319/351-5703.

Microsoft Excel, Microsoft Word Microsoft Corp., 1601 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.

NetWare for the Mac Novell, Inc., 890 Ross Dr., Sunnyvale, CA 94089; 408/747-4900.


Objectworks for Smalltalk-80 Objectworks Corp., 411 First Ave. S, Seattle, WA 98104; 206/622-5500.


Microsoft Excel, Microsoft Word Microsoft Corp., 1601 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.

NetWare for the Mac Novell, Inc., 890 Ross Dr., Sunnyvale, CA 94089; 408/747-4900.


Objectworks for Smalltalk-80 Objectworks Corp., 411 First Ave. S, Seattle, WA 98104; 206/622-5500.


(continues)
**WHERE TO BUY**

<table>
<thead>
<tr>
<th>Readerships</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReaderPoint</td>
<td>SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043; 415/964-8884.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Suvlct, 786 The Profit Center, Tronsoft Inc., 790 ReadySetGo Letraset USA, 40 RasterOps</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Radius Color Display System</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>QuarkPress Quark Inc., 300 S. Jackson, #100, Denver, CO 80209; 303/934-2211, 800/366-9063.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>RasterOps 1948H, RasterOps 19485 RasterOps Corp., 10161 Bubb Rd., Cupertino, CA 95014; 408/446-4090.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>ReadySetGo Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07625; 201/845-6100.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>SuperPaint Silicon Beach Software, Inc., PO Box 261430, San Diego, CA 92126; 619/695-0956.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>SFT NetWare Novell, Inc., 890 Ross Dr., Sunnyvale, CA 94089; 408/747-0000.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>TableTools Mansfield Systems, Inc., 550 Hamilton Ave., #150, Palo Alto, CA 94301; 415/326-0603.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Tektronix Color Image Printer Tektronix, Inc., P.O. Box 1000, Mailstop 65-477, Wilsonville, OR 97070; 800/835-6100.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Two-Minute Nutrition Manager DPEX, 3533 Bowers Ave., #190, Santa Clara, CA 95054; 408/727-1211.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Tydo Macreations, Inc., 329 Horizon Way, Pacifica, CA 94044; 415/359-7649.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Userland IPC Userland Software, Inc., 1100 Sharon Park Dr., Menlo Park, CA 94025; 415/854-6662.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>VideoWorks II MacroMind, Inc., 410 Townsend St., #408, San Francisco, CA 94107; 415/442-0200.</td>
</tr>
<tr>
<td>ReaderPoint</td>
<td>Viking II Montem Corp., 5740 Green Circle Dr., Minnetonka, MN 55343; 612/935-4151.</td>
</tr>
</tbody>
</table>

---

**Never buy another ribbon!!!**

Each MacInker shipped complete with free ink bottle, reservoir cover and ink dispenser.

**MacInker**

- **$42.00**

**Order Toll Free 800-547-3303**

in Oregon (503)626-2291- fax(503)643-5379

Special Offer. Order for $80.00 and say "I saw it in MacWorld" and get a free mousepad or free photo-art disk. Order for $100.00 and get free key-beeper with flashlight combined (a $15 value), or get a guaranteed, accurate LCD electronic pedometer, jogging & step meter & calculator for only $15.00 (a $40 value).

**Computer Friends, Inc.**

14250 NW Science Park Dr. Portland OR 97229

---

**LightFax 9624 FaxModem**

- **$749.00**

9600 baud fax and 2400 fully Hayes compatible modem in one. Full front panel control lights. Software features Background operation, NameCard data management, Scheduled Sending, Broadcasting, full input/output Journal and much more. Optional 200 dpi scanner for direct input into fax window or favorite paint program. Ask for bulletin "Facts on faxes".

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>LightFax 9624</td>
<td>$749.00</td>
</tr>
<tr>
<td>LightScan 2000 dpi</td>
<td>$199.00</td>
</tr>
<tr>
<td>2400 b modem only</td>
<td>$239.00</td>
</tr>
</tbody>
</table>

---

**WHERE TO BUY**

<table>
<thead>
<tr>
<th>Service</th>
<th><strong>WHERE TO BUY</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Font</td>
<td><strong>MacWorld</strong></td>
</tr>
<tr>
<td>Font</td>
<td><strong>AUGUST 1989</strong></td>
</tr>
</tbody>
</table>

---

**Over 100,000 sold since 1982**

**Average cost per re-inking is 5 cents.**

MacInker™, the original, automatic ribbon re-inker. MacInker mod 234IM re-inks ImageWriter I/II black & single color cartridges. The Universal MacInker re-inks hundreds of cartridge types (including the ImageWriter LQ, one color and multicolor) with suitable adapters. Proprietary, extra dark, dot matrix, lubricant ink yields better than new print quality and extends printhead life. New feltless reservoir for precise ink metering. Average number of re-inkings/canister is 60-100. With the optional Multicolor Adapter (mod M422, $40.00) your MacInker re-inks 4-color ImageWriter II cartridges. Full range of accessories available, inks & cartridges: indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. **Free catalog.**

ImageWriter I/II MacInker (mod 234IM) ........................................ 42.00

Multicolor Adapter (mod M422) .................................................. 40.00

Universal MacInker ..................................................................... 68.50

Heat Transfer Adapter ................................................................. 35.00

ImageWriter cartridges ............................................................... 4-color ........ 3.15/ea ....... 10.00/ea

ImageWriter LQ cartridges .......................................................... 4-color ........ 14.00 ........ 20.00

Extra ink bottle ........................................................................... 3.00/ea ........ 18.50

Shipping ....................................................................................... 4.50

---

**LightFax 9624 FaxModem**

- **$749.00**

9600 baud fax and 2400 fully Hayes compatible modem in one. Full front panel control lights. Software features Background operation, NameCard data management, Scheduled Sending, Broadcasting, full input/output Journal and much more. Optional 200 dpi scanner for direct input into fax window or favorite paint program. Ask for bulletin "Facts on faxes".

**LightFax 9624**, 1200 baud modem only ........................................... 99.00

2400 b modem only ................................................................. 50.00
America's source for MacProducts

1 MB SIMM's

1MB SIMM's: $149
Available now. Lifetime Manufacturer's Warranty!
256K SIMM's: $59

Printers

Qume ScripTEN: $3295
Qume CrystalPrint: $3195
ColorScript 100: call
GCC Printers: call

Magic Drives

20 megabyte: $399 - $579
30 megabyte: $399 - $599
45 megabyte: $519 - $649
60 megabyte: $599 - $699
80 megabyte: $699 - $799
91 megabyte: $850 - $995
150 MB CDC: $1395 - $1495
300 MB CDC: $1995 - $2350
600 MB CDC: $3550 - $650

Software

Adobe Fonts: Save 33%
Aldus Freehand: 299.00
Big Thesaurus: 54.00
Canvas 3.0: 175.00
FileMaker II: 225.00
Fluent Laser Fonts: 50.00
Foxbase+: 205.00
Illustrator '86: 325.00
LightSPEED C: 169.00
MS Word 4: 249.00
Mac Link+: 139.00
MacDraw II: 375.00
MacWrite: 180.00
Managing Your Money: 129.00
Master Juggler: call
Master Tracks Pro: 260.00
Mathematica: call
MiniCAD+: 519.00
MS Works 2.0: 199.00
MultiClip: 35.00
PageMaker 3.1: 379.00
Persuasion: 265.00
Quark XPress 2.1: 499.00
QuickKeys: 65.00
Red Ryder 10.4: 54.00
Retrospect: 169.00
Suitcase II: 48.00
SmartForm: 305.00
SUM/SAM: 99.00
SuperCard: 137.00
SuperPaint 2.0: 129.00
Swivel 3D: 289.00
TOPS Mac/IBM: 165.00 (call)
Vrex: 68.00
WingZ: 269.00
WriteNow 2.0: 139.00

102/030 Railgun

020/030 Railgun

19" BW Monitors:
72 dpi, 72 Hz. Includes 19" monitor and card for SE, SE/30, II, Ix, Icx: $999

Magicview 19

19" Monitor: $749

Video Products

13" & 14" Apple Compatible
8 bit color card: $49
19" 8 bit color card: $994
RasterOps - Sigma Designs Cornerstone - Taxan PCPC: Viking Call for prices.

Removable Media

60 MB Tape Backup: $695
150 MB Tape Backup: $895
45 MB Removable: $995
600 MB Read/Write Optical Drive: $3995
1.2 Gig Tape Backup: $3995

Accessories

Disks:
DS: 75.00
Sony Boxed: (10) $1.45
Sony Bulk (50): 1.15
MacDisk Bulk (50): 1.35
KAO Bulk (50): Call
High Density Disks: 2.50
Black Ribbons: 3.00
Colored Ribbons: 3.50
Disk File/30/80: 7.00/12.00
Fanny Mac GT: 39.00
Hard Top Covers: Call
ImageWriter LQ Ribbons: 15.00
ImageWriter LQ 4-Color: 25.00
MacGuard - Surge: 25.00
Mac Plus, SE Bag: 59.00/50
Mouse Cleaner: 12.00
Teak Desk Box 50/100/150: 16/25/33

Board/Upgrades

030 Railgun Cache: 499.00
Cyclone 6800: Call
DayStar 6800: 5250.00
Daystar: 6800/6888: 5250.00
Dove SCSI: 134.00
Dove Upgrades: Call
MacSprint: 225.00
Magic SCSI: 69.00
Orion 10.0: 689.00
EtherNet: (call)
68861, 68860: Co-Processors: call
PMU-68861: 299.00
15K-1024 Upgrade: 149.00
125K-512K Upgrade: 149.00
125K-1024K Upgrade: 255.00
80K Drive & ROM: 259.00

Smart Cache

SCSI Disk Cache
Cuts 30-50% off the access time of any SCSI hard drive
Tracks your history and optimizes using 64 caching algorithms
Write through cache for maximum data integrity

Magic Modem

100% Hayes Compatible
Auto Dial/Auto Answer
2400/1200/300 Baud
2-Year Warranty: $119
Red Ryder: 10.4: $54

Ordering

Ordering: 1-800-622-3475
Information: 1-512-343-6441
International: 1-512-304-9353
FAX: 1-512-343-6414
International FAX: 1-512-264-0353
Tech Support: 1-512-343-6413

Tech Support Hours: 9am - 5pm M-F
Minimum Order: $40.00
Payment:
Cash, Check, C.O.D., MasterCard, American Express, Visa, Discover, Access
Check, C.O.D., and Company Check

Shipping: Minimum $4.50

Price: Texas residents only, add 7.25% sales tax
Prices and Items are subject to change and availability
Terms: You are not charged until your order is shipped. Returns may be subject to a restocking fee.
Shipping: Minimum $4.50 Airborne, UPS Next Day & 2nd Day Air, US Mail
Leasing: Available on orders over $500. Call for more information.

