

80 NEW PRODUCTS FOR THE MAC! SEE PAGE 153

MACWORLD

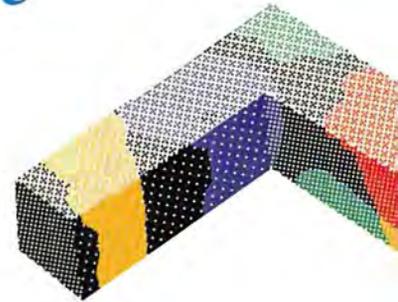
August 1988 \$3.95

Canada \$4.95

The Macintosh® Magazine

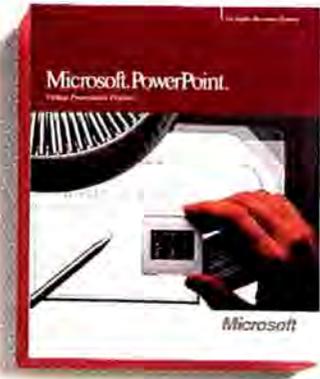
1988 Winners!

*Computer Graphics
on the Mac*



Now the person making the presentation can make the presentation.

The old adage "If you want something done right, do it yourself" couldn't be more true than when you're making a presentation. Or, right



PowerPoint 2.0 takes the stress out of putting together presentations – even when you have last-minute changes.

now, more possible.

In fact, all you'll really need is Microsoft® PowerPoint™ software and an Apple® Macintosh® to run it.

It's the easiest, most cost-efficient way to assemble a professional-looking presentation

from conception to completion, right from your own desktop.

PowerPoint gives you the power to create your own picture-perfect overhead transparencies, flipcharts, 35mm color slides, speaker notes, and audience handouts. In such record-breaking time that there'll be nothing for you to do the night before the big day but sleep.

Its built-in word processor (complete with spelling checker) and drawing tools allow you to mix text and graphics in countless ways. You can use different typefaces, logos, special effects like shaded backgrounds, dropshadows, and diagrams. Or you can copy charts, tables, and illustrations from other programs, like Microsoft Excel and Aldus® Freehand™ with a simple cut and paste.

Once you design an overall "look" for your presentation, PowerPoint allows you to standardize that format automatically. So you can use it slide after slide.

And you can make global changes easily with the Slide Master, which instantly executes your revisions throughout.

At any point along the way, the Slide Sorter feature lets you view slides one by one or scan your entire presentation at a glance, or simply rearrange the order with a point and click.

Then, whenever you're ready, you can print out all your presentation materials – from attention-getting overheads to handy speaker notes – without ever leaving your desk.

If 35mm slides are in order, simply send your presentation to the nearest Genigraphics® center, the leading presentation graphics service bureau, and your slides will be on their way in 48 hours.

Lastly, last-minute changes need no longer cause traditional last-minute panic. Because a PowerPoint presentation is as easy to change as it is to create.

If you'd like a live PowerPoint demonstration, call (800) 541-1261, Dept. I10, for the location of your nearest Microsoft dealer.

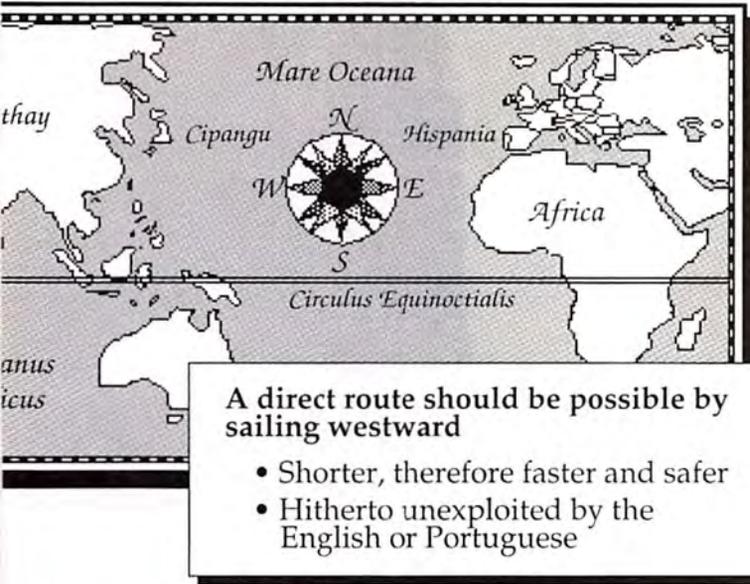
And remember, the best part of doing a presentation all by yourself comes afterward.

When you get all the credit.

Microsoft®



A NEW TRADE ROUTE



New World Expeditions ————— **March 14, 1491**

With artfully designed PowerPoint overheads, your presentation will be the center of attention.



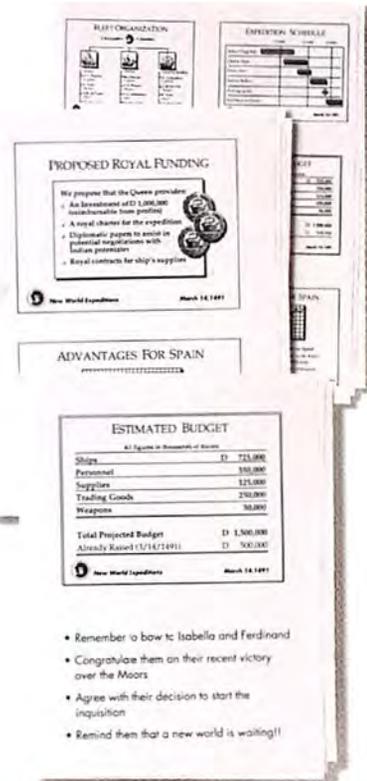
The PowerPoint Slide Sorter lets you put your presentation in order with a simple point and click.



You'll create 35mm slides in your choice of 16.8 million decorator colors with a Mac® II.

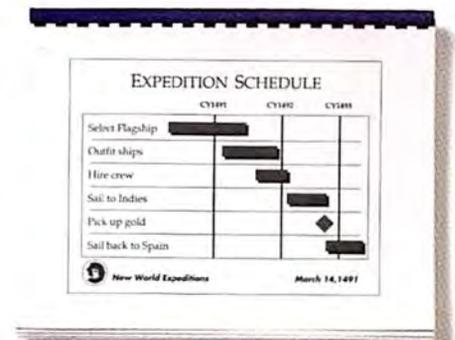


The Slide Show feature turns your Macintosh into a projector — for quick rehearsals or slick on-screen presentations.



- Remember to bow to Isabella and Ferdinand
- Congratulate them on their recent victory over the Moors
- Agree with their decision to start the expedition
- Remind them that a new world is waiting!

With PowerPoint it's easy to print out your speaker notes, or handouts with up to two, three, or six slides of your presentation on a page.

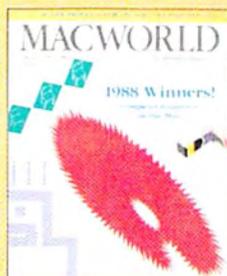


Your audience will flip over charts like this, created entirely with PowerPoint.

MACWORLD

August 1988

The Macintosh® Magazine



On the Cover

From the electronic drawing board: the Macintosh Masterpieces, award-winning works of art in Macworld's first annual contest appear on page 74. (Cover art by John Hersey.)

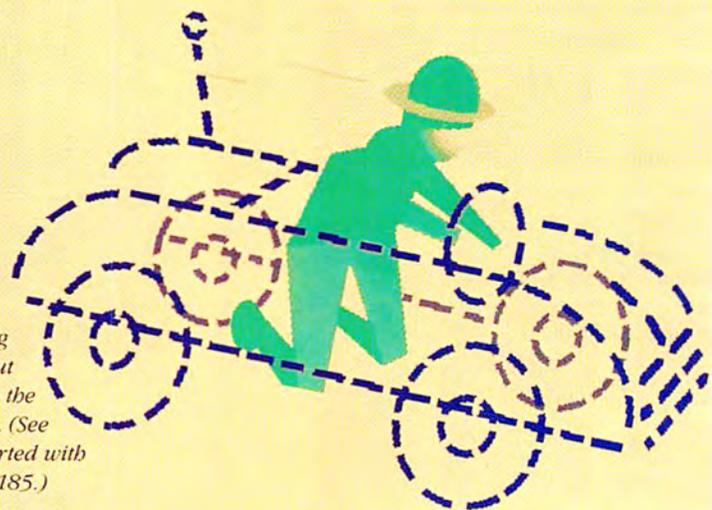
Departments

- 9 **Mac Bulletin**
Late-breaking news.
- 15 **David Bunnell**
- 19 **Letters**
- 29 **Commentary/Jerry Borrell**
- 37 **Steven Levy**
- 153 **New Products**
A quick look at new Macintosh software, hardware, and accessories.
- 173 **How To/Quick Tips**
Changing text styles in Word, running multiple macros in Excel, editing horizontal images, and more.
- 185 **How To/Getting Started with CAD**
An introduction to the electronic drafting system known as computer-aided design.
- 203 **How To/Insights on MacDraw II**
Two dozen tips and shortcuts for drawing with the original classic and the new version II.
- 227 **Updates**
The latest software upgrade news.
- 235 **Where to Buy**
Contact information for products in this issue.
- 240 **Best-Sellers**

55 Macworld News

- *High-End CAD* AutoCAD for workstations comes to the Mac II.
- *Desktop Video* How the Mac produces video animation.
- *PowerPoint in Color* Color slides brighten Mac-based presentations.

Plus, putting 3-D models on screen, HyperCard as a report-producing database, experimenting with headline fonts, and more.



Mac drafting programs put designers in the driver's seat. (See "Getting Started with CAD," page 185.)

*Dozens of dinos roam
the wilds of a new
HyperCard stack.
(See page 57).*

Features

- 74 Macintosh Masterpieces (Is It MacArt Yet?)**
Leaf through a gallery of stunning Macintosh art created by our contest winners.
- 82 Reality Transformed**
From special effects to filtering out artifacts—techniques for touching up scanned photos.
- 88 Color Monitors Revisited**
Choosing a color display for the Mac II: how 12 color monitors stack up.
- 96 Staying Alive**
Hardware add-ons to extend the life of your Mac Plus.
- 102 Where Are the Clones?**
Find out why we're still waiting for a PostScript-compatible printer.

Reviews

- 108 Heavy-Duty Word Processor**
WordPerfect power for the office.
- 111 Apple's PostScript Pair**
LaserWriter IINT and IINTX.
- 115 A Few Strokes Short**
A new version of MacPaint.
- 117 Is It a Printer or Is It a File?**
AnyText/AnyGraph translators.
- 119 Everything but the Kitchen**
McSink text-editing DA.
- 121 Upgrading to SCSI**
HD-20 WSI upgrade for Hard Disk 20.
- 123 Math without Tears**
Calculus tutorial program.
- 125 Carats to Cubits**
Chameleon changes measurement units.
- 127 More than an Upgrade**
MacProject II for nonprofessionals.
- 131 Miles and Miles of Art**
Two CD ROM clip-art libraries.
- 135 Focus on Presentations**
PC Viewer, MacMainFrame, and Flat-Top LCD projectors.
- 137 Two Pages in One**
Radius two-page display for the SE.
- 139 Low-Cost MIDI Interface Quartet**
Four MIDI products for the Mac.
- 141 Real Color Now**
RasterOps 24-bit color card.
- 143 Macintosh Rising**
MacAstrologer charting program.
- 145 Getting It Right**
MacProof and Sensible Grammar.
- 147 Machine Slaves**
QuickShare and Lap-Link Mac.



For a close-up view of how to improve scanned photos 16 ways, see "Reality Transformed," page 82.

MACWORLD

Jerry Borrell

Editor-in-Chief

Christopher Burg

Art Director

Editorial

Managing Editor: Charles Barrett

Senior Editors: Adrian Mello, David Ushijima

Editorial Manager: Jane Lagas

Associate Editors: Gil Davis, Nancy E. Dunn, Valerie L. Kuletz, Joe Matazzoni, Cheryl Spencer

East Coast Editor: Brita Meng

Assistant Editors: Cathy E. Abes, Mark Hurlow

Acting Senior Copy Editor: Felicity O'Meara

Copy Editors: William Freais, Richard Johnson,

Katherine L. Ulrich, O'Brien Young

Editorial Assistant: Liza Weiman

Editorial Administrative Assistant:

Cynthia J. Meade

Administrative Assistant: Sharon Roe

Contributing Editors: Robert C. Eckhardt,

Erfert Fenton, Danny Goodman, Rob Hahn,

Jim Heid, Steven Levy, David L. Peltz,

Lon Poole, Charles Seiter, Franklin Tessler,

Bruce F. Webster

Art and Design

Designer: Susan Howard

Associate Art Director: Joanne Hoffman

Senior Design Associates: Leslie Barton,

Tom Morgan, Michael Sumner

Design Associate: Hae Yoon Kim

Art Administrative Manager: Polly Smith

James E. Martin

President

Macworld Communications

Production

Senior Production Manager: Anne Foley

Editorial Production Manager: Elynn L. Hament

Production Editor: Susan M. Ford

Assistant Production Manager:

Claudia Dawn Smukler

Lead Typesetter: Mark L. Duran

Typesetters: Barbara Tannenbaum, Virginia Weir

Advertising Booking Coordinator:

Stephanie Cady

Advertising Billing Coordinator: So Fong Yip

Production Assistant: Katie Scott

Marketing and Advertising Sales

Director of Advertising Sales:

Patricia Navone (415/243-0505)

Senior Account Manager/No. California

(San Francisco): Penny Rigby (415/243-0505)

No. California (San Jose): Cherie La France

(415/243-0505)

Northeast: Gina Salaices (415/243-0505)

Midwest: Shannon Dolan (312/827-4477)

Southeast: Kathy Isaacs (404/394-0758)

New England: (617/879-0700) Joan Flynn

Eastern Advertising Manager/New York:

Bill Thompson (201/967-1350)

So. California, Southwest, Texas:

Lisa Hillgren, Cathi Tucker (714/250-1307)

Macworld Catalog: Carol Felde, Niki Stranz

Director of Marketing Services: Sandra Vargas

Research

Director: Cheryl Woodard

Manager: Ralph Ames

Market Analyst: Dusty Rody Pedersen

Research Assistant: Bill Segovia

Corporate Development

Corporate Editor: Harry Miller

Editorial Administrator: Karen Wickre

Public Relations Manager: Shirley Gines

Special Projects: Jeffrey S. Glines

Editorial Assistant: Emily Bower

Administrative Assistant: Cathleen Brennan

Circulation

Circulation Manager: Daniel Orum

Business Manager: Gail Egbert

Single-Copy Sales Manager: George Clark

Single-Copy Sales Rep: Martin Garchar

Promotion Coordinator: Ed Chittenden

Fulfillment Manager: Doug Norde

Fulfillment Coordinator: Evelyn Adenau

Administration

Director of Human Resources:

Janet D. McGinnis

Accounting Manager: Pat Murphy

Administrative Services Manager:

Joseph Wollenweber

Employee Relations Manager: Shelly Ginenthal

Technical Manager: Wally Clegg

Assistant to the President: Christina W. Spence

Assistant to the Publication Director:

Loretta Giglione

Corporate

PCW Communications, Inc.

David Bunnell

Chairman & Founder

Lee Vidmer

President

John Griffin

Vice President

James E. Martin

Vice President

Jacqueline Poirier

Vice President

Cheryl Woodard

Vice President

Andrew Fluegelman

1943-1985

Founding Editor

August 1988**Volume 5, Number 8**

Macworld® (ISSN 0741-8647) is published monthly by PCW Communications, Inc., 501 Second St., San Francisco, CA 94107. Subscription rates are \$30 for 12 issues, \$60 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage.

Add \$16 per year from Canada and Mexico; add \$16 per year for surface mail or \$95 per year for airmail from all other countries. Second-class postage paid at San Francisco. POSTMASTER: Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries call 800/621-5461, in California 800/521-8455. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.

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

Macworld is a publication of PCW Communications, Inc. *Macworld* is an independent journal not affiliated with Apple Computer, Inc. APPLE, the APPLE LOGO, MAC, MACINTOSH, and MACWORLD are registered trademarks, and MACLETTER is a trademark of Apple Computer, Inc. Printed in the United States of America.

Copyright ©1988 PCW Communications, Inc. All rights reserved. *Macworld* is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month.



A disk each month

PACKED with PROGRAMS

Over 500,000 sold to homes, schools and offices

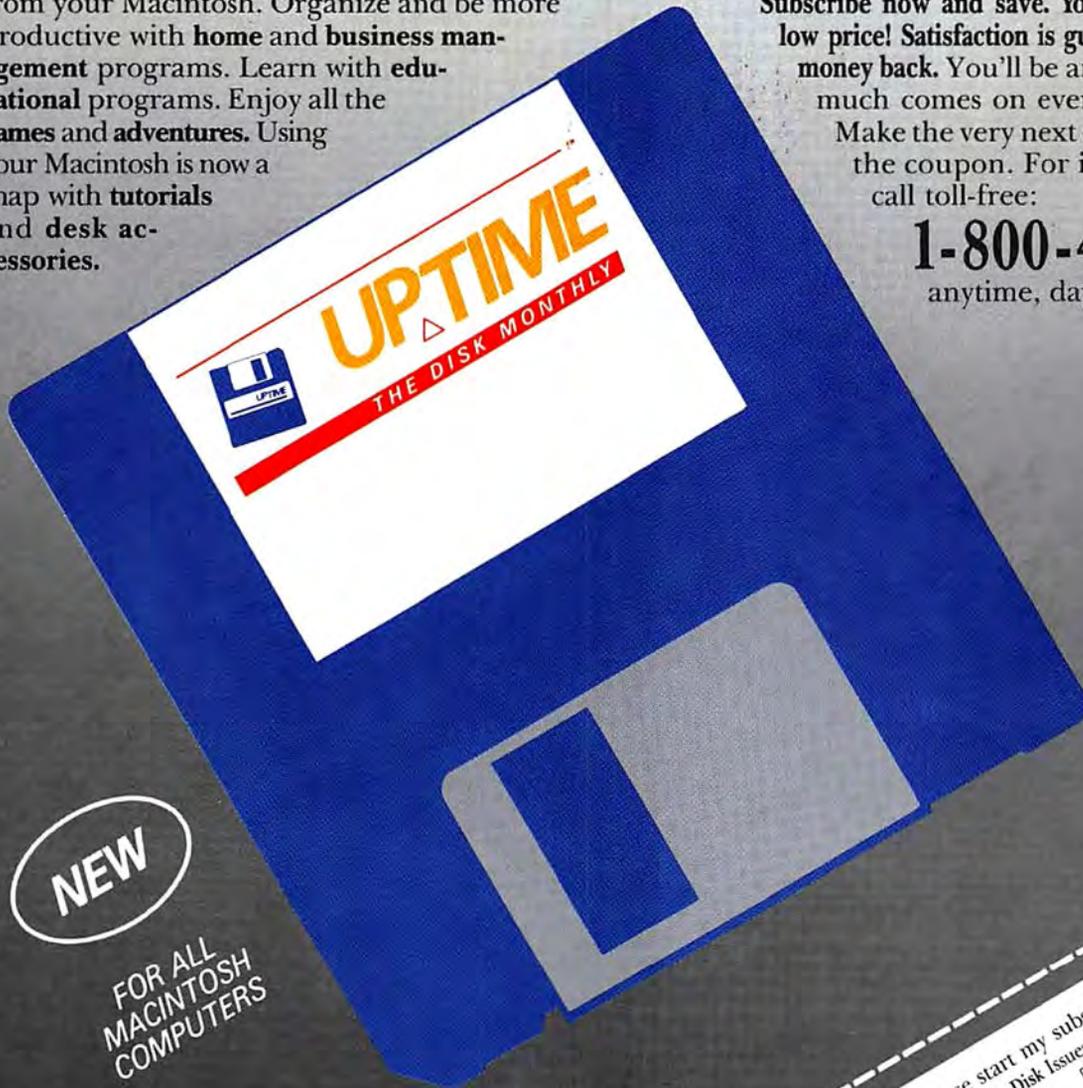
DISCOVER UPTIME. Build an exciting library of programs for less than one dollar each. You deserve value. At UPTIME value is yours. Each month over 30,000 people just like you enjoy UPTIME. Your disk arrives with eight programs and more every month...

Enjoy eight programs including two new desk accessories on each monthly disk. Make your life easier. Get more from your Macintosh. Organize and be more productive with **home and business management** programs. Learn with **educational** programs. Enjoy all the **games and adventures**. Using your Macintosh is now a snap with **tutorials** and **desk accessories**.

It's easy, inexpensive and fun. It's UPTIME! Too good to be true? There's even more! Each monthly disk has reviews of the latest software, hardware and peripherals. Save time and money. Learn the strengths and weaknesses of each item we evaluate. Shop "on the disk" in our Micro Discount Mall.

Subscribe now and save. You won't believe the low price! Satisfaction is guaranteed — or your money back. You'll be amazed at just how much comes on every UPTIME disk. Make the very next one yours. Fill out the coupon. For immediate service call toll-free:

1-800-437-0033
anytime, day or night.



NEW

FOR ALL
MACINTOSH
COMPUTERS

QUALITY PROGRAMS
LESS THAN
\$1 EACH

A Typical Disk Includes:

- Password Protect · Font Edit · Charlotte Font
- Version Reader · MacLanding · Blackjack
- Modem Meter DA · Newsletter Clips

Look for us in Waldenbooks, B. Dalton and other book and computer stores in your area.

I'LL BYTE!!!
SAVE \$89.90 → **12**

I'm a Macintosh enthusiast who wants more. Please start my subscription to **UPTIME** immediately.

Name _____ Address _____ City _____ State _____ Zip _____

Type of Computer _____ (Add \$2 per issue in foreign countries, except Canada and APO)

Bill my: Payment enclosed **6** Disk Issues \$89 **3** Disk Issues \$36 **1** Disk Issue \$14.95

Signature _____ Exp. Date _____

Account No. _____

(Please make checks payable to UPTIME.)

Send to:
UPTIME - PO Box 299
Newport, RI 02840
(401) 849-4925
MW 08

*Be Your Best
Reach for the Stars*

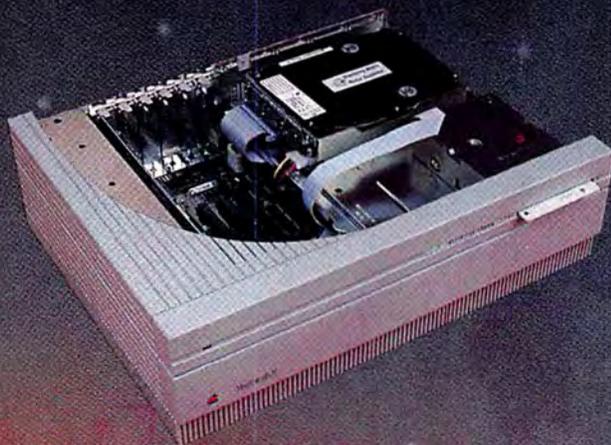
StarDrive

Internal and External SCSI Hard Disk
and Tape Drives for the Macintosh



- Two color front panel power/access light for internal and external drives — no more drive-status blackout.
- Powerful and flexible software with formatting, partitioning, performance testing and problem diagnosis.
- Network compatible, with up to 10 password protected partitions. Excellent for shared use of one single Macintosh.
- Ready to use - custom formatted with optimal interleave for your Macintosh model.
- Companion fast cassette tape drive, StarDrive 60TX, with compatible look, feel and function in software and hardware.
- Comprehensive manual covering installation, operation and problem solving.
- Cables terminator and all necessary tools (for internal drives) included.

StarDrive 60TX provides 60MB of tape backup with the capability of one-pass multipartition backup of user-selected files. \$890.00 shipped with all necessary hardware and software.



	Model Number	Access Time	Formatted Capacity	Price
I N T E R N A L	40DN (SE, II)	29ms	40MB	850.00
	90DN (II)	18ms	88MB	1450.00
	100DN (SE, II)	25ms	100MB	1550.00
	130DN (II)	25ms	132MB	2050.00
	160DN (II)	25ms	162MB	2500.00
E X T E R N A L	40DX	29ms	40MB	950.00
	90DX	18ms	88MB	1550.00
	100DX	25ms	100MB	1650.00
	130DX	25ms	132MB	2150.00
	160DX	25ms	162MB	2600.00

*Compare Quality, Compare Features, Compare Prices
These StarDrives are Within Your Reach!*

All Drives come with a 30 day money back guarantee and a 1 year limited warranty. Shipping and California sales tax extra. Credit cards not charged until shipment. Prices subject to change without notice.

Toll-free ordering and technical support
from all 50 states.

1-800-888-1668

Macintosh is a registered trademark of Apple Computer, Inc.
StarDrive is a trademark of Ruby Systems, Inc.

Circle 191 on reader service card



Ruby Systems

188 South Whisman Road
Mountain View, CA 94041
(415) 967-1187

INBOX: ELECTRONIC MAIL SO POWERFUL, IT'S LIKE BEING EVERYWHERE AT ONCE.



Imagine an electronic mail system that's so powerful yet so easy, everyone instantly transfers everything. From simple phone messages to detailed memos with attached files like spreadsheets, outlines, letters, graphics etc. That's InBox. Electronic mail software that helps groups or an entire company share information fast. Easily. And inexpensively over Appletalk, or virtually any PC network.

Maybe that's why InBox is the best seller, a *Mac-*

User Magazine Editor's Choice and *InfoWorld's* top rated LAN E-mail product. MAC to MAC, MAC to PC, or any combination, the best way to connect is with InBox. InBox makes individual, group, or entire company communications so effective, it's like being everywhere. At once.

Call (800) 888-0886
Ext. 306G for complete
information.

INBOX™
The Power in Electronic Mail

BUY MORE TODAY, AND SEE AMERICA FOR FREE.

**GET THE #1 BEST-SELLING
"A DAY IN THE LIFE OF AMERICA"
FREE* WHEN YOU BUY MORE,
AMERICA'S #1 PRESENTATION
AND PRODUCTIVITY SOFTWARE.**

Rick Smolan, creator of the "A Day In The Life" series, and David Cohen, President of Collins Publishing, used MORE to help organize and produce *A Day in The Life of America*. That's why from now until July 31, 1988 we'll give you their beautiful book (a \$45 value) as an incentive to improve your plans and presentations using MORE.

MORE combines an award winning out-line processor *and* an instant presentation maker because all great presentations start with great plans. MORE is the best choice for organizing ideas and projects quickly. And then presenting them even on a moment's notice. It turns your outlines into bullet or organization-



*How MORE helped
create A Day in the
Life of America.*

Planning, organizing, and presenting a project involving hundreds of photographers scattered across the country for *A Day in the Life of America* was a monumentally complex task. One that Rick Smolan and David Cohen managed with a lot of hard work. A Macintosh. And MORE. Msrs. Smolan and Cohen used MORE to help them think through, plan, organize, and implement each step of the project. Photographic assignments. Tracking people. Writing letters, making phone calls, instantly creating staff presentations... MORE helped them do it all. Rick Smolan describes MORE this way:

"MORE solves one of the twentieth century's greatest problems... dealing with information overload."

MICRO D

BEST SELLERS

WEEKS ON CHART		BUSINESS
RANK		
1	4	FILEMAKER
2	4	SUPER PAI
3	4	MICROSOFT
4	4	EXCEL • M
5	3	MORE • M
6	4	WORDPER
7	4	POWERPC
8	4	MICROSO
9	4	DBASE M
10	4	WRITENC
11	4	FULL PAI

THE NEW YORK TIMES BOOK REVIEW

Best Sellers

This Week **Nonfiction**

- 1 **A DAY IN THE LIFE OF AMERICA** (Collins Publishers) The nation on May 7, 1986, as recorded in pictures by 200 photojournalists.
- 2 **FATHERHOOD**, by Bill Cosby. (Dolphin/Doubleday, \$14.95.) Anecdotes and ruminations from the television star and father of five.
- 3 **HIS WAY**, by Kitty Kelley. (Bantam, \$21.95.) Hoboken to superstardom: an unauthorized biography of Frank Sinatra.
- 4 **PAT NIXON: The Untold Story**, by Julie Ni Eisenhower. (Simon & Schuster, \$19.95.) A biography of the wife of the 37th President by her daughter.
- 5 **WORD FOR WORD**, by Andrew A. Rooney. (Putnam, \$14.95; \$16.95 after Dec. 25.) A collection of columns by the journalist and television personality.
- 6 **MCMAHON!** by Jim McMahon with Bob (Warner, \$16.95.) The autobiography of the quarterback for the Chicago Bears.

type charts, complete with your choice of borders and fonts instantly. Not just fast. Instantly. With just one mouse click. Which means you can make thousands of overheads as quickly as one. For planning, organizing, and presenting everything from morning meeting agendas to nation-wide projects, MORE is your instant answer.

MORE is the industry best-seller. And, it is a *MacUser* product of the year. So, get MORE at your dealer today. You'll turn ideas into picture-perfect results tomorrow. But act now. After all, *A Day* will only last so long.

SYMANTEC™



117 Easy Street • Mountain View, CA 94043 • (415) 964-6300 *For a free copy of "A Day in the Life of America," (a \$45 value), send a copy of your original dated receipt and your completed registration card to MORE, A Day in the Life of America, c/o Symantec, Living Videotext Division, 117 Easy Street, Mountain View, CA 94043. Offer good on receipts dated between 5/11/88 and 7/31/88 only. Must be redeemed by 8/15/88. This offer may not be used in conjunction with any other MORE or Symantec offer. Rating information taken from Micro D Best Sellers List and New York Times Book Review Best Sellers List.

New AppleLink Service

▶ Apple and Quantum Computer Services have announced a new online communication and information service called AppleLink—Personal Edition, an end-user version of Apple's developer/dealer-oriented AppleLink online service. The service will be available to Apple II owners this summer. (Macintosh users, however, will have to wait until later in 1988 for access.)

Personal Edition will offer both Apple-specific and general-information forums. Among the forums will be a direct connection to Apple Customer Relations, online chat sessions, third-party company technical support, a public domain and shareware library, and the online Apple University. General forums include special-interest groups, stock market information, news, the Comp-u-store online shopping mall, and American Airlines EAAsy Sabre service.

Suggested retail price for the package is \$35, plus an annual subscription fee of \$35 after the first year. Connect charges are \$15 per hour for prime-time use (7 a.m. to 6 p.m. weekdays), and \$6 per hour for non-prime-time use. To make accessing Personal Edition more affordable, Apple will lower the price of its Personal Modem by \$120, to \$279.

Saving Your Hard Disk

▶ Many crashed hard disks still contain all their files and programs, but it has been impossible to access this information from their corrupted directories. Coming to the rescue is Symantec Utilities for the Mac (SUM). This utilities package contains a program called Guardian, which can often restore a crashed hard disk in less than a minute by building a desktop-style directory on the hard disk, and ideally on a floppy disk as well. But remember, this program must be used preemptively; it's intended to augment, not replace, backups.

Another major feature of Guardian is a virus-protection utility. While it cannot prevent a System from becoming infected, this utility informs you when a virus has invaded. The program prevents most crashes by blocking illegal System calls. Other SUM features are disk optimization, hard-disk partitioning with encryption, and rescuing of deleted files.

SUM's list price is \$99.95. With the first 5000 copies sold, purchasers can obtain an additional program free—either HFS Navigator or LaserSpeed, a print spooler. For further information, call Symantec at 408/253-9600.

Illustrator 88 Ships

▶ Adobe's long-awaited Illustrator 88 drawing program includes a number of features not originally intended for the color graphics product, such as freehand

drawing, automatic tracing of bitmapped images, masking, blending, and easier creation of resolution-independent fill patterns.

List price of the major upgrade is \$495. It's available free to those who purchased Illustrator after January 1, 1988, and for \$100 to all other owners.

Spot Inking for Brighter Images

▶ Four-color ribbons can be costly, especially when one band wears out long before the others do. Now there's a solution: Multicolor Mac Inker from Computer Friends.

With this inker you can reapply ink to any of the four bands either singly or in combination. According to Computer Friends, reinking costs only five or six cents per application, compared with buying a new multicolor cartridge that costs \$9 to \$25 depending on the printer and manufacturer. Another plus: freshly applied inks often yield brighter images.

Impressive Printing

▶ One way to substantially improve the appearance of laser printer output is with specially designed paper such as Laseredge from CG Graphic Arts in New York (212/925-5332). It increases clarity by providing a flat, smooth surface for deposited toner—no longer does toner drop down into the valleys of duplicator

paper, which has a much rougher surface. Laseredge is available in a wide range of weights and in films.

There's also a new product for the ImageWriter II that, while not improving print quality, will certainly make tractor-fed paper handling more convenient. This \$49.95 paper stand from Stay/Up (602/966-6886) automatically refolds tractor-fed paper as it comes out of the ImageWriter.

Horsepower for A/UX

▶ Golden Triangle Computers has announced a 25-MHz, 68020-based coprocessor board, called FirePower, for Mac IIs running under the A/UX operating system. FirePower is not an accelerator that replaces the II's CPU; rather, FirePower runs in conjunction with the CPU as an application coprocessor for computation-intensive A/UX tasks.

For example, users can off-load certain processor-intensive tasks to FirePower and thereby prevent tying up the Mac II system. If FirePower's Mac II host is on an Ethernet network, any other network node can access that FirePower board, providing that the node supports TCP/IP protocols. One Mac II can host up to five FirePower boards.

The board includes 1 megabyte of ROM, two Appletalk-compatible serial ports, and one high-speed SCSI interface that's said to be four to ten times faster than the Mac

(continues)

II's built-in SCSI interface. A 25-MHz, 68881 math coprocessor chip and up to 4MB of memory are optional. Prices for FirePower start at \$3000. For more information, contact Golden Triangle Computers at 619/279-2100.

World Markets Await

▶ Travel to a foreign country and you might be amazed to see your favorite program working in any one of 17 languages, including Japanese and Arabic. That's because it's relatively easy to "internationalize" Mac software: all of the language components—the menus and dialog boxes—are kept in separate modules that are quickly modifiable.

Apple is urging software developers to take advantage of its new Global Software Information evangelism program, which offers a new technical design manual, marketing information, and access to 27 versions of the Mac operating system (also available through the Apple Programmer's and Developer's Association).

An example of the growing internationalization of Macintosh markets is Rav-Ktav, a Hebrew/English word processor, and MacKtav, a Hebrew/English desktop publishing program, with list prices of \$350 and \$595, respectively, from Davka Corporation (800/621-8227).

Changes for SE and Plus

▶ By fall, you can expect to see the elimination of differences between the European and U.S. versions of the SE and Plus chassis. From a user perspective, the most visible change will be the elimina-

tion of a mounting bracket for plug-in cards on the SE. Previously, Apple spot-welded this bracket to the SE chassis. In the future, developers must provide this bracket—which costs about 20 cents—with each plug-in card. There should be few substantive differences for the Plus, which will continue with no fan and no slot for internal cards.

Extending the Reach

▶ In setting up a LocalTalk network, large factories, office complexes, and college campuses can run up against LocalTalk's 3000-foot line-length limitation. That's why Farallon Computing is offering LineDriver, which amplifies LocalTalk signals so they can reach at least 6000 feet. LineDriver works well with Farallon's PhoneNet cabling system and management software and is compatible with FlashTalk. List price is \$395. For further information, call Farallon at 415/849-2331.

New Mac II Newsletter

▶ *Macintosh II Report* is a monthly newsletter focusing on information specific to the Mac II. Its first edition, which came out in April, features a description of differences between the Mac II, the SE, and the Plus. Also included is a list of programs that have problems running on the Mac II, information on internal hard disks, and the latest word on upgrades and bug fixes. A sample issue is available for \$2; a year's subscription costs \$48. Write to Macreations, 329 Horizon Way, Pacifica, CA 94044.

Full-Fledged AI

▶ In March, Apple and Texas Instruments announced the microExplorer AI (artificial intelligence) workstation, based on a Mac II with a LISP coprocessor chip, that offered near-workstation-like performance at a greatly reduced price. All that was missing was the appropriate software.

Inference is filling this need by offering expert-system software called ART (Automated Reasoning Tool), which can be used to develop and implement AI applications that can combine with Macintosh programs. For instance, a Mac application that controls a manufacturing process can feed data to an ART program that sends decisions back to the Mac application for implementation. For further information, call Inference at 213/417-7997.

New CD ROM

▶ Both Toshiba and NEC are bringing CD ROM drives to the Mac, thus competing with Apple's own \$1199 Apple CD-SC, which has an average access time of 600 milliseconds. Toshiba's XM-2100A-Mac claims a significantly faster access time of 400 ms and sells for only \$999. NEC's Intersect CDR-77 drive costs \$1198 (including a \$199 Mac-SCSI interface) and offers an average access time of 500 ms. All three units will support the High Sierra CD ROM and Mac HFS file formats.

One important extra, available only with NEC's drive, is a \$399 CD ROM that includes 2500 3-D objects and fonts ready for importation to various graphics and publishing programs. Since the images are object-oriented, they can be edited, resized, and reshaped for many purposes.

A Science Cornucopia

▶ *Apple Engineering/Scientific Solutions Guide (Summer 1988)*, a 278-page publication that describes nearly 500 software and hardware products, is now available at Apple dealers for \$6.95. This Apple-produced document also includes information about price, support, and how to contact manufacturers. Products are listed in the following categories: architecture, manufacturing planning/control, mapping/earth resources, scientific/laboratory, software development, and technical productivity.

Apple's First Network Manager

▶ Apple now has its first network-management program for AppleTalk networks, InterPoll. With it, network administrators will be able to view the network number, node number, socket number, name, and device types of everyone on the network. The network can also be viewed on a zone-by-zone basis.

InterPoll can turn off the LaserWriter reinitialization dialog box. It can also determine if everyone on the network is operating with the same version of the System, Finder, and LaserWriter driver. InterPoll can send signals to any device on the network, determine where a break in the network has occurred, and determine whether all bridges are functioning properly. List price of InterPoll is \$129. □

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

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

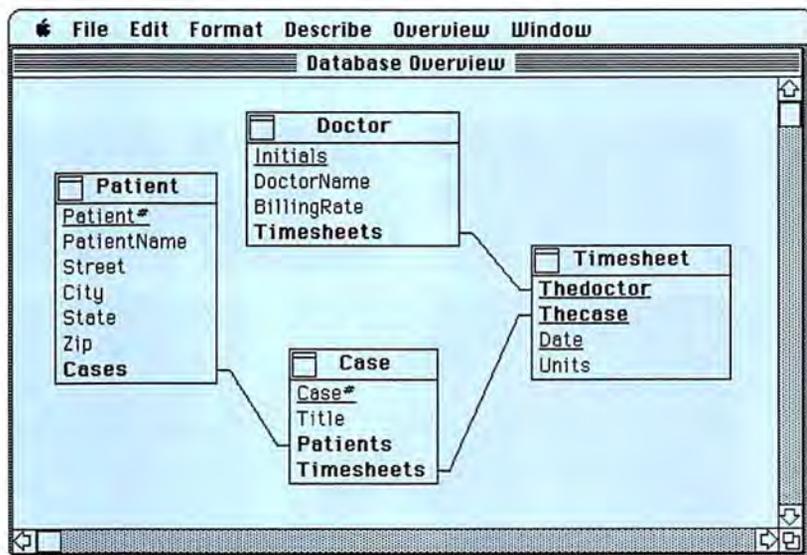
Many "database managers" are not much more than "list managers"—simple lists that can't connect and cross connect one item with another. So while they can "list," they can't really "manage."

What your data tells you depends on how you look at it

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

Some of the power pluses of Reflex Plus

- Visual database design—a "natural" for your Macintosh
- WYSIWYG ("What-you-see-is-what-you-get")
- Truly relational database manager
- Auto-Save—which means you'll never lose data again



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

- Paste Choice command that saves you enormous amounts of time
- Context-sensitive online Help
- Automatic creation of formulas to let you instantly search, sort, calculate, qualify and more
- Multiple entry forms for the same database
- Entry for more than one database in a single entry form
- Shows one record at a time or all records at once
- Calculated fields in entry forms
- Display-only fields
- Default, but editable fields
- GROUPBY function
- Record sizes can be 1000, 2000, or 4000 characters
- Compatible with all Macintoshes with at least 512K RAM including Macintosh SE and II
- New rewritten documentation

*Customer satisfaction is our main concern. If within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department, and we will arrange a refund.
All Borland products are trademarks or registered trademarks of Borland International, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.
Copyright ©1985 Borland International, Inc. B-1204

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

David Smith, MacTutor ”

How to succeed in business for only \$279

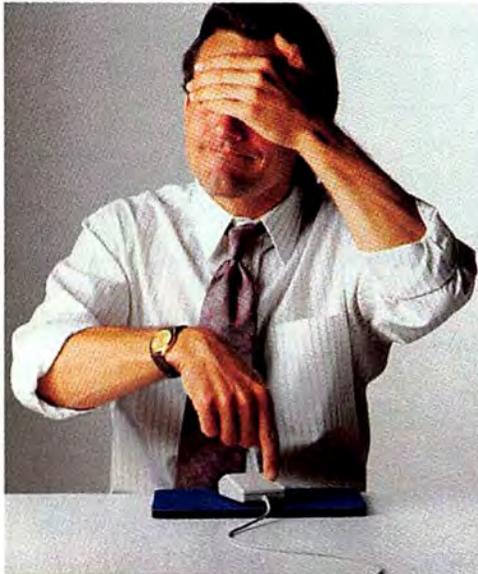
Reflex Plus is the super-power of truly relational databases, and it's only \$279 plus shipping and handling.



BORLAND *MACINTOSH SOFTWARE* **INTERNATIONAL**

60-Day Money-back Guarantee*
For the dealer nearest you or to order,
Call (800) 543-7543
Circle 199 on reader service card

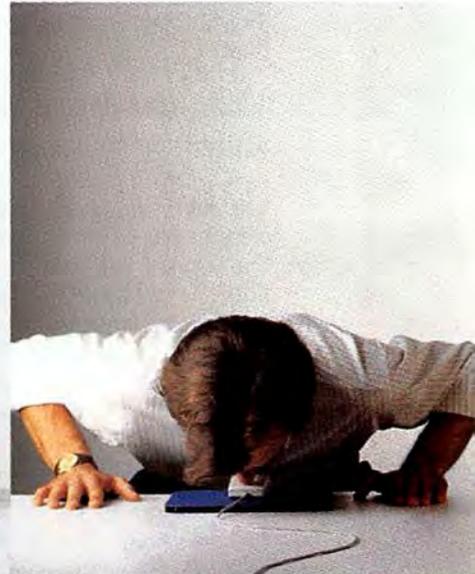
FIVE CLICKS TO SUPE



"...Folks, in all my years in broadcasting, I've never seen anything like it. Just look at the control!"



"He's on the table. He clicks again... This guy is taking some risks today."



"Looks like he's going in for the most difficult move yet, the Goldhaber Nose Click. And it's good!"

NOW, AN UPDATE ON THE TOPS NETWORK CHALLENGE...

Frank: You know Chet, since people have discovered how quick and easy it is to install a TOPS Network, things have gone wild in offices all over the U.S. It seems like installation techniques are getting wackier all the time!

Chet: And faster, too, Frank. It's hard to believe that with only five clicks of the mouse you can turn your Macintosh® into a LAN workstation. In a total elapsed time of less than one minute.

Frank: It's all because TOPS is the easiest to use network in the Mac and PC worlds. If you already have AppleTalk® cabling in place, all you have to do is insert the TOPS diskette, click the mouse five times, and you're ready to start sharing information.

Chet: And with just a few more clicks, you get print spooling. It's no wonder these folks have the time to develop such incredible maneuvers!

Frank: Right you are. And that means users not only share their printers, but with TOPS they can share their hard disks and MS/DOS files too.

Chet: But you know me Frank. The thing that excites me the most is the price. TOPS/Mac costs only \$249 per node, and there's no need to purchase an expensive dedicated file server.

Frank: You bet, Chet. With the lengths people are going to, I'm sure this is going to become a major international event...

R STARDOM.

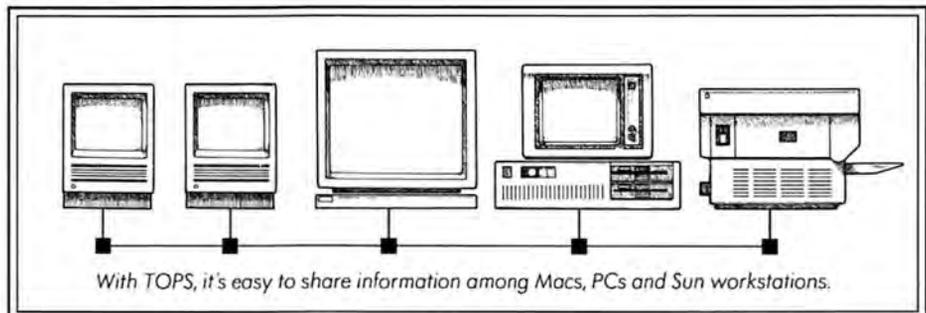


"Chet, I'd say this installation could put him into the TOPS Hall of Fame. He spins... there's the click! Can you believe this performance?"

"And he's up, on one finger. It's installed! I've never seen this before... A new record of 59.6 seconds!"

Want to try it yourself? For more information call us at 800-445-TOPS (from outside the U.S. and Canada, call 415-769-8700). Or write to us at TOPS, 950 Marina Village Parkway, Alameda, California 94501. And get ready to become a network star.

 **TOPS®**
A Sun Microsystems Company



TOPS is a registered trademark of Sun Microsystems, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. Prices shown are suggested retail prices and are subject to change without notice.

Circle 81 on reader service card



Telecommunications software for the Macintosh, a new version.

Soar to New Highs, Effortlessly

When Software Ventures set out to create MicroPhone, it had a simple mission: to develop the most intuitive communications software ever written. Indeed, when MicroPhone was born, it was universally hailed as a breakthrough in communications software. A product so friendly, it turned novices into experts. So sophisticated, it became, in the words of MacUser, a power user's delight.

MicroPhone is a legend. One of those precious software creations that single out the Macintosh as a superior computing machine.

With MicroPhone II, Software Ventures has set out to surpass itself: redefine power in telecommunications for years to come.

MicroPhone II is so revolutionary that PC Magazine was moved to say: "MicroPhone II is arguably the best

comm software ever written." We won't have it any other way. MicroPhone II. The freedom to be yourself. At the top.

Critics' Choice

Stewart Alsop, P.C. Letter:

"MicroPhone . . . sets the standards that general-purpose communications software will have to follow."

The New York Times:

"MicroPhone is a breakthrough in communications software . . ."



SOFTWARE
VENTURES

2907 Claremont Avenue Suite 220 Berkeley CA 94705
415-644-3232

Let's Get Technical

MultiFinder compatible. Supports background file transfer and script execution. Offers a full-featured script language: variables, counters, and expression-analyzer for string and arithmetic operations. Scripts allow: control of all communications settings; screen addressing and text editing; filtering of incoming text.

Supports import and export of scripts as text files. Allows control of PBX's, Hayes and non-Hayes modems through flexible modem drivers. Runs at 50 to 57,600 baud. Emulates DEC VT52, VT100, and TTY type terminals. Mac II and LaserWriter compatible. Works with all Mac large screen monitors. Supports the extended keyboard. Built-in text editor. Includes Glue, licensed from Solutions, Inc.

Engineering a New Mac Market



Or, is it already too late for Apple to reach some of the Mac II's natural friends?

I see in recent issues of *Fortune* and *Business Week* that Apple is inviting readers to discover what the Mac II can do for their businesses. The II has not done as well as was hoped; the Mac SE is the current sales darling. Estimates I've seen indicate that 18,000 SEs are sold each month, and only 7000 Mac IIs.

What I'm wondering is why the Mac II, with its 68020 chip, is sitting in *Business Week* ads flanked by word processors and spreadsheets. During Jean-Louis Gassée's first year at Apple, one of his favorite sayings was, "Apple should be marketing to its friends." He often mentioned how many high-tech and engineering firms were purchasing Macintoshes. So why aren't we seeing Apple's ads in *Scientific American* and other magazines favored by engineers and scientists?

There are about three million engineers in this country. They use computers for word processing and databases, and they need better graphics in all of their applications than do other PC users. They also tend to be more informed about the technology in general, and they really care about what kind of chips their PCs have.

These engineers and scientists are the natural friends of the Macintosh. Certainly their companies spend more on workstations than do most companies with white-collar workers, where the allure of machines that cost under \$1000 is irresistible.

I think that Apple is overlooking a potentially larger market in this group than the one it is seeking in business. Meanwhile, Sun Microsystems is preparing to launch its first line of retail workstations. Apple has squandered its head start with the Mac II, and now it's losing its slight lead by focusing the wrong machine on the wrong market. Sun has not so quietly become a one-billion-dollar company, and soon it could dominate the market for scientific and technical desktop computers.

It's not that developers have let Apple down. I know they're trying to push CAD and engineering applications for the Mac

II. But Apple isn't helping them. This is very different from the way the company's marketing executives created and advertised desktop publishing alliances two years ago. There are no equivalents to the campaigns featuring Living Videotext, Filevision, and PageMaker that we saw then.

If Apple were interested in creating a greater demand for the Mac II in the technical user market, it would have already signed deals with national developers to port existing software to its machines. Developers like Daisey, The Mentor, and Valid for integrated circuit design; SDRC, PDA, and Swanson in engineering; McAuto and Control Data in CAD. How can a company savvy enough to build a Mac II overlook its loyal developers and the major software vendors in one of the most lucrative markets of all?

During a recent Apple developers' conference, there were several questions from developers asking when Apple was going to add a plotter driver to system software print drivers. The glib answer from an Apple staffer was, "We can develop our own as quickly as we can buy one from another company." It's clear to me—as it was to the audience—that Apple intends to sit on the issue until it is forced to act. Whenever developers ask questions at Apple's public forums, I sure don't see many Apple executives in the room. If they were there, maybe they would be better prepared to deal with the competition from Sun's new desktop machines.

It's as if Apple has forgotten that it can create its own role in the business market. It has a tremendous entrée into technical corporations like Lockheed and General Electric. These are places where the II could sell like hot cakes, but Apple seems determined to slavishly emulate IBM and only go corporate. That's about as smart as treating the Apple II line as a poor relation, instead of realizing that it's a moneymaker with a very healthy installed base. Apple should be so lucky as to develop the same kind of market in engineering—and it will need a lot of luck to make up for its neglect of this important arena. □

SEE US AT
MACWORLD EXPO
BOOTH #5628

The POINT of Perfection!

Twice the Speed. Twice the Resolution.



Let's get right to the POINT.

The Abaton ProPoint sets a standard in perfection for precision cursor control. Advanced optical technology and digital electronics make ProPoint the most reliable and accurate cursor control available on the market.

Abaton's custom firmware delivers high resolution precision and the control needed to run today's sophisticated desktop publishing and design applications. At 200 counts per inch with built-in acceleration, the speed and accuracy of cursor placement is unrivaled.

ProPoint's ergonomic design complements the new Macintosh system profile. Productivity is dramatically increased (up to 60%) because the cursor control is always at your fingertips and your eyes never leave the screen.

The POINT of no return – 5-YEAR GUARANTY.

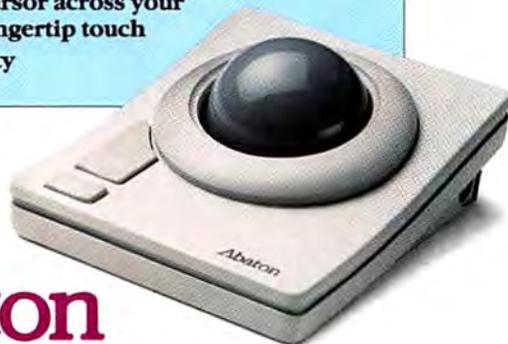
Abaton's patented technology and solid state design is so advanced and so reliable that we are backing ProPoint with a **5-year guaranty**.

Abaton — commitment to perfection.

Suggested retail list - \$159.95

Pick up a ProPoint for your Macintosh™ SE or Macintosh II at your local authorized Apple® dealer or call 1-800-444-5321 for the ProPoint dealer nearest you.

- Saves valuable desk space
- Flexibility allows you to keep your mouse or other input device
- Increased durability and reliability
- Pinpoint accuracy for better use of your desktop publishing, design, and CAD/CAM applications
- Maximum dexterity and freedom of movement - ideal for drawing and palette tools
- Moves your cursor across your screen with fingertip touch
- 5-year guaranty



Abaton

48431 Milmont Drive
Fremont, California 94538
Telephone (415) 683-2226

Circle 107 on reader service card

SEE US
MACWORD
EXPO
BOOTH #5628

Abaton Scan 300/S

Create your best image.



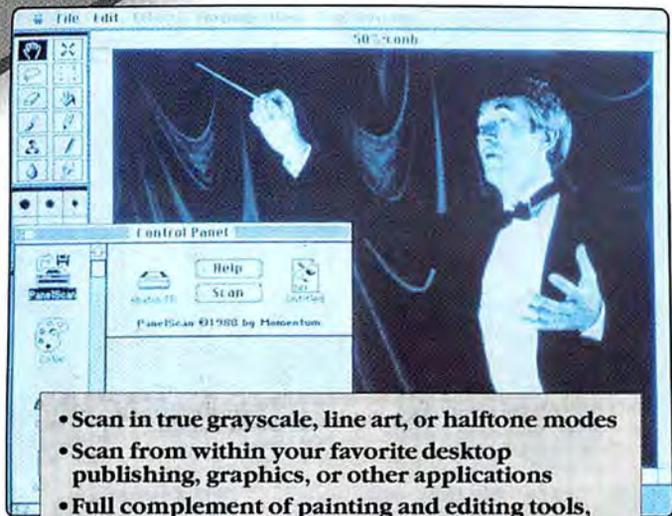
The Abaton scanning duet, our Scan 300/S scanner and C-Scan Plus™ software, orchestrates your scan so every image is a command performance. Scan in true grayscale and your favorite desktop publishing software can edit and resize the scanned image without distortion. Now you can really take advantage of high resolution output devices.

Abaton's medley of software packages power the Scan 300/S. C-Scan plus scans in multiple resolutions and gives you a full repertoire of painting and editing tools to dress up your halftone and line art scans.

Our unique PanelScan™ software lets you "quick-scan" directly from your Macintosh™ Control Panel without leaving your desktop publishing package. Abaton's OCR software teaches the Scan 300/S to "read" text in more than 120 typestyles and font sizes from 6 to 14 points, even on the same page! No one else makes scanning this convenient. We also offer IBM options.

With an Abaton Scan 300/S and your Macintosh, you'll be creating desktop publishing classics.

Ask your local authorized Apple® Dealer or call 1-800-444-5321 for the dealer nearest you.



- Scan in true grayscale, line art, or halftone modes
- Scan from within your favorite desktop publishing, graphics, or other applications
- Full complement of painting and editing tools, including text capabilities
- Preview your scans for positioning and cropping
- Saves in TIFF, Compressed TIFF, Encapsulated PostScript®, and MacPaint™ formats
- Scan in a variety of page sizes, resolutions, and reduction modes

Abaton

48431 Milmont Drive
Fremont, California 94538
Telephone (415) 683-2226

Circle 107 on reader service card

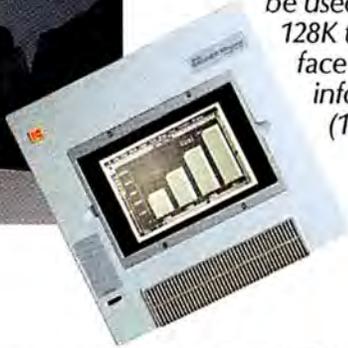
C-Scan Plus and PanelScan are trademarks of Abaton Technology Corporation. Apple is a registered trademark and Macintosh and MacPaint are trademarks of Apple Computer, Inc.



Macintosh is a registered trademark of Apple Computer, Inc.

**Now.
Put Macintosh images on the big screen.**

Finally, with the KODAK DATASHOW™ HR/M Projection Pad, users of Macintosh® computers won't have to look at fuzzy, blue-tinted projected images. Kodak presents the first black-and-white image for Macintosh, generated by an exclusive 20:1 contrast ratio and high-resolution 512 x 342 pixel display. Project any Mac program for a roomful of people. You'll see text and graphics that more closely match your monitor image than possible with any other LCD projection pad. You won't have to put up with fluctuating contrast, either. The cooling system eliminates the heat buildup that causes these problems in other systems. Advanced technology also eliminates time-consuming vertical and horizontal image adjustments. And finally, the Kodak pad can be used with all Macintosh computers from 128K through SE, with the advanced interface we offer. For product and dealer information, call 1 800 44KODAK (1 800 445-6325), Ext 835B.



**Corporate Climbing
Gear From Kodak**

THIS BLACK & WHITE IMAGE FOR MAC ONLY FROM KODAK

The new vision of Kodak



B2-004

Circle 194 on reader service card

Letters

A forum for Macworld readers

Rising from the Ashes

It is with mixed emotions, mostly disbelief, that I realize Ashes to Ashes may be one of our most successful programs. It was born out of momentary boredom while Stanley Crane and I were learning to program the Mac. At a trade show, Stan found a couple of copies in his pocket and gave them away. Since then, they've been turning up everywhere. I keep magnets on my refrigerator so they won't take to breeding in the lettuce bin.

Your response to Jim Flores's complaints about the bug that causes the score to decline at the 200,000 mark (*Letters*, March 1988) expresses our mercenary sentiments exactly—why put extra time and effort into a program that's provided us no income? I might also add that no one had broken 200,000 before the game made its public debut. We'd fix it, but we're not entirely certain we still have the development system. Maybe there's a copy in the butter dish...

*Daniel Matejka
via CompuServe*

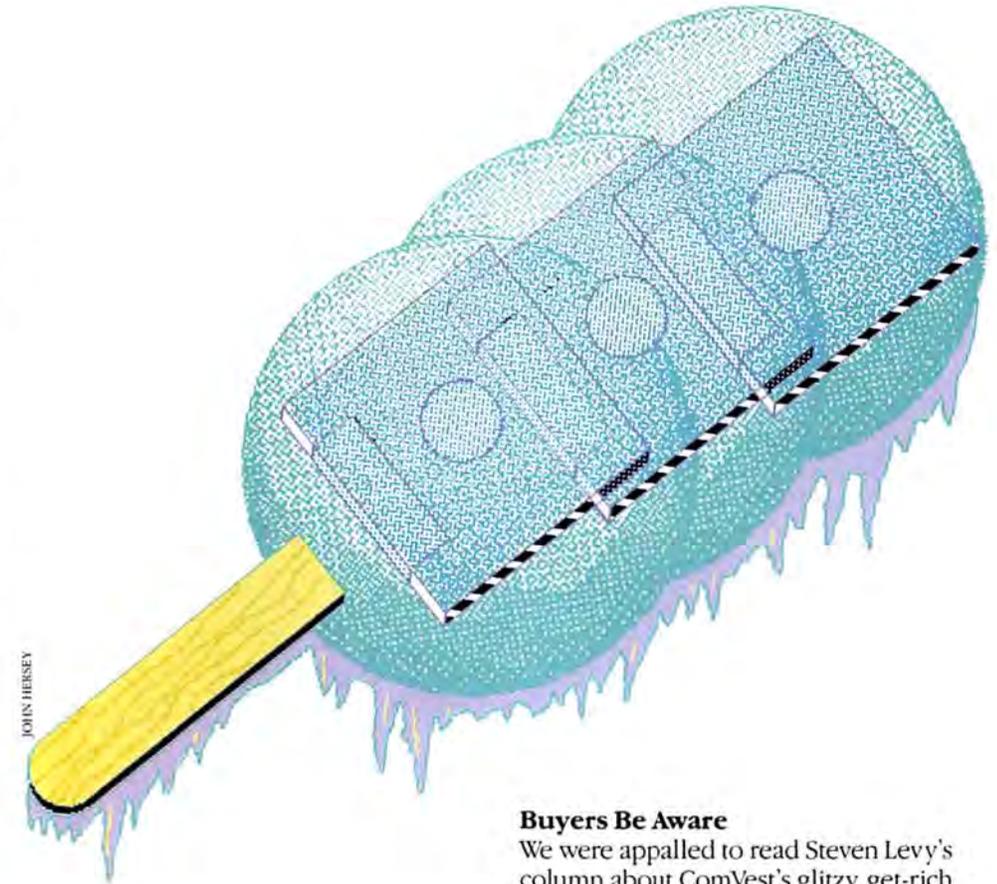
Landscapes in Color

Are there any programs that will colorize black-and-white MacPaint images on the Mac II? Also, are there any fractal programs that can produce color mountains and other landscapes?

*Robert A. Wyatt
Berryville, Virginia*

Correction

The 24-bit programmable color video card shown on page 113 (Macworld News, May 1988) is the Spectrum/24 by Super-Mac Technology, not RasterOps. It offers 1024-by-768-pixel resolution and sells for \$2995.



JOHN HERSEY

Colorizer (Palomar Software, 619/721-7000), PixelPaint (SuperMac, 415/964-9694), and Modern Artist (Computer Friends, 503/626-2291) all convert black-and-white images into color. One fractal program, Fractal Islands 5.0 by Scott Berfield, does color landscapes, but you're limited to green mountains and blue water. There are a number of Mandelbrot color fractal programs, including MandelColor 5.1 by Robert Woodbead, Mandelbrot Microscope by Martin Sandberg and William Hembree, and Mandel881 by Stephen Eubank. All are public domain except MandelColor, which is shareware (\$10). You can get them through EduComp, CompuServe, or various user groups.—Ed.

Buyers Be Aware

We were appalled to read Steven Levy's column about ComVest's glitzy, get-rich sales operation ("When You Wish upon a VAR," March 1988). Although millions of people fall prey to these marketing techniques each year, you shouldn't judge all VARs by this one example. Like us, most Apple VARs are committed to improving the business environment of their clients.

We work very hard to maintain our valued partnership with Apple. In response to your warning, "Let the buyer beware," we say, "Let the buyer be aware that most VARs offer worthy products at reasonable prices."

*Mark Hopkins
Micron Computer Company
Camarillo, California*

(continues)



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 a free catalog: 800-325-3841



Made in U.S.A.
All steel frame construction
Easily holds up to 150 lbs.



AnthroCart and Technology Furniture are
registered trademarks of Anthro.

**Anthro®
Technology Furniture®**
3221 N.W. Yeon St.
Portland, OR 97210
503-241-7113
Telex: 940103

Letters

Not Just for Typesetters

In "Page-Makeup Roundup" (April 1988), Steve Cummings refers to programs like JustText, TeX, and Textures as packages that "are not for graphic designers." Most professionals agree it is the fanatical pursuit of the finer points of typography that separate the pro from the less finicky craftsman. WYSIWYG programs are certainly lacking in this respect.

As a teacher of typographic design, I encourage my students to use PageMaker and ReadySetGo as well as JustText. While the last program is less intuitive, its typical results outshine those of the other two. Once Display PostScript becomes available, JustText will become very attractive to those now groping their way through the plethora of menus that are part and parcel of the supposedly easier programs.

*Joost van de Woestijne
Utrecht, The Netherlands*

A Prize Market

In his April column, "Eyes on the Prize," David Bunnell said just what I've been saying about Apple for a long time. There would certainly be many more Mac owners today if only Apple had offered them an affordable Macintosh.

I use a Mac Plus at work, and I like it a lot. But I voted with my wallet, as Bunnell put it, and bought an Amiga 500 with a megabyte of memory and two disk drives for less than half the price of a similarly equipped Mac Plus. Multiply me by over a million people tired of waiting for an affordable Mac who decide to buy something else, and you can see Apple is obviously missing a large market.

*Larry Kollar
Dawsonville, Georgia*

Protecting Its Image

No business likes to mess with a successful product—in Apple's case, the Apple II line (David Bunnell, April 1988). Until Apple is relatively sure that a cheap Mac won't hurt sales of the Apple II, you won't see a significant drop in the price of the Mac. If the Mac maintains its fashionable image and new-found business contacts, the price may stabilize or even increase.

Apple may be afraid that a low-cost Mac will tarnish its image in the minds of business people, but it may also find the business market is no sure bet either.

*Victor Rosengren
Fort Collins, Colorado*

(continues)

Christmas in July?



Registered users receive CANVAS 2.0.

If you're one of the 20,000 plus registered users of CANVAS 1.0, we've got a present for you. Starting in July, Deneba Software will automatically mail you the new CANVAS Version 2.0 at no additional cost (no disk fees or shipping charges).

Good just got better.

CANVAS is already one of the top graphics programs in use today. Now we've added even more features.

Create your own drawings using an unlimited number of layers. Color objects, bitmaps or text in your choice of 16.7 million colors. Create multi-point Bezier curves. Specify gray levels in 1% increments and hairlines as small as 1/1000th of an inch. Specify arrowheads (user editable) and auto-dimensioning on lines or arcs.

A normal view is now available while editing bitmaps as well as, a smoother, more powerful airbrush, and the ability to paint anywhere instantly. Improved importing and exporting allows you to read and write to a variety of formats including MacPaint, TIFF, PICT, PICT2 and MacDraw™.

Enhanced capabilities now allow for faster, more precise drawing (and printing) with increased precision to 1/64,000th of an inch. And CANVAS 2.0 now includes an even more powerful desk accessory version. All this and more to registered CANVAS users.

Still time to save.

If you're not currently enjoying all the graphic capabilities of CANVAS, here's an offer you can't resist. Purchase CANVAS now (suggested retail price \$195.00) and join the 20,000+ users who will be receiving the New 2.0 Version (suggested retail price \$299.95) at no additional charge. That's a savings of \$100.00.

MERRY CHRISTMAS!

Deneba
SOFTWARE

7855 N.W. 12th Street, Suite 202
Miami, Florida 33124, (305) 594-6965

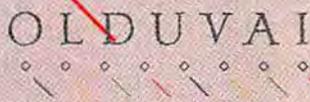
*Read Only

MacDraw is a registered trademark of the Claris Corporation.

Circle 282 on reader service card

SUCH AS KEYBOARDS, TRACKBALLS AND DIGITIZING TABLETS. READ-IT!™ OPTICAL CHARACTER RECOGNITION SOFTWARE FOR ANY SCANNER, INCLUDING THUNDERSCAN. INPUT ANY PRINTED TEXT INTO YOUR WORD PROCESSING, DATABASE OR DESKTOP PUBLISHING APPLICATION.

WHY TYPE IT, WHEN ANY SCANNER CAN READ IT!



Now, thanks to READ-IT! Optical Character Recognition software, any scanner (including ThunderScan) can be used to input text from books, magazines, newspapers, letters, price lists, phone books, in fact most any printed word, into your Macintosh. READ-IT! increases your productivity by converting scanned images into text files which you can then edit in your word processor, store in your database or use with your desktop publishing application.

READ-IT! comes pre-trained for most popular typewriter, ImageWriter and LaserWriter fonts. But don't despair if your documents use different fonts, because unlike other O.C.R.

systems (even the ones costing thousands of dollars more) you can teach READ-IT! to recognize

virtually any new typeface, even foreign and special characters.

Furthermore, READ-IT! can also read files from Fax Modems and works in the background under MultiFinder.

And the New Version 2.0 now includes drivers for all popular scanners, batch processing, speech,

automatic font selection, and EasyLearn™, the superfast way to teach READ-IT! new fonts.

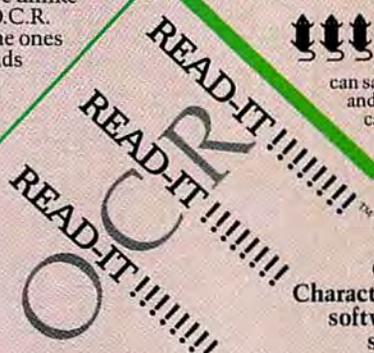
So if you're looking for the best way to enter printed data, the solution is as simple as the process. See your dealer or call toll-free 1-800-822-0772. And READ-IT!

To receive a FREE Olduvai product line HyperCard stack, just send us a blank disk.

READ-IT! O.C.R. for any scanner: \$395 for ThunderScan: \$149



"... READ-IT! can save you time, money and frustration, and it can dramatically increase your productivity!"
MacUser, April 1988



Optical Character Recognition software for any scanner.

OLDUVAI Corporation, 7520 Red Road, Suite A, South Miami, FL 33143
(305) 665-4665 Fax (305) 665-0671

READ-IT! is not copy-protected and requires 1 MB RAM and any scanner. ThunderScan version requires 512K and ThunderScan 4.0.

All product names mentioned are trademarks of their respective holders.

FONTS, FREES, AND EVEN EXCEL, QUICKERS AND TEMPO MACROS. POST-SCRIPT™ ART BY AWARD-WINNING ARTIST I GIGONNE. FONTS SHARE™. ALLOWS ALL MACS ON A NETWORK TO SHARE DOWNLOADABLE LASER FONTS RESIDING IN ANY APPLELINK SERVER.

Letters

Presenting Professional Image

"Get to the Point" (April 1988) was an interesting overview of presentation graphics that contained two slides produced by our software. However, the captions were inaccurate. Our product is called Professional Image, not Management Graphics, which is actually our competitor. The article also quotes typical prices (\$15-\$50) and turnaround times (4-5 days) for slide services. Our users get slides in 24 hours for \$7.

Allan D. Clarke
20/20 Data Systems
Austin, Texas

Fixing TOPS

We enjoyed your informative article on TOPS network software ("Insights on TOPS," March 1988). We use a TOPS LAN, but after upgrading to version 2.0, we discovered that while we could use an SE as a "many writer" server, we were unable to do the same with a Mac Plus. We've been informed that TOPS is working on a fix, but we're still waiting to get it.

Dave Davis
Brøderbund Software
San Rafael, California

Mike Rogers, TOPS technical manager, says the fix will go into the next upgrade, which should be out by now. In the meantime, a patch is being sent to customers who report the problem.—Ed.

Fish or Cut Bait

How nice of Apple to turn over MacWrite, MacPaint, and MacDraw to Claris for further development. But why wasn't MacTerminal given the same treatment? Apple should either get on with MacTerminal's development or admit that it has no plans to do so.

Vanya Matzek
Cupertino, California

When Apple spun off its software division, it decided to keep networking, communications, and system software, and hand over all other applications to Claris. According to an Apple representative, Apple plans to make MacTerminal a more integral part of future Mac operating systems.—Ed.

APDA Has Its Say

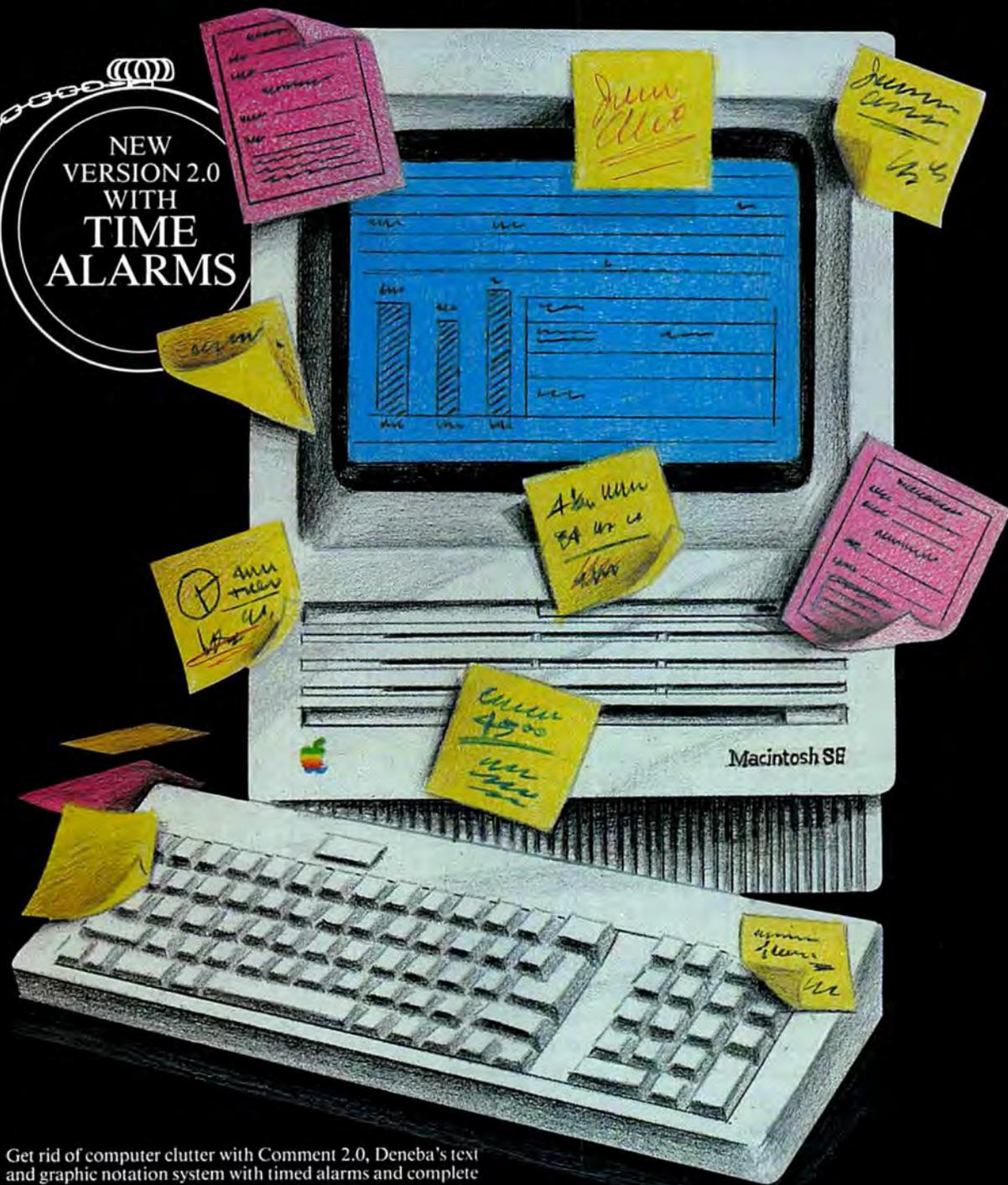
I noted with interest that Apple gave no response to Mark Jennings's complaint about Apple Programmer's and Developer's Association (Letters, April 1988). Since APDA is

(continues)

Circle 21 on reader service card

"No Comment"™

NEW
VERSION 2.0
WITH
TIME
ALARMS



Get rid of computer clutter with Comment 2.0, Deneba's text and graphic notation system with timed alarms and complete note management.

SPREADSHEETS... attach notes containing formulas and explanations to any cell within your spreadsheet. Then use these notes to create hypertext-like documents.

WORD PROCESSORS AND DESKTOP PUBLISHING... add comments, notes and suggestions to specific portions of text without altering the original document. You can even attach graphs and artwork to documents, making Comment the perfect clip-art filing system.

KEEP APPOINTMENTS, CREATE DIRECTORIES... Comment's time based alarm system can call up notes hourly, weekly, even yearly. And creating a telephone directory is just a mouse click away.

NOTE MANAGER... lets you review and edit all your notes from one location. Comment works as a desk accessory with most popular software applications and is fully Multi-Finder™ compatible.

GET UNSTUCK WITH COMMENT 2.0

(Suggested Retail: \$99.95)



Comment™
by **Deneba**
SOFTWARE

7855 N.W. 12th Street, Suite 202
Miami, Florida 33125 • (305) 594-6965
Site Licenses Now Available

Circle 217 on reader service card

The Classic Returns!



Quoted by industry experts, passed around in user groups, and relied upon by everyday Mac users, THE APPLE MACINTOSH BOOK is the bible of the Mac world. Now, it's thoroughly updated with the latest on new and emerging Mac products. If you just bought a Mac or are thinking of upgrading, don't miss this book. Cary Lu explores:

- how the Mac works: its video screen, keyboard and mouse, disks and disk drives, data pathways and memory, and printers
- what's currently and soon-to-be available in word processing, graphics, business software, communications, networking, and desktop publishing for the Mac
- how to manage disks with available memory and what options exist for mass storage
- what programming languages exist

THE APPLE MACINTOSH BOOK. Your Mac library is incomplete without it. **\$21.95**

Microsoft® Press Hardcore Computer Books

Available wherever books and software are sold.

Or call in your credit card order 800-638-3030 (In MD 824-7300). Refer to ad MW88.

Book Code 86-96213.

Circle 175 on reader service card

Letters

an independent organization with a contractual arrangement with Apple, we would be glad to respond to any future complaints.

Since our recent period of unexpected growth, we have improved our turnaround time for orders and customer service. And since we're a nonprofit organization that prices products as low as possible for widest distribution, the \$20 membership fee Mr. Jennings complains about is necessary to cover overhead and is required by our contract with Apple.

Frank Catalano

APDA

Renton, Washington

Leading the Blind

After reading about *The Blind Watchmaker* book and program (*Macworld News*, March 1988), I decided I wanted to buy it, but you didn't give an address for the company.

Steven W. Pollard

Montgomery, Alabama

The address for book publisher W.W. Norton & Co. is 500 Fifth Ave., New York, NY 10110 (phone number is 212/354-5500). You can obtain addresses of book publishers by calling your public library or local bookstore.—Ed.

A Sour Note

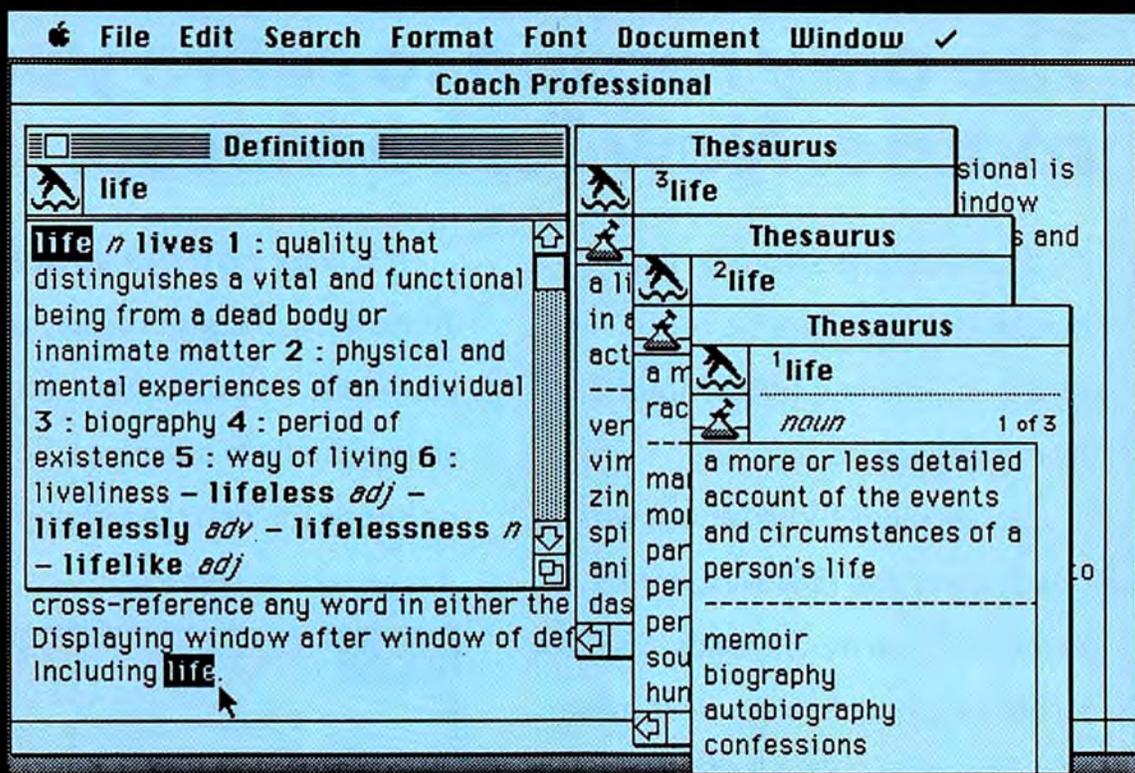
In "The Numbers Racket" (February 1988) you erroneously claimed that Jazz can read and write WKS and SYLK files, including formulas. Lotus technical support informed us that Jazz only imports WKS or SYLK files; it cannot export them. Only Lotus 1-2-3 version 2 can read Jazz files and save them in another format.

Rita Gelhausen

St. Meinrad, Indiana

You're right. Lotus's planned export utility for Jazz 1.A failed to materialize; this feature is now supposed to appear in Modern Jazz.—Ed. □

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to Macworld). Include a return address. Due to the high volume of mail received, we regret 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.



Spelling Coach Professional.[™] The only spelling checker that will also teach you the meaning of life.

Stop packing. It's no longer necessary to climb a mountain in Nepal to consult a legendary guru. Because now there's Spelling Coach Professional.[™] The first hyper-text spelling and reference system available for any microcomputer. It gives you instant access to Proximity/Merriam Webster's Concise 85,000 word electronic dictionary with *complete* definitions.

Installed as a desk accessory (Swamis can't do that), Coach Professional[™] is extremely easy to use. Simply select any word and in seconds a window appears showing you its definition, its correct hyphenation and all uses and tenses. Just as they appear in Merriam-Webster's book version.

Coach Professional[™] also includes the Coach[™]

Merriam-Webster Thesaurus. This 245,000 synonym thesaurus is organized by meaning group and is the only thesaurus with definitions to help you understand the difference between each meaning.

You can use Coach Professional[™] interactively (as you type), or your completed documents can be scanned at over 150 words per second. It shows your misspellings in context and suggests the correct spelling. Then one click and the correction is made.

In addition to the spelling dictionary, Coach Professional[™] includes a medical dictionary, a legal dictionary and even contains a special

20,000 word geographical and biographical supplement.

So if you're looking for the meaning of it all, look into Coach Professional.[™] At \$195, it's at least ten times cheaper than a round-trip ticket to Kathmandu.

Also available from Deneba are Spelling Coach[™] (spelling checker only) at \$99.95 and Coach[™] Thesaurus at \$59.95. See your local dealer for a complete demonstration of any of our products. Or call us at 1-800-622-6827. In Florida call (305) 594-6965.

Deneba
SOFTWARE

7855 N.W. 120th Street, Suite 202
Miami, FL 33126

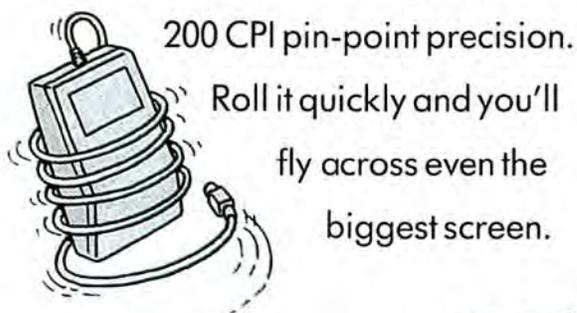
Circle 180 on reader service card

The only reason to retire your mouse. New Turbo Mouse.