MacProducts USA carries over 3500 products for the Mac, so call for products not listed.
Call for a free catalog.
## PRODUCT INDEX

### Software

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Software</th>
<th>VERTICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>BUSINESS</strong></td>
<td><strong>DATA MANAGEMENT</strong></td>
</tr>
<tr>
<td></td>
<td><strong>ADOBEE SYSTEMS, 90</strong></td>
<td><strong>COMPUTER FRIENDS</strong></td>
</tr>
<tr>
<td>306</td>
<td><strong>ALEXIS, 264</strong></td>
<td><strong>COMMUNICATION</strong></td>
</tr>
<tr>
<td>329</td>
<td><strong>ADOBEE SYSTEMS, 90</strong></td>
<td><strong>GRAPHICS</strong></td>
</tr>
<tr>
<td>329</td>
<td><strong>ALL-WINNERS ASSOCIATES, 220</strong></td>
<td><strong>DESIGN SCIENCE, 213</strong></td>
</tr>
<tr>
<td>220</td>
<td><strong>ASHTRAY, 21-25</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>208</td>
<td><strong>CASADYWARE &amp; GREENE, 30</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>138</td>
<td><strong>CHECKMARK SOFTWARE, 88</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>157</td>
<td><strong>DESIGN SCIENCE, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>157</td>
<td><strong>GENERIC SOFTWARE, 83</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>156</td>
<td><strong>GREAT PLAINS SOFTWARE, 235</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>133</td>
<td><strong>HIC SOFWARE, 44</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>369</td>
<td><strong>INFORNEX, 199</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>369</td>
<td><strong>INFORNEX, 191</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>135</td>
<td><strong>MICROSOFT, BPC-1, 166-167</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>238</td>
<td><strong>PERSONAL TRAINING SYSTEMS, 17</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>297</td>
<td><strong>SHANA CORPORATION, 94-95</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>298</td>
<td><strong>SILICON BEACH, 196</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>491</td>
<td><strong>SYMANTEC, 110</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>492</td>
<td><strong>SYMANTEC, 110</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>135</td>
<td><strong>TBSB, 239</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>238</td>
<td><strong>WILLIAMS &amp; MACIAS, 97</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>126</td>
<td><strong>WORDPERFECT, 72</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>376</td>
<td><strong>XENIX IMAGING SYSTEMS, 54-55</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

### Hard Drive

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Hardware</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>COMMUTER SYSTEMS</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>CASI-FRIENDS, 215</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>361</td>
<td><strong>MICROSOFT, 215</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

### Printers

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Printers</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MICROSOFT, 215</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

### Expansion/Upgrade

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Expansion/Upgrade</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MICROSOFT, 215</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

## Accessories

### Floppy Disk/Drivers

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Accessories</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MACAKADERM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>143</td>
<td><strong>MACAKADEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>193</td>
<td><strong>MACAKDEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>123</td>
<td><strong>MACAKDEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

## Mail Order

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Mail Order</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MACADDY, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>113</td>
<td><strong>MACADDY, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>123</td>
<td><strong>MACADDY, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>193</td>
<td><strong>MACADDY, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>14</td>
<td><strong>MACADDY, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>Software</th>
<th><strong>HYPERCARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>MICROSOFT, 215</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>143</td>
<td><strong>MACAKADEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>193</td>
<td><strong>MACAKADEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
<tr>
<td>123</td>
<td><strong>MACAKADEM, 213</strong></td>
<td><strong>EDUCATIONAL</strong></td>
</tr>
</tbody>
</table>
The Macintosh CAD/CAM Book
by the editors of the CAD/CAM Journal

If you’re planning to invest in a CAD/CAM system for your Mac, this is one reference you can’t afford to be without. Written by the editors of the most important CAD/CAM journal in the field, the book provides state-of-the-art information and advice that will soon make you an expert. Simply following the steps in this book will help you master all of Excel’s power and sophistication.

Excel Macros for the Macintosh
by John Annaloro

Perfect for both beginning and more advanced users, this book provides step-by-step instructions and detailed examples that thoroughly cover every important aspect of Excel macro programming, including how to use macros to handle numerous computational tasks simultaneously. Also included is a chapter on how to use macros to create custom business solutions and complex macros. And much more. Softbound, 325 pages. $24.95

Working with WordPerfect on the Macintosh
by Beverly B. Zimmerman and S. Scott Zimmerman

Here’s the most complete, current, and comprehensive guide available for mastering WordPerfect version 5.1 on the Mac. Filled with step-by-step instructions and detailed explanations, this book will help you get started. Format and print documents, format and print documents, convert documents, create columns, define fonts, and display graphics. Software, hardware, and network information, as well as a Macintosh user’s guide, is included. And much more. Softbound, 352 pages. $24.95

Hands-On Excel, Second Edition
by Danny Goodman and Gordon McComb

If you’re looking for a reference that will help you master all of Excel’s power and sophistication, look no further! This heavily illustrated edition (newly updated to include version 1.5) is packed with tips, shortcuts, and strategies that will soon make you an expert. Simply following the steps in this book will help you master all of Excel’s power and sophistication. And much more. Softbound, 325 pages. $24.95

Circle 100 on reader service card

Consult with a Mac Expert for $24.95 or less

Available wherever computer books are sold or mail orders to:
Scott, Foresman and Co.
Professional Books Group
1900 E. Lake Ave.
Glenview, Illinois 60025

Please include complete shipping information. Check, Money Order, VISA and MasterCard accepted. Postage required.

Or call 1-800-ALL-BOOK
Name, Address, City, State, Zip

ADVERTISER INDEX

173 Dover Computer, 202
168 Dr. Mac, 299
171 E-Machines, 320
154 Erman Engineering, 160-167
152 Erman Engineering, 160-167
326 Exodus Software, 217
190 Facilion Computing, 64-65
259 Fifth Generation, 210
152 Fox Software, 112
11 GCC Technologies, 11
439 GDIT Softworks, 231
157 Generic Software, 83
179 Graphsoft, 30
156 Great Plains Software, 255
GW Instruments, 20
76 IBM Systems, 100
440 Hard Drives International, 200
344 Hewlett Packard, 208-209
135 HJC Software, 44
63 In Focus Systems, 76
360 Infomix, 180
66 Intergraph, 40
19 Dataviz, 48
241 DCA, 210-211
329 Daceda Software, 29
165 Design Science, 213
242 Digital Vision, 213
70 Diskette Connection, 294
"What's wrong with copying software?"

"I use a lot of programs on my personal computer, and I copy them all the time."

"I'm a programmer. Every time you copy one of my programs, you're taking away my income—I depend on sold programs for a living."

"Oh, come on. I bought it: I have a right to copy it."

"You do have a right to make a back-up, that's true. But when you start copying programs for your friends and co-workers, that's breaking the law."

"What law? Any copying I do is in the privacy of my own home."

"It doesn't make any difference where you do it. Every time you copy a program without permission from the publisher, you're committing a federal offense."

"That's all right, I won't get caught."

"You're missing the point. The issue isn't "What can I get away with?"—it's "who am I hurting?"

Remember, lots of people worked hard to produce every program you use: designers, programmers, distributors, retailers, not to mention all the people who support users. They have a right to be compensated for their efforts, and their major compensation is through software sales.

"Well, I don't mean to hurt all those people—or anyone, really."

"Unfortunately, that's what copying does: it hurts people. And, ultimately, it hurts people like you, who want new and innovative software."

Do you copy software? Think about it.

The unauthorized copying of software is a crime.

Software Publishers Association
Suite 1200
1111 19th Street, N.W.
Washington, D.C. 20036

Created by Halcyon Associates, Brooklyn, New York.
If backing up data is your responsibility, there is now a way to ensure that you get the job done. With NetStream™, you can accomplish the following:

- Back up all of the nodes on your network, including the server, to one device: a tape drive, an optical drive or hard drive
- Backup your entire network to any type of AppleShare™ server, including a VAX
- Back up your data without being there — even at night
- Select frequency of backup from every day to once per week
- Up to 2.2 gigabytes can be backed up using PCPC's JetStream™ tape backup
- Speeds of up to 14.4 MB per minute when paired with PCPC's JetStream™
- Less than $100 per node with site licenses available (special pricing for tape version)
- No special network software or hardware required
- Virus checking built in
- Works in the background

AppleShare is a registered trademark of Apple Computer, Inc.

- Individual data security feature allows you to maintain privacy of your special files
- Multifinder Compatible
- AppleShare™ & TOPS™ Compatible
- Back up and restore AppleShare™ privileges
- Single or multiuser launchable
- Incremental, file by file, and image backups
- Multiple backup formats — finder, archive, etc.
- Transparent macros allow backup sessions to be saved and repeated with the click of the mouse
- Backup & restore files and folders selected by date, name, owner or type

Now Shipping!

800-622-2888 • 813-884-3092 • FAX 813-886-0520

From the wonderful folks who bring you MacBottom.

Personal Computer Peripherals Corporation
4710 Eisenhower Blvd., Bldg. A-4 • Tampa, Florida 33634

Circle 223 on reader service card
Some of the most enlightening articles in a magazine never make it to the table of contents.

Open to the table of contents in any publication and you can find some insightful stories. You'll also find some missing. Because the advertising isn't there.

Advertising is important. It's informative. It lets you know your options. And helps you to make decisions.

Like which car to buy. Which airline to fly. And what to serve for dinner.

So, next time you open a magazine, read it. From cover to cover.

Because what's on the back cover, may be just as important as what's on the front.

ADVERTISING.
Without it you wouldn't know.
Introducing A Better Display For The Macintosh II ...

For About $300.00 Less Than You'd Expect.

This is not just another display clone. It's the new Magnavox Analog Color (MAC) display, specifically designed and engineered to compliment the Macintosh II system.

When we decided to develop a display exclusively for the Macintosh II, we started with two objectives: Make it work better, and make it cost less.

Our 14" MAC display appeals to even the most discriminating user. It's equipped with our new proprietary 0.29mm dot pitch CRT for superb resolution, and a glossy CRT face for crystal clear images. Graphics and text on the MAC display shine at their best. The integrated tilt-base provides the ultimate in user comfort.

Additionally we offer a solid, two-year warranty instead of the usual 90 days. And the $699 retail makes this a great value.

Designing a superior display for the Macintosh II system was smart. Offering it for $300 less, that's very smart.

MAGNAVOX

Smart. Very smart.
Mail-Order Consumers Do Have Rights.

The vendors and developers who advertise in the pages of Macworld share with you a common goal—to serve you, the consumer. And as a mail-order consumer, you have certain rights you should know and understand.