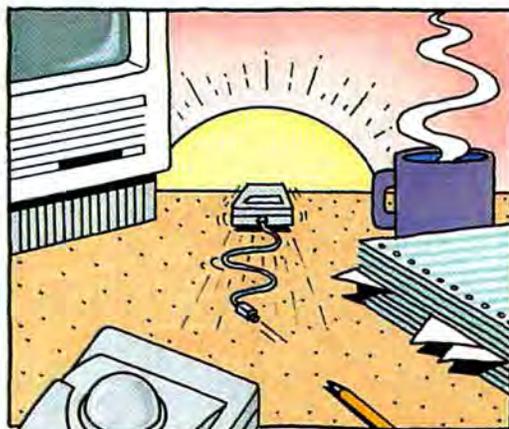
You've always sworn by your mouse. But now there's a reason to give it up. The new Turbo Mouse® from Kensington.

Our original Turbo Mouse was so good, it won the 1987 Macworld® Award for Best Input Device. The new technology built into our new Turbo Mouse makes it even better. It's quicker, quieter, and easier to use than any mouse.

It's twice as fast. It puts the mouse ball on top, so you move only the ball, not the whole mouse. And its automatic acceleration senses the speed at which you're working and moves the cursor further when you move faster. Roll the ball slowly for

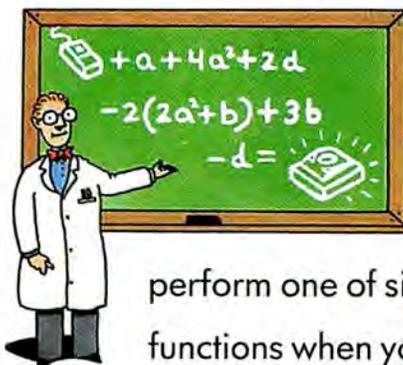


It takes half the space. Our Turbo Mouse doesn't scurry all over your desk. It does its fancy footwork sitting quietly in one place. So it's just as happy amidst a sea of papers as it is on a bare surface.



It's got twice the brains. And the mouse

buttons. One button is for regular clicking, the other is a click lock. You determine which is which, with the flip of a switch. A second switch*



lets you direct the Turbo Mouse to

perform one of six common functions when you click both its buttons at once. You can choose Save, Print, Open, Close, New, or Quit.

See Us at Macworld Expo
Bayside #1636



Actual size—Fits perfectly
next to keyboard.

It's reason enough to retire your mouse. Spend an hour with a Turbo Mouse, and you'll be putting your mouse on the next flight to Florida. For the Mac™ SE and Mac II, ask for the new Turbo Mouse ADB, model 62360 (available in July). For the Mac and Mac Plus,



ask for the new Turbo Mouse, model 62358 (available in August).

Both have a suggested retail of \$169.95

Call 800-535-4242 for a Kensington dealer near you. Outside the U.S., or in New York, call (212) 475-5200. Or write to Kensington, 251 Park Ave. S., NY, NY 10010.



Circle 192 on reader service card

* Only in Turbo Mouse ADB



Limited Time Offer

Order a drive now and receive: SilverServer™

- Complete hard disk management utilities.
- Modem and disk server for use within your LAN.

- Remote disk server to share hard disks in another LAN or at home.
- Available separately for \$149.00.

also receive:

- Carrying case for Cirrus drives.
- Available separately for \$30.00.



CIRRUS. PERFORMANCE WITHOUT COMPROMISE.

20MB/30MB

\$539/639

3 1/2" SCSI Hard Disks
2 3/4 x 6 1/2 x 9 1/4"
65 ms access time.
Wt: 4 1/2 lb

40MB

\$739

3 1/2" SCSI Hard Disk
2 3/4 x 6 1/2 x 9 1/4"
65 ms access time.
Wt: 4 1/2 lb

60MB

\$839

3 1/2" SCSI Hard Disk
2 3/4 x 6 1/2 x 9 1/4"
30 ms access time.
Wt: 4 1/2 lb

NEW!
80MB

\$1139

3 1/2" Quantum SCSI Hard Disk Includes DisCache™
2 3/4 x 6 1/2 x 9 1/4"
18 ms access time. Wt: 4 1/2 lb

NEW!
100MB

\$1539

3 1/2" SCSI Hard Disk
2 3/4 x 6 1/2 x 9 1/4"
28ms access time.
Wt: 4 1/2 lb

"Simply put, Cirrus Drives are a joy to work with... simple, elegant and impressive performers."

Cirrus hard drives deliver power and speed without compromising reliability, ergonomics or desktop real estate. Superior 3 1/2" drive technology and high-volume half speed fan provide cool, quiet operation you can rely and rely on.

All Cirrus drives are compatible with the Mac II, SE and Plus and are backed by a one year limited warranty. We also make the fastest (18 ms) 40 and 80 MB internal drives for the Mac II and SE. Call for prices.

Cirrus drives are shipped preformatted and ready-to-use with 2 SCSI ports, power and SCSI cables, terminators, manual and SilverServer utility software. This powerful, comprehensive software package includes: Auto mounting, auto parking, password protection, diagnostics and powerful volume

SPEED RELIABILITY QUIET OPERATION COMPACT SIZE POWERFUL SOFTWARE

"Very small and lightweight, constructed of quality materials designed to last." The Macintosh Journal

sizing functions that let you freely partition your drive into one or more volumes, or combine several drives into a single large volume. Plus you can change SCSI drivers and the interleave factor for extra speed.

When you order Cirrus Drives you also get SilverServer's exclusive new modem server, disk server and remote disk server so you can share modems and disks on an AppleTalk Network or even access hard disks over the phone!

Try a Cirrus drive soon. For over 2 years we've built drives of uncompromising quality so you won't have to compromise on performance.

LaCie LTD. 16285 SW 85th • No. 306
Tigard, OR 97224 • Ph: (503) 684-0143

Order your Cirrus Drive today, call 1-800-999-0143

Prices shown are cash prices and do not include shipping. Add 3% for VISA or Mastercard. Add 7% for rush handling. Cirrus, LaCie and SilverServer are trademarks of LaCie Ltd. Macintosh and AppleTalk are trademarks of Apple Computer. DisCache and Quantum are trademarks of Quantum Corporation. Prices and specifications subject to change without notice. Excerpts reprinted with permission of Mac Journal.

Circle 145 on reader service card



How Hollywood Moved to Silicon Valley

Or, what multimedia really means

We sat outside on the lawn, squinting against the sunlight on one of those glorious first days of California's spring. Trip Hawkins, founder of Electronic Arts, was talking about the future of the game industry when the conversation shifted to his observations of Silicon Valley.

"Within 20 years this will be Hollywood. Look, the computer game industry is already here in the Valley—Activision, Spectrum Holobyte, and Electronic Arts, with Brøderbund nearby in San Rafael. Together we produce the majority of all entertainment software for all home computers. When we have optical memory, sound, interactive graphics, and better software, we'll be producing applications that rival films from Hollywood."

One might expect to hear this from the founder of EA. After all, Hawkins originated the idea of calling programmers producers and directors. But Bruce Davis, the CEO of Activision (now Mediagenic), a somewhat less flamboyant figure, now has the same starry look in his eyes when he talks about the future.

It's a time of transition in Northern California. It's like Orange County in the fifties, when Walt Disney's vision of the future turned orange groves in Anaheim into Disneyland. Today, the last of the fruit orchards are being cut down around Santa Clara County in the southern end of Silicon Valley. The physical resemblance of Santa Clara's evolution to Los Angeles's is inescapable. Just the names of the places have changed. In LA it was aerospace, petro-

chemicals, and entertainment. Now, in Silicon Valley, it's semiconductors, computers, and entertainment.

All of the major players in personal computers (save Tandy) are here; Sun, Hewlett-Packard, Apple, and dozens of other computer companies. IBM, DEC, and Xerox all have major research facilities here. George Lucas and Francis Coppola have brought substantial film industry work to Northern California. Industrial Light and Magic, a Lucas company, produces special effects for many of today's films. The Valley has become a cauldron of creativity, innovation, and hard work. Not one that glitters with the sybaritic lifestyle of LA, but one that races along quietly, fueled by the enormous efforts of its engineers, programmers, and marketers.

It's not just hyperbole. I worked for years in Boston and Washington, D.C., prowling the high-tech corridors there, talking with computer company execs, and it's clear to me that there's something different about Silicon Valley now. Excellent companies reside in all of this country's high-tech centers, but now the talent flows noticeably, increasingly, toward the Valley.

It's no coincidence that Apple's new vision of the future involves multimedia, user programmability, natural language use, and the visualization of data. John Sculley's vision leaps ahead to the end results of these trends, while Jean-Louis Gassée articulates the goals that must be reached in order to achieve these ends. And the engineers groan about how to accomplish all that's needed. I sit now and imagine what the book will look like that records this transition.

Gassée's thoughts these days about multimedia go something like this: To be successful, the next generation of machines must be contextual. That is, computers must allow us to work within whatever is our context—in any subject area, by all appropriate means of access (audio, graph-

'Within 20 years... we'll be producing applications that rival films from Hollywood.'

ic, tactile), in any style of interaction we desire.

Second, they must provide "reusable experiences." Unlike videocassettes, computers must give people the perception that there are no bounds to what they can do with them—that each use can be an entirely new experience. (Gassée raises the concern, though, that the computer industry could fall into the media/advertising trap that television has, and produce mindless babble.)

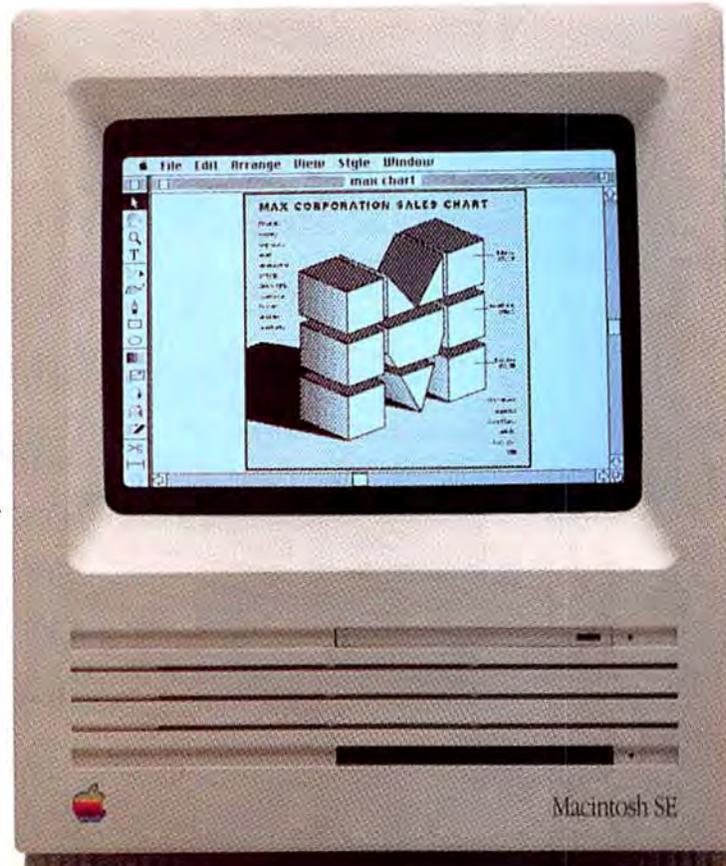
Third, the future machines must be user programmable. It's refreshing to hear Gassée say that HyperCard has allowed Apple inadvertently to begin along this path.

(continues)

Introducing

*Can you move a mouse?
Then you can draw with our
freehand tool.*

*You don't even have to draw
if you don't want to. Our
auto trace tool does it for you.*



*Blend one shade into another.
It just takes a few clicks.*

*Transform any text or
graphic by turning, twisting,
shearing, or scaling it till
it suits you.*

*If you want to change
something or get a duplicate
original, you don't have to go
back to the drawing board.*

What could be easier?

Maybe if you could push a button labeled "Sales Chart" and get a sales chart, that would be easier.

But it wouldn't be reality. This is.

Presenting Adobe Illustrator 88™ software.

A program so powerful, it makes making art effortless.

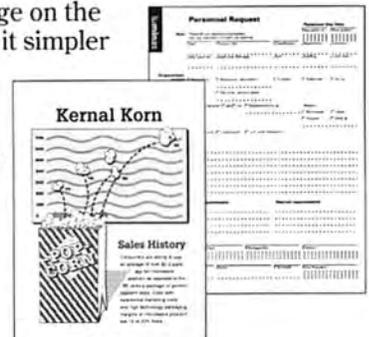
Begin anywhere you like. Like to start from scratch?



Just move the mouse to create an image on the screen. Our new freehand tool makes it simpler than ever.

Rather start with a rough sketch or existing line art? No problem.

Adobe Illustrator 88 software lets you scan all sorts of existing images so they appear directly on your computer screen. Then, our new auto trace tool takes over. Just click on or near a portion of the scanned image, and bingo, instant line art.

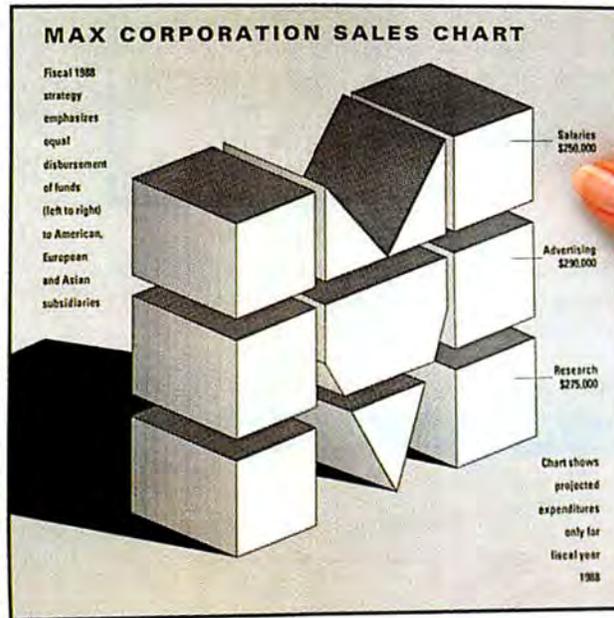


Automatic Art.

Creating exciting business graphics is an art. But now, you don't have to be an artist.

With a Macintosh® Plus, SE, or II, and any PostScript® printer you can get high quality Adobe Illustrator 88 art, automatically.

Adobe Illustrator 88 software can produce black and white, color, or color separated film. Just tell it what you want.

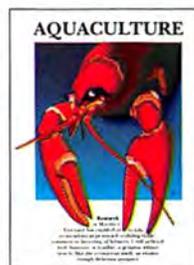


About that fast, too. Or let's say you've been working with less versatile programs like MacPaint® and MacDraw®, and you'd still like to use the art you created.

The Adobe Illustrator 88 program can convert those files for you. Click. That easy.

But let's say you want to do more. A lot more.

Like airbrushing effects



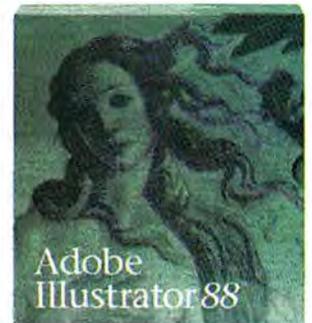
and shading and masking and blending and color separations and printing. But you don't know a thing about them.

That's okay. Now you don't have to.

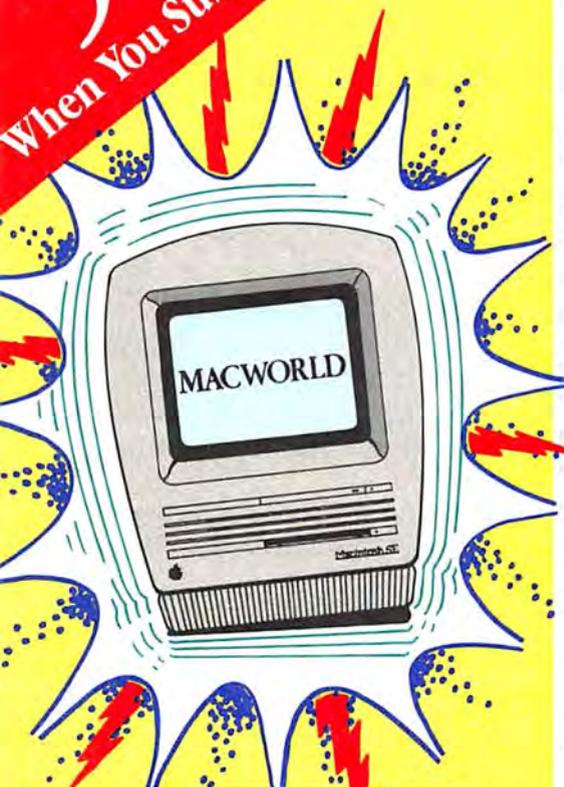
All you have to know is where to buy Adobe Illustrator 88 software. And that's easy, too. Just call us at (800) 29-ADOBE. Or (415) 962-2100 in Alaska and Canada.

No other illustration, paint, or drawing program lets you do so much so easily. You'll take to it automatically.

ADOBETM
SYSTEMS INCORPORATED



SAVE ALMOST 50% Off the Cover Price When You Subscribe Today



UNLEASH The Potential Of Your MAC!

**Discover The Power
Of Macworld At A
Special Savings Rate.**

Applications. Communications. Power upgrades. Tutorials. Buying guides. Answers to your questions. Straight-shooting reviews. Graphics and more. All from a user's point-of-view!

More Power! 12 Issues for ~~\$47.40~~

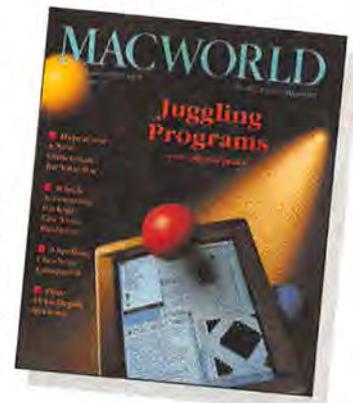
NOW ONLY \$24.00

- Send me 1 year/12 monthly issues of MACWORLD for \$24. Save 20% off the basic subscription rate.
- Save Even More!** 2 years/24 monthly issues for \$37.90.

Please Bill me later.

Name _____
 Company _____
 Address _____
 City State Zip _____

By regular subscription, Macworld is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



4BWJ4

MACWORLD

More Information! 12 Issues for ~~\$47.40~~

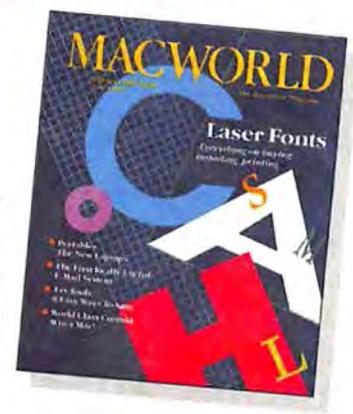
NOW ONLY \$24.00

- Send me 1 year/12 monthly issues of MACWORLD for \$24. Save 20% off the basic subscription rate.
- Save Even More!** 2 years/24 monthly issues for \$37.90.

Please Bill me later.

Name _____
 Company _____
 Address _____
 City State Zip _____

By regular subscription, Macworld is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



4BWJ4

MACWORLD

More to Give! 12 Issues for ~~\$47.40~~

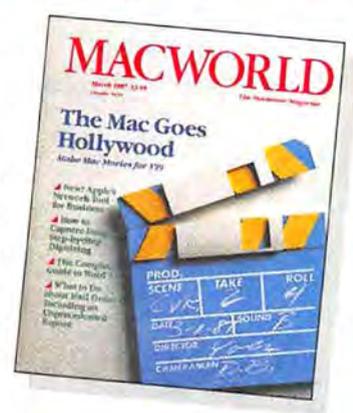
NOW ONLY \$24.00

A one-year subscription (12 issues for just \$24) will be sent to the person listed below. Save 20% off the regular subscription rate of \$30 and nearly 50% off the annual newsstand price of \$47.40.

Please Bill me later.

Send Gift to: Name _____
 Address _____
 City/State/Zip _____
 Send Gift from: Name _____
 Address _____
 City/State/Zip _____

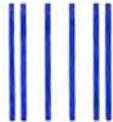
Please allow 6-8 weeks for delivery of your first issue. Offer good in the U.S. only.



2ADV1

MACWORLD

Save Almost
\$24.00
Off the cover price.



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



Save Almost
\$24.00
Off the cover price.



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

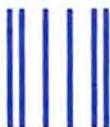
POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666



Save Almost
\$24.00
Off the cover price.



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

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

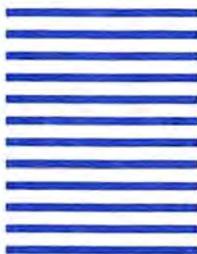
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



Save
Nearly
When
You Subscribe Today!

50%

MACWORLD

The magazine that helps you
get the most from your Mac

Macworld is your key to it all. Productivity. Creativity. Whether you want to upgrade software, hardware... or learn to use what you have to its fullest potential.

That's what Macworld does—links the Mac's potential to yours.

We look out for your interests. We tell you what's new for the Mac. What it does. Who it's for. Compare similar products—and name names! Discuss pros and cons. Assess value for money for both hardware and software.

We help clarify your options. Is the upgrade worth it? What does this program do that your present software doesn't? Will it work with your printer? If we help you make just one right decision, your subscription is worth it!

Macworld is more product-driven, more YOU-oriented than ever before. The thing to do now is make the most of your Mac. Macworld is the key.

- Applications
- Power Upgrades
- Buying Guides
- Straight-Shooting Reviews



Mail The
Attached Card
Today!

MacCalc

Speed, Style, Simplicity



Speed

MacCalc is the fastest spreadsheet you can buy, and More Speed gives you Greater Productivity.

"Amazingly speedy...[MacCalc] runs faster than Excel." — *InfoWorld*, November 3, 1986
 "Special routines in MacCalc make operations such as entering data and recalculating, opening files, scrolling...faster than Excel." — *Macworld*, December, 1986



Ease

MacCalc is easier to use and learn than any other spreadsheet, and Greater Ease means Less Frustration... "Simplicity is the ultimate sophistication."

"[Working] in MacCalc is easier than in Excel." — *Macworld*, December, 1986
 "Designed to be easy to use, and succeeds admirably." — *MACazine*, March, 1987
 "MacCalc answers the frustration of Excel users — its carefully planned menu structure makes MacCalc exceptionally easy to use." — *MacWEEK*, June 15, 1987
 "Simplicity and ease of use are MacCalc's greatest assets...[seen in] the richness and ease of use embodied in its user interface." — *MACazine*, November, 1987



Looks

MacCalc is the only spreadsheet which allows each cell to have its own format, font, size, and style — allowing high-impact, desktop publishing quality output, and Greater Clarity creates Dramatic Presentations.

"MacCalc offers [the most] flexibility in page and font setup, and has the most printing options." — *Macworld*, December, 1986
 "MacCalc lets you dress up your spreadsheet..." — *Publish!*, June, 1987
 "MacCalc's formatting features allow your spreadsheet to look more like pages from a finished report...brings the concept of publication-quality spreadsheets closer to reality." — *InfoWorld*, June 22, 1987



Value

At \$139, MacCalc provides the greatest value at about 1/3 the price of Excel.

"The clear value leader." — *InfoWorld*, November 3, 1986
 "MacCalc is a spreadsheet package of exceptional value." — *MacWEEK*, June 15, 1987
 "The best deal in a spreadsheet package that I've ever come across, bar none." — *MACazine*, November, 1987

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1987 Tot
East	\$12	\$13	\$17	\$15	\$57
North West	\$20	\$22	\$27	\$26	\$95
South West	\$19	\$22	\$22	\$23	\$86
Central	\$10	\$10	\$9	\$10	\$37
Totals	\$59	\$67	\$75	\$72	\$273

Note: 4th Quarter results are estimated.

The Best Spreadsheet — MacUser Editor's Choice Award

"It's faster than either Multiplan or Excel, and once you move [to MacCalc], you're not going to want to move back"

— *Macintosh Buyer's Guide*, Summer, 1987

"...MacCalc is a must-have. The product itself is highly functional, easy to learn and to use, and definitely supports the most visually appealing formatting/printing capabilities." — *MACazine*, November, 1987

"If you are interested in attractive output and value, MacCalc is the spreadsheet for you." — *InfoWorld*, June 22, 1987



Some of MacCalc's special features:

- Minimal recalculation™ technology for great speed
- Natural, powerful editing commands combined with easy to use interface
- Full choice of format, font, size and style in each cell for DTP quality output
- Variable row height and column width
- Cell notes, for audit trails and self-documenting worksheets
- On-Line Help
- Full Undo command
- Reads and writes WKS models (from Lotus 1-2-3 or Excel) and SYLK data
- Paste formatted tables from MacCalc directly into MacWrite or PageMaker documents
- Database sort, search, and fill commands
- Full desk accessory (DA) support and Switcher-compatibility

THE BOTTOM LINE: You can buy the slower, more difficult, overpriced, over-featured product from the competition, or you can buy MacCalc, the best spreadsheet for your real needs, for \$139.

BRAVO

Bravo Technologies, Inc.

For technical, corporate, or dealer information, please call 415/841-8552. MacCalc is available at better dealers everywhere. To order MacCalc directly for \$139 (plus tax in CA), please call our order desk at 800/345-2888 (orders only, please), and have your VISA or MasterCard ready, or write: (Purchase orders will be processed.) Bravo Technologies, Inc., c/o DPAS P.O. Box 1, Gilroy, CA 95021-2249. MacCalc is a registered trademark and minimal recalculation™ is a trademark of Bravo Technologies, Inc. Other product names mentioned above may be trademarks of their respective manufacturers.

Circle 183 on reader service card

We created WordPerfect no time flat. Relatively.



We don't mind telling you that we're breathing a collective sigh of relief. After slaving away, we've done it. We've de-

signed and manufactured a powerful word processor that's truly worthy of the Macintosh.

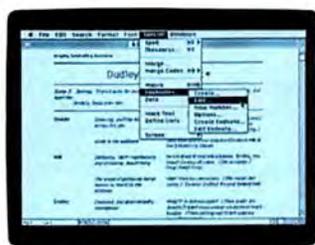
WordPerfect® for the

and easy to use; WordPerfect's unique hierarchical menus present commands in a logical, accessible manner.

Macintosh is designed to take advantage of the Mac's outstanding graphics capabilities. And its mouse interface is elegant

And WordPerfect for the Macintosh comes from a company dedicated to word processing. With proven features that have helped to make WordPerfect the best-selling word processing software in the world.

Those features include



(Left) WordPerfect offers parallel or newspaper-style column options. (Right) The interface is specially designed to be a familiar visual experience for Mac users.

for the Macintosh in



quickly scan and select files by employing "Word Search."

And, of course, WordPerfect for the Macintosh offers macro options as only WordPerfect can—helping to make repetitive tasks a thing of the past. Everything from memo forms to newsletter formats to complex procedures can be stored via macros with no limit as to number or size.

WordPerfect for the Mac also helps you compile professionally organized tables of contents, indexes, and outlines. It makes footnoting simple. And, using Print Preview, it lets you view your document in miniature so you can check its appearance before printing. Add to all of this a fully integrated, 115,000 word dictionary and a large, rapid-access thesaurus, and you've got the perfect tool for all of your word processing needs.



Inserting graphics into your work is as easy as retrieving a file. And fonts and pictures are displayed on screen.

WordPerfect for the Macintosh is designed for the individual, or for use in a shared environment. It's compatible with files derived from WordPerfect 4.2 for the PC, Microsoft

Word 3.01 and MacWrite.

Now you know what's gone into our word processor for the Mac. And maybe now you'll forgive us for the short delay. Well, relatively short.

For more information, call or write WordPerfect Corporation, 1555 North Technology Way, Orem, Utah 84057 (801)225-5000.

(In Canada, call 1-800-267-2499.)



WordPerfect for the Macintosh offers extensive, fully integrated dictionary and thesaurus.

parallel and newspaper-style (snaking) column options displayed on screen; automatic formatting and pagination; and a file manager that lets you copy, delete, rename, or print a file right from one WordPerfect dialogue—or



WordPerfect for the Macintosh

Circle 126 on reader service card

FoxBASE+ / Mac: The Fastest, Most Powerful Macintosh Database System

The One Mac Database System That Has It All.

We've combined the blazing speed and programming power of our award-winning DOS products with the things you love about your Mac: the elegant interface, perfectly integrated graphics, and peerless ease of use.

Speed To Burn.

FoxBASE+ / Mac gives you the power and performance you expect from Fox. In fact, FoxBASE+ / Mac is by far the fastest database system available for the Mac—up to 200 times faster!

Vast Program Library.

FoxBASE+ / Mac is completely compatible with the industry standard dBASE language—so hundreds of thousands of dBASE programs will run perfectly on your Mac—without changing a single line of code!

View Window.

The View Window is the master control panel for FoxBASE+ / Mac's graphical, non-programming interface. Use it to open and close files, set up indexes, establish relations, access BROWSE, and even to modify database structures!

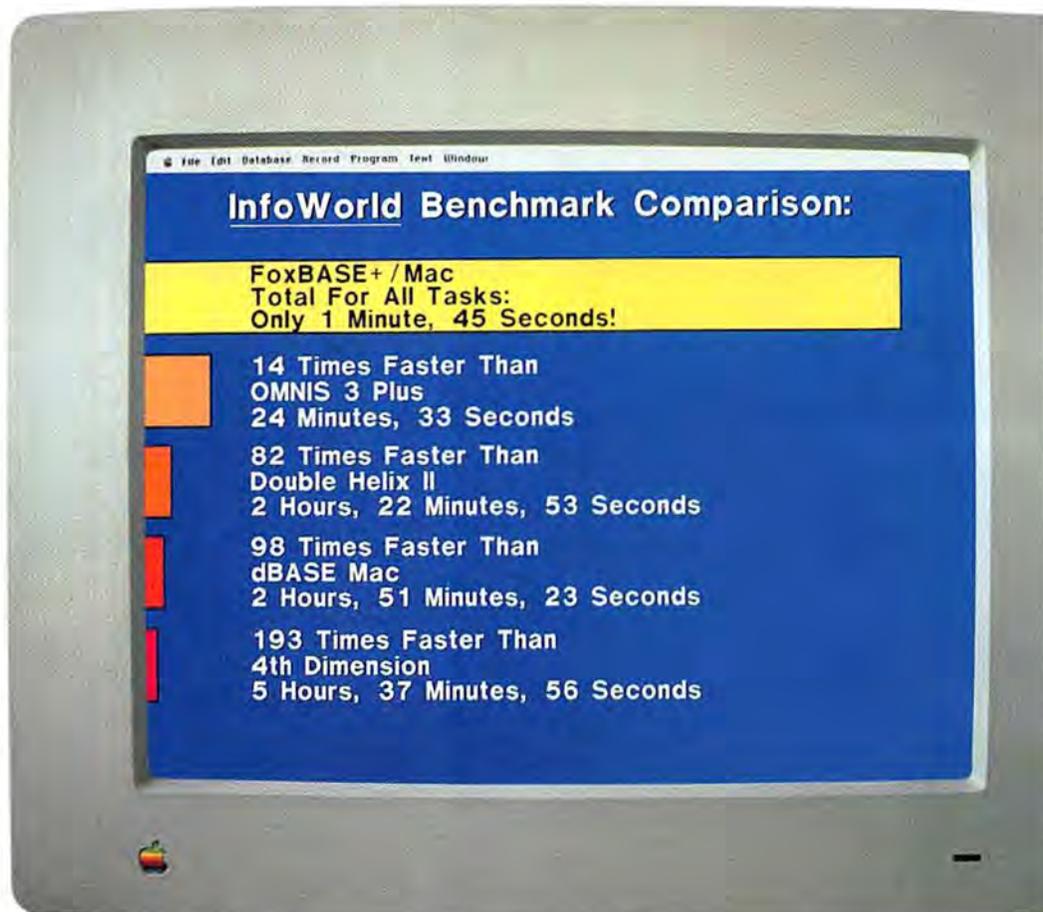
BROWSE.

FoxBASE+ / Mac's BROWSE feature brings new convenience and power to database display and editing! You're in complete control—BROWSE lets you dynamically adjust the size and order of fields displayed, add or delete records, and split the window to show different database sections side-by-side. Together, BROWSE and View Windows eliminate the need to write programs for common database operations!

Integrated Graphics.

Copy and paste graphs, charts, diagrams and even pictures into your database—instantly! FoxBASE+ / Mac gives you the power to display these graphics, or merge them into reports and documents!

FoxBASE and FoxBASE+ are trademarks of Fox Software. dBASE and dBASE III PLUS are trademarks of Ashton-Tate. Macintosh is a trademark of McIntosh Laboratory, Inc., licensed to Apple Computer, Inc.



FoxBASE+ / Mac blows away the competition in InfoWorld's speed benchmark tests!

Command Window.

FoxBASE+ / Mac's Command Window gives both experienced developers and novice users ultra-convenient access to the dBASE command language—just type a command into the Command Window, and it's executed!

Join The FoxBASE+ / Mac Pack!

At just \$395, FoxBASE+ / Mac is a bargain. You can't afford to be without it! Call (419) 874-0162 Ext. 650 for more information about FoxBASE+ / Mac. Or visit your local software retailer.



"Editor's Choice"—1987 & 1988!

FoxBASE+ / Mac is part of the award-winning family of products from Fox Software. For two years in a row, FoxBASE+ has been given the prestigious Editor's Choice award by PC Magazine, and scored an impressive 9.2 out of a possible 10 when tested by InfoWorld's Review Board!

Fox Software

Nothing Runs Like a Fox.

Fox Software, Inc. (419) 874-0162 Ext. 650
118 W. South Boundary FAX: (419) 874-8678
Perrysburg, OH 43551 Telex: 6503040827

Circle 152 on reader service card



Whose Music Is It, Anyway?

New Mac software makes virtuosos out of the fumble-fingered—so why learn the hard way?

My first guitar was a gnarly hunk of wood and string purchased for \$19.95 from the Sam Goody's retail chain. Oh, did it sound awful. But at 15 years old, I was convinced that it could make me sound like Bob Dylan, and maybe impress some females, so I hammered away at it until I made some sounds that were, well, adequate. I forced the fingers of my left hand to press down hard on the strings, which felt as rough as bridge cables, until the fingertips bled, blistered, and finally developed soothing calluses. My right hand had an even harder task—it had to learn to move in a totally unnatural manner. *Down* up down up, *down* up down up . . . done slowly and still botched, then done slowly and not botched, until miraculously, as if my hand had secretly been practicing on its own, the strum was mastered.

I had learned to play guitar. I worked hard at it for ten more years, and when things were very very good, my being bled into the music itself, and maybe I impressed a few females.

So imagine my chagrin when I booted a \$50 program named Jam Session on my Macintosh. Brøderbund Software's promises on the packaging implied that all my hard work and practice on the guitar had been squandered. *Make great-sounding music instantly . . . exercise your creativity without ever making a mistake . . . nothing to do except sit back and amaze yourself . . . If you don't know anything about music—who cares?*

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



MAX SEABAUGH

Could it be true? Could randomly hitting keys on my Mac Plus actually provide better guitar accompaniment than a Martin D-28 and my years of labor?

Yes, damn it. From the 19 possibilities, I chose a song called "Berry Jam," billed as "Classic rock 'n' roll from the '50s," and on my screen came an illustration of a rock group. Then the music started, a standard chord progression with bass, drums, and rhythm guitar. Even through my Mac speaker, they sounded like real instruments; they sounded more real when I patched the computer into my stereo system. All that was missing was the lead gui-

tarist . . . me. Each letter on my keyboard corresponded to a guitar riff or note, all of them appropriate to a Chuck Berry-style rave-up. Most amazingly, the riffs would automatically accommodate themselves to where the song was at any given moment. No matter what I played, it sounded right.

I had to admit it—if I had plugged in a vintage Fender Telecaster and amplifier and attempted to play lead the old-fashioned way, any discerning rock fan would have chosen the prepackaged version.

(continues)

Backup very carefully.



*Directape is priced at an extremely affordable \$1099.
Available at \$899 when purchased with any Jasper hard drive.*

If you don't back up data, you can throw your entire office into reverse.

That's the most eloquent argument for backing everything up very carefully. And for using the Jasmine DirectTape™ to do so.

DirectTape is different from most Mac back up systems. The reason? It's fully Apple compatible.

So we work with the data on any Apple-originated tape, regardless of the software that put the data there. We also have full support for the major applications that will soon be packaged on software cartridges. Which means besides data transfer, DirectTape also expertly handles software distribution.

We work faster, too. By the time it takes others to back up your data, we'll have already backed it up *and* automatically double-checked it. All while you're still using your Mac. Because with MultiFinder,™ DirectTape can work in the background.

DirectTape even prompts you to insert your second Jasmine preformatted cartridge when your first one is full. And with extra tape cartridges, you have unlimited back up capacity.

That's why the lightweight, portable DirectTape is perfectly geared for workgroups and departments. Attaching to Macs in seconds, without extra cabling.

Finally, we back you up in yet another way. Our no-nonsense full two year warranty!

So before you move forward from this ad, remember how important it is to back up. Call us toll free to charge a DirectTape today.

Because given the value of your data, you can't be too careful.



Jasmine

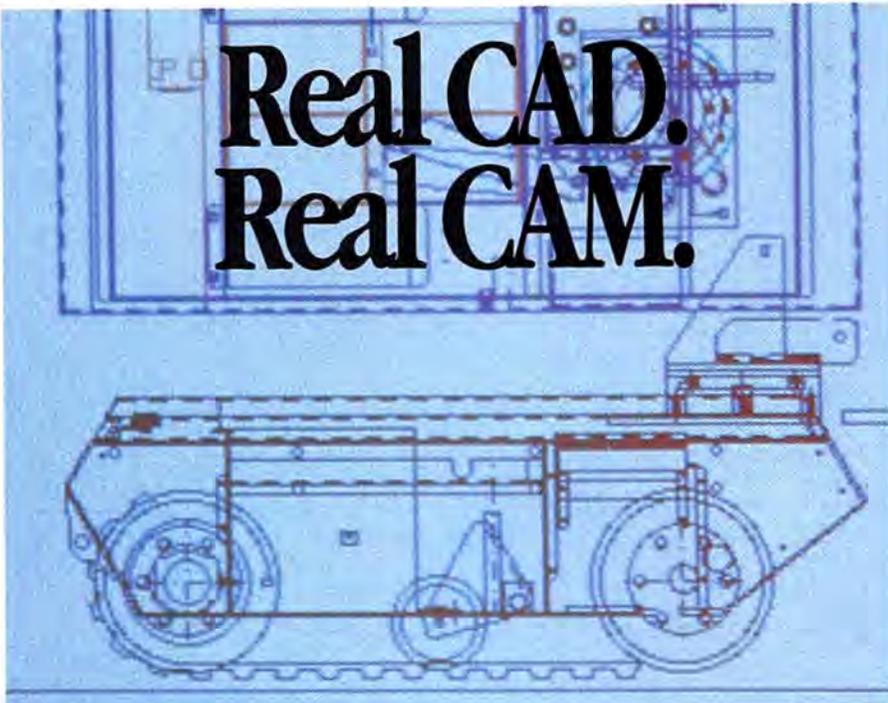
1-800-347-3228

See us at Booth #5458. World Trade Center - Macworld Expo, Boston

DirectTape is a trademark of Jasmine Technologies, Inc. Apple and Macintosh are registered trademarks and MultiFinder is a trademark licensed to Apple Computer, Inc.
© 1988 Jasmine Technologies, Inc.

Circle 102 on reader service card

Real CAD. Real CAM.



A lot of programs claim to be 'CAD.' But they're really just drawing programs. If you want to design something to be built, you need real CAD.

MGMStation™ is real CAD. It's part of a fast, sophisticated, cost-effective CAD/CAM package developed for engineers and designers. It offers capabilities equal to mainframe CAD packages, with floating point precision up to 16 decimal places. Unlimited zoom. Color or black-and-white output. Auto dimensioning. Multiple layers, multiple windows. Hatching and filling of arbitrary shapes. Sophisticated functions like filleting and chamfering. Display precision beyond that of QuickDraw™ (note the smooth curves). And built-in plotter drivers. Options include symbol libraries and an IGES conversion utility.



MacUser
Eddy Award
Winner
1988

If you're designing mechanical parts, you may be interested in our CAM package, too. It handles milling, turning, sheet metal cutting and wire EDM.

See your dealer for your HyperCAD™ demo stack or write us on your letterhead for a free disk.

If you are serious about creating producible designs on your Macintosh, you can't afford to waste your time on anything less.

MGMStation. Real CAD.

MGMStation

from Micro CAD/CAM Systems, Inc.

5900 Sepulveda Blvd., Van Nuys, CA 91411 (818) 376-0008 AppleLink D0572 Telex: (650) 310-7078 MCI-UW

Macintosh is a Registered Trademark and QuickDraw is a Trademark of Apple Computer, Inc.

Circle 209 on reader service card

Portrait of the Great American Investor



Lisa Kramer looks after patients with names like Smokey and Snowball. But she looks after herself, too. Lisa invests in U.S. Savings Bonds.

Bonds pay competitive rates, like money market accounts.

Find out more, call 1-800-US-BONDS.



Bonds held less than five years earn a lower rate.

A public service of this publication.

Steven Levy

At that point, the delight of my new computer toy overwhelmed the feeling that the hours spent honing my technique had been in vain. I tried the different songs, some of them giving me the power of a jazz pianist, a country banjo-picker, or a techno-hip synth player. With each song I got more excited—I just could not believe the music I was making.

It was only later that I dared asked myself a daunting question: Was I really making music? Or was this some sort of stunt, a cheap trick? If this was *really* music, then I think we have to make some major adjustments in our view of what musicianship consists of.

To probe this conundrum I took a look not only at the origins of Jam Session, but also at those of a couple of other programs that provide high-level music output for people with low musical skills, and found that the issues behind these programs were almost as fascinating as the sounds they produce.

Bogus Music

Ed Bogas has had a checkered career in the music business, ranging from the composition of the soundtrack for television animation featuring the beloved but not very funny Garfield character, to an appearance as a clucking chicken in commercials for the California Egg Board. Now he's focusing on computer software, particularly for the Mac. It was Bogas who headed the team that created the popular Studio Session program, which uses the metaphor of a multitrack tape recorder to allow users to create songs in layers, adding one instrument track to another. (By doing this, Bogas was offering a low-end version of professional sequencer programs, which use the Musical Instrument Digital Interface, or *MIDI*, standard to manage studio-quality recordings.) But to get the most out of Studio Session, one had to know something about musical notation and composition. Bogas wanted to bring things down to the level of musical moronhood.

"A team of us were working on a toy project," he recalls, "where you could push a button and have elaborate sound come out. Then one day I was sitting at the piano keyboard and thinking about the way a jazz musician operates. He has a bank of

(continues)

It's Lightning fast
 It's 45 megabytes
 It's removable



Simply eject the DATA PAK™ cartridge and take a 45 megabyte Winchester hard drive home tonight! Trustworthy and reliable, with an average access time of only 25ms it's even faster than most fixed hard drives. Imagine sending or carrying 45Mb of CAD/CAE drawings, color graphics or presentations with the ease and safety of a diskette.

partitioning are all standard. And with its unique 8Kb buffer it adapts itself to any Macintosh, while keeping its 1:1 interleave performance.

Available in three configurations. DATA PAK is a single cartridge drive system; DATA PAK_{duet}™ is a dual cartridge drive system; and DATA PAK_{hd}™ is a single cartridge drive coupled with either a 40, 80 or 120Mb fixed hard drive. With DATA PAK you now have POWER2 EXPAND!® 45mb at a time.



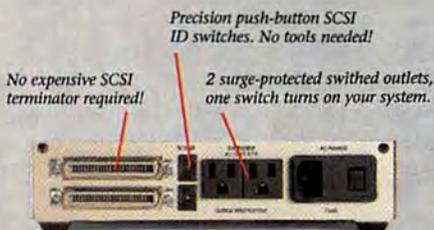
DATA PAK

Use DATA PAK's new transportable technology as your principle storage system and gain all the advantages of ultimate security (lock it in the file cabinet), easy organization of related projects, unlimited storage capacity and fast data back-up.



DATA PAK_{hd}

All the convenience of a floppy, all the performance of a hard drive. Buy a DATA PAK now at your favorite Apple dealer!



Precision push-button SCSI ID switches. No tools needed!

No expensive SCSI terminator required!

2 surge-protected switched outlets, one switch turns on your system.

The revolutionary DATA PAK also delivers the features you would demand in a more traditional hard drive system; self diagnostics, automatic park and lock heads, password protection, and volume



DATA PAK_{duet}

 **MASSMICRO**®
 s y s t e m s

550 Del Rey Ave ♦ Sunnyvale ♦ California ♦ 94086 ♦ 408-522-1200 ♦ 800-522-7979

DATA PAK, DATA PAK_{duet}, DATA PAK_{hd}, POWER2 EXPAND! and MASSMICRO Systems are trademarks of MASSMICRO Systems, Inc.

Circle 207 on reader service card

EXCLUSIVE!



PAD♦LOK
Password and
Partitioning
Software!

FullWrite Professional Everything else is just

Until now, most word processing programs limited your creativity and vision. And ultimately your communication.

But now there's FullWrite Professional from Ashton-Tate. A new powerful word processing environment that helps you express your thoughts in ways you could only imagine before. Because with FullWrite™ you can do more than word processing.

FullWrite is the next generation of word processing that you've been waiting for. With advanced page layout features, graphics and powerful word processing capabilities in one easy to use writing environment. There's no hassle. You don't have to switch between several programs to create more than a simple letter. Even if you're designing the letterhead at the same time.

For instance, FullWrite wraps text automatically around any imported graphic, regardless of the shape, with one simple command. Then adjusts the wrapping until it's exactly the way you want it.

And instead of using a separate layout program, FullWrite gives you control over multiple column sizes on the same page. Or even multiple documents on the same page. So you decide the exact look you want. Exactly.

ON THE FLY

6308 Troutmask Lane, Stillwater, Montana
A Memo On The Lures Of Trade



We at *On the Fly* lures want to ensure that the wily, sought-after creatures of the watery world are as captivated with our fishing customers as our customers are with our fine lines of natural, organic hand-tied flies. The line of lures we offer this year will, indeed, reel in customers as never before.

Tackle your fancy.

For the young novice angler looking to launch the hobby with tamer game, *On the Fly* will offer a range of smaller, lighter, less intricate lures, such as the Peanut Piper, the Pumpkin Puff,



the Weedy Wiggle and the Puddle Jumper. These lures are designed for easy handling, both on and off the hook. For the reel man who chums for larger catch, the new additions to our 1989 product line include the Chimner Swizzler, the FinchDog Fighter, the Man-Boy Behemoth and the Brassy Bottom Bonanza. These additions for 1989, plus the full line of tried-and-true *On the Fly* lures are on the following pages.

Lure, line & sinker.

Our *On the Fly* authorized dealers have long been aware of both our in-store and customer support services. This season is no different. In fact, in addition to our advertising budget, we have plans to expand our in-store displays and re-package the lures for easier inventory and handling.

PROJECTED SALES FOR 1989*		
	CHIMNER	BONANZA
100K	NO	YES
50K	YES	YES
25K	YES	YES
10K	YES	YES
5K	YES	YES

Hold the anchovies.

For our customers, we plan to initiate a toll-free 800 number to widely distribute information such as matching lure to fish, bait tips and techniques, hot spots for fishing and spawning cycles. With this service, the fishing line of our market will always be busy.

* SALES FIGURES FOR 1989 ARE JUST A WILD GUESS

This document created with Microsoft™ WORD 3.02.

Professional. Best Word processing.

ON THE FLY

6308 TROUTMASK LANE, STILLWATER, MONTANA

A Marketing Memo On The Lures Of Trade

 We at *On the Fly* lures want to ensure that the wily, sought-after creatures of the watery world are as captivated with our fishing customers as our customers are with our fine lines of natural, organic hand-tied flies. The line of lures we offer this year will, indeed, reel in customers as never before.

Tackle your fancy.

For the young novice angler looking to launch the hobby with tamer game, *On the Fly* will offer a range of smaller, lighter, less intricate lures, such as the Peanut Piper, the Pumpkin Puff, the Weedy Wiggle and the Puddle Jumper. These lures are designed for easy handling, both on and off the hook.

 For the reel man who chums for larger catch, the new additions to our 1989 product line include the Chimmer Swizzler, the FinchDog Fighter, the Man-Boy Behemoth and the Brassy Bottom Bonanza. These additions for 1989, plus the full line of tried-and-true *On the Fly* lures are on the following pages.



Lure, line & sinker.

Our *On the Fly* authorized dealers have long been aware of both our in-store and customer support services. This season is no different. In fact, in addition to our advertising budget, we have plans to expand our in-store displays and re-package the lures for easier inventory and handling.

Hold the anchovies.

For our customers, we plan to initiate a toll-free 800 number to widely distribute information such as matching lure to fish, bait tips and techniques, hot spots for fishing and spawning cycles. With this service, the fishing line of our market will always be busy.

PROJECTED SALES FOR 1989*

	CHIMMER	BONANZA
100K		
50K		
25K		
10K		
5K		

*Sales figures for 1989 are just a wild guess

This document created with FullWrite Professional.

Because all parameters are controlled in picas, points, centimeters, pixels, or inches. Right down to 1/10,000 of an inch. And that's important whether you're controlling a typesetter* or a LaserWriter.

To make it even easier to keep your eyes on the screen, your hands on the keyboard and your mind on your work, FullWrite has the most complete dictionary, thesaurus and outlining system for the Macintosh. Not to mention every other feature you expect in the next generation of word processing software for the Macintosh.

See The Next Generation of Word Processing.

For our one-on-one demonstration of what FullWrite Professional can do, visit your Ashton-Tate dealer. Or call 800-437-4329 Ext. 3401* for more information.

Because without FullWrite, you're only as good as your word.



 ASHTON-TATE®

*In Colorado, call 303-799-4900, Ext. 3401. *PostScript, Ashton-Tate and the Ashton-Tate logo are registered trademarks of Ashton-Tate Corporation. FullWrite and FullWrite Professional are trademarks of the Ashton-Tate Corporation. Microsoft is a registered trademark of Microsoft Corporation. PostScript is a trademark of Adobe Systems, Inc.

Circle 73 on reader service card



Save Hundreds of Dollars When You Re-Ink Costly Printer Ribbons

Now you can re-ink fabric ribbons again and again—for just pennies each time! So, don't throw away expensive ribbons—re-ink them and save, save, save. Bede Tech Ribbon Inker comes with FREE 4-oz. bottle of black ink (lasts 50-100 re-inkings), FREE ink roller and FREE roller cover.

NEW CUSTOM RIBBON INKER \$64⁹⁵

Factory Set For Your Ribbon—Call with Printer Manufacturer and Model
EPSON PRINTER RIBBON INKER \$52.95
IMAGEWRITER PRINTER INKER \$49.00

INK & RIBBONS

Black Ink, 4 oz. bottle \$ 4.50
 Black Ink, Pint 16.50
 ImageWriter ribbons, uninked 2/10.00
 ImageWriter ribbons, inked 2/12.00
 Colored Ink, Multi-Color Ribbons CALL



HI-CAPACITY, LOW-COST DISK ORGANIZERS

Sturdy, stackable 200 lb. test corrugated cdb. dividers, 11d. Specify High-Gloss White or Satiny Wood-Grain finish.

5 1/4" FLOPPY DISK ORGANIZER
 Holds 100 disks \$5.45 4/\$19.95
3.5" DISK ORGANIZER
 Holds 100 disks \$7.45 4/\$24.95
3.5" DESK TOP DISK ORGANIZER
 Holds 50 disks \$4.45 4/\$14.95
COMPACT DISK ORGANIZER
 Holds 50 C.D.s \$3.95 4/\$13.95

MacWorld Expo Booth #5056
SEE US AT THE WORLD TRADE CENTER

FREE Illustrated Catalog With Many More Items
 • 24 Hour Shipment • 30 Day Money-Back Guarantee
 • We Don't Bill You Until We Ship To You



bede tech

CALL 24 HOURS TO ORDER

800-772-4536

IN OHIO 216-631-4214 • FAX 216-631-1452

Division, Bede Industries, Inc. • Established 1976 • 8327 Clinton Rd. • Cleveland, OH 44144
 ImageWriter is a trademark of Apple Computers, Inc. 8WM



PRINTER SILENCER \$29⁹⁵!

Reduce irritating printer noise up to 90%! Attractive wood grain finish, 200 lb. test corrugated cdb. Ideal for light and medium use of printers up to 17.5" x 13.5" x 5".

NEW ACCESSORIES

Keyboard Drawer \$32.95
 Printer/Monitor Stand \$12.95
 PC/Mac II CPU Vertical Stand \$19.95
 Mac II Monitor & CPU
 Ext. Cables \$32.95
 Mac II Keyboard Ext. Cable \$25.95
 PC Monitor/Keyboard Ext. Cables \$32.95
 3 1/2" Disk Holder w/Velcro Mounting \$ 6.95
 5 1/4" Disk Holder w/Velcro Mounting \$ 7.95
 Mac, Mac Plus, Mac SE System Stand \$19.95
 Apple/Mac Security Cable Kit \$32.95
 Hard Keyboard Covers.
 Specify: Mac, Mac Plus, Mac SE Mac II, Apple IIGs \$ 9.95
 Mac SE or Mac II Extended \$12.95

NEW EZ GLIDER™ PAD FOR YOUR TEFLON MOUSE

Designed specifically for the new Mac II and SE Teflon padded mouse. Will also put new life into your old mouse. Specify platinum, maroon or royal blue.

EZ GLIDER MOUSE PAD \$11.95
STANDARD MOUSE PAD (royal blue) \$5.95

licks in his mind and, depending on the way he feels and the way the music is playing, he chooses one." It could be a fast one, a slow one, or a single note—it could be anything that fits the composition. A lifetime of experience is behind the choice, as well as a storehouse of dexterity required to play the riff once it's chosen. But Bogas intuited that all the hard parts could be bypassed.

"Why not give nonmusicians the 'chops' the musician has at his or her disposal," he asked, "and let the people make the aesthetic choices?" With a team that included Steve Capps, of the original Macintosh software group, Bogas created Jam Session, which does just that. He knew it worked when one day an observer who had been watching a demonstration began shaking his head and wondered aloud whether Oscar Peterson had just become obsolete.

That thought hadn't occurred to me. To the contrary, I'm not sure at all that when you're jammin' with Jam Session, you're actually making music. But Ed Bogas has no doubts.

"I say you are creating music when you use Jam Session," he says. He explains that you can, for instance, build a jazz solo much in the same way that Oscar Peterson does, choosing slow riffs, climbing octaves, chording. "You have a sense of control," Bogas says. "You can play with feeling. You can express emotion."

Bogas admits that he has not yet heard any solos created with Jam Session that have startled him by going beyond the program's apparent limitations. The John Coltrane of Jam Session has yet to emerge, and it is questionable if he ever will. On the other hand, Bogas contends that nonmusicians are grateful. "They all say, 'It's like suddenly being able to do the thing I've never been able to do before. I'm not all thumbs!'"

Is it possible that the program and ones like it will create a disincentive to traditional music training?

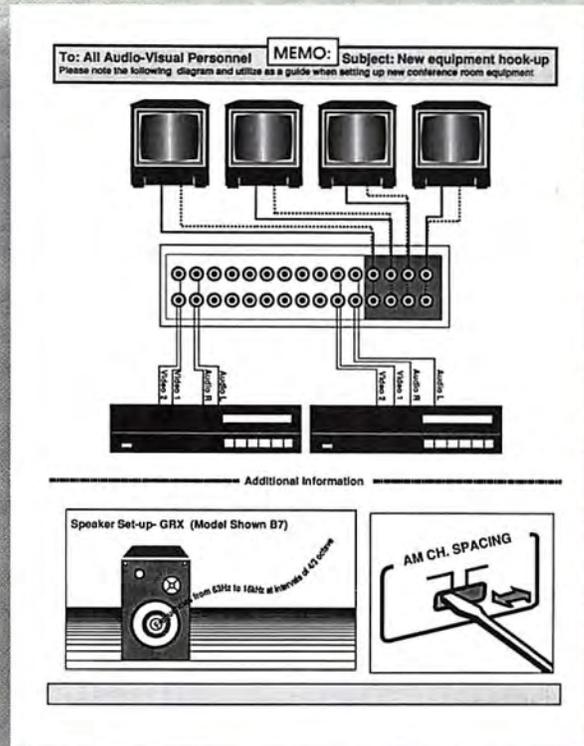
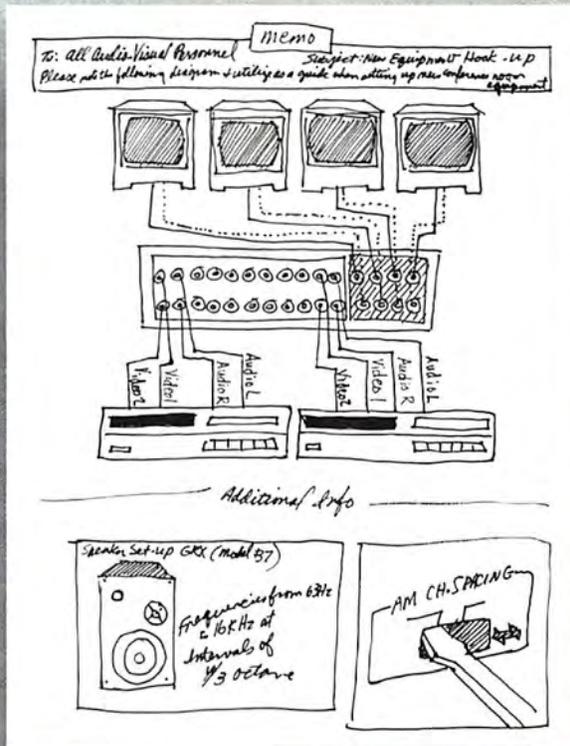
"I don't think so," says Bogas. "I know in music you cannot stop the desire to learn. Most musicians start very young. If they have the inclination, you cannot stop them."

The Mouse That Roared

If I was reluctant to accept that argument, I was more so after toying with another make-music-no-questions-asked program. This one is called Music Mouse,

(continues)

Why You Need Cricket Draw



Not For Professionals Only When you need to create good-looking professional quality graphics you don't have to struggle with a program designed for professional artists. Cricket Draw is the PostScript drawing program for everyone.

Make It Easy With Cricket Draw, professional effects like tints, shadows, and rotated text are easy. Clear, understandable menus combined with a powerful set of tools help simplify even the most ambitious drawing projects.

Do It In Color Work in color, even on a black and white Macintosh! And with Cricket Device Drivers you can produce dazzling color hard copy with a variety of popular non-PostScript devices.

From The First Family of Graphics Depend on the Cricket Software Family for all of your graphic needs—Cricket Presents, Cricket Draw, Cricket Paint, Cricket Graph, Cricket Pict-O-Graph, and Cricket Device Drivers.



40 Valley Stream Parkway
Great Valley Corporate Center
Malvern, PA 19355 • (215) 251-9890

Circle 15 on reader service card

Macintosh is a trademark of Apple Computer Inc. PostScript is a trademark of Adobe Systems, Inc.
© Copyright 1988 Cricket Software, Inc.

Connect Wang and Macintosh

VsCom/Macintosh—The industry standard Wang VS 2110 terminal emulation and file transfer software is now available for the Apple Macintosh.

VsCom/Macintosh provides true Wang VS 2110 terminal emulation including complete support of the Macintosh user interface standard.

Wang VS function keys are accessible through continuously displayed icons, the Macintosh extended keyboard, or regular keyboard aliases.

Two-way transfer of documents and files between the Wang VS and the Macintosh are easily accomplished with VsCom/Macintosh.

Document conversions include Microsoft Word, MacWrite, WriteNow, WordPerfect, and DCA.

An additional key feature is direct transfer of Macintosh documents and files in and out of Wang Office.

All the standard features of VsCom/IBM PC are included.



Make the Wang—Macintosh connection your way

M/H GROUP

222 West Adams Street • Chicago, Illinois 60606 • 312.443.1222

Circle 160 on reader service card

Steven Levy

available from OpCode Systems of Menlo Park, California. Though the compositions you create with Music Mouse sound less familiar than the instrumentals produced through Jam Session, it gives a rank amateur even more musical power.

Music Mouse is hard to describe. It is sort of a synthesizer with intelligence. (It is also best used in MIDI mode, with a synthesizer rather than the Mac's internal speaker providing the sound—I used a cheap Casio CZ-101 digital synthesizer.) Basically, the program lets you play music by sliding the Macintosh mouse around; you have considerable power to shape the music by setting some simple parameters. You can set patterns in motion, strike harmonies, and create all sorts of highly evocative phrases. What comes out often resembles film soundtracks, for movies that could be anything from moody romances to spine-chilling horror flicks. All in all, Music Mouse seems especially geared to create the sort of compositions that would be favored by an avant garde composer who lives in a big funky loft in downtown New York City.

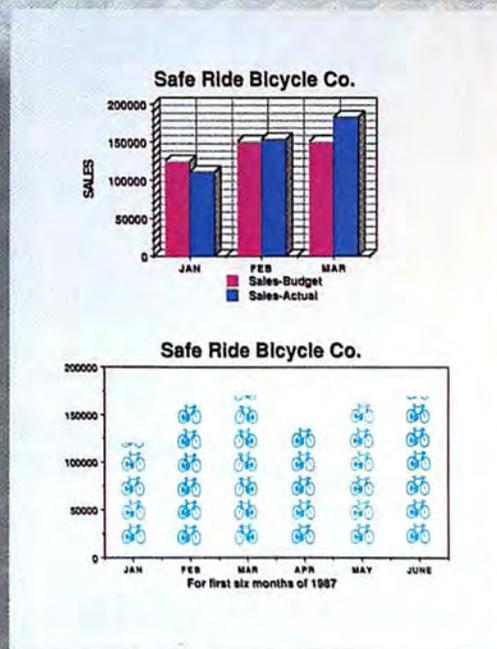
So it comes as no surprise that the creator of Music Mouse is Laurie Spiegel, an avant garde composer who lives in a downtown New York City loft. Spiegel has been composing with computers since 1973, when she worked at Bell Labs with the pioneers in the field. With Music Mouse she believes she has placed maximum power in the hands of minimally trained people, and she makes no apologies about it. In fact, she sees her program as a blow against "tyranny" in the music establishment, which she considers elitist and snobbish.

"First of all," she says, "sheer physical coordination has nothing to do with musicality." So much for those hours of training my fingers to make chords while the other hand picked at strings. "Second, the ability to deal with and manipulate symbolic notation is irrelevant to musical ability." This is rather comforting, since I don't read music. "All in all, we filter out 90 percent of the musicians [by those bogus criteria] and we're left with virtuosos who play piano like it's a sport—without soul."

(continues)

Why You Need

Cricket Graph & Cricket Pict-O-Graph



The Fast Track To Dazzling Graphs & Charts When you're knee-deep in raw data and want to create colorful graphs and charts *fast*, rely on the graphing program more Macintosh owners turn to than any other—Cricket Graph.

Powerful Yet Easy Enter or import your data into a spreadsheet-like window, select one of the dozen different graph types, and you're done. Cricket Graph does all the work. It's powerful, yet easy. No wonder Cricket Graph was the winner of both *MacUser's* and *MacWorld's* top awards for business graphics software.

Pict-O-Graph—Perfect For Publishing And Presenting Now you can create dazzling pictograms (picture graphs) with Cricket Graph's companion product—Cricket Pict-O-Graph. Easily produce pictograms using the built-in library of icons or create your own.

Do It In Color Work in color, even on a monochrome Macintosh, and with Cricket Device Drivers you can produce beautiful color hard copy with a variety of popular non-PostScript devices including ink jet, thermal, and laser printers.

From The First Family Of Graphics Depend on the Cricket Software Family for all of your graphic needs—Cricket Presents, Cricket Draw, Cricket Paint, Cricket Graph, Cricket Pict-O-Graph, and Cricket Device Drivers.



Circle 384 on reader service card

cricket
software

40 Valley Stream Parkway
Great Valley Corporate Center
Malvern, PA 19355 • (215) 251-9890

Macintosh is a trademark of Apple Computer Inc. PostScript is a trademark of Adobe Systems, Inc.
© Copyright 1988 Cricket Software, Inc.

Programs & Peripherals



Specials good through August 31, 1988

Stepping Out II by Berkeley System Design, Inc.



Stepping Out II is a program designed to expand the capabilities of any standard Macintosh display to give it the same feel and features as a full page display. Now you can choose the screen size which is most comfortable for you. Working with large spreadsheets and full page layouts becomes easy since you are no longer limited by small windows and slow scrolling. For detail work on small areas you can enlarge any portion of the big screen up to sixteen times. Handy features and ease of use makes *Stepping Out II* the ultimate viewing tool for any Mac.

Stepping Out II 54.

Desk Accessory Programs

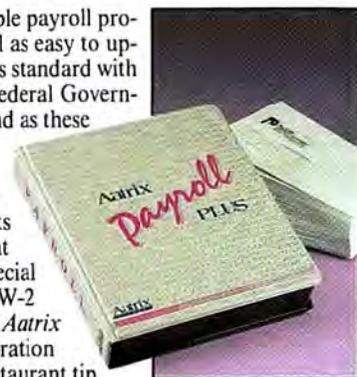
Affinity Microsystems Tempo II	89.	Imagine Software	
AffiniFile	46.	Smart Alarms & Appointment Diary	35.
Borland Turbo Pascal	59.	Multi-User Appointment Diary	85.
Borland SideKick V2.0	32.	Solutions, International	35.
Cortland	32.	SmartScrap & The Clipper	38.
Top Desk		Symmetry HyperDA (Req. 512K)	
Greene, Inc.			
QuickDex 1.4A			

Languages

Apple Computer MacPascal	99.	Mainstay	
Borland Turbo Pascal	65.	V.I.P. (Visual Interactive Programming)	79.
Turbo Pascal Numerical Methods	65.	Microsoft	
Turbo Pascal Tutor	45.	Microsoft Basic Interpreter 3.0	62.
Cognition Technology		Microsoft Basic Compiler	125.
MacSMARTS	135.	THINK Technologies	
Consulair		Lightspeed C	95.
Macintosh 68000 Development System	59.	Lightspeed Pascal	65.

Aatrix Payroll Plus by Aatrix Software

Finally, a complete and adaptable payroll program that is easy to use, as well as easy to update. *Aatrix Payroll Plus* comes standard with the current tax tables for the Federal Government, as well as all 50 States, and as these tables change through the years, it's a simple process to update your program. Printing functions, from the actual checks to W-2's are user defined so that there is no need to purchase special checks or buy upgrades when W-2 forms change. Other features of *Aatrix Payroll Plus* include easy integration with other programs, special restaurant tip section, form 940 and 941 reporting and password protection.



Aatrix Payroll Plus 195.

New Turbo Mouse by Kensington



Here is the best reason around to retire your mouse, the *New Turbo Mouse* from Kensington. Twice as fast as a regular mouse, while taking up half the space. When rolling the ball slowly, you can attain 200 CPI precision. Roll it quickly and you'll fly across even the largest "Big Screen". It uses half the space of the normal mouse, and since it doesn't move all over your desk, it's at home amidst a sea of papers as well as an empty desk. One of the mouse buttons operates like a standard mouse

button, while the other is a "Click Lock". You can also program your mouse to perform one of six time saving functions when you click both of the buttons at once.

New Turbo Mouse 115.

Utility Software

ALSoft Disk Express 1.10	26.	Olduvai Software DA-Switcher II	25.
Font/DA Juggler Plus	32.	Font Sharer	149.
Berkeley System Design		Icon-It! (Assign Icons to Menu Items)	39.
Stepping Out II	Special 54.	Read-It! TS (For Thunderscan)	79.
Beyond Inc. Menu Fonts 2 or Fore Runner	32.	Read-It! O.C.R. (For Image Scanners)	199.
CE Software QuickKeys (Macro Program)	54.	Software Power Power-op Disk Optimizer	33.
DiskTop 3.0 or CalendarMaker 3.0	28.	Software Supply Suitcase or Power Station	37.
Central Point Software		SRT MacTree	38.
Copy II Mac (Includes MacTools)	20.	SuperMac Software SuperSpool 5.0	49.
Design Software/Electronic Arts		SuperLaserSpool 2.0	82.
DS Backup	49.	Multi-User SuperLaserSpool	199.
Dove RamSnap	21.	Diskfit 1.4	54.
Electronic Arts Disk Tools Plus	31.	Network Diskfit 1.4	203.
Emerald City Software LaserTalk	187.	Sentinel 1.0	155.
Fifth Generation Systems		Synex Mac Envelope	19.
FastBack For The Macintosh	59.	Mac Invoice	32.
Ideaform Disk Quick V2.10	25.	TOPS Tops 2.0 or Net Print	119.
Hyper Book Maker	34.	Tops Repeater	189.
Infosphere Liaison	129.	Williams & Macias Disk Finder	29.
MacServe (Network Software)	158.	myDiskLabeler w/Color	31.
LaserServe (LaserWriter Print Spooler)	62.	myDiskLabeler w/LaserWriter Option	34.
Microlytics, Inc. GOfEr	Special 49.	Working Software, Inc. Findswell 2.0	36.

Communications Software

CompuServe CompuServe Starter Kit	24.	Software Ventures	
Grolier On Line Encyclopedia	32.	Microphone II (Includes Glue)	229.
CompuServe Navigator	45.	Think Technologies, Inc.	
DataViz MacLink Plus with Cable	145.	InBox-Starter Kit V2.0	
FreeSoft Red Ryder V10	55.	(3 Personal Connections)	199.
Palantir InTalk V3	99.	Traveling Software LAP-LINK	85.

to Polish Up Your Mac...

Chuck Yeager's Advanced Flight Simulator by Electronic Arts

Imagine racing through the clouds at Mach 3, putting one of the fourteen different aircraft at your disposal through it's paces. Or screaming along just above the ground, racing against a computer controlled aircraft through skyscrapers, slalom and gates. These are just a few of the thrills you'll experience flying *Chuck Yeager's Advanced Flight Simulator*. Other features include Mach speed graphics with highly detailed 3D terrain, a black box recorder to save and playback your best tricks and races, and a choice of 10 distinct viewing perspectives with a zoom feature which can enlarge up to 256 times. All this and much more make *Advanced Flight Simulator* the ultimate way to make your Macintosh fly.



Chuck Yeager's Advanced Flight Simulator 36.

Gofer by Microlytics, Inc.

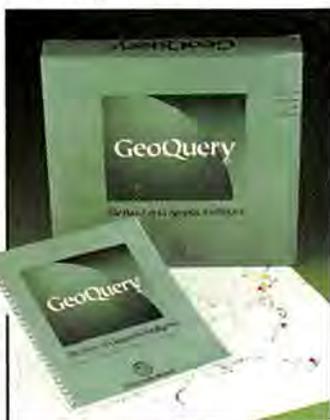


Gofer is the ultimate desk accessory for finding facts and numbers previously hidden from view on disks. Give *Gofer* a phrase, a fact or a date and send him looking for it on floppies, hard disks, ram disks, even most popular regular networks. You can search for up to eight items simultaneously, with or without leaving your application. *Gofer* also allows you to view, cut and paste the items you searched for, and include what you've chosen into your current program. Multifinder and Hypercard compatibility, the ability to search with AND, OR, NOT and Nearby criterion, and the fact that it's not copy protected makes *Gofer* a real find for all Mac users.

Gofer 49.

GeoQuery by Odesta Corporation

GeoQuery puts your data — and you — on the map. This exciting new product turns your spreadsheet or database into interactive "pushpins" on a U.S. map. You'll instantly see geographic relationships among your customers, employees, locations — anything! You have all 50 states to work with, and can zoom in to specific areas. Use the drawing tools to: generate reports on or target mailings to specific areas, flag bad addresses in your database, turn one sales call into five on your next trip, and create spectacular presentation maps. If location matters to you, you'll love *GeoQuery*.



GeoQuery (Plus, SE, & II) 275.

MacSnap Internal Memory Expansions by Dove Computer Corporation



It's a safe bet that no matter what Macintosh model you have, Dove Computer has a *MacSnap* memory expansion product that matches your needs. That's because Dove has an extensive line of high quality memory and productivity enhancement products available. All Dove products are easy to install and represent a superior value! We've selected some of the most popular models, and are offering them at special prices. All models listed include Dove's RamSnap software, their intelligent ram management software.

MacSnap 2SE	299.
MacSnap 524E	189.
MacSnap 524S	250.
MacSnap 548E	425.
MacSnap 548S	489.
MacSnap Plus 2	315.

Sensible Grammar by Sensible Software

Sensible Grammar, using it's library of over 2200 commonly misused English phrases, allows you to check your manuscripts for common writing errors. Faulty phrases which are overly formal, informal, cliché, vague, wordy, or sexist are brought to your attention and suggestions are given which you can "click" into your text, or you may type a correction. *Sensible Grammar* also checks for common punctuation errors, as well as allowing you to customize the program and phrase library to your specific needs. *Sensible Grammar* works with multifinder, is not copy protected, and is the best way I've seen to take the drudgery out of analyzing your writing style.



Sensible Grammar 55.

Positively A Plus

PROGRAMS
PLUS

800/832-3201

Positively A Plus!

Disk Drives/Hard Disks/Upgrades

AST Research		MacSnap Plus 2 (MacPlus to	
Mac86 Co-Processor (Mac SE)	419.	2MB Non Expandable)	Special 315.
Mac286 Co-Processor (Mac II)	1119.	MacSnap 2SE	Special 299.
Central Point		1024 Option (1MB Accelerator	
Central Point 800K External Drive	185.	or MacII Memory Exp.)	195.
Copy II PC Deluxe Option Board	129.	Math Kit (Math Co-processor Chip Set)	225.
CMS MacStack 20 Ext Subsystem		SCSI Interface/Port	85.
(MacPlus/SE/II)		Call	
MacStack 60 Ext Subsystem		MacSnap Toolkit (torx driver,	
(MacPlus/SE/II)	849.	opener & grounding set)	15.
Pro-SE 40 I or R	839.	Everex Emac 20D (20Mg Hard Disk)	520.
Pro-SE 100 I or R	1489.	Emac 20 Deluxe	585.
Pro II 43 Internal	649.	MacMemory, Inc. Turbo SE (16 Mhz	
Pro II 102 Internal	1189.	68000 Accelerator for the Mac SE)	369.
60MB Tape Backup (MacPlus/SE/II)	739.	Personal Computer Peripherals	
Cutting Edge Cutting Edge 800k Drive	175.	Beige or Platinum Color. Optional	
Cutting Edge Wedge XL 30		Built-In Modems Available.	
Plus SCSI Hard Drive	629.	MacBottom HD-21	
Cutting Edge Wedge XL 45		(20*MB SCSI Hard Disk)	749.
Plus SCSI Hard Drive	829.	MacBottom HD-32	
Dove Computer Corporation		(32MB SCSI Hard Disk)	879.
68020 Accelerator Boards for Mac SE		MacBottom HD-45	
MSE 1 (16 Mhz)	585.	(45MB SCSI Hard Disk)	1139.
MSE 2 (16 Mhz w/1MB)	779.	MacBottom HD-70 (70MB	
MSE 3 (16 Mhz w/Math Co-processor)	779.	SCSI Hard Disk) Plat only	1395.
MSE 4 (16 Mhz w/1MB		MacBottom IHD-144 (Mac II)	2195.
and Math Co-processor)	975.	WS1 (connects HD-20 SCSI)	295.
MacSnap 524 (512K to 1MB)	215.	Rodime Rodime 20 Plus Ext.	
MacSnap 524E (512E to 1MB)	Special 189.	or 201 Plus Int.	629.
MacSnap 524S		Rodime 45 Plus (Ext. 45MB SCSI)	939.
(512E to 1MB w/SCSI)	Special 250.	Rodime 450RX (Int. 45MB Mac SE/II)	829.
MacSnap 548 (512K to 2MB)	359.	Rodime 60 Plus (Ext. 60MB SCSI)	1039.
MacSnap 548E (512E to 2MB)	Special 425.	Rodime 100 Plus (Ext. 100MB SCSI)	1169.
MacSnap 548S		Rodime 140 Plus (Ext. 140MB SCSI)	1319.
(512E to 2MB w/SCSI)	Special 489.	Rodime 1000 RX (Int. 100MB MacII)	1045.
		Rodime 1400 RX (Int. 144MB MacII)	1669.

Printers & Digitizers

AST Research TurboLaser P/S	3559.	Saikosha	
TurboScan (Sheetfeed model)	1199.	SPI1000 (Imagewriter Compatible)	229.
TurboScan (Flatbed model)	1329.	Summagraphics MacTablet 12x12 size	379.
Koala Technologies Corp.		Bit Pad Plus (MacSE & MacII)	335.
MacVision 2.0 (Digitizer)	225.	ThunderWare ThunderScan V4.0 with	
Kurta		Power Port (Mac 512K, 512K Enhanced,	
IS ADB Tablet	259.	MacPlus, and Macintosh SE)	199.
Cordless 4 Button Cursor	99.	Mac II Power Accessory	42.

Accessories

Abaton ProPoint (ADB Turbo Mouse		Disk Drive Cleaning Kit	20.
for Mac SE & Mac II)	119.	Tilt/Swivel	22.
Asher Engineering Turbo Trackball		Universal Copy Stand	22.
(Mac & Mac+ or Mac SE & Mac II)	69.	Apple Security Kit	34.
Bech-Tech		Antiglare Polarizing Filter	33.
Fanny Mac (Beige or Platinum)	65.	Printer Muffler 80	43.
Cambridge Automation Numeric Turbo		Printer Muffler 132	58.
Curtis Manufacturing	99.	Masterpiece 400	64.
Emerald-Surge Suppressor-SP-2	36.	System Saver Mac (Beige or Platinum)	64.
Ruby-Surge Suppressor-SPF-2	55.	Super Base	34.
Cutting Edge Cutting Edge EADB-105		System Saver SE	62.
(Mac SE & Mac II)	135.	Masterpiece Mac II	119.
DataDesk MAC-101 Keyboard/Beige		New Turbo Mouse	
(128K/512K & Mac Plus)	139.	(Reg. or ADB)	Special 115.
MAC-101 ADB Keyboard/Platinum		Mouse Systems A+ Mouse (MacPlus)	67.
(Mac SE & Mac II)	139.	A+ ADB Mouse (Mac SE/Mac II)	87.
Ergotron Mouse Cleaner 360°	15.	Moustrak MousePad 7"x9" Size	8.
MacTilt or MacTilt SE (Platinum Color)	68.	MousePad 9"x11" Size	9.
Farallon MacRecorder Sound System		Nuotech	
(Mac SE or Mac II)	149.	EasyNet (Specifies Din 8 or DB-9)	27.
I/O Design		TurboNet 128/512K or TurboNet Plus	27.
Mac Luggage in Navy or Platinum Gray		Orange Micro Grappler C/Mac/GS	
Macinware Plus Carrying Case	69.	(Parallel Interface for the Mac)	84.
Macinware SE Carrying Case	79.	Grappler L/Q (Parallel Interface	
Imageware II Carrying Case	49.	for 24 Pin & Laser Printers)	98.
Kalmar Designs		Ribbons	
Teakwood Roll-Top Disk Cases:		Available in Black, Blue, Brown, Green,	
Micro Cabinet (holds 45 disks)	14.	Orange, Purple, Red, Yellow, Silver & Gold	
Double Micro Cabinet (holds 90 disks)	20.	ImageWriter Ribbon	4.
Triple Micro Cabinet (holds 135 disks)	27.	ImageWriter Black 6-pack	20.
Kensington External Disk Drive Cover	8.	ImageWriter Rainbow Pack (6 Colors)	20.
Extra Long ADB Keyboard Cable	25.	ImageWriter II-Four Color Ribbon	9.
Macintosh II Stand	20.	Silicon Comforts MacChimney	
Macintosh II Monitor Cable Extension	33.	(Very Effective Cardboard	
Mouse Pocket (Reg. or ADB)	8.	Laminate Convection Cooling Device)	16.
Mouseway (Mousepad)	8.	Sopris Softworks	
ImageWriter or ImageWriter II Cover	9.	High Trek Carry Cases - Platinum Gray, Navy	
Macintosh Plus/SE Dust Cover	9.	Imagewriter II Case	49.
Macintosh SE w/extended Kybd Cover	9.	Macintosh Plus, SE w/Standard Kybd	59.
Mouse Cleaning Kit w/Pocket	17.	Macintosh SE & Extended Kybd Case	69.

Blank Media

Single Sided 3 1/2" Diskettes		Centech 3 1/2" DS/DD Color Disks (10)	19.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Sony 3 1/2" DS/DD Disks (box of 10)	18.
Sony 3 1/2" SS/DD Disks (box of 10)	13.	Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Double Sided 3 1/2" Diskettes		Maxell 3 1/2" DS/DD Disks (box of 10)	20.
BASF 3 1/2" DS/DD Disks (box of 5)	9.	Verbatim 3 1/2" DS/DD Disks (box of 10)	19.
Bulk (Sony) 3 1/2" DS/DD (10)	17.	3M 3 1/2" DS/DD Disks (box of 10)	20.

Modems

Epic		MacCommpack	
Epic 2400 Int. SE		(2400SA w/ Microphone & Cable)	249.
(Hayes Compatible)	249.	Prometheus	
Epic 2400 Int. Mac II		Promodem 1200 (Hayes Compatible)	239.
(Hayes Compatible)	249.	Promodem 2400 (Hayes Compatible)	309.
Epic 2400 Plus Ext (Hayes Compatible)	155.	Mac Pack w/Procom M and Cable	
Everex Emac 2400 Baud	225.	(Specify Mac or MacPlus)	49.
Hayes Microcomputing		Shiva	
Smartmodem 1200	299.	Net Modem V1200	369.
Smartmodem 1200 Mac		Net Modem V2400	489.
w/Smartcom II & Cable (MacPlus)	359.	Net Modem X232	309.
Smartmodem 2400	449.	Net Bridge	309.
Migent Migent Pocket Modem		Supra Corporation	
(ext. 300/1200 Baud)	115.	Supra Modem 2400	149.
Novation		U.S. Robotics	
Novation Parrot 1200	109.	Courier 1200 (Hayes Compatible)	199.
Practical Peripherals		Courier 2400 (Hayes Compatible)	349.
Practical Modem 1200SA	109.	Courier 2400E (Hayes Compatible)	379.
Practical Modem 2400SA	189.	Courier HST 9600 (Hayes Compatible)	689.

800/832-3201

Customer Service (203) 378-3662 • FAX (203) 381-9043
Monday thru Friday 9 A.M. to 9 P.M.
Saturdays 10 A.M. to 6 P.M. (Eastern Time)

OUR POLICIES

- We accept MASTERCARD and VISA with no added 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.
- If you are ordering by mail, we accept private and company checks. With MASTERCARD and VISA orders include card number and expiration date. Connecticut residents add 7.5% sales tax.
- Locations more than 1 day away shipped via Federal Express Standard Air service.*
- Federal Express Priority 1 service also available.
- Sorry, we cannot accept COD orders.

SHIPPING

- **Continental United States:** Add \$3.00 per order to cover Federal Express Standard Air service* APO/FPO orders shipped 1st Class Mail (add 3% \$5.00 Min charge). Alaska, Hawaii and Outside Continental US: call or write for information.

RETURNS

- Defective software will be replaced immediately by the same item. Defective hardware will be replaced or repaired at our own discretion. Call customer service at (203) 378-3662 to obtain a Return Authorization Number before returning goods for replacement. Products purchased in error subject to a 20% restocking fee.

All items subject to availability. Prices subject to change without notice. Mail-in orders (especially from foreign countries), please furnish telephone number.

*When your order is shipped from our facility in Stratford, CT, Federal Express Standard Air service will deliver the package in 1 to 2 days. This service does not guarantee next day delivery.

Now Shipping Standard Air Service by



75 Research Drive
Stratford, Connecticut 06497
800/832-3201

& Phenomenal Prices.

DataBase Management

Activision Focal Point	59.	Fox Software Fox Base Plus	214.
Business Class or City to City Reports for Hypercard	30.	Fox Base Runtime	162.
Acuis 4th Dimension	559.	Microsoft Microsoft File	119.
Apple Computer HyperCard	44.	Nantucket Software	
Ashton Tate dBASE Mac 1.0	295.	McMax (dBase III Compatible)	178.
Blythe Software		Nashoba Systems FileMaker Plus	149.
Omnis 3 Plus/Express	275.	FileMaker 4	189.
Borland Reflex Plus	165.	Nordic HyperCONTROL	42.
Chang Laboratories		Odesta Double Helix II	339.
C.A.T. Contacts*Activities*Time	229.	GeoQuery	Special 275.
Ducsoft, Inc. Applications & Routines for 4th Dimension Vol. 1	86.	ProVUE Development OverVUE 2.1E	149.
		Software Discoveries RecordHolderPlus	45.
		Telegraphics Hypertutor	30.

Business Software

Access Mind Write	95.	Mainstay Think 'n Time	61.
Trapeze 2.0	159.	Mac Flow 2.0 or Mac Schedule	115.
Bedford Software Simply Accounting	229.	Capture	38.
Bravo Technologies MacCalc	79.	Micro Planning Software	
Claris MacProject II	439.	Micro Planner 6.0	349.
CE Software Quick Mail	179.	Microsoft Microsoft Excel 1.06	249.
Crickit Software Cricket Graph	119.	Microsoft Works 1.1 with Spellswell	185.
Cricket Presents...	289.	Microsoft Multiplan 1.1	119.
Pict-O-Graph	105.	Microsoft Mail 1-4 users	195.
Deneba Software Comment	56.	Microsoft PowerPoint 1.01	249.
Xtra 2.0	109.	Micro Systems Software Analyze!	99.
Dow Jones Desktop Express	95.	North Edge Software Timeslips III	119.
Legisoft/Noto Press WillMaker 2.0	29.	Owl International Guide 2.0	119.
Lotus Jazz 1A	189.	Guide Envelope System	99.
Lundeen & Associates		Satori Software Bulk Mailer 3.2	79.
WorksPlus Commands	60.	Bulk Mailer Plus	195.
MacroPac International		Shana Enterprises Fast Forms	79.
101 Macros For Excel	44.	Turner Hall Publishing MacSQZ!	49.

Word & Outline Processors

Claris MacWrite 5.0	119.	Microsoft Write	113.
Living Videotext More 1.1C (Color Ver.)	175.	Symmetry Acta V2.0	36.
Microsoft Microsoft Word 3.02	249.	T/Maker Company WriteNow V2.0	98.

Spelling & Grammar Checkers

Aegis Development		Spelling Coach Professional Multi-User	279.
Doug Clapp's Word Tools	42.	Lundeen & Associates	
A.L.P. Systems MacProof 3.0 (Requires MacPlus)	115.	WorksPlus Spell 1.1	46.
Batteries Included Thunder! 1.23	30.	Microlytics, Inc.	
Deneba Software		Word Finder (Synonym Finder)	35.
Coach Merriam Webster's Thesaurus 2.0	36.	Sensible Software	
Spelling Coach 3.0		Sensible Grammar	Special 55.
(Webster's/Medical/Legal/Hyphenation)	54.	Sensible Speller	48.
Spelling Coach 3.0 Professional		Working Software, Inc.	
(Adds Definitions & Thesaurus)	109.	Spellswell 2.0	42.
		Lookup (Makes Spelling Suggestions)	29.

Desktop Publishing

Aldus Corporation PageMaker 3.0	475.	Postcraft International, Inc. Laser FX	115.
Allan Bonadio Associates		Laser FX Font Packs #1-8 (each)	30.
Expressionist 1.1	46.	Quark, Inc. QuarkXPress V2.0	Call
Ashton Tate FullWrite Professional	275.	Solutions, International Super Glue	52.
Letraset Ready, Set, Go! 4.0	279.	Target Software Scoop	189.
ImageStudio	279.	Word Perfect Corporation Word Perfect	185.

Accounting Packages

Aatrix Software Aatrix Timecard	69.	Rags to Riches GL, AR, or AP	120.
Aatrix Payroll V3.0	115.	Intuit Quicken	35.
Aatrix TimeMinder	135.	Layred Insight One Write	189.
Aatrix Payroll Plus	Special 195.	MECA	
Chang Labs		Managun:g Your Money	129.
New Enhanced Version III Modules!		Migent In House Accountant	119.
Rags to Riches 3-Pak 3.1 (GL/AR/AP)	289.	Monogram Business Sense	279.
Professional 3-Pak or Retail Business 3-Pak	359.	Dollars & Sense 4.0	81.
Inventory Control 2.6 or Professional Billing 2.6	239.	Peachtree	
		Back To Basics 3-Pak (GL/AR/AP)	139.
		Survivor Software	
		MacMoney 3.0 (Enhanced Version)	62.

Statistics & Math Packages

Abacus StatView II	369.	Borland Eureka! The Solver	129.
BrainPower StatView 512 Plus	175.	Systat Systat 3.1 (Specify Mac 512K, Mac Plus, or Mac II)	459.
Math View Professional	145.		

Graphics Software

3G Graphics Images with Impact!	60.	Foundation Publishing Comic People	25.
ABA Software Draw It Again Sam...	89.	Comic Strip Factory	45.
Adobe Systems Adobe Illustrator 88	349.	Laserware Laserpaint Color II	359.
Aldus Freehand	379.	Macromind Videoworks II	118.
Altsys Corp. FONtastic Plus 2.0	59.	Videoworks II Accelerator or Driver for Hypercard	125.
Fontographer 2.2	239.	Meta Software Design/2.0	199.
Ashton Tate Full Paint	75.	Micro: Maps MacAtlas Paint Version	32.
Broderbund Print Shop	36.	MacAtlas Professional	129.
Casadyware Fluent Fonts 2.0 (2-Disk Set)	45.	Mindscape GraphicWorks 1.1	84.
Fluent Laser Fonts Vol. 1-19 (ea)	26.	Olduval Software Post-ART (3-Disk Set)	35.
Claris MacPaint 2.0	119.	Silicon Beach Software SuperPaint 2.0	109.
Computer Friends Modern Artist	109.	Digital Darkroom	169.
Deneba Software Canvas 2.0 (Includes Desk Accessory)	169.	Silicon Press	41.
Canvas DA 2.0	75.	Solutions International	
Dream Maker Mac Gallery	35.	The Curator (Catalog Your Art)	79.
Dubl-Click Software		Springboard Certificate Maker	24.
World Class Fonts! Vol 1 & 2 or 3 & 4	36.	SuperMac Software Pixel Paint	259.
WetPaint Vol 1 & 2 or 3 & 4	36.	T/Maker Click Art Letters I, Letters II, Personal Graphics, Publications, Effects, Business Image, or Holidays (each)	28.
Enzan-Hoshigumi USA	109.	Christian Images	35.
MacCalligraphy 2.0		Click Art EPS Illustrations	75.
Japanese Clip Art Scroll 1 "Heaven" or Scroll 2 "Earth"	52.	Zedcor DeskPaint 1.0	65.
Year of the Dragon	21.		

CAD Products

Challenger Software Mac 3D (Ver. 2.0)	119.	Innovative Data Design Dreams	319.
Claris MacDraw II	179.	MacDraft 1.2B	149.
Crickit Software Crickit Draw	169.	Silicon Beach Software Super 3D	159.
Diehl Graphsoft Mini Cad 4.0	375.	Super 3D Enhanced (Mac II)	249.

Educational/Creative Software

Baron's Baron's SAT	35.	1st Byte/Electronic Arts	
Bible Research The Word (KJV or NIV)	165.	Kid Talk, Speller Bee,	
Bogas Productions Studio Session	49.	First Shapes, or Math Talk	32.
Broderbund Jam Session	30.	Great Wave Software TimeMasters	22.
Geometry, Calculus or Physics	60.	KidTime	26.
Type!	31.	Concertware+ MIDI 4.0	79.
Where in the World is Carmen San Diego?	25.	Learning Company Reader Rabbit	33.
Coda Mac Drums	26.	Mindscape Perfect Score SAT	
Compu-Teach Once Upon A Time	23.	w/The Perfect College	46.
Stepping Stones Level I or Level II	23.	Nordic MacKids	
Davidson & Associates Speed Reader II	39.	Educational Programs (each)	29.
Math Blaster or Word Attack!	27.	Rubicon Publishing	
Electronic Arts Mavis Beacon Typing	36.	Dinner at Eight-Silver Palate Bundle	51.
Venture's Business Simulator	47.	Simon & Schuster Typing Tutor IV	35.
Business Advantage	49.	Springboard Early Games for Young Children or Easy as ABC	28.
Deluxe Music Construction Set V2.0	61.		

Game Software

Access World Class Leader Board Golf	34.	Microsoft Flight Simulator 1.02	32.
Accolade Hard Ball	23.	Micro Sports MSFL Pro Draft	26.
Activision Firepower	16.	MSFL Pro League Football	32.
Shanghai or Romantic Encounters		Miles Computing Inc.	
or Jinxter	24.	Downhill Racer or Quintette	24.
Might and Magic	37.	Harrier Strike Mission II	
Sky Travel	45.	or The Fool's Errand	27.
Artworx Bridge 5.0	22.	Mindscape Balance of Power,	
Avalon Hill Mac Pro Football	28.	Crossword Magic or Citadel	30.
Baudville Award Maker Plus	29.	Deja Vu: A Nightmare Comes True	30.
Broderbund Ancient Art of War or Ancient Art of War at Sea	27.	King Of Chicago or Shadowgate	30.
Poster Maker Plus	39.	Defender of the Crown, Siboot	
Bullseye Software		or The Uninvited	30.
Fokker TriPlane or Ferrari Grand Prix	32.	Practical Computer Applications	
Electronic Arts Ogre	20.	Lunar Rescue	30.
ChessMaster 2000	28.	MacGolf 2.0 or MacRacquetball V2.0	35.
Chuck Yeager Flight Simulator	Special 36.	MacCourses	34.
Starfleet I	37.	Primera Smash Hit Racquetball II	21.
Patton vs Rommel or Scrabble	27.	Different Drummer	62.
One-On-One, Pinball Construction Set, Seven Cities of Gold or SkyFox (each)	15.	Sierra On-Line Leisure Suit Larry	23.
EPYX Winter Games		Space Quest or Space Quest II	30.
or Sub Battle Simulator	24.	Police Quest	35.
Hayden Software Sargon III	29.	Silicon Beach Software World Builder	41.
Infinity Software, LTD. Go	27.	Dark Castle or Apache Strike	27.
Infocom Leather Goddesses of Phobos, Nord & Bert, Plundered Hearts, or Sherlock (each)	24.	Beyond Dark Castle	27.
Beyond Zork	30.	Simon & Schuster	
Hitchhiker's Guide to The Galaxy	18.	Star Trek (The Kobayashi Adventure)	24.
Science Fiction Classics	35.	Star Trek (The Prometheus Prophecy)	24.
Zork Trilogy	42.	Sir-Tech Mac Wizardry	35.
Intracorp Bumper Sticker Maker	35.	Sphere, Inc. Pt-109	32.
Business Card Maker	36.	GATO, Orbiter, or Falcon	26.
		Solitaire Royale	19.
		Studio Zero Orbital Mech	35.
		XOR Software NFL Challenge	64.
		Pro Challenge or Basketball Challenge	31.

Music Mouse is her blow against that music establishment, but it is more than a musical tool. In fact, the program is so powerful that it goes beyond categorization. So easy to use that it has found favor with people attempting to rehabilitate prisoners and raise the self-esteem of physically impaired people. At the same time, such an intricate musical composition aid that professional musicians have told Spiegel they consider the program a full collaborator—and they've listed it that way on record albums and in performance notes.

This brings up an interesting question. Since it is so easy to produce engaging music with Music Mouse—one can virtually press a few keys on the Mac, step back, and listen as the program generates complex counterharmonies and rhythms—is it the user or the program that has created the music? Or the creator of the program? The problem is so vexing that the U.S. Copyright Office has yet to figure it out. In fact, it still can't decide whether Music Mouse is a software program, a musical instrument,

or a musical composition with infinite sheet music.

Meanwhile, Spiegel does admit that extending such power to nonmusicians—or boosting the power of trained musicians—can have its problems. She cites one example: the faculty at the Berklee College of Music is having trouble judging student tapes because “they can't tell who has talent or who used the software to do the creation for them.”

Music for Millions

Certainly that confusion will only get worse as this genre of software proliferates. The Intelligent Music Corporation of Albany, New York, which publishes somewhat more technical composition programs like M and Jam Factory is, according to its president Joel Chadabe, planning several programs that will enable musical virgins to make music. One is a mouse-driven program called Ovaltunes; another, called Riff, is “an improvising program that places a band of players under your direction.”

Ultimately, does it matter if software makes Eric Claptons out of klutzes, or Steve

Reichs out of the tone-deaf? When we hear or create pleasing or stirring music, what difference does it make how much sweat went into creating it? The creators say that Music Mouse, Jam Session, and other tools provide the essence of music without the fuss and muss, and that those with superior imagination, musical intuition, and theoretical vision will use the composing aids to go further. I have to admit that when I play with those programs, I am pleased with the sounds that emerge. As an added bonus, when I play a sizzling guitar lead on Jam Session, my face does not make the silly contortions endemic to note-bending lead guitarists.

On the other hand, I cannot imagine this brand of musicianship—which entails moving a mouse or hitting letters on a keyboard—as capable of elevating a teenage boy to Life of the Party, thus impressing females. As long as that's so, don't look for the computer keyboard to be the nexus of music creativity. □

Click Into Casino Excitement

CRAPSMASTER™

GET READY TO BEAT THE HOUSE! Casino Craps gives skilled players nearly the same winning edge as the house. You'll feel just like you're at the casino, but play and learn at your own pace with no risk. CRAPSMASTER™ includes player-selectable stake, chip value, and Odds rules. You can play multiple Odds and Place bets as well as all other standard bets. On-screen display options show house advantages and payoffs. Manuals include complete rules and betting strategies. New for Mac. Tens of thousands of our casino games sold to satisfied customers. For Mac's with 512K memory.

ONLY \$39 for either game; or both for **ONLY \$69**. Shipping included. Telephone orders accepted with MasterCard, Visa, American Express.

ROULETTEMASTER™

CATCH ROULETTE FEVER! The croupier sliding over your winnings is the only thing missing from our realistic Casino Roulette game. Learn all the bet combinations and develop betting strategies. Watch the wheel spin; feel the excitement of hitting a big winner! Play either American or European-style roulette. Select stake and chip value. On-screen display option shows payoff rules.

CALL TOLL FREE 1-800-848-2424
or send your check to:
Centron Software, Inc.
621 N.W. 53rd Street, Suite 240, Boca Raton, FL 33487
MASTER THE WINNING EDGE

CRAPSMASTER™ AND ROULETTEMASTER™ ARE TRADEMARKS OF CENTRON SOFTWARE, INC. AND HITECH MANAGEMENT CORP.

Circle 219 on reader service card

The Breakthrough Used To Be ATs And Macs In The Same Room.

Now They're In The Same Computer.



It was getting pretty crowded. As more and more Macintoshes started showing up at work, the duplication of computers, monitors, printers and keyboards was simply getting out of hand.

And while there was still a need to use vital programs like Lotus® 1-2-3® and dBASE®, there was also an ever increasing demand for the Macintosh. Would the two computer environments be able to work together?

Times have changed. Now Macintosh™ IIs can run MS-DOS® software just as easily as Macintosh applications. With AST's Mac286™, the AT-compatible, 80286 computer-on-a-board that runs inside the Macintosh II. Its advanced hardware design actually runs faster than an IBM® PC AT.

With Mac286, familiar MS-DOS programs take advantage of many of the elements of the Macintosh environment. Copy and paste text, print on an Apple® LaserWriter®, store your files on the Mac hard disk and share DOS files with other users. It's that easy.

Of course, the future is built in, too. By installing an advanced hardware solution for MS-DOS compatibility, you're insuring a home for the best of today's, and tomorrow's, software programs.

Because there's one thing you can always count on in the world of personal computers. Times will change.

If you're interested in putting an AT-compatible computer inside your Mac II, call AST at (714) 863-0181 or fill out the coupon, and we'll tell you how you can have the best of both worlds.



- Yes, send me information on the Mac286.
 Yes, have an AST representative call me.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

Send to: AST Research, Inc. 2121 Alton Ave.
Irvine, CA 92714-4992. Attn: M.C.

MACWORLD 8/88

AST
RESEARCH INC.

Times Have Changed.

AST markets products worldwide—In Europe and the Middle East call: 44 1 568 4350; in the Far East call: 852 5 717223.

AST and AST logo registered and Mac286 trademark of AST Research, Inc. IBM and AT registered trademarks International Business Machines Corp. Apple and LaserWriter registered and Macintosh trademark of Apple Computer, Inc. MS-DOS registered trademark Microsoft Corp. Lotus and 1-2-3 registered trademarks of Lotus Development Corp. dBASE registered trademark Ashton-Tate. Copyright © 1988 AST Research, Inc. All rights reserved.

Circle 462 on reader service card

Network news.



We always wanted to keep a low profile. But since we introduced the PhoneNET System two years ago, hardly a week goes by that we don't make network news.

A leading Macintosh magazine advises that you install PhoneNET for any AppleTalk network. The PhoneNET StarController was selected as the best way to build large networks. And reporters are calling MacRecorder the new wave in sound technology for the Mac.

The result is a quarter-million PhoneNET nodes, and counting. Can we handle the exposure? Well, the inside story is we're still the same friendly people, with the same great service. And we'll continue to be an innovative company with new ideas. Just not as quiet.

Stay tuned. Your Farallon dealer has more good news and a free demo disk. For the dealer nearest you, call (415) 849-2331, ext. 83.

 farallon
computing

2150 Kittredge St., Berkeley, CA 94704



Circle 150 on reader service card

Macworld News

by Gil Davis

Desktop Video



Thanks to desktop video, which processes images and sound, in addition to words, the art of storytelling is evolving rapidly.

In fact, novelist Ken Kesey (author of *One Flew Over the Cuckoo's Nest*) predicts that the Kafkas and Joyces of tomorrow will be using video as a means of expression. Already desktop video is producing segments of animation that look as if they might have been done on a much more expensive Pixar or Cubicomp system.

Aegis's video products for the Mac have helped create several TV commercials and music videos, including Coca-Cola's Max Headroom commercials and other productions by Timbuck III, Tom Petty, and Todd Rundgren. A key element is Aegis's Animation Workshop for the Mac II, which offers full-feature video titling with cell animation; the manipulation of video images with flips, turns, tumbles, and rolls; an animated-image compression system (to greatly increase the number of images that can be stored on a hard disk); and a HyperCard link with a 3-D animation player. Animations can be played back at a rate of up to 30 frames per second (fps) from a disk or up to 100 fps from RAM.

To implement desktop video software, Julian Systems is offering an NTSC video card to hook up standard video monitors to the Mac II. The company



Television commercials, training videos, animated films—all created using the new capabilities of desktop video, which Aegis and other developers are bringing to the Mac.

will soon be releasing a Mac II video production card, which will permit standard video signals to be mingled with Mac images.

If you're interested in creating your own movies or commercials—complete with soundtrack, animation, and special effects—for under \$10,000, then a desktop video system may be your best choice. For further information, call Aegis in Santa Monica, California, at 213/392-9972; and Julian Systems in Concord, California, at 415/686-4400.—Allan Lundell

Easy Access to SQL



Mac users can easily and quickly use the power of SQL databases on Digital Equipment Corporation's VAX computers without sacrificing the Mac interface, thanks to Alisa Systems' SequeLink. Alisa's package enables Mac users to extract data from SQL databases (such as Oracle) using programs like 4th Dimension or HyperCard. HyperCard stacks can be created to access SQL databases

using SequeLink's external commands (XCMDs). A 4th Dimension application, called SequeView, is included with SequeLink. It constructs queries to an SQL database using a spreadsheetlike format.

In order for SequeLink to work, a user's Mac must be connected to a VAX computer via either AppleTalk or DECnet. When a Mac-generated query for data is directed to the VAX, SequeLink's SQL server on the VAX communicates with the database, extracts the appro-

(continues)



Suffering from a lack of memory?

Due to the memory demands of today's sophisticated software, insufficient memory can make any computer system seem . . . mindless. Micron can fill your system's memory void with high quality, add-in memory products.

We offer memory boards for the IBM PC/AT and compatible systems, memory expansion kits for the Apple Macintosh II, SE and Plus, and memory expansion boards for the Commodore Amiga 500, 1000 and 2000 systems.

Micron memory products are manufactured and tested under the industry's most stringent quality control procedures, and supported by our "Hands on Excellence" service program to ensure reliable performance.

Plus, we warrant our products for two years to registered users.

So, if your system is suffering from a lack of memory, call us now for the highest quality, U.S. manufactured memory products. 1-800-642-7661.

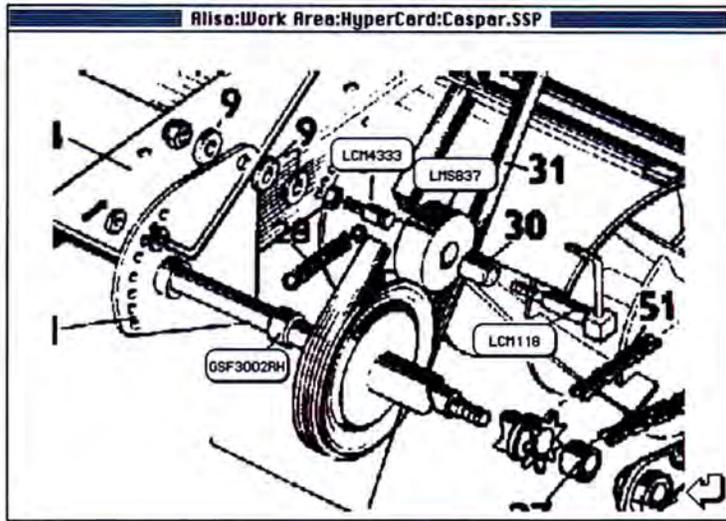
MICRON. It's a name worth remembering.

Micron Technology, Inc.
Systems Group
2805 E. Columbia Road
Boise, Idaho 83706
1-800-642-7661, (208) 386-3800

MICRON
TECHNOLOGY, INC.

Macintosh is a trademark of Apple Computer, Inc. Amiga is a registered trademark of Commodore-Amiga, Inc. Commodore is a registered trademark of Commodore Electronics, Ltd. IBM and PC/AT are registered trademarks of International Business Machines.

Circle 161 on reader service card



This HyperCard application accesses information located on mainframe computers. Click on hot spots, like the part numbers above, and up pop new windows.

private data from the SQL database, and sends only the requested data back to the Mac.

As a result of these features, SequeLink is one of the few products available that provide "seamless integration" of processes running on both the Mac and the VAX computers, making it easier for users to get the best of both worlds.

—David R. Kosiur

black-and-white slides and overhead transparencies, but it still doesn't draw or paint complex images well. So it relies on such programs as Illustrator 88, FreeHand, and LaserPaint Color II for creating especially interesting backgrounds, which can be imported into PowerPoint 2.0 as PICT, bitmap, or encapsulated PostScript files and placed into one of many layers. By altering the position and density of the see-through layers, it's easy to create unusual embossing and shadow effects, previously available only on much more expensive slide systems.

Once you finish designing your presentation, you can output it on a film recorder or send it to a slide service center like Genigraphics. Genigraphics, which has 24 locations around the country, can produce color slides using files created on any Macintosh (color or black-and-white) through the use of proprietary templates. But beginning in September or October, registered owners of PowerPoint 2.0 will receive a Chooser driver that makes sending slides (via modem) to Genigraphics as routine as printing—completed slides will often be returned to the sender by Express Mail the next day.

PowerPoint in Color

Microsoft's PowerPoint 2.0 presentation software for the Mac produces color slides that will knock your socks off. The program's automatic color palettes let you choose from among eight complementary colors (based on your choice of a primary color); multidirectional washes allow you to create a gradually lightened background; and automatic formatting permits a specified combination of colors and fonts to be applied instantly to all slides in your presentation.

PowerPoint retains all of its capabilities for producing

Other enhancements to PowerPoint include a spelling checker and a search-and-replace function. PowerPoint's list price remains \$395. For further information, call Microsoft at 800/426-9400.

Stop Mousing Around



The Apple Desktop Bus (ADB) is a serial communications bus that allows up to 16 peripheral devices to be connected to the Mac II or SE. Until recently, about the only input devices users could attach to the ADB on either computer were Apple's keyboard and mouse. Now, however, a host of input alternatives have appeared—from tablets to trackballs to devices that defy categorization.

"But I have a Mac 512K or a Plus," you say. Don't worry—Olduvai Corporation's \$129 AD-Bridge lets you connect to the

new ADB devices, and it works the other way as well, allowing you to connect your old peripherals to the Mac SE or II.

Summagraphics and Kurta both offer ADB graphics tablets. Kurta's \$395 IS/ADB Input System consists of an 8½-by-11-inch tablet and a pen or cursor device (both are available with cord or cordless). Summagraphics has announced the \$495 Bit Pad Plus, a 12-by-12-inch tablet with a stylus and a 4-button cursor device.

If you prefer a trackball to the mouse, you have several options. Asher Engineering offers the Turbo Trackball for \$119.95, Abaton's ProPoint optical trackball sells for \$159.95, and Kensington Microware recently announced Turbo Mouse ADB for \$169.95 (Kensington also offers a 7-foot ADB keyboard cable for \$39.95).

For game fans, Advanced Gravis has announced an ADB-compatible joystick with a fire button at the tip and two mouse buttons on the base; it

(continues)



PowerPoint's new on-screen color capabilities make possible both real-time presentations and sophisticated color slides.

Rodime drives for the Mac.

Capacity like you wouldn't believe.

**OFFER
EXTENDED!**

FOR A LIMITED TIME!

All Rodime Drives
are shipped with
FASTBACK for the Mac!
The fastest backup
for the fastest drive.
A \$99.95 value, yours **FREE!**

10 Megabytes / 10 Minutes

**FAST
BACK**
For The Macintosh

The largest capacities of any hard disk drives for Macintosh™—140 megabytes with the largest selections, 20, 45, 100 and 140! And the fastest average seek times... 28 ms!

A combination any Mac user would love.

The 450 RX™—45 megabytes of internal storage for the Macintosh SE and Macintosh II.

The 1000 RX™ and 1400 RX™—100 and 140 megabytes of internal

storage for the Macintosh II.

And the PLUS External Series for the Mac Plus and SE. 20 and 45 megabyte capacities and our new 100 and 140 megabyte external box that fits right under the Mac.

The 20 and 45 megabyte internal PLUS drives have fans that cool

the drives and the Mac Plus. Designed by Rodime for easy installation.

Best of all, the RX and PLUS Series drives have the unmatched reliability and support of Rodime—the largest supplier of hard disk technology for the Macintosh.

Rodime drives. The largest capacities and the fastest speeds.

Load up with the leader and you'll be a believer.

RODIME
SYSTEMS

Rodime, Inc., 29525 Chagrin Blvd., Pepper Pike, OH 44122, 216-765-8414
Rodime PLC, Nasmyth Road, Southfield Industrial Estates, Glenrothes KY6 2SD, Fife, Scotland

Circle 149 on reader service card

can also be used as a mouse replacement.

Perhaps you want to try a new technology altogether. Lightgate's \$149 Felix is an input-and-pointing device that consists of a small handle that you hold like a pen and move within a 1-inch-square area. Unlike the mouse, Felix offers an optical tracking system, and absolute positioning.

Or, you could try a mouse that contains none of the moving parts that can gum up a mechanical mouse. The optical mouse, A+, from Mouse Systems, skims over a shiny metal pad that reflects a tiny beam of light as it tracks every hand movement.

Finally, Personal Writer's handwriting-recognition system, Personal Writer 15S, which converts handwritten text and numbers to characters on the screen, is now ADB compatible. The grid-based Personal Writer 15S sells for \$895; the Personal Writer 15SL, which allows you to write on unlined paper, costs \$1795.



FRED STIMSON

ADB devices include trackballs and a wireless pen.

For further information, contact Abaton at 415/463-8822, Advanced Gravis at 800/663-8558, Asher Engineering at 818/960-4839, Kensington Micro-ware at 212/475-5200, Kurta at 602/276-5533, Lightgate at 415/596-2350, Olduvai at 305/665-4665, Personal Writer at 800/322-4744, Summagraphics at 203/384-1344, and Mouse Systems at 408/988-0211.

—Erfert Fenton



ROBERT HOLMGREN

Frank Purtil and Wade Killfer of Carde/Killfer Architects in Santa Monica, California, examine computer-aided drawings printed by IDD's new Dreams program.

Easy CAD— a Reality

T Dreams often set our mood for the day, and occasionally they reveal the future. Perhaps that's why Innovative Data Design (IDD), the publishers of the highly popular MacDraft, have called their next-generation CAD program Dreams.

Dreams is a very powerful program that's easy to use. For instance, you can specify the scale of your drawing in real-world terms. When you ask for an object's dimensions, Dreams calculates its actual size and displays it in the units you choose.

Other features include palettes that float above the document on a separate plane and are always active. Clicking on any of the palettes' tools gives you a menu of available options. Special editing tools allow rotation, gluing of edges, and merging of objects.

With Dreams you can draw using any of 16.8 million colors or 10 shades of laser-printer gray. The program generates color patterns using a 32-by-32-pixel tablet. The number of lay-

ers is restricted only by available memory. You can also take advantage of symbol libraries that will be commercially available, or create them using pre-drawn objects and text blocks.

Dreams helps define the Mac's long-term CAD future by supplying a "graphics engine" to which various capabilities are attached as modules. Using modules, both IDD and third-party developers can offer symbol libraries, integrated database functionality (for automatically generating proposals and reports from designs), and whole new programs.

Dreams is priced at \$500. For more information, call IDD in Concord, California, at 415/680-6818.

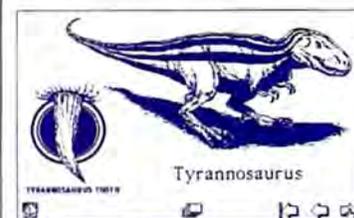
HYPERCARD Hot Stacks

H Today's emerging stacks seem to be either content-intensive or technique-intensive. Technique-intensive stacks work like mini-applications; a set of tools is offered to perform tasks. Content-intensive stacks work like mini-encyclopedias;

authors cram the stacks full of information, and readers have it at their fingertips.

Two content-intensive stacks help you learn about Russian and dinosaurs. Dinosaurs are all the rage these days, and this stack has some great-looking beasts. Clicking on buttons provides the scientific details that everyone seems to forget. What this stack really needs is sound and animation. For example, HyperCard's magic could make a classic confrontation between *Triceratops* and *Tyrannosaurus rex* really come alive. The stack was produced by A. A. H. Computer Graphics Productions.

Another content stack is a set of Russian lessons, written by Martin P. Rice, which uses the somewhat uneven Macintosh voice synthesizer. Sections on grammar, vocabulary, reading, and exercises will have you saying *nyet* to IBM's offer of



Flying and ground-hugging dinosaurs inhabit this stack.

glasnost. Similar disks will cover other languages. HyperCard's format lends itself naturally to language lessons. A more technique-intensive stack is called Text File Importer/Exporter. It's a well-thought-out stack utility that provides a vehicle between ordinary text files (accessible from word processing programs) and the fields in HyperCard stacks. Unlike other text utilities, this one has user-defined options and built-in error checking. Written and very well documented by Allen G. Cecil.

You can probably obtain these public domain and share-

(continues)

Not just
another
pretty
face



Sure, you're going to love the new look of Sigma Designs' LaserView Display System.

But the real beauty is in how well it handles your desktop publishing, spreadsheets and word processing.

Quite simply, LaserView offers the sharpest image anywhere: an eye-opening 1664 x 1200 (115 dpi) resolution for detail drawings, half-tone images, or even 6-point type. And an additional resolution mode of 832 x 600 for text-based work (for the Macintosh II and SE).

So what you'll get is the performance of a workstation in

a PC environment. A full 19" monitor that's easy on the eyes, thanks to its high contrast screen; easy on the body because of its tilt/swivel base; and easy to work with, since you can view anything from a two-page spread to an engineering drawing.

Put it all together and you have a single monitor solution for IBM PCs and Macintosh II or SE. With full software compatibility. LaserView allows you to see your work the way it was meant to be seen. No matter what software
Circle 117 on reader service card

you're using — Ventura Publisher, Pagemaker, Excel, or whatever.

Want a closer look? Visit your nearest authorized Sigma Designs dealer. Or call Sigma Designs today at 415-770-0100.

Then see why the newest screen star isn't just another pretty face.



Sigma Designs, Inc.
46501 Landing Parkway
Fremont, CA 94538

LaserView: TM Sigma Designs, Inc. IBM: © International Business Machines Corp. Macintosh: TM Apple Computer, Inc. Ventura Publisher: TM Ventura Software Inc. Pagemaker: © Aldus Corp. Microsoft Excel: © Microsoft Corp.
**See Us At Macworld Expo
Boston, August 11-13**

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

ware stacks very inexpensively from a local or national users group. For example, BMUG, one of the biggest groups, charges only \$3 for its disks. (BMUG, 1442A Walnut St. #62, Berkeley, CA 94709.)—*Scott Kronick*

Objects in Space

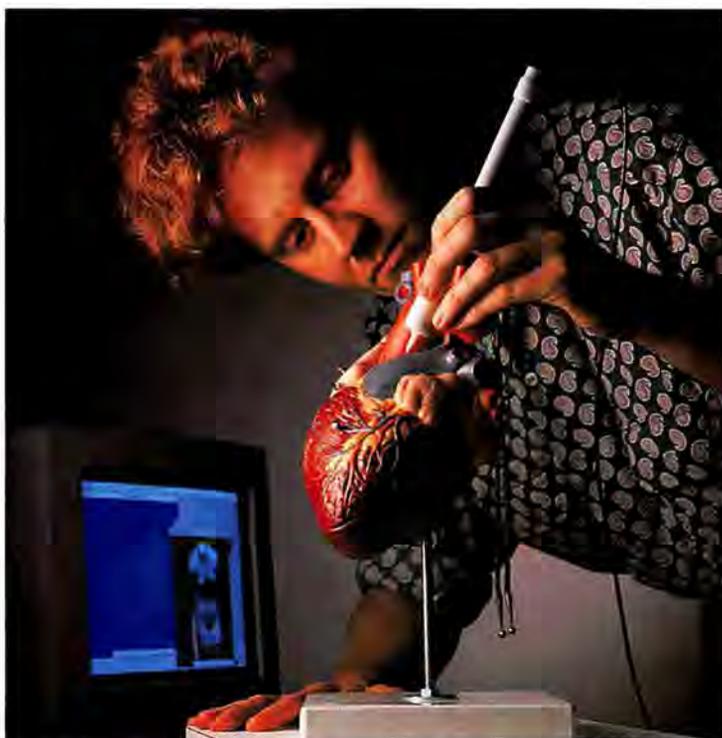
 If you need 3-D objects for animations, modeling, or illustrations, the Modeler by Mira Imaging may be for you.

It works like this. You set any small, nonmetallic object atop a special platform and “draw” a grid on the surface of the object with a pencil-like probe. Then you touch the probe to as many intersecting points as necessary to define the shape. As you draw, more and more triangles appear on the Mac’s screen as points are connected to form a wire grid that approximates the object’s actual shape.



This three-dimensional image is composed of filled-in triangles that can be smoothed.

Once captured, this 3-D image can be moved and edited. For instance, ask for 3-D bezier curves, and you can push or pull on any point to modify the shape. And since you can view



Dan Donaldson uses Mira Imaging’s 3-D probe, which images and rotates three-dimensional shapes, to define the surface of a heart model to a nearby Macintosh.

any curve from multiple angles, you can reshape the bow of a speedboat, for instance, while looking at cross-sectional, side, and bottom views.

The next step is to create a solid object by filling in all the triangles; then you use a smoothing tool to round out each flat triangle until the final image appears like a polished sculpture. Give the program another command and you can use the probe once again to view your creation from any angle and change the light source to emphasize important features. Once you’re done, you can print the image using both PICT and PostScript. Images created on a Mac II can be saved in color PICT format for enhancement with a color paint program.

Prices begin at \$5000 for the complete system including a McDonnell Douglas 3-D digitizer. For more information, call Mira Imaging in Toronto at 416/489-9247.

HYPERCARD

New Type of HyperCard?

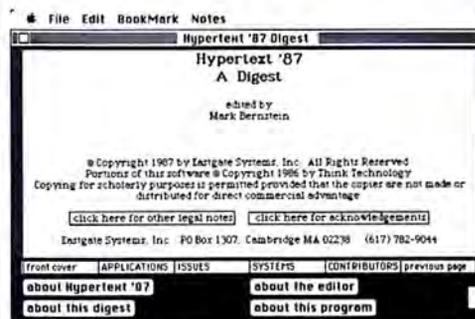
 When the word *hypertext* is mentioned, Apple’s HyperCard usually springs to mind. A few will associate hypertext with OWL’s Guide, a hypertext development tool that lets you jump around documents via buttons. But in fact there are at least nine hypertext products, some of which contain features and

concepts that may be destined for future versions of HyperCard.

If you order a recently released \$10 disk from Eastgate Systems, you’ll discover a relatively unknown hypertext program called HyperGate, which functions somewhat like HyperCard’s Browse mode. Once in HyperGate, you’ll view selected quotes from last year’s first-ever Hypertext Conference, which featured more than 180 presentations on the future of hypertext.

The disk, called the Hypertext ’87 Digest, exemplifies many of the difficulties and promises of hypertext. Divided into Issues, Applications, Systems, and Contributors, the digest is hierarchically organized by buttons and is generously cross-referenced. The navigation aids keep the browser from getting lost in hyperspace, a common complaint about many hypertext systems. Although you can insert “bookmarks,” add entries to the index, and make margin notes, you cannot create your own links. Unfortunately, embedded links are few and far between.

Although hypertext has a reputation for being all things to all people, the picture that emerges from the digest conveys the seriousness of the enterprise as well as enthusiasm for real-world projects such as the CD ROM version of *The Oxford English Dictionary*. To order, write Eastgate Systems, P.O. Box 1307, Cambridge, MA 02238.—*Richard Rawles*



Hidden inside this hypertext file are possible future HyperCard concepts and other “hyper” ideas discussed at a 1987 conference.

EXTRAORDINARY DOCUMENTS
USING MERE ORDINARY PROGRAMS

You are looking at the leading edge in desk top publishing design. The distinctive documents featured here were created using ordinary page layout software programs such as PageMaker™, ReadySetGo™ and X-Press™. What makes them extraordinary is the innovative use of PostScript™ clip art, fonts and clip photography by Image Club.

Take a look at the art room and dark room of the future. The ArtRoom™ is a CD ROM disk which contains over 70 megabytes (125 disks) of Image Club clip art and fonts - our entire library on one convenient compact disk. The DarkRoom™ is our newest CD ROM - A 200 megabyte stock photo library containing over 400 useful clip photographs ideal for any publishing project.

The ArtRoom™ and DarkRoom™ CD ROM require a CD ROM disk drive such as the new Apple CD SC, Toshiba 2100A, or NEC's CD ROM drive.

The ArtRoom™ CD ROM Features:

- Digit-Art™ - Over 1000 high resolution encapsulated PostScript clip art images
- HotType™ - The complete set of over 100 fonts
- Pages™ - Over 50 pages of publishing templates
- ArtRoom Retriever™ - A handy desk accessory that lets you quickly access any image with the push of a button

- Font Juggler™ - Instantly installs fonts
- Network Compatibility - Your entire office can access the worlds grandest collection of clip art and fonts

The DarkRoom™ CD ROM Features:

- 400 photographs - in grey scale TIFF format
- Enlarge, reduce or crop without loss of quality
- Edit with Image Studio or Digital Darkroom

Image Club's famous clip art and font collections are available as separate floppy disk packages starting from \$99 or the entire \$2500 library on the ArtRoom CD ROM disk for \$999. The DarkRoom clip photography library is available only on CD for \$499. If you would like to try Image Club's clip art, fonts and clip photography, ask for the State of the Art trial package. A sample of PostScript clip art, clip photos, a type face and our 1988 product catalog for only \$59. To order the trial package or any Image Club product call 1-800-661-9410. For a dealer nearest you phone 800-535-0900. (800-874-8662 in Cal.) For more information call 403-250-1969.

Image Club Digit-Art volumes, HotType sets, The ArtRoom CD and the DarkRoom CD - creating extraordinary documents with mere ordinary programs.

TOSHIBA CD OFFER

Purchase the ArtRoom CD for \$999 direct from Image Club and receive a Toshiba CD ROM drive for only \$400.

\$1399
ArtRoom & Toshiba

\$1898
ArtRoom, DarkRoom & Toshiba



I M A G E C L U B

Image Club Graphics Inc. Suite 206, 2915 - 19 St NE Calgary, Alberta T2E 7A2 (403) 250-1969 Fax: (403) 291-4053

Circle 222 on reader service card

Fonts for Display



Designers will soon have a new set of tools at their disposal when Letraset ships a program, called LetraStudio, that is specially designed to handle display type in ways never before possible on the Mac.

For example, after typing out an advertising slogan and changing the type size to anything from 1 to 999 points (nearly 14 inches), you can choose from among a number of tools that distort or give perspective to the type. Select a tool, and a box with "handles" surrounds the slogan. Now click on any handle, move it, and the type moves too; you can slant it, change its height, and even flip it back on itself until it's upside down. Before Letraset, many of these tools were available only on much more expensive systems.

Other features enable you to edit fonts down to 1 pixel at a time, select half-tone templates, adjust letter or word spacing, vary the weight of strokes, fill a font or shadow with colors, use

ate any size font from any available font, no matter how many fonts are already in the System Folder.

Font Manager will ship by September, list at \$100, and include four Compugraphic typefaces. LetraStudio will cost under \$400, come with two typefaces, and ship by fall. For further information, call Letraset in Paramus, New Jersey, at 201/845-6100, and Compugraphic in Wilmington, Massachusetts, at 617/658-5600.

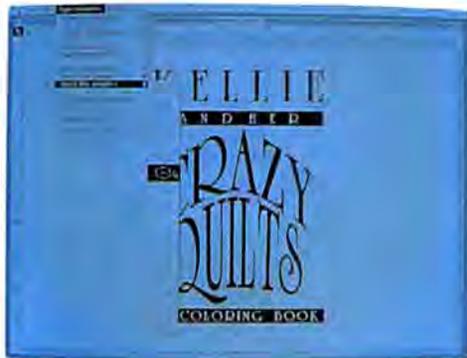
Color DTP with Video



Imagine a client arriving with a videotape that contains color images that are to appear in a brochure. Using a special card in your Mac II, you capture the video images right off a VCR. (You can also use scanned color images from slides, photographs, paintings, or printed materials.)

You then open up PageMaker 3.0 to a previously prepared

LetraStudio's specialty is creating headline-size display type using a host of graphic design tools, some of which wrap text around curves and circles.



Pantone colors, and string text along the inside or outside of any polygon or bezier curve.

Another type-oriented product, Compugraphic's Font Manager, provides editable screen fonts in sizes ranging from 9 to 127 points. Basically, Font Manager brings a font factory to the Macintosh; it allows you to cre-

brochure layout. Within moments, you've placed the color images in your proposed brochure. Now you get down to finalizing the design using a 21-inch color monitor that displays two full-size pages. It's exciting work. Twenty-four-bit color—with its 16.8 million available hues—gives you images of



Michael Maietta of RasterOps demonstrates his company's FrameGrabber card, which captures video images for DTP.

photographic quality. You see everything just as it will appear in print.

All this is now possible using a new 24-bit color FrameGrabber card from RasterOps. The FrameGrabber can store in memory any picture that appears in one of two formats: standard American television (NTSC) and red-green-blue (RGB).

Your 21-inch, high-resolution video screen is driven by the ColorBoard 244. This card supports monitors capable of resolving 1280 by 1024 pixels with 24-bit color using the Mac's standard full-size 72-dpi resolution. In addition, you can automatically pan across a much larger virtual screen: up to 2048 by 1024 pixels.

Should you want to try animations, the ColorBoard 244 includes an 8-bit Alpha channel that lets you move colored objects in front of a 24-bit image. Each movement can be recorded as a single frame and a series can be played back as a movie using a frame recorder.

As of press time, RasterOps was the only manufacturer delivering 24-bit color video cards to end-users. All other video cards for the Mac II are limited to 8 bits, or 256 colors. For further information, call RasterOps in Cupertino, California, at 408/446-4090.

HYPERCARD

Reports for HyperCard



Although sensational for inputting and viewing different kinds of data, HyperCard can print information only in a card format as pictured on screen. What's missing is the ability to print a list of all names appearing on all cards, for example. Coming to the rescue is Activision's Reports, which turns HyperCard into a powerful relational database with full report-generation capabilities, including full-page printouts.

To get an idea of how Reports works, consider a check-writing program created in HyperCard. Without Reports, you can print only the stack's cards, which in this case are likely to be just a series of checks. But with Reports you can sort financial records alphabetically, numerically, or by date, using up to 15 selection criteria. For instance, you can select checks from a certain time period, or checks relating only to utility costs, car payments, or food expenses. Then you can arrange this information in columns, add a heading and footer, and print the sorted material.

(continues)

Macintosh Accessories

Mac II Workstation

Everyone who needs the power of the Mac II also needs the space that the Monitor and Processor occupy. With no desk space to organize work and lay out projects, the Mac II's effectiveness is limited. The Mac II Workstation takes a totally new approach to workstation ergonomics. It provides a unique arm suspension system and shelf area giving the operator the ultimate in adjustability and space savings.

\$499.95

MacTilt SE

The Mac SE sitting on the desk leaves the screen too low for comfortable operation. MacTilt SE elevates the Mac 4" and provides 30° tilt and 360° rotation for better viewing and greater operator comfort.

\$89.95

Mouse Cleaner 360°

By regularly cleaning your Mouse, you can eliminate sluggish operation and expensive repair bills. By removing the grime from the tracking rollers, free cursor movement is quickly restored. Compatible with Macintosh, IBM, and any Mouse using either a 7/8" or 1" positioning ball.

\$16.95

MacTilt for Mac II & Large Screens

The same outstanding features and user benefits of the MacTilt SE are now available for your Large Screen Display or Mac II Monitor. Call for specific models.

\$89.95 - \$99.95

The Muzzle

The Muzzle protects your confidential files, documents, and software on your hard drive by preventing the Mac SE from being powered up. Models are also available which allow operation of the Mac SE, yet prevent access to the 3.5" disk drive for showroom and software demonstrations.

\$69.95

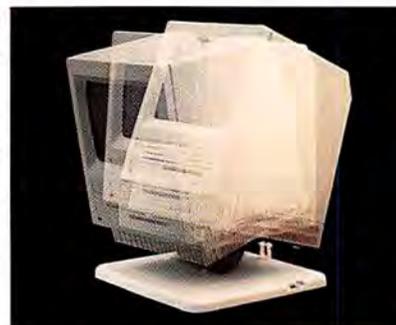
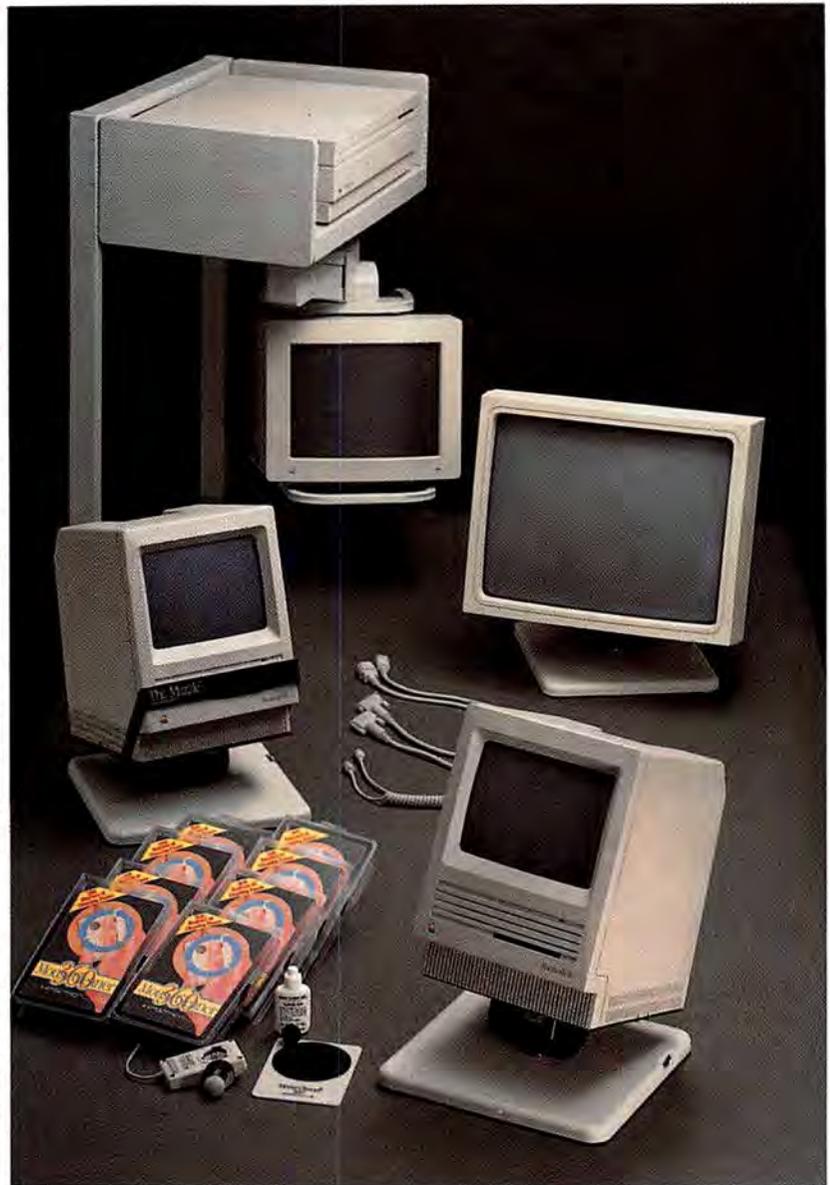
Mac Extension Cables

Ergotron's Extension Cables allow the user to position the Monitor or Keyboard up to 8' away from the Macintosh SE or Mac II.

\$30.00-\$45.00

Ergotron Accessories are available at your local Apple Dealer or Distributor including Bonsu, Micro D, and Ingram. In Canada contact Softcode.

Ergotron, Mac II Workstation, and MacTilt SE are registered trademarks of Ergotron, Inc. Mouse Cleaner 360° is a trademark of Ergotron, Inc.



ERGOTRON[®]

3450 Yankee Drive
Eagan, MN 55121
612/452-8135 • 800/888-8458

Circle 148 on reader service card

Reports also brings you calculated fields and five levels of sorting. You can relate information from multiple stacks, use any combination of font sizes and styles, include graphics, do mail merge with automatic formatting, and order chained reports for unattended printing.

In fact, Reports is so powerful that Activision expects many software developers and shareware authors to use a runtime version within their own HyperCard-based applications. For instance, a complicated accounting system written in HyperCard could have all printing handled by Reports. Users probably wouldn't know Reports was at work nor would they mind paying the pennies Activision expects to charge for each copy of run-time Reports. As an application, Reports lists for \$99. For more information, call Activision in Mountain View, California, at 415/960-0518.

Programming Secrets

 If you want to learn how to program the Macintosh, the first thing you need to do is distinguish among the Scott K's. There's a Kronick (that's me), a Knaster (whose book is being reviewed here), and a Kamins (who wrote manuals for Apple). These three Scotts do little else but write about Macintosh programming.

The rules for distinguishing among the three Scotts are simple:

To begin learning how to program in Pascal or MPW assembly, you read Kronick. If you're already an accomplished programmer and you want to know why your programs still don't run worth a darn, you read Knaster. If you know ev-

erything in Kronick's and Knaster's books, you read Kamins to determine if you want a job writing code for Apple.

Knaster's second book, *Macintosh Programming Secrets* (Addison-Wesley, 1987), continues where his first book, *How to Write Macintosh Software* (Hayden Books/Howard W. Sams, 1986), left off. In it, he ex-



Scott Knaster's programming books are well known among professional Mac programmers.

plores the common problem areas of experienced Macintosh programmers.

Don't be misled by the simple names of Knaster's books. They do not offer introductory material or language tutorials of any sort. This is precisely the value of Knaster's contribution: his books really help professional programmers solve problems specific to the Macintosh.

Knaster has lots of experience with third-party developers' questions, and he addresses issues confidently and fluidly. He offers sometimes-irreverent explanations of design decisions, which makes reading the technical material more fun.

Final note: Addison-Wesley and Hayden Books/Howard W. Sams deserve mention for the high quality of their books. They use clean white paper, firm bindings, and sharp covers. They're a refreshing contrast to the companies that make ugly books with brownish paper rough enough to give splinters.—*Scott Kronick*

Making Slides Easy



Options that let the Mac user create business presentation slides are multiplying. Three new film recorders—Matrix Computer Graphics' ProColor, Mirus Corporation's FilmPrinter, and LaserGraphics' Personal Film Recorder—have joined Presentation Technologies' ImageMaker, which has had the Mac market largely to itself.

At 8000 lines per inch, ImageMaker has the highest degree of text resolution available because it uses fully formed letters, a technology similar to that used in daisy wheel printers. That technology also limits the product, as the Mac community is used to having WYSIWYG output without the daisy wheel's restrictions as to number, size, or style of fonts (each new size or style of font requires a new daisy wheel). Priced at less than \$5000, ImageMaker works with most software and all Macs.

In the same price range is LaserGraphics' Personal Film

Recorder, which works with any Mac and most software. It offers only 4000- and 2000-line resolution but greater speed. In addition to the standard 35mm film camera, there's a Polaroid camera available for proofing.

More expensive (\$6995), but claiming a superior image, is Matrix's ProColor. This recorder should be available in September, for the Mac II only. It will be compatible with any software that supports the PICT file format and will have a resolution of 4096 lines.

Mirus's FilmPrinter, priced at about \$6000, supports 35 LaserWriter fonts in any size and 16 million colors. Resolution is up to 8000 lines per inch.

For those who can't justify the cost of one of these units, a slide production service remains a viable alternative. For further information, call Presentation Technologies in Sunnysvale, California, at 408/749-1959; LaserGraphics in Irvine, California, at 714/660-9497; Matrix Computer Graphics in Orangeburg, New York, at 914/365-0190; and Mirus Corporation in Los Altos, California, at 415/949-5544.—*Scott Beamer*



Film recorders like LaserGraphics' PFR, Matrix's ProColor, and Presentation Technologies' ImageMaker Plus (left to right) bring new color capability to the Mac.

Even the most sophisticated desktop publishing system is incomplete without VeloBind.

Don't let your desktop publishing stop at the printer.

Complete it with VeloBind, the only binding solution that transforms the promise of desktop publishing into reality. VeloBind provides the crucial, finishing touch to desktop publishing by turning any printed material into impressive, authoritative documents. Desktop publishing that increases your document's chances of being noticed, read, and accepted.

Only VeloBind allows you to "publish" your desktop publishing



in a library-quality hard cover. In under a minute. Or choose from a wide variety of soft cover materials and colors. Even without a cover, desktop publishing bound with VeloBind looks more professional.

All on your desktop.

VeloBind binding systems are compact, fast and easy to operate. Binding that complements your desktop publishing and creates a positive reflection on you. So do yourself — and your desktop publishing — justice. Visit your local computer or stationery store today or call us for more information. Or stop by your local copy shop and use their VeloBind system to

complete your desktop publishing.

Because, after all, your desktop publishing is just a stack of paper until it's bound. With VeloBind.



VeloBind

The desktop binding for desktop publishing.

650 Almanor Avenue, Sunnyvale, CA 94086
(800) 672-1822 (inside California)
(800) 538-1798 (outside California)



Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Macintosh is a trademark of Apple Computer, Inc. VeloBind is a registered trademark of VeloBind, Inc.

Circle 27 on reader service card

High-End CAD

Question: What CAD software has 150,000 users on Suns, Apollos, DECs, IBMs, and clones, and will soon run on a 4MB-8MB Macintosh II with full file-interchangeability among all? **Answer:** AutoCAD version 10, with 3-D wire-frame functionality, surface modeling, 41 third-party software products, and a price tag of \$3000.

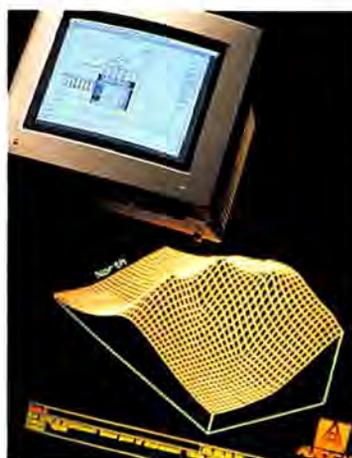
First shown publicly at A/E/C Systems '88 as a Mac port from the MS-DOS version, its user interface and operation will appeal mostly to present AutoCAD users. Unless the final released version becomes more Mac-like, Mac II users will find that it doesn't take advantage of Mac capabilities that they take for granted, including copying and pasting from the Clipboard into AutoCAD, multiple windows and multiple screens, Mac fonts and fill patterns, and on-screen icons instead of text menus. Autodesk says its first release of AutoCAD has some basic Mac functionality; next year's version will have much more Mac compatibility. No performance comparisons are available yet, but the Mac version—4MB RAM resident—

may prove to be faster than the MS-DOS version, which requires frequent disk accesses.

AutoCAD's 3-D capabilities extend its 2-D drawing tools. When you have selected a construction plane in 3-D space, the AutoCAD drawing tools enable you to create 3-D wire frames on that plane. You can create 3-D surfaces by rotating simple or complex lines; by using 3-D polylines, 3-D meshes, tabulated cylinders, or ruled surfaces; or by defining Coon's surfaces (surface patches). Dynamic viewing allows rotation of a 3-D model in real time. Also available is a choice of parallel or perspective projection, as well as dynamic pan and zoom. You can display 3-D images from one of 16 viewpoints.

The Mac version of AutoCAD will support AutoLISP (a programming language for creating macros) without the severe 640K memory limitations of MS-DOS machines. Users will be able to customize menus to meet their needs, and objects in a drawing can be included in a database automatically.

The availability of AutoCAD and third-party products firmly establishes the Mac II as a viable CAD platform for even the



AutoCAD for the Mac creates many kinds of 3-D images.

most demanding user. It also opens up the Mac to a host of specialized applications previously unreachable with Mac mechanical and AEC CAD software. Such applications include parametric drafting, piping, chemical engineering, mapping, and new areas in computer-aided manufacturing and structural and civil engineering. Release 10 will output to both laser printers and industry-standard plotters.

Autodesk will have version 10 available by September this year. In a unique upgrade offer, the company may prompt a user exodus to Macs. When upgrading from version 9 for \$250, current AutoCAD users will be given a choice of switching platforms and receiving the Macintosh version. For further information, call Autodesk in Sausalito, California, at 415/331-8093.—David Peltz

Macworld News: Readers' Views

This month's reader survey focuses on brands and storage capacities of hard disks. We received 537 responses from a survey sent to 1000 randomly selected *Macworld* readers. Of those, slightly over two-thirds,

68.7 percent, use a hard disk with their Mac.

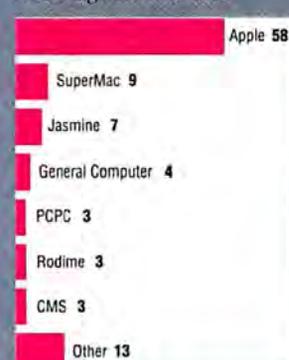
Not surprisingly, the favorite brand was Apple, with 58 percent usage, followed by SuperMac and Jasmine with 9 and 7 percent, respectively.

The most popular drive size was 20 megabytes, 68 percent usage; 40MB drives scored 15 percent usage. Only 4 percent of the respondents preferred hard disks with less than 20MB. Respondents split about evenly between internal and external mounting (48 and 52 percent, respectively).

If you're curious about your fellow readers' Mac habits, send your suggested questions to News Editor, *Macworld*, 501 Second St., San Francisco, CA 94107.

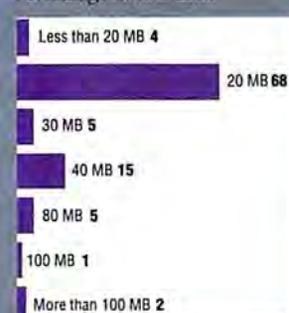
Hard Disk Usage

Percentage of brand used



Based on 354 respondents.

Percentage of size used



Based on 358 respondents.

Apple takes the lion's share of the Macintosh hard-disk market, while other suppliers compete for what's left.



Bill Atkinson (left) shares the second annual Andrew Fluegelman Award with PageMaker developers Jeremy Jaech, Ted Johnson, and Clyde McQueen (right). PCW Communications chair David Bunnell presents the award.

Order today.

Visit us at the
MacWorld Exposition
in Boston, MA
August 10-13, Booth 1540
Bayside Exposition Center

SOFTWARE

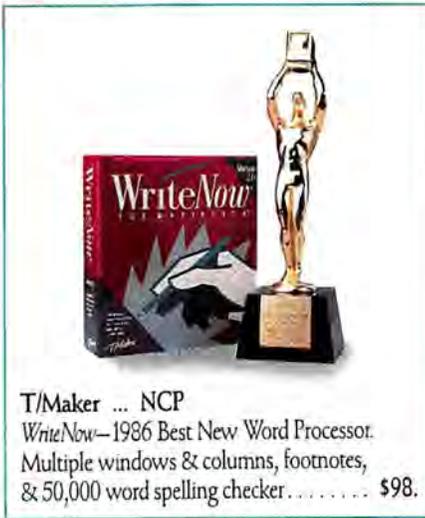
NCP denotes not copy-protected.
CP denotes copy-protected.

Aba Software ... NCP
"Draw it again, Sam" (paint program) ... \$89.
Access Technology ... NCP
MindWrite (outlining & word processing) ... 95.
Trapeze (spreadsheet & graphics) ... 159.
Activision ... NCP
Postcards (clip-art, card stock) ... 20.
Business Class or City to City ... 30.
Focal Point or Reports! ... 59.



Chang Labs ... NCP
Rags-to-Riches (AR, AP, GL)—Now thru Aug. 31,
place an order of \$250 or more (any products)
from MacConnection, and you may choose
one of Chang Labs top-rated accounting
modules for only \$19. Limit 1 per customer.

Adobe Systems ... NCP
Adobe Illustrator '88 ... 325.
Adobe Type Libraries ... call
Newsletters (Century Old Style, ITC Franklin
Gothic, ITC Galliard) ... 269.
Aegis Development ... NCP
Doug Clapp's Word Tools ... 42.
Affinity Microsystems ... NCP
Affinifile (DA filer) ... 46.
Tempo II (power user's macro utility) ... 89.
Allan Bonadio Associates ... NCP
Expressionist 2.0 (equation processor) ... 84.
ALSoft ... NCP
DiskExpress (maximize disk performance) ... 26.
Font/DA Juggler Plus (w/sound utility) ... 32.
Altsys ... NCP
FONtastic Plus 2.0 (advanced font editor) ... 54.
Fontographer (LaserWriter font editor) ... 239.
Ashton-Tate ... NCP
FullPaint (expanded paint program) ... 69.
FullWrite (the wait is over!) ... 275.
dBASE Mac (relational, req. MacPlus) ... 295.
Berkeley System Design ... NCP
Stepping Out II (screen extender) ... 54.



T/Maker ... NCP
WriteNow—1986 Best New Word Processor.
Multiple windows & columns, footnotes,
& 50,000 word spelling checker ... \$98.

Blyth ... NCP
Omnis 3 Plus/Express (database) ... 275.
Omnis 3 Plus/Express (2-5 users) ... 489.
Bogas Productions ... NCP
Studio Session (music creation) ... 49.
Country, Heavy Metal, or String Quartet ... 15.
Borland International ... NCP
Turbo Pascal Tutor ... 46.
Sidekick (includes MacPlan) ... 59.
Numerical Methods Toolbox ... 65.
Turbo Pascal (HFS compatible) ... 65.
Eureka: The Solver ... 129.
Reflex Plus (info management tool) ... 165.
BrainPower ... NCP
StatView (statistics package) ... 32.
StatView 512+ (full-featured) ... 175.
DataScan (converts charts to num. data) ... 119.
DesignScope (electronic circuit design) ... 128.
MathView Professional (num. analysis) ... 145.
Bravo Technologies ... NCP
MacCalc (easy to use spreadsheet) ... 79.
Bright Star Technology ... NCP
Alphabet Blocks (teaches phonetic sounds) ... 32.
Broderbund ... CP
Jam Session (create your own tunes) ... 30.
Print Shop (create cards and memos) ... 36.
Geometry or Physics ... 60.
CAMDE ... NCP
Nutri-Calc (diet & nutrition analysis) ... 39.
Nutri-Calc Plus (full-featured program) ... 175.
CasadyWare ... NCP
Fluent Fonts (two-disk set) ... 27.
Fluent Laser Fonts (Vols. 1-18) ... each 45.
CE Software ... NCP
Calendar Maker (create custom calendars) ... 28.
Disktop (powerful DA Finder) ... 28.
QuicKeys (reduce mouse movements) ... 54.
Challenger Software ... NCP
Mac3D (3D graphics, CAD features) ... 119.
Chang Labs ... NCP
Rags to Riches 3-Pak (GL, AR, & AP) ... 289.
C.A.T. (contacts, activities, time) ... 239.
Inventory Control or Professional Billing ... 239.
Professional or Retail Business 3 Pak ... 359.
Cricket Software ... NCP
Pict-O-Graph (color on the Mac II) ... 105.
Cricket Graph (multiple windows) ... 119.
Cricket Draw (advanced draw capabilities) ... 169.

Cricket Presents (MacPlus, SE & II) ... \$289.
DataViz ... NCP
MacLink Plus (transfer Mac/IBM data) ... 145.
Davidson ... CP
Math Blaster! (grades 1-6) ... 27.
Deneba Software ... NCP
Merriam-Webster's Thesaurus ... 36.
Comment (electronic Post-It notes) ... 54.
Canvas DA (contains 80% of Canvas) ... 54.
Canvas 1.0 (free upgrade to 2.0) ... 109.
Coach (interactive spell checker) ... 54.
Coach Professional ... 109.
Dow Jones ... CP
Desktop Express (documents via MCI mail) ... 95.
Dubl-Click Software ... NCP
Calculator Construction Set ... 36.
World-Class Fonts! (both volumes) ... 36.
WetPaint Clip Art (both volumes) ... 36.
Electronic Arts ... NCP
Thunder! (Batteries Included spell checker) ... 30.
Disk Tools Plus (8 DAs plus tools) ... 31.
Deluxe Music Construction Set ... 61.
Enzan-Hoshigumi USA ... NCP
MacCalligraphy (create unique designs) ... 109.
Japanese Clip Art ... call
Farallon Computing ... NCP
MacRecorder™ Sound System ... 145.
Fifth Generation Systems ... NCP
Suitcase (font and DA utility) ... 37.
PowerStation (alternative to Finder) ... 37.
FastBack Mac (powerful backup utility) ... 54.
1st Byte ... CP
First Shapes, KidTalk, MathTalk Fractions,
MathTalk, SmoothTalker, Speller Bee ... each 32.
Forethought ... NCP
Factfinder 1.1 (information organizer) ... 35.
FileMaker 1.0 (custom design reports) ... 39.
Foundation Publishing ... NCP
Comic People (create your own characters) ... 25.
Comic Strip Factory (create cartoons) ... 45.
FWB Software ... NCP
Hard Disk Partition ... 45.
Hard Disk Util (program backup) ... 54.
Great Wave Software ... NCP
TimeMasters (learn about time, ages 4+) ... 22.
KidsTime (educational, ages 3-8) ... 26.
American Discovery (U.S. facts & fun) ... 39.
Crystal Paint (graphic symmetries) ... 41.



BrainPower ... NCP
StatView 512+—The professional's data analysis
package. Includes descriptive and comparative
statistics, multi-variate and factor analyses,
graphics and more ... \$175.

SAVE
\$23⁴⁰

*off the
cover
price*

12 Issues for \$24!

When you subscribe today

Send me 1 year (12 monthly issues) of *MACWORLD* for \$24. Save 20% off the basic subscription rate.

SAVE EVEN MORE! 2 years (24 monthly issues) for \$37.90.

Please Bill me later.

4BWM8

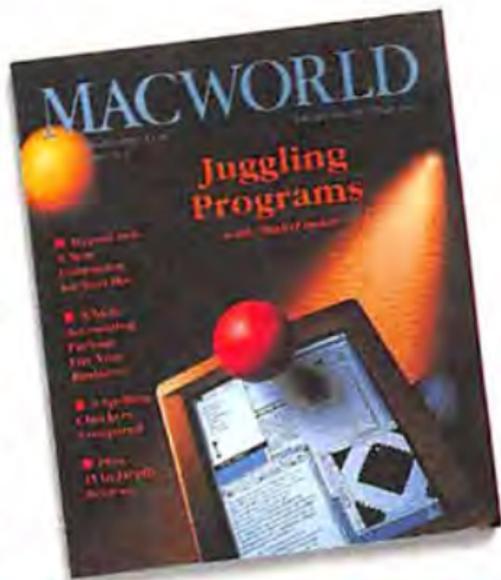
Name _____

Company _____

Address _____

City/State/Zip _____

By regular subscription, *MACWORLD* is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



MACWORLD

SAVE

ALMOST

50%

SEE
BACK



NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666





“Unfortunately I was in the shower.”

“Dear MacConnection,

“I ordered some programs and disks late yesterday afternoon and the person taking the order said that it would be delivered today.

“Well I was shocked when the buzzer went off at 9:20 AM with my order. Unfortunately I was in the shower. But I got it and

everything checked out. Great work! I’ve ordered from you and other vendors in the past, but your service and honesty about your stock is a great relief. There is no need to look elsewhere—even for a few dollars less—than MacConnection.

“Thanks.”

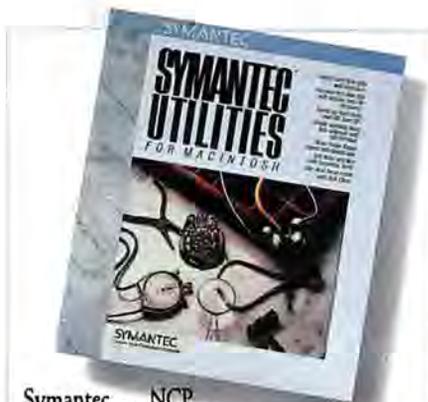
William Lombardo
Modelmaker & Illustrator
New York, NY

MacConnection™

14 MILL STREET, MARLOW, NH 03456 1-800/622-5472 603/446-7711 FAX 603/446-7791

© Copyright 1988 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc., Marlow, NH.

For just \$3.



Symantec ... NCP
Symantec Utilities for the Macintosh (SUM)—recovers files from crashed hard disks. Also optimizes disk space, and does fast floppy duplication (formerly MacZAP). \$59.

Simon & Schuster ... NCP
 Typing Tutor IV (typing instruction) 35.

SmethersBarnes ... NCP
 Prototyper (design & edit prototypes). 75.

SoftStyle ... NCP
 Epstart (Epson printer driver, CP) 27.
 Laserstart (Hewlett-Packard Laserjet, CP) 58.
 Printworks for the Mac (Dot Matrix) 43.
 Printworks for the Mac (Daisywheel) 56.
 Printworks for the Mac (non-PostScript™) 85.

SoftView ... NCP
 MacInUse (time-use manager). 42.
 TaxView Planner 1987-1991 49.

Software Discoveries ... NCP
 Merge Write (MacWrite mail merge) 35.
 Record Holder Plus (data manager) 45.

Software Ventures ... NCP
 Microphone 1.1 (includes Glue™) 119.
 Microphone II (MultiFinder compatible) 229.

Solutions, Inc. ... NCP
 SmartScrap & The Clipper 35.
 SuperGlue (total graphic integration) 52.
 The Curator (access your artwork) 79.

Springboard ... CP
 Art a la Mac Volume 1 or 2 (NCP) 23.
 Early Games (counting, shapes, ages 2-6) 28.
 Certificate Maker (over 200 certificates!) 24.
 Certificate Maker Library Vol. 1 18.

SuperMac Software ... NCP
 SuperSpool 4.0 (very fast, top-rated) 54.
 SuperLaserSpool 2.0 82.
 Multi-User SuperLaserSpool 199.
 Diskfit (backup & restore utility) 54.
 Network Diskfit (automatic back up) 199.
 Sentinel (encryption) 155.
 PixelPaint (color Paint program) 259.

Survivor Software ... NCP
 MacMoney (personal finance) 62.

Symantec ... NCP
 SUM (comprehensive disk utilities package) 59.
 More (Living Videotext outliner) 175.

Symantec/THINK Technologies ... NCP
 HFS Navigator (search for buried files) 34.
 Laserspeed (LaserWriter utility) 55.
 Lightspeed Pascal (great debugger) 65.
 Lightspeed C (top-rated C Compiler) 95.
 CAPP's for Lightspeed C or Pascal 49.
 InBox Starter Kit (CP) 199.

InBox Personal Connection (Mac or PC) . . . call

Symantec/Turner Hall ... NCP
 MacSQZ! (use w/Microsoft Excel) 49.

Symmetry ... NCP
 Acta (outline/writing desk accessory) 36.
 HyperDA (access HyperCard stacks) 38.
 PictureBase (clip art manager, 512k) 58.

3G Graphics ... NCP
 Images with Impact (PostScript™ clip art) . . . 59.

Telegraphics ... NCP
 HyperTutor (HyperTalk tutorial) 30.

Think Educational ... CP
 MacEdge II or Mind Over Mac 28.

T/Maker ... NCP
 ClickArt Personal Graphics, Effects, Publications, Letters Vol. 1 or 2,
 Holidays, Business Images each 28.
 Christian Images 35.
 Bombay, Plymouth, or Seville Laser font 45.
 EPS Illustrations (over 3 Meg's worth) 75.
 Write Now (word processor w/spell checker) 98.

TOPS ... CP
 TOPS Teleconnector (DIN8 or DB9) 39.
 TOPS (file-server/LAN software) 119.
 TOPS Repeater 132.

Deneba ... NCP
Canvas—incorporate object-oriented and bit-mapped graphics in the same layer. Buy now and get a free upgrade to version 2.0 (a \$100 value). \$109.

Traveling Software ... NCP
 LAP-LINK Mac (connect Mac to IBM-PC) . . . 85.

True BASIC ... NCP
 LANGUAGE & TOOLKITS
 True BASIC (interpreter & compiler) 59.
 3D Graphics, Sorting & Searching, Advanced String, Business Graphics, Scientific Graphics or Mathematicians Toolkit each 49.

EDUCATIONAL SOFTWARE
 Algebra I or II, Pre-Calculus, Trigonometry, Discrete Math, Probability, Calculus, Arithmetic & MacFunction each 35.
 TrueSTAT (statistics) 49.

Unicorn ... CP
 Animal Kingdom (ages 6-12) 27.
 Math Wizard (math games, ages 5-10) 27.
 Read-A-Rama (reading, ages 5-8) 32.

William & Macias ... NCP
 DiskFinder (DA disk catalog) 29.
 myDiskLabeler w/Color (req. ImageWriter II) 31.
 myDiskLabeler w/LaserWriter option 34.

WordPerfect ... NCP
 WordPerfect Mac (word processor) 185.

Working Software ... NCP
 Lookup (90,000 word dictionary) \$29.
 Findswell (locate documents fast) 29.
 Spellswell (spelling checker) 42.
 Spellswell Legal or Medical Dictionary 54.

GAMES

Accolade ... CP
 Hardball (baseball simulation) 23.

Activision ... CP
 Shanghai (Mah Jongg strategy) 24.

Addison-Wesley ... CP
 Puppy Love (you and your dog will love it!) 19.

Avalon Hill ... CP
 MacPro Football (req. 1 Meg) 28.

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

Blue Chip ... CP
 Millionaire (stock market simulation) 35.

Broderbund Software ... CP
 Lode Runner or Ultima III 24.
 Ancient Art of War (military strategy) 27.
 Toy Shop (create working models) 30.

Bullseye ... CP
 Ferrari Grand Prix or Fokker TriPlane 32.

Electronic Arts ... CP
 Skyfox, Pinball Construction Set,
 Dr J vs Larry Bird each 15.
 Ogre (tank simulation) 20.
 Patton vs Rommel or Scrabble 27.
 Chessmaster 2000 28.

Epyx ... CP
 Sub Battle Simulator (NCP) 24.
 Winter Games (Olympic events) 24.

Greene, Inc. ... CP
 Crystal Quest (top-rated color arcade) 24.

Hayden Software ... CP
 Sargon III (9 levels of chess) 29.

Infinity Software ... CP
 Go or Grand Slam Tennis 27.

Infocom ... CP
 Leather Goddesses, Bureaucracy,
 Borderzone, Lurking Horror each 24.
 Beyond Zork 30.
 Classic Mystery Library: Moonmist,
 Suspect, & Witness 36.



Personal Computer Peripherals ... 2 years
MacBacon—High performance hard drives (21, 32, 45, or 70 Meg) with optional built-in modem. Formatted & ready to plug in. Includes spooler, back-up, & other utilities. . . see listing

Get it tomorrow.

ConcertWare+ (music composition)	\$39.
ConcertWare+ MIDI	79.
Greene, Inc. ... NCP	
QuickDEX (address book)	32.
Hayden Software ... CP	
Score Improvement for the SAT	58.
Hayes ... NCP	
Smartcom II (communications)	88.
Ideaform ... NCP	
MacLabeler or DiskQuick	27.
HyperBook Maker (print stacks into book)	31.
Imagine ... NCP	
Smart Alarms (DA reminder system)	35.
Multi-user Appointment Diary	85.
Infosphere ... CP	
LaserServe (network software)	62.
ComServe (NCP, modem sharer)	124.
MacServe (network software)	158.
Innovative Data Design ... NCP	
MacDraft (object-oriented graphics)	149.
Intuit ... NCP	
Quicken (personal accounting)	35.
Kent Marsh Ltd.	
The NightWatch (hard disk security)	89.
MacSafe (advanced security program)	89.
LaserWare ... NCP	
LaserPaint Color II (256 gray scales)	379.
Layered ... CP	
Notes for...Excel, Works or Word	40.
Learning Company ... CP	
Reader Rabbit (ages 4-7)	33.
Letraset ... NCP	
Image Studio or Ready,Set,Go!4	279.
Linguist's Software ... NCP	
Tech (1000 different symbols)	59.
LaserTech	79.
FOREIGN LANGUAGE FONTS	
SuperFrench/German/Spanish	39.
MacKana/Basic Kanji	39.
MacHebrew, MacKanji, MacKorean, MacThai, MacGreek, MacCyrillic	each 59.
MacHebrew Scriptures	79.
MacGreek New or Old Testament	79.
MacChinese (supplements available)	79.
MacGreek/Hebrew/Phonetics	89.
FOREIGN LANGUAGE LASER FONTS	
LaserFrench/German/Spanish	79.
LaserGreek or LaserHebrew	79.

Lundeen & Associates ... NCP	
WorksPlus Spell (spell checker for Works)	\$46.
WorksPlus Command (macros for Works)	60.
MacroMind ... NCP	
VideoWorks II (animation tool)	118.
VideoWorks II Accelerator or Driver for HyperCard	61.
MacroPac International ... NCP	
101 Macros for Excel	44.
Manhattan Graphics ... NCP	
Ready,Set,Show (presentations)	289.
MECA ... NCP	
Managing Your Money (finance)	129.
Microlytics ... NCP	
Word Finder (synonym finder)	35.
GOfer (text finder)	45.
Microseeds Publishing ... NCP	
Redux (fast & easy backup utility)	65.
Microsoft ... NCP	
Basic Interpreter 3.0	62.
Chart 1.02 (42 chart styles, CP)	79.
Microsoft Write 1.0 (w/spell checker)	113.
Multiplan 1.1	119.
File 1.05	119.