Mail-order sales must comply with the rules of the Federal Trade Commission (FTC) and various state laws. Here are some guidelines to alert you to your rights and help you shop by mail more efficiently.

THE FTC MAIL ORDER RULES STATE:
1. The Seller must ship your order within 30 days of receiving it, unless clearly delayed in the advertisement.
2. If the Seller cannot ship your order when promised, you must be notified in writing prior to the promised date.
3. If the order is not shipped, the Seller must give you the opportunity to cancel without extra costs.
4. You may return the merchandise in its original condition within 30 days of receipt for a full refund, including shipping costs.
5. If you are charged for shipping, the charges must be reasonable and must be clearly stated in the advertisement or on the order form.

THE FTC MAIL ORDER RULES TELL YOU:
1. You have the right to cancel your order within 30 days and receive a full refund, including shipping costs, if the Seller does not ship within the promised time.
2. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
3. You have the right to cancel the order if the Seller does not ship within the promised time.
4. You have the right to cancel the order if the merchandise is defective, damaged, or not as advertised.
5. You have the right to cancel the order if the price of the merchandise increases after you place your order.

THE FTC MAIL ORDER RULES TELL YOU THAT:
1. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
2. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
3. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
4. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
5. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.

THE FTC MAIL ORDER RULES TELL YOU THAT:
1. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
2. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
3. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
4. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.
5. You have the right to return the merchandise in its original condition within 30 days and receive a full refund, including shipping costs.

Mail-order sales must comply with the rules of the Federal Trade Commission (FTC) and various state laws. Here are some guidelines to alert you to your rights and help you shop by mail more efficiently.
## 20 Megabyte External Hard Drives

**Beverly Hills**
- 20 Megabyte External $399
- 140 Megabyte External $1198

**CMS**
(External Subsystems for all Macs)
- SD 20 Megabyte $448
- SD 30 Megabyte $498
- SD 45 Megabyte $598
- SD 60 Megabyte $698
- SD 80 Megabyte $798
- SD 140 Megabyte $1248
- Removable 44 Megabyte $998

**CMS Internal Subsystems**
(For SE/SE 30/II/IIx/IIcx)
- PRO 30 Megabyte $398
- PRO 45 Megabyte $478
- PRO 40 Megabyte (25ms) $548
- PRO 80 MB (Mac II/IIX only) $698
- PRO 100 Megabyte $878
- PRO 140 MB (Mac II/IIX only) $998

*Call for larger capacity drives*

### Cutting Edge
800K External Drive $175

### Everex/EMAC
- External 20D $498
- External 20 Zero Footprint $548
- Impact 40 Plus $748
- Impact 60 $848

### PCPC MacBottom
- HD-21 $639
- HD-32 $689
- HD-45 $829
- HD-70 $969
- HD-84 $1229

### Tape Back-up Systems
- CMS 60 Megabyte External $698

## Dot Matrix Printers

### Seikosha
- SP 1000 AP $215
  - Imagewriter Compatible

### EPSON
- LX-810
  - 9 pin, 180 cps $199
  - Grappler C/Mac $179
- LQ-510 *
  - 24 pin, 180 cps $339
- LQ-850
  - Call
- LQ-1050
  - Call
- LQ-2550
  - Call
- LQ Printer Software $68
  - (Interface for all LQ series printers)

*Requires serial card*

## GCC Write Move
Portable ink-jet printer $519

## Monitors

### E-Machines
- Big Picture 17” monochrome $1298
- Big Picture Z21 $1798
- Big Picture Z21 IQ $2598
- Big Picture T-16 color $2598
- Big Picture TX-16 $3398
- Big Picture T-19 $4498

### Moniterm
- Viking 1 19” $1498
- Viking 2400 24” $1898
- Viking GS 19” $2498
- Viking 10 Color 19” $3898

### PCPC
- Shadowgraph $2449

### Magnavox 14” Mac Display
- 640 x 480 Resolution $509
  - Fine Dot Pitch, Tilt & Swivel Base

### Sigma Design
- Pageview Plus/SE 15” $1798
- Silverview 21” $1598
- Silverview 256 Grey Shades $2398
- Colormax 19” $3648

### Raster Ops
- Colorboards Call
- Monitors Call

*Please call for competitive system pricing.*

---

**Beverly Hills Computer**

Computer professionals since 1975.

**1-800-426-8166**

From Beverly Hills  (213)273-3710  Fax Machine  (213)675-2522

279 South Beverly Drive, Suite 1200, Beverly Hills, California 90212
Hard Drive $399

New!
Logitech
Hand-Held Scanner .......... $398
Selectable Resolution to 400 d.p.i.
Scans Images Quickly 4" Wide and
Up to 14" Long.

FAX Products
Abaton InterFax ............... $319

Modems
Beverly Hills
External 1200 Baud ............ $69
External 2400 Baud ............ $129
Internal 2400 Mac II .......... $199

Epic Technology
Internal 2400 Mac II .......... $299

Everex
Emac External 2400 ............ $199

Practical Peripherals
Mac Pack 2400 ................. $229
Shiva Corp
NetModem 2400 ............... $399
NetSerial .................... $269
U.S. Robotics
External 2400 ................. $169

DCA
Mac Irma-Mac II or SE ........ $795

Dove Computer
MacSnap Tool Kit .............. $15
MacSnap Plus 2 ............... Call
MacSnap 2 SE ................. Call
MacSnap 524S ................. Call
MacSnap 548S ................. Call
MaraThon 020 Accelerator .... $549
MaraThon 030 Accelerator .... $1198
Co-Processor 68881 .......... $249

Call for SIMM prices
Accelerators
DoubleTime-16 ................ $299

GCC Technologies
Hypercharger 020 Accelerator . $679

Scanners
Microtek
300C 16 grey levels .......... $1199
300QS 64 grey levels ......... $1499
300G 256 grey levels ......... $1899
400G 256 grey levels 400 dpi .. $3299
All Scanners bundled w/Software.

Imagewriter II Carrying Case .. $59
Imagewriter II Carrying Case .. $59
Mac Plus/SE Carrying Case .. $59
Mac SE w/Ext. Keyboard ...... $69

Farallon
MacRecorder Sound System . $129
ScreenRecorder ............... $135

OUR POLICY
- Plain and simple. Hardware: your satisfaction guaranteed or your money back.
- Software: defective software will be replaced. Manufacturers policies prohibit
  us from offering refunds on opened
- We accept most major credit cards with no surcharge added.
- Your credit card is not charged until we ship.
- Please allow 10 days for personal and company checks to clear.
- C.O.D. orders accepted.
- We gladly accept purchase orders from most major institutions.
- International orders accepted.
- California, Texas, Georgia and Arizona residents please add the appropriate
  local sales tax.
- To Place orders call Monday thru Friday
  7AM to 6PM P.S.T.
- Prices and availability subject to change.

Generic Computer Supply
Disks Box of 10 DS/DD .......... $17
Mouse Pad .................... $7
Monitor Stand ................ $18
Printer Stand 80 column ....... $14
Printer Stand 132 column ....... $19
Surge Protector 6 outlet ....... $18

Kensington
Superbase .................... $33
System Saver ................ $63
System Saver SE .............. $52
Security System ............. $34
Mac II System Stand .......... $19
Masterpiece Mac II .......... $105
Keyboard Cable ADB .......... $25
Monitor Extension Kit ......... $33
MacTilt & Swivel ............. $22
Turbo Mouse ................ $109
Turbo Mouse ADB ........... $109

Microspeed
MacTrac Trackball ............. $78

Low prices, great service!

Imagewriter II Printer .......... $19
Imagewriter LQ Printer ......... $14
Laserwriter Printer .......... $24

Grappler C/Mac ................ Call
Grappler LQ or LS ............. ..

Mobius
Fanny Mac QT ................. $58
SE Silencer ................ $39
Multiscreen Video Card ....... $339

Mouse System
A+ Mouse .................... $65
A+ ADB Mouse ............... $79

Orange Micro
Grappler C/Mac ............... $79
Grappler LQ or LS ........... $89

SE Silencer
Ultra quiet
Internal Fan
Keeps it cool & quiet .......... $39

SE Silencer
Ultra quiet
Internal Fan
Keeps it cool & quiet .......... $39

Mouse System
A+ Mouse .................... $65
A+ ADB Mouse ............... $79

Orange Micro
Grappler C/Mac ............... $79
Grappler LQ or LS ........... $89

SHIPPING
All items in stock will ship in 24 hours. We offer daily service from Federal Express,
UPS, U.S. Postal Service. Call for handling
and shipping fees. Minimum shipping
charge $14.00.

Circle 5 on reader service card
WARNING: Beware of money-back offers on hardware! MacLand sells only NEW, NEVER USED merchandise. We will not send you re-packaged, slightly-used hard disks.

For Ordering and Technical Support Call 1-800-333-3353

For The Lowest Price!

Removable Tape Back-Ups

CMS Enhancements 44.25ms . . . . . . . $1,299.
MicroNet 44.25ms ............... $1,299.
60 Megabyte Tape Back-Up . .... $699.
CMS Enhancements 60 . . . . . . . . . . . $749.
MicroNet 60 . . . . . . . . . . . . . . . . . $799.
150 Megabyte Tape Backup . . . . . . $1,599.
MicroNet 150 . . . . . . . . . . . . . . . . . $1,199.

Accelerators, Printers, Memory, Monitors and more!

Removable Cartridges (Will fit Any 44 Removable Drive) . . . . . . $119.
General Computer ................. $1,699.
Personal LaserWriter ......... $1,579.
Qume .......................... $3,299.
Crystal Print Publisher ........ $3,199.
ScriptTEN Postscript Printer .. $3,199.
Radius .. . .. ...... $599.
Radius 16 + Accelerator .......... $739.
Radius 25 Accelerator ....... $1,249.
Full Page Display + SE.II ........ $1,299.
Two Page Display SE.II ........ $1,399.
Two Page Gray Scale II ........ $2,956.
SystemsGate 800K External Floppy Drive .... $199.

SIMMS In Stock, Call For The Lowest Price!
SAME DAY SHIPPING on all in stock items if orders are placed by 3 PM Mountain Standard Time.

ALL DRIVES are preformatted and tested by MacLand technicians.
All hard disk drives carry a manufacturers one year warranty except for the "Quantum drives, which have a manufacturers two year warranty.

HiCIX Compatible

Prices are good thru August 1989

For Ordering and Technical Support Call 1-800-333-3353
The BEST MAC DISKS

Quality User Supported Software.
Works with all MAC Systems

So easy to Use
- No Computer Experience Necessary
- Instructions for each Order
- FREE Phone Support

So Easy to Order
- FREE Membership
- FREE 800-# for Orders
- FREE Same-Day Shipping
- UPS 2nd Day Air Service when you need it Now!
- FREE Catalog - Your Order Guaranteed

Top 40

Business

□ MACmail (2000) - A super mail list manager for MAC. Stores names, addresses, and other vital information. (Also prints labels)
□ Bi-Plane Spreadsheet (2100) - An extremely powerful and complete program with a multitude of options and functions.
□ Home Inventory (2012) - Keeps track of all your personal items, expenses, and budgets.
□ Accounting & More (2016) - Has a cash accounting, and a loan evaluating program.

Education

□ Stars (2102) - Star charting-Astronomy (Breathtaking graphics and really fun education.)
□ Math Tutor (2108) - It's easy to improve your typing skills with this excellent tutor.
□ Teacher (2112) - Allows you to track grades and create quizzes.
□ Spelling Tutor (2114) - Listen and learn how to spell. (Requires MACinTalk)
□ MACArt 2 (2403) - Over 30 animal art songs and a player
□ MACinTalk (2408) - Includes several programs to get you started painting.
□ MACFonts (2411) - Many of your favorite picture and art fonts.
□ Writing Tools (2406) - Helps you write and correct that paper or essay you got to get done. (this one really comes in handy.)
□ Desk accessories (2406) - Over 40 Dest Acc. for business, utilities, and just plain fun.
□ Stratego (2703) - Just like the "classic" strategy game board game.
□ Checkers (2705) - Try to beat the MAC or a human. (Multiple levels to choose from)
□ Blackjack Tutor (2730) - Teaches you to play, and to increase your odds of winning.
□ Risk (2731) - Try to conquer the World. (up to six can play!)
□ Spacestation Pheta (2732) - Cimb, Jump, and run through the spacestation picking up keys before you run out of oxygen.
□ Crossword (2733) - Play crossword puzzles provided for you, or create your own.
□ Blackjack & Poker II (2734) - Includes three different styles of Blackjack play.
□ Baseball (2735) - Control the Pitcher, batter, and fielder.

Top 40

Utilities

□ Menu Utilities (2200) - Use these to edit and install menus.
□ Disk Utilities (2202) - Disk and file recovery tools that everyone should have - just in case.
□ Vaccine (2204) - Programs that will check for, eliminate, and protect against many computer viruses.
□ Screen Dump (2206) - Allows you to print anything on the screen to your printer or a disk.
□ Disk Librarian (2212) - A complete disk cataloging database program.
□ MACArt 2 (2403) - Over 30 animal art songs and a player
□ MACinTalk (2408) - Includes several programs to get you started painting.
□ MACFonts (2411) - Many of your favorite picture and art fonts.
□ Writing Tools (2406) - Helps you write and correct that paper or essay you got to get done. (this one really comes in handy.)
□ Desk accessories (2406) - Over 40 Dest Acc. for business, utilities, and just plain fun.
□ Stratego (2703) - Just like the "classic" strategy game board game.
□ Checkers (2705) - Try to beat the MAC or a human. (Multiple levels to choose from)
□ Blackjack Tutor (2730) - Teaches you to play, and to increase your odds of winning.
□ Risk (2731) - Try to conquer the World. (up to six can play!)
□ Spacestation Pheta (2732) - Cimb, Jump, and run through the spacestation picking up keys before you run out of oxygen.
□ Crossword (2733) - Play crossword puzzles provided for you, or create your own.
□ Blackjack & Poker II (2734) - Includes three different styles of Blackjack play.
□ Baseball (2735) - Control the Pitcher, batter, and fielder.

Top 40

Creativity

□ Music Tutor (2104) - Several fun math quiz games. A really great educational tool for kids.
□ Typing Tutor (2106) - Over twenty musical styles and versions.
□ Slots (2200) - Includes a whole slew of great styles and versions.
□ Centipede (2718) - Two excellent versions of the arcade game everybody loves.
□ MACYahztee (2719) - Play Yahtzee on your MAC. (1 to 4 players)
□ DSToMo (2720) - Two versions of "Battleship" has great sound and allows you to play against a human of the MAC!
□ Tank (2727) - Tank battle against the MAC!
□ Concentration (2728) - It's like TV's "Memory Game." (Sorry Vanna not included with your order.)
□ Backgammon (2714) - Try to outplay your MAC! (Before it's too late!)
□ Solitaire (2726) - A whole slew of great styles and versions.
□ Checkers (2705) - Try to beat the MAC or a human. (Multiple levels to choose from)
□ Blackjack Tutor (2730) - Teaches you to play, and to increase your odds of winning.
□ Risk (2731) - Try to conquer the World. (up to six can play!)
□ Spacestation Pheta (2732) - Cimb, Jump, and run through the spacestation picking up keys before you run out of oxygen.
□ Crossword (2733) - Play crossword puzzles provided for you, or create your own.
□ Blackjack & Poker II (2734) - Includes three different styles of Blackjack play.
□ Baseball (2735) - Control the Pitcher, batter, and fielder.

Hyper-CARD

To run these Hypercard stacks you must have "Hypercard," an $80K drive and at least one Meg of memory.

Business

□ Business 1 (2800) - Includes Checkbook, Checkwriter, Hypercheck, Bill Tracker, Appointment Master, and much more!
□ Business 2 (2801) - Comes with Stock Helper, Hyperstocks, Spready, Hyper Payroll, Shareware Payroll; Personal Financier, and other great stacks!
□ Education (2820) - Spelling Tutor, Finger Spell, Spelling 2, Vocabulary Stack, and speller.
□ Education 2 (2821) - Includes Heather's Multiplication, Heather's Notes, Time for Heather, Children's Literature, and Hyper Zoo Big.
□ Music 1 (2840) - Learn Guitar with; The Guitar Tutor, Guitar Tutor, Guitar Chords, Keyboards, and Common Sounds.
□ Music 2 (2841) - Great Music Storage & More; Record Stack, Music Library, CD Collection, Music Collection, Six Stack.
□ Graphics (2856) - Slide Show, Animation Stack, Visual Effects, Plot Stack, Clip Art, and much much more.
□ Games (2870) - Adventure, Adventure Stack, Criminals, Hyper Craps, and Bowling scores, (Many hours of fun!)...
Introducing 4th DIMENSION Version 2

An entirely new Dimension

Over 300 new features

Secure and trustworthy

Transparent and extensible

Intuitive and configurable

RELATIONAL DATABASE FOR THE MACINTOSH
Now *Macworld* connects you with the world of Macintosh products instantly. And cost-effectively. *The Macworld Catalog* is your immediate access to hundreds of Macintosh products, manufacturers, and services. Each month, this special direct response section brings you detailed product information arranged by category—so you can quickly compare prices and capabilities. Then pick up the phone and order!

For the best Macintosh buys, scroll through *The Macworld Catalog.*
## Accessories
- Furniture .................................. 267
- Gifts ........................................ 267
- Hardware .................................... 267
- Mouse Pads .................................. 267
- Supplies ..................................... 267

## Software
- Animation .................................... 274
- Bar Code ...................................... 274
- Business ..................................... 274
- Clip Art ...................................... 276
- Communications ............................ 276
- Data Base .................................... 276
- Desktop Publishing .......................... 277
- Educational ................................. 277
- Engineering ................................. 277
- Entertainment ............................... 278
- Fonts .......................................... 279
- Genealogy .................................... 279
- Graphics ..................................... 279
- Health ....................................... 280
- Investment ................................... 280
- Languages ................................... 280
- Medical ...................................... 280
- Music/MIDI ................................... 280
- Presentation ................................. 280
- Programming Tools .......................... 280
- Public Domain ............................... 281
- Real Estate ................................... 281
- Religion ...................................... 281
- Retail ......................................... 282
- Sales/Marketing ............................. 282
- Scientific .................................... 282
- Statistics .................................... 282
- Word Processors ............................. 282

## Hardware
- Bar Code ...................................... 268
- Computer Systems .......................... 268
- Data Acquisition ............................. 269
- Emulators .................................... 269
- Memory Upgrade ............................. 269
- Miscellaneous ............................... 272
- Peripherals ................................... 272
- Printers ....................................... 272

## Services
- Computer Insurance .......................... 273
- Data Conversion ............................. 273
- Desktop Publishing .......................... 273
- Laser Recharge ............................... 273
- Training ....................................... 274

## Miscellaneous
- Business Oppor ................................ 282
- Mailing Lists ................................. 282

### Advertising Rates & Information
**The Macworld Catalog**

The Macworld Catalog section is a monthly link-up for advertisers and volume purchasers of Macintosh-related products and services. The Catalog offers advertisers a low-cost marketing opportunity and provides readers with a timely, easy-to-use menu for product buying.

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
    - 800/888-8622
  - **Account Managers**
    - Niki Stranz, Western U.S.
    - Carol Felde, Eastern U.S.

---

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Mouse Pads

Custom Printing Available

Cloth: Blue, Gray, Burgundy, Red, Brown, Green, Black, Navy & Platinum

Size: 8x7 1/2 x 8x9 1/2 x 81/2 x 11

12 Pads 3.25 3.50 3.75

72 3.00 3.25 3.50

144 2.85 3.10 3.35

PLASTIC: Blue, Platinum, Gray & Red

Size: 8 x 2 1/2 x 8 x 11

12 Pads 6.50 6.00

72 15.75 15.25

CALL AND ASK US ABOUT OUR VIEW PAD AND PICTURE PAD,

Precision Line Inc., 71400 23rd Ave N., Minneapolis, MN 55441

1-800/328-0077, 612/557-1979

Supplies

MacDisks for less.

MACINTOSH DUST COVERS

Mac, keyboard & mouse.

Reg. $32, NOW $25

Mac II, monitor atop CPU, keyboard & mouse.

Reg. $42, NOW $33

8" x 8½" Mousepad valued at $10 with cover set purchase.

SATISFACTION GUARANTEED.

Computer Cover Company

23S2P Peralta, #14, Laguna Hills, CA 92653

TOLL-FREE: 800/235-5330

VISA / MC

Continuous form labels!

2½" x 2½" - 1 across - 2500 . . . . . $12.00/500 . . . . . $16.00

Shrink Wrapped

BULK 10% OFF

3.5 DS/DD 100 or more

Blue, Gray, Red

5 Color Labels

In 8 colors $1.28, 50 or more.