Enzan-Hoshigumi ... NCP
Mac Calligraphy—The cultural scripting of the East comes to your Mac. Helps you picture your words in a thousand ways. Includes Japanese clip-art **\$109.**



Microlytics ... NCP
GOfer—Where's that letter? Which memo mentioned coffee breaks? Find them fast! *GOfer* quickly searches all your text files for keywords & tells you what's buried where **\$45.**

Nashoba Systems ... NCP	
FileMaker Plus (feature-packed database)	149.
Nolo Press ... NCP	
WillMaker 3.0 (prepare your own will)	35.
North Edge Software ... NCP	
Timeslips III (time & expense tracking)	119.
Odesta ... NCP	
GeoQuery (geographical database)	299.
Double Helix II (relational, custom menus)	339.
Olduvai Software ... NCP	
DA-Switcher (unlimited desk accessories)	25.
Post ART (clip art, 3 disk set)	35.
Icon-It! (create custom icon bars)	39.
FontShare (share PostScript™ fonts)	149.
Read-It!TS (OCR software for Thunderscan)	79.
Read-It! (300 dpi OCR software)	199.
OWL International ... NCP	
Guide 2.0 (hypertext, free-form info)	119.
Palantir ... NCP	
MacType (typing instruction)	31.
inTalk (communication to emulation)	119.
Passport Designs ... CP	
Mastertracks Jr.	109.
Mastertracks Pro (music editor)	259.
Peripherals Computers & Supplies ... NCP	
KaleidaGraph (data analysis & graphics)	125.
VersaTerm (terminal emulator/comm.)	135.
VersaTerm-PRO (powerful terminal prog.)	199.
Personal Computer Peripherals ... NCP	
HFS Backup	28.
Postcraft International ... NCP	
Laser FX (PostScript™ fonts special effects)	115.
ProVUE Development ... NCP	
OverVUE (power-packed database)	149.
Rubicon Publishing ... CP	
Dinner At Eight-Encore Edition Bundle	51.
Satori ... NCP	
BulkMailer 3.2 (mailing lists)	79.
BulkMailer Plus (up to 90,000 names)	195.
Legal Billing (attorneys to accountants)	369.
Project Billing (architects to engineers)	439.
Sensible Software ... NCP	
Sensible Grammar	55.
Silicon Beach Software ... NCP	
Silicon Press (printer utility, 512k)	41.
World Builder (program creator)	41.
SuperPaint (advanced graphics program)	79.
Super3D (3D modeling & animation)	159.



Aba Software ... NCP
"Draw it again, Sam"—Object-oriented drawing program with ten layered drawing planes. Produce color separations or cell animation. Includes graphic library **\$89.**

Basic Compiler 1.0	125.
Fortran 2.2 (compiler)	189.
Works 1.1 (integrated tool)	189.
Microsoft Mail (up to four users)	195.
Microsoft Mail (up to 10 users)	325.
Microsoft Mail (up to 20 users)	499.
Excel 1.06 (power spreadsheet)	249.
Word 3.02 (powerful word processor)	249.
PowerPoint 2.0 (presentations)	249.
Migent ... NCP	
In House Accountant (small business)	119.
Miles Computing ... NCP	
Orchestra of Fonts Vol. 4	special 19.
Mac the Ripper Vol. 3 (req. Paint program)	27.
Peoples, Places & Things Vol. 5	27.
Mindscape ... NCP	
The Perfect Score: SAT (CP)	46.
ComicWorks (create your own comics)	47.
GraphicWorks (newsletters & posters)	84.
Monogram ... NCP	
Dollars & Sense (home, small business)	81.
Business Sense (full-featured)	279.
Nantucket ... NCP	
McMax (dBASE III compatible)	175.

What's hot & co

Science Fiction Classics: Hitchhiker's, Planetfall, & A Mind Forever Voyaging . . .	\$36.
Zork Trilogy	42.
MacroMind ... NCP	
Mazewars+ (play via modem or network) . . .	31.
Microsoft ... CP	
Flight Simulator (the Mac takes flight)	32.
Micro Sports ... NCP	
MSFL Pro League Football	32.
Miles Computing ... CP	
Down Hill Racer (3D ski simulation)	24.
Harrier Strike Mission II	27.
Fool's Errand (puzzles, mazes and more) . . .	27.
Mindscape ... CP	
Trust & Betrayal: The Legacy of Siboot,	
Crossword Magic, Balance of Power, Deja Vu,	
Shadowgate, Uninvited each	30.



Chang Labs ... 5 years
C.A.T.—Powerful relational database for managing Contacts, Activities, and Time. Use to organize events, meetings, day-to-day projects, expense reports, personnel records, etc. **\$239.**

Olduvai Software ... NCP	
Maze Survival (action game)	21.
PBI Software ... CP	
Strategic Conquest (multi-user)	35.
Primer Software ... CP	
Smash Hit Racquetball II	22.
Psion ... CP	
Psion Chess (3D and multi-lingual)	31.
Sierra On-Line ... CP	
Leisure Suit Larry (swinging single life) . . .	23.
King's Quest I, II, or III	30.
Space Quest (save the universe!)	30.
Silicon Beach Software ... NCP	
Airborne! (CP, digitized sounds)	20.
Enchanted Scepters (CP, over 200 scenes) . . .	21.
Dark Castle (top-rated arcade action)	27.
Beyond Dark Castle (super sequel)	27.

Apache Strike (3D helicopter action)	\$27.
Simon & Schuster ... CP	
Star Trek—The Kobayashi Adventure	24.
Promethian Prophecy	24.
Sir-Tech ... CP	
Mac Wizardry (high-rated fantasy)	35.
SPHERE, Inc. ... NCP	
PT-109 (torpedo boat simulation)	26.
GATO (submarine simulator)	26.
Orbiter (space shuttle simulation)	26.
Falcon (F-16 flight simulation)	26.
XOR ... NCP	
Pro Challenge (football)	30.
NFL Challenge (willustrated handbook)	64.

HARDWARE

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

1 Meg SIMMs	call for availability.
Abaton ... lifetime	
ProPoint ADB for Mac SE or II	117.
Asher Engineering ... Lifetime	
Turbo Trackball (specify Mac)	79.
AST Research ... 6 months	
Mac 286 (MS-DOS on your Mac II)	call
AST TurboScan (300 dpi scanner)	call
AST TurboScan (flatbed scanner)	call
AST TurboLaser P/S	call
Curtis Manufacturing ... lifetime	
SURGE SUPPRESSORS	
Safestrip (6 outlets)	21.
Diamond (6 outlets)	32.
Emerald (6 outlets; 6 ft cord)	36.
Sapphire (3 outlets; EMI/RFI filtered)	47.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) . .	59.
Datadesk ... 2 years	
MAC-101 (high-performance keyboards for the Mac 512, Plus, SE or II) each	139.
HyperDialer (auto-dial for Mac & HyperCard) . .	26.
Dove Computer ... 90 days	
Toolkit (clamp, torx driver & wrist strap)	15.
SCSI Interface/Port	85.
MacSnap 524E (512E to 1 Meg)	195.
MacSnap 524 (512k to 1 Meg)	195.
MacSnap 524S (512E to 1 Meg w/SCSI)	219.
MacSnap 548E (512E to 2 Meg)	389.
MacSnap 548 (512k to 2 Meg)	399.
MacSnap 548S (512E to 2 Meg w/SCSI)	479.
MacSnap 2S (1 Meg to 2.5 Meg)	call
MacSnap 2SE (Mac SE to 2 Meg)	299.
MacSnap 4S (1 Meg to 4 Meg)	call
MacSnap 8S (for Mac II, to 8 Meg)	call
MacSnap Plus 2 (MacPlus to 2 Meg)	299.

MacSnap Plus 2H (MacPlus to 2.5 Meg)	call
MacSnap Plus 4H (Plus/II to 4 Meg)	call
68020 ACCELERATOR BOARDS FOR MAC SE	
Model MSE 1 (16 MHz, 0 Meg of memory)	585.
Model MSE 2 (MSE 1 with 1 Meg)	779.
Model MSE 3 (MSE 1 w/math co-processor)	779.
Model MSE 4 (MSE 1 with 1 Meg & math co-processor)	975.
1024 Option (1 Meg accelerator or Mac II memory expansion)	299.
Math Kit (math co-processor chip set)	225.
Ergotron ... 1 year	
Mouse Cleaner 360°	15.
MacTilt or MacTilt SE	68.
MacTilt (for large monitor)	85.
Farallon Computing ... 1 year	
PhoneNET-AppleTalk 120	9.
PhoneNET PLUS (DB-9 or DIN-8)	36.
PhoneNET StarController™	1395.
PhoneNET Punch Down Block Wire Kit	69.
TrafficWatch (monitor network)	159.
Hayes ... 2 years	
Smartmodem 1200	299.
Smartmodem 2400	449.
MacPlus/SE/II 1200 or 2400 Package	call
Kensington ... 1 year	
Mouseway (mouse pad)	8.
Mouse Pocket (ADB)	8.
Mac Plus/Mac SE Cover	9.
Printer Stand	16.
Disk Drive Cleaning Kit	20.
Macintosh II Stand	20.
Universal Copy Stand	22.
Extra Long ADB Keyboard Cable	25.



Kensington ... 1 year
New Turbo Mouse—Twice the speed in half the space. 200 CPI precision. Advanced button features. Specify MacPlus, SE, or II. . . . **\$109.**

1-800/Mac&Lisa 850C

MacConnection™



MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/622-5472 603/446-7711 FAX 603/446-7791

©Copyright 1988 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc.

All items subject to availability. Prices subject to change without notice.

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

ool for your Mac.

Anti-glare Filter (for MacPlus or SE)	\$33.
Macintosh II Monitor Cable	33.
Apple Security System	34.
SuperBase (tilt/swivel & shelf)	35.
Printer Muffler (80 column)	43.
Printer Muffler (132 column)	58.
Printer Muffler Stand (80 column)	25.
MasterPiece 400	64.
MasterPiece Mac II	105.
A-B Box (mini DIN-8)	64.
System Saver Mac	64.
Turbo Mouse (specify MacPlus, SE or II)	109.
Koala Technologies ... 90 days	
MacVision 1.4 (digitizer)	169.
Kraft Systems ... 1 year	
3-Button QuickStick (specify Mac)	39.
Kurta ... Lifetime	
IS ADB Tablet (graphics tablet)	259.
Cordless 4 Button Cursor	99.
Migent ... 1 year	
Pocket Modem (ext. 300/1200 baud)	115.
MSC Technologies ... lifetime	
A+ Mouse (optical mouse)	65.
A+ Mouse ADB (for Mac SE & II)	85.
Nutmeg Systems ... 90 days	
Nutmeg 19" Monitor (for MacPlus or SE)	1495.
Nutmeg 19" Monitor (for Mac II)	1595.
Nuvotech	
TurboNet/AppleTalk connector cable	6.
TurboNet (DIN8 or DB9 connector)	27.
Orange Micro ... 1 year	
Grappler (universal parallel interface)	79.
Passport Designs ... 90 days	
Passport MIDI Interface	95.
MIDI Transport (2 MIDI in, 5 MIDI out)	339.
Personal Computer Peripherals ... 2 years	
HD-WSI (connects Apple HD 20 to SCSI)	269.
MacBottom HD 21 Meg SCSI	749.
MacBottom HD 21 Meg SCSI w/Modem	915.
MacBottom HD 32 Meg SCSI	899.
MacBottom HD 32 Meg SCSI w/Modem	1045.
MacBottom HD 45 Meg SCSI	1149.
MacBottom HD 45 Meg SCSI w/Modem	1295.
MacBottom HD 70 Meg SCSI	1395.
MacBottom IHD-144 Meg (for Mac II; 1 yr)	2189.
Practical Peripherals ... 5 years	
1200 Baud External Modem	109.
2400 Baud External Modem	189.

SoftStyle ... 90 days	
MacEnhancer (for plotters to printers)	\$159.
Summagraphics ... 90 days	
MacTablet 12" x 12"	379.
Thunderware ... 90 days	
ThunderScan 4.0 with PowerPort	199.
Mac II Power Accessory	42.

DISKS

Double-sided diskettes.

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

INFORMATION SERVICES

CompuServe	
CompuServe Information Service	24.
Grolier's Online Encyclopedia	32.
CompuServe Navigator	45.



Telegraphics ... NCP
HyperTutor—Get help when you need it. HyperTutor works within HyperCard to give you immediate on-screen help and instruction for your HyperCard Stacks \$30.

Dow Jones	
Dow Jones News/Retrieval Membership Kit	24.

ACCESSORIES

Bantam Books	
The Complete HyperCard Handbook	24.
Clean Image Ribbon Co.	
Clean Image Ribbon Kit	12.
Computer Coverup	
External 800k Drive Cover	4.
ImageWriter II Cover	8.
Mac Plus or Mac SE Cover Set	10.
Goldstein & Blair	
The Macintosh Bible (incl. 2 free updates)	16.
I/O Design	
ImageWare II (ImageWriter II carry case)	49.
Macinware SE (Mac SE carry case)	79.
Kalmar Designs	
Teakwood Roll-top Case (holds 45 disks)	14.
Teakwood Roll-top Case (holds 90 disks)	20.
Teakwood Roll-top Case (holds 135 disks)	27.
Moustrak	
Available in a variety of colors.	
Moustrak Pad (standard 7" x 9")	8.

BrainPower ... NCP
MathView Professional—Superb mathematical and computation program. Handles linear and non-linear equations, 2 and 3 dimensional plotting, stats and series operations, etc. \$145.

Moustrak Pad (large 9" x 11")	9.
Moustrak Pad L/F (9" x 11")	10.
Moustrak Pad L/F (Designer Series)	12.
Ribbons	
ImageWriter Ribbons	4.
Available colors: black, blue, brown, green, orange, purple, red, yellow, silver and gold.	
Rainbow Pack (6 single color ribbons)	20.
Multi 4-Color Ribbon (req. ImageWriter II)	9.
Sensible Softworks	
Quality "MacAttire" nylon dust covers	7-17.
High Trek ImageWriter II carry case	49.
High Trek Mac SE & ext. kybd. carry case	69.
Targus (Canada) Ltd.	
ImageWriter II Carry Case (black)	49.
MacPlus Carry Case (black)	59.

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.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 1 week for personal and company checks to clear.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

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

Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

Farallon Computing ... NCP
MacRecorder™—Personalize your Mac with your own beep sound, or add sounds to HyperCard Stacks. MacRecorder makes it simple. Includes sound edit for creating special effects . . . \$145.

Macintosh Masterpieces

by Joe Matazzoni

Presenting the winners of the first Macintosh Masters art contest

When we mentioned in the announcement of *Macworld's* first annual art contest that slides of Mac-designed sculpture and mixed-media pieces would be acceptable, we were just shooting in the dark. We had no idea whether anyone was actually doing such things, we just hoped they were and wanted to let people know we were open to anything.

Well, people seem to have gotten the message.

The hundreds of Mac Masters submissions that poured in from around the world showed that both the Macintosh and Mac users are living up to their reputations: the former as a powerful graphics machine, the latter as a creative band of boundary pushers. Not only did we receive mixed-media and sculptural submissions (witness the winning entry on the facing page), we got a number of works that defied even the broad categories we set up for the contest. How, for example, do you judge a giant soft sculpture with a Macintosh *inside* it? Is that computer art? Or which category does a Mac-machined aluminum time capsule belong in? For a while, every morning at *Macworld* was like Christmas, as each day's mail revealed a new haul of everything from fabric wall-hangings incorporating Mac graphics to clothes made from Mac-patterned material, handmade books, star charts, and musical scores. Finding new output methods for their graphics was one area where Mac artists displayed particular ingenuity; our collection included etchings, silk screens, digital photographs, lithographs, and other pieces made with completely new, hybrid techniques.

Evaluating this heterogeneous collection required a panel with experience in both the art world and the world of computers. Loren Carpenter, senior scientist at Pixar and a recognized authority on image processing and computer animation, was indispensable when it came to judging the more technically sophisticated submissions. Jack Davis, image editor for the Mac art journal *Verbum*, lent his knowledge of Macintosh graphics to the effort. On the purely artistic side, expert judgment was supplied by Sidra Stich, senior curator at the University Art Museum in Berkeley, California, and by Robert Johnson, curator of the Achenbach Foundation for Graphic Arts at the California Palace of the Legion of Honor, in San Francisco.

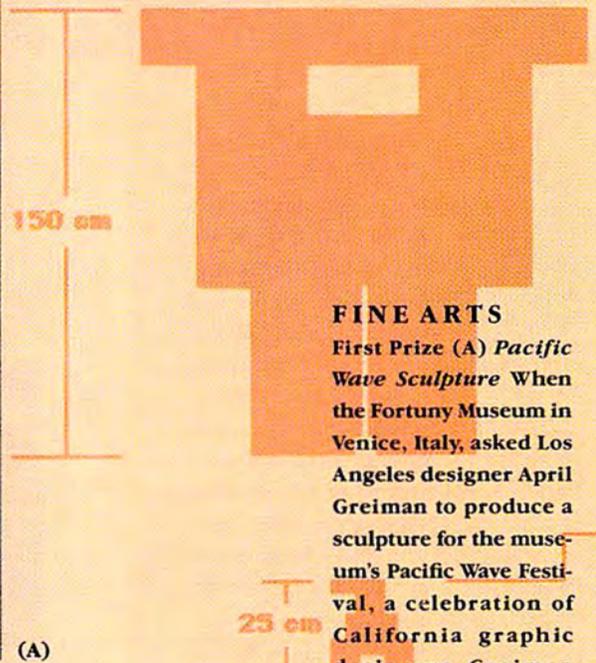
The judges selected winners in six of the eight contest categories. The winners will choose a software prize from a selection of graphics products donated by the contest's sponsors (see below). Two of the category winners also earned top honors. The grand-prize winner will receive a Mac II donated by Apple; a cash award of \$2000 goes to the runner-up. We'll announce these two winners at the SIGGRAPH computer graphics conference this month in Atlanta; check *Macworld News* next month for the story.

So is it art? Certainly—some of it. Which pieces qualify will probably be different for each beholder. What everyone should be able to agree on, however, is that the winning entries are head and shoulders above anything you could have seen on the Mac a year ago. No doubt we can expect to see the same exponential increases in sophistication from year to year through at least the next few contests—something to look forward to. Meanwhile, on behalf of *Macworld* I'd like to congratulate this year's winners, thank the sponsors and all the artists who participated, and invite everyone to help make next year's contest an even greater success. □

This year's Macintosh Masters contest was made possible by support from the following companies: Adobe Systems, Aldus Corporation, Apple Computer, Cricket Software, Letraset USA, Microsoft Corporation, Silicon Beach Software, and SuperMac.

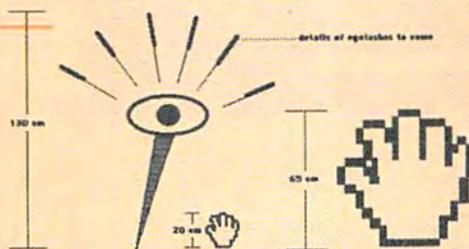
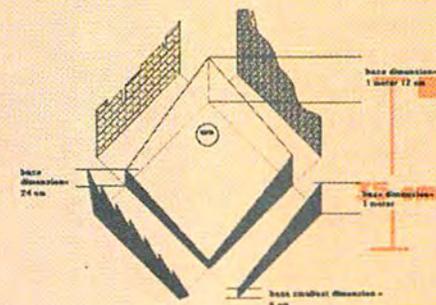
base
dimension=
24 cm

(Is It MacArt Yet?)



The icons (scale)

Platform with base heights



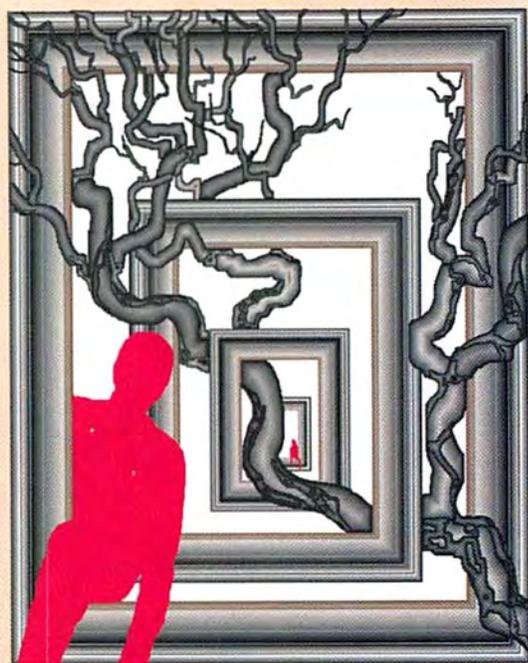
use separate art for patterns and colors of side panels
top material is a synthetic foam which we call Astro-foam.
It is incredibly bright green like grass plus veins.
let me know if you can't get this... perhaps we need to ship?

FINE ARTS

First Prize (A) *Pacific Wave Sculpture* When the Fortuny Museum in Venice, Italy, asked Los Angeles designer April Greiman to produce a sculpture for the museum's Pacific Wave Festival, a celebration of California graphic designers, Greiman turned to her Macintosh. Since she knew no Italian and the Venetian fabricator knew no English, all communication had to be visual. Greiman drew up the plans in MacDraw and FullPaint, digitized a scale model using MacVision, and then faxed the drawings and digitization to Italy. "When I arrived," she remembers, "there it was, waving at me, just as I'd imagined."



(B)



(D)

FINE ARTS

Honorable Mention (B)

Boxicopia To create this 3-by-4-foot hanging, Susan Migliore of Laguna Beach, California, used a color-xerox,

heat-transfer process to put MacPaint images onto painted and dyed linen. To add dimension,

she sewed the fabric onto bent-wire armatures. (C) *Mediterranean Discourse*

Michael Tidmus of Los Angeles created this collage from 4-bit grayscale scans that he manipulated in ImageStudio, saved as TIFF files, and then assembled in PageMaker. (D) *Expositton*

Dominique de Bardonèche-Berglund from Morges, Switzerland, created the frames in this PixelPaint image using the Shape Burst tool. (Not Shown) *Chair Facing Blue Ocean Waves*

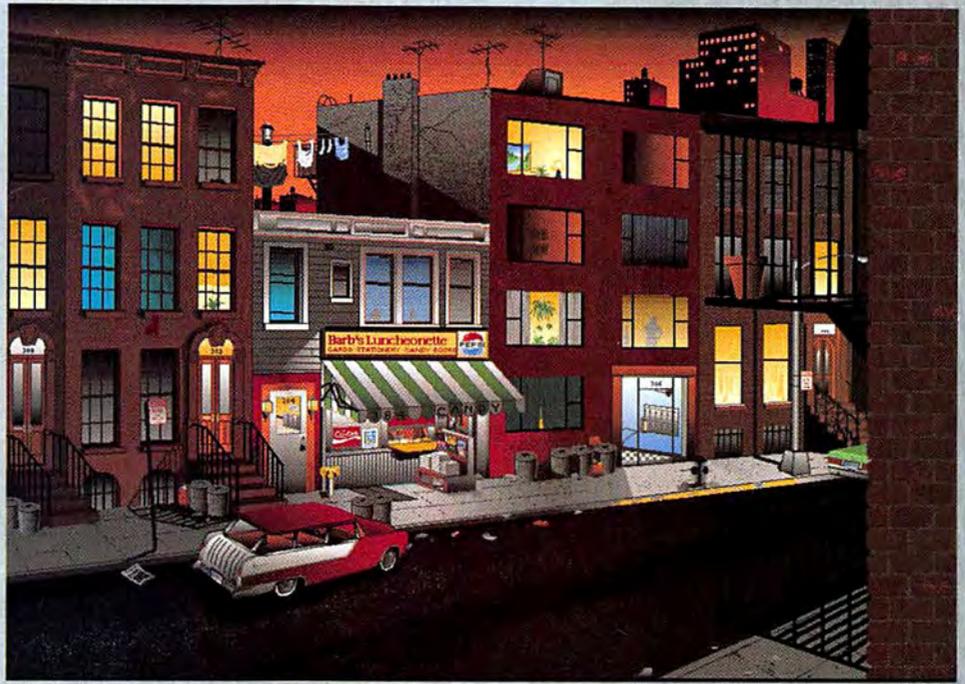
Chiu-ping KU, Hong-Kong.



(C)



(D)



(A)



(C)

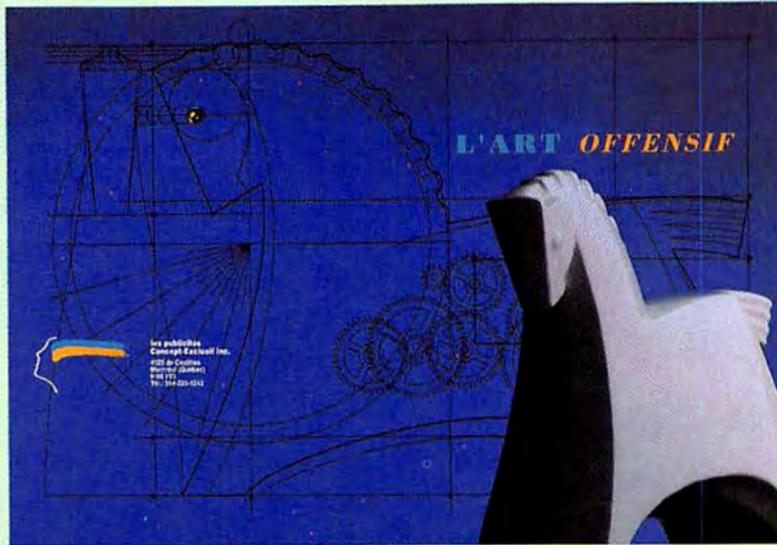


(B)

ILLUSTRATION

First Prize (A) *Street* Except for the Chieftain Safari Wagon, which he drew in Illustrator, Brooklyn's Bert Monroy created the image entirely in PixelPaint. The use of gradations throughout lends the image its richness.

Honorable Mention (B) *Oni-men* David Hastings of Seattle fashioned this mask in Aldus Free-Hand. He based the design on the Kumadori style of makeup used in Kabuki theater. (C) *Afternoon on Titan* Ron Cobb of Santa Monica, California, painted this hypothetical landscape of Saturn's sixth moon primarily in PixelPaint's FatBits mode, for better control. The monochromatic palette centering on orange depicts Titan's perhaps romantic-looking but certainly lethal methane atmosphere. (D) Lance Jackson of Oakland, California, developed his distinctive style of Mac caricature working for the *San Francisco Examiner*. He drew this cartoon of Robin Williams in SuperPaint. (Not Shown) *Rudolph* Scott Baldwin, Los Angeles.



(A)



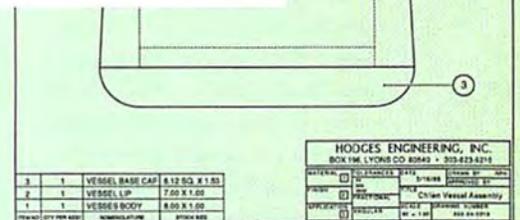
GRAPHIC DESIGN/PUBLISHING

First Prize (A) *L'art offensif* Alain Côté (creative director) and Yve Bernard (art director, designer, and illustrator) pulled out all the stops on this brochure for their Montreal design studio, Concept-Exclusif. On each page, Mac-typeset line art and type are layered in a complex collage with photography, pencil drawing, airbrush, stamped images, and spot varnishes. Placement and shape of the non-Mac elements were determined on the computer, as these laser-printed thumbnails show.

Honorable Mention (B) *The Vessel Project* Lyons, Colorado, engineer Dick Hodges describes his solid-aluminum vases/time capsules as "art objects combining sculpture, precision machine work, and Macintosh graphics... artifacts of the early computer age." Designed in MacDraft and decorated with SuperPaint patterns, the vessels are machined according to instructions from control programs coded on the Mac. The prototype vessel didn't fit into any of our categories, but the superior design of the documentation won a mention here. (C) *Emanuel's Manual of the Simple Life* (Missing Books, London, 1987) Michael Green, who lives in Jerusalem, notes accurately that his laser-printed PageMaker meditation "doesn't belong in any recognizable literary category." The book does, however, deliver on the promise desktop publishing has always held out of making possible more experimental, personal works. (D) *Two Lyric Pieces* (Equinox Music, Manchester, Vermont, 1987) Bruce Hobson of Manchester Center, Vermont, used SuperGlue to transport the Deluxe Music Construction Set file of this original piano solo into Illustrator. There he added his own slurs and customized the stock symbols of Adobe's Sonata music font. Other programs Hobson used include Fontographer, SuperPaint, Canvas, and PageMaker. (E) *The Raven* Tom Ahern of Warwick, Rhode Island, assembled scanned imagery with text in PageMaker to create this cover for a handmade book.



(B)



2	1	VESSEL BASE CAP	6.12 90. X 1.83
2	1	VESSEL LIP	7.00 X 1.00
1	1	VESSEL BODY	8.00 X 1.00

HODGES ENGINEERING, INC.			
BOX 1M, LYONS CO 80648 • 303-623-8216			
MATERIAL	QUANTITY	DATE	ISSUED BY
ALUMINUM	1	5/1/88	DR
DATE	BY	CHKD	BY
5/1/88	DR	DR	DR
DESCRIPTION	Crown Vessel Assembly		
OPERATOR	SCALE	DESIGN NUMBER	
DR	1:1	HE-1001	
DATE	AUG 24 1988		

Your friend comes round in the middle of the Night. The darkest Night in living memory. And says, Come on Abe! let's go out and Do something. So you ask her, Zoë, what have you got in mind? I don't know, she answers. I don't know: I think I'm lost. Give me something to create and nurture with the sensitivity and the groundwork that Nature has at her command. I want to consider the Questions. I want to have a Coronation. There must be something here for us that nobody can deny. We have all this time behind us: how many forefathers and ancestors have we had in all? And how much have we received to pass on to our children?

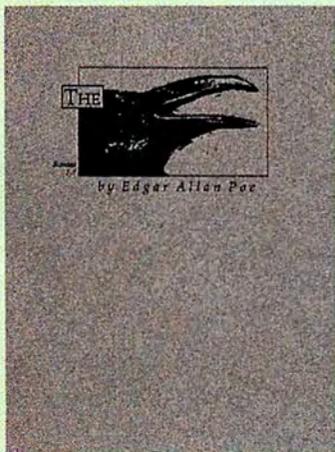
A Pig-pen A Cataract
 A Silk purse A Sow's ear
 A Shirt of shot silk A Final message

It's a tangled web that we weave

(C)



(D)



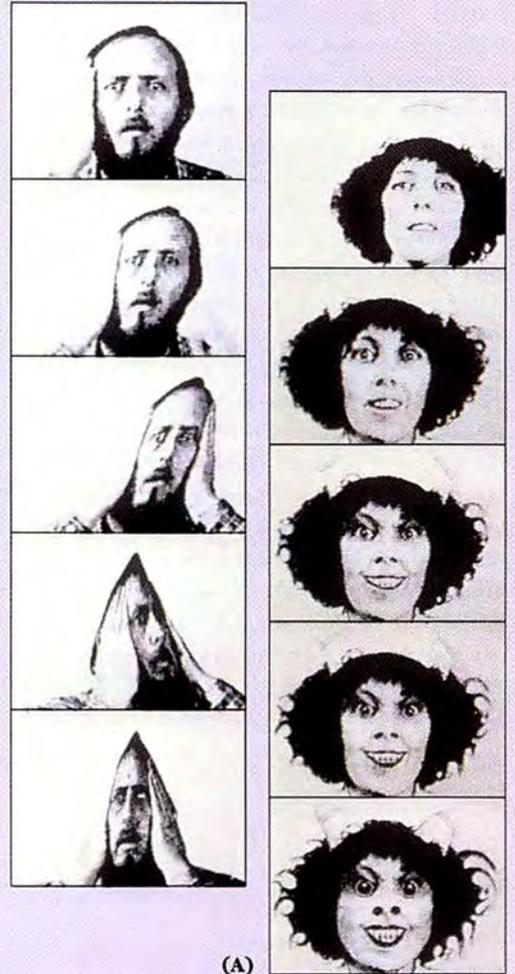
(E)

ANIMATION

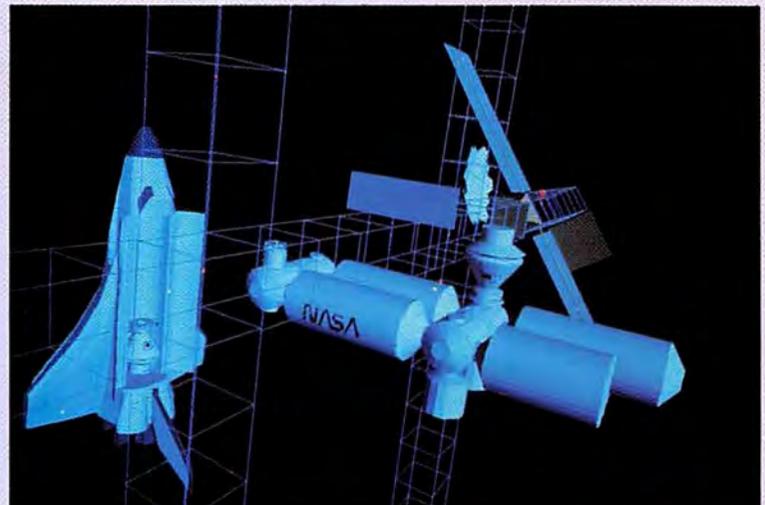
First Prize(A) *Burnout*

David Herrold of Greencastle, Indiana, based much of the action of this black-and-white animation on video sequences. Herrold used a Magic video digitizer to bring video segments frame-by-frame from the TV screen into the Mac, where he embellished them using 3-D and paint software. He then reassembled his work on movie film by shooting the 5½-minute piece's 5000 frames one at a time from the Mac screen.

Honorable Mention (B) *Crew Emergency Return Vehicle Presentation* Chipp Walters and a team at Design Edge in Houston prepared this piece to show NASA the space station's escape vehicle in transport, storage, and deployment. The 3-D models were created in Super 3D.



(A)



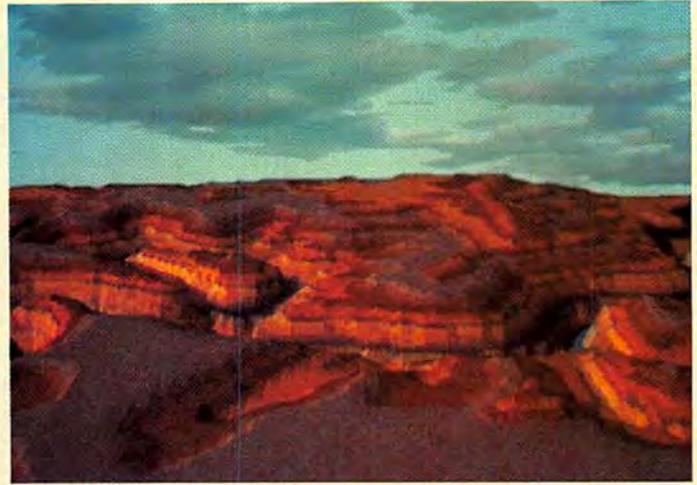
(B)

3-D/IMAGE SYNTHESIS

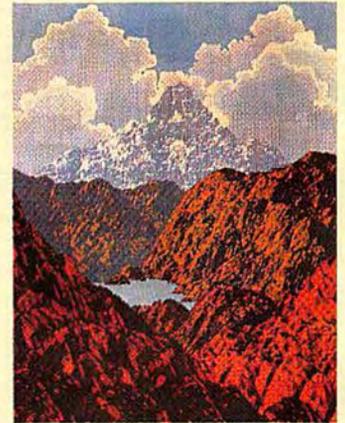
First Prize (A) *Southwest Meander Looking South* Dan Spence of Fort Mitchell, Kentucky, uses three computers and his own imaging software to produce landscapes. On a graphics tablet he sketches an overhead view of a landscape, marking out any distinctive high and low points. An Apple III reads that drawing off an Inovion screen and translates it into elevation data. That data is then mixed with color information that keys elevations to specific shades, and a Mac II renders the final picture.

Honorable Mention (B) *Biff* Brian E. Pinz rendered this playful image using a ray-trace program developed at the University of California at Santa Barbara. A digitized pattern was applied to Biff's doghouse to create the bark texture. (C) *Random Peak* Printmaker David C. Dickinson of Mount Morris, New York, used MacFractal to create the basic forms of this landscape. He then took the image into SuperPaint, where he edited it and manually produced four separations. A Canon color copier was used to combine the separations on rag paper. (Not shown) *Ralph/chair 22* Young Harvill, Palo Alto, California, and Sean McKenna, San Francisco.

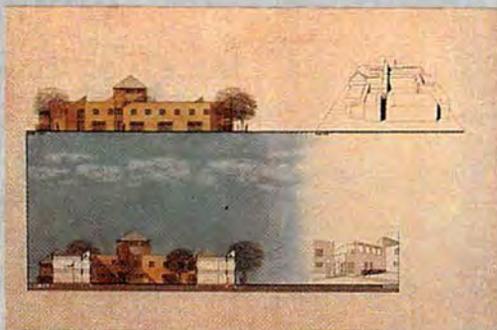
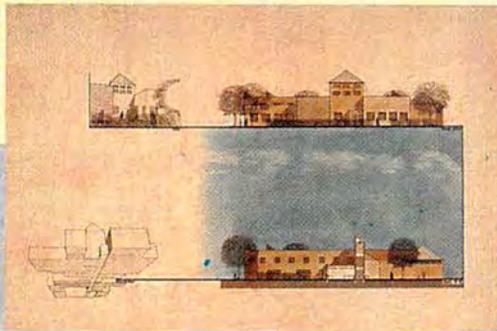
(A)



(B)



(C)



ARCHITECTURE

Honorable Mention *Proposal for Transitional Shelter for Albuquerque's Homeless* Christopher Purvis of Santa Fe, New Mexico, completed the initial design work for this proposal in MacDraft. He drew the trees and other details in SuperPaint and made the 3-D views in MacModel. Purvis assembled the images in MacDraft, plotted the final picture, and added LaserWriter titles printed on sticky-back. After having that composite sepia-tone printed, he added color using chalk pastels. (Not Shown) *Silvetti* Darrell Fields, Arlington, Texas.

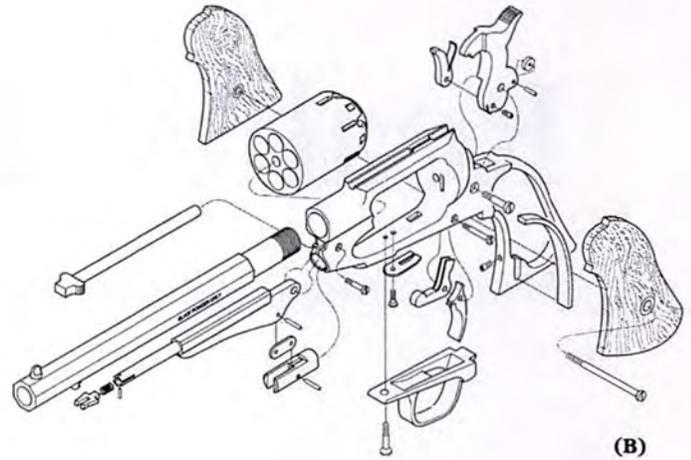
TECHNICAL ILLUSTRATION

First Prize (A) High Performance Michael Scaramozzino of Providence, Rhode Island, used *Illustrator* and a drawing tablet to create this smoothly realistic Lamborghini Countach.

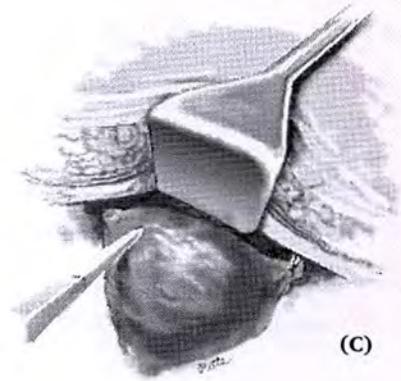
Honorable Mention (B) 1859 Remington Army .44 Caliber Jim Mullen of Battle Creek, Michigan, drew the exploded view of this Civil War pistol to scale in *Illustrator*. He later created a shaded rendering (not shown) by assembling the visible parts of the gun on screen. **(C) Abdominal Hysterectomy** Bobby Pitts of Rochester, New York, began this illustration in *ImageStudio*, painting freehand with the program's gray-scale editing tools. He saved the *ImageStudio* file in TIFF, then brought it into *LaserPaint* to add vector lines and text. **(Not Shown) Canon EOS 650** Gunter Dunz-Wolff, Hamburg, West Germany.



(A)



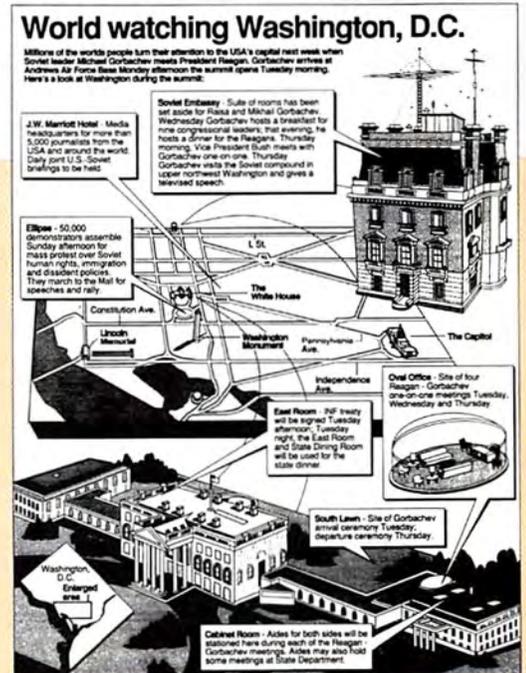
(B)



(C)

INFORMATIONAL GRAPHICS

Honorable Mention World Watching Washington, D.C. *USA Today* has been a leader in the use of Macintosh news illustrations. Here Bill Baker, of Washington, D.C., has used *MacDraw* to help a curious nation visualize Reagan and Gorbachev's schedule during the event-filled days of their third summit meeting. **(Not Shown) The Soft Benefits of Scanning** Roger Sawhill, Atlanta.



Reality Transformed

Process images almost as easily as revising text

"All the pictures which science now draws of nature and which alone seem capable of agreeing with observational fact are mathematical pictures. . . ."

—Sir James Hopwood Jeans, 1930

by Brita Meng

In the simplest sense, image processing means manipulating a picture—modifying, enhancing, or analyzing it. Adjusting the brightness on a television set is one type of image processing; by changing analog voltages, you alter the brightness of the picture displayed on the screen.

The Macintosh, however, manipulates digital information. To process Mac images, applications like ImageStudio or Digital Darkroom use mathematical formulas to manipulate the individual picture elements or *pixels* that make up each image.

Image processing differs from computer graphics. Whereas applications such as paint programs allow you to create computer-generated images from scratch, image processing lets you analyze and alter images from real-world sources such as video recorders, satellite cameras, and CAT scanners.

The Rudiments of Image Processing

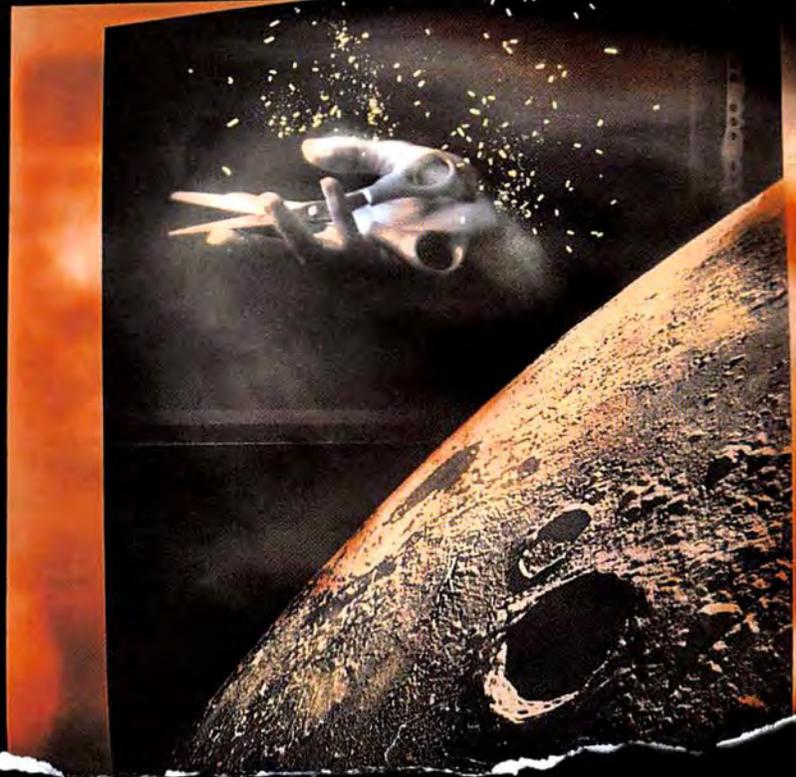
To enter an image into the Mac, the image must be digitized by an input device, for example a scanner or a video camera. Scanners and digitizers break down a continuous-tone image, such as a photograph, into an array of pixels. With the appropriate scanner, each pixel can include gray-level or color information.

Digitizers take input from a video source like a camera. Pixelogic's ProViz, Mass Micro's ColorSpace, and Comtrex's Imagizer are all examples of digitizers. Frame grabbers capture a single video frame from a camera or a video cassette recorder (VCR) in $\frac{1}{30}$ second; video equipment displays data at 30 frames per second. Data Translation's QuickCapture and Color-Capture and TrueVision's NuVista board are examples of frame grabbers. Grabbed images can be stored, displayed, and processed on the Mac. Before being processed, the entire digitized image must be loaded into the Mac's RAM or, if the Mac uses external hardware, into the memory of a dedicated image processor.

To display an image accurately while you work with it, you need a monitor that displays gray levels or color, particularly if you're working with a continuous-tone image. Some operations manipulate pixels so

REFS 578 JORN

KODAK



14A

AC H8CE

52921

KODAK

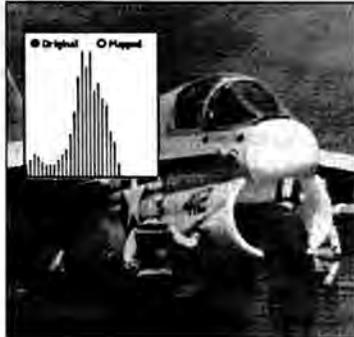
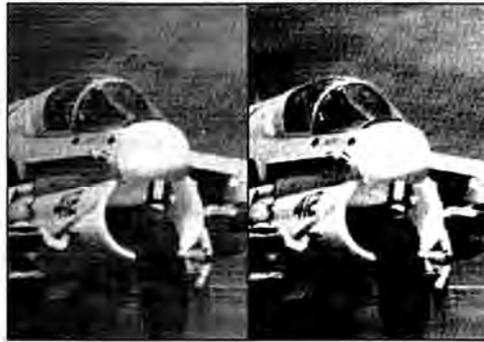
FUJI



JEFFERY NEWBURY

Brightness and Contrast

The original *Thunderscan* image imported into *Digital Darkroom* (left) is a little light, and there's also not enough contrast. You can adjust the brightness and contrast controls to enhance the image.

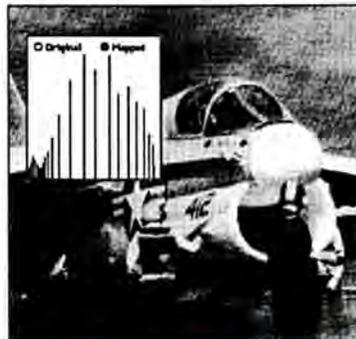


Histogram

A histogram map shows the distribution of gray levels in an image. For example, this histogram shows that most of the pixels in the image are medium gray, and that the whole image contains very few dark grays.

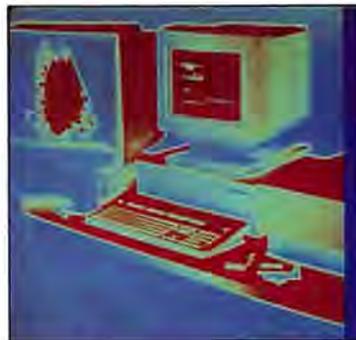
Equalized Histogram

By equalizing its histogram, you can expand an image's dynamic range so that it contains more dark gray areas. This enhances the image.



Pseudocolor

When you pseudocolor an image, you assign specific colors to gray values. Here, a gray-scale image on *NuVision* has been pseudocolored for red, green, and blue.



Posterization

Posterizing restricts the number of gray shades that can appear in an image. This image was posterized at three gray levels to see false contouring and better discrete colors. The original image contained 256 gray levels.



subtly that some black-and-white displays—like the built-in Mac Plus or SE monitors—don't really show the results.

Saving a captured image requires a high-capacity mass storage device like a large hard disk or an optical WORM (write-once, read-many) drive. An 8½-by-11-inch image with 256 gray levels, scanned at 300 dots per inch, could take up 8.4 megabytes on a hard disk.

Finally, you can print an image with a variety of output devices: a laser printer, a phototypesetter, a film recorder, even a dot-matrix printer like the *Image-Writer*. Which device you choose depends on the resolution and quality you're after. If high-quality output is particularly important, you may need to output to a film recorder or phototypesetter.

Two Approaches to Image Processing

Image processing is a very computation-intensive job. In fact, it was only recently that personal computers acquired the processing power necessary to perform the operations in seconds rather than minutes, or maybe even hours.

ImageStudio, *Digital Darkroom*, and *MacImage* are all examples of software-based image processing. They use the Mac's internal microprocessor, either the 68000 or 68020 chip, to process pixels.

Because the Mac's CPU limits how fast an image can be processed, complicated imaging functions benefit greatly from additional image processing hardware like *Perceptics' NuVision*.

Hardware-based image processors come in two forms—general purpose and dedicated. *NuVision* is an example of a general-purpose system (see "*NuVision Hardware for Image Processing*"). Apple and Pixar are also working on a product that will allow a Mac II running A/UX to control the Pixar Image Computer (PIC). The PIC is a powerful general-purpose image processor capable of three-dimensional or *volume* imaging. This process creates three-dimensional images from a series of two-dimensional pictures taken from different perspectives (see "*3-D Imaging*").

Image Gallery

There are a variety of ways to modify an image—changing the brightness and contrast, enhancing the edges of objects, even removing unwanted visual defects. *ImageStudio*, *Digital Darkroom*, *MacImage*, and *NuVision* use preprogrammed *algorithms*, or mathematical formulas, to process images. Knowing what some common algorithms do can help you decide which operations to perform and which application you need (see "*What You Can Do with an Image*").

A point-process algorithm operates on every pixel in the image area and uses each pixel's value to compute a new value for the pixel. If you're working with an image that is too dark and lacks contrast, you can lighten it and increase the contrast by applying a simple point process (see "*Brightness and Contrast*").

You can also change an image's dynamic range by using a point process called *histogram equalization*,

NuVision Hardware for Image Processing

Perceptics' NuVision is the first hardware image processor based on the Macintosh II. Instead of the Mac II's 68020 processor, NuVision uses specially designed image processing hardware to divert processing from the Mac's CPU.

The Mac II acts as the host computer and controls all of NuVision's image processing operations. The NuVision chassis connects to the Mac II and houses up to six add-in boards. NuVision allows these boards to work in parallel, processing images simultaneously.

In its basic configuration, NuVision comes with three

boards: the Smart Memory board and the Video Interface board, both of which plug into the NuVision chassis, and a Mac II NuBus interface board, which plugs into the Mac II. The Video Interface board lets NuVision display images at up to 1280 by 1024 pixels and contains a frame grabber.

The Smart Memory board contains a digital signal processor (DSP) dedicated to image processing. Whereas the 68020 is a general-purpose processor, the DSP, a 40-megahertz Texas Instruments 32025, is specifically designed to process bits, or pixels. An optional board,

the Pixel Processor, is designed for logic functions, such as the addition and subtraction of images.

Because NuVision operates on images stored in the Smart Memory board and each board contains its own dedicated processor, imaging operations run many times faster than on the Mac. For example, you can use a NuVision system equipped with three Smart Memory boards to process a color image; assigning one Smart Memory board to each color plane (red, green, and blue) reduces the overall processing time for the image.

an algorithm that changes the distribution of gray levels (see "Histogram" and "Equalized Histogram").

You can color an image by assigning specific colors to gray values in an image. This operation, called *pseudocoloring*, is another point process (see "Pseudocolor").

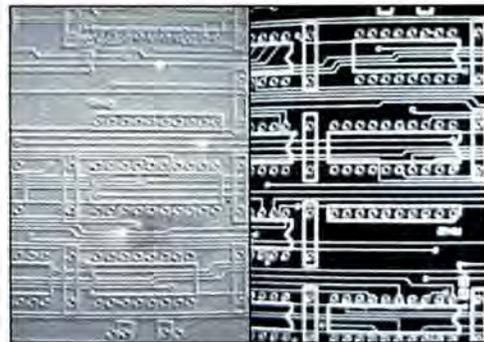
If an image looks too smooth because its gray shades blend together, you can make it bolder by using a point process called *posterization* (see "Posterization").

Often you can combine images to produce a desired effect. For example, you could compare one image with another to check for defective parts coming off an assembly line (see "Subtraction"). Operations involving more than one image are called *frame processes*. You can use frame processes to improve image quality and to detect motion.

To correct the distortion caused by camera optics or viewpoints, you can apply what's called a *geometric process*, an algorithm that changes the spatial arrangement of pixels to a specified shape. You can also use a geometric process to create special warping effects (see "Warping").

You can alter an image's appearance, or locate specific information, with an *area* or *spatial* process. For example, you can sharpen an image using a filter (see "Sharpening"). Spatial processes change a pixel's original value using a formula based on that value and the values of neighboring pixels.

If you want to locate specific information—perhaps all the edges in an image—you can perform a classic spatial process called *convolution* (see "Fil-



Subtraction

A frame process can highlight the differences between two very similar images. The reference image shows a nondefective printed circuit board. Using NuVision to subtract a camera image of the same portion of a "bad" printed circuit board highlights the differences as very light blotches.

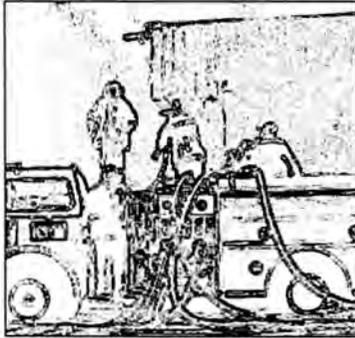


Warping

Warping corrects for camera optics and also creates special effects. The balloons in this 24-bit color image have been magnified, rotated, and warped into a parallelogram using Perceptics' NuVision.

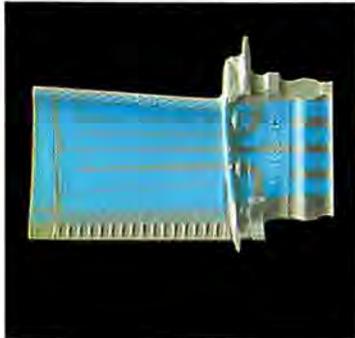
Sharpening

ImageStudio's Sharpen More filter can sharpen an image repeatedly. The image of a fire truck was sharpened twice.



Filtering

Filtering lets you find all the edges in an image. This image shows what happens when you locate edges of the fire truck. Digital Darkroom lets you choose the width of the line defining the edge; in this case, it's a thick line.



3-D Imaging

Internal air passages used for cooling a turbine blade appear in blue in this volumetric reconstruction from computer tomography slices.

tering"). Convolution lets you *filter* an image for the features you want.

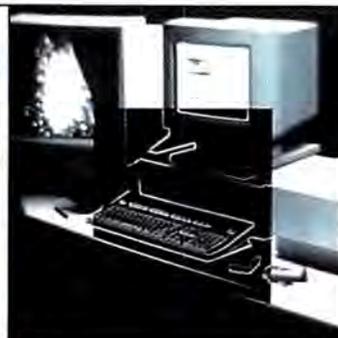
The convolution operation replaces a pixel's value with the sum of the values of that pixel and its neighbors, each weighted (multiplied) by a certain factor. The weighting factors are called the *convolution kernel* or filter. By using different weight factors in the filter, you can manipulate an image in many ways such as smoothing it (see "Convolution") or even isolating all its vertical or horizontal lines.

With some images, convolution will not achieve the desired result. Say, for example, that you have an image of a black object on a dark background. Because there's not enough contrast between the object and the background, you can't tell them apart.

Like your eyes, convolution filters work better at discerning obvious contrasts, or *spatial frequency* changes, within an image. If an object and a background are too similar, a filter must process more pixels to tell them apart—the less difference in contrast, the larger the area the filter must process. The convolution process can, of course, reach the point of diminishing returns as far as processing time is concerned—especially if you're working with a very large image.

Let's say you have an image with low overall contrasts, as is the case with X-rays or CAT scans. If you have a dark object on a black background, you can isolate the object using an algorithm called a *Fourier transform*.

The Fourier transform identifies the actual color frequencies that occur in an image. By isolating an image's color frequencies, you can perform point processes on selected frequencies. For example, to highlight an object in an X-ray, you can multiply the object's frequency by a large number. Similarly, you can multi-



Convolution

This image from NuVision shows one 3-by-3 convolution kernel, or filter, enhancing edges. In the photo on the right, a Sobel filter is being applied to one region of the entire image.



(a)

(b)

(c)

Fourier Transform

The 8-bit monochrome image in (a) shows a considerable amount of periodic noise, random aberrations in pixel values. By performing a Fourier transform, you can see the frequencies of the image data. Photo (b) shows the result of that transform. The periodic noise produces a set of frequency peaks in a circle around the center of the spectrum. You can suppress those frequency peaks by performing point processes or by filtering the peaks. After performing an inverse Fourier transform, the periodic noise disappears (c).

What You Can Do with an Image

	Digital Darkroom ¹	ImageStudio	MacImage	NuVision
Brightness/contrast control	x	x	x	x
Custom map	x	x	x ²	x
Blur	x	x		
Despeckle	x			
Diffuse	x ³	x		
Enhance edges	x	x		x
Sharpen	x	x		x
Custom filters	x			x
Custom programs	x ³			x
Posterize	x	x	x	x
Equalize histograms	x	x		x
Invert	x	x	x	x ⁴
Rotate	x	x ⁵		x
Warp	x			x
Fourier transform				x
Object measurement (blob analysis)				x
Halftone print	x ⁶	x	x	
Other features	Autotrace converts bitmapped graphics to object-oriented graphics; advanced graphics selection tools	Custom Paint tools included	Works only with images from Datacopy scanners; some bitmap-editing features	Parallel processing capability; 24-bit color support; requires Mac II
Exportable file formats	PICT II, TIFF, Digital Darkroom Archive, ThunderScan	RIFF, MacPaint, TIFF, encapsulated PostScript	PICT II, TIFF, MacPaint, RIFF, Datacopy IMG, LaserBits, PageMaker 1.2, encapsulated PostScript	TIFF

¹Compiled from beta version.

²Extensive mapping capabilities with gamma functions, including edge detection and noise control.

³Add-on module.

⁴No menu choice; done with custom map.

⁵Rotation possible only in 90-degree increments.

⁶PostScript and non-PostScript printers.

ply a specific frequency by zero to eliminate that frequency from an image (see "Fourier Transform").

To display an image with its modified frequency information, you apply an algorithm called an *inverse Fourier transform*.

Everything in the Picture

The advent of Mac-based image processing systems has brought everyone into the picture. The cost of admission is merely a Mac, a digitizer, and the required software. Even shareware image processing programs are appearing for the Mac II. And you don't have to know how to program algorithms—just pull down a menu.

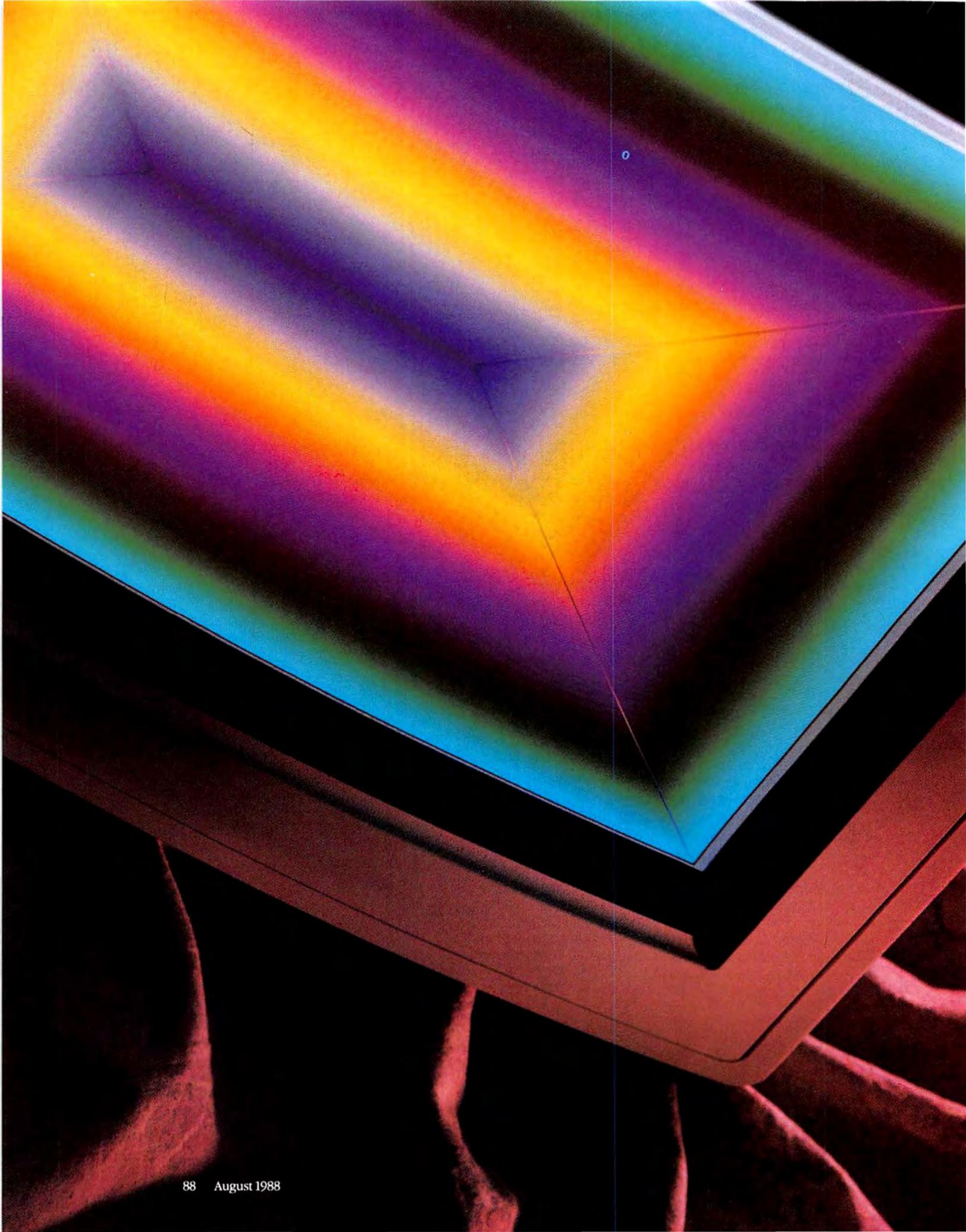
Once you start processing images, though, you'll want to do more. In moving up to the high end, you'll need a Mac II, more memory, a high-resolution scanner or digitizer that reads color or gray-scale informa-

tion, and a monitor that displays that information. In some cases, you'll even need dedicated image processing hardware.

To take full advantage of the Mac's image processing capabilities, it helps to understand the underlying principles. When you do, you're in a better position to evaluate the products now available for the Mac. Then you'll know just what to do when you're faced with an image. □

The author would like to thank Andrew Wilson for his assistance with this article.

See *Where to Buy* for contact information.



Select a color screen for the Mac II. Compare 12 of the best.

Color Monitors Revisited

by Bruce F. Webster

As I complete this review, I'm surrounded by more color monitors than I ever expect to see in one place again. Twelve, to be exact. If I plugged them in and turned them on all at the same time, I'd probably get a suntan or something. As it stands, I'm probably going to have to see my chiropractor; most of these monitors are 19-inch RGB models, and they are heavy.

To business. Since I reviewed color monitors for the Mac II last December ("Looking through the Mac II Kaleidoscope"), a number of new or improved ones have come on the market. Likewise, some of the existing video cards

Comparing Color Monitors

Monitor Model	Price	Size	Display Area	Maximum Resolution	Resolution Used	Dots per Inch
AppleColor High-Resolution RGB Monitor	\$999	13"	235mm × 176mm	640 × 480	640 × 480	70
Conrac Model 7250	\$2995	19"	360mm × 270mm	1024 × 1024	640 × 480	45
Conrac Model 7351	\$2995	19"	396mm × 297mm	1024 × 1024	1024 × 768	69
Electrohome ECM 1910	\$2895	19"	350mm × 260mm	n/s	640 × 480	46
Electrohome ECM 1912	\$2995	19"	350mm × 260mm	n/s	640 × 480	46
Nanao Flexscan 8060S-US	\$919	14"	250mm × 167mm	930 × 625	640 × 480	80
Princeton's Ultrasync	\$849	12"	215mm × 160mm	800 × 600	640 × 480	73
Sony GDM-1602	\$2495 ¹	16"	295mm × 221mm	1024 × 768	1024 × 768	84
Sony GDM-1952	\$3695 ²	19"	360mm × 270mm	1024 × 768	1024 × 768	72
Taxan MultiVision 770 Plus	\$915	13"	252mm × 185mm	n/s	640 × 480	69

n/s = not specified

¹RasterOps price \$4395 with Spectrum/8 or PCPC card.

²RasterOps price \$5795 with Spectrum/8, \$5295 with PCPC card.

have been upgraded, and new ones have appeared. Most exciting is the release—well, it's still in beta as I write this, but it's beta 0.95—of a 24-bits-per-pixel color video card for the Mac II.

AppleColor Replacements

Several of the monitors I received are intended to replace the AppleColor High-Resolution RGB Monitor. They include the Nanao Flexscan 8060S, Princeton Graphics Systems' Ultrasync, and the Taxan MultiVision 770 Plus.

With a sense of déjà vu, I must announce that the AppleColor is the best of the small RGB monitors I looked at. It has the crispest display, the most vivid color, and no distortions. The only apparent flaw (for those bothered by such things) is the almost invisible hairline across the screen two-thirds of the way down, caused by a wire that supports the Trinitron mask. Some folks are bothered by the line and by the rather startling noise the machine makes when you power it up; I've long since ceased to notice either.

Second place goes to the Nanao Flexscan. I wasn't too impressed with its display at first, but with some fine adjustments I was able to center the image and display true circles and squares with equal height and width, an indicator of the monitor's 1:1 pixel aspect ratio (the ratio of pixel height to width). Also, by measuring on-screen images with a flexible plastic ruler, I determined that the Nanao monitor displays objects at their actual size—that is, an on-screen ruler's measurements are accurate according to a real-life ruler.

The Nanao's colors are nice, though a bit paler than the AppleColor's. Text is crisp and firm. There is some bowing of the image, bending in on the left and out on the right, but nothing critical. The monitor itself comes with plenty of controls and adjustment points.

In the front it has knobs for horizontal size, vertical size, display color, contrast, brightness, and power. In the back are knobs for vertical position and horizontal position. The monitor comes mounted on a tilt/swivel base, and one of the knobs in front lets you switch between amber, monochrome, and color displays. As with all the replacement monitors, you can switch between analog RGB (the standard for Mac II color video cards) and TTL-level inputs, allowing you to use the display with a number of IBM-compatible video cards.

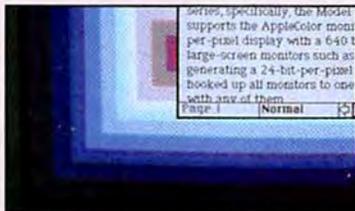
Princeton's Ultrasync is right up there, too, though I'd probably choose the Nanao over it. The Ultrasync has no visual distortions; however, the Mac desktop background behind an open window appears slightly darker than on the AppleColor. The image isn't as sharp as on the Nanao monitor, but the colors are brighter. Knobs in the back enable you to adjust vertical and horizontal size and position. You can display true circles and squares, but the image is slightly smaller than real life. The power switch is on the right side; a switch labeled "Text" allows you to switch between regular, blue, amber, and green displays. The monitor itself is compact, light, and comes on a tilt/swivel base.

The Taxan MultiVision 770 Plus comes in right behind the other two. The MultiVision's display isn't as crisp; it's a bit fuzzy and washed out. This seems to be the same model I reviewed in the December article and it has the same video artifact: a green line in the bottom-left corner of the screen. Colors bleed slightly along the top and left edges. The monitor displays objects in perfect proportion, though the images are slightly larger than real life due to its 69-dots-per-inch (dpi) resolution.

19-Inch AppleColor Replacement Monitors

Three of the replacement monitors are actually 19-inch CRTs that plug into the Apple Mac II Video Card. The result is a greatly enlarged display, typically

Dot Pitch	Vertical Scan	Horizontal Scan	Input
0.25mm	66.7 Hz	35.0 kHz	analog
0.31mm	48-60 Hz	15.75-37 kHz	TTL/analog
0.34mm	47-63 Hz	45-67 kHz	analog
n/s	47-85 Hz	15-34 kHz	TTL/analog
n/s	47-85 Hz	15-34 kHz	TTL/analog
0.28mm	50-80 Hz	15.7-35 kHz	TTL/analog
0.28mm	45-120 Hz	15-35 kHz	TTL/analog
0.26mm	60 Hz	48.8 kHz	analog
0.31mm	60 Hz	48.8 kHz	analog
0.31mm	50-90 Hz	15-34 kHz	TTL/analog



1. The Taxan MultiVision is a bit fuzzier than the other AppleColor replacements. Images are slightly larger than real life.

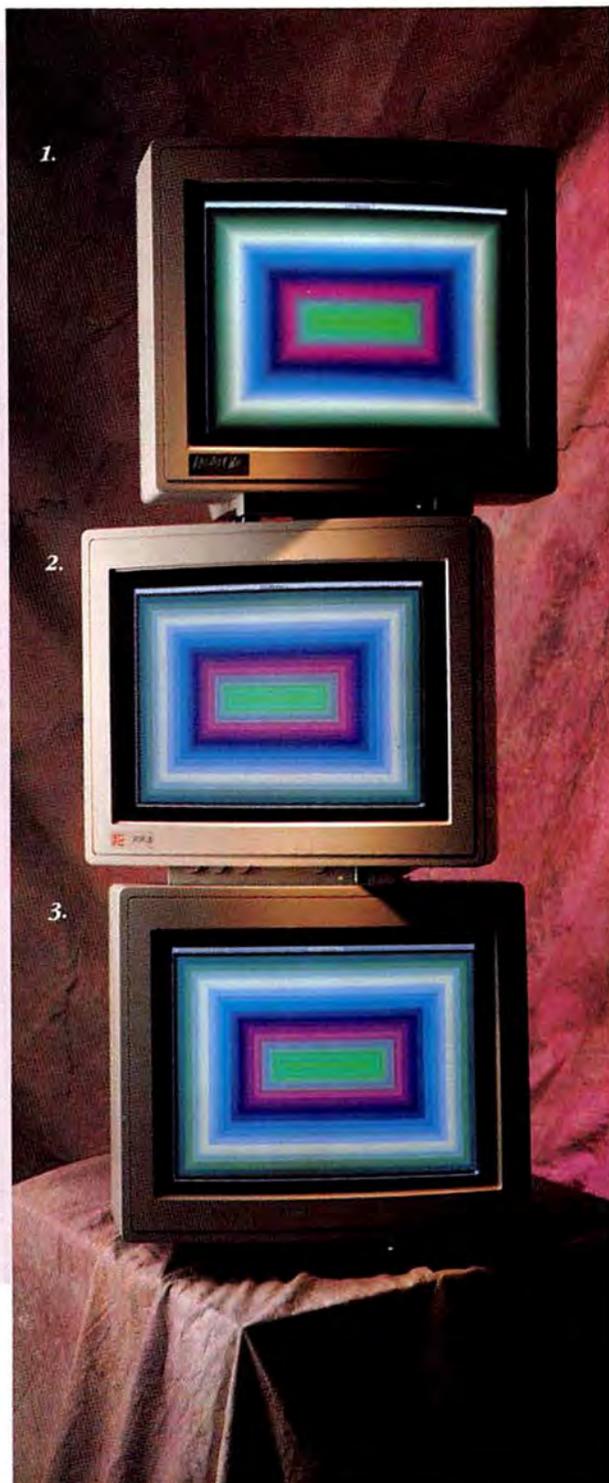


2. The Nanao Flexscan finished second only to the AppleColor monitor: It displays objects at actual size with a 1:1 pixel aspect ratio.



3. The Princeton UltraSync's colors are brighter than the Nanao's, but the images are not as sharp and are slightly smaller than real life.





1. RasterOps's 19-inch Sony monitor with the ColorBoard 104, the only 24-bit color system available today.



2. The PCPC II card driving a 19-inch Sony monitor provides bold colors and crisp text in a high-resolution 8-bit color display.



3. SuperMac's Spectrum/8 (with 19-inch Sony monitor) supports 2, 4, 16, or 256 colors and is configurable for most monitors.

half again as large as an AppleColor monitor's.

Two of the monitors come from Electrohome, the 1910 and the 1912. Both are 19-inch RGB monitors that plug into a Mac II Video Card (or equivalent). They have a power switch on the front along with brightness and contrast knobs. In the back are a *degaussing* switch for clearing the residual magnetic field that builds up, a switch for selecting analog RGB or TTL inputs, and knobs to adjust vertical and horizontal position and size. When the screen is adjusted for proper height and width, it displays objects about 1.5 times larger than real life. The displays are crisp, focused, with no real distortion (though there is some apparent bowing across the top, due to the curvature of the CRT). The Electrohome's display quality is better than

any of the other 13-inch monitors' above, though the gray background does have a brown tint to it, especially on the 1912.

The difference between the 1910 and 1912 is the phosphor used: a long-persistence phosphor on the 1912, and a short-persistence one on the 1910. I prefer the 1910: the colors are bolder, the phosphor has less of a brown tint, and there's no image persistence during animation. For example, when I ran an animation from *Beyond Dark Castle*, image tracing was apparent (if not bothersome) on the 1912, but was nonexistent on the 1910. Either monitor would make an excellent choice for trade shows, classrooms, and people with diminished visual acuity.

The third 19-inch monitor, the 7250, came from Conrac. I wasn't terribly impressed with the display at first: it was rather washed out, reminiscent of an overhead projector. After the recommended 30-minute warm-up period, the display improves, but not all that much, and it is never anywhere close to the quality of either Electrohome monitor. The aspect ratio is close to (but not exactly) 1:1, and the monitor displays images about 1.6 times larger than real life. The Conrac 7250 has three controls on the front: contrast, brightness, and a degaussing button. The contrast control can make text look crisp, but usually at the cost of color boldness. The power switch is half-hidden (literally) in the back; the usual control for switching between analog RGB and TTL inputs is back there as well.

Higher-Resolution Monitors

I received only one large screen add-on monitor designed for a video board producing more dots (higher resolution) than the Mac II Video Card. That was the Conrac 7351, a 19-inch analog RGB monitor. Like its cousin above, it has a 30-minute warm-up time that doesn't really improve the display much. It has the same rather washed-out color as the 7250 and doesn't really compare with the other higher-resolution monitors—which were all Sony Trinitrons.

To be exact, I received three Sony GDM 1952 19-inch monitors (with the PCPC, RasterOps, and SuperMac video cards) and one Sony GDM 1602 16-inch monitor (from SuperMac). They are all much better than the Conrac 7351; in fact, they are better than all but the AppleColor monitor (which, of course, only comes in a 13-inch model). The actual visual quality varies somewhat between the video cards—more on that in a minute—but in all cases, the displays are crisp, clean, and steady. Objects displayed on the 16-inch Sony are about 0.8 times their real-life size. The 16-inch Sony has an aspect ratio of 1.11:1, making the text look slightly taller than normal, while the 19-inch monitors all have aspect ratios of 1:1. All four Sony units have five controls on the front: vertical and horizontal convergence, vertical centering, contrast, and power. Finally, all four Sony monitors share two minor visual flaws: two very thin, visible mask wires cross the screen (one-third and two-thirds of the way down); and a faint, dark-and-light vertical banding crosses the standard alternating black-and-white (dithered) desktop background, but the banding doesn't appear over images, windows, text, and so forth.

8-Bit Color Video Cards

Of the four video cards I received, two were repeats from last December: the PCPC II and the SuperMac Spectrum/8. Both come with 19-inch Sony monitors. SuperMac also sent the 16-inch Sony, which it offers as an option.

The PCPC II hasn't changed much since I last reviewed it. It still gives a nice display, with few video problems—just some slight color bleeding along the upper right edge. You can set the board for 2 colors (black and white) or 256 colors. Display resolution is 1024 by 768 pixels, or exactly four times the size of the Macintosh SE display. Colors are bold, text is crisp—it all works just fine.

The SuperMac Spectrum/8 has improved significantly since I last looked at it. Many changes that had then been recently proposed have been implemented.

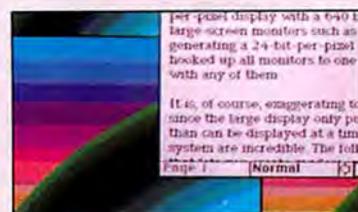
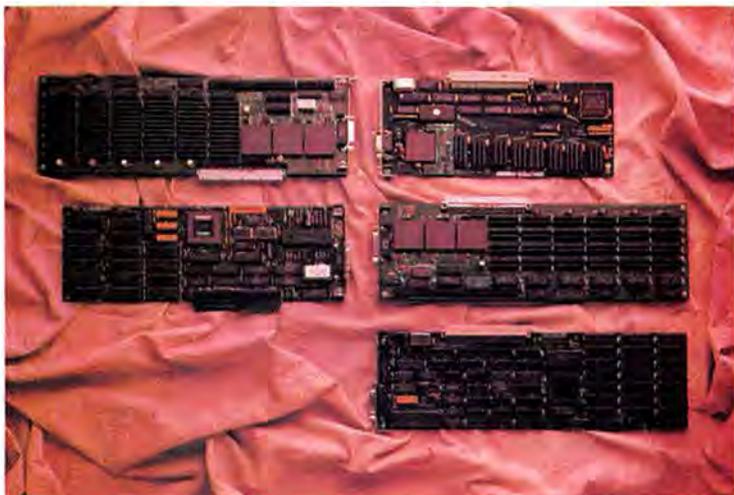
Color Video Cards

Video Card	Price	Resolution	Colors	Notes
Macintosh II 4-bit Video Card	\$499	640 × 480	2, 4, 16	can be expanded to 8 bits (256 colors)
Macintosh II 8-bit Video Card	\$648	640 × 480	2, 4, 16, 256	
PCPC II Graphics System	\$1795	1024 × 768	256	
RasterOps ColorBoard 64	\$2395	640 × 480	256, 16 million	software control of 24-bit (16 million color) mode
RasterOps ColorBoard 104	\$3195	1024 × 768	256, 16 million	software control of 24-bit (16 million color) mode
SuperMac Spectrum/8 Video Board	\$1595	1024 × 768 640 × 480 768 × 576	2, 4, 16, 256	comes configured for 1024 × 768 display; can support additional resolutions by replacing oscillator chip and selecting resolution via control panel

It supports 2, 4, 16, or 256 colors, in a 1024-by-768-pixel display. By changing the oscillator on the card and reconfiguring the card via the Control Panel, you can drive other monitors, including the AppleColor monitors that synchronize to multiple horizontal scan rates, the NTSC RGB monitors used in the U.S. and Japanese television industry, and the PAL RGB monitors used in Western Europe. (Users interested in video recording will be interested in the last two.) You can even program the card to handle just about any other monitor, if you obtain the proper oscillator and build your own cable. The Spectrum/8 with the Sony 19-inch monitor is the best of the card-monitor combinations I reviewed, except for the Spectrum/8 with the AppleColor monitor, and the Spectrum/8 plus the Sony 16-inch is even crisper and brighter than the Apple. Documentation is also excellent, explaining how to set up a system and how to configure the Spectrum/8 for different monitors. On top of all that, SuperMac throws in a copy of PixelPaint, a nifty paint program that lets you make use of those 256 colors.

16 Million Colors

The other two cards, the RasterOps ColorBoard 64 and ColorBoard 104, are brand new; in fact, I received beta versions (0.95) of the cards and accompanying software. The ColorBoard 64 supports the AppleColor monitor (and replacements), generating a 24-bits-per-pixel display with a 640-by-480-pixel reso-



1. The Electrohome 1910 is ideal for meeting-room presentations. The monitor displays objects 1½ times larger than real life.

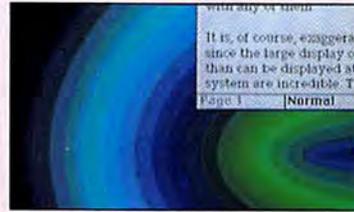


2. The Sony GDM-1602 provides the highest quality picture in a high-resolution 16-inch display.

lution. The ColorBoard 104 supports large-screen monitors such as the Sony 19-inch, Sony 16-inch, and Conrac 7351, generating a 24-bits-per-pixel display with 1024-by-768-pixel resolution. I hooked up all monitors to one card or the other; there were no problems with any of them (for more information on the ColorBoard 104, see *Reviews* in this issue).

It is, of course, exaggerating to say you can display 16 million colors at once; since the large screen contains only 786,432 pixels, that's how many colors you can display at a time. Even so, the images that come out of this system are incredible. The folks at RasterOps sent along a demo program that lets you create random images and make color separations of them. They also sent (in Scrapbook form) several 24-bit digitized images that you can paste into the demo program and display.

Even more amazing is the fact that you can run the Finder (and MultiFinder), as well as normal applications, under 24-bit mode. Things slow down a bit, since so much more drawing has to take place, and none of the existing color applications except LaserPaint currently takes advantage of 24-bit color. I tried using existing color software, however, while in 24-bit mode; most of it seemed to work just fine—sometimes perhaps more slowly. The only problem I had was with PixelPaint, but my version of PixelPaint was specific to the SuperMac Spectrum/8 board, so even that was excusable.



3. The Conrac 7250 displays images at about $1\frac{1}{2}$ times actual size. The colors are reminiscent of an overhead projector.



4. The Conrac 7351 is a higher-resolution version of the 7250, with many of the same color attributes.

You can use the board as a regular 256-color board; in fact, that's the mode it comes up in whenever you boot or restart. You select the RasterOps option in the Control Panel to invoke 24-bit mode. This was still somewhat inconsistent in the version I got, but version 1.0 should allow you to switch between 8 and 24 bits.

This obviously is not a video board for everyone, but at only \$2595 for the ColorBoard 64 and \$3195 for the 104, it's pretty cheap for what it does. Of course, you still have to buy a monitor (preferably a Sony), but you end up with a system that a year or two ago would have cost five to ten times as much.

Color Picks

My current conclusions sound a lot like the ones I reached the last time I reviewed color monitors: the AppleColor monitor is the best 640 by 480 display; the Sony 19-inch (or, if you don't mind small text, the Sony 16-inch) is the best 1024 by 768 display; and the SuperMac Spectrum is the best 8-bit video card. However, the Electrohome 1910 is a great enlarged display for those of you who need one, and for you power users the RasterOps ColorBoards are definitely worth looking at. □

See *Where to Buy* for contact information.

Bruce F. Webster is a Macworld contributing editor and freelance writer living in the redwoods near Santa Cruz, California.