MacWorld Catalog

Instant Link: Macintosh Products, Manufacturers, Services

For your ad to appear on The Macworld Catalog screen, call 800-888-8622.
The Macworld Catalog

**Hardware**

**Bar Code**

- **BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II**
  - Connects on keyboard or ADB
  - Requires no additional program or port
  - Does not affect keyboard or mouse
  - Industrial quality, heavy-duty units
  - Also available:
    - SmartCard encoder/reader
    - Magnetic encoder
    - Code 39 UPC & Printing Software
    - Portable Bar Code Reader

**Computer Systems**

**MacLite/Z88 Computer**

A portable 2 lb. computer. Can upload/download Excel and W.P., SS, DB, Basic, Diary, Terminal software, 32K expandable to 1.5 Mb. Runs 20 hours on 4 AA batteries. MacLite contains 288, HC organizer for $779.95. Call or write for info and the lowest prices. Visa/MC accepted with 3%.

**To Order:** 1-800-942-4008

Shall’s, Box 326, Mechanicsville, VA 23111, 804/730-9697

**Fax:** 804/746-7988

**Next Day Anywhere in the USA**

Call Free 800-727-3685

**800 PC-RENTL**

- IBM PS/2 50Z, 70, 80
- Compaq Deskpro 386S, 386E, Portabile III, SLT/286
- Mac SE, SE/30, Mac IIx
- Apple LaserWriter NT, NTX
- H-P LaserJet Series II

**800 PC-RENTL**

- **189** per mo.
- **Mac SE**

**Next Day Anywhere in the USA**

Call Free 800-727-3685

**For your ad to appear on The Macworld Catalog screen, call 800/888-8622.**

---

**DISCOUNT MACINTOSH**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Plus</td>
<td>$1,295</td>
</tr>
<tr>
<td>Mac SE 2drive</td>
<td>$2,245</td>
</tr>
<tr>
<td>Mac SE 4mb</td>
<td>$2,745</td>
</tr>
<tr>
<td>Mac SE/30 40mb</td>
<td>$3,595</td>
</tr>
<tr>
<td>Mac SE/30 80/4mb</td>
<td>$4,595</td>
</tr>
<tr>
<td>Mac IIx CPU</td>
<td>$3,495</td>
</tr>
<tr>
<td>Mac IIx 40mb</td>
<td>$3,995</td>
</tr>
<tr>
<td>Mac IIx 80/4mb</td>
<td>$4,995</td>
</tr>
<tr>
<td>Mac IIx 80/4mb</td>
<td>$5,695</td>
</tr>
<tr>
<td>Apple color monitor</td>
<td>$750</td>
</tr>
<tr>
<td>Apple 8 bit video card</td>
<td>$945</td>
</tr>
<tr>
<td>Apple keyboard</td>
<td>$100</td>
</tr>
<tr>
<td>Apple ext keyboard</td>
<td>$175</td>
</tr>
<tr>
<td>Imagingwriter II</td>
<td>$450</td>
</tr>
<tr>
<td>Imagingwriter LQ</td>
<td>$995</td>
</tr>
<tr>
<td>Laserwriter NT</td>
<td>$3,955</td>
</tr>
<tr>
<td>GCC P.L.P. Plus</td>
<td>$1,645</td>
</tr>
</tbody>
</table>

**ComputerWear**

- **DUST COVERS**
  - **100% COTTON CANVAS**
    - MAC, SE, II & PRINTERS
      - Beige w/Grey Trim & Breathable Static-Free
    - NEW! Seal-Skins
      - For Keyboards

**To Order:** 1-800-826-5761

1-(800) 826-5761

**The VDS 240**

"It's the only way to store disks" — Jeff Judge, owner MacOrchid

---

**Instant Link: Macintosh Products, Manufacturers, Services**
The Macworld Catalog

NATION'S TOP
MACINTOSH SYSTEM INTEGRATORS
CPUs: II, SE, SE/30, Plus, Ilx, Ilcx, Compaq, AST
Monitors: RasterOps, Radius, Apple Printers: Ilx, Ilcx, LinoX, QMS, NEC LC890
Film Recorders: Matrix ProColor, LaserGraphics
Hard Drives: CMS, Everex, Rodime, Micronet, PCPC
Scanners: Sharp, Dest, Abaton
SIMMs and Software
(Maintenance contracts & financing available.)
• NECVISA add 1% - 15% restocking charge
• 30 day trial period/guaranteed 100%
satisfaction - 100% satisfaction guaranteed.
• 90 day warranty on Apple
Hi End Specialty Systems
(214)620-9332
FAX (214)241-0929
P.O. Box 260576
Plano, TX 75026-0576
Hi End Specialty Systems is not an authorized Apple dealer because all
30 day warranties should be sent to MFG for repair. All trademarks belong
in their respective owners.

DATA (213)470-9555
Computers Fax 470-9457
2553 Westwood Blvd. L.A. CA 90064
LaserWrkSC/NT/NTX In Stock
Mac+ /20Mb 1345/1895.
MacSE/20Mb+ 2275/2595.
MacSE/45Mb+ 2685/2895.
MacII/40Mb* 3555/3995.
MacII/80Mb* 4145/4535.
CMS Hard Drives CALL
MonitorMono/Color 325/725.
*Keyboard Reg./Ext. 99/175.
COD & Next Day Delivery Available
No Tax Outside California

CIRCLE 650 ON READER SERVICE CARD

DATA Acquisition

MacPacq
The MacPacq transforms the
Macintosh into a digital oscil­
lo­scope, chart recorder & wave­form
 generator. A complete
data acquisition & control sys­
tem. 8 channel A/D, 8 digital
 I/O, programmable gain, 64K
 RAM. Optically isolated, line or
 ncidal powered. Runs remote
 and/or connected to Mac. Com­
prehensive software interface
 provides for powerful & flexib le
 system. $1195 complete.
Biopac Systems, 5960 Man­
darin Dr., #D5, Goleta,
CA 93117, 805 196 7-6615

CIRCLE 650 ON READER SERVICE CARD

Emulators

II in a Mac
An Apple ll/e computer
...all in software!
Run Apple II software on
your Macintosh.
Convert Apple II files to
Macintosh files.
$149.95
Add $1 for PRH
COMPUTERAPPLICATIONS, INC.
12813 Lindley Drive Raleigh, NC 27614
(919) 846-1411

CIRCLE 640 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
**How big do you want your Apple?**

**Memory Expansion SIMMs From Newer™ Technology**
- Guaranteed Same Day Shipment
- University and Corporate Purchase Orders Accepted
- Ask about our Exclusive Extended Warranty

**MacSElEtror**
Accelerator Board for Macintosh SE

68000 microprocessor doubles the speed and power of your Mac SE. An optional 68881 math co-processor is available for technical applications.

**Newer TECHNOLOGY**

**HARD DRIVES**

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
<th>Warranty</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 MEG</td>
<td>$398</td>
<td>Lifetime</td>
<td>AMDI</td>
</tr>
<tr>
<td>30 MEG</td>
<td>$410</td>
<td></td>
<td>American Micro Distributors, Inc., 16897-D Algonquin, Huntington Beach, CA 92649; 714-840-5560; Fax: 714-846-0570</td>
</tr>
<tr>
<td>40 MEG</td>
<td>$489</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 MEG</td>
<td>$499</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 MEG</td>
<td>$550</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 MEG</td>
<td>$670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 MEG</td>
<td>$705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 MEG</td>
<td>$855</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DartCard™**
Solid State Hard Disk

**ADDITiON™**
Compaq Memory

**attention™**
Extended Memory

**Attraction™**
Extended Memory

**Concentration™**
Expanded Memory

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.
A SIMM IS A TERRIBLE THING TO WASTE!

Computer Care Inc. has introduced a new line of cost effective memory upgrades for Macintosh computers. SOFTSTEP allows you to upgrade by using standard 256K SIMMs. SOFTSTEP I & II are socketed SIMMs with onboard memory that accept the factory installed 256K SIMMs to increase the machine's memory. SOFTSTEP III, IV & V are SIMM modules that allow you to build 512K & 1 Meg SIMMs for the Macintosh using 256K SIMMs.

No machine modifications are required when using any of our products. 1 year warranty on all parts. Made in USA. Call for free information. VISA / MC accepted.

ORDERS & INFO
1-800-950-CARE
In MN (612) 920-CARE (2273)
Dealer inquiries welcome

SOUTH COAST ELECTRONICS
700 S. Flower St. #2200
Los Angeles, CA 90017
213-489-7824

We've Got The Winning Hand . . .

. . . You've Got The Winning Card!

SIMM MODULES
For Mac Plus, II, or SE
Advance your Mac's capabilities with MAGICsim memory:

1 meg • 100 ns $199.00
1 meg • 80 ns $239.00

Special Offer for readers of MACWORLD:
Mention this ad and we will ship next day air at no extra charge!

American Scientific, Inc. • (702) 362-5353
1025 Sheridan Street • Second Floor Brookman Building • Las Vegas, NV 89102
CALL NOW ... QUANTITY DISCOUNTS AVAILABLE!

DON'T LET THIS HAPPEN TO YOU!
COLOR? or MULTIFINDER?
MEMORY UPGRADES FOR THE MAC PLUS, SE, II
SINGLE I N-LINE MEMORY MODULES

Cento ENTERPRISE (714) 630-4633
2970-E. LA PALMA, ANAHEIM, CA 92806

CIRCLE 665 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
The Macworld Catalog

Miscellaneous

We BUY Mac's & Mac Stuff!!
We Buy, Sell, & Horsetrade Popular Computers!!

Mac Parts Call

Everex 20 meg. $495.
Used Mac's------CALL

Shreve Systems
2421 Malcolm Street Shreveport La. 71108
Fax 318-965-2006 visa/m.c. O.K. 318-635-1121

CIRCLE 609 ON READER SERVICE CARD

Peripherals

9-Track Tape Subsystem For the Macintosh™

Exchange data files between your Macintosh and any mainframe or mini-computer using IBM compatible 1600 or 6250 BPI 9-track tape.

Apple Daisywheel Printer

TRUE letter quality on all Mac's & Apple II's. Proport. spacing, boldface, 158 columns. Fast 40cps speed and full 130 character printwheel. NEW $449, RECONDITIONED $349 include easy MAC point & click driver software & cable. New bi-di tractor $99, sheetfeeder $49. All heavy duty with 90-day guarantee.

Quality Discount Computers, Inc., 135 Artist View Dr., Wellington, NV 89444, 702/465-2473, 415/487-8148

CIRCLE 703 ON READER SERVICE CARD

Printer

Apple Daisywheel Printer

HyperCard Stacks

Any Bright Ideas?

Copyrights, Trademarks & Patents (V, 3.0) Protect all of your bright ideas with CFP™!

- Great resource for attorneys, corporate legal dept. & entrepreneurs! $159.95 "Mini" version avail. $49.95 ($4 s/h, $10 Int'l MC/VISA/AMEX.

Aardwark Dev. Labs, 14400 Ella Blvd. #150, Houston, TX 77014, 713/872-8085

CIRCLE 713 ON READER SERVICE CARD

HyperTools™

POWER TOOLS FOR HYPERCARD™

Don't take just our word about HyperTools:
"The tools and utilities in these two packages (16 in each program) are powerful, and they can definitely help stack authors take fuller advantage of HyperCard's potential." - MacWorld, Dec 88

HyperTools™ #1: Icon Editor, Scan Cards, Alignment & Array Creation Tools, Script & Font Tools, XCMD tools, Button Tools and more. $99.95

HyperTools™ #2: Multiple Choice Lists, Fields, Field Sorting, Formatting & Validation, Sound Tools, Group Tools, Font Tools and more. $99.95

Stack Cleaner™: Complete menu creation & editing facility for stacks. Plus utilities to merge, split, clone and reduce the size of stacks. $49.95

Trendware Corporation
PO Box 2285 Huntington, CA 92644 (203)926-1116

CIRCLE 612 ON READER SERVICE CARD

HyperTools™

Tulip Software
P.O. Box 3046
Andover, MA 01810
508/475-8711

...all under control of your scripts, which keep on running while the pictures are viewed. Only $59. Macintosh Plus, SE & II compatible.

HyperWorks

CIRCLE 614 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
The software that really works!
Write for our latest catalog.
"Quality software without the expensive packaging."

Uncle Max sez,
"Spring into action!"
maxStax+ HyperCard® software.

The software that really works!
Write for our latest catalog.
"Quality software without the expensive packaging."

New! VariTypey 4300PS Typesetting from your Mac/PC, disk or modem, offers superior imaging and speed using Adobe's newest PostScript RIP, 1200/2400 dpi Neps or paper; Adobe fonts.
- Color PostScript Printer
- Color Seps/Proofs/Stats
- LaserWriter II NTX
- Microtek 300G Scanner
24-hr. turnaround
- Fax/Fed-X
- Low Prices; MC/VISA; Try us!

MacSunSet® Postscript Services
101 N. Main #515, Ann Arbor, MI 48104
Voice: 313/668-7330
24-hr. BBS: 313/492-9880

Waldman graphics
NYC / NJ / Phila DESIGNERS
We help top-notch designers achieve high resolution type & graphics using desktop tools. Keep your standards while lowering your costs. Original electronic art and PostScript special effects our specialty.
- 1700 & 2540 dpi pages from Linotype L200's
- Repro, Pos., Neg, Film
- Disk or modem
- Color separations
- Scribus system
- Award-winning presswork, printing, binding & mailing
- 18 messengers
- Adobe dealer
We are the most knowledgeable people you will talk to. Call Mary Ann Ostberg for more information about our superb services.
212-923-2430 / 201-522-8776 / 215-627-7200 / 551-612-6111

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Looking for great desktop output? Now, with RIP III for accurate color separations, 2 Linotronic 300s for your Mac/IBM files. Ask us about special offer: FREE SCREEN FONTS Volumes 1-70. Printer fonts 30% off list. FREE UPS delivery. High res 2540 dpi. Fast service. Check the low prices on our 24-hour BBS at 201-530-4594. OCR, image scanning and disk conversions. We offer a full range of pre-press services. How can we help you?

Call Toll Free 1-800-877-TYPE

SOUTHERN CARTRIDGE SERVICE, INC.
High Tech Remanufacturers

1-800-442-6288

ABSOLUTE SAME DAY SERVICE
We Buy Empties

33 Mathews Drive, Hilton Head Island, S.C. 29926

CBT Development Stacks
Create Computer-Based Training in HYPERCARD
Four disks, 32 stacks, almost 3 megs of routines, templates and scripts—a roadmap for developing CBT in HyperCard. 100-page User Manual with documentation, instructions and authoring ideas. Price: $135.

No licensing fees or royalties. VISA or MasterCard.

New: Version 1.1

(212) 730-8211

LightMagic

• Create flicker free movies on your Mac by moving LightMagic™ graphic objects on the screen with mouse!
• Grab artwork from any program!
• Play movies @ up to 60 frames/second!
• Use 2, 4, 16, or 256 colors per movie!
• Pay multiple movies at once!
• Pay LightMagic™ movies on top of any HyperCard™ stack with the LightMagic™ MacCard™ Driver!

LightMagic™ and MacCard™ BM
Only $199.00

LightMagic™ HyperCard™ Driver
Only $99.00

Software Cashes

Bates/Water 2230
San Anselmo, CA 94960

(415) 493-8784

Look Before You Leap!...
50 Classic Business Contracts
Don't jump into a business agreement without knowing what's involved! • 50 Classic Business Contracts, a major resource for the small business. • 50 Copy and Edit Contracts • "Hyperlinked" legal definitions. • Use with Word, Works, MacWrite, WriteNow, & many others! • Easy-to-Use • On-line Help • Only $49.95 (add $4 s/h, $10 Int'l) MC/VISA/AMEX, Checks, MO's.

Aardvark Dev. Labs, 14400 Ella Blvd. #150, Houston, TX 77014, 713-872-8085

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Set a Trend by Drawing a Trend

Draw your forecast line and Tim Berry's Forecaster instantly shows the numbers. MacWeek says it "stands an industry trend on its head." It's faster and better than most other methods because most of us intuitively understand graphs better than numbers.

Palo Alto Software
260 Sheridan Ave, Suite 219
Palo Alto, CA 94306

Only 69.95.
(800) 336-5544
In CA: (415) 325-3190
FAX: (415) 325-1250

CIRCLE 726 ON READER SERVICE CARD

MacEnvelope™ 4.1 prints envelopes or labels with addresses, graphics, messages, fonts, styles, sizes, imports lists, saves addresses, saves layouts and speeds your mail through the postal system with automatic bar coding.

(800) 447-9639 Check/Visa/MC $89.95 + $3 s/h (NY add tax)
FAX (718) 768-3997 SYNEX 692 10th St., Brooklyn, NY 11215

CIRCLE 622 ON READER SERVICE CARD


Ask for FREE Brochure and Sample Schedule!

© Wetzell & Company, Inc. Macintosh Plus, SE, II, IIx, Laserwriter are trademarks of Apple Computer Inc.

30 Day Money Back Guarantee

CIRCLE 658 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
The Macworld Catalog

Strategic Business & Marketing Plans

BizPlanBuilder™ Quickly and easily complete an effective business/marketing plan for presentation to senior management, investors or clients. A comprehensive and proven framework—Over 85 pages of outlines, headings, structured sentences & paragraphs, lists, suggestions... already typed & formatted in 29 MacWrite™ & MS WORD™ files. Includes spreadsheet financials in Excel™.

Marketing & Sales Oriented
Everything you will need to organize, describe, promote & support your venture. (Similar to reverse engineering where the best elements of good plans are cut & pasted together.) No blank pages. Follow the tutorials & edit into a finished plan.

Includes manual. Preferred by investment capital experts, corporate managers & experienced consultants.

Also available:
• Investment Capital Sources
• Domestic & International Marketing
• Employee Handbook Template

Excel Templates
• Business Management 2.0 $39.95
19 templates for planning & operations.
• Financial Decisions 2.0 $49.95
31 calculator templates & loan amort.
• Invoices, POs, and Inventory 2.0 $29.95
Integrated, macro-driven.
• Personal Affairs 2.0 $29.95
13 for finances, investments, etc.
• All 4 plus bonus package $109.95
Money back guaranteed.

HeadStart Software
P.O. Box 5396 • Durham, NC 27717
VISA/MC; call 919/567-8792

Clip Art

Cartoons
125 people, kids & animals by top ad artists. They work. People love 'em!
Paint $49 hi-res $59
$3 S/H
800 842-0927

mail check or money order

Maxxi Inc 900 Warren Ave N #200
Seattle WA 98109

Communications

Burroughs emulation
Contact™ emulates TD/MT/ET and T27 terminals. Sophisticated data capture — all screen data can be used by spreadsheet, database or word processor... CANDE file transfer, fully à la Mac interface, soft keys, multiple pages & addresses, password protection... Soon: advanced file transfer

PacerLink (was pCINK)
Connects Macs to VAX (VMS/ULTRIX), DG Stratus & UNIX systems. Supports connections via RS232, direct Ethernet, & LocalTalk bridged to Ethernet. Provides terminal emulation (VT220, VT100), file transfer, virtual disk, & print services. PacerShare extension lets VAX system be an AppleShare compatible file server; PacerTOPS extension lets VAX/VMS system be file server onTOPS network. Pacer Software, Inc;
#402, 7911 Herschel Ave.
La Jolla, CA 92037,
619/454-0565

Data Base

HELP!

With 4th Dimension
• Pre-written procedures and applications that you can use as templates or as examples to learn from.
• A desk accessory that enables you to type and paste your procedures directly into your applications.
• 160 Page Manual.
• Applications include Statistics, Communications, Invoicing, Graphics and much more.
• $129.00.

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Japanese Desktop Publishing

Kanji PageMaker™

- Supports varied multi-column formats
- Supports Kanji JIS level I and II
- Compatible with Kanji Talk 2.0
- Compatible with E&Word 3.0

Kieran
Integrated learning program for children 2-6 yrs. Uses child's name in speech and pictures. Mouse driven, no reading required. Color on Mac II. Covers alphabet training, time telling, counting skills, upper-lower case, addition, matching shapes, and mystery door! dice rating in MacUser. Great Gift! MC/VISA $39.95

Obm Software, 163 Richard Dr., Twerton, RI 02878, 800/253-9354

ScreenShare
ScreenShare is a software product which enables an instructor to do demonstrations in a classroom of networked Macintosh computers. ScreenShare broadcasts the contents of an instructor's Macintosh screen to the screens of the students' Macintoshes while temporarily suspending the students' work. ScreenShare for a classroom $249 ($295 Canada).

White Knight Software Corp., P.O. Box 564 - 810 West Broadway, Vancouver, B.C. Canada V6Z 4C9 (604) 290-4855

Teacher's Rollbook
A complete classroom management tool! Grade averaging and reporting. • New quick grade entry • Full attendance records and totals • Records disciplinary actions • Class size reports • Up to 315 students per file • Remember birthdays & check out items • Letters to parents • Min. req. Mac 512K, 2 drives • $99 • Demo $10.

Current Class Productions, 22024 Berendo Ave., Torrance, CA 90502, 213/326-4245

MacAnatomy
A complete electronic atlas of human anatomy in MacPaint document form. The drawings may be modified and merged into MacWrite documents using the Clipboard. Comprised of four volumes, available singly or as a collection.