Staying Alive

by Bruce F. Webster

Well, you heard the news a few months ago, and you knew it was all over. Apple cut the list price of the Macintosh Plus down to \$1799, a clear sign that the Plus's days are numbered. Or are they? It may just be that Apple sees the burgeoning home market for cheap PC clones and wants to get a share of that. In either case, the Mac Plus, once the flagship (and the savior) of the Macintosh product line, has become the low-end product, a poor—or at least inexpensive—cousin to the Mac SE, the Mac II, and whatever else Apple might bring out in the near future.

The Mac Plus is threatened with becoming a dead-end product. The Mac SE has far more in common with the Mac II than with the Plus, and those first two are what developers are focusing on. Many third-party products now divide Macs into two groups: the 128K, 512K, 512KE, and Plus; and the SE and II. And we all know what happened to the 128K and 512K, don't we?

Bruce F. Webster is a Macworld contributing editor and freelance writer living in the redwoods near Santa Cruz, California.

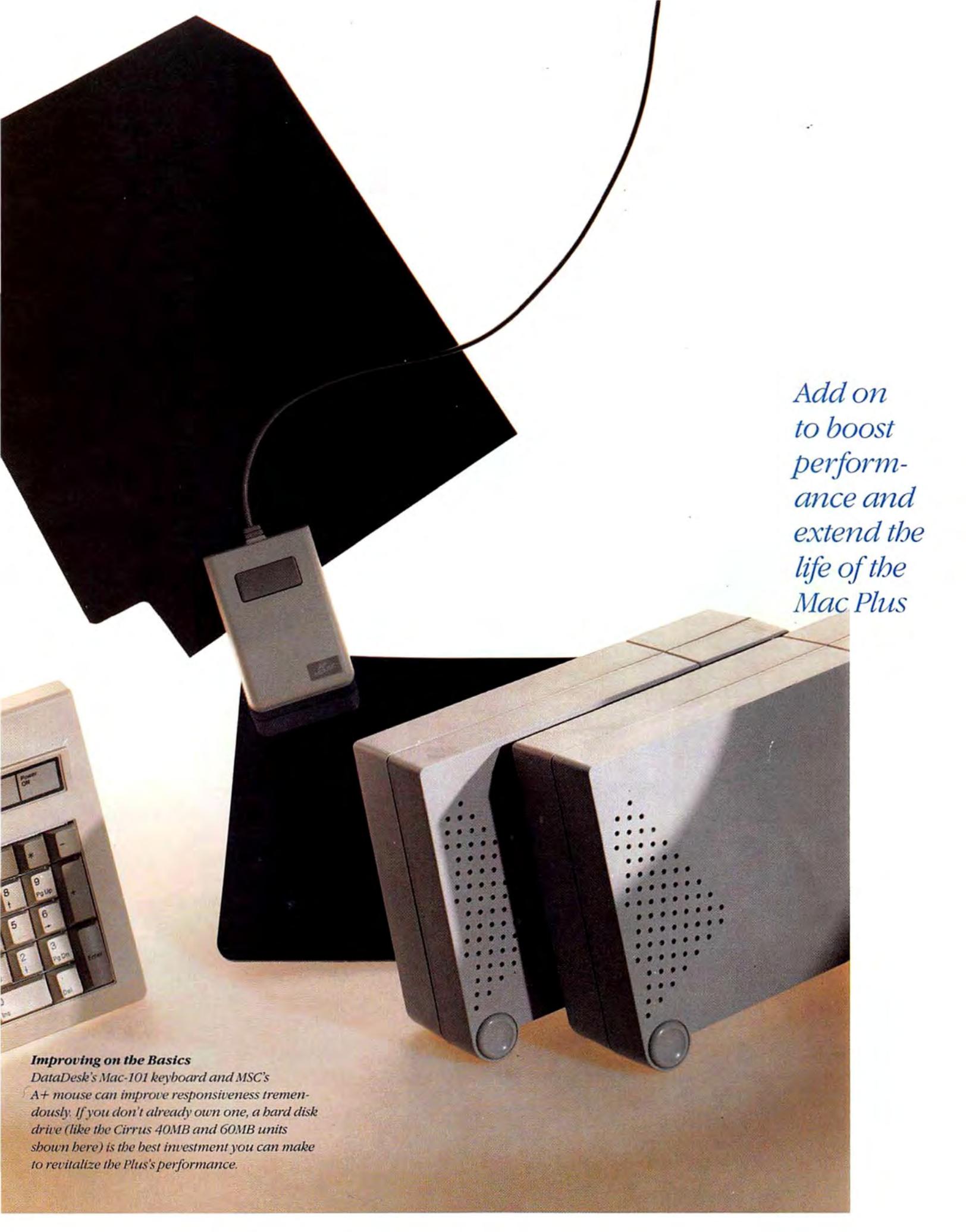
Not to worry. Your Mac Plus isn't going to break down overnight; it's served you just fine up till now, and it's not going to stop working just because of its changing market position. In fact, if Apple lowers the price enough, it may sell very well in some new markets, such as education and home.

Most important, don't think you're stuck with a dead-end system. While the Mac Plus wasn't designed for expansion, it can be expanded nevertheless. And I'm going to show you how to do it. I'm going to take a Mac Plus and give it a face-lift of sorts. And by the end of the article, you won't feel bad at all.

First Things First

Get a hard disk. Seriously. Or, in this case, Cirrus-ly. La Cie sent us not one, but two of their Cirrus hard disk drives, one 40MB and one 60MB. These are small, slick units that sit by the side of a Mac Plus. They're about the same depth as the Plus, half the height, and two inches wide. You can stack them horizontally or vertically, they don't make much noise, and they're fast. If this were a formal review of hard





*Add on
to boost
perform-
ance and
extend the
life of the
Mac Plus*

Improving on the Basics

DataDesk's Mac-101 keyboard and MSC's

*A+ mouse can improve responsiveness tremen-
dously. If you don't already own one, a hard disk
drive (like the Cirrus 40MB and 60MB units
shown here) is the best investment you can make
to revitalize the Plus's performance.*

disks, we'd list two dozen of them, with cost, capacity, features, and access times. But it's not, so we'll just say that the Cirrus is fast enough for all practical purposes, and it beats the heck out of working with floppies.

By the way, you can hook up the two Cirrus hard disks—or, for that matter, any two SCSI drives—to the Mac Plus at the same time. In the case of the Cirrus drives, you must open up the cabinet of one disk, move two jumpers, and then close the cabinet back up. That changes the SCSI ID of that hard disk from 1 to 2. Careful closing the cabinet, though; I had some difficulty stuffing all the wires back inside.

The result is worth it: 100MB of on-line storage, easily accessible. The Cirrus drives come with volume-management and remote-disk-serving software (called Sil-

verServer) that makes it easy to organize that space into manageable chunks. Or, if you want, you can set up the two drives to look like a single volume. Cost of the drives: \$739 for the 40MB Cirrus, \$839 for the 60MB.

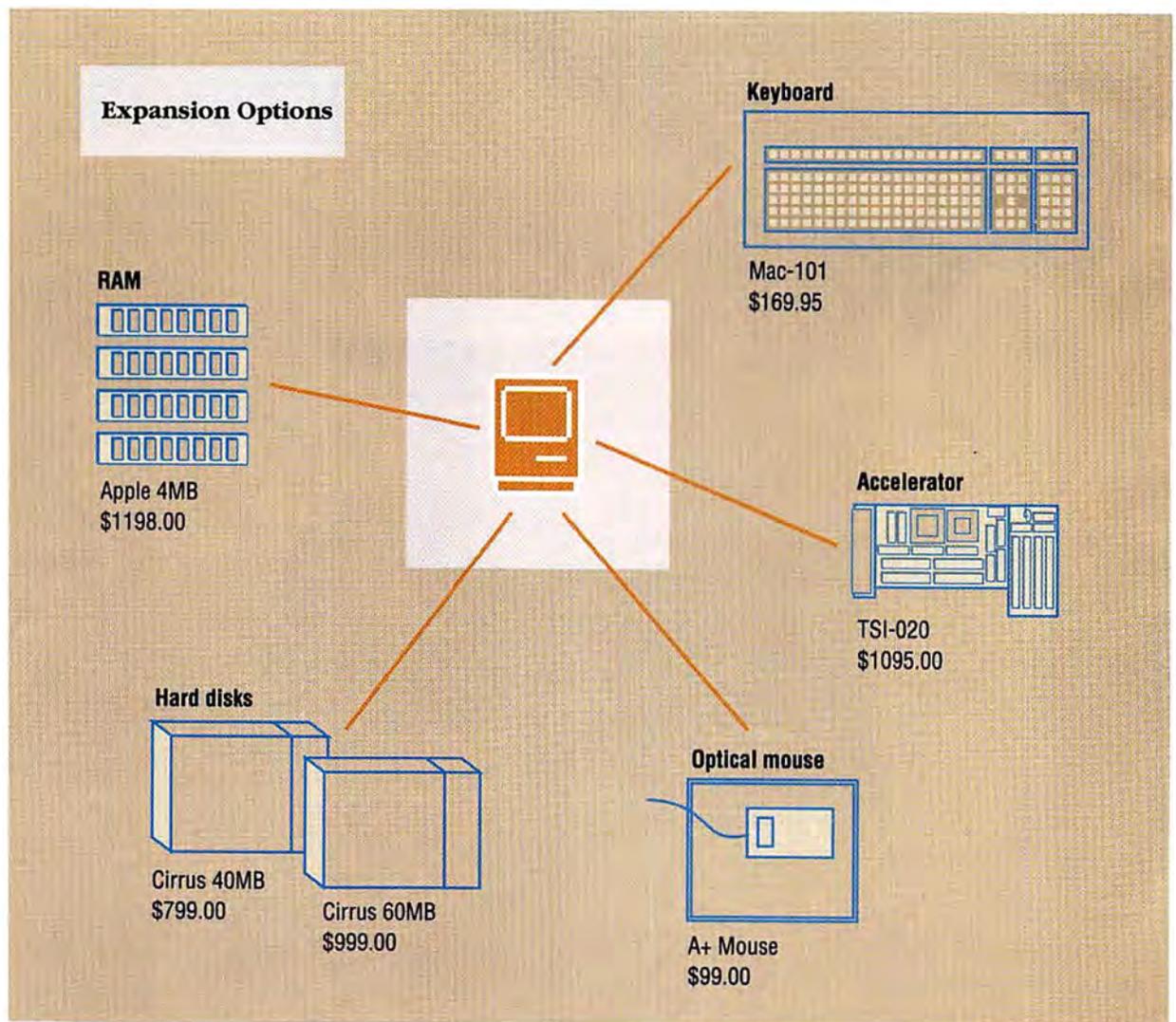
Expand Memory

Next thing you need is more memory. That way, when your friends start dropping comments about having 2MB or 4MB on their SEs (or even more on their IIs), you can casually yawn and say, "Yeah, I really like having 4MB on my Mac Plus."

Of course, it isn't going to come cheap. Thanks to our government's efforts to protect the American semiconductor industry, RAM prices—after a steady decline for years—are now on the upswing. The strength of the yen doesn't help, either. You

can expect to pay anywhere from \$1200 to \$2400 for 4 Single Inline Memory Modules (SIMMs), each containing 1MB of RAM. They plug into the SIMM sockets on the Mac Plus system board. Instructions for adding RAM to the Mac can be found in the May 1988 issue of *Macworld* ("Installing Memory"), while a comprehensive listing of companies selling RAM can be found in the February 1988 issue ("New Life for an Old Mac").

In this case, we went with Apple's product. We got two packages, each containing two 1MB SIMMs. Installation required a specialized Mac opener and a bit of caution, but otherwise went well. Cost: \$849 per 2MB, or \$1698 altogether. Note that if you're getting an accelerator board, however, you may not need (or be able to use) the extra memory on the Mac Plus



system board. Be sure to check this out with your dealer.

Trade In Your Keyboard

After three years of keyboards with no function or cursor keys, Apple came out with not one but two honest-to-goodness professional keyboards. That's the good news. The bad news is that they only work on (you guessed it) the Mac SE and the Mac II. Your Mac Plus is stuck with that plain ol' Macintosh keyboard.

Or is it? One alternative from Olduvai, AdBridge, lets you attach keyboards for the SE and II, or for that matter any Apple Desktop Bus device, to the Plus. Alternatively, the folks at DataDesk International have a keyboard for the Mac Plus that puts either of Apple's new offerings to shame. The Mac-101 Keyboard sports 101 keys, including 15 function keys, a full numeric keypad that looks amazingly like a PC's, a separate set of cursor keys that actually work, and a number of special-purpose keys. It doesn't, however, have a Ctrl key, though one presumes the SE/II model does. (Yes, there is a model for the SE and II.)

The keyboard has a nice feel to it. I always thought I liked my keys a bit bouncier, but I seem to type faster on the Mac-101 than on the regular Mac Plus keyboard. More important, though, is that the Mac-101 supports keyboard macros. It comes with several predefined macro files, including one for Microsoft Word 3.0, and an overlay template for the function keys. The keyboard also has a desk accessory that lets you create your own keyboard macros. In other words, you can map a sequence of characters, as well as window commands, to a single key. The Mac-101 comes with excellent documentation (some 50 pages' worth) telling you how to get the most out of the keyboard. I may get one of these for the Mac II. Cost of the Mac-101 (for all Mac versions): \$169.95.

Get a Faster Mouse

Here's a way to show up those upper-class-Mac snobs. Throw away your old mechanical Apple mouse and get an optical one. This gadget works by shining light onto a pad containing a grid pattern and reading the reflections. The bad news is that an optical mouse works only on a special precision pad. The good news is that an optical mouse moves and handles a lot

smoother than the usual mouse. It's also very easy to make fine movements—especially handy when drawing. And you don't have to open it up and clean the gunk off the rollers every month or so.

The optical mouse I tried is the A+ Mouse from MSC Technologies. No real installation; just plug it into the regular mouse port, put it on its pad, and you're ready to go. Cost of the A+ Mouse: \$99. If your SE and II friends get jealous, they can buy one, too, but it'll cost them extra: \$129 for the A+ ADB Mouse.

Add On or Trade Up

So, here we are with the Mac Plus. It now has 4MB of RAM, somewhere from 40MB to 100MB of hard disk storage, a full-size keyboard (complete with macro facilities), and an optical mouse. This is a system that will stay productive for a long time. Still, you might want something more, something with *oomph*. And so you opt to get an accelerator board for your Plus.

Horsepower to Go

If it's speed you're after, accelerators like the TSI-020 (shown here) can put Mac II performance in a case you can carry:



This is a major upgrade and not without pitfalls. There are significant compatibility problems with 68020-based accelerators—just as there are with the Mac II—though the compatibility problems are slowly being resolved. More important, installing an accelerator means messing around with the Mac Plus system board. Yeah, you had to do that for the memory upgrade, but that was a breeze compared to this. You may want to have a dealer do it, or possibly even the firm that makes the upgrade. (I chose to live dangerously and do it myself.)

This is also the point to stop and ask yourself about buying a Mac II. TEK Computer in San Francisco is currently selling a Mac II with a monochrome monitor, Apple video card, standard keyboard, 1MB of RAM, and a 40MB hard disk, for under \$4000. Given the upgrade prices we're

looking at, especially for accelerators, you might be better off selling the Mac Plus and buying a Mac II. However, assuming you want to upgrade the Plus, let's add an accelerator.

Boost Performance

An accelerator board gives the Mac Plus a new central processing unit (CPU). Typically, it's a 68020 processor, sometimes with a 68881 math coprocessor, the same duo found in the Mac II. A few accelerators simply offer the same 68000 processor as the Mac Plus, but running at a higher clock speed—sort of like playing LPs at 78 rpm instead of 33½. When choosing an accelerator, look carefully at the various features and options: the processor, the clock speed, a math coprocessor, memory expansion, memory usage.

Macworld has covered accelerators in many articles over the past year, including "Beefing Up the SE," September 1987, and several follow-up reviews. An extensive list (and discussion) appeared in "New Life for an Old Mac" in the February 1988 issue.

For this article, I chose an upgrade that hadn't been reviewed yet: the TSI-020 accelerator, from Total Systems Integration (TSI). Unfortunately, my experience wasn't quite representative of what you're likely to encounter. The problem was I asked TSI to

send me an accelerator that had already been installed on a system board, because the installation involves soldering connector pins to the Plus's existing 68000. The "piggyback board"—a circuit board containing the 68020, 68881, and up to 4MB of RAM—then mounts to the connector pins. TSI was out of Mac Plus system boards, however, and the company sent an accelerator mounted on an old 512K system board. That, of course, caused a couple of major problems. First, the 512K board has no SCSI port, so I couldn't hook up the hard disks again. Second, the 512K board has a different set of ports on the back, so I couldn't put the Mac Plus case back on.

TSI had solutions for both problems. First, it sent me a special adapter that runs a SCSI cable out from the piggyback board. That allowed me to hook up the hard disks. Second, TSI sent the back of a Mac 512K case, so I could close up my Mac.

Though TSI recommends that a dealer install the upgrade, I went through the procedure to see what it involves. The upgrade itself is fairly easy to perform, if a bit nerve-racking. I removed the back of the case (being extremely careful not to touch the flyback cable—I value my life), unplugged the power and disk drive cables from the system board, and slid it out of the machine. I installed the auxiliary power sup-

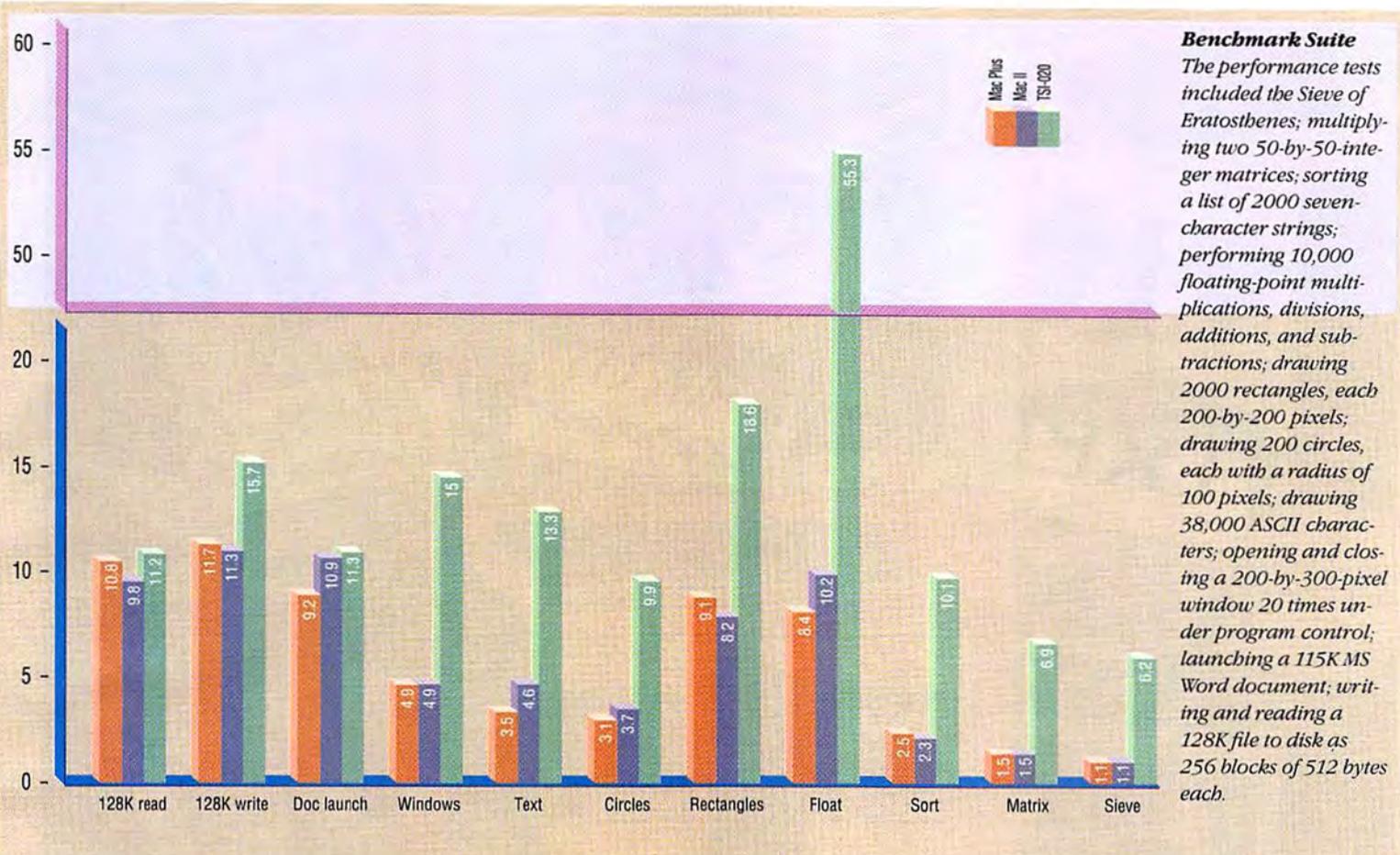
ply (from TSI) and hooked the clips to the Mac's analog board. I pried the Mac Plus ROM chips out of the Mac Plus system board and inserted them in the 512K board from TSI. I then inserted the upgraded system board; it doesn't slide in, so you have to lever it into place from underneath. I connected the necessary wires and cables, put the Mac 512K case on, plugged everything in, and powered up. It worked!

Performance using the TSI-020 is equivalent to and occasionally better than a Mac II's in most areas. At first the TSI-020 didn't appear to support automatic access of the 68881 math coprocessor. However, I discovered a utility that routes Standard Apple Numerics Environment (SANE) calls to the 68881, which speeds up floating-point operations.

"Benchmark Suite" shows some simple benchmarks performed on the Mac II (running MultiFinder), the TSI-020 (running its system software), and the Mac Plus (running pre-MultiFinder system software). The document launch involved double-clicking on a 115K Microsoft Word document and timing how long it took for the document to appear, with the cursor at the beginning of the file. All disk benchmarks were done using an internal 800K floppy drive. The benchmarks should be treated as a general indication of relative perfor-

Accelerator Boards for the Macintosh Plus

Company	Product	Processor	On-board Memory	Floating-Point Unit
Levco	Prodigy 4	16MHz 68020	4MB RAM	optional
MacProducts USA	Magic 020	12.5MHz 68020	none	included
Network Specialties	Jump 020	16MHz 68020	1MB to 4MB	optional
Radius	Radius Accelerator 16	16MHz 68020	32K cache	optional
Ryad	MacEngine GT	16MHz 68000	up to 4MB	no
Ryad	MacEngine Turbo	16MHz 68020	up to 4MB	optional
Spectra Micro Development	MacAccelerator	12MHz 68020	none	included
Total Systems Integration	TSI-020	16MHz 68020	up to 4MB	included



Benchmark Suite
 The performance tests included the Sieve of Eratosthenes; multiplying two 50-by-50-integer matrices; sorting a list of 2000 seven-character strings; performing 10,000 floating-point multiplications, divisions, additions, and subtractions; drawing 2000 rectangles, each 200-by-200 pixels; drawing 200 circles, each with a radius of 100 pixels; drawing 38,000 ASCII characters; opening and closing a 200-by-300-pixel window 20 times under program control; launching a 115K MS Word document; writing and reading a 128K file to disk as 256 blocks of 512 bytes each.

Expansion Port	Other	Price
MegaScreen Plus	clip-on board; includes fan, power supply, SCSI port, RAM disk kit; chips not included	\$3099
none		\$99
Stretch Screen and Stretch Projector	clip-on board; CPU can run at 16MHz or 24MHz	from \$1595
none		\$995
none	includes fan, power supply	from \$595
none	includes fan, power supply	from \$695
The Big Picture	clip-on board; includes C compiler and assembler	\$695
none	clip-on board; includes fan, power supply	from \$1295

mance, not as exhaustive, scientific tests.

Cost of the TSI-020 upgrade, with a 16Mhz 68020, 16MHz 68881, and 1MB of RAM: \$1295.

Well Worth the Effort

The total cost for the upgrade without the accelerator and with 4MB of RAM from Apple was \$2706. The total cost with accelerator and auxiliary power supply (but without the Apple RAM) was \$2453. Even though I usually work on a Mac II with a large screen, I found the Mac Plus (with no accelerator) very acceptable to work on; funny what a lot of memory and disk space can do. With the accelerator, it was wonderful.

The bottom line is that you can keep your Mac Plus running and productive for quite some time. Just because its price is coming down—even if Apple discontinues it—the Mac Plus isn't ready for the scrap heap yet.

See *Where to Buy* for contact information.



Where Are the Clones?

What are these so-called PostScript clones, anyway, and what's taking them so long?

by Brita Meng

I admit it—when I heard that printer manufacturers were developing laser printers that could print PostScript files without using Adobe Systems' page-description language, I nearly jumped for joy. The companies were promising the output quality of a PostScript printer, better performance, and a lower price. But, more than a year since the printers were first hyped, you and I are still waiting for the first PostScript clones.

Manufacturers know that if they don't ship product, they sow skepticism: How similar can their printers be to printers equipped with Adobe's (and no one else's) PostScript? Can a clone outperform the original? Will the fonts be as good as PostScript fonts? Will the clones really be less expensive than PostScript printers?

You'll have to wait a little longer still for answers to those questions. Developers working on printer controllers that copy the way a PostScript-equipped controller works have discovered how difficult it is to

clone PostScript. To be called compatible, a PostScript clone can't just print pages that look as if they were produced by, say, an Apple LaserWriter. A clone must go beyond that and actually duplicate how a PostScript printer handles text, graphics, and special effects. You should be able to connect a clone to a Mac or an AppleTalk network and drive it from Mac applications as if it were a LaserWriter.

Meanwhile, you should consider yourself lucky, because the first PostScript clones are strictly for IBM PC users, who will serve as de facto laboratory mice in the test of PostScript compatibility. But sooner or later you, too, will have to decide to clone or not to clone.

What to Expect

To take advantage of PostScript, a laser printer needs a specific combination of hardware and software (see "The Controller Board"). Without a doubt, two software elements have caused most of the technical headaches for clone developers. One is the PostScript *interpreter*, which translates

PostScript language files into bitmaps that the printer's *marking engine* can print. The other is the software that scales font outlines to print type in different sizes.

Printer manufacturers are licensing interpreters from companies other than Adobe in hopes of achieving either a price or performance advantage over Adobe-based printers (see "Why Clones?"). Developers of PostScript-compatible interpreters are aiming to compete with the performance—not the price—of printers equipped with Adobe's interpreters, and they're taking several approaches. The first is to improve the speed at which the interpreter creates the bitmap of each page to be printed. This *rasterization* process involves a lot of computation—at 300 dots per inch (dpi), more than seven million dots have to be mapped in the image of a single 8-by-10-inch page.

Some PostScript-clone interpreters use graphics coprocessors in conjunction with general-purpose processors like the

Motorola 68000 to accelerate PostScript processing. For example, the 720 IQ laser printer from Printware in Saint Paul, Minnesota, uses two 68000 chips and a proprietary coprocessor on its controller. Other clones are employing proprietary chips, such as reduced instruction-set computer (RISC) chips or application-specific integrated circuits (ASICs), specially designed to handle the PostScript language. The interpreter from Raster Image Processing Systems (RIPS) of Boulder, Colorado, is optimized to run on a proprietary RISC chip; Eicon Technology of Montreal, Canada, is

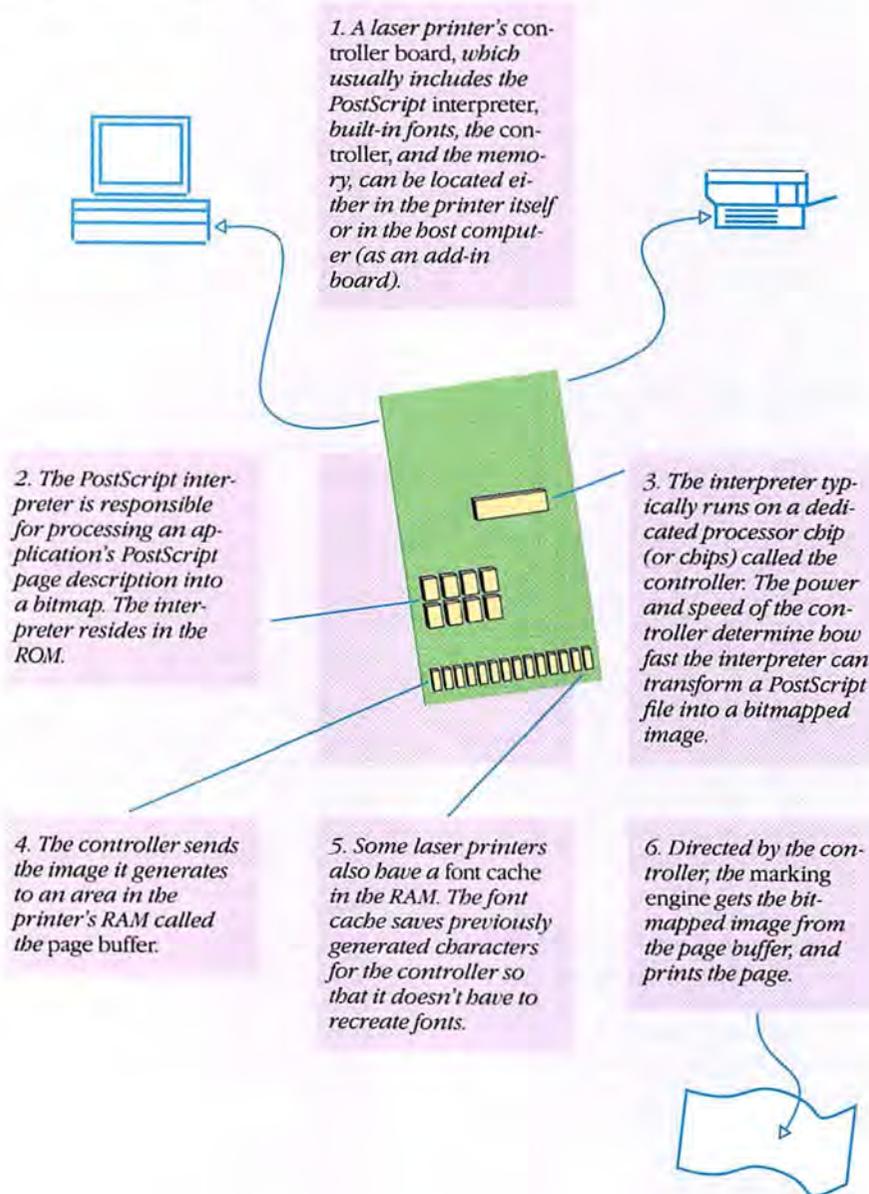
working on a printer controller based on transputer technology.

A second approach is to employ a faster marking engine in the laser printer. The LaserWriter IINTX laser printer—even with a 68020 on its controller—can print only 8 pages per minute. Two laser printers from Kentek Information Systems in Allendale, New Jersey, the K3 and K4, use the PostScript interpreter clone developed by Phoenix Technologies in Norwood, Massachusetts. The K3 is a 24-page-per-minute printer; the K4 is a 24-side-per-minute printer.

The third way to enhance PostScript clones' performance is to give them printing resolutions higher than the 300-dpi laser printer standard. The PrintWare 720 IQ, for example, prints at 1200 dpi, and other PostScript-clone printers are designed to print at 1600 or more dpi. But all these approaches cost money, so don't expect PostScript clones to offer significant savings over PostScript-equipped laser printers.

Seeking less expensive solutions, some developers are working on software approaches to giving non-PostScript printers PostScript capabilities. General Computer Corporation in Waltham, Massachusetts, for example, offers a "PostScript brain transplant" that adds a clone interpreter to its QuickDraw Personal Laser-Printer and costs about \$2000.

The Controller Board



How Compatible Is Compatible?

No matter the perks of price or performance, PostScript clones, almost by definition, are only as good as they are compatible with PostScript printers. A developer working on a clone of a PostScript interpreter must produce software and hardware that can take PostScript code generated by an application program and create a bitmap for the printer's marking engine, and that bitmap must be as close as possible to the bitmap produced by an Adobe interpreter using the same code.

For a PostScript clone to be compatible, its interpreter must be able to recognize all PostScript language commands defined in Adobe's *PostScript Language Reference Manual* (also called the Red Book). The interpreter must be able to execute those commands on the printer according to Red Book definitions. The Red Book, however, is incomplete. Adobe's interpreters have their own undocumented idiosyncracies. The PostScript operator *eexec*, for example, is not included among Adobe's published definitions. The *eexec* operator enables PostScript programmers to modify existing PostScript commands, add additional commands to the interpreter, and encode and decode font information. It has also been used for patching PostScript bugs to avoid upgrading a laser printer's read-only memory (ROM).

Macintosh system software designed for a specific PostScript printer (Laser Prep for the LaserWriter, for example) complicates matters further. Laser Prep defines some extra PostScript features, not included in the LaserWriter's ROM, written specifically for the LaserWriter. In fact, each

Why Clones?

PostScript printers are in high demand. Users want to buy them, and printer manufacturers want to sell them. Equipping their printers with PostScript means that manufacturers have to license Adobe's proprietary interpreter and Adobe's proprietary fonts. Because Adobe works closely with each printer manufacturer to develop the right PostScript interpreter for its printer, high demand means long hours for Adobe engineers and a long queue of eager printer manufacturers waiting impatiently for Adobe to get around to them. Developers of PostScript-compatible interpreters have offered those manufacturers another option.

Interpreter developers (see "For More Information") claim that their clones offer significant advantages to printer manufacturers and (by extension) to you. In the first place, they say, manufacturers must wait a year for Adobe to develop a PostScript interpreter specifically for their printers—time that printer companies would rather spend selling their printers.

Second, clone makers claim that Adobe's licensing and royalty fees are excessive—\$100,000 down and a \$2 million minimum over two years are the figures most often cited. Industry analysts at Datek in Newtonville, Massachusetts, say that 7 percent of each PostScript printer's price tag goes to Adobe.

In addition to charging high fees, say clone makers, Adobe offers a slow interpreter. They claim that graphics coprocessors, reduced instruction-set computer (RISC) chips, and application-specific integrated circuits (ASICs) in printer controllers improve printer performance. All the clone makers currently claim that their printer controllers are faster than Adobe's.

Adobe denies all those allegations. Clinton Nagy, national sales manager, says that generally there is not a year-long wait for an Adobe interpreter. The development time depends on the complexity of the project. If a printer vendor wants a high-speed, high-resolution, color laser printer, it could take a year or so, according to Nagy.

On the other hand, he points out, AST Research was able to deliver finished printers to stores only 90 days after Adobe and AST signed a PostScript contract.

Nagy also disputes the charges of excessive Adobe royalty and licensing fees. He claims that clone developers themselves have acknowledged the high cost of research and development involved in cloning PostScript interpreters, let alone in developing the original itself. Steve Butterfield, vice president of marketing and sales at another clone developer, Bauer Enterprises in San Jose, California, estimates that Bauer's effort to make a PostScript-compatible interpreter is easily a 20-worker-year project.

Meanwhile, Adobe is improving PostScript performance. According to Nagy, much of the high-performance code developed for Display PostScript will be used in Adobe's PostScript interpreters. Adobe is also working with the same graphics coprocessors, ASICs, and RISC chips that many of the clones are using to improve performance.

Adobe PostScript interpreter includes commands specific to the printer for which it was developed. These *device-level* commands depend on the paper tray, document feeder, and collator features, among others, that a manufacturer would like to include with its printer.

By the end of this year, Adobe expects to have more than 70 implementations of its own PostScript interpreter installed in laser printers. Thus, clone vendors face more compatibility questions. Exactly which PostScript printer do they want to clone? And which Adobe interpreter ver-

sion do they choose for that printer? (Many clone developers have decided to emulate Adobe's implementation of PostScript for the LaserWriter, but there are at least two versions of LaserWriter interpreters. The original LaserWriter included version 38; the most current LaserWriter interpreter, used in the IINT models, is version 47.)

There are also bugs in Adobe's own interpreters. In some cases, software programmers have accommodated those bugs in their applications. Clone makers must decide whether they should implement those Adobe bugs in their interpreters so that such applications print documents as expected on the clones. According to Mike

Drewry, technical marketing support manager at Control-C Software in Beaverton, Oregon, Control-C's PostScript interpreter clone includes all the Adobe bugs in version 38; the company is now working on its version 47 clone.

Aside from System prep files and different versions of PostScript, clone makers also have to consider printer drivers. All Mac applications use the Mac's LaserWriter driver to send documents to a laser printer. If a PostScript clone can't work with that driver, applications won't print on the clone. You'd be forced to use only those

For More Information

Interpreter Manufacturers

- Adobe Systems, P.O. Box 7900, Mountain View, CA 94039-7900. 415/961-4400.
- Bauer Enterprises, 1340 Saratoga-Sunnyvale Rd., #201, San Jose, CA 95129. 408/446-4944.
- Control-C Software, Inc., 9205 S.W. Gemini Dr., Ste. A, Beaverton, OR 97005. 503/641-8128.
- Eicon Technology Corp., 2196 32nd Ave., La Chine, Quebec, Canada H8T 3H7. 514/631-2592.
- Imagen Corp., 2650 San Tomas Expwy., Santa Clara, CA 95051. 408/986-9400.
- Phoenix Technologies, Ltd.,

320 Norwood Park S, Norwood, MA 02062. 617/762-5030.

- Printware Inc., 1385 Mendota Heights Rd., Saint Paul, MN 55120. 612/456-1435.
- Raster Image Processing Systems (RIPS) Inc., 4665 Nautilus Court S, Boulder, CO 80301. 303/530-2910.

Font Vendors

- Bitstream Inc., 215 First St., Cambridge, MA 02142. 617/497-6222.
- Compugraphic Corp., 200 Ballardvale St., Wilmington, MA 01887. 617/658-5600.
- URW, via The Company (U.S. marketing arm) 400 World

Trade Blvd., Boston, MA 02210. 617/439-5347.

Printer Vendors

- Birmy Graphics, 2244 N.W. 21 Terr., Miami, FL 33142. 305/633-5241.
- Imagen Corp., 2650 San Tomas Expwy., Santa Clara, CA 95051. 408/986-9400.
- Itek Graphics, 34 Cellu Dr., Nashua, NH 03063. 603/889-1400.
- Kentek Information Systems Inc., 6 Pearl Ct., Box 78, Allendale, NJ 07401. 201/825-8500.
- Printware Inc., 1385 Mendota Heights Rd., Saint Paul, MN 55120. 612/456-1435.

Mac applications that can print through a printer driver specific to that clone. To simplify matters, PostScript printers other than the LaserWriter, like QMS's PS-800 Plus and Texas Instruments' OmniLaser 2108, use the standard LaserWriter printer driver.

Networking is yet another issue. According to Doug Macrae, chair of General Computer, developing a printer that works over AppleTalk is not a simple task. Apple and Adobe worked together to ensure that the LaserWriter could be shared over AppleTalk; General Computer also worked

closely with Apple to put its Personal Laser-Printer on AppleTalk networks. Although several printers can be connected to a Mac via the serial port, you can't share those printers. You don't want to buy a clone only to find that you can't use it over AppleTalk.

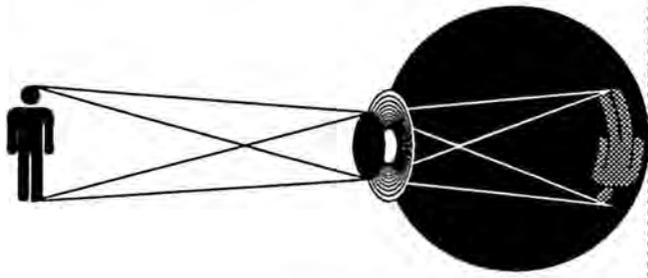
Is It Type or Is It Hype?

Font quality is the major issue faced by PostScript clone developers, and it will be the major issue that potential customers will be considering. Many of the first clones (Printware's 720 IQ, the Ulte Type-

setter from Birmy Graphics, and Itek Graphics' IGX 7000) did not print at 300 dpi, but rather at higher resolutions—1200 dpi and up—that allow for smoother edges and better definition in type characters.

Producing well-defined characters in various type sizes—especially small text faces and large display type—at 300 dpi has been Adobe's (and PostScript's) advantage all along. The clone developers' problem lies in the rasterization process that transforms an outline font into bitmapped characters. The outline is scaled to the selected type size and then filled with dots. To maintain its fonts' design and edge definitions, Adobe uses carefully guarded "hints" in its interpreters that clone makers can only approximate, some more successfully than others.

To achieve the same type quality available from PostScript printers, clone manufacturers must either develop their own scaling and rasterization techniques or search for font vendors with comparable technology. Most clone makers are not type experts. Many have gone to established manufacturers of digital type for PostScript-compatible fonts—Bitstream in Cambridge, Massachusetts; Compugraphic in Wilmington, Massachusetts; and URW in Hamburg, West Germany, among others.



Graphic Output

An example of graphic output from the RIPS PostScript-compatible interpreter.

Reviews

Heavy-Duty Word Processor

WordPerfect 1.0

Word processor. **Pros:** Tremendous depth and breadth of features; includes macro language, newspaper- or screenplay-style columns; sophisticated editing, formatting, and file management; automatic save, automatic hyphenation, spelling checker, thesaurus, outliner; facilities for endnotes, footnotes, table of contents, and index; elaborate online help; exhaustive manual; toll-free technical support. **Cons:** Still contains some bugs, especially with screen refresh and word wrap; some formatting limitations when importing or exporting WordPerfect files from or to WordPerfect running on different computers; some unnecessary variations from the Mac interface. **Company:** WordPerfect. **List price:** \$395. **Requires:** 512K, two 800K drives; hard disk recommended.



WordPerfect, one of the premier word processors in the MS-DOS world, brings to the Mac power features that are oriented toward the office user. Although those not in the business mainstream will find the product a bit too impersonal, WordPerfect offers more breadth and depth of features than any other word processor on the Mac, and in spite of its MS-DOS heritage, it is distinctly Mac-like. For those writers who need a program as powerful as this, there's no substitute.

More than a Look-Alike

Initially, WordPerfect seems a lot like MacWrite. For instance, WordPerfect offers only one more choice, Windows, on the main menu bar. But when you start to explore, you'll find that WordPerfect has 154 menu choices (including 18 hierarchical menus) and 67 ⌘-key options. (For those with extended keyboards, there are also 60 F-key combinations.) MacWrite, on the other hand, offers only 46 menu choices and 20 ⌘-key options. This is a crude way to compare packages, but you get the idea.

WordPerfect's and MacWrite's start-up screens look similar, except for the bottom of the window. MacWrite makes this area part of the writing surface; most other word processors display the page number in the lower left-hand corner and provide a horizontal scroll bar. WordPerfect displays

not only the page number, but the line number as well. Although this feature may seem unimportant—especially when you consider that your per-page line count can vary drastically depending on the font you use—users whose work requires a line count will find it a lot more efficient than doing a manual count. Moving the cursor over the page number changes the arrow to the word *GO*. Enter any number, and the cursor jumps to that page.

Just to the right of the line number is the most un-Mac-like feature in the pro-

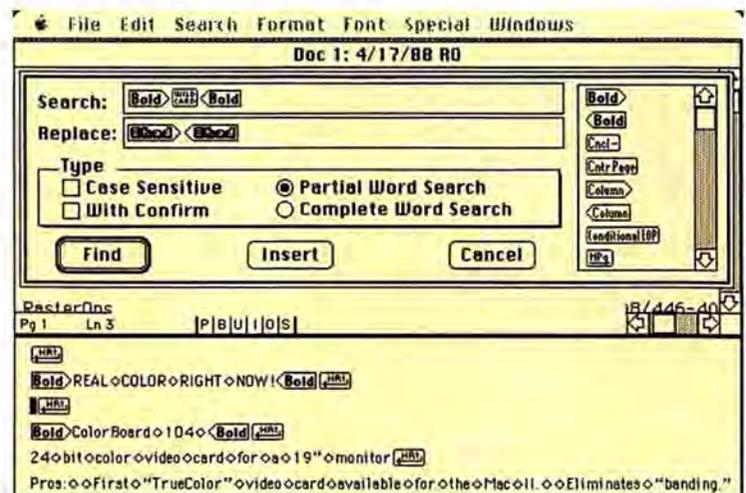
Snazzy Searches

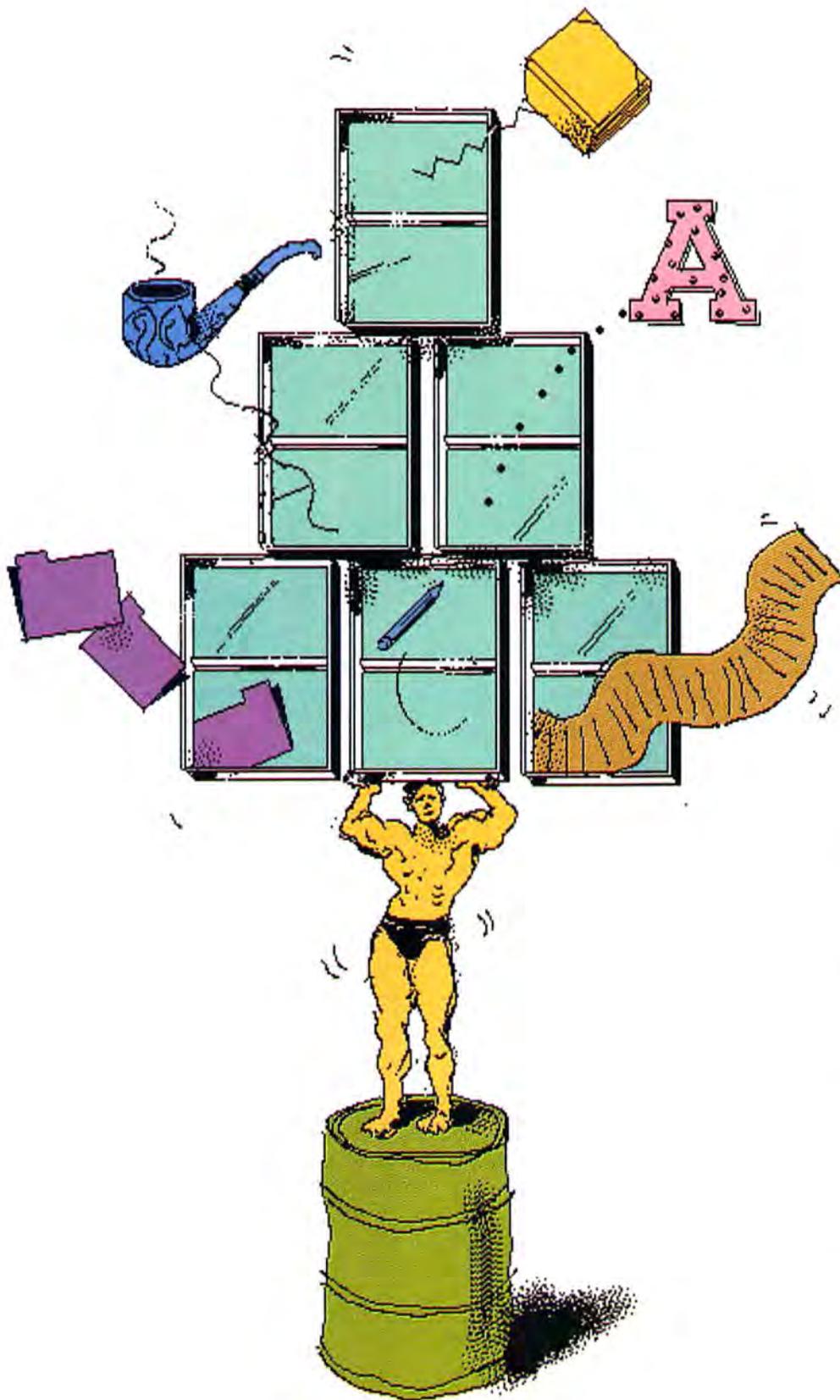
In addition to the standard Search and Replace options, WordPerfect offers a scrollable list of formatting codes that you can search for, replace, or insert. Note the Wild Card option. In the bottom half of this split screen, the user has opted to display formatting codes. You can delete, copy, cut, or paste any of them.

gram: a row of six small buttons for changing style (for instance, boldface or italic). Clicking one of these buttons changes the style of selected text, or lets you begin typing in a new style. (Alternately, you can change style with a ⌘-key combination or via a hierarchical menu.) Next to the buttons is a large space that displays messages that indicate when the program is automatically saving a file or when text is selected, for example.

Features Galore

If I did nothing but list WordPerfect's features, I would still exceed the space *Macworld* has allotted this review. But to mention some of the most important ones: you can open as many windows as your machine's memory allows; you can use big screens, small screens, or a combination of the two; and you can see your documents in color. The ruler can be up to 22 inches wide. WordPerfect's macro language handles very sophisticated operations like mail merge, or trivial tasks like reassigning ⌘-key combinations. Making style sheets or customized stationery are excellent ways to use the macro language. Those ten-





tative about writing macros can have the program record a series of mouse and keyboard actions. The File Management feature gives you a level of control found only in utilities such as Disk Tools II. For instance, you can open, print, copy, rename, and delete files, select Get Info for a file, create a new folder, or do a word search.

A real lifesaver, the Auto Save option smoothly and unobtrusively backs up the active file as often as you like—so if the system crashes, your work is safe. You can, however, still close a file without permanently saving any changes made during the work session.

For precision editing, you can make the normally invisible formatting codes visible. The window splits, with the top appearing as normal and the bottom containing WordPerfect's proprietary formatting icons. The icons can be cut, copied, and pasted. The Search and Change window includes a scrollable list of WordPerfect's hundred or so symbols, making global replacement a snap. In addition to the standard Undo feature, the program offers an Undelete command that recovers three levels of deleted material. You can append to, rather than replace, the Clipboard's contents.

WordPerfect is the first Macintosh word processor to include both newspaper-style and screenplay-style columns. In newspaper-style columns, text flows from the bottom of one column to the top of the next column on the same page. With screenplay-style columns, text flows from the bottom of one column to the top of a column in the same position on the next page—a very handy feature when creating tables. Each page can have up to 24 columns of various widths, and you can use different column styles on the same page.

Other features include an outliner, merge, endnotes, footnotes, and the ability to embed PostScript commands in any document. The spelling checker is excellent, with a dictionary fattened to 115,000 words, including several thousand legal and medical terms. Less-important features that are among my favorites include word count, fixed or variable date stamp, dot leader tabs (for example, 229 327), and vertical page centering.

Performance

Although not totally bug free, WordPerfect version 1.0 is many times cleaner than Word 3.0 was when it was released. WordPerfect's screen refresh is still slow,

(continues)



Nothing Protects Your Apple Like Tallgrass.

Sooner or later your Macintosh is going to crash. And unless your Mac's been backed up, it'll probably take your data with it. That's why you need the TG-4000 high performance tape backup system from Tallgrass. It features the tape format that Apple endorses, QIC-100. We invented it, and now it's the industry standard.

The Fastest Backup in the Business.

The TG-4000 backs up your data twice as fast as our closest competitor, with over 40 Mb of fully-formatted space. So you won't waste time rotating diskettes in and out of drives.

Backup's Never Been So Easy.

You won't ever have to use the manual. The TG-4000 is icon-interfaced, so you can get the system up and running in no time. From novice to power user, the TG-4000 offers the total flexibility you need and expect from a backup system. Plus, it's compatible with Apple's 40 SC,™ AppleShare™

and A/UX.™ And since its backup operations are automatic and unattended, you can just set it and forget it.

Nobody Backs Their Backup System Like Tallgrass. Our Exclusive 3-Year Warranty Proves It.



Whether you need a tape only system, tape plus disk, or you want to add an extra 40-100 Mega-bytes of disk storage at a later date, the TG-4000 fully backs up your Mac Plus, SE, or II.

Check for yourself. Only Tallgrass has enough confidence to offer a three-year exclusive warranty on their backup system.

Tallgrass Protects Your Company's Bottom Line, Too.

The TG-4000 protects your valuable data at a price much lower than you'd expect, and lower than any of our competitors.

Protect Your Apple Before It Falls.

Call 1-800-TAL-GRAS or write to:
11100 West 82nd Street, Overland Park, KS 66214

Circle 6 on reader service card

 **TALLGRASS**
TECHNOLOGIES

When it's worth saving, it's worth Tallgrass

On the Other Hand

For all the effort put into loading WordPerfect with features, the developers seem to have lost sight of the really important points. The program is disturbingly slow when reformatting, say, a paragraph in which I've just deleted some text. The word wrap can't keep up with my typing (40 to 50 words per minute), sometimes getting so far behind that a line becomes temporarily garbled. And, for all the program's claims of flexibility, the interface is awkward for those who prefer using the mouse for most operations. Nearly 70 percent of the commands must be

accessed through sub-menus, including those for such commonly used features as line spacing (the ruler lacks an icon for specifying single or double spacing). In addition, to get a true Macintosh feel, the style buttons at the bottom of the screen should be customizable and the window that displays formatting codes should be resizable. I'd really like to find a substitute for Microsoft Word, but WordPerfect's major performance and interface problems rule it out as a candidate.

—Cheryl Spencer

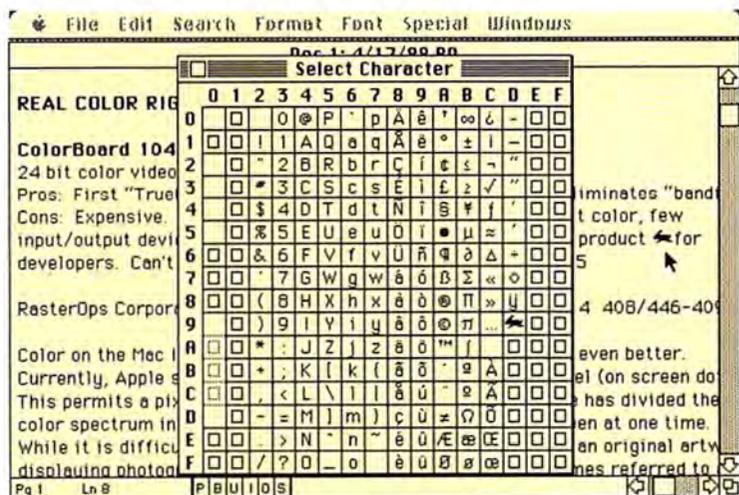
and characters sometimes disappear mysteriously at the end of lines in certain word wrap situations, only to reappear miraculously if you change the wrap. Others with different work habits from mine will undoubtedly uncover additional problems.

From PC to Mac

Ideally, WordPerfect would allow users to transfer word processing files transparently between all brands of computers that run the program. Just how much users are going to be disappointed by this implied promise remains to be seen. WordPerfect has stated that it will not currently attempt to transfer all the Mac formatting—such as font size, types, and styles—to the PC version. It will very likely be easier to retain

formatting when transferring files among various Mac word processors than when passing Mac WordPerfect files to WordPerfect on the IBM PC or other computers. Currently, the manual recommends that before opening a WordPerfect file from another computer, the user should change the file's Creator and Type. People whose regular work routine includes such file transfers aren't going to like this.

The manual is a three-ring binder holding nearly 700 pages. In general, it is well organized and well written. Technical support is toll free and the support technicians are affable and knowledgeable. Ask others who use WordPerfect—the company has a long-standing reputation for quality service.



Searching for Something Strange
Ever forgotten how to find a foreign or strange character? The Insert Literal menu choice shows you the complete character set currently in use. Just click on the desired character. WordPerfect inserts it at the cursor, and the Insert Literal window disappears.

A Power User Purchase

This is not the ideal word processor for everyone—many users have little need for the high-end features or the high-end price tag. Others will want a different set of features, such as those found in page-layout programs. WordPerfect allows you to import graphics, resize and move them, but it does not offer drawing tools, nor does it even allow you to draw boxes around blocks of text. But, although this product won't allow everyone to pass files back and forth transparently in an office with more than one brand of computer, WordPerfect is already my word processor of choice for the business environment.

—Scott Beamer

See *Where to Buy* for contact information.

Apple's PostScript Pair

LaserWriter IINT

PostScript laser printer. **Pros:** Faster, smaller, and less expensive than previous LaserWriters; darker blacks; newer PostScript version allows more downloadable fonts. **Cons:** No memory-expansion options; awkward DIP switches for changing operation mode; performance remains average. **Company:** Apple Computer. **List price:** \$4599.

LaserWriter IINTX

PostScript laser printer. **Pros:** Fast, 68020-based controller; expandable to 12MB RAM; accepts SCSI drive for font storage; emulates Hewlett-Packard LaserJet Plus. **Cons:** Performance hampered by relatively slow Canon SX engine; doesn't work with some storage devices; no parallel port for PC connection; awkward DIP switches for changing operation mode. **Company:** Apple Computer. **List price:** \$6599.



With its LaserWriter family, Apple introduced the world to the quality of PostScript printing. But Apple's pioneering printers were quickly upstaged by faster, often less-expensive printers. The LaserWriter IINT and IINTX update Apple's PostScript printer line and share several commendable traits.

Both printers run version 47 of PostScript, which is faster and uses memory

(continues)

We were ready for the Mac II almost before they were.

INTRODUCING THE NS8/16 MEMORY EXPANSION BOARD FOR THE MACINTOSH II

National has been providing high-level add-in products for over a decade. We've helped well over a hundred thousand multi-tasking, multi-user business environments run faster and better. So even before Apple was ready with the new Mac™ II, we were ready with the expertise and technology to help it work harder.

In fact, we viewed the Macintosh™ II as an 'open' invitation to provide power users with the right tools. And now we're proud to introduce the NS8/16 Memory Expansion Board.

GET 4, 8, 12, OR 16 MBYTES OF RAM FEATURING:

- Apple/UNIX® (A/UX) compatibility.
- RAMdisk software.
- Advanced NuBus™ support.

Speed through memory hungry applications like: CAD/CAM. Desktop Publishing. High Resolution Graphics. Big

Macintosh and Mac are trademarks of Apple Computer, Inc.
UNIX is a registered trademark of AT&T Bell Labs.
NuBus is a trademark of Texas Instruments Incorporated.
© 1987 National Semiconductor Corp.



ALL WITH QUALITY AND SUPPORT YOU CAN RELY ON

Get a full 5-year warranty on the NS8/16. Backed by the leader in memory products. And customer service.

National is the company you should think of for add-in products. Now, with our NS8/16 Memory Expansion Board. And in the future — you can expect to see a whole line of add-in products for the Mac II.

It's experience that lets us make a promise like that. So now that you have the Mac II ready to run, you know who can help you see how far it can go.

Databases and Spreadsheets. Financial/Accounting packages. And AI Programming. Just to name a few.

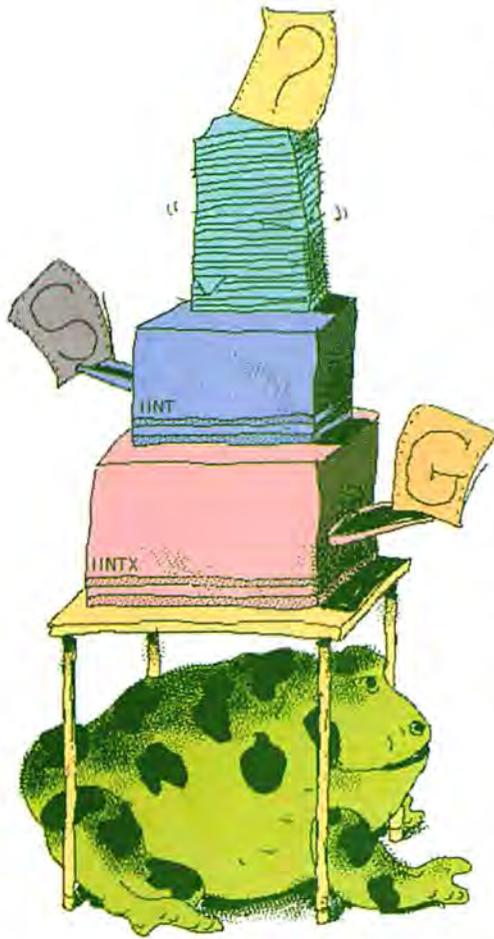
AND RUN A/UX MORE EFFICIENTLY

High-end applications will run at top performance levels under A/UX. Without modifications. And the NS8/16 remains completely transparent to the user.

In the Macintosh II operating system, the RAMdisk utility allows an application to treat the NS8/16 as one, or a series, of pseudo disk drives, accessing files at NuBus memory speeds.

So memory intensive applications will go much faster. As will switching between applications.

FOR MORE INFORMATION
CALL THE COMPATIBLE
PRODUCTS GROUP AT
800-345-4006
OUTSIDE OF CALIFORNIA
CALL 800-538-8510



more efficiently than its predecessors. Both use Canon's new SX print engine, which replaces the CX engine used in earlier LaserWriters. The SX engine feeds paper more reliably and prints darker images, although some people—myself included—prefer the CX engine for its superior rendering of fine details. Unlike other PostScript printers, both the IINT and IINTX contain smoothing routines that can be used to soften the edges of bitmapped graphics and text. (For background on the LaserWriter II family, see "The LaserWriter Lines Up," *Macworld*, March 1988).

Both printers also offer various upgrade and expansion options. For an additional \$2499, an NT becomes a top-of-the-line NTX. (That's \$499 more than you'll pay for an NTX to begin with, however.) The NTX accepts a variety of memory and hard disk expansion options.

Running on NT

The IINT replaces the LaserWriter Plus as Apple's PostScript printer for the masses (at least the masses who can spend over four grand for a printer). Like the Plus, the

NT includes 35 fonts. The NT, however, contains 2 megabytes of RAM, versus the Plus's 1.5MB. That, combined with the memory-efficient PostScript version 47, means the NT can hold many more downloadable fonts than the Plus. I successfully shoehorned 14 fonts into the NT's memory; the Plus usually chokes after 4.

Many of the NT's competitors, however—including QMS's PS 810, AST's TurboLaser/PS, and NEC's SilentWriter LC-890—offer 3MB of RAM, and thus can hold dozens of fonts. Unfortunately, the NT's memory isn't expandable. If you use downloadable fonts by the dozen, consider those other printers first.

The NT retains the LaserWriter Plus's ports and operating modes. There's an AppleTalk port and a 25-pin serial port for use with IBM PCs and other computers lacking AppleTalk interfaces, and there's a Diablo 630 emulation mode. On earlier LaserWriters, you switched between modes using a clearly labeled rotary switch. On the NT, you must wrestle with two tiny DIP switches located next to the printer's serial port—after you've checked the manual to find the right settings. Unlabeled DIP switches aren't what I expect from a company whose claim to fame is simplicity. On the test track, the NT performed well, but far from best (see "PostScript Performance").

These criticisms might lead you to believe that NT stands for "nice try." I wouldn't go that far. The NT is a good performer, and its price is among the lowest in its class. The NT simply lacks features that

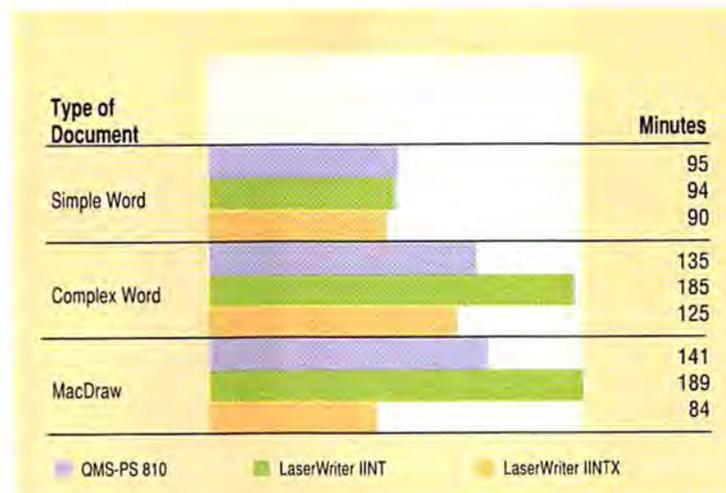
many of its competitors provide, including a Hewlett-Packard LaserJet Plus emulation mode and a parallel port for fast communication with IBM PCs. If you plan to use a printer with PCs as well as Macs, you'd be better off with the QMS-PS 810. In addition to working better with PCs, the PS 810 is faster. At \$5495, however, the PS 810 lists for \$896 more than the NT.

More Power to You

The LaserWriter IINTX is the Mac II of Apple's PostScript printer line: a high-performance model designed for demanding applications. Like the Mac II, the NTX is driven by a 68020 microprocessor running at 16MHz (the 68000 in the NT runs at only 12MHz). Also like the Mac II, the NTX is expandable. You can increase its RAM to a whopping 12MB, and there's space to plug in optional font-expansion boards. (No boards had been announced at this writing.)

The NTX's biggest asset is its ability to use a SCSI storage device for holding downloadable fonts and as an extension of the printer's font cache—both performance-boosting features. But you can't use just any SCSI drive. Before it can initialize the drive, the NTX software must determine the drive's capacity. Most Mac hard disks can provide this information via a SCSI routine, but some disk makers haven't implemented that routine. At this writing, Apple was preparing a list of drives that do and don't work with the NTX.

(continues)



Performance

The LaserWriter IINT performed well against QMS's PS 810 and the high-end IINTX on a simple text document but stumbled when printing complex material. On complex documents, the NTX outpaces all competition—adding memory and a hard disk would make it even faster. Tests were run on a 2MB Mac II with a hard disk.

Clear Images. Clear Choice.

The Microtek MSF-300C Scanner.



Meet Marsha Lyon. Marsha coordinates and creates in-house publications for *Allergan, Inc.*, the world's leader in eye-care products. She uses the **Microtek MSF-300C Desktop Scanner** because it gives her complete control over her desktop publishing.

Instead of sending out images to be halftoned, Marsha can scan photos in up to 64 shades of gray using any one of 8 halftone patterns. Unlike all other scanners, the MSF-300C has 15 independent brightness and contrast settings to compensate for imperfect photos, drawings or logos. And its quick and accurate OCR capability eliminates the tedious re-keying of lengthy documents.

"Now, I get sharp, clear images and text that improve the look of my publications." But don't just take Marsha's word for it, *PC Magazine* awarded the MSF-300C its Editor's Choice.

So, if you have an Apple Macintosh, an IBM PC or PS/2, find out how to get a Microtek scanner of your own. Call (213) 321-2121 in California, or 1-800-654-4160 for your local authorized Microtek dealer.

MICROTEK

16901 South Western Avenue
Gardena, California 90247

Circle 585 on reader service card



The NTX also emulates an HP LaserJet Plus, although it lacks the parallel port so common in the PC world. And my complaints about unlabeled DIP switches apply here, too. The NTX has not two, but six of the beasts, making mode switching that much more complicated.

But it's hard to argue with the NTX's performance. This Porsche of a printer turned in faster times than any PostScript printer I've used, especially when printing complex graphics documents. A 20MB SCSI hard disk boosted performance further.

In most PostScript printers, the engine often waits for the controller. That isn't always the case with the NTX, which can print many documents at its engine's rated speed of eight pages per minute. QMS and Dataproducts have announced NTX competitors that combine similar controllers with faster engines. Users in the market for a high-performance, high-volume PostScript printer should also consider QMS's PS 1500 and Dataproducts' LZR-1260.

The LaserWriter IINT and IINTX are solid, reliable performers, and they're competitively priced. But the NT's mix of performance and features is uninspiring, and the NTX may be outdone by other offerings. In the game of PostScript printer leapfrog, Apple has yet to regain its lead.
—Jim Heid

See *Where to Buy* for contact information.

A Few Strokes Short

MacPaint 2.0

Paint software. **Pros:** Easy to learn and use; Snapshot feature encourages experimentation; autoscrolling; multiple windows and magnification levels; full use of tools in 50 percent view.

Cons: No object-oriented drawing layer; poor value compared with some competitors; no 300-dpi editing. **Company:** Claris. **List price:** \$125. **Requires:** 512KE.



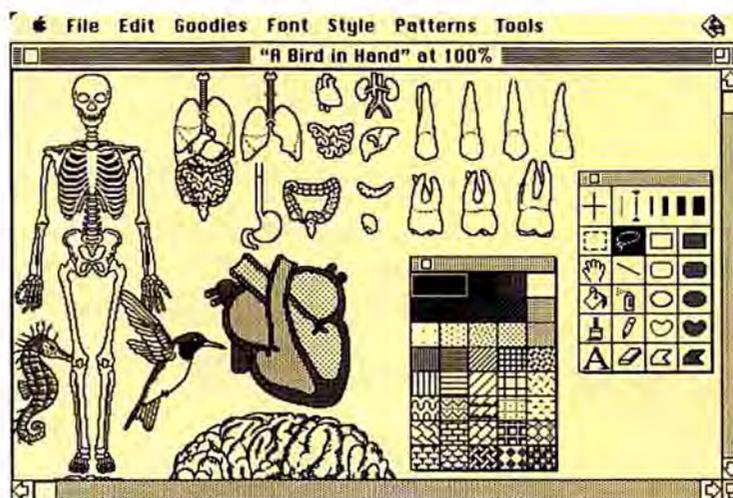
Sometimes you fall so far behind in a race that it's hard to catch up. This appears to be the case with the latest version of MacPaint. MacPaint 2.0 falls short of its competitors because it does not let you create object-oriented

graphics or text—you can't edit shapes as shapes and you can't work with text as in a word processor. Furthermore, you can't take advantage of a laser printer's ability to produce higher-resolution text and graphics.

MacPaint's lack of object-oriented drawing features, however, makes the program easy to learn and use. Some people

Snapshot and Magic Eraser features, most of MacPaint's redesign merely serves to make current a program badly out of date. As offered, MacPaint reminds me most of FullPaint, a program introduced two years ago that was quickly discarded by most people in favor of SuperPaint.

Screen layout features, including windowing, scrolling, and magnifications, pro-



Tear-Offs

MacPaint keeps drawing tools and patterns in tear-off menus, which you can drag onto the desktop. Here's a tip: By pressing t for tools or p for patterns you can hide or show the appropriate menu at the cursor position.

are confused by graphics programs that mix objects with bitmaps; they try to edit the bitmapped portions of the document with object-drawing tools and vice versa—which, of course, they can't do.

Snapshots and a Magic Eraser

MacPaint's best new feature, the Snapshot, leaves you free to experiment and make mistakes. Taking a snapshot saves the current image in memory (not on disk). You can continue drawing, adding as many modifications as you like. Later, if you decide you don't like the changes you can revert to the original image.

More significant is the ability to restore sections of the document selectively. Using the selection tools with the Revert To Snapshot command lets you reinstate only the selected area. You can also use the Magic Eraser, which erases only those changes made since the last snapshot.

Measuring Strokes

Compared just on the basis of its paint features, MacPaint is roughly equal to its competition. With the exception of the

vide MacPaint's major improvements. First of all, if you have a big enough screen you can see the entire 8-by-10-inch drawing area. You can also open up to nine documents at once, depending on available memory. Moving around a document has been improved by the addition of scroll bars and automatic scrolling.

The terms FatBits and Show Page have been retired for a better (if less colorful) world of four magnification levels—of 50, 200, 400, and 800 percent. You can use all tools in all four magnification levels. I especially appreciated the ability to work at the 50 percent magnification. But, unlike most of its competition, MacPaint cannot edit pictures at 300 dots per inch—a useful feature for refining graphic details such as logos.

Much is made of one new feature called tear-off menus. The tools and pattern palettes have been reconstituted as broad, squat menus that you can drag onto the desktop. At first glance this seems to be the best of both worlds. But in practice, you almost never select tools from the menu, an operation that requires extra dexterity and mouse movement. Once on

(continues)

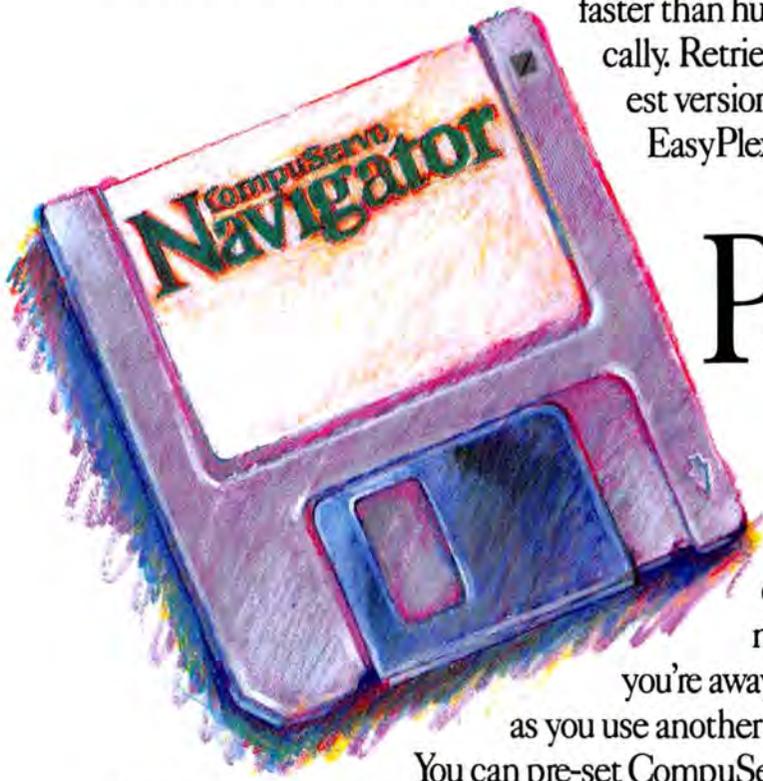
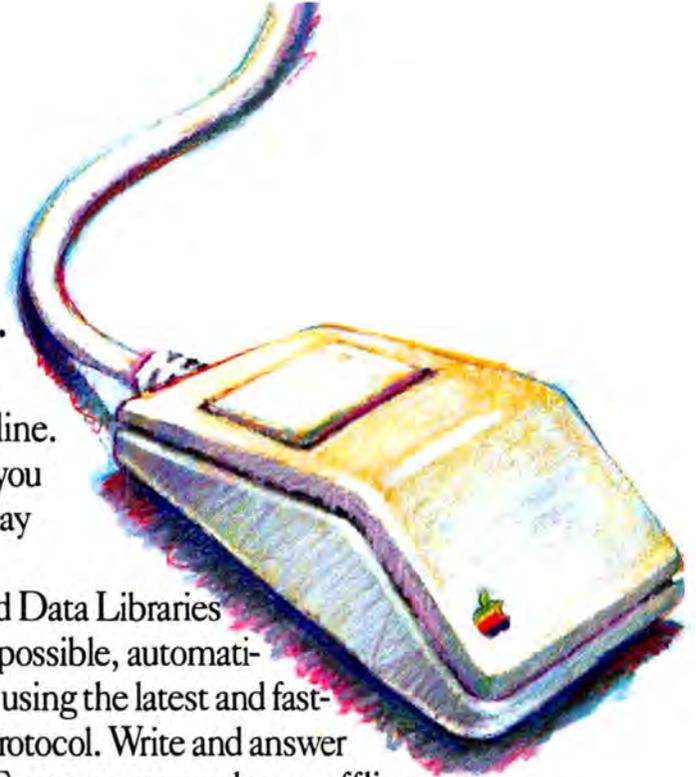
Command.

CompuServe Navigator speaks your language.

If you're accustomed to the friendly Mac™ computing style, you no longer have to compromise when you go online.

Because now CompuServe Navigator™ software gives you user-friendly, Mac-like icons and the kind of familiar display formats you prefer.

You're in command. Search Forum Message Boards and Data Libraries faster than humanly possible, automatically. Retrieve files using the latest and fastest version of B Protocol. Write and answer EasyPlex® and Forum correspondence, offline.



Performance.

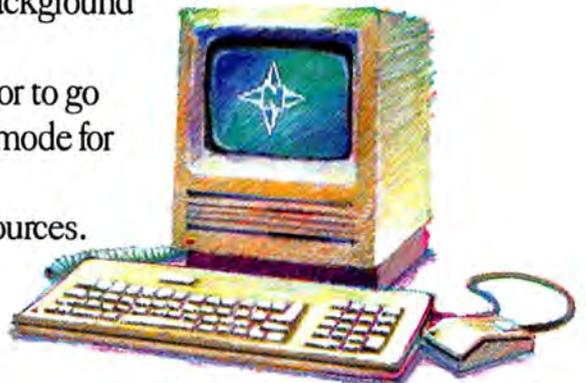
Run your Mac on auto-pilot.

CompuServe Navigator makes the most of every second you spend online. It logs on, takes care of your Forum business and pending electronic mail, and logs off. It can even run unattended, while you're away or in the background as you use another program.

You can pre-set CompuServe Navigator to go online during off-peak hours. And of course there's a terminal mode for easy conventional access.

No other software gets more out of CompuServe Forum resources. All for just \$59.95. Regularly \$79.95.

To order online, type GO ORDER at any ! prompt, or call 1-800-848-8199. In Ohio and Canada, call 614-457-0802.



CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, Ohio 43220
An H&R Block Company

Circle 57 on reader service card



the desktop, the broad shape of the palettes is more difficult to work around than narrow columns. Worst of all, the tear-off menus make the program less accessible to beginners—MacPaint's chief virtue.

Finishing Touches

A few other additions worth mentioning are an adjustable grid, scalable selections, transparent patterns, templates, shapes drawn from their centers, and mouse position readouts. Although MacPaint still lacks an adjustable airbrush and such common effects as distort, skew, per-

spective, and 1-degree rotations, these are not really serious omissions.

MacPaint's problem is that it is a few strokes short on value. You can get both object-oriented drawing and bitmapped graphics for the same price by purchasing one of the program's competitors. Due largely to the Snapshot feature and MacPaint's appealing simplicity, the program has a place among users who find object-oriented graphics confusing and plan only to use an ImageWriter. Overall, however, as MacPaint approaches the finish line it is still playing catch-up. —Adrian Mello

See *Where to Buy* for contact information.

Is It a Printer or Is It a File?

AnyText 1.12

AnyGraph 1.11

PC printer capture program for text and graphics with translators for use with Apple File Exchange. **Pros:** Print-capture feature makes it easy to use with many PC programs. **Cons:** No file-transfer features; limited to MacWrite and MacPaint formats; graphics files use large amounts of disk space on the PC; AnyPC with AnyGraph is slow. **Company:** Compatible Systems Corporation. **List price:** \$95 each (includes AnyPC). **Requires:** Mac Plus.



With more and more Macs and IBM PCs and compatibles rubbing shoulders in offices, transferring information between the two types of machines has become all the more important. AnyText and AnyGraph are packages that attempt to translate PC output files into Mac-format files but fail to cover all the bases.

My Printer, Your File

AnyText and AnyGraph are translator files that work with the Apple File Exchange (AFE) program that comes with Apple's System Software Update 5.0. Included with both packages is a program called AnyPC, which runs on any PC and redirects printer output to a PC file for subsequent transfer to the Mac, where it can be translated.

AnyPC intercepts all output directed to the IBM Graphics Printer or equivalent; when activated, AnyPC pops up on the PC screen and provides options for saving the output to a file or continuing as a normal print job. To use the output on a Mac, you save the output in a PC file, transfer that file to the Mac, and use AFE with either AnyText or AnyGraph to convert the file into a usable format. Neither AnyText nor AnyGraph provides the means for transferring files between a PC and a Mac, so you'll have to use another utility, such as QuickShare, TOPS, AppleShare PC, or the DaynaFile.

AnyPC translates word processing files fairly quickly on the PC because it has to deal with characters and text styles only (see "A Test of Time"). On the other hand, AnyPC captures graphics output much more slowly because it has to resolve the printed page in a line-by-line, or *raster*, mode. Files saved by AnyPC for conversion to Mac files with AnyGraph take up a lot of disk space. A simple 5K Lotus .PIC file became a 250K file when I captured it using AnyPC. In fact, the first time I tried saving the file, I ran out of disk space, but the program saved the incomplete file nonetheless. Since AnyPC behaves like a dot matrix printer, saving the image line by line, the program simply closed the file when it ran out of disk space. (AnyGraph had no problem translating the truncated file into a MacPaint file.) The size of the final complete MacPaint file was only 12K.

On the Mac side, you need to know how to use the AFE, which is described in the Macintosh Utilities User's Guide. AFE is simple to use, partly because of its similarity to Apple's Font/DA Mover. The only added step is selecting the AnyText or AnyGraph file for use as a translator. Then you select the files to be translated and AFE does the rest.

Lowest Common Denominators

As translators of PC output, AnyText and AnyGraph are fairly versatile despite their apparent simplicity. By emulating a rather common dot matrix printer, AnyPC allows you to create files using any PC-based word processor. However, the resulting MacWrite file may not resemble the original PC word processor file exactly. AnyText preserves bold and italic styles as well as superscripts and subscripts, but doesn't always handle all of the tabs in a ta-

(continues)

Now you can be in pictures with your Mac II.



—Fred Molinari, President



Introducing QuickCapture.™

We're gonna sweep you off your feet with this little invention.

For only \$995, our QuickCapture board and software capture live video images from ordinary video cameras and VCRs in 1/30 second ("real time") for display on the Mac's own monitor!

QuickCapture displays images with 640 x 480 square-pixel resolution and 256 gray levels for star quality. What's more, images can be displayed continuously, or QuickCapture can freeze live motion.

Once frozen, images can be enhanced, edited, analyzed, or stored away by simply clicking menu options. They can be printed on the LaserWriter®, or, they can be sent to other programs, like ImageStudio™, Ready,Set,Go!™, PageMaker®, Digital Darkroom™, VideoWorks™ II, HyperCard™, MacPaint®, MacDraw®—to name a few other stars.

Plug QuickCapture into your Mac II today. And become a legend in your own computer.

Call (617) 481-3700

Graphic Design and Entertainment	Scientific	Industrial
Animation Desktop publishing Picture databases Slidemaking Training	Astronomy Medical imaging Microscopy Modeling Motion analysis	Machine guidance Inspection Robotic vision

DATA TRANSLATION®

World Headquarters: Data Translation, Inc., 100 Locke Drive, Marlboro, MA 01752-1192 USA, (617) 481-3700 Tlx 951646
United Kingdom Headquarters: Data Translation Ltd., The Mulberry Business Park, Wokingham, Berkshire RG11 2QJ, U.K. (0734) 793838 Tlx 94011914
West Germany Headquarters: Data Translation GmbH, Stuttgarter Strasse 66, 7120 Bietigheim-Bissingen, West Germany 07142-54025
International Sales Offices: Australia (2) 662-4255; Belgium (2) 735-2135; Canada (416) 625-1907; Chile (2) 25-3689; China (408) 727-8222, (8) 721-4017; Denmark (2) 274511; Finland (90) 372-144; France (1) 69077802; Greece (1) 951-4944, (3) 527-039, (1) 361-4300; Hong Kong (3) 771-8585; India (22) 23-1040; Israel (3) 32-4298; Italy (2) 824701; Japan (3) 502-5550, (3) 375-1551, (3) 355-1111; Korea (82) 756-9954; Morocco (9) 30-4181; Netherlands (70) 99-6360; New Zealand (9) 504759; Norway (2) 53 12 50; Peru (14) 31-8060; Philippines 818-0103; Portugal 545313; Singapore 7797621; South Africa (12) 46-9221; Spain (1) 455-8112; Sweden (8) 761-7820; Switzerland (1) 723-1410; Taiwan (2) 7371896; United Kingdom (0734) 793838; West Germany 07142-54025.
 QuickCapture is a trademark and Data Translation is a registered trademark of Data Translation, Inc. Other brands and products are trademarks of their respective holders.

Circle 122 on reader service card

A Test of Time

Original File Size	Time to Create	AnyPC File Size
WordStar		
5600 bytes	17 secs.	6192 bytes
11,200 bytes	25 secs.	12,281 bytes
22,400 bytes	45 secs.	24,455 bytes
Lotus 1-2-3 .PIC file		
5000 bytes	1 min. 55 secs.	200,200 bytes
6000 bytes	2 min. 10 secs.	253,000 bytes

ble. Sometimes it readjusts to fit MacWrite's default 6-inch column, which may change the length of a document. AnyText uses a statistical method to determine what the tabs are and fails to recognize tabs in a table shorter than three lines.

Using AnyPC to capture graphical output from a PC reveals more limitations. Although the IBM Graphics Printer handles resolutions of 60, 120, and 240 dots per inch (dpi), Compatible Systems recommends using the lowest printer resolution so that the translated file in MacPaint format (80 dpi) will more closely resemble the original. As the company admits, the IBM Graphics Printer was chosen as the lowest common denominator, which means that many of the PC's more powerful graphics programs and spreadsheets are severely restricted by what they can portray when directed to AnyPC. For example, there's no way to save the color attributes of a PC screen. If you're looking to transfer EGA-format (Enhanced Graphics Adapter) screen shots in color or gray levels to the Mac, you're better off using PC programs like HotShot and Hijaak to save

the screens and convert them to encapsulated PostScript or PICT files.

Too Little for Too Much

Considering that AnyPC forms a common link between AnyText and AnyGraph, I feel that the two translators should be bundled together as one package, rather than sold separately. Especially since AnyText and AnyGraph do not include file-transfer facilities (Compatible Systems would probably like to see you buy its QuickShare product), \$190 is a little steep for the privilege of translating both text and graphics files. The combination of AnyText, AnyGraph, and AnyPC performs exactly the same functions as QSPC and PC Transfer, which are part of QuickShare. If your office already has networked Macs and PCs, AnyText is useful for translating word processor files and tables, but if you're planning on moving beyond low-resolution MacPaint graphics, you'd be better served by other PC-based screen-capture programs.—*Dave Kosiur*

See *Where to Buy* for contact information.

A Test of Time

These timing tests for AnyPC's capture of output from WordStar (for text files) and Lotus 1-2-3's PrintGraph facility (for graphics) were run on a Tandy PC/XT clone.

Everything but the Kitchen

McSink 4.4

Text-editing and file-management desk accessory. **Pros:** A wide variety of options augment application operations. **Cons:** Garbage appears at ends of lines after some operations; capricious system crashes. **Company:** Signature Software (also available on most online services). **List price:** Version 4.5 \$25 **Requires:** 512KE; System 4.1; 128K ROM.



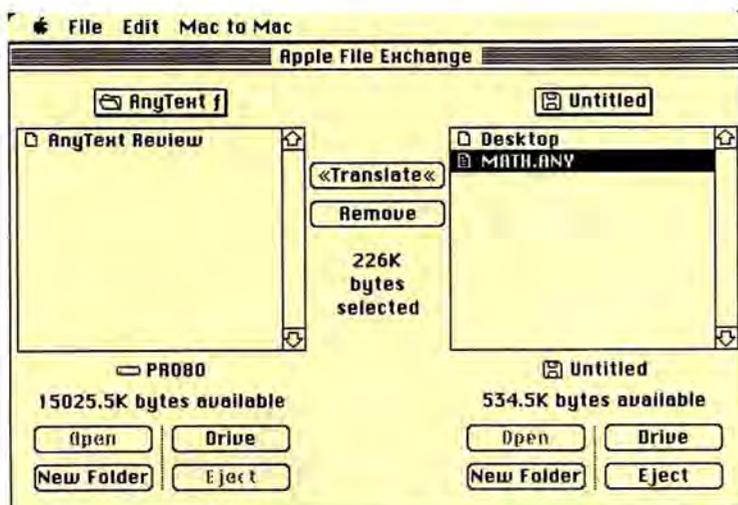
Do your favorite applications allow you to check the number of characters, words, or paragraphs in any given text selection? Can you sort; add line numbers; columnize data; or choose to see tab, space, and carriage returns as symbols? Delete files without leaving an open document? Display and edit file info such as Type and Creator codes? McSink, a very ambitious shareware desk accessory, purports to do all this and more. And with bug fixes and enhancements spawning new versions almost monthly, McSink comes close to matching expectations with performance.

Initially, McSink sported a single window and a hodgepodge menu. Now, the program handles up to 16 concurrent windows and offers nearly 50 text-editing and file-management options. To edit text, however, you must first bring it into the McSink window by copying it from the Clipboard. You can also open files saved in text-only format and previously created McSink files.

Once you place text inside a McSink window, you can set parameters for changing the case of letters or words, for indentations, for converting tabs to spaces and back again, for adding line numbers, and for columnizing information. Prefix and suffix strings can be added to selected lines as can line feeds. Trailing white space can be stripped from selected text.

Version 4.4 seems to fix a bug that made McSink crash when writing to any printer besides an ImageWriter. No matter what printer you use (including laser printers), text appears only in draft mode. A handy new option, Statistics, records

(continues)



Making the Move

Once the AnyText and AnyGraph translators are installed in Apple File Exchange, you select files (MATH.ANY was created by AnyPC from a Lotus 1-2-3 graph) for translation into MacWrite, for AnyText, or MacPaint, for AnyGraph.

TEMPEST users who know their apples like our variety.



Presenting a rich new harvest of Apple® products for TEMPEST environments—from Atlantic Research Corporation.

The TEMPEST LaserWriter® IINT is a TEMPEST version of the latest breakthrough in desktop publishing. It will network with up to 31 separate CPUs and will support any PostScript® compatible software, including virtually all Macintosh® applications and software for Apple IIGS, MS-DOS, OS/2 and AT&T Unix. And the LaserWriter IINT produces near-typeset quality documents in 35 distinct type faces.

The most powerful Apple workstation available for TEMPEST users is our TEMPEST Macintosh II—and now it's available with a selection of monitors! Choose a 12" monochrome monitor, a



13" color monitor or a 19" high-resolution color monitor—all listed on the Preferred Products List. The Mac II features a choice of either a 40 MB or 80 MB removable hard drive in addition to two standard 3.5" drives and is delivered with an Apple Extended Keyboard modified for TEMPEST use.

There's more variety still, with the TEMPEST Mac SE, which combines high-powered computing with the compact Macintosh footprint. Like the Mac II, our TEMPEST Mac SE has Appletalk for connection with all ARC Apple products. Our TEMPEST Mac SE also features a removable external 20 MB hard disk and is fully approved for use in all TEMPEST environments. Our SE is also delivered with a TEMPEST Extended Keyboard.

The best of all of the apples are available now from ARC.



Authorized Value Added Reseller

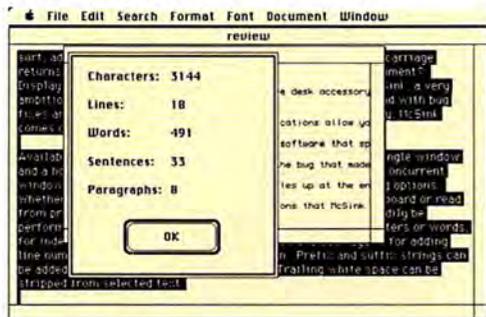
Apple, the Apple logo, Macintosh and LaserWriter are registered trademarks of Apple Computer, Inc. PostScript is a trademark licensed to Apple Computer, Inc. Screen Image Simulated.

THE TEMPEST DIVISION OF
ATLANTIC RESEARCH CORPORATION
THE INFORMATION SECURITY PEOPLE

ARC

1/800-542-5323
in Virginia, call 703/642-4280

Circle 8 on reader service card



Handy Stats

McSink's Statistics feature provides information on the number of characters, lines, words, sentences, and paragraphs in this selection from a Word document. Because McSink doesn't always count carriage returns, however, the paragraph stat is unreliable. The McSink window can be seen behind the statistics, and the Word document behind that.

how many characters, words, lines, sentences, and paragraphs occur within a selection; but because it doesn't always count carriage returns as the start of a new paragraph, paragraph data can be unreliable. Change and Change All options have been added to the Find feature. Switching from "Word wrap to length" (you set line length in a dialog box) to "Word wrap to window" (text wraps to whatever size you make the window) now takes much less time. And in a bug fix, McSink no longer crashes when quitting MacWrite with more than one McSink window open.

There are still glitches. Garbage piles up at the ends of lines after some operations, such as changing tabs. System crashes occur occasionally when opening and closing windows. Using the Columnize options requires careful planning so that rows don't end up as columns and data doesn't become indecipherably misaligned. And the McSink menu disappears when using the Find option.

Still, given the sheer number of options that McSink handles successfully, this shareware seems well worth the price of registration. (Users who download it and report undiscovered bugs are registered for free.) And, as all-encompassing as this DA has proven to be, maybe future versions will even throw in the kitchen sink. —Suzanne Stefanac

See *Where to Buy* for contact information.

Upgrading to SCSI

HD-20 WSI 1.1

Hard disk upgrade. *Pros:* Substantially improves performance of an Apple Hard Disk 20; easy installation. *Cons:* Can't format for best performance on Mac SE or Mac II. **Company:** Personal Computer Peripherals Corporation. **List price:** \$295. **Requires:** Hard Disk 20; SCSI port.



You don't know how slow a hard disk drive can be unless you've used an Apple Hard Disk 20 connected to the Mac disk port. Nevertheless, Apple sold thousands of Hard Disk 20 drives because they're solidly built, reliable, reasonably quiet, and for a while were as fast as anything except expensive, exotic, temperamental, internal hard disk drives. A WSI (With SCSI Interface) upgrade improves a Hard Disk 20's perfor-

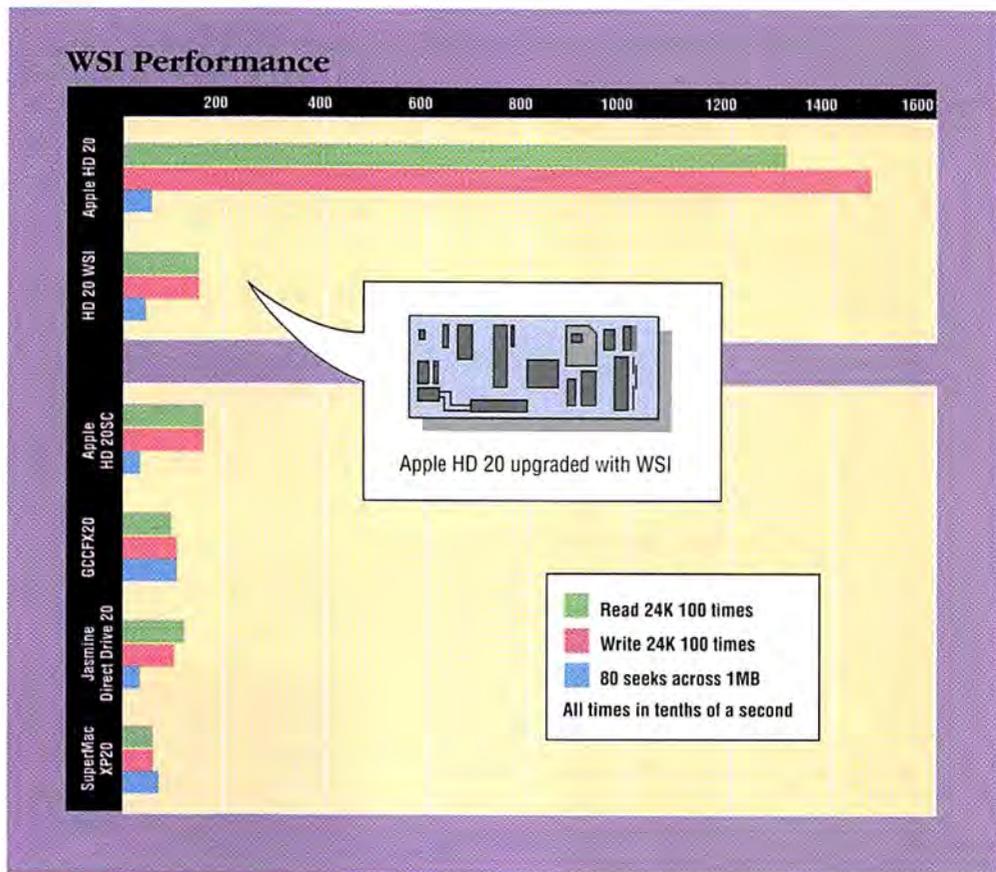
mance by exchanging the disk port interface for the much faster SCSI port interface that's standard on all Macs sold today. (A Mac 512K or 512KE can also be retrofitted with a SCSI port.)

The WSI upgrade consists of a circuit board and cable assembly that replace the standard board and cable in a Hard Disk 20. In addition, you get a manual with complete installation instructions, a special tool for opening the Hard Disk 20 cabinet, and two floppies containing utility software. The software includes a test and format utility, a file locator, ImageWriter and LaserWriter spoolers, a quick-copier for floppy copying, and a backup/restore application.

Installing the Upgrade

Personal Computers Peripherals Corporation (PCPC) recommends having a technician install the upgrade, but any reasonably handy person can do it in a half-

(continues)



WSI Performance

Apple's Hard Disk 20 (which connects to the Mac's disk port) performs dismally when compared with Apple's Hard Disk 20SC. But adding the HD-20 WSI board gives the HD-20 a SCSI interface and brings its performance in line with today's popular SCSI hard disks. Tests were done using DiskTimer II.

WORK REWORK REWARD

Creating printed materials is a lot of work. And Ready,Set,Go! page layout software is the best choice to handle it all. It's a real workhorse, fine tuned and balanced for optimum productivity. You get top performance in word processing, type handling and layout without sacrificing ease of learning or use.

You're productive sooner

A survey of multiple program owners showed RSG is the easiest page layout program to learn. The secret is the way it visually organizes your work with design aids like standard or custom grids and guides for quick column alignment. Type handling is familiar too. Menu selections and specification boxes easily deliver the type quality you want. It adds up to a fast start.

When the changes come, you're ready

The full featured word processor lets you create, spell check or change text right in your layout. Style sheets and global search & replace make changes fast and simple. In fact, to produce the same job, RSG requires fewer commands and menu selections than comparable software.

Best value in page layout

Most businesses appreciate effort but they reward productivity. Especially when it's at a good price. Ready, Set, Go! software delivers both. For a demonstration of the package that Personal Publishing calls "a...powerhouse program" see your authorized Letraset Graphic Design Software Dealer today.

For more information call (800) 722-0377.

Letraset Subsidiaries

- Australia
Tel 02 975 1033
- Austria
Tel 0222 921449
- Belgium
Tel 02 4287156
- Denmark
Tel 02 849300
- Letraset Export Ltd
Tel 0233 24421
- Canada
Tel 416 4757511
- Finland
Tel 358 0565 3355
- France
Tel 4859 1540
- Germany
Tel 069 420 9940
- Nederland
Tel 02907-5641
- Italy
Tel 02 462451/2/3
- Japan
Tel 03454 0931
- Norway
Tel 02 257350
- Spain
Tel 91 2798072
- Sweden
Tel 08 7647760
- Switzerland
Tel 01 8106266
- UK
Tel 01 928 3411
- Letraset USA
Tel 1 201 845 6100

Letraset
ESSELTE



Technical Bulletin

17

Specifications of pre-assembled modules and their aspects.

Feb 88
The modular concept of design and its benefits in rapid prototyping and development are highlighted in this article. The author, who has been working in the field of modular design for many years, discusses the advantages of this approach and the challenges it presents. The article is intended for designers and engineers who are interested in the use of modular design in their work.

Feb 88
This article discusses the design and development of a modular system for the production of printed materials. The author describes the various components of the system and the way they are integrated to provide a flexible and efficient solution. The article is intended for designers and engineers who are interested in the use of modular design in their work.

Specifications
Modular System 4300/88
Character 2000 per page
Printed 800 lines
1988

Keeping pace of the trends in modular assemblies

MARKETPLACENews

Technical Specifications Open New Markets

The modular concept of design and assembly in super conductive components has long been recognized as the most efficient way to provide repetitive tasking and delivery without losing the benefits of customization. Modutech Inc. has developed its unique manufacturing technology to provide increased benefits for component manufacturers in the aerospace industry.



The Computer Revolution
As all who participate in the use of the computer are well aware, the computer has revolutionized the way we work. The computer has made it possible to do things that were previously impossible. The computer has made it possible to do things that were previously impossible. The computer has made it possible to do things that were previously impossible.

Customer Feedback and Satisfaction
The customer is the most important person in the business. The customer is the most important person in the business. The customer is the most important person in the business. The customer is the most important person in the business.

Big ideas are the seeds of innovation
Big ideas are the seeds of innovation. Big ideas are the seeds of innovation. Big ideas are the seeds of innovation. Big ideas are the seeds of innovation.

The largest manufacturer of modular cores and modular sub-assemblies

Modutech Inc.

Products, Systems, Applications

The modular concept of design and assembly in super conductive components has long been recognized as the most efficient way



New! Version 4.1
All purchasers of Ready,Set,Go! software after July 5, 1988 will receive a free Upgrade.
• Fractional type handling
• Supports color
• Grey level image control

© Letraset, 1988
Ready,Set,Go! is the trademark of Manhattan Graphics Corporation.

hour or so using two screwdrivers and the hex wrench that PCPC provides. The installation instructions are detailed, straightforward, and fairly complete. The main danger of installing it yourself is inadvertently zapping the upgrade circuit board with static electricity. Static you can't see or feel can be strong enough to weaken or destroy electronic components.

You must spend 1 to 6 hours before and after installation testing, backing up, formatting, and restoring the Hard Disk 20, depending on how full your drive is and whether you back up to floppies, tape, or another hard disk. The work isn't difficult, although I became a bit confused when formatting the drive, because the formatting program offers several options not explained in the instructions. A tech support person explained why the options were irrelevant and assured me that I could rely on the printed instructions.

Using an HD

After surgery, the Hard Disk 20 looks, sounds, and smells the same. But the tortoise has become a hare. The HD-20 WSI's theoretical performance, as measured by the DiskTimer II tests, is on a par with other 20-megabyte SCSI drives (see "WSI Performance"). Some people criticize these tests as too academic, but the numbers are widely published for many hard disks, and do show some correlation with performance in everyday use. After using an HD-20 WSI for a month, I'd say it performs like an average 20MB hard disk.

The disk space available after formatting is less than the average, however, and also a bit less than before the conversion. Whereas most 20MB hard disks have between 20MB and 21MB, a conventional Hard Disk 20 has just over 19MB and an HD-20 WSI has just under 18MB.

You can chain other SCSI devices to an HD-20 WSI. It has a 25-pin SCSI port where the external floppy port was before the upgrade. Switches inside the drive determine the SCSI priority number. Termination is internal and can be removed by prying out three small electronic parts.

Adequate Software

The bundled software is useful but hardly a compelling reason to buy. The file locator desk accessory and laser printer spooler provide functions and performance similar to Apple's Find File and

Print Monitor. PCPC's laser spooler interferes less with foreground work but is more trouble-prone than Apple's. For example, restarting the Mac in the midst of a spooled laser print job can result in a hung Mac. The PCPC ImageWriter spooler has no Apple equivalent, and it works fine.

The included backup application, HFS Backup 2.02, is adequate but not the best available. The software formatter could set up the disk with only a 3-to-1 interleave ratio, making the HD-20 WSI best suited to a Plus. The WSI will work on an SE or Mac II, but won't have the speed of a drive that can be formatted with a 2-to-1 or 1-to-1 interleave ratio.

Don't put your venerable Hard Disk 20 out to pasture because it's too slow. It will deliver contemporary SCSI performance if you install the WSI upgrade. I'd do it if I had a Hard Disk 20. —Lon Poole

See *Where to Buy* for contact information.

Math without Tears

Calculus 1.0

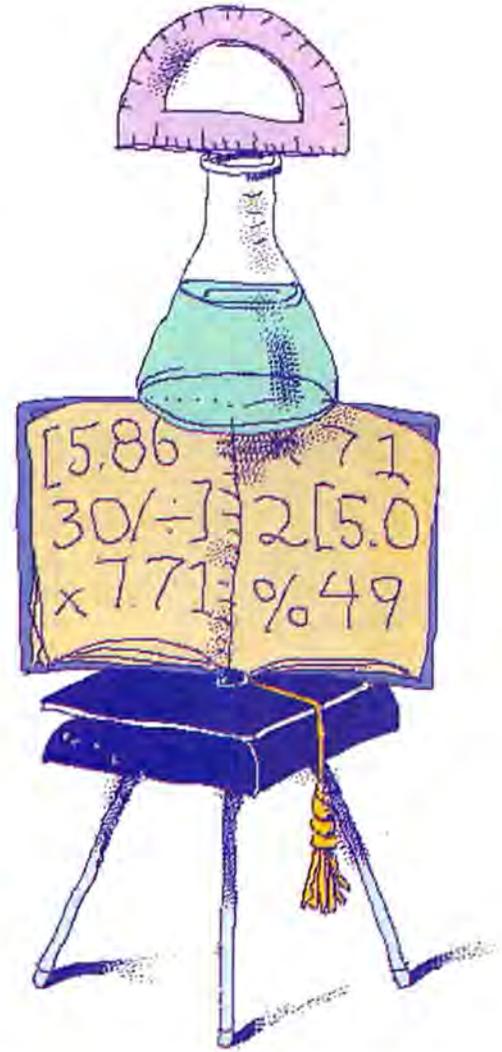
Math tutorial program. *Pros:* Amazingly well-designed interface and demonstrations.

Cons: Copy-protected master disk. **Company:** Sensei Software. **List price:** \$99.95. **Requires:** 512K, 800K total disk space.



Calculus is a great educational watershed, upon which it is decided who becomes a scientist or engineer and who doesn't. Unfortunately, it's a subject in which students in the United States show the worst test results of any industrial nation.

Sensei has accepted the challenge of producing software that will really help you *learn* Calculus IA, as well as pass the course. In succeeding beyond anyone's most optimistic expectations, Calculus rates as one of the best pieces of educational software ever produced—superior in some respects even to Sensei's remarkable Physics program. It's also the only program of its kind available on any computer. If you were a college student having trouble with calculus, it would make good economic sense to buy an old 512K Mac just for the purpose of using this program. It's that good.



By the Book

The program is keyed to the order of presentation in standard texts, covering limits, derivatives and their applications, integrals and their applications, methods of integration, and a special unit on graphing. The Subject menu lets you jump to any of 11 chapters with a Table of Contents, or to specific topics with an Index. One of my few complaints about the program is that it doesn't reach into vector calculus, but the treatment of calculus basics is so thorough that advanced topics would require another disk. As it stands, the material will take a freshman calculus student from September to April or May.

There are three parts to a Calculus chapter. First, the program has short tuto-

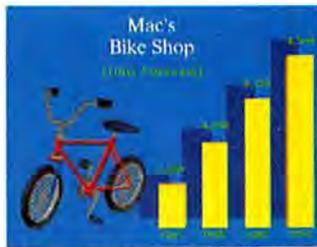
(continues)

Swivel 3D goes where no program has gone before.



Product Design

Use Swivel 3D to conceptualize and visualize complex products with moving parts.



Presentation Graphics

Add a new dimension to your business presentations quickly and easily.



Animation

Create animation sequences using Swivel 3D's Tweening command.



Computer Illustration

Let your creativity run wild by drawing unique 3D illustrations.

Introducing Swivel 3D. The program with the speed and power to create masterpieces in color 3D.

Swivel 3D is the fastest color, three-dimensional drawing/modeling program for the Macintosh®.

It is also the first program to feature *Linking*. Linking allows you to quickly build models with parts that swivel. Your models can have switches, knobs, hinges, wheels or even more complex joints for building arms and legs that move naturally.

The best tool for unlocking your imagination.

Swivel 3D is an essential graphics tool for preparing business and slide presentations, graphics, illustrations, product designs and animation. Using the scrapbook, you can easily move images to programs such as Adobe Illustrator™, ImageStudio™, PowerPoint™, Cricket Presents, MacDraw™, SuperPaint™, PixelPaint™ and many others. Images can be saved in two formats: PICT, or Draw type images; and bit-map, or Paint type images.



The beginning of 3D animation right at your fingertips.

Swivel 3D also provides an incremental animation command (*Tweening*) which can save an animation sequence of Paint files. Animation can be easily created using HyperCard stacks or with animation packages like VideoWorks.

Start creating today.

Because Swivel 3D uses standard Macintosh commands and contains a library of pre-drawn images, you can begin creating in 3D right away.

For more information see your local computer dealer or call Paracomp at 415-543-3848 and see just how far you can go with 3D. Suggested retail price is \$395.00.

Swivel 3D™

Set your imagination free with the power of 3D

© 1988 Paracomp, Inc. Swivel 3D is a trademark of Paracomp, Inc. VideoWorks is a trademark of MacroMind Inc. SuperPaint is a trademark of Silicon Beach Software, Inc. ImageStudio is a trademark of Letraset. Adobe Illustrator is a trademark of Adobe Systems, Inc. PixelPaint is a trademark of SuperMac Software, Inc. PowerPoint is a trademark of Microsoft Corp. MacDraw is a trademark of Claris Corp. Macintosh is a trademark of Apple Computer, Inc. HyperCard is a trademark of Apple Computer, Inc.

PARACOMP



Paracomp, Inc.
123 Townsend Street, Suite 310
San Francisco, CA 94107, 415-543-3848

Circle 229 on reader service card

rial introductions to topics, amplified by hypertext insertions (you can click on italicized terms and More buttons for extra explanation) and animated diagrams of concepts. This means—in contrast to textbook presentations—that you view a continuous flow of the “right” material, matched to your own questions and needs. Pedagogically, this is ideal for maintaining interest and motivation.

Second, each chapter has extensive lists of orthodox problems. For solving these, you can call on Reference, Hint, or Solution from the Calculus Help menu—the Options menu also lets you step through the chapters in Problems Only or Tutorial Only mode.

Finally, there are demonstrations of sample problems. These are step-by-step solutions of fancier textbook material, using animation to particularly good effect in showing computational substitutions and simplifications. The demonstration window includes a Why? button to explain each step in the sequence, and Repeat and Start Again buttons to simulate an infinitely patient instructor. For convenience, the File menu features Save Place and Restore Place items (a sort of bookmark function) and a Print Page option. These are standard in all Sensei applications.

Local Maxima

The people who developed this software clearly understand the realities of calculus teaching. The program, for example, offers lots of drill on topics (trigonometry,

In and exp functions) that are properly part of a pre-calculus course. The topics are included here because deficiencies in background are often the most serious obstacles to learning calculus. Likewise, recognizing that many students in college will be taking physics at the same time, there's an emphasis on acceleration/velocity problems as applications.

The problem and demonstration set in methods of integration (a topic on which many students fall apart completely) is not only thorough but sympathetic. It presents a carefully graded sequence that works from absolutely simple cases at the beginning, through small steps, up to challenging exam-level problems.

Integrated Software

This sample problem from Calculus shows the straightforward character of its problem drills—you can find this one in most texts. But the program goes far beyond standard texts in its interactive demonstration of problem-solving methods.

Sensei has also evaluated all the ways a graphics screen can go beyond a blackboard or text illustration, and has made every screen count. Assuming that the student has almost no background in graphing, the program also offers a special section on graphing that amounts to a compelling demonstration of the Mac's powers as an instructional tool.

The Answers

For many students, this program could mean the difference between passing and failing calculus. That's not bad for a hundred bucks. For other Mac owners, it could be an interesting educational bridge that takes them into a deeper comprehension of the world of science. Let's hope Sensei brings out programs on advanced calculus and differential equations as well.

—Charles Seiter

See *Where to Buy* for contact information.

Carats to Cubits

Chameleon 1.0

Measurement-conversion utility.

Pros: Encyclopedic range of possible conversions; easy to use. **Cons:** Application version only; no cut and paste; occasional glitches.

Company: Spectrum Computing. **List price:** \$69.95 **Requires:** 512K.



Hauling out a copy of the *CRC Handbook of Chemistry and Physics* and converting units of

measurement is sometimes difficult and confusing. Converting units of power (energy divided by time), for example, often produces Murphy's Law situations in which seconds or feet or pounds or kilograms don't match up properly. If you regularly need to convert picas to inches or carats to grams, you should investigate Chameleon.

Not only does Chameleon automate unit conversions, it also offers a relentlessly thorough list of units. As you would expect, all types of metric-to-English-system conversions are featured, but the scope of the program also covers items like barleycorns, kalpas (an aeon-like Hindu time unit), and barns (a very tiny area unit used in nuclear physics). The program is much more compact (80K) than a comparable reference book would be, and includes more than a million possible conversions.

Dollars to Doughnuts

Chameleon uses a menu bar which, while sufficient unto its purposes, deviates from standard Macintosh practice. Instead of a File menu, there are menus for selecting types of conversion and invoking Chameleon's simple Multiply function. Basic Units includes distance, mass, time, and temperature; Derived Units includes energy, pressure, force, and illumination; and Other Units includes area, volume, speed, density, power, flow rate, inertia (area), and inertia (volume). The documentation is minimal, but it's no problem running Chameleon without help, anyway.

After selecting a type of conversion, you pick a unit from the scrolling list on the left, and one from the list on the right;

(continues)

Some people will try to tell you that one product will fit every Macintosh application.

WHY WE DON'T MAKE JUST ONE LURE FOR EVERY FISH IN THE SEA.



If you're like most people, you don't try to use a spread sheet for word processing. You have applications tailored for the task at hand.

Introducing The Big Picture[®] Macintosh Display Systems From E-Machines.[™]

At E-Machines, we don't think all Mac users are trying to catch the same fish. That's why we make a complete range of large displays, and one that's just right for you.

For the Macintosh SE and Plus, we recommend our unique landscape-format monochrome display, *The Big Picture*. For the Macintosh II, depending on the application, we offer *The Big Picture* monochrome; *The Big Picture IQ[™]* grey scale display; *DoubleColor[™]* low-cost, full page color display card; *The Big Picture CX[™]* 17 inch color; and the *The Big Picture C20[™]* 20 inch color display systems.

So if you're casting about for a large screen, give us a call at (503) 646-6699. Tell us your application and interests and we'll help you find the Apple dealer that can install your new display.



E-MACHINES
9305 S.W. Gemini Drive
Beaverton, OR 97005
(503) 646-6699

Circle 101 on reader service card

© 1988 E-Machines. The Big Picture is a registered trademark, and The Big Picture IQ, DoubleColor, Double Feature, The Big Picture CX, and The Big Picture C20 are trademarks of E-Machines, Inc. Apple and Macintosh are trademarks of Apple Computer, Inc. Multisync is a trademark of NEC. Excel is a trademark of Microsoft.



The Big Picture CX showing color CAD drawing.



The Big Picture with Double Feature software displaying word processing and spreadsheet.



The Big Picture C20 displaying a color scan photograph.



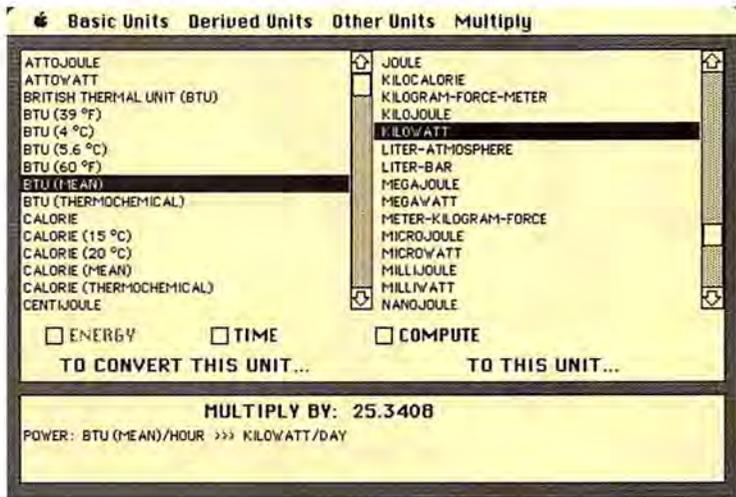
The Big Picture for the Macintosh II showing Excel[™] spreadsheet.



DoubleColor card showing full page presentation running on NEC Multisync[™] Plus.



The Big Picture IQ[™] photographic image quality grey scale monitor.



Chameleon gives you the conversion factor (see "Quick-Change Artist"). Chameleon is especially convenient for conversions involving derived units; the program forces you to do the conversion correctly (it's always clear what you're converting from, and what you're converting to). To be blunt, you will get the right answer using Chameleon, even if you're not very good at this sort of thing and have only a hazy understanding of dimensional analysis.

Does Not Compute (Partly)

Chameleon is afflicted with a small number of programming infelicities. If you invoke a DA, such as Calculator, you will find a DA-sized hole in the screen when you close the DA. The screen can usually be restored by clicking in Chameleon's scroll bars, but it's an annoying defect, occasionally hanging the program altogether. Also, since the program doesn't offer the standard File and Edit menus, there's no way to cut and paste conversion factors to another program. Instead, you must write down the numbers and rekey them in the other application.

Although Chameleon does run under MultiFinder, nearly everyone who sees it asks, "Why isn't this a DA?" Indeed, a smaller version of the program, with many historical or otherwise curious units omitted, would make a spectacular 25K science/engineering DA. Spectrum Computing, however, defends its approach, saying that its intention is to provide an automated, foolproof replacement for a reference book—one that the user will consult relatively infrequently, but one that will also be well worth the price when the need arises.

Does It Add Up?

Spectrum's claim is valid. The program will pay for itself in a great variety of professional applications, despite its lack of such conveniences as direct export of conversion factors. Perhaps Spectrum will eventually supply the program as both application and DA. In the meanwhile, it's a competent utility tailored to its own niche market. —Charles Seiter

See *Where to Buy* for contact information.

More than an Upgrade

MacProject II 1.0

Project planning software. *Pros:* Quick learning curve; enables you to monitor and plan projects; allows a lot of "what if" operations.

Cons: Uses nonstandard PERT chart; doesn't link resources and tasks closely enough.

Company: Claris. **List price:** \$495.

Requires: 512KE.



Like an automatic transmission, MacProject II provides a way for novices to quickly get up to speed in a complex discipline, but it does so at the expense of some control and fine-tuning ability. Although people with no project-management experience will be pleasantly surprised at how quickly they can lay out and monitor projects, others may be frustrated by the program's nonstandard PERT chart and the undisciplined method of creating a plan.

A Quick Study

MacProject II's quick learning curve comes partly from the direct method with which you create the Schedule chart, usually called a PERT (program evaluation review technique) chart. Tasks are represented by boxes that you create as you would in MacDraw. Dependencies between tasks (when one task cannot begin until a previous one has been concluded) are represented by lines connecting the two boxes. You can join tasks as you go, or you can create all the boxes and arrange and connect them later.

Although this is an easy way to create charts, it is not the way most professional project managers work. Normally, you plan tasks and dependencies using an outlining program or paper and pencil. Then you enter them into the project management software, which creates a PERT chart automatically. Also, standard PERT charts look nothing like MacProject II's Schedule chart. In PERT charts, lines represent tasks, and numbered circles (or other shapes) represent the beginning and end of the task. (In MacProject II, shapes represent tasks.) MacProject II also indicates critical path tasks—those which cannot be delayed without delaying the entire project—by displaying them in bold wherever they occur in the chart. Standard project managers string critical path tasks out along a straight line at the top of the chart.

Project-management practices and standards are not whimsy but have been

(continues)

Task	Duration	Resource	Work-Days	Number	Effort	Duration
Excavation	5	Excavator	5	1.00	100	2.50
		Backhoe Operator	5	1.00	100	5
		Backhoe	5	1.00	100	5
		Foreman	2	1.00	25	8

DATES

Earliest Start: 1/8/88 Latest Finish: 1/19/88 % Done: 15
 Actual Start: 1/8/88 Actual Finish: 1/19/88

COSTS

Fixed Cost: 1750.00 Fixed Income: 2500.00
 Actual Cost: 0.00 Actual Income: 0.00

Task Info

You specify resource statistics in the Task Info window. Then the program calculates how long the task will take and displays the result in the Latest Finish box. Here the person planning the project expected the task to take only 5 days. But MacProject II calculated that given the needed resources, it would take 8 working days. The Actual and the % Done boxes allow you to monitor the project.

WHY NO OTHER INEXPENSIVE LASER PRINTER CAN PRINT THIS STATEMENT.

At \$1999, our Personal LaserPrinter (PLP) costs about \$800 less than Apple's LaserWriter® II SC.* But that's the least of many good reasons why you should buy one.

One of the best is demonstrated, in rich and varied prose, above.

The PLP is the only laser printer in its category that lets you print in any number of point sizes, even fractionals. The LaserWriter II SC, by contrast, lets you print in any number of point sizes as long as the number is six.

The PLP gives you unlimited free-



dom in reducing and enlarging documents (critical for applications such as Excel and PageMaker®).

The LaserWriter II SC doesn't.

With the PLP, italics are true *italics* and bolds are true **bolds**

—because the PLP uses true outline fonts. The LaserWriter II SC doesn't.

All this begs an obvious question: how can we offer so much functionality and still charge less for it?

The answer is software—software that enables your Macintosh to use its own resources to do the processing that would otherwise require

costly additional hardware.

But there's another reason the PLP performs better: it has to.

In a market saturated with laser printers, there's no point in offering one that's less functional and more expensive. After all, our competition has that market all sewed up.

For a PLP demonstration—or details on our ImageWriter® trade-in program—see your authorized General Computer dealer. For the dealer nearest you, call (617) 890-0880†



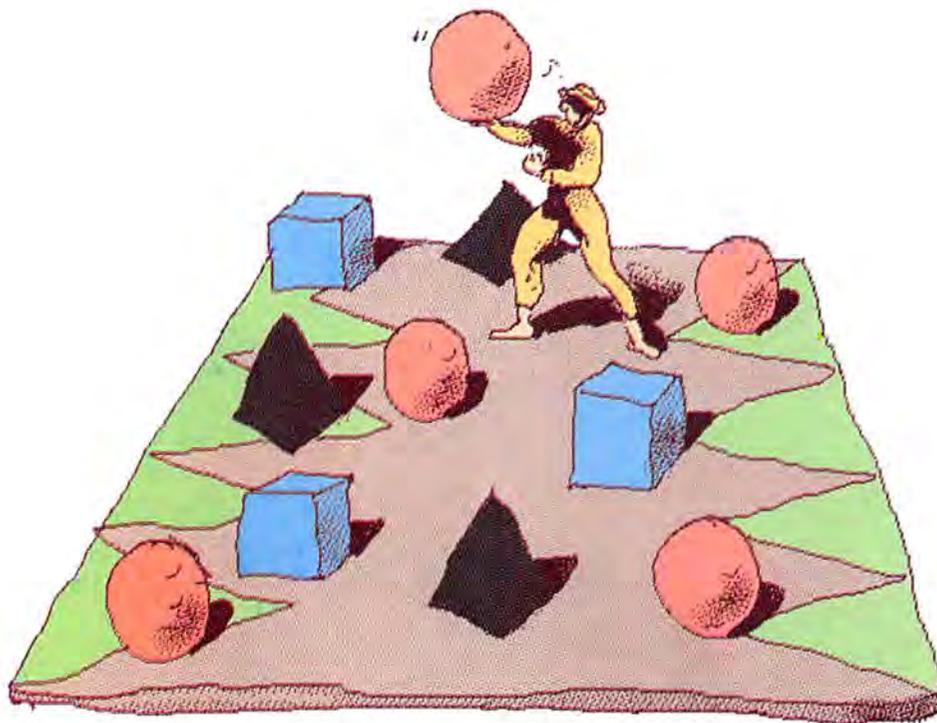
*Based on a comparison of manufacturer's suggested retail prices. †In Canada, (800) 263-1405 © 1988 General Computer Corp. General Computer and the General Computer logo are registered trademarks of General Computer Corp. Personal LaserPrinter and PLP are trademarks of General Computer Corp. Macintosh is a trademark of Apple Computer, Inc. LaserWriter and ImageWriter are registered trademarks of Apple Computer, Inc. PageMaker is a registered trademark of Aldus Corp. The document above was created with PageMaker 3.0 and printed on a General Computer Personal LaserPrinter.

Circle 177 on reader service card

Reviews

developed over the last 30 years as the clearest and most effective way to create, depict, and monitor a plan. So while learning how to create a chart is simple with MacProject II, actually creating a legible one that represents a large and complex project is difficult. Even after rearranging things a good deal, you may end up with a tangle of boxes and lines that's hard to follow. But the standard approach demands not only more training for using software, but also a higher level of sophistication with project management in general, since a great deal of planning takes place before you begin to use any program.

The problem of chart legibility occurs only with the Schedule chart—MacProject II creates all other charts automatically. The Task Timeline represents tasks as horizontal bars along a time line. It depicts any slack time—for example, when you expect a task to take one week, but you have two weeks to complete it—as a gray appendage to the task bar. The Resource Timeline depicts resources such as tools or employees in a similar way, allowing you to see clearly if a backhoe is scheduled to be used in two places at once. The Resource Histogram is a bar chart showing the planned level of activity of a single resource. It will



warn you if, for example, the backhoe is assigned an impossible 150 percent usage on December 3.

One serious criticism leveled at the original MacProject was that it did not allow you to monitor ongoing projects. In MacProject II, you can enter the Actual Start and/or Finish dates for each task. MacProject II recalculates all other dates to show new Actual Start and Finish dates. You can also enter what percentage of each task has been completed. The Task Timeline depicts the completed portion as a black bar beneath the task bar.

Project-planning software should enable you to experiment with rearranging tasks and resources to see how changes affect the project. MacProject II allows a wide range of these "what-if" operations. For example, to change two sequential tasks into parallel ones, simply clear the dependency line between them and reconnect the second task to the same box that the first task is attached to. You can also delay the start date of a task by dragging its bar in the Task Timeline. Or, if resources are overused, you can change the calendar to include Saturday work or extend the workday.

The ability to complete a project on time depends heavily on resources. MacProject II computes the relationship between resources and completion dates, but the program doesn't go far enough. Say

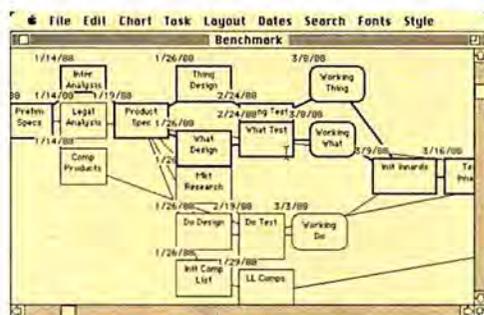
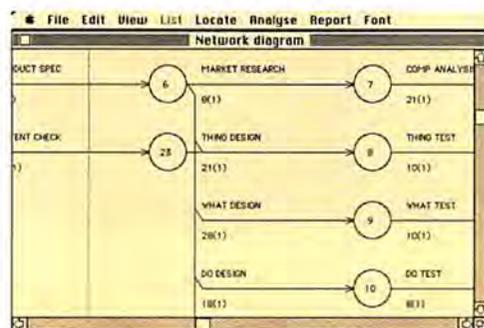
you have a single task scheduled to take 5 days, but it requires 80 hours of work from a key employee who has only 8 hours a day to spend on the task. The program automatically reports that the task will take 10 days, and changes the Actual Start and Finish dates of all activities to reflect the delay. If an employee is scheduled to work on two parallel tasks for 40 hours each, the program shows the conflict on the Resource Timeline and Histogram, but it does not reschedule the project. This means you must add resources or go through the tedious process of rescheduling all tasks.

MacProject II versus the Rest

To call MacProject II an upgrade of MacProject is to do its many new features an injustice. Here's a short list of things added to MacProject II: the ability to link subprojects, the ability to calculate resource duration using percentage of effort, optional display of 16 attributes around task boxes, eight different calendars, extensive search modes, and more keyboard entry items. Still, people who have already used MacProject should be able to learn MacProject II very quickly.

At present a Mac user's only other choice in project-planning software is Micro Planner Plus from Micro Planning International. This product uses standard formats and closely resembles mainframe, mini, and IBM PC-based project-planning

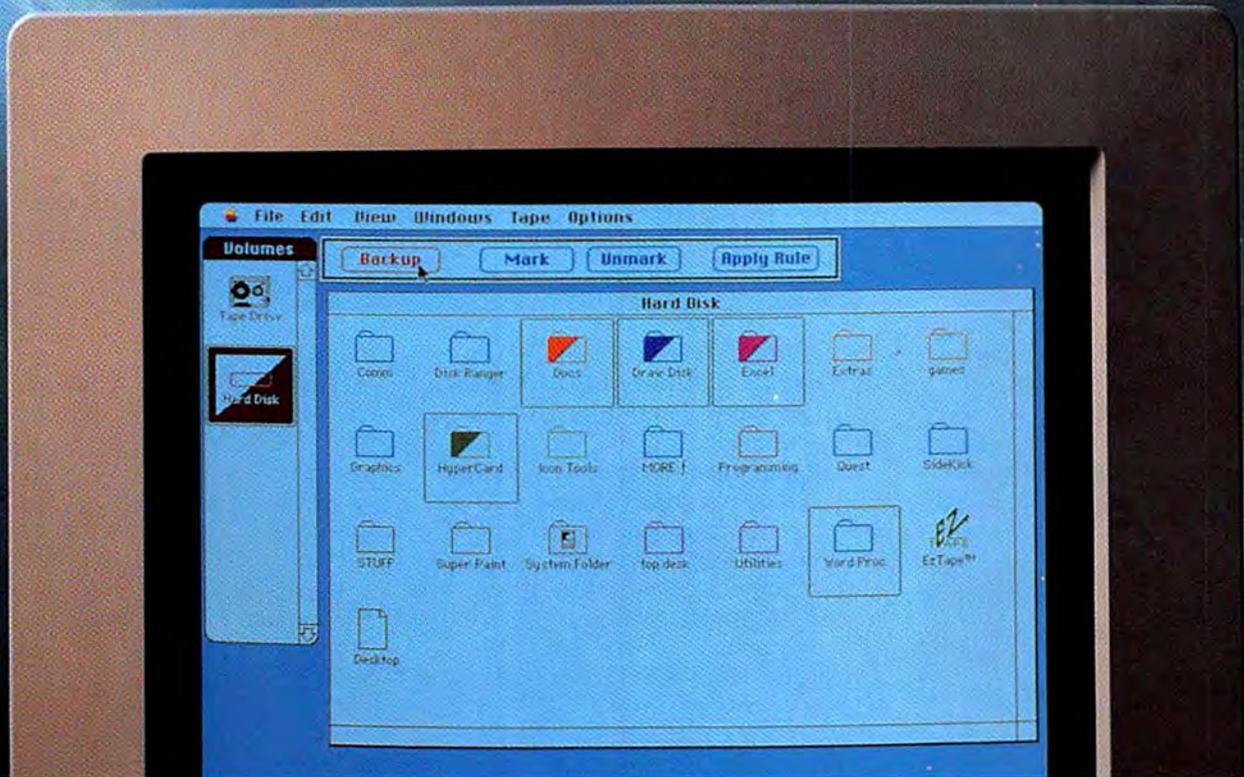
(continues)



Professional Method vs. Easy Method

MacProject II doesn't use a standard PERT chart, so complex projects can be difficult to display legibly. This is an example of a MacProject II schedule chart (top) and the same project on Micro Planner Plus, which uses standard charts.

Finally, backup that works like a Mac



At last there's a backup system with the power, sophistication and ease of use to equal your Mac: Irwin BACKUP for the Macintosh.

Our new 40 and 80 megabyte tape backup systems are the first with fully iconographic EzTape® software which provides maximum control and flexibility in selecting folders and files to backup or restore. They're the only backup systems with the power to support AppleShare, TOPS and Apple's new A/UX. The only backup sophisticated enough to allow data exchange between Macintosh, Unix, MS-DOS and OS/2 computers.

And all this comes with the proven reliability of Irwin's patented AccuTrak™ data tracking technology. It's just one more reason why Irwin is the world leader in microcomputer tape backup, with more than 500,000 systems already installed.

For data protection on a par with your Macintosh, there's only one choice: Irwin BACKUP.

For more information on the new Irwin BACKUP systems for the Macintosh, see your dealer or call **1-800-BACKUP1**.

Irwin and EzTape are registered trademarks and AccuTrak, iconographic and Irwin BACKUP are trademarks of Irwin Magnetic Systems, Inc. Macintosh is a registered trademark and AppleShare and A/UX are trademarks of Apple Computer, Inc. Unix is a registered trademark of AT&T. TOPS is a registered trademark of Sun Microsystems, Inc. MS-DOS is a registered trademark of Microsoft Corp. OS/2 is a trademark of International Business Machines Corp.

IRWIN[®]
MAGNETICS

2101 Commonwealth Blvd.
Ann Arbor, MI 48105-1531
313/996-3300

Circle 82 on reader service card

software. The primary market for Micro Planner Plus has been professional project managers. Because of its nonstandard PERT chart, MacProject II will have difficulty making inroads in that area. If you intend to work with professional project managers who are accustomed to standard methods, and you are considering MacProject II, you'll have to decide if you can live with being a square peg in a round world.

But there are many more projects that need managing than there are professional project managers. More than a few executives find themselves knee deep and sinking fast in a quagmire of a project that has grown out of control. MacProject II can be a ready tree limb that executives use to pull themselves out of the mess and quickly get on top of things.—*Lawrence Stevens*

See *Where to Buy* for contact information.

Miles and Miles of Art

ArtRoom 1.0

Clip art and fonts on compact disk.

Pros: Large quantity of artwork that doesn't take up space on a hard disk. **Cons:** User can't add keywords; libraries should be better organized to facilitate fast searches. **Company:** Image Club Graphics. **List price:** \$999. (For information on package deals, call Image Club Graphics.) **Requires:** Mac with SCSI port; CD ROM drive.

Kwickee Inhouse Graphic Services' Art Department 1st and 2nd quarters, 1988

Advertising-oriented clip art on compact disk. **Pros:** Large quantity of artwork that doesn't take up space on a hard disk. **Cons:** User can't add keywords; search technique finds unwanted illustrations because of embedded character strings. **Company:** Multi-Ad Services. **List price:** \$195 per month. **Requires:** Mac with SCSI port; CD ROM drive.

APPLE OVERSIC DISC According to an insert in Image Club Graphics' latest catalog, a CD ROM disk stores data on a spiral track 3 miles long. A single compact disk can store the equivalent of almost 700 double-sided floppy disks. The mind boggles! But lest you become overwhelmed by

sheer quantity, take a minute before buying a CD full of graphics to consider other important factors: quality, ease of access, and whether the artwork is appropriate for your needs. I looked at two CD collections of clip art—Image Club's ArtRoom and Multi-Ad Services' Art Department, a component of their Kwickee Inhouse Graphic Services—and I'm not convinced that CDs are state-of-the-art when it comes to canned art.

What You Get

Let's discuss content first. Image Club's ArtRoom disk contains approximately 1000 images created with Illustrator, MacDraw, and Cricket Draw, and saved in PICT or EPS (encapsulated PostScript) format. The disk also includes 50 PageMaker and ReadySetGo page templates and 100 decorative PostScript fonts. The images fall into standard clip art categories such as business, entertainment, travel, maps, sports, people, food, machines, and dingbats. You can paste a drawing into its parent program for editing, or place the drawing directly into a page-layout program.

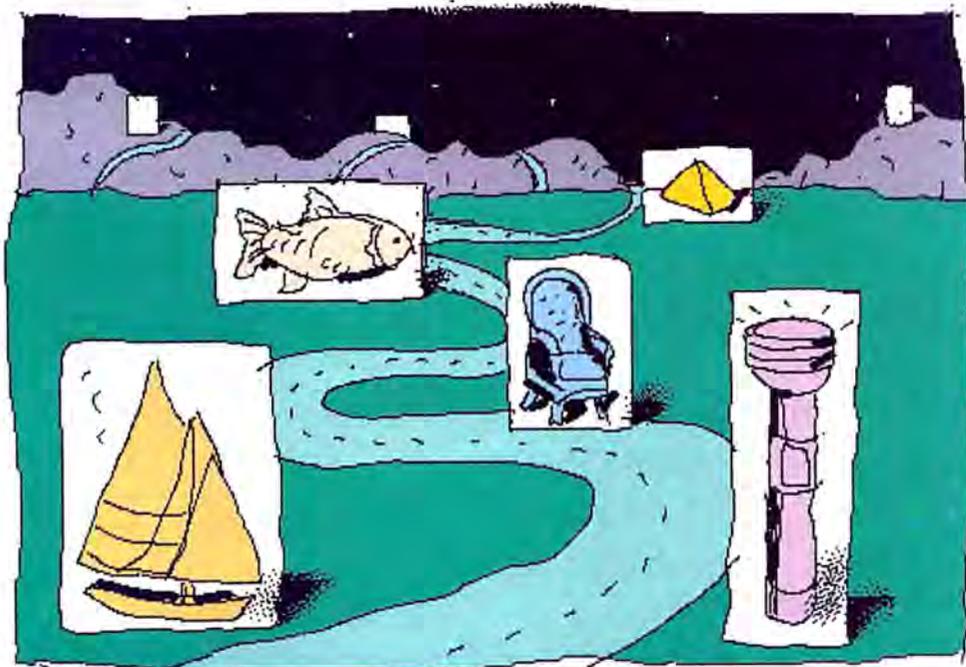
The images on the ArtRoom disk vary in style and quality. While many are finely crafted, others are simpler and could be drawn by anyone who is reasonably proficient with a graphics program. On the whole, however, I found Image Club's artwork skillfully executed. My main objection is that most of ArtRoom's people and animals are drawn in a cartoon style that,

frankly, doesn't appeal to me. But judge for yourself: "ArtRoom Sampler" displays several ArtRoom illustrations.

While Image Club's graphics seem to be aimed at individuals, office art departments, or newsletter publishers, Multi-Ad's artwork is intended mainly for retailers and newspaper art departments. A large percentage of Multi-Ad's Art Department collection depicts brand-name and generic products likely to be found in a supermarket or drugstore; the advertising insert included with your Sunday paper may contain some Multi-Ad images. Subject areas for the more than 1000 Illustrator images include sports, leisure, performing arts, foods, consumer goods, maps, fashion, classified ad headings, and months (holiday and seasonal images are provided for each month). Illustrator is the only format these images are available in. Multi-Ad offers quarterly disks at this time; a \$149 generic disk for nonadvertising applications is in the works.

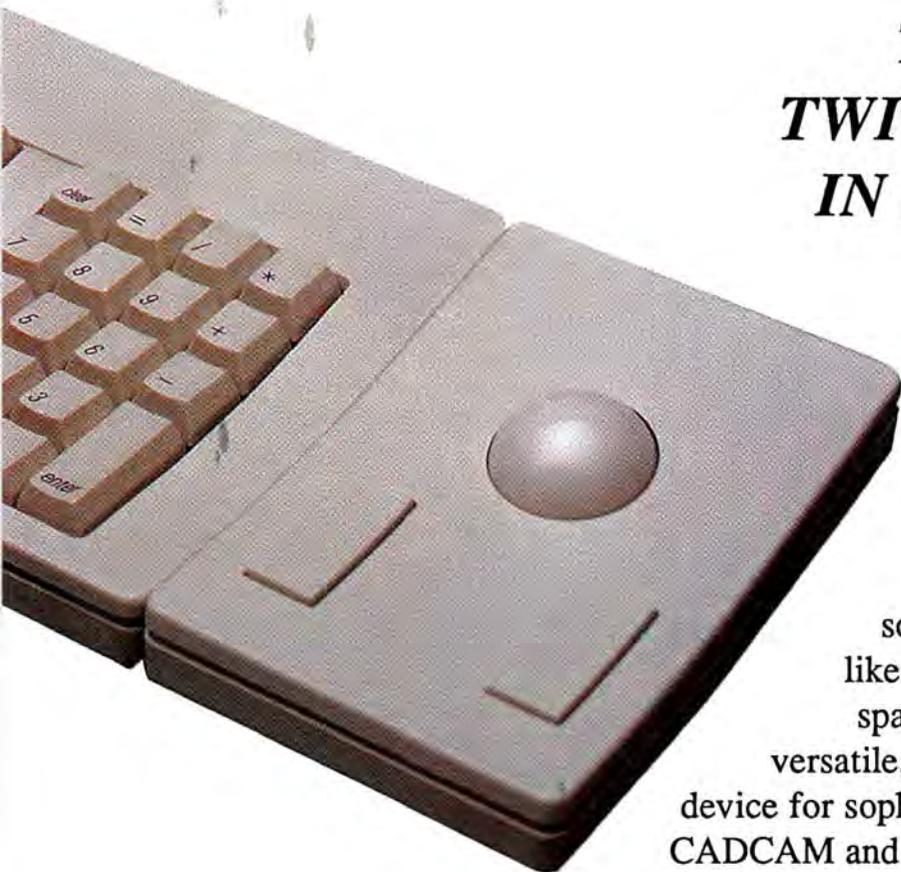
As with Image Club's collection, Multi-Ad's images vary in style. The disk is divided into two folders, Product Art and Theme Art. Most of the food and product images are competently rendered but fairly prosaic—but that's what you'd expect from advertising art. The Theme Art images—fashion, seasons, travel, and so on—include realistic renderings as well as whimsical cartoons. "Art Department Sampler" shows some representative images.

(continues)



PERFECT MATCH TURBO TRACKBALL

***TWICE THE SPEED,
TWICE THE ACCURACY
IN HALF THE SPACE!!***



The perfect matching trackball, with the lowest profile and lowest price. The Asher Turbo Trackball™ gives you precise fingertip control in a space saving, ergonomic package designed with a patented hi-tech encoder used in sophisticated aerospace instrumentation; like aircraft, missiles, torpedoes, gyros and space shuttles. The Turbo Trackball™ is a versatile, reliable, easy to use and very accurate device for sophisticated desktop publishing, graphics, CAD/CAM and many other applications with over 250 counts per inch of tracking resolution.

Also available for
IBM PC, XT, AT and compatibles.

Asher's patented encoder and high quality components allow us to offer a lifetime warranty.

ASHER ENGINEERING CORP.

15115 Ramona Blvd.
Baldwin Park, CA 91706

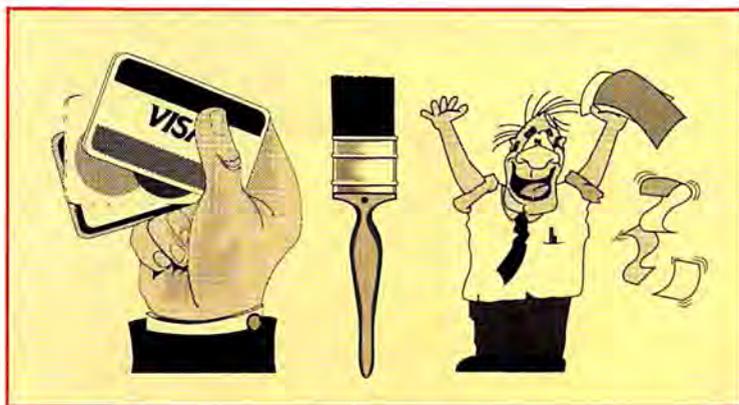
\$99.00

For Macintosh™, Mac Plus, Apple® IIe or IIc
ask for model LX200-192-D1

For Macintosh SE, Mac II or Apple IIGS (ADB)
ask for model LX200-192-S1

	ASHER Turbo Trackball	ABATON ProPoint	KENSINGTON Turbo Mouse
Technology	Patented encoder	Opto-Mech	Opto-Mech
Manufacturer	Asher Eng.	Abaton	3rd Party
Precision	250 CPI	200 CPI	< 200 CPI
Shift Lock Key	Yes	Yes	No
Left or Right Hand Option	Yes	No	No
30 Day Money Back Guarantee	Yes	No	No
Warranty	Lifetime	Lifetime	One Year
PRICE	\$99.00	\$159.95	\$129.00

**To order yours today contact your local Apple Dealer or call:
800-824-3522 (outside CA) or 818-960-4839 (inside CA).**



ArtRoom Sampler
Shown here are representative images from Image Club's CD-based clip art collection.

look at carrots, cartoons, credit cards, cartoons, scary monsters, health care products, and so on.

You can always search by title, but the library organization problem applies to this method as well; if you don't know which library a drawing resides in, you'll have to search all libraries. Furthermore, the titles listed in Image Club's printed catalog don't always match those on the CD. When titles do match, the same title often applies to several drawings. Fortunately, Multi-Ad's catalog is helpful and well organized.

One final problem: some drawings from each manufacturer contain several separate images. PictureBase Retriever provides no way to select a portion of a drawing, so you must either crop the drawing in your page-layout program or open the drawing with the parent program and separate it.

CD or Not CD?

As you can see, the technology for finding and retrieving clip art from compact disk is far from perfect. The problems I've mentioned are not entirely the fault of the clip art distributors—although more care should be taken in organizing material—nor of PictureBase Retriever, which was designed for hard disk-based collections. The problem lies with the medium itself; until users can write to CDs, more efficient methods of searching huge quantities of data must be found. An on-disk index would be a good start. Compact disks full of artwork are, in theory, a godsend for newspapers, art departments, and offices; it's up to the clip art distributors to make them so in practice. —*Erfert Fenton*

See *Where to Buy* for contact information.

Getting the Picture

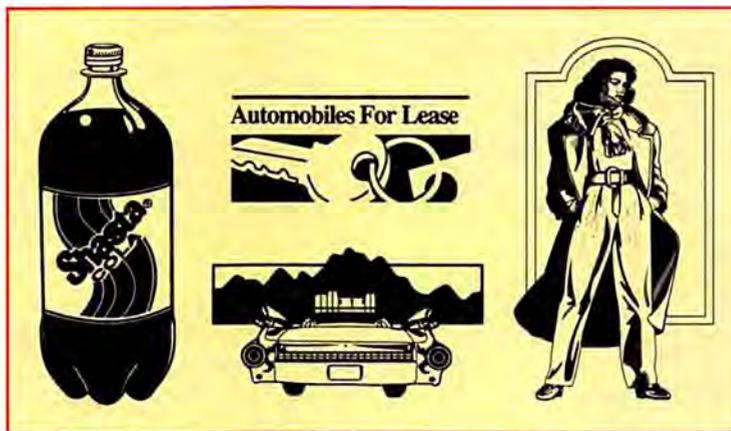
Assuming one of the CD collections meets your needs, the next order of business is retrieving images. Both manufacturers provide their collections in PictureBase (a popular art cataloging and retrieval program), in addition to the original file formats.

The PictureBase Retriever desk accessory comes with both packages. It allows you to view each picture in a library, search a particular library, or search the entire disk to find the image you need. Image Club's disk allows you to place images displayed by the Retriever into PageMaker, ReadySetGo, XPress, and Scoop. Unfortunately, at this time Multi-Ad's illustrations can be placed only into InHouse Layout Department, a customized version of XPress distributed by Multi-Ad Services. (Check with Multi-Ad Services if you wish to use another layout program; a future release should be compatible with several.)

So far the procedure for retrieving graphics seems simple: you're working in a page-layout program and need a certain image; you select the PictureBase Retriever DA, search for the illustration by title or keyword, and place the picture in your document. Unfortunately, once you start looking for images you'll quickly realize that you're stuck with the organizational techniques of the disk's manufacturer. Users of art-organization programs are accustomed to setting up personalized systems, specifying their own categories, and adding keywords. But with a CD, you can't add or delete keywords, nor can you organize libraries in a way that suits your work habits; the disk's contents are etched in stone (well, etched in polycarbonate plastic, anyway). And since PictureBase Retriever doesn't provide a master list of keywords, it's up to you to guess what words might be attached to the image you're seeking.

As I searched miles and miles of disk space, I became more and more frustrated. Image Club, for example, groups its artwork into the following PictureBase libraries: Headings, Humorous, Maps, Symbols, Mortices, and Clip Art. The Clip Art library is a 6000K catch-all for images that don't fit in the other categories; further division into sublibraries would have been helpful. Fortunately, Multi-Ad Services did a better job of organizing its libraries. However, if the image you need isn't in the library you suspect it's in, you're obliged to search all libraries, which can be excruciatingly slow on a packed CD.

As you search, you must wait for each image to appear on the screen. Some of the images—especially Image Club's—aren't centered in the PictureBase Retriever window, forcing you to scroll in order to see the entire drawing. Worse yet, when searching by keyword you're often treated to images totally unrelated to the one you're looking for, since any keywords containing the word you type will cause the associated picture to display. If you search for *car*, for example, you'll have to



Art Department Sampler

Multi-Ad Services is an established distributor of advertising clip art. While many of Art Department's graphics depict products, it includes more general categories such as holidays and seasons as well.

QUICKEYS™

The keyboard enhancer for your Macintosh
For: Macintosh 512E, Plus, SE and II. This award winning program works with all keyboards, especially extended keyboards.

You told us macro programs were complicated, hard to learn and unreliable. We agreed. So, we wrote QuicKeys.

How fast can you learn to use QuicKeys?
How fast did you read this sentence?

All basic actions: opening programs, clicking and dragging, typing text, selecting menu items, buttons, sequencing actions and many more are condensed within a compact menu.

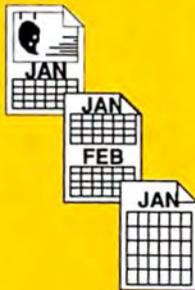
Virtually anything you can do with your Macintosh is done with a keystroke in QuicKeys. It even prints keyboard templates!
★★★★ MacUser-Jan '88
Just \$99.95

Simply select an action from this menu, press a key and... Bingo! You're creating QuicKeys.

CalendarMaker™

Presentation quality calendars.

"If you use calendars, you need CalendarMaker"
- Nibble Mac, October 1987



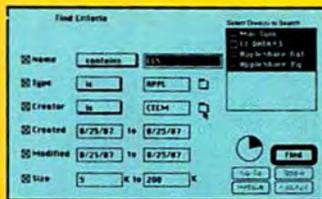
"Every year I have the same problem: finding the ideal calendar... In answer to this universal dilemma CE Software has published CalendarMaker."
MacWorld, March, 1987

★★★★ MacUser-Dec. '86
Enter events manually or import from programs including: MORE!™, SideKick™, BatteryPak™, SmartAlarms™. Export calendars to MacWrite, MacPaint, MacDraw, PageMaker and others... Just \$49.95

DiskTop™

A portable finder.

"DiskTop may well be the best desk accessory I've ever owned; I use it more than any other... this may be the best value in Macintosh software today."
The MACazine, November, 1987



★★★★ MacUser-Aug. '87
With DiskTop you can find, copy, move, rename, create folders, and more without ever leaving the document you're working in.
DiskTop contains the most powerful yet easy to use "Find" command available on the Macintosh. Hard drive users love it. Just \$49.95



CE SOFTWARE

Visit your retailer or call (800) 5-CESOFT for VISA/MasterCard orders. To purchase by mail send VISA/MasterCard number with expiration date, check or money order with appropriate amount plus \$2.00 shipping and handling for each product ordered to CE Software, P.O. Box 65580, West Des Moines, Iowa 50265. For information call (515) 224-1995.

CalendarMaker, DiskTop and QuicKeys are trademarks of CE Software. Other names indicated by ™ or © are trademarks of their respective manufacturers.

Circle 147 on reader service card

Focus on Presentations

PC Viewer PCV 6488AV

LCD projector and interface. **Pros:** High-contrast image is easy to see; compatible with IBM, Apple II, and other PCs. **Cons:** Image deteriorates and clouds on older, hot projectors; requires fine-tuning for optimal image. **Company:** In Focus Systems. **List price:** \$1695 for projection unit; \$119 for Mac Plus or SE interface. **Requires:** 128K.

MacViewFrame

LCD projector and interface. **Pros:** Image is easy to see and stable, even on hot projectors; sturdy protective case. **Cons:** Not compatible with other PCs. **Company:** nView Corporation. **List price:** \$1695 (includes interface for 512K, Plus, and SE). **Requires:** 512K.

Flat-Top 1.02

LCD projector and interface. **Pros:** Requires no additional power supply; projects more than can be shown on the original Mac screen; IBM compatible. **Cons:** Image lacks sharp contrast found in the other two units and deteriorates on hot projectors; software INIT must be included in System Folder; not compatible with 512K or 512KE. **Company:** Network Specialties. **List price:** \$1495 for projection unit; \$99 for Mac Plus interface, \$195 for SE interface. **Requires:** 1MB; Mac Plus or SE.

Until recently, the only way to present Mac screen images to large groups was with expensive, bulky, and finicky projectors and monitors. Now there are three new products—PC Viewer (model PCV 6488AV), MacViewFrame, and the Flat-Top—that feature specially designed liquid crystal display (LCD) panels that work with standard overhead projectors so you can display chalkboard-size Macintosh screen images on classroom or boardroom walls.

Preview

Since the Macintosh has no standard video-out port, all three viewers require installation of a jack that taps into the computer's video signal. Because of the lack of standards, you can't freely interchange the three viewers with each other or with other projection devices. Installation of



Liquid crystal display projectors for the Macintosh: (left to right) MacViewFrame, Flat-Top, PC Viewer.

any of these units requires that a licensed technician open up the Mac and plug one or more connectors into existing sockets or circuit boards.

After installation of the video port, all three units are simple to connect and operate. With the MacViewFrame and the PC Viewer, you must also connect the viewer to the Mac with a cable, plug the viewer's power supply into a 110-volt outlet, and plug the LCD unit into the Mac.

The Flat-Top draws its power directly from the Mac, so it doesn't require an electrical outlet. But unlike the other two units, the Flat-Top won't display what's on the Mac screen unless the Mac's System Folder includes a special 9K INIT file. When this INIT is installed, you have the option of sending exactly the same thing you see on the 512 by 342 Mac screen to the LCD screen. Or you can take advantage of the LCD panel's 640 by 400 image to display more of your desktop, your spreadsheet, or your tree chart without scrolling.

The Flat-Top has only one hardware control: a contrast wheel that you'll probably never move from the maximum position. The MacViewFrame has a contrast knob and a switch that reverses the dark and the light pixels. The PC Viewer's touch-sensitive panel has buttons to control brightness, inverse video, location on the screen, and sequencing—an adjustment that sometimes needs to be made to eliminate a sparkle effect peculiar to the PC Viewer.

The View from Here

What about the display? None of the three units produces the black-on-white contrast of standard overhead transparency foils; each uses its own shade of blue, green, or yellow. The PC Viewer has the highest contrast, with a display that is crisp and clear when fine-tuned to optimal settings. The MacViewFrame projects an image that isn't quite as high in contrast but doesn't seem to require as much adjustment to keep it sharp. The Flat-Top's contrast ratio pales when compared with the other two, but the lack of contrast is at least partially offset by its wider viewing area. None of the three viewers displays rapid movements without blurring.

I demonstrated the PC Viewer and the MacViewFrame to a local user group on a high-quality overhead projector. Members seated around the 200-seat hall preferred the PC Viewer's image over that of the MacViewFrame by a five-to-one margin.

When I tested all three units on consecutive days in a large classroom, though, the PC Viewer earned just one of about 180 votes; the MacViewFrame was the clear class favorite, earning about twice as many votes as the second-place Flat-Top. The difference in outcome of these two popularity

(continues)

BUY ONE.

Purchase one of the following titles from your local dealer.



Soko-Ban
Action Strategy Game
IBM, Apple II, and C-64



PT-109
Torpedo Boat
Simulation Macintosh

Falcon
The F-16 Fighter Simulation IBM/
Tandy 1000 and Macintosh



Tetris
The Soviet Challenge IBM, Apple II/IGS,
Macintosh, Macintosh II, and C-64



Dondra
Animated Graphics
Adventure Apple II/IGS and C-64



Solitaire Royale
Collection of Solitaire games IBM/Tandy 1000,
Macintosh, and Macintosh II

GET ONE FREE.

Receive one of the following titles from Spectrum HoloByte.



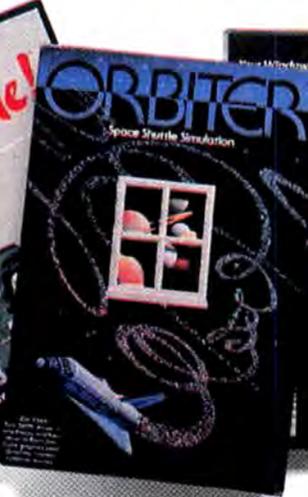
Lunar Explorer
Lunar Landing Vehicle Simulation Apple II



Wilderness
Survival Simulation IBM
and Apple II



Intrigue!
Mystery Thriller
Apple II and C-64



Orbiter
Space Shuttle Simulation IBM and Macintosh



TellStar
Astronomy Program IBM, Apple II,
and Macintosh



The Art Studio
Graphics/Paint Program IBM

IT'S THE BEST DEAL AROUND! Buy one of Spectrum HoloByte's hottest titles from your local dealer between Aug. 1 and Oct. 31, 1988, and we'll send you another product of your choice absolutely FREE!

YOUR CHOICES TO PURCHASE ARE: FALCON, TETRIS, PT-109, SOKO-BAN, SOLITAIRE ROYALE, OR DONDRA.

Here's how it works. To redeem your free software simply complete either the coupon in this ad or one

from your local retailer; mail it along with proofs of purchase and \$4 (per free product) for shipping and handling. If our product is unavailable locally, call us direct at 415-522-0107. Tell us what product you wish to buy and which product you want FREE. We accept either Visa or MasterCard.

YOUR FREE PRODUCT CHOICES ARE: ORBITER, INTRIGUE, LUNAR EXPLORER, TELLSTAR, WILDERNESS, OR ART STUDIO.

Spectrum HoloByte™

A Division of SPHERE, INC.

2061 Challenger Drive • Alameda, CA 94501

All software products are trademarks of or licensed to Spectrum HoloByte. Hardware products are trademarks of their respective holders.

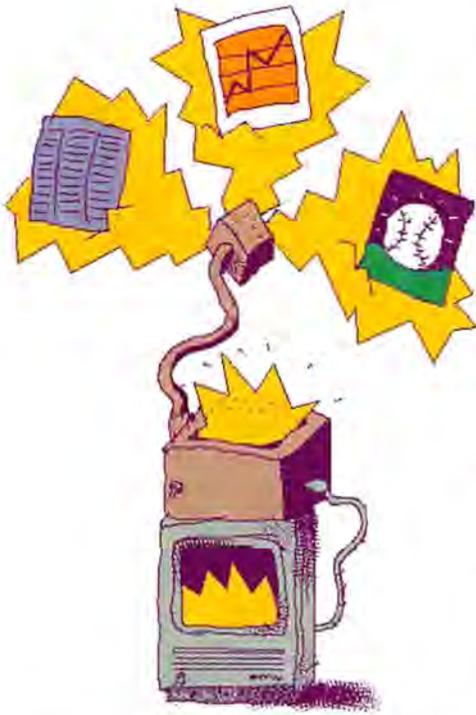
Mail-In Coupon

Please send my free software to the following address. Enclosed are required proofs of purchase (specified below) and \$4 (U.S. funds) per free product for shipping and handling. Check or money order should be made payable to Spectrum HoloByte.

Name _____ VISA MasterCard _____ Exp. Date _____
 Address _____ City _____ State _____ Zip _____
 My free software choice _____ Computer format I wish to receive _____
 Signature _____

PROOF OF PURCHASE REQUIREMENTS: Send the following original items: (1) the dated cash register tape or sales receipt showing the product purchased, and (2) the actual UPC label located on the lower right corner of package back. (Cut the label off.)

Mail to: Spectrum HoloByte, BUY 1, GET 1 FREE, 2061 Challenger Drive, Alameda, CA 94501. Only valid requests postmarked by Nov. 1, 1988, will be honored. Allow 3-6 weeks for delivery.



contests boils down to one word: heat. The projector I used in the classroom test was an older model, and the two units without fans couldn't take the heat.

The MacViewFrame contains a fan to keep it cool, while the other two companies claim a fan isn't necessary when their viewers are used on most modern overhead projectors. Fortunately, most overhead projectors in use today operate well below the 140-to-150-degree maximum surface temperature recommended for these two units.

Overview

If you're looking for a machine that can display output from a variety of different kinds of computers, the PC Viewer is your best choice. Even if you only use it with a Mac, you'll probably prefer its clear, easy-to-read display, provided your projector doesn't double as a toaster. The Flat-Top is worth a look if you want to project more of the desktop than you can see on the Mac screen, and it's plug-compatible with the company's Big-Top and High-Top monitors. But if you need a Macintosh projector that can work well in the most adverse conditions, the MacViewFrame, with its cooling fan and hard-shell protective carrying case, is your best bet.

If none of these units meets all of your needs, then stay tuned: the LCD projector wars have just begun. —George Beekman

See *Where to Buy* for contact information.

Two Pages in One

Radius Two Page Display

19-inch-diagonal monochrome monitor:

Pros: Clear, stable picture; useful software enhancements. **Cons:** More appropriate for graphics than text. **Company:** Radius. **List price:** \$1695, plus \$695 for Radius TPD interface card; \$1895 for gray-scale card for Mac II. **Requires:** Macintosh SE.



Dedicated Mac users are perfectly comfortable with the nose-to-CRT pose encouraged by the Mac's classic 9-inch-diagonal screen. Nonetheless, even before Apple sanctioned the idea of larger screens with the Mac II, manufacturers began addressing the grumblings of a few obviously myopic malcontents by developing monitors readable from more than a foot away. Seriously, there are now many ways to supplement the Mac's screen, and one of the slickest is the Radius Two Page Display (TPD). If you usually work with graphics, engineering drawings, or spreadsheets, you may fall in love with the TPD. Those who work heavily with text may find Radius's Full Page Display (FPD) a better choice.

Seeing the Light

As the name suggests, the TPD is very nearly twice the size of the popular FPD. Whereas the FPD offers SE and Plus versions, the TPD is for the SE only (though there is an \$1895 full-gray-scale interface card that allows you to use the TPD with a Mac II). Clarity is excellent at 1152 by 864 pixels, essentially the same density as the Mac screen. The high-contrast phosphor and fast screen-refresh rate do indeed make the large screen look paperlike, with no flicker, just as Radius claims.

Furthermore, the engineering in this product can't be faulted. If you install the TPD card yourself (absolutely not recommended—at these prices let the dealer do it) you will find a well-laid-out card with no hand-wired changes, and as simple an installation as is possible in the crowded SE. The monitor itself is a refreshingly clean design that minimizes weight (it's still 55 pounds) and sits on an adjustable stand.

The TPD system includes Control Panel software that allows you to place the SE and TPD screens next to each other and

adjust them so that the cursor tracks without interruption between the two. A tear-off menu scheme lets you park most of the menus for your applications on the SE screen, leaving the TPD screen clear as a working area. A magnification feature displays blown-up sections of screen on the TPD or the SE. Sizing, centering, and zooming of windows can all be optimized through simple settings.

The TPD is compatible with nearly all best-selling software. The limitations are minimal: tear-off menus don't work under MultiFinder; scrolling, hierarchical, and HyperCard menus require special handling for tear-off; and the TPD doesn't support Switcher.

The \$2400 Question

So, do you need a display system that costs nearly as much as a discounted SE with hard disk? Under certain circumstances, you might. If you work extensively with spreadsheets, you'll find this system ideal for displaying a year's itemized budget, month by month. The TPD isn't cheap, but it's a bargain compared to 19-inch color monitors for the Mac II. If you work with large graphics, you'll find using the TPD more efficient than using the scroll bars on an SE. In both financial and engineering applications, the use of Radius's \$995 Accelerator (others are not TPD-compatible) is strongly recommended—the SE must write over five times the normal display area (SE plus TPD) and scrolling is slow in the stock system.

If your work is mostly text, the benefits of the TPD largely disappear. There is no comfortable desktop viewing distance for two pages of 10-point Helvetica, and screen curvature problems are exaggerated by close viewing. The per-letter pixel density is no better than the standard Mac display, so you can assess the readability issue for yourself. You could, of course, take the text up to 14 points, but then you have spent a lot of money for the privilege of reading your work from four feet away. For word processing applications, the Radius FPD is the better choice.

If you have a task that justifies the cost of a 19-inch monochrome monitor, the Two Page Display is a good choice. It provides a wonderful picture, and Radius offers superior technical support. With a TPD and a Radius Accelerator, the SE does a passable impersonation of a \$10,000-plus workstation. —Charles Seiter

See *Where to Buy* for contact information.

UNLEASH THE POWER

MacMoney

No other home and small business financial management package has all of the features that power MacMoney. Our versatility and flexibility combine with exceptional ease of use to provide you with everything necessary to get on top of your finances and stay there.

MacMoney works the way the real world works. You won't have to learn any fancy accounting principles to get us up and running. In fact, if you know how to write a check, you can put MacMoney to work.



But you won't stop with check-writing. Soon you'll be balancing your checkbook and credit card accounts as well. You'll track expenses and income with standard and flexible reporting features. You'll set up a budget, and—with a click of your mouse—find out how well you're sticking to it. And we'll be there to answer any questions you have—**free**.*

Whether you want to track your personal accounts or you're running a small business, you'll love MacMoney.

SEE US AT BOSTON EXPO, BOOTH 911

*We'll send you a bibliography of our reviews and more information about MacMoney. Just call or write. Address written requests to 'Reviews', Survivor Software, 11222 La Cienega Blvd., Inglewood, CA 90304. Phone (213) 410-9527. List price \$119.95. Hardware: 512K Macintosh, Macintosh XL, Plus, SE & II. Printer (recommended): ImageWriter or Laserwriter (or equivalents). MacMoney is a trademark of Survivor Software Ltd.; any other trademarks are for reference only.

Circle 112 on reader service card

Low-Cost MIDI Interface Quartet

This review compares four low-cost MIDI interfaces for the Macintosh:

Apple Computer—Apple MIDI Interface.
Austin Development—MIDIface II.
Opcode Systems—Professional Plus.
Passport Designs—Passport MIDI Interface.

Information is provided on the number of MIDI inputs and outputs, external power supply requirements, and inclusion of required cables. All four interfaces require at least a Mac Plus.