MacMedic Publications Inc., 7530 Harwin Dr., Houston, TX 77036, 713/977-2655
The Macworld Catalog

IEEE 488 Interfaces

Mac488 • NuBus IEEE board for Mac II
MacSCI488 • SCIIEE controller
Mac8488 • Serial IEEE controller
Mac4D488 • IEEE plotter interface
MacD448 • IEEE desk accessory
MacD448plus • IEEE language driver

Call or send for your FREE Technical Guide
(216) 439-4091

CIRCLE 702 ON READER SERVICE CARD

Road Design

MacRoad is a fully interactive road design program that allows you to:
- Design cross sections using a palette of edge & surface types
- Design vertical gradings graphically
- Produce a schedule of quantities
- Adjust the grading & immediately see the effect on the cross sections & quantities
- Produce drawings on a range of printers or pen plotters

Creative Engineering, 6 Antill St., Wilston Queensland 4051, Australia, +61 73366271

MacAC Circuit Analysis

Perform analog circuit analysis on your Mac Plus or SE! MacAC fully utilizes the Macintosh interface for graphical circuit entry, editing, simulation, and data plotting. Now you can do circuit design on your own Mac without having to resort to expensive Spice packages.

MacAC sells for only $149.95
San Juan Software Company, P.O. Box 27620, Seattle, WA 98125-2620, 206/525-9269

Electronic CAD

The powerful, easy-to-use Douglas CAD/CAM Professional System takes you from the schematic drawing to the final routed board with:
- Color support on Mac II
- Unlimited libraries
- SMT capability
- I/O resolution
- Layer wise parts placement facility
- Schematic & digital simulation
- Flexible, multi-pass router

Take your first step into the new age of electronic CAD by ordering a full-feature demo with 3 programs included. Call or write to us today:
Douglas
Pro: Layout: $1000
Schematic: $700
AutoRoute: $700
Demo: $25
(415) 483-8770

CIRCLE 740 ON READER SERVICE CARD

Schematic: $700
Layout: $700
AutoRoute: $25
Demo: $25

Entertainment

Pardon me, boys, is this the Macnocho Choo-Choo?

Yes, it’s a super true-to-life electronic train set!
You can model electronic model railroad systems on your Macintosh and bring them to life with the click of a switch! You simple plug designer images on your screen or mouse to run your train on its own track, under your control.

Abbracadabra
$49.95
404 Shipping
Box 291, Dept. HH
Eugene, OR 97402
(503) 342-3030

CIRCLE 467 ON READER SERVICE CARD

WINGING-IT

Air Traffic Control for Microsoft and Sublogic Flight Simulators
Get an audio cassette including ground, tower, departure, center, approach, traffic advisories, weather advisories.
Plus airport maps, & flight plans. Realistic adventures. Order today! Each tape $12.95 plus $1.75 shipping. (Gotta make a donation to the cause, too.)
Call (800) 234-1595 or (415) 836-1595
Calypse Products
P.O. Box 5366
Novato, CA 94948
(415) 388-1882

CIRCLE 664 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
**The Macworld Catalog**

**STAMP, COIN & BASEBALL CARD COLLECTORS!**
Call or write for FREE catalog describing the most popular software for the inventorying and evaluation of your collection.

**COMPU-QUOTE SOFTWARE FOR COLLECTORS**
6914 Berquist Ave. Dept. CM Canoga Park, CA. 91307 660-786-6776 (ext. 39) In CA (618) 346-3302

**Tired of Arcade Games?**
Try the challenge of battle strategy simulation. Nine original, upgraded games. Rommers DESERT WAR/MIDWAY or SOLOMONS carrier action; Romers glory in BARBARIA or EAGLES IN THE SAND; Civil War action in WESTERN CAMPAIGNS or ARMY OF NORTHERN VIRGINIA; USSoviet dashes in NORWEGIAN SEA or US Invasion in RED STARS. Coming Soon: Patrons Attack on Russia, Hannibal's War With Rome, US War in Vietnam.

**Prepare to meet your NEMESIS™**

A tale has been a way of life in the Orient for over 4,000 years. As much a philosophy as it is a game, Go is considered as many to be the secret of Japanese success.

"While chess is a game of war, Go is a game of market share." (Pros: Nicko Horio, From the Father of Computer Go. NEMESIS Go Master® is the only program rated in human tournaments. "I've had a blast playing and learning to play this incredible game. The beauty of it is that NEMESIS helps." G. Ernest, Microcomputer Musings)

**STAMP, COIN & BASEBALL CARD COLLECTORS!**
Call or write for FREE catalog describing the most popular software for the inventorying and evaluation of your collection.

**COMPU-QUOTE SOFTWARE FOR COLLECTORS**
6914 Berquist Ave. Dept. CM Canoga Park, CA. 91307 660-786-6776 (ext. 39) In CA (618) 346-3302

**Beverly Hills**

"Best ImageWriter™ font available!" - "TypeSet" look, 11 sizes, 6-36 pts.

- Multi-digit fractions; horiz. lines
- Fine spacing, mathematical symbols
- Includes disc, 70-p. printed manual
- Two compatible versions available:
  - v 2.0 (ImageWriter 1 or II): $29.95
  - v LQ-1.0 (GW LQ, Mac +): $39.95
- Direct orders add $3.00 S/H (plus $1.20 or $2.40 sales tax in Calif.)
- Site licenses, dealer inquiries invited

ADH Software
P.O. Box 67129
Los Angeles, CA 90067-0129

**Gambling**

**Gamblin' Times**
The best gambling simulation available.
Includes Craps, Roulette, $1 00,000 Keno, 4x4, BlackJack, 7 Card Stud, Speed, Tactic stock, Slots and Liars Poker. Lots of XFCN's for fast graphics, voice, sounds and animation. Supports Las Vegas Rules, odds, unlimited betting, rapid repeat bets, card counting, double odds, adjustable speeds and a lot more. All ten games combined into one interactive game which keeps track of all winnings and assets by game. Requires Mac with Hypercard 1.2

Only $47.95
(That's only $5 per game)
Send check or MO to Wilson Advertising, 1295 E. Palm Street, Altadena, CA 91001
For phone orders call (818) 791-3656 MC/VISA

**Family Heritage File**
Most powerful genealogy program on the Mac. Rated "Best" by Macworld. Licensed ver. of Personal Ancestral File™ produced by the LDS Church. New enhancements for non-LDS.
- Mac user interface
- Supports all Mac & hard disks except 128K
- Exports data to word processor/databases/modems
- Reports: pedigree, family group sheets, family lines, family history books, mailing lists and labels, birthday calendars, person sheets and indexes.$95 plus $3 S/H. Visa/MC welcome. Call or write for a free brochure.

**Hyper Family-Tree™**
The HyperCard stack that easily records and graphically displays genealogy information including digitized photographs of your relatives, all standard genealogy facts, and up to 5000 words of miscellaneous notes and comments per person. Keeping track of your family was never so much fun! Point and click to navigate through generations of your ancestors. Automatically create, print and export 5-generation pedigree charts, 20-generation descendant charts, family group sheets, family lines, family history books, mailing lists and labels, birthday calendars, person sheets and indexes.$95 plus $3 S/H. Visa/MC welcome. Call or write for a free brochure.

**Hyper Family-Tree™**
The HyperCard stack that easily records and graphically displays genealogy information including digitized photographs of your relatives, all standard genealogy facts, and up to 5000 words of miscellaneous notes and comments per person. Keeping track of your family was never so much fun! Point and click to navigate through generations of your ancestors. Automatically create, print and export 5-generation pedigree charts, 20-generation descendant charts, family group sheets, family lines, family history books, mailing lists and labels, birthday calendars, person sheets and indexes.$95 plus $3 S/H. Visa/MC welcome. Call or write for a free brochure.

**Hyper Family-Tree™**
The HyperCard stack that easily records and graphically displays genealogy information including digitized photographs of your relatives, all standard genealogy facts, and up to 5000 words of miscellaneous notes and comments per person. Keeping track of your family was never so much fun! Point and click to navigate through generations of your ancestors. Automatically create, print and export 5-generation pedigree charts, 20-generation descendant charts, family group sheets, family lines, family history books, mailing lists and labels, birthday calendars, person sheets and indexes.$95 plus $3 S/H. Visa/MC welcome. Call or write for a free brochure.

800.888.8622

**Call Up Your Ad On Our Screen.**

The Macworld Catalog

800.888.8622
The Macworld Catalog

Investment

The Right Time System
The Stock, Index & Futures programs generate accurate Buy/Sell signals for individual stocks, indexes and commodities. The software was developed by an expert portfolio manager for his own personal use & are now available for any smart trader who wants to make quick profits. Call or write for free info.
T.B.S.P. Inc., 620 Avacado Ave. Corona Del Mar, Ca 92625 714/548-2874

Music/Midi

Languages

Fortran on Your Desktop
No need to wait for time on the “big” computer any longer. Language Systems Fortran lets you run the same high performance Fortran programs at your desk. VAX-compatible extensions, high precision IEEE floating point data types, complete access to Toolbox, direct code generation for the Mac II, and the MPW programming environment make this compiler the most powerful Fortran for the Mac.
Language Systems Corp., 441 Carlisle Drive, Horndon, VA 22070, 703/478-0181

Presentation

CaptGen
Produce a self-running presentation or caption a video without a dedicated CG machine. Using time controlled sequences, CaptGen:
• Displays PICT2 files
• Can superimpose text over graphics
• Fading text
• Dissolving text and much more!
$179.95 + 3.50 S/H
MiroLogic Software Inc., 2629 N. Plumer, Tucson, AZ 85719
To order call: 602/325-8794

MacPerspective
It's simple and easy to construct accurate perspectives on screen with dimension coordinates input by witty commands.

MacPerspective

CADMOVER
GRAPHIC TRANSLATION UTILITY FOR MACINTOSH

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
New from RealData —
Real Estate Investment Analysis, Version 6.0

Real Estate Investment Analysis has been our best-selling product since it was introduced in 1982. Many software products have come and gone over the years, but RealData and our Investment Analysis have stood the test of time. Now Version 6.0 adds new power to this popular program.

What can it do? Real Estate Investment Analysis allows you to make ten-year projections of the income, expenses, cash flows, resale and tax implications of your property. It performs virtually all of the complex Tax Reform, financing and rate-of-return calculations for you in just seconds. It also includes a lease analysis and annual operating statement.

Real Estate Investment Analysis, Version 6.0 runs with Microsoft Excel™ or Works™ on the Mac 512 or greater — just $250.

To order, call or write today. MC, VISA, AMEX Welcome or send $2 for our catalog of real estate software for the Mac and PC.

ConCensus™
Contributions and Census management software from the nation’s largest publisher of church bulletins. Made for the Mac, it tracks and reports membership, statements, donations, fees, labels and more. Multi-user version available. For literature or demo pack, call today.


Property Management
Comprehensive software for managing residential, commercial, condos, and more. Two versions: Basic PM for owner/manager—$495, Deluxe PM with complete general ledger for professional management—$1,195. Includes check writing, recurring expenses, financial statements, complete management reporting.