By now you've probably heard about MIDI (musical instrument digital interface), the standard protocol that allows synthesizers to communicate with computers. There are over 200 Macintosh MIDI software packages in existence (commercial, public domain, and HyperCard MIDI stacks), and with the cost of synthesizers dropping to the \$200 range, the MIDI boat is one you shouldn't miss. There is one catch, though: to convert your synthesizer's MIDI data into something the Macintosh can understand (and vice versa), you need a MIDI interface.

Variations on a Theme

To connect a Mac to MIDI devices, all you really need is an interface with one MIDI In port, one MIDI Out port, and a single cable (see "Room for Expansion"). Con-

trary to what you'd expect, this configuration doesn't limit you to a single sound device. A synthesizer, for instance, has a third MIDI port labeled MIDI Thru that passes information it receives to additional devices in a setup referred to as a *daisy chain*. Timing delays introduced between each MIDI In and MIDI Thru port limit the size of such MIDI networks to four synthesizers. For larger networks, some interfaces include up to six MIDI Outs, bringing the number of possible devices up to 16 and allowing *star* systems, in which each device has a dedicated MIDI Out port.

The MIDIface II offers the high-end option of using the Mac's two serial ports, allowing you to hook up two sets of 16 MIDI channels each. The result is a total of 32 MIDI channels, which can access 32 different sound sources simultaneously. It is possible to achieve the same effect by connecting one single-input interface to the modem port and another to the printer port. Either setup provides two discrete MIDI inputs that aid in synchronization applications.

Synchronizing a Mac with synthesizers, drum machines, tape recorders, and VCRs is a complicated process. Most sequencer and notation software now support the Song Position Pointer MIDI command. This feature permits devices to keep track of the number of elapsed 16th notes so that one device can instruct others to start at specific points on a track. Synchronization is possible using a single MIDI In, although synchronization while recording new data is not possible unless you add a somewhat costly MIDI merger peripheral.

Having two MIDI Ins circumvents this restriction.

Once you've dedicated the Mac's serial port(s) to MIDI, you might wonder how you can access a modem or printer without continually swapping cables. High-end interfaces include built-in function switches, but for the MIDI interfaces reviewed here, you'll need a switch box or two (add \$50 to \$100).

Apple MIDI Interface

Apple entered the MIDI world when it introduced its single MIDI Input, single MIDI Output, single port interface last January. If you're new to MIDI and want to take the plunge with an inexpensive, easy-to-set-up, compact interface that requires no external power, this is the one for you. The \$99 price, which includes two MIDI cables, makes it an excellent entry-level buy.

Austin Development's MIDIface II

Many musicians have not heard of Austin Development's interface because the company does very little advertising. This is unfortunate; MIDIface II is one of the two low-cost interfaces with two MIDI Inputs each assigned to three MIDI Outputs. (Word of a similarly priced two MIDI In, six MIDI Out interface, from Altech Systems, came too late for us to include the product in this review.) An internal switch (accessible by removing the back panel) can direct the modem port input to all six MIDI Outputs if desired. However, unlike high-end

(continues)

Four MIDI Interfaces

	Apple MIDI Interface	Opcode Professional Plus	Austin Development MIDIface II	Passport Designs MIDI Interface
Number of MIDI Ins and Outs	1 In, 1 Out	1 In, 3 Out	2 In, 6 Out	1 In, 1 Out
Mac connections (printer/modem)	either	either	either or both	either
Ins assignable to Outs	n/a	n/a	1 In maps to 6 Outs	n/a
Cables included (MIDI, Mac)	2 MIDI, 1 Mac	1 Mac	none	2 MIDI, 1 Mac
Power supply required	no	external (included)	internal	no
Dimensions (in inches)	2.625 × 1.25 × 1	1.25 × 3.875 × 1.375	3 × 5 × 2	1.25 × 4.5 × 2.5
Price	\$99	\$150	\$119.95	\$129.95

When considering MIDI interfaces, be sure to note that not all interfaces include the required cables, and that additional cables can be costly. Also, none of the interfaces in this table will fit under the Mac; they must be positioned either alongside or behind it. Both Opcode and Passport offer higher-end interfaces for additional cost.

FROM THE DUBL-CLICK COLLECTION



CLASSIC CLIP-ART (vol 1/2) Contemporary: maps, icons, symbols, borders, office, computers, transportation, tools, western, food, people, animals, dinosaurs, holidays.	ANIMAL KINGDOM (vol 5/6) Modern line-art and crisp, digitized images of: animals (and lots of them!), camping, fishing, hunting, and the great outdoors.	PRINTERS' HELPER (vol 9/10) * Turn-of-the-Century: borders, frames, fancy letters, signs, symbols, art nouveau, silhouettes, shadows, dingbats & book ornaments.	OLD EARTH ALTMANAC (vol 13/14) * A Compendium of Encyclopedic Images: animals, plantlife, people, turn-of-the-century lifestyles.
FOR PUBLISHING (vol 3/4) Contemporary: food, sports, people, housewares, office, medical, military, computers, space, transportation, holidays, symbols and borders.	SPECIAL OCCASIONS (vol 7/8) * Turn-of-the-century: holidays, seasonal, religious, children, music, dance, food and feasting.	INDUSTRIAL REVOLUTION (vol 11/12) * Turn-of-the-Century: machines, professions, business, characters, expressions, the old west.	ISLAND LIFE (vol 15/16) Hawaiian and Australian: animal life, tropical vegetation, trademarks, and leisure activities from hula dancing and surfing to camel riding.

MacUser gave WetPaint 5 mice (Sept. 1987) saying "...the WetPaint art is almost a must for clip art users; the ArtRoundup desk accessory is a necessity." Volumes marked with * were previously released as "MacMemories."

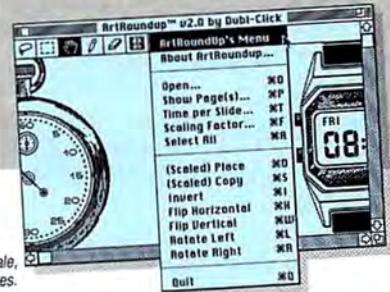
ArtRoundup comes free with WetPaint, and can Scale, Invert, Flip and Rotate the largest of paint-style images.



Each **WetPaint** volume contains an extensive collection of useful pictures, icons, borders, maps and patterns—in a wide variety of styles, designed for both home and business use.

WetPaint files can be read read by painting programs (like FullPaint™, MacPaint™, SuperPaint™) and applications like PageMaker™. WetPaint is also available in PictureBase™ format at an additional \$30 per volume.

Even if you don't own a painting program, you can still copy pictures directly from WetPaint files using our **ArtRoundup™** desk accessory—included **Free** with every WetPaint volume! And ArtRoundup's new **Slideshow** tool is a great way to scan hundreds of images in minutes.



MacUser gave World Class Fonts! 5 mice (Dec. 1986).

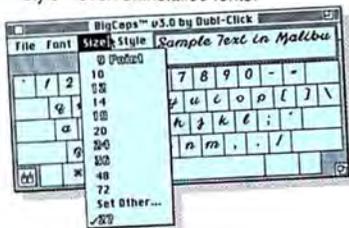
WORLD-CLASS FONTS!

Each volume is chocked full of what MacUser magazine describes as "the Best collection of ImageWriter fonts available." We just made the Best even Better! All World Class Fonts volumes have now been redesigned to achieve even better results on the ImageWriter LQ and LaserWriter SC.

The **Originals** & The **Stylish** volumes range from practical text and symbol fonts to striking display faces. The **Giants** are ultra-large sizes ideally suited for high-resolution printing and creating desktop presentations.

Our fonts install easily using the Font/DA Mover, included along with our handy **BigCaps™** desk accessory which replaces Apple's Keycaps and can display any font in any size or style—even uninstalled fonts!

Volume 1/2 The Originals Albuquerque ARLINGTON AUSTIN (very small) Berkeley Boca Raton BOISE CALDWELL Boston CAMELOT CANYON Canaveral CARIBEL Chicago COPENHAGEN Cupertino	DAKAR DALLAS DETROIT Florence FRANKFURT GREENBAY HELSINKI HOLLYWOOD Hong Kong Istanbul KAWASAKI Laredo LAS VEGAS Liverpool London Luxembourg Malibu Manhattan MEIBOURNE Monterey Montreal	MOCKBA MOSCOW NAZARETH (all symbols) N.Y. Heads Obispo OLEAN OSaka PARIS POCATELLO P.O.S-T-A-L CITY PRAGUE R-OME Saigon SAN DIEGO Santa Fe SCOTTS DALE	STANFORD Stockholm STUTTGART SUNNYVALE Sydney Tel Aviv Tokyo! Venice Washington D.C. WOODSTOCK Volume 3/4 The Stylish Abeline Ann Arbor Assisi Buenos Aries Burbank Calcutta	CAPE CODE Corinthia Denver Drafty City DRUM East L.A. FLINT Gotham Indianapolis Jmeau Kent La Plata Madrid Martha's Vineyard Nantucket PaleTmo	Phoenix Quebec San Isidro Symbol City Tripoli Vancouver Waco, Texas WALTHAM Waterbury OCR Zurich Volume 5/6 The Giants ImageWriter LQ and LaserWriter users: This volume has ultra-large double, triple, and quadruple sizes of the most popular fonts from 'Originals' and 'Stylish!'
--	---	---	---	---	---



Each volume is three 800K disks.
\$79.95 suggested retail.



©1988 Dubl-Click Software, Inc. ♦ 18201 Gresham Street ♦ Northridge, CA 91325 ♦ (818) 349-2758 Pacific Std. Time

Circle 155 on reader service card

Basic MIDI Setup

MIDI Thru port passes all incoming MIDI data to additional daisy-chained devices.

Mid-range interfaces may add additional MIDI Ins and Outs and built-in switch box.

Switch box may be needed to access printer and modem (2 if both ports used).

**Room For Expansion**

The basic MIDI setup requires a Macintosh, a MIDI interface (such as the Apple interface pictured here), and a single MIDI synthesizer. Specific applications and individual hardware preferences will determine what type of interface is required, as well as the kinds of interface peripherals needed.

devices, which also have two MIDI Inputs and six MIDI Outputs, the internally powered MIDiface II cannot be used in place of a MIDI Thru box (a peripheral designed to reroute outgoing MIDI data) while the Mac is doing something else. The \$119.95 price seems low, but keep in mind that it does not include the required Macintosh cable (about \$30) or any MIDI cables (\$18 to \$25 per pair).

Opcode Systems' Professional Plus

The Professional Plus is the descendant of the first Macintosh MIDI interface, Opcode's MIDIMac Interface. It has a single In, three Outs, and requires an external power supply (included). Essentially, the Professional Plus is one-half of Opcode's popular high-end Studio Plus II interface minus the switches and status LEDs, at well over half the price. The Macintosh cable is included, but you will still need a pair of MIDI cables. With this in mind, the \$150 price may seem steep. On the other hand, Opcode has a good reputation for quality and reliability. Opcode also markets a synchronization peripheral, the Timecode Machine.

Passport MIDI Interface

Passport's interface specs out exactly like Apple's: it's an entry-level interface with a single MIDI In and MIDI Out, no

power supply required, and all cables included. The unit is slightly larger than Apple's and the price is slightly higher: \$129.95. Passport also markets a high-end interface/sync box, the MIDI Transport, which provides many of the features offered by Opcode's Studio Plus II/Timecode Machine combination. Passport discounts the interface when it's bundled with Master Tracks Pro Sequencer.

All Shapes and Sizes

Although there are other interfaces with features similar to Opcode's and Passport's high-end models' (for instance, Southworth's Jambox series and Sonus's MacFace and SMX 2000), no single product has everything. So the number of Ins and Outs becomes a primary consideration when you are buying an interface. Also keep in mind the additional expense of cables, future expansion to a system with two Ins, and synchronization capabilities. You may even want to look at packages that bundle software and interfaces.

—Christopher Yavelow

See *Where to Buy* for contact information.

Real Color Now

ColorBoard 104

24-bit color video card. **Pros:** Provides near-photographic-quality color; eliminates banding. **Cons:** Expensive; slow; no official Apple support for 24-bit color; few input/output devices available; no software yet for developers; can't revert to 8-bit color without rebooting.

Company: RasterOps. **List price:** \$3195.

Requires: Mac II; color monitor. (ColorBoard 64 available for 13-inch monitor.)



Standard color on the Mac II looks great, but it could look even better. At 24 bits per pixel, the Mac II is capable of displaying all of the 16.8 million colors into which Apple has divided the color spectrum. Currently, however, Apple supports only 8 bits per pixel, which limits the Mac to displaying 256 colors at a time. While it is difficult to imagine an original work of art with more than 256 colors, photographic-quality images require a much wider spectrum. The subtle shadings of real life quickly exceed Apple's 256-color limit, and banding (visible transitions within color regions that should blend smoothly) results. Harnessing the Mac II's 24-bit-per-pixel capacity solves the banding problem and renders images with life-like quality—every pixel on the screen can assume any of over 16 million colors.

But there are severe limitations to using 24-bit color. First, since Apple doesn't yet officially support 24-bit color, most software companies are delaying development of 24-bit graphics applications. Second, input and output devices for 24-bit color are rare and expensive. Third, screen refresh is very slow because the Mac II draws the screen three times—once for each primary color. The problem will persist until Apple releases a version of Color QuickDraw that directly supports 24-bit color.

RasterOps' ColorBoard is one of the first 24-bit color video cards for the Mac II. RasterOps has squeezed three 8-bit primary-color circuits onto two cards, which are bolted together. Although the ColorBoard fits into one NuBus slot, it draws as much power as three normal cards, so you'll need to be careful how many other

(continues)



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

Introducing *MacLinkPlus/Wang VS* from DataViz, the workstation emulator that provides a Macintosh user access to Wang applications, word processing, data processing, electronic mail and file transfer.

“It’s a whole new system to learn, right?”

Wrong. It works just like a Wang, but with all the friendly Macintosh features. All Wang functions are available through pull-down menus, the familiar Macintosh mouse and the standard or extended keyboard.

“And what about file transfer & translation?”

Exchanging information is a snap. You can transfer a Wang WP document to your Macintosh and work in Microsoft Word or MacWrite. And it works the other way, too.

“Good enough. But if I want to connect with a Wang PC, or even an IBM PC...”

No problem. *MacLinkPlus/Wang VS* connects with either one, and includes a “library” of more than 25 different data translators, such as Wang WP, WordPerfect, Microsoft Word, MacWrite, DCA, dBase, Lotus, and more. Works with the Apple File Exchange utility, too.

Ask your Macintosh dealer about *MacLinkPlus/Wang VS*, or call us direct at (203) 866-4944.

DATA VIZ

Reviews

cards you install. The board provides standard 72-dots-per-inch resolution (1024 by 768 on a 19-inch screen).

The software consists of a CDEV that you install by dragging its icon into the System Folder. The Mac II then boots up in the 8-bit mode and, as with Apple's standard color card, you switch between gray scale, 8-bit color, and monochrome using the control panel. To shift to 24-bit color, you double-click on the RasterOps icon in the Control Panel. To shift from 24-bit color back to one of the usual modes, however, you must reboot. To make all these changes more convenient, RasterOps includes QuickKeys—a utility that allows you to assign ⌘-key combinations to menu choices.

Works Fine, But . . .

In more than a month of using the RasterOps board, I found no serious bugs, nor did the board cause any system crashes. To get the 24-bit mode to work properly, however, you have to modify the System file or use the one supplied by RasterOps. Additionally, the cursor tends to flicker and change colors. But these are minor annoyances. Most software works fine with 24-bit color. (Apple has stated that the implementation of 24-bit color used by RasterOps should work properly with all software that follows Apple's 8-bit-color guidelines.) I pasted 24-bit color images into PageMaker, ReadySetGo, and XPress and resized, moved, and rotated them. Because the screen refresh rate is so slow (just try scrolling text and watching each line draw three times as it moves up the

screen), I recommend working in the 8-bit mode when 24-bit color is not required.

Programs designed specifically to take advantage of 8-bit color, however, may have compatibility problems. For instance, when a 24-bit color picture is pasted into Modern Artist or PixelPaint, the entire screen breaks up into random colors, forcing you to reboot to return to normal. On the other hand, LaserPaint Color II can display 24-bit color images and can produce color separations. With LaserPaint, you can import images, such as those from PixelPaint, and display them in 24-bit color. The program also contains the only Mac driver for the Sharp JX 550 color scanner (one of the few ways a 24-bit color image can be imported).

Users hoping to do desktop publishing in color shouldn't expect too much too soon. Spot and line color can be done nicely at 8 bits per pixel. But screen images in 24-bit color look better than the output from 300-dpi printers. To get output as good as the screen image, you must use a 24-bit film recorder or high-quality, four-color printing press, neither of which is currently available for the Mac.

How Much?

Price is sure to keep most users from considering 24-bit color. A 19-inch Trinitron monitor with the ColorBoard costs nearly \$6600. Some people would rather buy a car. A slightly less expensive alternative is RasterOps' ColorBoard 64, which has the same quality 24-bit color at the same resolution but works with a smaller 13-inch monitor. Though the savings on the Color-

Board 64 is only \$600, the savings on, say, an Apple Color monitor versus the 19-inch Trinitron is \$2700, so you can get a complete video setup for \$3300.

Until RasterOps speeds up the performance of its ColorBoard and until more input/output devices and software are available, 24-bit color will remain an unjustifiable expense for most people. In a couple of years or so, however, 24-bit color may well be the affordable standard we wish it were now.—*Scott Beamer*

See *Where to Buy* for contact information.

Macintosh Rising

MacAstrologer 1.0

Astrological charting program. **Pros:** Simple chart generation with beautiful LaserWriter output; thorough, professional documentation. **Cons:** No online help function. **Company:** Full Phase Software. **List price:** \$179.95. **Requires:** 128K.



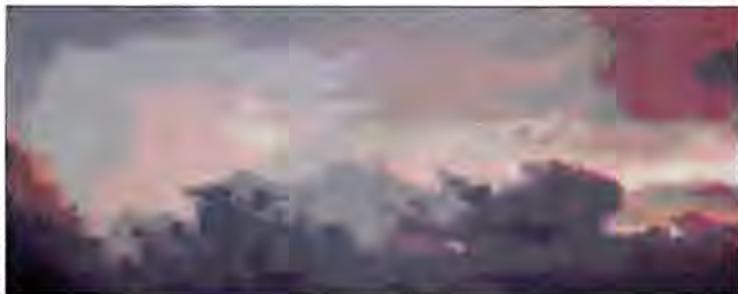
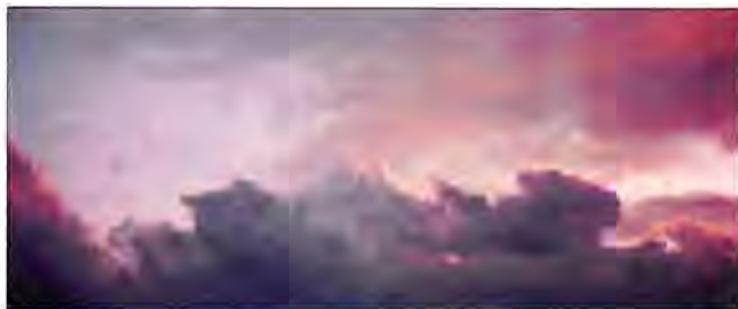
MacAstrologer generates nearly every type of popular astrological chart, as well as some more obscure ones. It was designed for use by people whose everyday chitchat refers to ecliptic coordinates and sidereal zodiacs, and it has been priced likewise—in a way that discourages casual dabblers. Although *Macworld* is not, of course, endorsing astrology per se, this program produces charts that a refined, artistic Libra would be sure to love, and it provides documentation to satisfy the fussiest Virgo.

Aspects of the Program

From a computing standpoint, astrological charts are the inverse of navigational charts. In celestial navigation, you use the time and the position of heavenly bodies to determine a location; in astrology, you are given the time and location (of a person's birth) and must then determine the position of the sun, moon, and planets. This has traditionally been done using sets of tables called ephemeris, but the tables are difficult to use and require multivolume sets to cover long periods of time.

MacAstrologer simply replaces all those tables with internal formulas for performing chart calculations. You enter birth

(continues)

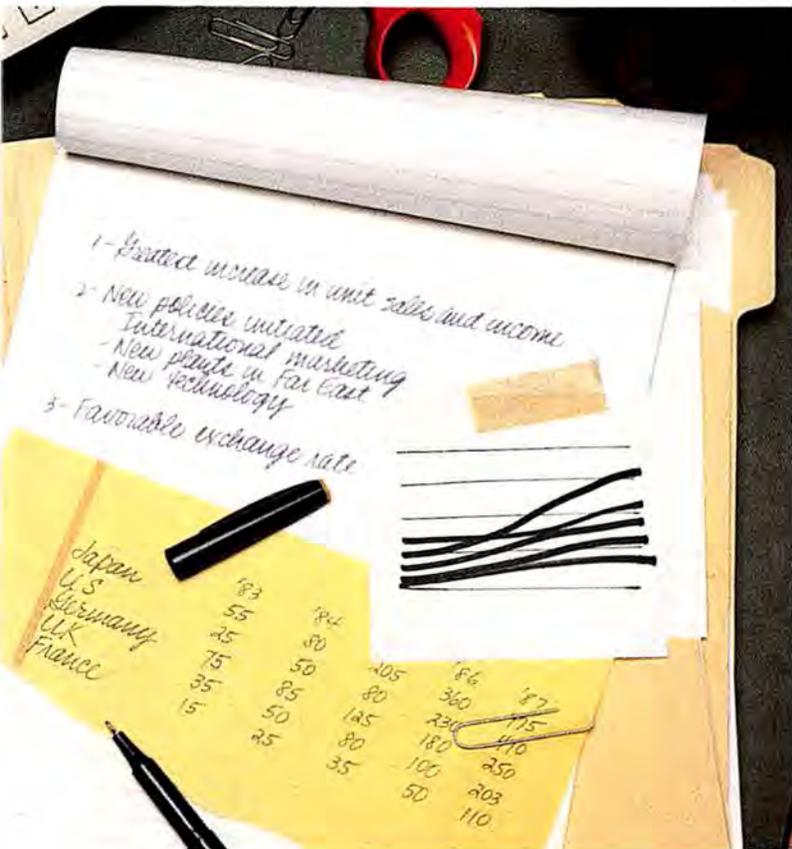


Clouds vs. Clouds

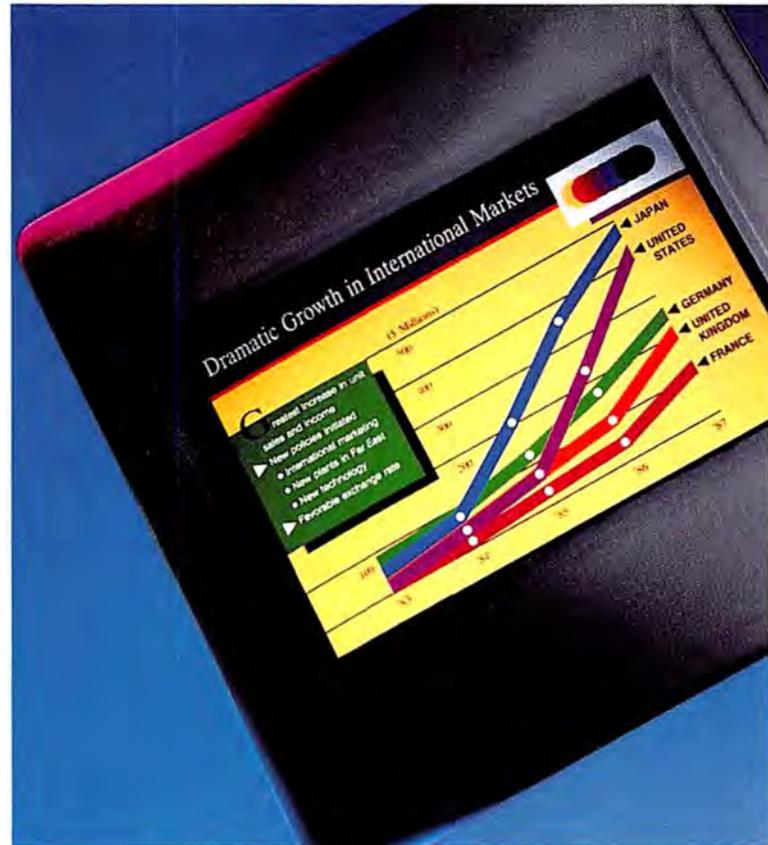
These two pictures demonstrate the huge difference between 24-bit color (top) and 8-bit color (bottom). In the 24-bit image, the clouds have a photographic quality; the 8-bit image looks much rougher. Unfortunately, applications that support 24-bit color are rare, as are input and output devices that support it.

ReadySetShow.

What you say counts.



How you say it counts even more.



In the business world, if the quality of your presentation isn't first-rate, chances are you won't be given a second chance.

So, whether you're selling a new idea to management, your product or service to customers, or your company's performance to its shareholders, you'll want the professional edge that only ReadySetShow™ can provide.

This revolutionary software package makes it easy to create dramatic, full-color slides and transparencies. To instantly change a single slide or rearrange the whole show. And to support your presentation with speaker's notes and handouts.

ReadySetShow delivers fully-integrated charts and graphs and lets you switch chart types with a click of the mouse. Its powerful text-handling capability includes essential time-savers like glossaries, style sheets, and spell-checking. And as you'd expect from the makers of ReadySetGo™, professional typographic effects—like kerning and letterspacing—produce headlines which look typeset, not typed.

An extensive library of design templates, wide file import capability, and compatibility with a broad range of output devices are just some of the features that make ReadySetShow the most advanced desktop presentation software on the market today.

For turning rough ideas into polished and compelling presentations...



ReadySetShow™

We work harder to make you look better.

© 1988 Manhattan Graphics Corporation, 401 Columbus Avenue, Valhalla, NY 10595. ReadySetGo and ReadySetShow are trademarks of Manhattan Graphics Corporation.

Special Introductory Offer. Call now toll free: (800) 451-1668 for a demo kit which includes a fully functional demo disk, a selection of design templates, and *The ReadySetShow Design Guide*. The \$15.00 price includes Federal Express delivery cost.

All orders shipped Federal Express.



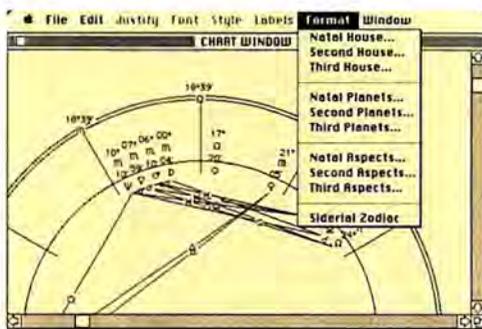
time and place data in an input window, and a finished chart pops up in a second or so (all input/output functions are directed by dialog boxes in separate windows).

What sets this program apart is flexibility in chart presentation—using its design window, you can modify most features of data presentation for aesthetic appeal or interpretational emphasis. Chart types include natal, solar return, lunar return, composite (derived and midpoint), and progressed. MacAstrologer allows you to choose tropical or sidereal zodiacs, based on ecliptic, heliocentric, or right ascension coordinates for calculating those charts; and it displays Placidus, Koch, Porphyry, Equal, or Campanus house systems. All variations of the above may be crammed onto one chart or displayed separately (see “Solar Energy”). Through a series of dialog box choices, any calculable piece of information in the whole system can be presented or suppressed in a particular display.

Planetary Circuits

Although using a 68000 processor in support of this mystical view of man’s fate highlights some curious contradictions in our culture, there’s no denying that the resulting charts, particularly when printed on a LaserWriter, are spectacular and interesting in and of themselves.

Professional astrologers should note that MacAstrologer’s batch mode can store and process up to 50 client files at a time. This means that the program can compress



Solar Energy

This plain-vanilla natal chart (of a Libra with rather a lot of items in Scorpio) has been re-drawn—with some choices from the Format menu—to display a small set of Aspects. The full range of display possibilities is nothing short of mind-boggling.

about two weeks worth of chart drawing into a 20-minute automated session—that’s the program’s strongest economic appeal. Another plus is Full Phase Software’s customer support, which is prompt and helpful.

For simple recreational use, Graphic Astrology (version 2.3), a \$39.50 program from Time Cycles Research, would be more appropriate. But for serious practitioners, MacAstrologer is a complete and well-designed system.—Charles Seiter

See *Where to Buy* for contact information.

Getting It Right

MacProof 3.0

Grammar, punctuation, and spelling checker. **Pros:** Desk accessory; can check part of a document; points out weak paragraph and sentence structure. **Cons:** Loses text formatting with some applications; can’t mark errors; doesn’t recognize words with curly apostrophes; misses many grammatical errors. **Company:** ALP Systems. **List price:** \$195. **Requires:** 1MB; two 800K drives; hard disk recommended.

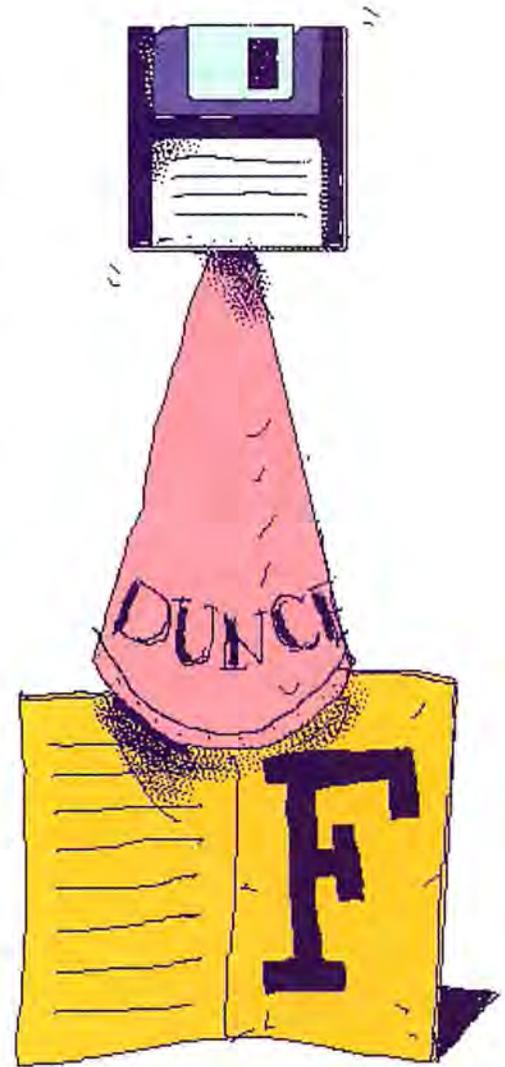
Sensible Grammar 1.1a

Grammar and punctuation checker. **Pros:** Suggests alternatives for problem words or phrases; can flag problems for later work. **Cons:** Can’t be used within a word processor; only checks whole documents; no spelling checker; misses many grammatical errors. **Company:** Sensible Software. **List price:** \$99.95. **Requires:** 512K; hard disk recommended.

Even if you can’t tell a split infinitive from a subordinate clause, you’ll probably agree that proper grammar, usage, and punctuation makes writing more effective. Word processors—even ones with spelling checkers—are fine for entering text, but they’ll accept “its OK” without batting an electronic eyelash. MacProof and Sensible Grammar claim to go a step further by pointing out flaws in wording and punctuation.

Mac Proofreader

MacProof is a desk accessory that scans text for mistakes in mechanics (including spelling), usage, and style. An easy-to-use checklist lets you pick which types of errors to look for. When it catches a po-



tential problem, MacProof shows the suspect word or phrase in context, along with a short explanation (see “Checking It Out”). You don’t have to leave MacProof to edit the document, but you can revise only one sentence at a time.

The Analyze Structure function is supposed to help you recognize structural weaknesses by letting you look at your writing in different ways. For example, you can highlight the opening and closing sentences of every paragraph or the first words of every sentence. Analysis is minimal, though—it’s up to you to decide if you’re satisfied with what you see.

MacProof only examines selected text, so you can check a single word or an entire chapter. But with some applications (including Microsoft Word) all formatting dis-

(continues)

120 MINUTES OF SPAGHETTI WESTERNS. OR 80 MEGABYTES OF BACKED-UP DATA.



Did you ever dream that you could record data as well as movies on an ordinary, inexpensive videocassette? That, after the shoot-em-ups leave you laughing, a head crash doesn't have to leave you crying?

Pinch yourself. And start keeping those precious megabytes safe and sound with the newest version of our ingenious Videotrax[®] system. Now featuring a controller and software for the Macintosh[™] Plus, Macintosh SE, or Macintosh II computer.

The system utilizes our enhanced Videotrax VCR—or any old VCR for that matter—to back up data on standard VHS or Beta cassettes. Hooks up to your Mac's SCSI port with standard cables. And—by reason of exhaustive

testing, self-monitoring, and the long-term experience of tens of thousands of microcomputer users—is more reliable than any other backup option. Not to mention easier.

Because a VCR, you already understand. And our pull-down menus tell you everything else you need to know. How to copy or restore an entire hard disk, specific files, or just the files that have been

added or changed since the last backup.

Could anything be simpler?

As a matter of fact, yes. With our "smart" Videotrax VCR, everything happens automatically.

You can see it for yourself by visiting your nearest Videotrax dealer. And you can get the name of your nearest dealer by calling 800-992-9779 (in California, 800-821-0612).

We strongly suggest you do that.

Because if your data means anything to you, acquiring Videotrax protection is a thought you should definitely entertain.

VIDEOTRAX
DATA BACKUP FROM
alpha micro



appears if you make changes in MacProof. (Of the programs I tried it with, MacProof worked perfectly only with MacWrite. It wasn't compatible with ReadySetGo 4.0 or a beta version of FullWrite Professional.) Just as annoying is MacProof's inability to recognize words with curly apostrophes like the one in "can't."



Checking It Out

Querying the word *meaningful*, MacProof tells you what the problem is, but doesn't suggest any improvement.

Sensible Choices

Sensible Grammar isn't a desk accessory, so you have to quit the word processor you're working in to use it. (Running both programs under MultiFinder helps, but you still have to save a file before checking it.) Sensible Grammar handles Microsoft Word, PageMaker, MacWrite (version 4.5 or later), and plain text files. Once you've opened a document, there's no turning back—if you stop partway through, you lose any changes you've made. Sensible Grammar doesn't check spelling, and it can't display selected sentences and paragraphs the way MacProof can.

On the other hand, Sensible Grammar is more flexible than MacProof for reviewing manuscripts. I like the way it usually offers a list of suggestions when it finds something that might need correction (see "Suggestions, Anyone?"). Unlike MacProof, Sensible Grammar lets you mark problem areas for later attention; you can then deal with the flagged areas in a word processor. Sensible Grammar keeps track of homophones (like *to* and *two*), but it displays them in a separate window; whether you'll

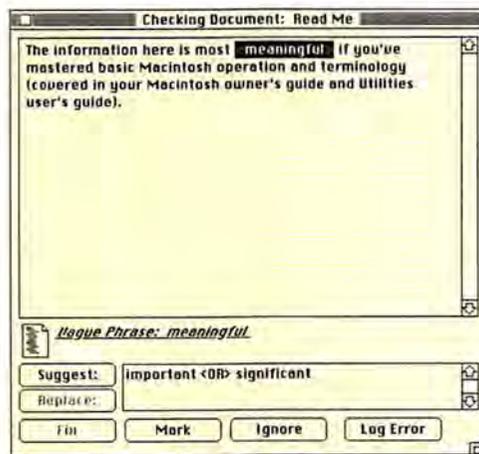
consider this a bug or a feature depends on how often you confuse such words.

Failing Grades

To test Sensible Grammar's and MacProof's ability to verify grammar and punctuation, I ran a simple five-sentence test: The captain wants to see I today. (*I* should be replaced by *me*.) Jack was more smarter than Jill. (*More* should be omitted.) A flock of birds come to stay every night. (Should read *comes*.) I feel horribly today. (Substitute *horrible* for *horribly*.) He came he saw he conquered. (Missing commas.)

None of these mistakes are especially subtle, yet neither program picked up a single one. (For the record, Doug Clapp's Word Tools, a competing application, couldn't detect any problems either.) On grammar and punctuation, both Sensible Grammar and MacProof rate an F.

The failure to detect those simple errors isn't too surprising when you realize that neither program is intelligent enough to understand what it reads. MacProof and Sensible Grammar work by comparing text against lists of troublesome words and phrases, so they do better at finding specific words that should be avoided because they're corny, pompous, sexist, racist, or just plain dull. MacProof and Sensible Grammar are more adept than most spelling checkers at spotting typos, especially words that aren't capitalized correctly.



Suggestions, Anyone?

Sensible Grammar isn't happy with the choice of words, but it offers some alternatives. Clicking on Suggest shows what the suggestions look like in context.

It's a sure bet that these programs won't put editors out of business. If grammar and punctuation are your weaknesses, you'd be better off with a good writer's handbook. But if your prose suffers from overworked clichés and typographical errors, I'd recommend Sensible Grammar. Even though it's not as convenient to use as MacProof, in my tests it did a more credible job of pointing out problem words and offering reasonable suggestions for improvement. It's also easier to customize the phrase lists that Sensible Grammar bases its judgments on. At almost a hundred dollars cheaper, it's a better value than MacProof, too.—*Franklin Tessler*

See *Where to Buy* for contact information.

Machine Slaves

QuickShare

Mac-PC file-transfer program and PC card. **Pros:** Fast file transfers; PC remains functional. **Cons:** Limited file translations. **Company:** Compatible Systems. **List price:** \$465. **Requires:** Mac with SCSI port.

Lap-Link Mac 1.2

Mac-PC file-transfer program. **Pros:** Works in background under MultiFinder; inexpensive; versatile wild-card file selection. **Cons:** Requires some knowledge of MS-DOS; no file translations. **Company:** Traveling Software. **List price:** \$139.95. **Requires:** 128K.

In addition to such networking solutions as AppleShare PC and TOPS, two new programs provide evidence that peaceful coexistence between Macs and IBM PCs is possible. QuickShare uses a PC card to link a Mac to a PC's hard disk, and should solve many file translation problems (although it only works in one direction—to the Mac). Lap-Link Mac is a slower file-transfer aid. It links serial ports but forces you to look elsewhere for file translation.

QuickShare: Mac as Master

If your Mac's an orphan with no hard disk, but you've got a PC lying around, you

(continues)



“Meet the future of federal and corporate publishing— at CEPS/Fall in Washington, D.C.”

—David Henry Goodstein, President
InterConsult, Inc.

If you're looking for *practical answers* on how to implement corporate publishing and electronic information dissemination into your operations—look to CEPS/Fall in Washington D.C. It's your gateway to the future.

For three days in September, you'll have an opportunity to examine a decade's worth of progress—at CEPS/Fall. The conferences *and* the exhibition.

Talk to the major manufacturers. Get immediate answers to your questions. See what it takes to create a complete in-house solution. Desktop. Workstation. The most advanced electronic publishing and printing systems.

Conference topics will be tailored to meet all your electronic publishing needs:

- "Open Architecture for Corporate and Federal Publishing," keynote speaker, Scott G. McNealy, President, Sun Microsystems, Inc.
- "Technical and Federal Documentation Publishing," keynote speaker, Bruce Lepisto, Deputy Director of Defense, CALS Policy Office
- "The Printing and Publishing Industry," keynote speaker, David R. Gergen, Editor, *U.S. News & World Report*
- "Desktop Publishing: Personal Productivity Tools for the 1990s," keynote speaker, Theodor H. Nelson, Inventor of the concept of Hypertext and designer of Xanadu™
- "Office Publishing: the Future of Work Processing," keynote speaker, Henry Ancona, Vice President of Business & Office Information Systems, Digital Equipment Corp.
- "Desktop Publishing for Associations and Newsletters," keynote speaker, Paul G. Zurkowski, President, Information Industry Association

Call 1-800-255-7798 for complete details on the conferences and the exhibition.

Save \$15 on admission to CEPS®/Fall exhibits!

Bring this coupon to CEPS®/Fall in Washington, D.C. You'll save \$15 on admission to all exhibits (conferences not included). With this coupon you pay only \$5 (on-site registration is regularly \$20). Fill out registration form on-site (available in lobby) and proceed to an attendee typist with this coupon.

CEPS®/Fall
Corporate
Electronic
Publishing
Systems®

Exhibition and Conferences

September 28-30, 1988
Washington Convention Center
Washington, D.C.

*The premier user event
for electronic publishing
in government and business*

Reviews

can use QuickShare to link the two and let the Mac use the PC's hard disk as its own. QuickShare's PC card provides a SCSI link between the Mac and the PC's hard disk; the PC card has only one SCSI port so you'll have to make sure that the PC disk is the last device on the Mac's chain of SCSI devices. Installing the card in the PC is straightforward, and even though you can change the DIP switches on the card to avoid conflicts with other PC cards, I didn't find it necessary to do so on two PCs with different configurations. QuickShare doesn't give you access to all of the PC's hard disk; it lets you create a special file of any size on the PC (called the *virtual disk*) that serves as the Mac's portion of that hard disk. You access the virtual disk via the SCSI port. Starting up the PC with a program titled QUICKSHR.EXE enables you to use the virtual disk.

The Mac recognizes the QuickShare virtual disk as an ordinary Mac hard disk. Once you initialize the virtual disk, you can transfer System files and applications to it and even boot the Mac from that disk.

In addition to letting a Mac and PC share the same hard disk, QuickShare includes PC Transfer, a Mac program for transferring and translating PC files to the virtual disk. PC Transfer lets you transfer files in a byte-for-byte mode; you can transfer Lotus 1-2-3 WKS files for input into Excel, for example. Programs that operate on both Macs and PCs, such as Microsoft Word, PageMaker, and WordPerfect, can make good use of this option. For other programs, you can transfer ASCII files; PC Transfer strips line feeds from the PC file so that a program like MacWrite can read it. QuickShare's QSPC program lets you capture PC print files in a format that can be translated (by PC Transfer) to MacPaint or MacWrite files for use on the Mac.

Lap-Link Mac: PC as Master

Lap-Link Mac takes a different approach: it uses an ordinary RS-232 cable to link a Mac and a PC, and the program that controls file transfers resides on the PC. Because the PC side controls Lap-Link Mac, you need some familiarity with PC commands. The Lap-Link manual attempts to provide the necessary information on using PC commands, but some of the program's structure would be unclear even to people who use PCs daily.

Lap-Link Mac is designed to transfer text-only files and files from programs such as Word, WordPerfect, PageMaker, Excel, and dBase II and III between Macs and PCs. Lap-Link Mac doesn't attempt any translations between different types of files; it merely allows you to transfer files between both machines. If you plan to use a WordStar file on the Mac, for example, you can transfer the file with Lap-Link Mac, but you'll have to use another program, such as Apple File Exchange or MacLink Plus, to translate the file. As for the file transfer, you could accomplish the same thing by using terminal emulation programs on both the Mac and the PC.

Share's file-transfer speed depends greatly on both the PC's processor speed and the hard disk speed. Even at its slowest speed, QuickShare is still faster than Lap-Link Mac or MacLink Plus. Typical transfer rates with QuickShare are about the same as with Apple's old non-SCSI HD20; in most instances, a QuickShare file transfer takes two-thirds the time of a transfer using TOPS. Lap-Link Mac takes about ten times as long as QuickShare. Also, although Lap-Link Mac's raw data rate is 57.6 kilobits per second and MacLink Plus's rate is 9.6 kilobits per second, Lap-Link Mac transfers files only about two to three times faster than MacLink Plus.

File Formats

Product	File Formats
QuickShare	Any PC word processor → MacWrite PC screen dumps → MacPaint ASCII text files (add/delete line feeds) MacBinary Byte Image (Lotus WKS, PageMaker, dBase III)
Lap-Link Mac	MacWrite, Microsoft Word, WordPerfect, Excel, PageMaker ASCII text files (add/delete line feeds) Any PC word processor → ASCII text file

File Formats

QuickShare and Lap-Link Mac can both handle ordinary text files, as well as file formats common to programs that currently exist on both Macs and PCs. QuickShare has more flexibility in handling the formatted output from PC word processors.

Lap-Link Mac is compatible with Multi-Finder, so you don't have to slave the Mac to a PC. Once you start the Mac program of the Lap-Link Mac package, you can keep it running in the background under Multi-Finder and let someone handle the file transfers on the PC.

How Do They Stack Up?

The proximity of Macs and PCs in your office may be a deciding factor in selecting one of these programs. QuickShare requires that the Mac and PC be no more than 10 feet apart. Lap-Link Mac is a bit more forgiving because, although a Mac and PC must be close together, the Mac can serve as a gateway to a TOPS network whose volumes can be accessed by Lap-Link Mac.

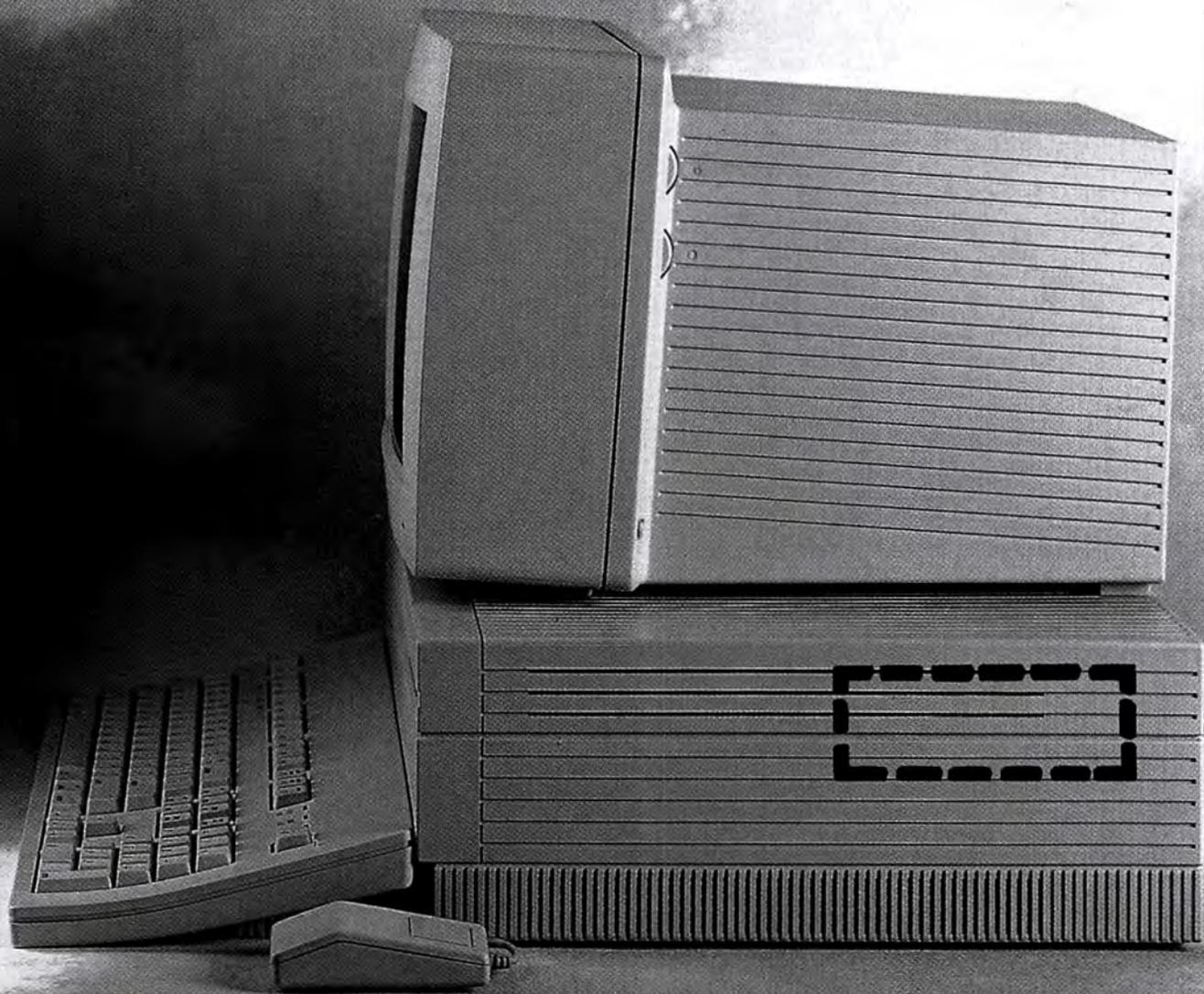
Speed is an important factor if you're transferring a large number of files. Because it uses the SCSI port, QuickShare is by far the fastest at transferring files. Quick-

If you're interested in high-speed transfer of lots of PC files to a Mac, QuickShare makes sense. QuickShare's QSPC program is a clever way to convert PC word processor files into MacWrite files without special translators such as MacLink Plus's. But remember, you cannot translate Mac files back to PC formats unless you use an extra program like MacLink Plus.

If you're familiar with MS-DOS commands, you probably won't mind using Lap-Link Mac for transferring files, but I can think of dozens of terminal emulation programs on the Mac and PC that can handle the same transfers just as well. Lacking file translation features, Lap-Link Mac isn't anything special. —*Dave Kosiur*

See *Where to Buy* for contact information.

Inner



Sanctum.

We have a very simple solution to your storage problems.

Put them out of sight, out of mind. By installing a Jasmine InnerDrive™ in your Mac II or SE.

All it takes is a quick look at our brief, straightforward documentation and five minutes of your time. (We told you it's simple, didn't we?)

From here, you'll never give storage another thought again. Ranging in capacity from 45MB up to 100MB for the SE and up to 140MB for the Mac II, InnerDrives can diagnose themselves, automatically correcting media errors; an integrated diagnostic feature alerts you to any potential problems.

That way, you always know the precise status of your InnerDrive. Without ever having to open up your Mac.

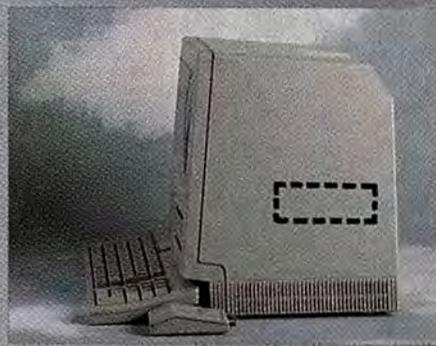
In fact, you'll never even know we're in there. We're remarkably quiet

and run 33% cooler than most other drives. And unlike the competition, InnerDrives don't eliminate a floppy drive in your SE.

There's yet another Jasmine Exclusive: true SCSI Partitioning.

A feature that enables you to allocate distinct storage "partitions" while you manage everything from the control panel.

So call us toll-free to charge an InnerDrive with our full two-year warranty. And internalize your storage problems.



Macintosh II InnerDrives	Macintosh SE InnerDrives
3.5" 45MB \$749	3.5" 45MB \$749
3.5" 70MB \$949	3.5" 70MB \$949
5.25" 100MB \$1199	3.5" 100MB \$1349
5.25" 140MB \$1449	



Jasmine

1-800-347-3228

See us at Booth #5458. World Trade Center - Macworld Expo, Boston

© 1988 Jasmine Technologies, Inc. InnerDrive is a trademark of Jasmine Technologies, Inc. Macintosh II and Macintosh SE are trademarks licensed to Apple Computer, Inc.

Circle 457 on reader service card

Welcome to our 1-800-NOW-MAC2

Phone Hours: Monday, Wednesday & Thursday
7 am - 9 pm; Tuesday & Friday 7 am - 5 pm;
Saturday 9 am - 5 pm MST.



2701 W. Glendale Ave. • Phoenix, AZ 85051

new Mac House

FAX #: (602) 246-7805
Order Line—1-800-669-6222
Order Status and
Technical Support
602-246-2222

Accounting

MECA Managing Your Money	145
Migent	
In House Accountant	90
Monogram Dollars & Sense	81
Peachtree Software Accounting System (3 pack)	129
Softsync Personal Accounting	29

Entertainment

Avalon Hill MacPro Football Electronic Arts	28
Chessmaster 2000	30
Deluxe Music Cont	63
One On One	16
Patton vs. Rommel	27
Scrabble	39
Seven Cities of Gold	16
Holobyte Falcon	32
Infocom Beyond Zork	32
Lurking Horror	28
Mindscape Balance of Power	30
Deja Vu	29
King of Chicago	29
Sierra On Line	
Championship Boxing	28
Silicon Beach	
Beyond Dark Castle	28
Dark Castle	28
Enchanted Scepters	22

Statistical Analysis

Borland Eureka	119
Brainpower Statview 512+	179

Disk Drives/ Hard Drives

Fast-20	859
20MB hard disk drive	
Central Point 800K 3.5" Drive	185
General Computer Corp.	
HyperDrive FX/20	649
20MB ext. hard disk	
HyperDrive FX/40	909
HyperDrive F1/40	909
40MB int. hard disk for MAC SE	
HyperTape Platinum Kit	998
40MB SCSI tape drive	

Communication

Centram Tops	119
Dataviz MacLink Plus w/cable	145
Palantir Software Intalk	105
Hayes Smartcom II	88

Utilities

Central Point Copy II Mac	21
FGS Fastback	55
Silicon Beach Silicon Press	45
Word Builder	45
Supernac Diskfit	45
Superspool	45
Superspool Laser	85
Superspool Multiuser	210

Input/Output

CH Product Mach IV Joystick	45
Flight Gate Felix	99
General Computer Corp. Personal Laser Printer	1449
Kensington Turbo Mouse	85
Koala MacVision	175
Kraft Quick Stick III	39
Sigma Designs	
LaserView 15"	1345
for the MAC SE	
LaserView 19"	1715
for the MAC SE	
T-Maker Writenow	1419
LaserView 15"	
for the MAC II	
LaserView 19"	1780
for the MAC II	
Summagraphics Mac Tablet	379

Database

Ashton Tate dBASE Mac	295
Borland Reflex Plus	159
Forethought Filemaker Plus	159
Microsoft File	110
Nantucket McMax	169
Odesta Double Helix	275
Double Helix II	340
Multi User Kit	179
Provue Overvue 2.1	149

Graphics

Ann Arbor Full Paint	55
Borderbund Printshop	35
Videoworks 2	115
Cricket-Cricket Draw	159
Cricket Graph	112
Microsoft Chart	79
Mindscape Graphic Works 1.1	59
Silicon Beach Super Paint	78
Soft Style Bluestart	29
Colormate 2.1	49
Epstart	29
Jetstart	29
Springboard Certificate Maker	25
Super Mac Pixel Paint	252
T-Maker	
Click Art Business Image	29
Click Art Effects	29
Click Art Personal Graphics	29
Click Art Publications	29

Word Processors/ Spellers

Aegis Development	
Doug Clapps Word Tools	49
Ann Arbor Fullwrite	195
Batteries Included	
Thunder	32
Living Videotext More 1.1C	179
Microsoft Word 3.01	195
T-Maker Writenow	99
Working Software	
Spellswell	42

Worksheets

Batteries Included	
Timelink	42
Multiplan 1.11	115
Softview Mac In Use	35

Desktop Publisher

Aldus Pagemaker 3.0	399
Letraset Ready Set Go 4.0	279
Microsoft Power Point	239
Orange Micro Ragtime	216

Modems

Hayes Smartmodem 1200	359
includes Smartcom II and cable	
Migent Migent MAC Modem	165

Educational

Davidson Math Blaster	28
First Byte First Letters & Words	32
First Shapes	32
Kid Talk	32
Math Talk	32
Speller Bee	32
Mindscape	
New Improved Mastertype	32
Perfect Score SAT	45
Simon & Schuster	
Typing Tutor IV	39
Springboard	
Early Games	30
Easy As ABC	30

Integrated

Microsoft Excel 1.04	201
Works 1.0	179

Languages

Borland Turbo Pascal	65
Microsoft	
Basic Compiler 1.0	115
Basic Interpreter 3.0	58
Fortran Compiler 2.2	172
Think Technologies	
Lightspeed C	99
Lightspeed Pascal	72

Accessories

Curtis Ruby SPF-2	59
Kensington A-B Box	59
Appletalk Clips	10
Appletalk Cable Clips	18
Appletalk Connectors	18
Disk Case	22
Polarizing Filters	35
Tilt/Swivel (platinum or beige)	27
Softstyle Mac Enhancer	169

Disk Drives/ Hard Drives

AST Research AST 2000	1429
20MB SCSI/20MB tape backup	
AST 4000	3379
74MB SCSI/60MB tape backup	

Upgrades

AST Research MAC86 MS DOS	
co-processor for MAC SE	419
MAC286 MS DOS	
co-processor for MAC II	1049
both cards require an external 5-1/4" PC drive	
Dove MacSnap 548	425
MacSnap 548S	475
MacSnap Plus 2	305
MacSnap Toolkit	16
MacSnap 2S	507
MacSnap 4S	1009
MacSnap 524	182
MacSnap 524E	162
MacSnap 524S	229
General Computer Corp.	
Hypercharger 020	719
no ram or 68881	
Hypercharger 020 no 68881	929
Hypercharger 020 w/68881	1219

Servicing our PC buyers with low pricing and technical experience since 1979.

- Shipping on most software is \$5.00
- AZ orders add 6.7% sales tax.
- We accept Purchase Orders from authorized institutions for 3.5% more than cash price.

- Personal/company check allow 14 days to clear.
- All returns are subject to our approval.
- Sorry, no refunds on open software, due to copyright laws.

- There will be a 20% restock fee on all returns.
- All Prices are subject to change.
- Sorry, no COD orders.

No Charge for MasterCard or Visa



SAVE ALMOST 50% Off the Cover Price When You Subscribe Today

UNLEASH The Potential Of Your MAC!

Discover The Power Of Macworld At A Special Savings Rate.

Applications. Communications. Power upgrades. Tutorials. Buying guides. Answers to your questions. Straight-shooting reviews. Graphics and more. All from a user's point-of-view!



More Power! 12 Issues for ~~\$47.40~~

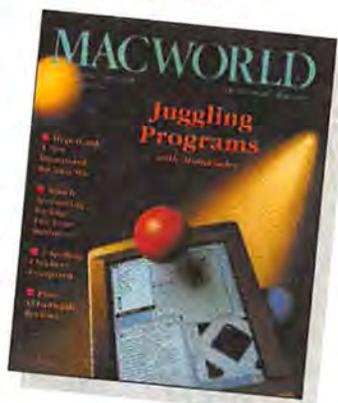
NOW ONLY \$24.00

- Send me 1 year/12 monthly issues of MACWORLD for \$24. Save 20% off the basic subscription rate.
- Save Even More!** 2 years/24 monthly issues for \$37.90.

Please Bill me later.

Name _____
 Company _____
 Address _____
 City State Zip _____

By regular subscription, Macworld is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



4BWJ4

MACWORLD

More Information! 12 Issues for ~~\$47.40~~

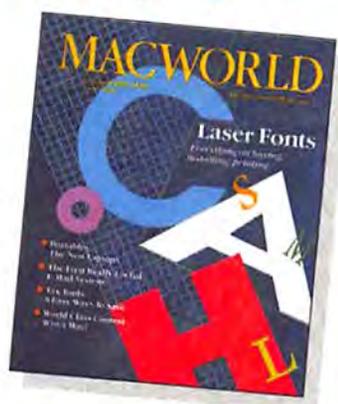
NOW ONLY \$24.00

- Send me 1 year/12 monthly issues of MACWORLD for \$24. Save 20% off the basic subscription rate.
- Save Even More!** 2 years/24 monthly issues for \$37.90.

Please Bill me later.

Name _____
 Company _____
 Address _____
 City State Zip _____

By regular subscription, Macworld is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



4BWJ4

MACWORLD

More to Give! 12 Issues for ~~\$47.40~~

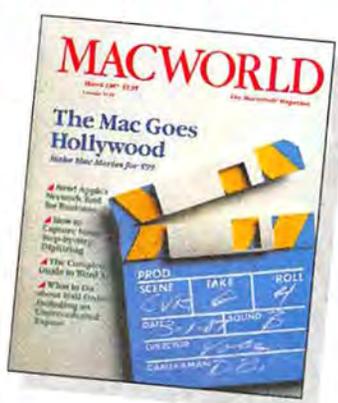
NOW ONLY \$24.00

A one-year subscription (12 issues for just \$24) will be sent to the person listed below. Save 20% off the regular subscription rate of \$30 and nearly 50% off the annual newsstand price of \$47.40.

Please Bill me later.

Send Gift to: Name _____
 Address _____
 City/State/Zip _____
 Send Gift from: Name _____
 Address _____
 City/State/Zip _____

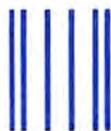
Please allow 6-8 weeks for delivery of your first issue. Offer good in the U.S. only.



MACWORLD

2ADV1

Save Almost
\$24.00
Off the cover price.



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



Save Almost
\$24.00
Off the cover price.



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

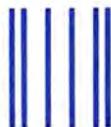
POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666



Save Almost
\$24.00
Off the cover price.



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



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



Save
Nearly
When **50%**
You Subscribe Today!

MACWORLD

The magazine that helps you
get the most from your Mac

Macworld is your key to it all. Productivity. Creativity. Whether you want to upgrade software, hardware. . .or learn to use what you have to its fullest potential.

That's what Macworld does—links the Mac's potential to yours.

We look out for your interests. We tell you what's new for the Mac. What it does. Who it's for. Compare similar products—and name names! Discuss pros and cons. Assess value for money for both hardware and software.

We help clarify your options. Is the upgrade worth it? What does this program do that your present software doesn't? Will it work with your printer? If we help you make just one right decision, your subscription is worth it!

Macworld is more product-driven, more YOU-oriented than ever before. The thing to do now is make the most of your Mac. Macworld is the key.

- Applications
- Power Upgrades
- Buying Guides
- Straight-Shooting Reviews



Mail The
Attached Card
Today!

New Products

*Information on the Mac's latest software,
hardware, and accessories*

Edited by Eileen Drapiza

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

Bid Analysis Microsoft Excel template designed for any bidding situation. Features analysis of cost recovery probable on first successful bid, division of bid into components, bid adjustment, ability to integrate last-minute sub-bids and to forecast risk exposure indicated by percentage of bid components. Allows you to massage the bid. 512K min. memory. \$249. Hewpact Ltd., 613/389-3200.

CAD PAC Desk accessory enhances MacDraw II's accuracy and performance with four CAD extensions: sizing and reporting, adjacency, extend and clip, and filleting. Extensions have keyboard equivalents for fast activation. Works on rotated objects. 128K min. memory. Price to be announced. Paracom, 415/543-3848.

CBT Development Stacks Toolkit for developing and delivering interactive computer-based training. 1MB min. memory; requires second disk drive and HyperCard. \$135. First Reference, 212/730-8211.

ChemIntosh Desk accessory lets you draw chemical structures without quitting your current application. Includes standard application features like Undo, on-screen help, printing, and resizing objects. \$295; educational discounts available. SoftShell Company, 716/334-7150.

ChemStack Facilitates chemical structure construction and indexing. Includes major ring systems, compound types, and a full set of structural building blocks. Online manual explains new structure construction and adds new structures to the library for rapid retrieval and customizing. May be used in conjunction with DrawStructures. 1MB min. memory; requires HyperCard; hard disk recommended. \$80; \$40 for registered users of DrawStructures; educational discount available. Modern Graphics, 317/253-4317.

Cube and Tess Cube is a computer-based version of the famous six-color cube puzzle. It can be manipulated by pointing and clicking. Combines single moves into sequences that can be replayed in forward or reverse. Tess is a 4-D version. Can also be used as an instructional aid to illustrate basic concepts of group theory in three and four dimensions. 128K min. memory. \$24.95. Atlantic Software, 617/922-4352.

FontMaster '88 Public domain font editor utility can create a large number of styles from a single font, and create font families. T Tauri SoftSystems, 416/690-5886.

Glatt Plagiarism Teaching Program Tutorial instructs students about what constitutes plagiarism and how to avoid it. Teaches the difference between plagiarizing and paraphrasing, and when and how to provide proper attributions. Includes Self Plagiarism Detection Test for immediate feedback. \$250. Glatt Plagiarism Services, Inc., 916/483-8773.

Health Care 1 Clip art collection stored in MacPaint, MacDraw, and FullPaint files. Contains more than 200 images. Includes a how-to guide, pictorial index, and permanent storage case. \$74.95. Dynamic Graphics, 309/688-8800.

HyperAtlas Allows access to geographically based data in HyperCard stacks. Comes with basic data for countries, and users can also use the map interface to display their own data. Country names on maps are linked to information stacks containing cards for each country. \$99. Micro-Maps Software, Inc., 609/397-1611.

HyperBase-Home Replaces the Home Stack that comes with HyperCard. Features simple stack installation. Lets you launch applications or stacks from HyperBase-Home, and returns to it on quitting. Unlimited number of installed stacks; fully compatible with MultiFinder; built-in text editor, screen saver, and HyperHelp. Lets you Copy, Delete, Rename, Get File, Create New Folder, and open and delete stacks from HyperBase-Home. \$20; free 30-day trial version available on CompuServe and GENie. HyperBase Software, 58 Waverley St., Belmont, MA 02178.

HyperText '87 Digest Stand-alone hypertext document containing summaries of more than 100 position papers written by leading authorities. Contributors include Ted Nelson, K. Eric Drexler, Esther Dyson, Frank Halasz, Kirk Kelley, Stephen Weyer, and Nicole Yankelovich. Topics range from storage management for global hypertext libraries to hypertext applications in linguistics, archaeology, and medicine. 512KE min. memory. \$10. Eastgate Systems Inc., 617/782-9044.

KeyCap Fonts Consists of three font sets: KeyCap Ovals, ASCII screen-graphics characters, and gray halftone boxes. The sets include pictures of computer keys and screen images in document files. 128K min. memory. Requires a PostScript printer. \$149.95. Paperback Software International, 415/644-2116.

(continues)

You already know how to make great slides.

WITH THE MIRUS DIGITAL FILMPRINTER AND YOUR MACINTOSH.

If you use a Macintosh, you already know how to use the most advanced slidemaking system ever made.

The Mirus™ Desktop Digital FilmPrinter™

The first slidemaking system designed to take full advantage of the graphics power and point-and-click simplicity of the Macintosh.

And just wait till you see the slides it delivers.

SERVICE BUREAU
SLIDEMAKING
TECHNOLOGY
ON A DESKTOP.

Before the Mirus FilmPrinter, you had only two choices in desktop presentation systems.

Either a video-based, or a font-wheel film recorder.

Neither has the flexibility and paper-cut sharpness of service bureau slides.

But with more than 16 million colors and up to 8000 lines of Scalable Resolution™, the Mirus

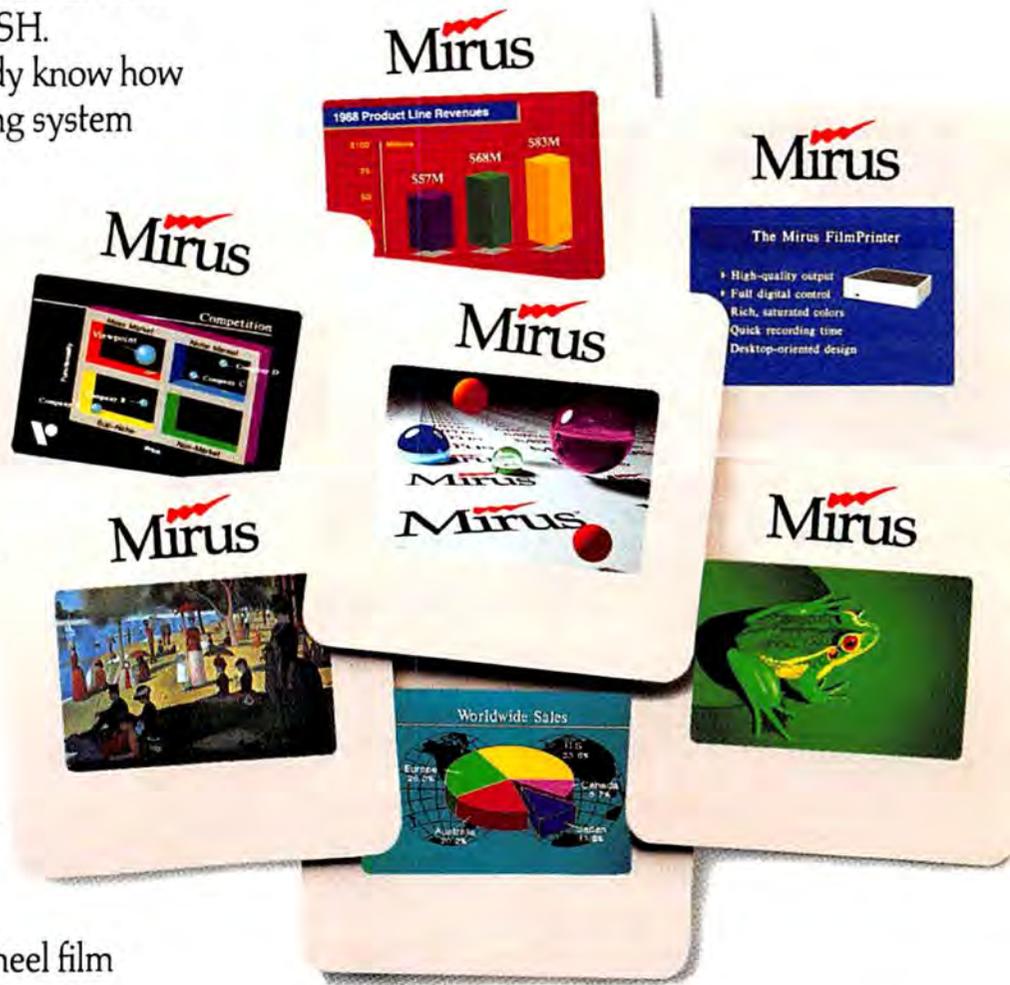
FilmPrinter has both.

And more.

Including the same kind of digital imaging techniques for both object and

bit-mapped graphics as service bureau systems costing as much as \$100,000.

All for under \$6,000.



To you and your Chooser, the FilmPrinter is just another printer.



IT'S SO ADVANCED,
YOU ALREADY KNOW
HOW TO USE IT.

The Mirus FilmPrinter works like the other printers you have attached to your Mac.

Just plug it into the SCSI port.

To make slides, you go to the Chooser, select the FilmPrinter, then just pull down the File menu and click on Print. That's all there is to it.

The FilmPrinter's software will look familiar, too. Because it uses the same Macintosh software you've been using all along.

Canvas, Cricket Presents, Excel, MacDraw, MORE, PixelPaint, PowerPoint, SuperPaint, and many, many more.

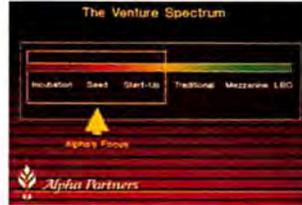
File	
New	⌘N
Open	⌘O
Close	
Save	⌘S
Save As...	
Page Setup...	
Print	⌘P
Quit	⌘Q

To make slides, just point at Print and click.

You don't have to get used to new fonts, either. The FilmPrinter gives you the same kind of scalable, crisp, outlined fonts that are in the LaserWriter and LaserWriter Plus printers.



Stand out in a crowd. Emboss your corporate logo.



The Mirus FilmPrinter has millions of colors so you can smoothly sweep from one to another.



Get true color photo inserts without going to a service bureau. Or into debt.

And even if you have a black-and-white Macintosh Plus or SE, don't worry.

Using patterns to indicate color, the FilmPrinter puts the color where it really counts. On film.

COME SEE THE GREATEST SHOW ON A DESKTOP.

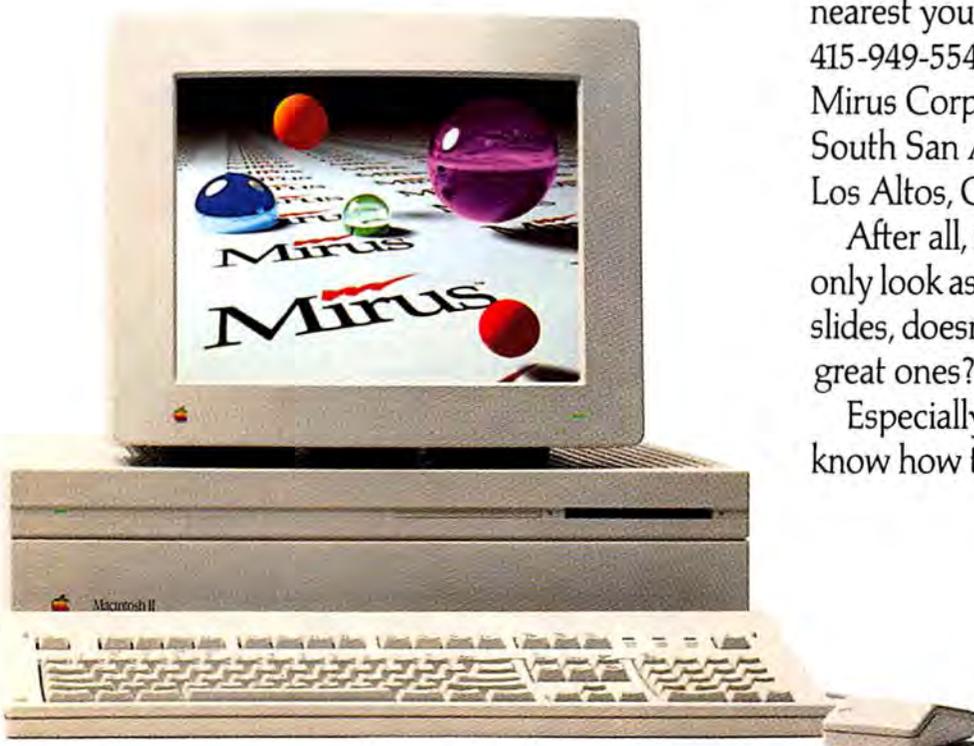
Knowing what you know now, what you probably want to know next is where you can buy the Mirus FilmPrinter, or at least see it in living color.

Just call us at 1-800-654-0808 for the Mirus dealer nearest you, in California, 415-949-5544. Or write, Mirus Corporation, 445 South San Antonio Road, Los Altos, CA 94022.

After all, if it's true that you only look as good as your slides, doesn't it pay to have great ones?

Especially since you already know how to make them?

The FilmPrinter works with the same software you do. So why do without it?



Mirus™

© 1988 Mirus Corporation. Desktop Digital FilmPrinter, Scalable Resolution, and Mirus are trademarks of Mirus Corporation. Other brand or product names are trademarks or registered trademarks of their respective holders.

New Products

IPT 1000 Allows a user to network the Mac SE with any machine that has either an Internet Protocol or Ethernalk device driver. Operates with several different TCP/IP products currently available as well as Ethernalk. Supports AFP file servers. Provides Mac-to-Unix networking. \$495. Information Presentation Technologies, Inc., 818/347-7791.

Lapcad Finite Element Modeler Creates finite-element models for use in MacNeal-Schwendler Corporation's MSC/pal. 1MB min. memory. \$295. Lapcad Engineering, 619/421-1236.

LaserThai Series of six PostScript Thai fonts includes styles ranging from modern to classical. Compatible with all current Mac software. Offers all consonants, vowels, and tone markers with accompanying bitmapped fonts. Includes Thai Key Caps. \$149.95. Linguists' Software, 206/775-1130.

Lunar Rescue Combines graphic animation, unique game features, and arcade-style sound effects with an imaginative scenario in which the player searches for stolen crystals, coordinates transport sup-

plies, and buys and sells commodities. 512KE min. memory. \$49.95. PCAI, 612/427-4789.

MacBlast Communications package comes with standard terminal emulation, including DEC VT100/VT200 and Data General D200. Supports MultiFinder for background file transfers. Includes auto-dialing and auto-log in to remote computers, automated modem support, and scripting. 1MB min. memory. \$195. Communications Research Group, 504/923-0888.

MacGallery Clip art collection of more than 400 original images covers topics such as holidays, sports, food, special occasions, nature, fantasy, religion, phrases, teddy bears, mortise cuts, and borders. Available as HyperCard stackware or as MacPaint files. Includes reference guide. \$49.95 plus \$2 s/h. Dream Maker Software, 213/221-6436.

Mac Personal Class Stackware for personal information organization in areas such as family records and investment and insurance data. Features automatic installation on your home card, self registration, and detailed online help screens. 1MB min.

memory. \$59 plus \$3.50 s/h. Quadmaton, Inc., 408/985-8984.

MacYacc Program capable of automatically generating C or Pascal source code for building assemblers, compilers, calculators, typesetting languages, language translators, and pattern analyzers. Generated code can then be compiled to produce the final product. Run-time library and example sources provided. 1MB min. memory. Personal version \$139, professional version \$395. Abraxas Software, 503/244-5253.

Milo Mathematical problem solver combines WYSIWYG technical word processor, symbolic algebra program, and graphics tool. 512K min. memory. \$250. Paracom, 415/543-3848.

The Movie Stack HyperCard stackware features over 4100 movie titles available on video or laser disc. Movies are listed with title, stars, director, year of production, rating, category, and descriptive keywords. 1MB min. memory; requires HyperCard. Movie Stack \$39.95; set of two \$70. South-eastern Software, 504/246-8438.

(continues)

SONY®

Packaged 10 Per Box

	2 BOX	5 BOX	10 BOX
3 1/2" Single Side	11 ⁹⁵	11 ⁵⁰	10 ⁹⁵
3 1/2" Double Side	16 ⁵⁰	15 ⁹⁵	15 ⁵⁰
HIGH DENSITY	42 ⁹⁵	41 ⁹⁵	39 ⁹⁵

SONY, without labels or box
Packaged in Fifties

MAC-PAC-50's	50	100	400
3 1/2" Single Side	1.05 EA.	1.02 EA.	.99 EA.
3 1/2" Double Side	1.29 EA.	1.25 EA.	1.19 EA.

Old Remable
Diskette Connection

Minimum Order \$25.00. Visa, MasterCard accepted. C.O.D orders add \$3.00. Surface Shipping on 3.5 or 5.25" add \$3.00 per 100 disks. 8" add \$4.00 per 100 disks. UPS delivery only. U.S. mail for APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!

Delaware 1-800-451-1849
P.O. BOX 10247, WILMINGTON, DE. 19850

Oklahoma 1-800-654-4058
P.O. BOX 1674, BETHANY, OK. 73008

Nevada 1-800-621-6221
P.O. BOX 12396, LAS VEGAS, NV. 89112

Telex#4933362 Fax#405-495-4598

Prevent Macintosh Theft!



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 Kablit fasteners for peripherals. Cable passes through Kablit fasteners, preventing removal of screws.

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 Kablit systems for IBM, Apple, others.



\$39.95 + \$3.00 shipping/handling

Quantity pricing also available for multiple purchases from schools, institutions, businesses, industrials, etc. Send P.O.

Money back if returned in 30 days.
Phone or send check.

Secure-It, Inc.

18 Maple Court
East Longmeadow, MA 01028
800-451-7592 413-525-7039
Dealer Inquiries Invited

Circle 239 on reader service card

Circle 562 on reader service card

Only One Company Guarantees You Make The Right Choice.

5

Y E A R
W A R R A N T Y

Microtech Peripherals is the *only* company that offers you a *guaranteed* right choice with the unprecedented Five Year Limited Warranty.* If you are making a purchasing decision on a hard disk drive for your Macintosh computer - Make the *Right Choice!*
only

 <p>NOVA 20/30/50/80/120MB for Mac Plus, SE & II</p> <p>From \$659 to \$1599</p>	 <p>NEW! NOVA T60</p> <p>60MB Tape Backup for Mac Plus, SE & II</p> <p>\$899</p>
 <p>MICRO MAC 30/45MB for Mac SE</p> <p>30MB \$661 40MB \$849</p>	 <p>BUY 30 OR 45MB NOW EXPAND LATER TO 60, 75 or 90MB</p> <p>Double Drive Kit for Mac II</p> <p>As low as \$659</p>

800-325-1895

 **Microtech Peripherals, Inc.** 29 Business Park Drive/Branford, Connecticut USA 06405/(203) 488-8993

*The five year limited warranty is available on hard disk drives only, manufactured by Microtech International, Inc. and must be sold and delivered in the United States or Canada. Certain restrictions and exclusions apply. Terms and conditions of the five year limited warranty are available upon request. Prices and specifications are subject to change without notice. NOVA AND MICRO MAC are trademarks of Microtech International, Inc. - Macintosh Plus, SE and II are trademarks of Apple Computer, Inc.

Circle 62 on reader service card

New Products

Oyster Authoring system for creating educational simulated experiences. Features dynamic outlining window that keeps track of the architecture of an exercise, allowing the author to develop intricate branching structures that emulate the associative process of learning. Creates stand-alone exercises that may be distributed freely. 512K min. memory. \$79.95. Poseidon, Inc., 312/382-7275.

PC MacTerm Works with pcAnywhere III to let users run a PC from a Mac, through a modem or direct cable connection or on a LocalTalk network. Requires System version 4.1 or later. \$99. DMA, 212/687-7115.

Printer Interface II Utility package that serves as printer driver allowing the Mac to communicate with non-Apple printers such as serial typewriters and serial printers. \$95. DataPak Software, Inc., 818/905-6419.

QuickMail E-mail desk accessory offers real-time conferencing, personalization, prioritizing, return receipts, and message management. 512KE min. memory. \$300 for ten-user package. CE Software, 515/224-1995.

SongBook Albums MIDI song files of original arrangements plus pop and soft rock tunes from the '60s, '70s, and '80s, and classical and jazz works. Detailed program notes including biographies, historical highlights, instrumental scoring, and tips on MIDI realization enclosed with each disk. Each album \$34.95 plus \$3 s/h; all four disk albums \$125 plus \$6 s/h. Syn-Comp Productions, Inc., 217/351-6478.

Symbol Libraries Architectural libraries include plan view symbols for residential floor plans, electrical and wiring layout, and office layout. Library of formats for A through E sizes. For use with Snap 2.02. \$69 to \$150, depending on library. Data Basics, Inc., 803/878-7484.

Techman Vol. 1 Clip art collection of more than 60 images of popular computer systems, including models of IBM and VAX mainframes and workstations, DEC peripherals, and other personal computer workstations. MacDraw and CricketDraw PostScript graphics in PICT format. 512KE min. memory. \$79.95. Alsek Productions, Inc., 602/961-3686.

TX802 PRO Integrated editor/librarian for the Yamaha TX802 synthesizer and the Mac. Simplifies and enhances the operation of the TX802 by presenting user with a full view of the synthesizer's inner workings on a computer screen. Special features include the ability to edit envelopes and scale curves graphically. Provides bands and libraries that can hold hundreds of voices or performances. 1MB min. memory. \$395. Digital Music Services, 714/951-1159.

HARDWARE

AminoPath Laboratory System Pathology lab system for complete information management based on Mac SE or II. Maintains complete information for patients, referring physicians, department staff, staff pathologists, surgical and cytology specimens, and diagnostic texts. Provides instant retrieval of all diagnoses made on any patient. Mac SE \$14,225; Mac II \$19,995. Small Business Computers of New England, 603/673-0228.