Yardi Systems, Inc., 813 Reddick St., Santa Barbara, CA 93103, 805/966-3666

Bible study tools that grow with you.

THE WORD processor
The most comprehensive Family of Products for Bible Study.

Start with VERSE SEARCH including the Bible translation of your choice with Instant Access to any verse. Search for any words or phrases. Separate windows for comparing verses. And much more! Only $99.95

AS YOU GROW, add NIV, RSV, KJV or NKJV text, Greek or Hebrew translators or topical cross references, personal commentary, a chronological Bible and chain references. Our memory resident VERSE TYPIST transfers verses to your word processor.

Bible Research Systems
1-800-423-1228
2013 Wells Branch Parkway #304 • Austin, Texas 78728
Tech Support (512) 251-7541 • FAX 800/788-5800
For IBM, MSDOS, Macintosh.
**GodSpeed**

**FASTEST BIBLE SEARCH PROGRAM AVAILABLE...3 SEC.**

*Search by Words, Phrase, or Word/Phrase Combinations*

*OVER 100,000 COPIES SOLD*

- **IT'S POWERFUL**
- **IT'S EASY TO USE**
- **IT'S ONLY $149.95**

**WHOLE BIBLE (King James)**

**ASTEST BIBLE SEARCH**

**OVER 100,000 COPIES SOLD**

Call: (619) 287-7444

San Diego, CA 92115

(Houberg Development)

CIRCLE 714 ON READER SERVICE CARD

**MARKET MASTER R/A**

"The best sales follow-up program you can buy..." MacGuide

**SELL LIKE NEVER BEFORE!** It doesn't just track leads, it handles them for you. Producers Call Lists, Reports, and Instant Analysis of results. Sends ALL letters due with ONE menu click. Letters look personally typed with envelopes, labels.

Breakthrough Productions

10659 Caminito Cascara

San Diego, CA 92138

(619) 281-6174

CIRCLE 706 ON READER SERVICE CARD

**Address envelopes!**

Enclose your quality correspondence in envelopes addressed on your LaserWriter®, or ImageWriter®. You deserve quality results.

**Infologic™ Envelope**

Infologic Software, Inc.

1937 Regent Street

Niskayuna, NY 12309

(800) 548-4124

CIRCLE 704 ON READER SERVICE CARD

**Geological Software**

Great graphics, low prices!

- Lithologic log plotting
- Gridding • Contouring • Piper/Stiff plots • Oil & Gas economics 
- Stereonet plots • Plate tectonics • Geophysical modeling • much more for the Macintosh & PC $50-$1500. Call or write for FREE catalog of easy-to-use software products.

RockWare Inc., 4251 Kipling

Suite 505, Wheat Ridge,

CO 80033, 303/423-6171,

Telex: 9102504964

CIRCLE 703 ON READER SERVICE CARD

**Scientific**

**CLR ANOVA**

Analysis of variance program that can compute up to a 10-way design with repeated measures and unequal n. Marginal means, plots of interactions, simple effects, range tests, contrasts, and more. Full Mac interface. Can read text files w/entries separated by spaces, commas, or tabs. $100 + $5 s/h.

Clear Lake Research.

2476 Bisover #343 Houston, TX 77005, 713/523-7842

**Mailing Lists**

**MAILING LIST of Mac Users**

On labels, tapes, diskettes...or by modem.

- Choose from hundreds of thousands of users!
- Only 5¢ per name, with no charge for selecting, sorting, media, or delivery.

CIRCLE 670 ON READER SERVICE CARD

**Expressionist™ 2.0**

"An excellent toolkit that all technical people should have..." Jean Louis Gassée, VP, Apple Computer, Inc.

A powerful application and desk accessory that generates equations for word processing and Desktop Publishing.

CIRCLE 690 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Picture yourself at MACWORLD Expo

There are ~ good reasons why you should attend the MACWORLD Expo nearest you. First, attending MACWORLD Expo means you don't have to spend lots of and trying to find the best solutions to your computing problems. Second, you can ~ and the latest Macintosh products . . . demo hundreds of hardware, software and peripheral exhibits representing the future of computing. Third, whether you use your in the , at or at you'll learn how to use it better. Fourth, if you develop, produce or sell products, you'll have a unique opportunity to spot upcoming . And fifth, you'll be able to your skills, using one of the many available, to practice what you've learned. So the coupon below, and it for more information. And this is the original Macintosh-exclusive show. Choose from Boston '89 or San Francisco '90 and for other upcoming shows in 1990.

BOSTON
August 10-12, 1989
Bayside Expo Center
World Trade Center

SAN FRANCISCO
April 11-13, 1990
Moscone Center
Brooks Hall/Civic Auditorium

Just fill in below, clip and mail to: MACWORLD Expo, Mitch Hall Associates, P.O. Box 155, Westwood, MA 02090. You'll receive complete information on each show as soon as it's available. No obligation of course.

I want to get the big picture.

I am interested in: [ ] Attending [ ] Exhibiting
Please send me details about the following MACWORLD Expos:
[ ] Boston, August 10-12, 1989 [ ] San Francisco April 11-13, 1990 [ ] Upcoming shows in 1990

Name ______________________ Title ______________________
Company __________________ Street __________________
City/State/Zip _____________ Phone __________________
# BEST-SELLERS

## BUSINESS SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>42</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>38</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

- **Microsoft Word** by Microsoft
- **Microsoft Works** by Microsoft
- **Microsoft Excel** by Microsoft
- **PageMaker** by Aldus
- **MacWrite** by Claris
- **MacDraw** by Claris
- **WordPerfect for the Macintosh** by WordPerfect
- **QuarkXPress** by Quark
- **FreeHand** by Aldus
- **Adobe Illustrator/Illustrator 88** by Adobe

## EDUCATION SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>34</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>30</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>31</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Reader Rabbit** by The Learning Company
- **Where in the World Is Carmen Sandiego?** by Broderbund
- **Math Blaster** by Davidson & Associates
- **KidsTime** by Great Wave Software
- **Typing Tutor** by Simon & Schuster

## ENTERTAINMENT SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>33</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

- **MacGolf** by ACAI
- **Crystal Quest** by Casady & Greene
- **Dark Castle** by Silicon Beach Software
- **Falcon** by Spectrum HoloByte
- **Flight Simulator** by Microsoft

## NETWORK/DATA COMMUNICATIONS

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>33</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **TOPS** by TOPS
- **AppleShare** by Apple Computer
- **LocalTalk** by Apple Computer
- **NetWare** by Novell
- **Red Ryder** by FreeSoft

## HARD DISKS*

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **FX20** by General Computer
- **MacStack SD20** by CMS Enhancements
- **Apple Hard Disk 20SC** by Apple Computer
- **Rodime 20 Plus External** by Rodime
- **Apple Hard Disk 40SC** by Apple Computer

## ADD-IN BOARDS

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

- **Radius Interface Display** by Radius
- **Radius Accelerator** by Radius
- **Video Board/Large Screen** by Ryad
- **Apple 2MB Memory Expansion Kit** by Apple Computer
- **LocalTalk PC Card** by Apple Computer

## PRODUCT WATCH

Editors' choice of other recent or forthcoming products of particular interest.

- **Cosmic Osmo** by Activision HyperCard game
- **Microsoft Word 4.0** by Microsoft new version of word processor
- **SuperPoint 2.0** by Silicon Beach Software paint and draw program

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during April 1989.

*Does not include hard disks installed at the factory.
The Right Choice... WriteNow.

“BEST NEW WORD PROCESSOR”
—MacUser Magazine, May 1989

“READER’S CHOICE”
—MACazine, January 1989

“GOLDEN GAVEL AWARD”

AWARDS & RECOGNITION
WriteNow is the highest-rated word processor in the Macintosh world. MacUser Magazine said it best—"WriteNow wins best new word processor hands down."

EASY-TO-LEARN, EASY-TO-USE
If we were to pick one word that our customers use to describe WriteNow, it’s usable. A great word processor is more than just a stockpile of features—it’s the usability of those features, how easy they are to learn and use, and how they feel under your fingertips when doing real work. Everyone claims ease-of-use, but WriteNow actually delivers it—and our awards and ratings prove it.

BUSINESS POWER & PERFORMANCE
WriteNow has all the power business users need, including: Mail merge; 100,000 word spelling dictionary; multiple columns; in-line graphics; format accelerators (style sheet equivalents); outline indenting, character and word counting, fixed and flexible line spacing, and much more. As important, WriteNow is the fastest word processor in the Mac world, whether you’ve got a small Mac 512K or a loaded Mac IIX.

<table>
<thead>
<tr>
<th></th>
<th>Copy &amp; paste large area</th>
<th>Search for a word</th>
<th>Spell check document</th>
<th>Change indents &amp; double spacing</th>
<th>Undo ruler changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WriteNow 2.0</td>
<td>6.7 sec.</td>
<td>2.9 sec.</td>
<td>7.4 sec.</td>
<td>23.3 sec.</td>
<td>1.6 sec.</td>
</tr>
<tr>
<td>MacWrite II</td>
<td>45.9 sec.</td>
<td>40.2 sec.</td>
<td>33.6 sec.</td>
<td>44.7 sec.</td>
<td>24.7 sec.</td>
</tr>
<tr>
<td>MS Works 2.0</td>
<td>1min, 50.8 sec.</td>
<td>35.7 sec.</td>
<td>5min, 13.4 sec.</td>
<td>2min, 24.1 sec.</td>
<td>1min, 14.5 sec.</td>
</tr>
<tr>
<td>MS Word 4.0</td>
<td>21.6 sec.</td>
<td>11.0 sec.</td>
<td>3min, 55.1 sec.</td>
<td>39.4 sec.</td>
<td>25.8 sec.</td>
</tr>
</tbody>
</table>

For more information:
T/Maker Company
1390 Villa Street
Mountain View • CA • 94041
Telephone: (415) 962-0195
FAX: (415) 962-0201

Circle 332 on reader service card
New for the Mac II—Protection and Convenience, On or Off Your Desk!

- Our sturdy Mac II Monitor Stand lets you put a heavy monitor on top of your Mac II.
- Our Large Screen Anti-Glare Filters relieve eye strain, cutting reflected glare by 96%!
- Our Power Backers protect your file server against every power problem from surges to black-outs. The complete line of Power Backers are small, light-weight and can be placed conveniently on a shelf or a desktop.
- Our Mac II Stand and Cables even let you get your Mac II system unit off your desk and out of your way.

Call for a free brochure!

800-535-4242 or 212-475-5200

Or write to Kensington Microware Ltd., 251 Park Ave. South, New York, NY 10010.