(continues)

Hot Summer Specials

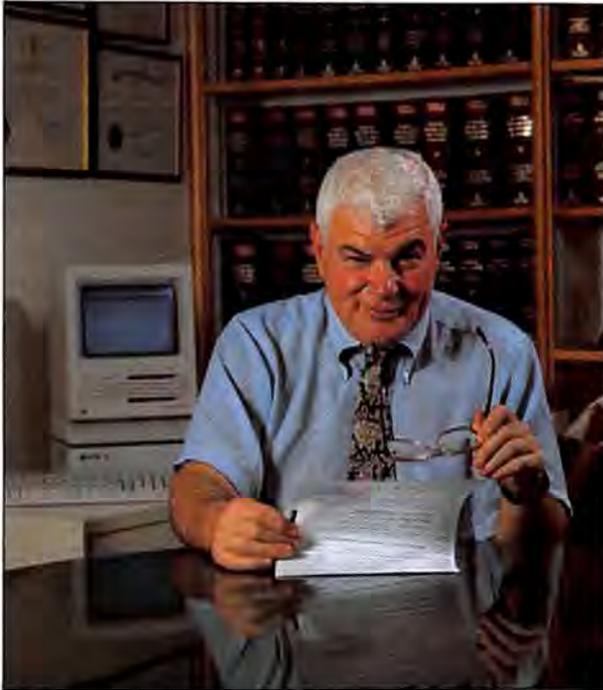
1-800-MAC-DISK

Information

Software	Hardware	Information																																																																																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Adobe Fonts</td><td>25% off</td></tr> <tr><td>Business Sense</td><td>310.00</td></tr> <tr><td>Canvas</td><td>119.00</td></tr> <tr><td> C.A.T.</td><td>299.00</td></tr> <tr><td>Cricket Presents</td><td>309.00</td></tr> <tr><td>Falcon</td><td>35.00</td></tr> <tr><td>Freehand</td><td>365.00</td></tr> <tr><td>FullWrite Pro</td><td>285.00</td></tr> <tr><td> Illustrator 88</td><td>375.00</td></tr> <tr><td>Lightspeed C</td><td>125.00</td></tr> <tr><td>Lunar Rescue</td><td>29.00</td></tr> <tr><td>MacGolf</td><td>35.00</td></tr> <tr><td>MacMoney 3.0</td><td>59.00</td></tr> <tr><td>MacRecorder</td><td>143.00</td></tr> <tr><td>Microsoft</td><td>37% off</td></tr> <tr><td>MiniCAD 4.0</td><td>379.00</td></tr> <tr><td>PageMaker 3.0</td><td>435.00</td></tr> <tr><td>Payroll</td><td>139.00</td></tr> <tr><td>Pictograph</td><td>109.00</td></tr> <tr><td>Pixel Paint</td><td>265.00</td></tr> <tr><td>Red Ryder</td><td>59.00</td></tr> <tr><td> Reflex Plus</td><td>169.00</td></tr> <tr><td>Suitcase</td><td>39.00</td></tr> <tr><td>Tops (Mac or DOS)</td><td>145.00</td></tr> <tr><td>Word Perfect</td><td>189.00</td></tr> </table>	Adobe Fonts	25% off	Business Sense	310.00	Canvas	119.00	C.A.T.	299.00	Cricket Presents	309.00	Falcon	35.00	Freehand	365.00	FullWrite Pro	285.00	Illustrator 88	375.00	Lightspeed C	125.00	Lunar Rescue	29.00	MacGolf	35.00	MacMoney 3.0	59.00	MacRecorder	143.00	Microsoft	37% off	MiniCAD 4.0	379.00	PageMaker 3.0	435.00	Payroll	139.00	Pictograph	109.00	Pixel Paint	265.00	Red Ryder	59.00	Reflex Plus	169.00	Suitcase	39.00	Tops (Mac or DOS)	145.00	Word Perfect	189.00	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <h3 style="text-align: center; margin: 0;">RasterOps</h3> <p style="text-align: center; margin: 0;">ColorBoard 104 \$2499.00</p> <p style="text-align: center; margin: 0;">24-bit, high resolution graphics board</p> </div> <h3 style="text-align: center; margin: 0;">Boards & Upgrades</h3> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>128K-512K Upgrade</td><td>169.00</td></tr> <tr><td>128K-1024K Upgrade</td><td>359.00</td></tr> <tr><td>512K-1024K Upgrade</td><td>169.00</td></tr> <tr><td>512K-2048K Upgrade</td><td>499.00</td></tr> <tr><td>1Meg SIMMs</td><td>call</td></tr> <tr><td>Magic SCSI Port</td><td>69.00</td></tr> <tr><td>68030 Accelerator</td><td>call</td></tr> <tr><td>Dove Mach2 SE</td><td>649.00</td></tr> <tr><td>Dove 524</td><td>165.00</td></tr> <tr><td>Dove MacSnap+2</td><td>299.00</td></tr> <tr><td>Dove SCSI</td><td>99.00</td></tr> <tr><td>HyperCharger</td><td>699.00</td></tr> <tr><td>DoubleTime 16 Board</td><td>295.00</td></tr> <tr><td>FX 882</td><td>295.00</td></tr> </table>	128K-512K Upgrade	169.00	128K-1024K Upgrade	359.00	512K-1024K Upgrade	169.00	512K-2048K Upgrade	499.00	1Meg SIMMs	call	Magic SCSI Port	69.00	68030 Accelerator	call	Dove Mach2 SE	649.00	Dove 524	165.00	Dove MacSnap+2	299.00	Dove SCSI	99.00	HyperCharger	699.00	DoubleTime 16 Board	295.00	FX 882	295.00	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <h3 style="text-align: center; margin: 0;">Qume</h3> <p style="text-align: center; margin: 0;">ScriptEN LaserWriter \$3650.00</p> <p style="text-align: center; margin: 0;">3MB, affordable and extremely quick</p> </div> <h3 style="text-align: center; margin: 0;">Accessories</h3> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Disks:</th> <th>DS</th> <th>SS</th> </tr> </thead> <tbody> <tr><td>Sony Boxed</td><td>17.50</td><td>12.75</td></tr> <tr><td>Sony Bulk</td><td>1.40</td><td>1.11</td></tr> <tr><td>MacDisk</td><td>1.25</td><td>.99</td></tr> <tr><td>KAO Bulk</td><td>1.35</td><td>----</td></tr> <tr><td>Black Ribbons</td><td colspan="2">3.00</td></tr> <tr><td>Colored Ribbons</td><td colspan="2">3.50</td></tr> <tr><td>Multicolored Ribbons</td><td colspan="2">12.00</td></tr> <tr><td>MacPlus Bag</td><td colspan="2">55.00</td></tr> <tr><td>MacSE Bag</td><td colspan="2">65.00</td></tr> <tr><td>Imagell Bag</td><td colspan="2">49.00</td></tr> <tr><td>Teak 90 Disk Holder</td><td colspan="2">22.00</td></tr> <tr><td>Hypercard Handbook</td><td colspan="2">19.95</td></tr> <tr><td>Cables</td><td colspan="2">19.95</td></tr> </tbody> </table>	Disks:	DS	SS	Sony Boxed	17.50	12.75	Sony Bulk	1.40	1.11	MacDisk	1.25	.99	KAO Bulk	1.35	----	Black Ribbons	3.00		Colored Ribbons	3.50		Multicolored Ribbons	12.00		MacPlus Bag	55.00		MacSE Bag	65.00		Imagell Bag	49.00		Teak 90 Disk Holder	22.00		Hypercard Handbook	19.95		Cables	19.95		<p>Orders: 1-800-622-3475 Information: 1-512-832-0335 FAX: 1-512-835-7315</p> <p>Hours: 7:00am - 10:00pm CDT Minimum Order: \$40.00 Payment: American Express, Visa, MasterCard (No surcharge), C.O.D., Checks, and Company & Institution Purchase Orders</p> <div style="display: flex; justify-content: space-around; align-items: center;"> </div> <p>Terms: You are not charged until your order is shipped. Tax: Texas residents only, add 8% sales tax. Prices and items are subject to change and availability. Returns may be subject to a restocking fee. Shipping: Minimum \$4.00 -- Federal Express, UPS Next Day & 2nd Day Air, US Mail.</p>
Adobe Fonts	25% off																																																																																																																										
Business Sense	310.00																																																																																																																										
Canvas	119.00																																																																																																																										
C.A.T.	299.00																																																																																																																										
Cricket Presents	309.00																																																																																																																										
Falcon	35.00																																																																																																																										
Freehand	365.00																																																																																																																										
FullWrite Pro	285.00																																																																																																																										
Illustrator 88	375.00																																																																																																																										
Lightspeed C	125.00																																																																																																																										
Lunar Rescue	29.00																																																																																																																										
MacGolf	35.00																																																																																																																										
MacMoney 3.0	59.00																																																																																																																										
MacRecorder	143.00																																																																																																																										
Microsoft	37% off																																																																																																																										
MiniCAD 4.0	379.00																																																																																																																										
PageMaker 3.0	435.00																																																																																																																										
Payroll	139.00																																																																																																																										
Pictograph	109.00																																																																																																																										
Pixel Paint	265.00																																																																																																																										
Red Ryder	59.00																																																																																																																										
Reflex Plus	169.00																																																																																																																										
Suitcase	39.00																																																																																																																										
Tops (Mac or DOS)	145.00																																																																																																																										
Word Perfect	189.00																																																																																																																										
128K-512K Upgrade	169.00																																																																																																																										
128K-1024K Upgrade	359.00																																																																																																																										
512K-1024K Upgrade	169.00																																																																																																																										
512K-2048K Upgrade	499.00																																																																																																																										
1Meg SIMMs	call																																																																																																																										
Magic SCSI Port	69.00																																																																																																																										
68030 Accelerator	call																																																																																																																										
Dove Mach2 SE	649.00																																																																																																																										
Dove 524	165.00																																																																																																																										
Dove MacSnap+2	299.00																																																																																																																										
Dove SCSI	99.00																																																																																																																										
HyperCharger	699.00																																																																																																																										
DoubleTime 16 Board	295.00																																																																																																																										
FX 882	295.00																																																																																																																										
Disks:	DS	SS																																																																																																																									
Sony Boxed	17.50	12.75																																																																																																																									
Sony Bulk	1.40	1.11																																																																																																																									
MacDisk	1.25	.99																																																																																																																									
KAO Bulk	1.35	----																																																																																																																									
Black Ribbons	3.00																																																																																																																										
Colored Ribbons	3.50																																																																																																																										
Multicolored Ribbons	12.00																																																																																																																										
MacPlus Bag	55.00																																																																																																																										
MacSE Bag	65.00																																																																																																																										
Imagell Bag	49.00																																																																																																																										
Teak 90 Disk Holder	22.00																																																																																																																										
Hypercard Handbook	19.95																																																																																																																										
Cables	19.95																																																																																																																										
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 30%;"> <p>MacProducts USA carries over 1500 products for the Mac, so please call for products not listed.</p> </div> <div style="width: 40%; text-align: center;"> <p style="font-size: 1.2em; margin: 0;">MacProducts USA</p> <p style="margin: 0;">9709 Brown Lane Suite E Austin Texas 78754</p> </div> <div style="width: 30%; text-align: right;"> <p>Try a software product before you buy. We also rent software for 1/5 of the purchase price.</p> </div> </div>																																																																																																																											

Circle 86 on reader service card

Making The Right Choice From Generation to Generation.



Attorney at Law, Henry Maretz, was asked why he chose Microtech...

“A few years ago, while my son was at Harvard, I bought him a Microtech 800k floppy disk drive for his Macintosh. I think I was one of the first to buy one - in fact Microtech had just released the product. I remember they were hard to get at the time. Well, my son's graduated now and working in the computer field, but he's still crazy about his Mac - and his

Microtech drive. He even started to convince me that I should have a Macintosh computer and Microtech drive for my law practice. Well believe me, he can be pretty convincing.

I began to do some research. I was already impressed with the Macintosh, but I knew I would need a hard drive. I called Microtech again and was glad to find their selection of internal and external hard drives to be quite extensive. When I heard that Microtech drives were chosen by my alma mater Dartmouth, I was becoming even more convinced. I am familiar with Dartmouth's incredible computer network. Then when I realized that Microtech was offering a 5 year warranty on their hard drives, I needed no further persuading. From personal experience I knew Microtech would be around long enough to give me the service and support I was looking for. Once I was sold on the Mac, I was definitely convinced Microtech had to be the right choice - no, the only choice - for a hard disk drive, just as it had been for my son's 800k drive a few years ago.”

800-325-1895



Microtech Peripherals, Inc. 29 Business Park Drive/Branford, Connecticut USA 06405/(203) 488-8993

*The five year limited warranty is available on hard disk drives only, manufactured by Microtech International, Inc. and must be sold and delivered in the United States or Canada. Certain restrictions and exclusions apply. Terms and conditions of the five year limited warranty are available upon request. Prices and specifications are subject to change without notice.

Circle 62 on reader service card

More muscle.

Introducing FileMaker® 4. The powerful new easy-to-use data management program with multi-user capabilities. From the people who brought you FileMaker.

More power to manage your business.

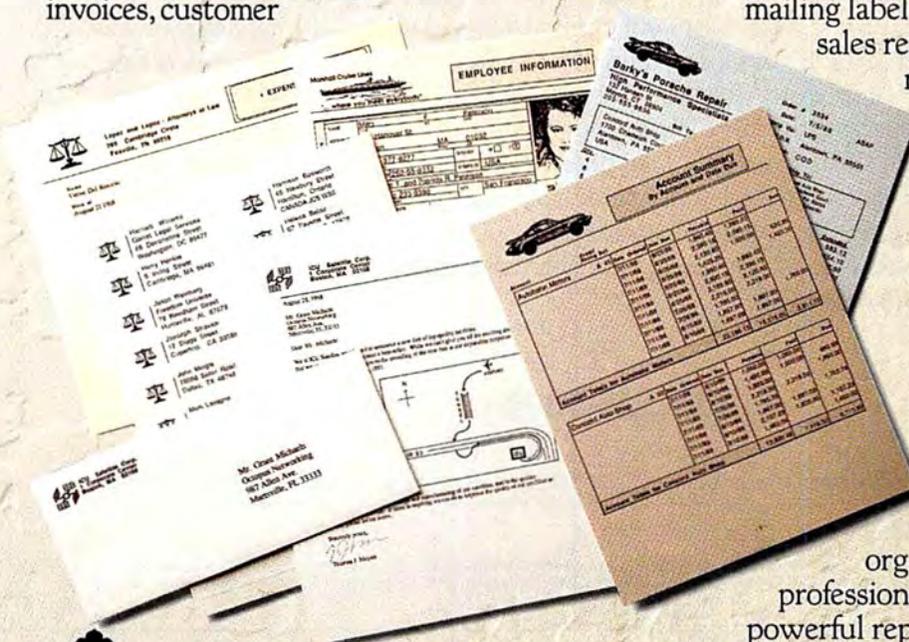
Every business has a database. You may call it something else, but you have one. It's your sales invoices, customer

lists, inventory, accounts receivable, repair orders, all the information you use to run your business.

FileMaker 4 helps manage your database, and your business, by automatically indexing every word, number and date you enter. You can use it to look up pricing information, then quickly calculate, sort and summarize invoices. You can produce contact lists, form letters and mailing labels, even automate repetitive tasks like sales reports. FileMaker 4 lets you view multiple records on-screen, and import and export information and graphics from other programs. You can also print mailing labels nearly any way you want, plus a host of other features your business can really use.

*Everything you need.
Nothing you don't.*

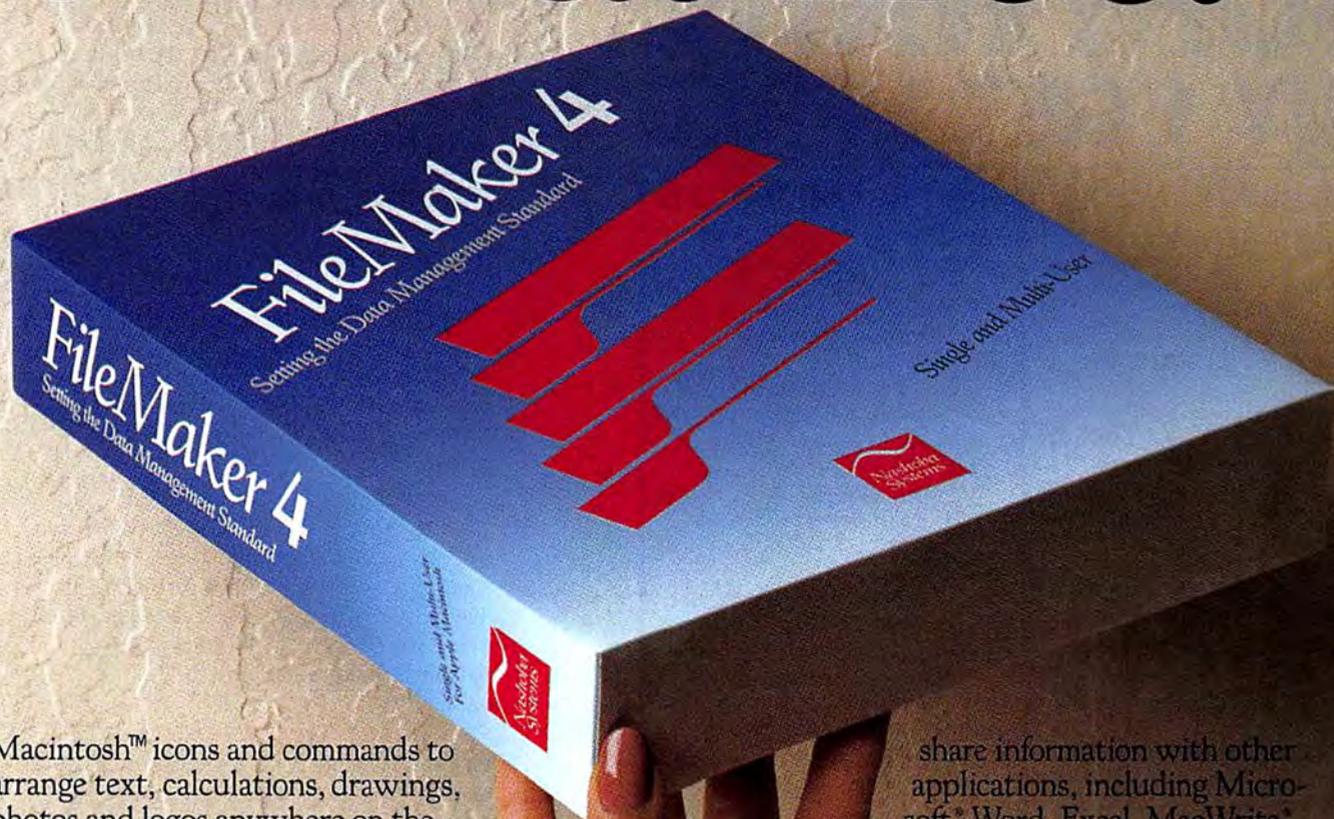
You don't have to be a programmer to use FileMaker 4. Just read the Quick Tour chapter in the instruction manual and you're ready to organize your information and produce professional-quality reports. FileMaker 4's powerful reports and form generator uses simple



Demo version bundled on all Jasmine Hard Disk Drives.

FileMaker is a registered trademark of Nashoba Systems, Inc. LaserWriter, ImageWriter and MacWrite are registered trademarks of, and AppleTalk, Macintosh, MultiFinder, MacDraw and MacPaint are trademarks of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Rolodex is a registered trademark of Insilco.

Still fat-free.



Macintosh™ icons and commands to arrange text, calculations, drawings, photos and logos anywhere on the page. To help you get started, the program includes pre-designed templates for the most-used applications, including mailing labels, purchase orders, invoices, statements, Rolodex® cards, a checkbook with register, membership lists, and more.

Share with your friends.

FileMaker 4's multi-user capabilities let you share your information with everyone else on your Macintosh network with just a few clicks of the mouse. With FileMaker 4 and AppleTalk™ you don't need additional software to share data.

FileMaker 4 works with Macintosh Plus, Macintosh SE and Macintosh II computers, plus ImageWriter® II and all LaserWriter® printers, even the latest system software such as MultiFinder.™ You can also

share information with other applications, including Microsoft® Word, Excel, MacWrite®, MacPaint™ and MacDraw.™

Upgrade to FileMaker 4.

You can now upgrade from FileMaker Plus for only \$50.00. Act now, this special offer ends June 30. Call 800-323-1776 ext. 139 or send your serial number, name, address and payment to Nashoba Systems, Inc., Attn: FileMaker Upgrades, 1157 Triton Drive, Suite A, Foster City, CA 94404.

Backed by Nashoba.

Nashoba Systems supports FileMaker 4 with unlimited free technical support and the latest technical upgrades as we develop them.

We also back it with a 100% guarantee. If you're not completely satisfied that FileMaker 4 is the best data management program you can buy for your business, return it within 30 days of purchase and we'll refund your money. Call 1-800-274-0610 today for the name of the FileMaker 4 dealer nearest you.



Circle 72 on reader service card

FREE SOFTWARE BUY 1 GET 1 FREE

MAC SOFTWARE

DESKTOP PUBLISHING

- 90 Boston II — laser qlytly lmgwtr . . \$9
- 133 Beverly Hills — sharpest lmgwtr . \$9
- 220 Laser Printer Fonts \$9
- 221 PageMaker Templates — business cards, envelopes, signs, labels . \$9

BUSINESS

- 135 Best of Business, Home Finance * \$9
- 163 Dbases: mail, inventory, real estate * \$9

GENEALOGY

- 215 MACROOTS: descendant and pedigree charts, family group sheets (requires MacWrite 4.5) * . . . \$9

GRAPHICS

- 116, 117 Clipboard art, Slideshow, Viewpaint (2 disks) \$18
- 203 Best of Graphics \$9

NUDES

- 200, 202 Girls! Adults only pictures (2 disks) \$18

COMMUNICATION

- 29 Red Ryder 9.4 terminal w/doc * . \$9

GAMES

- 207 Best of Games — Bill's Casino, MacLanding MacMissiles, etc. . . \$9
- 210 Air Traffic Simulator, Video Poker. \$9

MATH

- 214 Binary trees, statistics, algebra \$9

PROGRAMMING

- 166 Complete Sesame C compiler * . \$9

UTILITIES

- 6, 89 ResEdit: edit fonts +icons (2 disks) \$18

* Contains Shareware Software

HYPERCARD STACKS

BUSINESS

- HC1 Payroll, call screener, address filer, calculators \$9
- HC2 Checkbook, Disk Librarian, LP organizer, recipe box \$9

EDUCATION

- HC6 Electronics, chemistry, geography, biology \$9

FUNSTUFF

- HC5 Psychoanalyst, Yahtzee, Star Trek, Tic-tac-toe \$9
- HC8 Screen Savers, cartoons, pranks, more \$9

GAMES

- HC10 Sword playing, 56 World Class Chess games \$9

GRAPHICS

- HC9 Excellent sketchings and sound animation * \$9

MODEM

- HC3 Hyper BBS, BBS lists, terminal programs \$9

MUSIC AND SOUNDS

- HC16 TV and radio favorites, classical/pop edit sounds into music on disk * \$9

SCIENCE

- HC17 Astronomy quiz, periodic table animal + plant structures * . . . \$9

UTILITIES

- HC19 Menu installer, Power Tools, Stack tutor, screenlock, text file installer * \$9
- HC7 Stack protection crackers, guide to HC programming, more . . . \$9

* Contains Shareware Software

MEMBERSHIP OFFER:

- Quarterly Magazines — Hot Tips, Updates, author interviews.
- 350 Page Directory of our software — 1000's of programs, graphics, indexes.
- Special Discounts!

- 1 Year Membership \$19.99
(Foreign members \$35)

Add \$4 (\$10 foreign) for shipping & handling. CA orders add sales tax.

Enclosed \$ _____ by Check VISA MC

Card No. _____ Exp. _____



Name _____ Public Domain Exchange

Address _____ 2074-C Walsh Ave., #118

City _____ State _____ Zip _____ Santa Clara, CA 95050



IN CA 408-496-0624 DEALER INQUIRIES INVITED

ORDER TOLL FREE 800-331-8125

Circle 335 on reader service card

New Products

The Big Picture Two-page color monitor for Mac II. 76 dpi, 1024 by 808 pixels at one or eight bits per pixel. 72 Hz refresh rate. Includes tilt-and-swivel base. \$5195. E Machines, 503/646-6699.

ETAP Neftis, ETAP Atris 72-dpi full- and two-page monitors for Mac SE and II; refresh at 75 Hz, noninterlaced. Paper-white phosphor with high luminance. Includes toggle between standard Mac display and the large screen. Contact company for prices. ETAP Information Technology, Steenovenstraat 1A, B-2150 Malle, Belgium, 32 3 310 0411.

Four+One Communications board for the Mac II adds four serial interface ports, plus a 2400-baud, industry-standard modem. Supports Mac operating system and A/UX. \$949. Tara Systems Corporation, 619/481-7109.

High Capacity Series I SCSI hard disk subsystems; 16.5 ms average access time. HCS-mac 150E provides 146MB formatted storage, while HCS-mac 300E provides 299MB. Mac 150E \$34.99; Mac 300E \$43.99. N/Hance Systems, 617/461-1970.

Newsbuilder Editorial Workstation Mac II-based workstation offers features of traditional systems. Programmable keyboard can combine multiple keystrokes for speed editing. Lets editors flow copy in actual font into multiple columns and jump stories to multiple pages. Dictionary-based hyphenation; spaceband and white space control; manual and table kerning. 4MB min. memory. \$9495 to \$13,995 depending on hardware and options. Digital Technology International, 801/226-2984.

Scanmaster/35, Scanmaster/35 II Scan and digitize 35mm film for display and storage. Scanmaster/35 has 2000-by-2000-dpi scanning resolution with 180-degree image rotation capability. Scanmaster/35 II has 2000 by 3000 dpi. \$6995, with optional Scan-It/35 software \$8195. Howtek, Inc., 603/882-5200.

Telenode Device allows remote access to a LocalTalk network, peripherals, and services over regular telephone lines. \$595. DataSpace Corporation, 800/387-0492, 416/474-0113 in Ontario.

(continues)



New!
High
performance
80 mb SCSI
28 MS
\$1249.00



20 mb SCSI
65 MS \$560⁰⁰
40 mb SCSI
40 MS \$770⁰⁰
60 mb SCSI
40 MS \$839⁰⁰
Seagate

APPLECRATE™ & Seagate ...Quality Works

Introducing APPLECRATE™

Our sub systems have been designed to provide quick and easy installation and are fully compatible with Apple Mac Plus, Mac SE and Mac II.

These powerful systems include driver and utility software, an internal power supply,



SCSI cabling, all necessary hardware and have been shock mounted for trouble-free transport.

The Apple Crate comes with a 2 YEAR WARRANTY on parts and labor and a direct wats line to our "72 hour turnaround" service department.

Complies with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC rules. Patent pending.

Apple, Apple Mac Plus, Mac SE, and Mac II are registered trademarks of Apple Computer, Inc.

The Apple Crate provides:

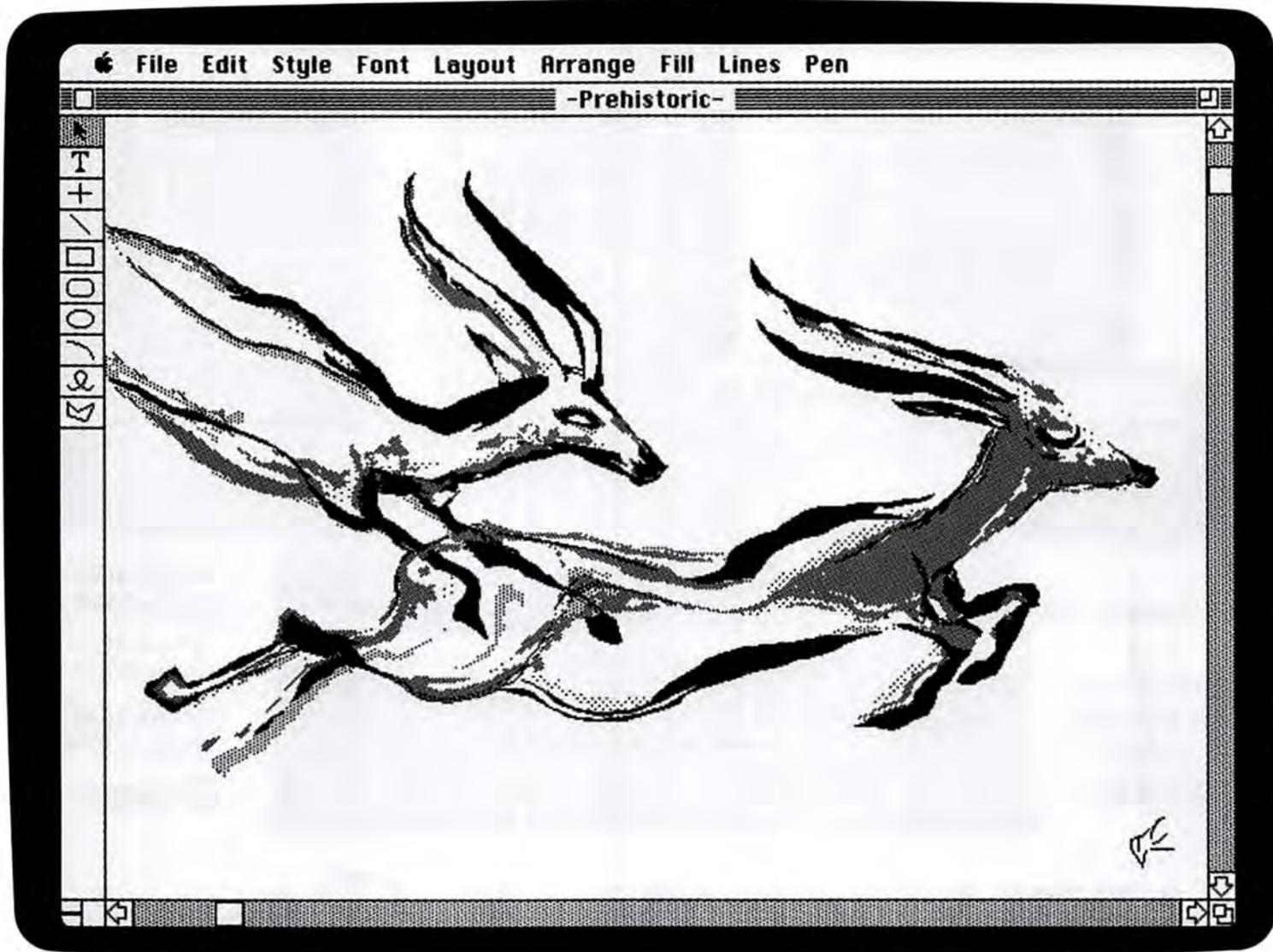
- Additional SCSI port which allows daisy-chaining up to 7 SCSI devices
- Convenient fuse holder
- SCSI address select
- Controls and cable controls—clearly marked and easy to operate.

In California • Nationwide
800-323-9994 • 800-543-5808
 Call for same day orders or technical support



APPLECRATE
 6850 Vineland Ave., Bldg. M., North Hollywood, CA 91605
(818) 766-4001

Circle 97 on reader service card



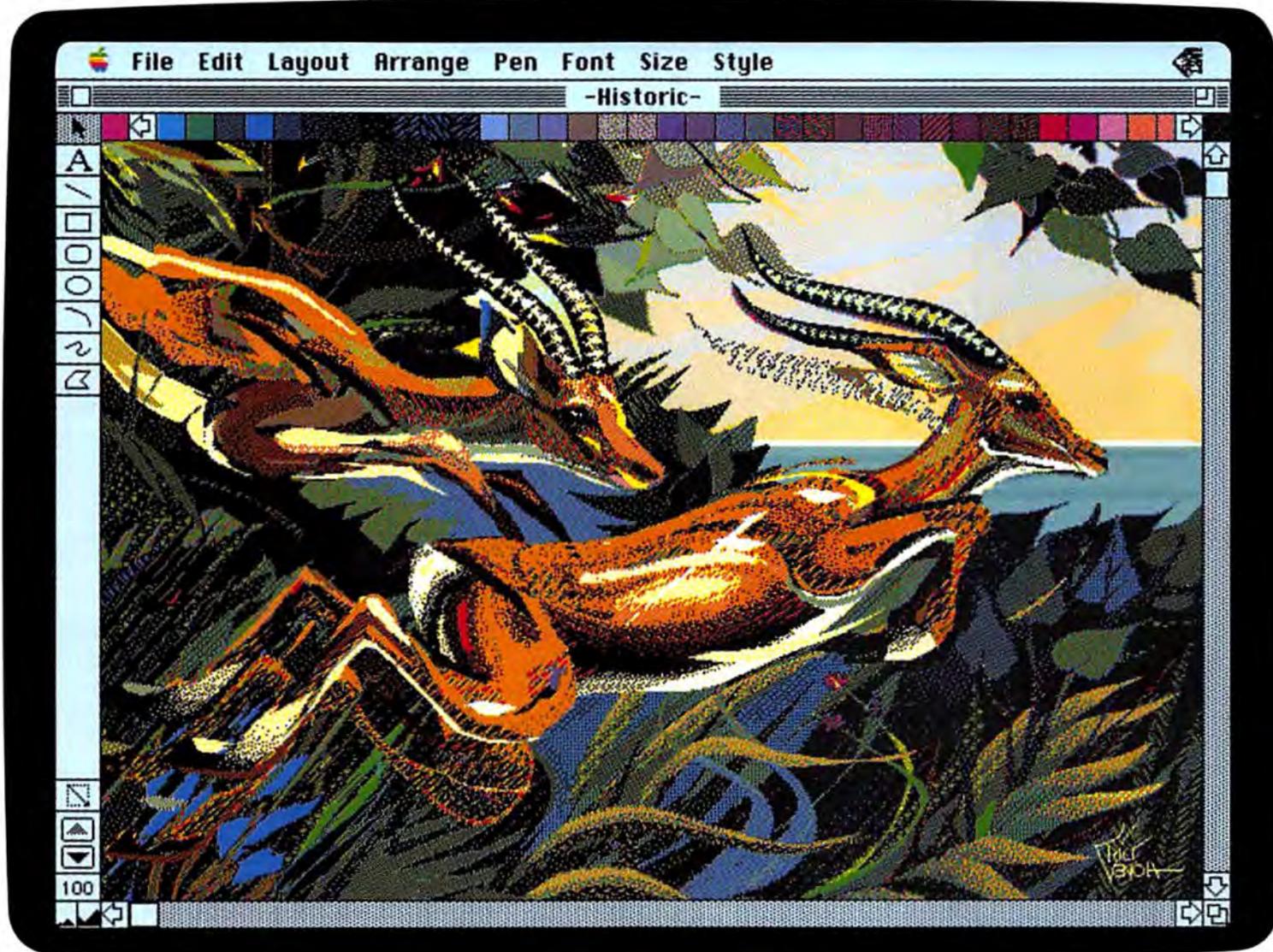
MacDraw.

MacDraw[®] emerged at the dawn of the Macintosh era. To forever change the way business people looked at graphics. It was a revelation.

It produced them quickly. Easily. Inexpensively.

In short order, MacDraw became the standard for professional business graphics. All was well.

Until one day someone said, "I wish it were faster and more precise. And color would be terrific."



MacDraw II.

We went back to square one. To say nothing of oval one and polygon one. And the result, to quote *MacUser*, is "a real stunner."

On speed alone, MacDraw II represents light years of improvement. Because it's up to 10 times faster than its predecessor.

It's also very precise. You can draw in any scale from inches to kilometers. And enlarge your drawing up to 32 times with a resolution of more than 2,000 dots per inch.

That makes MacDraw II exceptional for everything from designing graphics and presentations to engineering floorplans and better mousetraps.

With MacDraw II, you can create layers of a drawing (the number of layers is limited only by RAM size). And store frequently used graphics in a special "object library" for quick access.

MacDraw II permits unlimited text styles,

sizes and fonts in a single field. It can even rotate text in increments of less than 1°.

You can import text and bit mapped graphics at any resolution, making MacDraw II excellent for many desktop publishing applications.

And you can customize patterns, lines, dashes, and even hone your own arrowheads.

Finally, MacDraw II offers over 16,000 different color patterns on the Macintosh II. And drawings like the one above can be reproduced on a color plotter or printer. You can even do color separations.

Of course, MacDraw II is easy to learn. If you're a MacDraw user, you'll find it draws on what you already know.

For more information and location of a Claris dealer near you, call 800-334-3535, ext. 250. And discover the all-new MacDraw II. It's a quantum leap.

CLARIS™



The old way to learn software.

A better way to learn software.

At last, a better way to learn Macintosh® software.

Forget about struggling through manuals. Interactive audio tutorials from Personal Training Systems are a fast, effective way to learn the most popular Macintosh software packages.

Choose from audio tutorials for:

- PageMaker 3.0®
- Excel®
- Adobe Illustrator 88®
- Word
- HyperCard™
- Works
- Using the Macintosh
- MORE®

By having your own personal tutor on cassette tape, you can learn quickly, completely and at your own pace. There are modules for beginning, intermediate and advanced users. You can select the level that's right for you.

Our tutorials are so effective, they are unconditionally guaranteed.

Discover a better way to learn Macintosh software. Call us at (408) 559-8635 or return the coupon below.

Send me information on your training series for PageMaker,® Excel,® Word, Works, HyperCard,™ MORE,® Adobe Illustrator 88,® and using the Macintosh.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Daytime Phone (_____) _____



Personal Training Systems

The Smart Way To Learn Macintosh Software

P.O. Box 54240 • San Jose, California 95154

(408) 559-8635

See us at the Boston MacWorld Expo, booth 5562 • August 11-13, 1988

© 1988 Personal Training Systems. The following are registered and unregistered trademarks of the companies listed: PageTutor, Personal Training Systems - Personal Training Systems; Apple, Macintosh, HyperCard - Apple Computer, Inc.; PageMaker - Aldus Corporation; Microsoft, Excel - Microsoft Corporation; MORE - Living Videotext; Adobe Illustrator 88 - Adobe Systems Incorporated.

Circle 223 on reader service card

New Products

Toppan Scan-Note System Mac II used in conjunction with a piano keyboard terminal for input and a PostScript output device for proofing. Compatible with Yamaha DX-21, DX-27, DX-100. 5MB min. memory; requires 40MB hard disk. £25,000. Toppan Printing Co., Ltd., 11 Grosvenor Gardens, London SW1 W OBD, England, 01 828 7292.

ACCESSORIES

Comp-U-Lock One Plus (no drill) CLIPN Single-lock system requires no drilling or other modifications to equipment for installation. Mastic-coated steel plate attaches to underside of the machine to secure to a mastic plate on the desktop. \$48.95; two-lock system \$89.95. Versa Lock, Inc., 800/248-5625, 800/642-5625 in California, 818/886-8962.

Mac Cozy Computer covers in loud Hawaiian Hula or Leopard print; 100 percent cotton lining. \$10 to \$45 depending on configuration. *The Chicken Boy Catalog for a Perfect World* available. Future Studio, 213/660-0620.

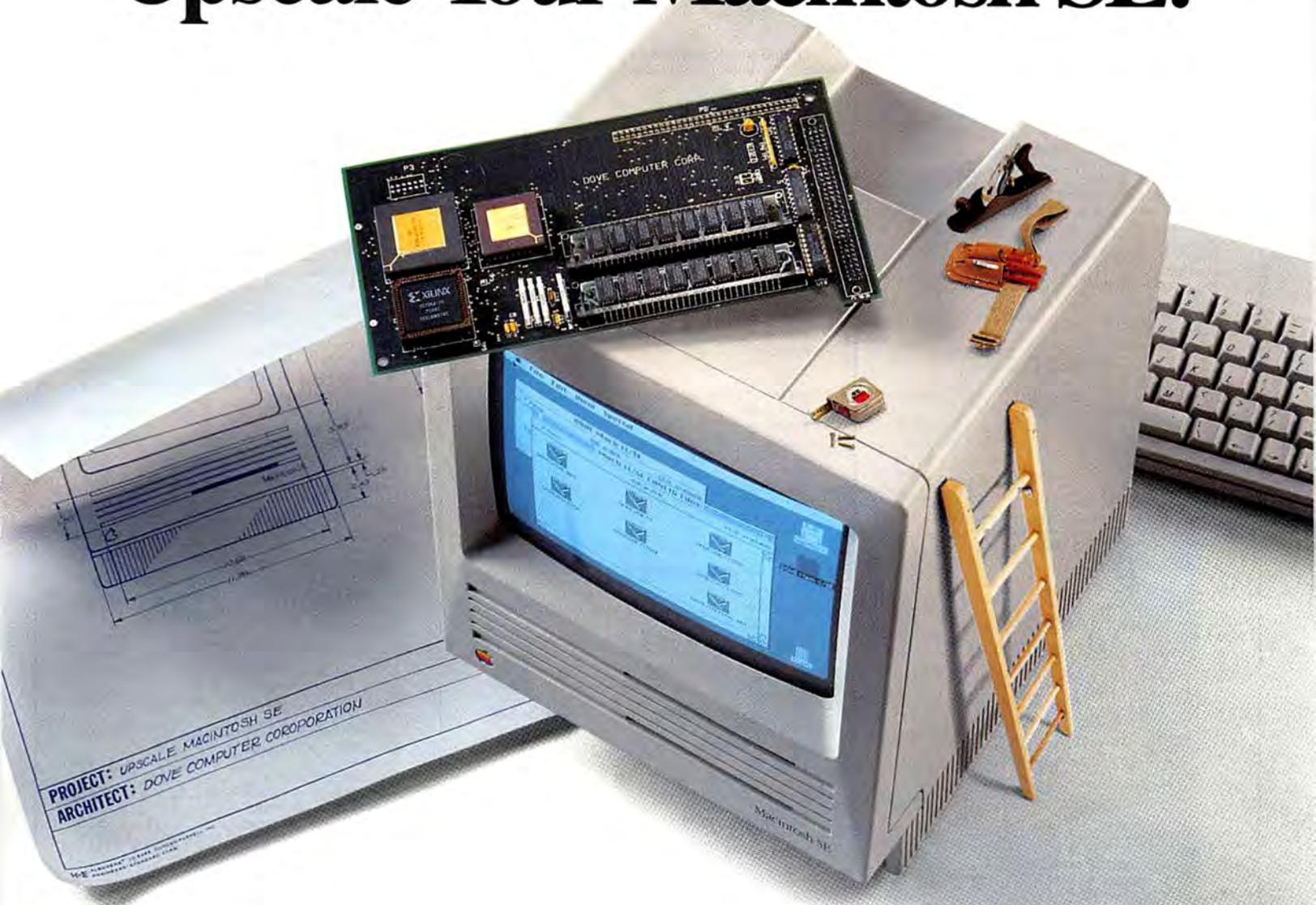
Macintosh Upgrade Book Contains information about various Mac configurations and tips on attaining desired performance. Describes good and bad points of various features found in upgrades. 52 pages. \$2.95. Computer Quick, 213/941-7951.

Pro-Tech Laser Labels Self-adhesive, white or clear labels withstand high temperatures of laser printers. 2½ by 1 inch, formatted three across and ten down on 8½-by-11-inch sheets. Packages of 25 or 100 sheets. \$10.95 to \$174.95 depending on quantity and type. James River Corporation, 603/636-1154.

STAX Lockable and stackable disk storage units come with 5 color-coded dividers for indexing. \$29.95. T. S. Microtech, Inc., 213/644-0859. □

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.

Upscale Your Macintosh SE.



Mach II/SE™ gives your Macintosh acceleration and performance

Performance is the name of the game when you run large compute-intensive applications; CAD, CAE, graphics, desktop publishing, office automation. Dove's Mach II/SE accelerator with its 68020 processor gives you performance comparable to a Macintosh II and it makes your Macintosh faster and easier to use than any PC or PS/2™.

The Mach II/SE is synonymous with *Value*. An advanced product design guarantees product reliability, performance and expandability. The Mach II/SE is fully compatible with Dove's MacSnap™, FastNet™ and soon to be announced graphics

products—further enhancing your SE's applications and networking value.

Mach II/SE Benefits

- Cost effectively quadruples your SE's performance
- Supports maximum memory configurations up to 5 megs
- Provides an optional 68881 math co-processor
- Programmable LCA technology coupled with the 68020 equals flexibility and assures simple software upgrades
- Installs easily in 10 minutes

without modifications

- The best choice for running processor and memory intensive applications

Like all Dove products the Mach II/SE will help you soar to new heights of productivity. For more information and the name of your nearest dealer call us at 1-800-622-7627.



1200 North 23rd Street
Wilmington, North Carolina
28405
919-763-7918

Mach II/SE, MacSnap and FastNet are trademarks of Dove Computer Corporation. Macintosh is a registered trademark of Apple Computer, Inc. PS/2 is a registered trademark of International Business Machines Corporation.

See Us At Macworld Expo Booth 5168

Circle 174 on reader service card

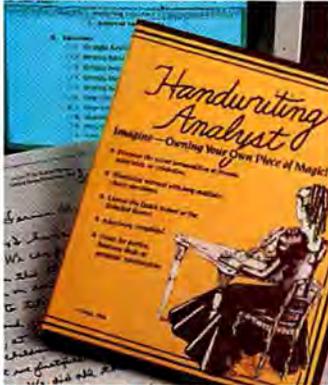
MORE FOR YOUR MAC...

HYPERWARE

Activision	
Business Class	30.00
Focal Point	59.00
Reports! for HyperCard	59.00
Bantam (Goodman)	
Complete HyperCard Handbook	24.00
DataDesk	
HyperDialer	26.00
Hyperpress Publishing	
Script Expert	49.00
Icon Factory	29.00
MacroMind	
VideoWorks II HyperCard Driver	79.00
MicroMaps	
HyperAtlas	64.00
Symmetry	
HyperDA	38.00
Teligraphics	
HyperTutor	32.00

UTILITIES

Affinity	
Tempo II	89.00
Berkeley System Design, Inc.	
Stepping Out II	54.00
CE Software	
DiskTop 3.0	28.00
QuicKeys (new macro programmer)	54.00
Central Point	
Copy II Mac (with MacTools)	20.00



Handwriting Analyst (Ciasa) — Contains multiple-choice questions about your writing and creates a profile of the writer's personality. (entertainment) \$29.00

Emerald City Software	
Lasertalk 1.0	187.00
Kent Marsh	
MacSafe	99.00
NightWatch	109.00
Magic Software	
Autosave	29.00
Mainstay	
Capture	47.00
TypeNow	30.00
Micro Analyst	
MacZap (disk utility)	39.00
Microlytics	
GOfer!	49.00
Olduvai	
FontShare	149.00
Icon-It!	40.00
Simon and Schuster	
Fully Powered Mac	24.00
Software Power Company	
PowerOP 1.4	39.00
Software Supply	
PowerStation	38.00
Suitcase	37.00
SuperMac	
DiskFit	54.00
Sentinel 1.0	155.00
SuperSpool	54.00
Symantec Corporation	
Symantec Utilities for Macintosh	59.00

DESK ACCESSORIES

Activision	
Focal Point	59.00
Affinity	
AffiniFile	46.00

Allan Bonadio Associates	
Expressionist 1.11 (equation editor)	46.00
Borland	
Sidekick 2.0	65.00
Electronic Arts	
DiskTools Plus	31.00
Greene	
QuickDEX	32.00
Imagine	
Multi User Appointment Diary w/Smart Alarms	89.00
Smart Alarms and Appointment Diary	35.00
Mainstay	
Think 'n Time	61.00
Software For Recognition Tech	
MiniDraw	21.00
Solutions	
SmartScrap & The Clipper	35.00

LANGUAGES

Borland	
Turbo Pascal	65.00
Consulair	
68000 Development System	59.00
Microsoft	
Basic Interpreter 3.0	61.00
Fortran Compiler 2.2	169.00
SmethersBarnes	
Prototyper	79.00
Think Tech	
Lightspeed C (super compiler)	95.00
Lightspeed Pascal	65.00
Zedcor	
ZBasic	65.00

COMMUNICATIONS

CE Software	
QuickMail	169.00
CompuServe	
CompuServe Navigator	49.00
CompuServe Subscription Kit	24.00
Computer Applications	
II In A Mac	109.00
DataVIZ	
MacLink Plus w/Cable	145.00
Dow Jones	
Desktop Express	95.00
FreeSoft	
Red Ryder 10.3	55.00
Hayes	
Smartcom II (communications)	88.00
Medbar Enterprises	
PortaFax III	1297.00
Software Ventures	
Microphone 1.1 (includes Glue)	119.00
Traveling Software	
LAP-LINK	84.00



MAC-101 Keyboard (DataDesk) — Features 101 Keys, 15 function keys and 6 Key Cluster. Includes free macro software. Two year manufacturer warranty. (input/output) \$139.00

DATABASE SOFTWARE

1st Desk Systems	
1st File	59.00
Aclus	
4th Dimension	575.00
Ashton-Tate	
dBase Mac	295.00
Borland	
Reflex Plus	165.00
Fox Software	
FoxBASE+/Mac	214.00
Nashoba Systems	
FileMaker 4	Call

MacWAREHOUSE™
ORDERS NOW SHIPPED



Odesta	
Double Helix II	349.00
Park Row Incorporated	
Publish or Perish	21.00
Software Discoveries	
Record Holder Plus	45.00

BUSINESS SOFTWARE

1st Desk Systems	
1st Merge	59.00
Activision	
City to City	30.00
Borland	
Eureka: The Solver	129.00
Bravo	
MacCalc	79.00
Cognition Technology	
MacSMARTS	149.00
Cricket	
Cricket Graph (advanced graphing)	119.00
Cricket Presents	289.00
Lundeen & Associates	
WorksPlus Commands	60.00
Microsoft	
Excel 1.06	249.00
PowerPoint 2.0	249.00
Works 1.1 (integrated software)	189.00
North Edge Software	
Timeslips III (time/expense tracking)	119.00
Satori	
Bulk Mailer 3.0	79.00
Select Micro Systems	
FlowMaster	369.00
Shana Enterprises	
FastForms! Construction Kit	96.00
Software Discoveries	
MergeWrite (mailing program)	35.00

WORD PROCESSORS AND OUTLINERS

Ashton-Tate	
FullWrite Professional	Call
Bootware Software	
Pro Resume Writer (multiple resumes)	75.00
Microsoft	
Word 3.02 (updated word processor)	249.00
Write 1.0 (new word processor)	113.00
Paragon	
Qued/M	109.00
T/Maker	
WriteNow (word processor)	98.00
WordPerfect Corp.	
WordPerfect	185.00

SPELLING CHECKERS

Aegis	
Doug Clapp's Word Tools	42.00
Deneba Software	
Spelling Coach 3.0	56.00
Spelling Coach Pro	109.00
Coach Merriam-Webster Thesaurus	36.00
Electronic Arts	
Thunder (spelling checker)	30.00
Microlytics	
Word Finder (synonym finder)	35.00
Sensible Software	
Sensible Grammar	55.00
Working Software	
Spellswell 2.0 (spelling checker)	42.00

GRAPHICS

3G Graphics	
Images w/Impact/Graphics & Symbols 1	60.00
Aba Software	
Draw It Again Sam 2.0	89.00
Activision	
Postcards	20.00
Aldus	
Freehand	379.00
Broderbund	
Print Shop (cards and more)	36.00

FREE!

THE NEW MacWAREHOUSE™ CATALOG

Don't Start Up Without It!

Great News! If you're the kind of Mac user that just has to be up to date with all the latest product news, can't sleep for fear there's some new development out there you haven't seen yet, then you must get your hands on the brand new edition of the MacWarehouse catalog.

Our editors have been locked away for weeks — testing, reviewing, photographing and badgering manufacturers — all to make certain they produce the very last word on each entry. The definitive Mac user's "Handbook".

You'll quickly find all your questions on compatibility, copy protection and function answered clearly with full color pictures and informative screen dumps.

FREE TECHNICAL SUPPORT

And, of course, if there's anything else you need to know, our TECHNICAL SUPPORT department is only a toll free call away. (1-800-255-6227)

You get your catalog automatically when you place an order and if you're not ready to order right now, just mail us the coupon below and we'll rush the catalog to your door.

GREAT SERVICE — GREAT PRICES

When you're ready to place an order our sales representatives are standing by ready to help. We'll update you on any version changes and rush your order to you by FEDEX/AL EXPRESS Standard Air. We'll also tell you about our many MACWAREHOUSE specials. Here's just a few:

SYMANTEC UTILITIES FOR MACINTOSH



Symantec Utilities for Macintosh is a set of six utility programs... from crashed disk and deleted file recovery to hard disk partitioning and optimization. It also comes with a disk and file editing application and a utility for superfast duplication of floppies. They're all easy to use and give you the powerful protection you need for your valuable data. (utilities) \$59.00

TETRIS

This new game from Spectrum HoloByte's International Series is an addictive challenge from the U.S.S.R. best described as the "Rubik's Cube" of computer games. Contains ten levels of difficulty requiring fast thinking and quick reflexes. Contains beautiful background graphics. (entertainment) \$23.00 (Plus, SE); \$25.00 (Mac II)



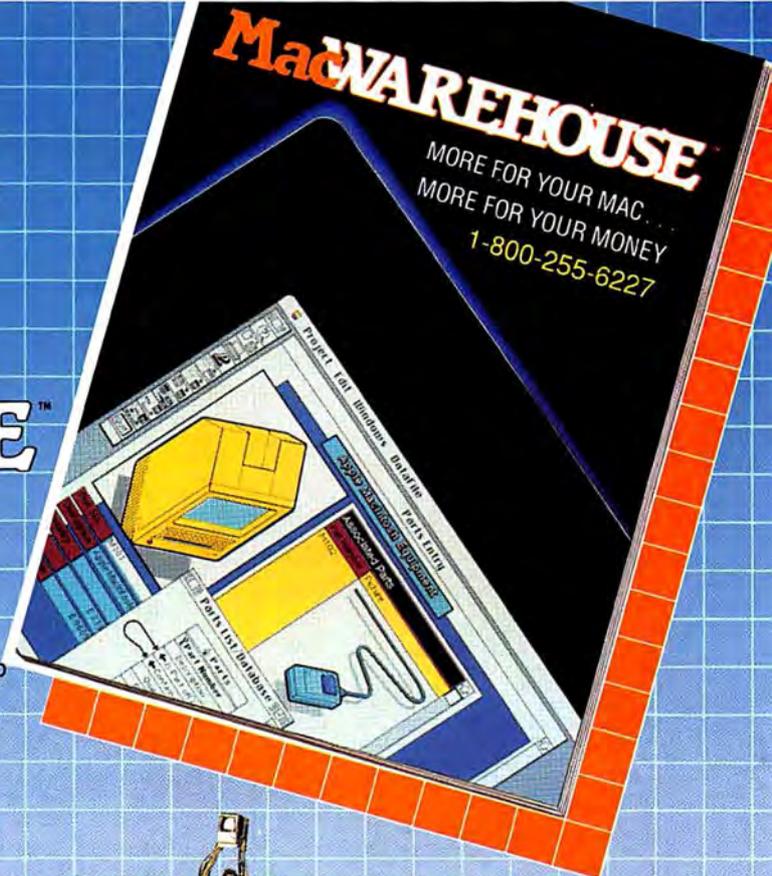
MWH8

MacWAREHOUSE CATALOG

1690 Oak Street
P.O. Box 1579
Lakewood, NJ 08701

I don't need to order right now, but please RUSH me my FREE copy of the brand new MacWarehouse Catalog.

NAME _____
ADDRESS _____ APT# _____
CITY _____ STATE _____ ZIP _____



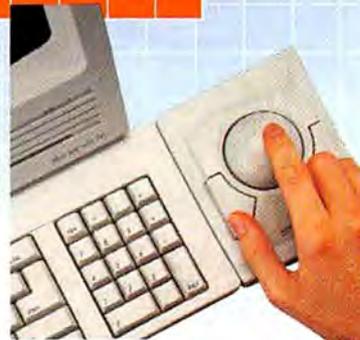
QUICKEYS™



Award winning keyboard enhancer enables you to assign keystrokes to often used commands. Anything you can do with a mouse and a click, you can do with QuicKeys. Works with all Mac keyboards, even third party. Assign up to 100 universal keys and up to 100 for every application. (utilities) \$54.00

NEW TURBO MOUSE

Retire your mouse and replace it with the New Turbo Mouse from Kensington. With the mouse ball on top, it's quicker, quieter, and easier to use. Automatic acceleration moves the cursor further when you roll the ball quickly (great for big screens). Advanced button features include a Click Lock. New Turbo Mouse (512, Plus) or New Turbo Mouse ADB (SE, II) (input/output) \$94.00



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!

I'm Kerry, call me at:

MacWAREHOUSE™

1-800-255-6227

(1-800-ALL MACS)

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)

Circle 78 on reader service card

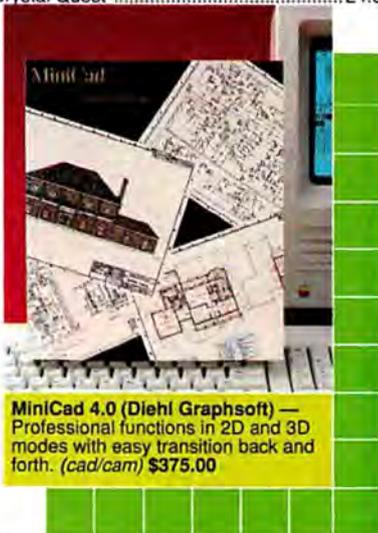


FROM MacWAREHOUSE™

Great Wave	
Kids Time	26.00
Nolo Press	
Will Maker 2.0 (prepare your own will)	36.00
Nordic Software	
MacKids Turbo Math Facts	21.00
Palantir	
MacType	31.00
Think Educ	
MacEdge II	28.00

GAMES

Accolade	
Hardball	23.00
Activision	
Mad Libs (20 "talking" stories)	14.00
Shanghai (strategy)	24.00
Artworx	
Bridge 5.0	22.00
Broderbund	
Where in the World is Carmen San Diego	25.00
Bullseye	
Ferrari Grand Prix (racing)	32.00
Fokker Triplane Flight Simulator	32.00
Ciasa	
Handwriting Analyst	29.00
Electronic Arts	
Chessmaster 2000 (deluxe chess)	28.00
Patton vs. Rommel (strategy)	27.00
Starfleet I: The War Begins!	37.00
Chuck Yeager Adv Flight Trainer	36.00
Greene	
Crystal Quest	24.00



MiniCad 4.0 (Diehl Graphsoft) — Professional functions in 2D and 3D modes with easy transition back and forth. (cad/cam) \$375.00

Microsoft	
Flight Simulator 1.0	32.00
Mindscape	
Balance of Power, Deja Vu -	ea 30.00
Citadel	39.00
Make Millions	17.00
Shadowgate, Uninvited -	ea 30.00
PBI	
Strategic Conquest Plus	46.00
Practical Computer	
Lunar Rescue	29.00
MacCourses	34.00
MacGolf 2.0, MacRacquetball -	ea 35.00
Primera	
Smash Hit Racquetball II	22.00
Sierra On-Line	
Leisure Suit Larry	23.00
Silicon Beach	
Apache Strike, Dark Castle -	ea 27.00
Beyond Dark Castle	27.00
Simon & Schuster	
Star Trek - Kobayashi Alternative	24.00
Simulated Environment Systems	
Quarterstaff	29.00
Spectrum HoloByte	
Falcon, Gato -	ea 26.00
PT109	32.00
Solitaire Royale	19.00
TETRIS (Mac II)	25.00
TETRIS	23.00

DISK DRIVES/MEMORY UPGRADES

AST	
Mac286 Co-Processor (Mac II)	1049.00

CMS	
MacStack 20 Meg	569.00
MacStack 40 Meg	789.00
MacStack 60 Meg	869.00
Cutting Edge	
800K Disk Drive	179.00
Wedge XL 30 Plus	629.00
Wedge XL 45 Plus	829.00
XL 30 Internal	509.00
XL 45 Internal	649.00
Dayna Communications	
DaynaFile single 360K (5 1/4")	529.00
Dove	
Mach II/SE Accelerator Board	555.00
MacSnap 2SE	299.00
MacSnap 2S cmos	Call
MacSnap SCSI Interface Port	85.00
MacSnap 4S cmos	Call
MacSnap 524 (512k to 1 meg)	175.00
MacSnap 524S (incl SCSI interface)	239.00
MacSnap 548 (512k to 2 meg)	389.00
MacSnap 548S (incl SCSI interface)	449.00
MacSnap Plus 2 (MacPlus to 2 meg)	279.00
MacSnap 8S cmos (II to 8 meg)	Call
MacSnap1024 Accelerator Board	345.00
MacSnap Tool Kit (installation tools)	15.00
Everex	
EMAC 20D (hard drive)	520.00
EMAC 20D Deluxe (0 footprint)	585.00
EMAC 40D (hard drive)	945.00
EMAC 40D Deluxe (0 footprint)	995.00
EMAC 60T (tape backup)	895.00
PCPC	
MacBottom HD21 (SCSI)	749.00
MacBottom HD21 (SCSI) w/Modem	915.00
MacBottom HD32 (SCSI)	899.00
MacBottom HD32 (SCSI) w/Modem	1,045.00
MacBottom HD45 (SCSI)	1,149.00
MacBottom HD45 (SCSI) w/Modem	1,295.00
WSI (With SCSI Interface)	295.00

MODEMS

Everex	
EMAC 2400	225.00
Hayes	
Smartmodem 1200	299.00
Smartmodem 2400	449.00
Migent	
Pocket Modem (ext. 300/1200 baud)	115.00
Novation	
Parrot Modem (with software)	93.00
Shiva	
NetModem 1200 (modem for network use)	450.00
US Robotics	
Courier 1200 Modem	199.00
Courier 2400 Modem	349.00

BLANK MEDIA

Goldstar	
DS/DD (box of 10)	15.00
Sony	
DS/DD (box of 10)	18.00
SS/DD (box of 10)	13.00

INPUT/OUTPUT

Abaton	
ProPoint	119.00
Asher Engineering	
Turbo Trackball (512/Plus or SE/II)	69.00
Cutting Edge	
CE-105 ADB Keyboard	135.00
DataDesk	
Mac 101 Keyboard	139.00
Kensington	
New Turbo Mouse	94.00
New Turbo Mouse ADB (for SE and II)	94.00
Koala	
MacVision (digitizer) 2.0	225.00
Kraft	
3 Button QuickStick	39.00
Mouse Systems	
A+ Mouse (512, Plus)	69.00
A+ Mouse ADB (SE, II)	87.00
New Image	
MacScan (feed-thru)	1,189.00
MacScan (flatbed)	1,749.00
Seikosha America	
Seikosha Printer (dot-matrix)	219.00
Summagraphics	
MacTablet 12 x 12	379.00
ThunderWare	
ThunderScan 4.0 (incl. Powerport)	199.00
ThunderScan 4.0 Mac II Accessory Kit	42.00

ACCESSORIES

Beck Tech	
Fanny Mac	65.00
Computer Friends, Inc.	
MacInker/Black Ink	3.00
MacInker (IW & IWI)	41.00
Curtis	
Ruby (6 outlets; filtered; 6 ft cord)	55.00
Ergotron	
MacTilt or MacTilt SE	68.00
Mouse Cleaner 360	15.00
I/O Designs	
IW II Ribbons-Black or Color	5.00
Four Color Ribbon	12.00



EMAC-40D Deluxe (Everex) — Fast, portable 40MB hard disk with two SCSI ports to allow daisy-chaining. Complete with cable, terminator, and disk utility. (disk drives) \$995.00

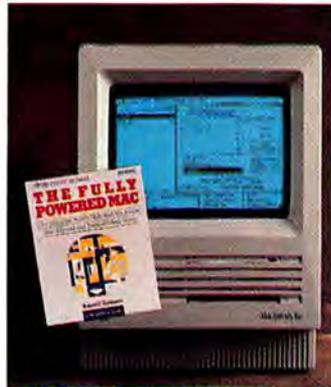
Matrix Film Ribbon-Black or Color	8.00
Macinware Plus Carrying Case	64.00
Macinware SE Carrying Case	76.00
Ribbon for Seikosha - Black	6.00
Innovative Tech	
Easel Plus	14.00
Pocket Pak (holds 6 disks)	9.00
Kalmar	
Rolltop Cabinets (45, 90, or 135 disks)	Call
Kensington	
ADB Keyboard Cable—Extra Long	26.00
Anti-Glare Filter	33.00
Apple Security Kit	34.00
AppleTalk Clips—cables or connectors	1.00
Disk Drive Cleaning Kit	20.00
Mac II Monitor Cable Extension Kit	35.00
Mac II Stand	21.00
MasterPiece Mac II	134.00
Printer Stand	16.00
System Saver Mac	64.00
Super Base	Call
MacCable	
Modem Cables (various)	Call
Printer Cables (various)	Call
SCSI Cables (various)	Call
Omnium Corporation	
Mac Desktop Workstation	75.00
Orange Micro	
Grappler Interface L/Q	98.00
Polaroid	
Circular Polarizing Filter	35.00



MacSMARTS (Cognition Technology) — Best-selling expert system tool for knowledge management and decision support. Features click-and-go links to hypertext and HyperCard™ stacks. (business) \$149.00

MORE FOR YOUR MONEY...

CE Software	
CalendarMaker	27.00
Challenger	
Mac3D 2.1 (3-D graphics)	119.00
Cricket	
Cricket Draw	169.00
Pict-O-Graph (color on the Mac II)	105.00
Deneba	
Canvas	109.00
Dream Maker	
MacGallery	29.00
Dubl-Click	
Wet Paint - Both Volumes	36.00
Enzan-Hoshigumi	
MacCalligraphy	109.00
LaserWare	
LaserPaint Color II	359.00
Management Graphics	
Easy Slider 1.0	105.00
MicroMaps	
MacAtlas Pro (MacDraw format)	129.00
Olduvai	
Post-Art	35.00
Shaherazam	
Mac-a-Mug	39.00
Mac-a-Mug Pro	349.00
Silicon Beach	
Digital Darkroom	159.00
SuperPaint (super graphics)	109.00
Super 3D	159.00
Solutions	
Curator (graphics management)	79.00
SuperMac	
PixelPaint	259.00
Symmetry	
PictureBase 1.2	58.00
T/Maker	
ClickArt Business or Publications	28.00
ClickArt EPS Illustrations	78.00
Unison World	
Chest Top Publishing	34.00
Zedcor	
DeskPaint	69.00



The Fully Powered Mac (Simon & Schuster) — Packed with essential programs to unleash your Mac's hidden power. Includes numerous shareware utilities. (utilities) **\$24.00**

Olduvai	
Read-It! (optical character recognition) ...	199.00
Read-It! TS (ThunderScan version)	79.00
Solutions	
SuperGlue (total graphics integration)	55.00
Target	
Scoop	SPECIAL 189.00

NETWORKING PRODUCTS

Connect Inc.	
MacNet	Call
Farallon	
PhoneNET (128/512 or Plus, SE & II)	Call
PhoneNET Appletalk Adapter	8.00
Microsoft	
Mail	Call
Nuvotech	
TurboNET (128/512 or Plus, SE & II) ... ea	27.00
TurboNET Apple Talk Adapter	5.00
TOPS	
TOPS	119.00
WOS Data Systems	
Timbuktu 2-User pack	119.00
Timbuktu Add'l pks	67.00

FONTS

Adobe	
Fonts (various volumes)	Call
Altsys	
Fontastic Plus	47.00
Beyond Inc.	
MenuFonts 2	32.00
Dubl-Click	
World Class Fonts - Both Volumes	36.00
Postcraft	
Laser FX	117.00

CAD/CAM

Diehl Graphsoft	
MiniCad 4.0	375.00
Innovative Data	
MacDraft 1.2a (power drafting)	155.00
Micro CAD/CAM	
MGMStation 2.5 (professional CAD)	685.00
VersaCad	
VersaCAD Macintosh	1499.00

FINANCIAL AND ACCOUNTING SOFTWARE

Aatrix	
Payroll 3.01	115.00
Bedford	
Simply Accounting	219.00
Chang	
Rags to Riches 3 Pak	289.00
Intuit	
Quicken	35.00
MECA	
Andrew Tobias' Managing Your Money ..	129.00
Migent	
In-House Accountant	119.00
Monogram	
Business Sense	279.00
ShopKeeper Software	
Bill-It 1.06	99.00
Survivor	
MacMoney (personal finance)	62.00

STATISTICAL ANALYSIS

Abacus Concepts	
StatView II (req. Mac II, or Plus/SE w/68881 co-processor)	369.00
BrainPower	
MathView Professional	145.00
StatView 512+ (requires 512k)	175.00
D2 Software	
MacSpin 1.5	155.00

MUSIC AND SOUND

Electronic Arts	
Deluxe Music Construction 2.0	61.00
Farallon Computing	
MacRecorder (records sound)	149.00
Great Wave	
ConcertWare + MIDI 4.0	79.00
Impulse	
Impulse Audio Digitizer w/SoundWave ...	149.00
Opcode Systems	
Music Mouse	39.00
Passport Designs	
Master Tracks Pro	259.00
Master Track Jr.	109.00

EDUCATIONAL/PERSONAL

Bright Star Technology	
Alphabet Blocks	32.00
Davidson	
Math Blaster	27.00
Electronic Arts	
Business Simulator (executive training) ...	48.00
First Byte	
Kid Talk, Math Talk ea	32.00



Prototyper(SmethersBarnes) — Unique design that allows you to create a complete, professional user interface without writing one line of program source code. (language) **\$79.00**

DESKTOP PUBLISHING PRODUCTS

Adobe	
Illustrator 88	349.00
Aldus	
PageMaker 3.0	489.00
Letraset	
Image Studio	279.00
Ready,Set,Go! 4	279.00



Canvas 1.0 (Deneba) — Create professional quality graphics designs with extra large continuous drawing area using six different transfer modes. (graphics) **\$109.00**

- VISA and MASTERCARD accepted. No surcharge.
 - Your credit card will not be charged until your order is shipped.
 - If we must ship a partial order, we pay the freight on the remaining portion.
 - All U.S. shipments are insured at no extra charge.
 - C.O.D. orders accepted (add \$3.00 surcharge) — \$1,000 maximum. Cash or certified check.
 - Corporate purchase orders accepted subject to credit approval.
 - All products are covered by a 120 day limited warranty.*
 - CT residents add 7.5% sales tax. NJ residents add 6.0% sales tax.
- SHIPPING**
- All orders add \$3.00 per order. We ship Federal Express Standard Air, unless UPS ground delivers overnight.
 - We ship all orders (except C.O.D.) via Federal Express Standard Air unless instructed otherwise at time of order.
 - C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS ground).
 - Alaska, Hawaii, Foreign, APO/FPO please inquire at time of order.
- * Defective software replaced immediately. Hardware replaced or repaired at our discretion.

I'm Kerry, call me at:
1-800-255-6227
 (1-800-ALL-MACS)
 Inquiries: 201-367-0440 Canada: 800-255-6447
 FAX # 201-905-9279

MacWAREHOUSE™
 1690 Oak Street, P.O. Box 1579,
 Lakewood, NJ 08701
 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)

MWH8





“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.”

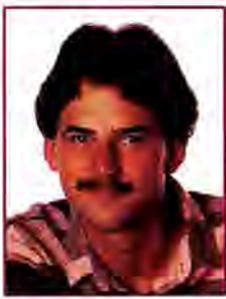
“Well, I don’t mean to hurt all those people—or anyone, really.”

“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.

SPA  Software Publishers Association
Suite 1200
1111 19th Street, N.W.
Washington, D.C. 20036



Quick Tips

Answers to your questions

by **Lon Poole**

As I mentioned in a previous column (April 1988), you can prefix folder and document names with spaces or symbols to determine where the names appear in the Open dialog box or the Finder's By Name view. But Andy Hong of Menlo Park, California, notes that the Finder won't let you simply insert a space in front of a name. To fool the Finder, you must type a nonspace character followed by a space. Then delete the nonspace character—for example, by pressing the Left Arrow key followed by the Backspace (or Delete) key.

Stack Fonts II

In response to a tip in an earlier issue, I said that you could use Font/DA Mover to move fonts into HyperCard stacks. But Bruce Long, who submitted the tip, points out that Font/DA Mover cannot install fonts in stacks or other documents that have no resources. If you try, the utility informs you that the file you're trying to open may be damaged or in use. Because most stacks have no resources, Long suggests using ResEdit to copy fonts into stacks.

Object Self-Reference

How do I get a HyperCard button to refer to itself? The following script doesn't work:

```
on mouseUp
  get the name of this button
  go stack it
end mouseUp
```

*Brad Knowles
Norman, Oklahoma*

A You can't identify a button using the word *this*. Instead, use the Target function, which identifies the object

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, 1987).

that first received the current message. You can also use the special object Me, which identifies the owner of the current handler. Try either of these scripts:

```
on mouseUp
  go stack short name of the target
end mouseUp
or
mouseUp
  go stack short name of me
end mouseUp
```

Enormous Word Documents

While trying out Microsoft Word 3.0 at my local dealer, I decided to find out how many pages Word could handle. So I wrote a sentence, copied it, and pasted it many times. When I tried to save this document on an 800K disk, an alert box said, "Not enough space on disk to save work." In the lower-left corner of the Word window was the cryptic message, "5331201 Cha." My dealer couldn't explain it; can you?

*Stefan Johansson
Malmo, Sweden*

A Although theoretically there's no limit to Word document size, practical limits intrude when a document gets very large. You discovered one such limit, namely that the whole document must fit in the space available on a disk. The document you created would have been over 5000K. An empty 800K disk has space for slightly less than one-sixth of that. You might have been able to save your mammoth document on a hard disk, although saving 5000K would have taken ages. I've found Word documents over about 200K aren't worth the wait. Word lets you split a long document into manageable pieces and link the pieces together with a special feature of the Page Setup command (described in the Word manual under "Long Documents").

You might think your 5-megabyte document would be too big for your Mac's

1MB memory. Word uses "mirrors" to let you paste together a document larger than the available memory. What you see on screen are reflections of the original text. However, Word doesn't save reflections on disk. It needs space to store real text.

Text Style Changes in Bulk

Is there a way to change text style throughout a document using one command in a word processor such as Microsoft Word, MacWrite, or WriteNow? The grant and research proposals we write at North Texas State University require italicized scientific terms that may each appear as many as 50 times in a 300-page paper.

*John F. Vickrey
Denton, Texas*

A A word processor with style sheets at the character level would make your task easy. However, no currently available Mac word processor has them. Word 3 for the Mac has style sheets at the paragraph level only (the IBM PC version of Word has had character-level style sheets for years—growl). New word processors such as FullWrite Professional, WordPerfect, and the next version of Word may include character style sheets.

In the meantime, you can change the text attributes of a specific word or phrase throughout a Word 3 document using the Change command from the Search menu. First, find an instance of the text you want changed and give it the attributes you want it to have. Select and copy that text to the Clipboard. Click at the beginning of the document and choose the Change command. Type the text you want to find in the Find What box, and type ^c (lowercase c) in the Change To box. This tells Word to replace each instance of the original text with the contents of the Clipboard.

(continues)



YOUR WORDS DESERVE OUR LETTERS...

Now you can choose from over 40 Letraset display faces for your page layout and design work on the Macintosh. These faces are best sellers from the Letraset Library of over 700 display styles. All of these styles have been specifically designed to work in headlines or for short word settings for logos, ads, posters, covers, packaging, etc. They offer a potential for creative typography previously unavailable on the Macintosh.

Type quality from a type leader

Each face is digitized from the original master to the highest typographic

standards. It ensures that your designs have the true type character envisioned by the type designer. The complete font has been produced including alternate characters, ligatures, flourishes and symbols. You spend less time polishing typographic ideas because the refinements are available at a keystroke.

Extensive compatibility

Letraset Electronic Type Library™ faces are designed to be used with LetraStudio software. They are compatible with all page layout, illustration and paint programs supporting EPSF as well as all Apple Macintosh compatible printers. The styles are offered in packs of 3-5 faces.

Call (800) 722-0377 for the nearest Authorized Letraset Graphic Design Software dealer.



ALGERIAN

BALLOON Extra Bold

Balmoral

Bramley Medium

Brighton Medium

Cabaret

Caxton Roman Light

Caxton Roman Light Italic

Caxton Roman Book

Caxton Roman Bold

Caxton Roman Extra Bold

CHROMIUM ONE

Commercial Script

Compacta

Compacta Italic

Compacta Bold

Corinthian Light

Corinthian Medium

Corinthian Bold

Corinthian Extra Bold

Crillee Italic

Crillee Extra Bold Italic

Demian

FRANKFURTER

Frankfurter Medium

Freestyle Script

Gillies Gothic Extra Bold Shaded

Harlow

Harlow Solid

Helvetica Medium Condensed

Helvetica Bold Condensed

Premier Lightline

PREMIER Shaded

PRINCETOWN

Romic Light

Romic Light Italic

Romic Medium

SUPERSTAR

University Roman Bold

Van Dijk

Vegas

Letraset Subsidiaries

Australia
Tel 02 975 1033

Austria
Tel 0222 921449

Belgium
Tel 02 4287156

Denmark
Tel 02 849300

Letraset Export Ltd.
Tel 0233 24421

Canada
Tel 416 4757511

Finland
Tel 358 0565 3355

France
Tel 4859 1540

Germany
Tel 069 420 9940

Nederland
Tel 02907-5641

Italy
Tel 02 462451/2/3

Japan
Tel 03454 0931

Norway
Tel 02 257350

Spain
Tel 91 2798072

Sweden
Tel 08 7647760

Switzerland
Tel 01 8106266

UK
Tel 01 928 3411

Letraset USA
Tel 1 201 845 6100

All typefaces shown will be available by year end 1988.



...AND LETRASTUDIO™ SOFTWARE TO MAKE THEM EXCITING

LetraStudio lettering software gives you real creative control over all your display typography. You can manipulate and customize type to achieve the maximum creative potential in each Letraset face. Your designs will get more attention while adding character to the overall message. These examples show just a few of the ways you can create exciting typography. LetraStudio software works with all Letraset software design solutions including Ready,Set,Go!™ page layout software and ImageStudio™ image processing software.

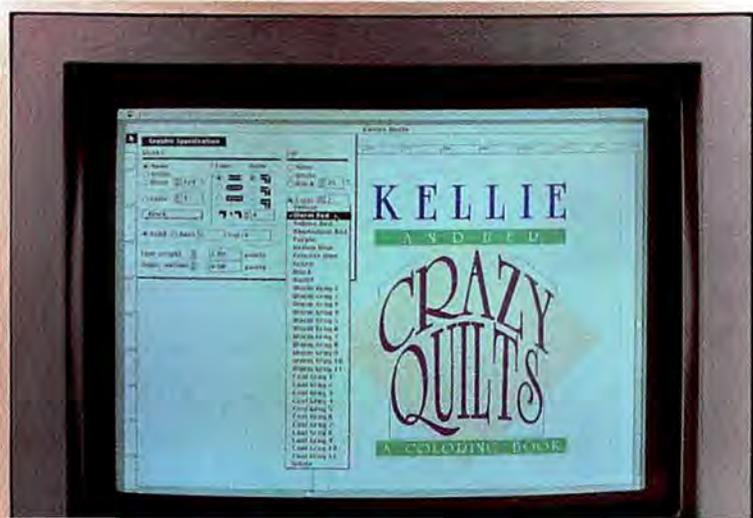
► LetraStudio type distortion option creates a focal point for this cover design. There are 8 different options plus running text along straight, circular or arbitrary curves.

Type: Letraset University Roman Bold

KELLIE
AND HER

CRAZY
QUILTS

A COLORING BOOK



SNOOKER



◀ An extra dimension was added to the type with LetraStudio software and combined with art created on Adobe Illustrator '88.

Type: Helvetica

TAKING A
GIANT
STEP

◀ Spot art is easy to create—the box shapes were produced in LetraStudio software and then the type was stretched while in position.

Type: Letraset Frankfurter

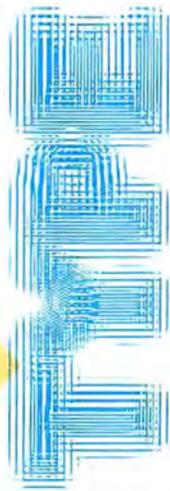


image
TYPE
image

◀ Special effects created by combining a Letraset Electronic Type Library font and ImageStudio software. Most page layout and art software for the Macintosh is supported by LetraStudio software.

Type: Helvetica & Freestyle Script



◀ The character of a beautiful letter is enhanced by selecting one of the many optical distortions available.

Type: Letraset Algerian

Letraset®

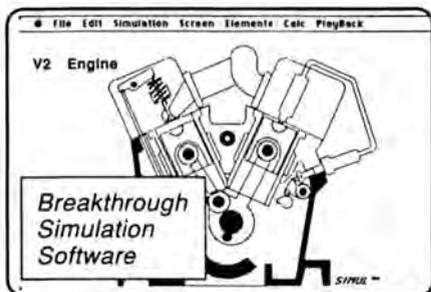
⊗ ESSELTE

Ready,Set,Go! is the trademark of Manhattan Graphics Corporation. ImageStudio, LetraStudio and Electronic Type Library are trademarks of Esselte Pandalflex Corporation in the USA, of Letraset Canada Limited in Canada and of Esselte Letraset Limited elsewhere. Other brand or product names are trademarks or registered trademarks of their respective holders.

© Letraset, 1988

Circle 226 on reader service card

TAKE THE UNIVERSE OUT FOR A TEST DRIVE!TM FREE!



Trying to explain how to use a product that can simulate just about any dynamic relationship in the known universe can get a little mind-boggling, so we thought we'd get you to help us. Send us your problem...and you'll solve ours.

You see, SIMUL can do some fantastic things. It is helping the U.S. Coast Guard design a boat that doesn't rock and roll in rough waters. It has shown a machine fabricator exactly how long to cut a sheet of metal and where to bend it. In applications like this, SIMUL totally eliminates expensive trial-and-error techniques, time-consuming model building and does testing that was never before possible. Some of the cost savings have been so great that the software not only paid for itself, but also paid for the hardware to run it.

Here's our offer. On your letterhead, tell us what problem you think SIMUL could solve for you. We'll pick the one that most exemplifies just how amazing our software is and award a FREE copy to the winner, as well as extended technical support for the project.

We will pick the winner on September 1st and tell you about it in the November issue of *Macworld*.

Now is your chance to "Test Drive the Universe" FREE and solve some problems that may have been unsolvable until now.

SIMULTM—For the first time, you can draw, visualize, and calculate the dynamic interaction occurring in virtually *any* phenomena, right on your desktop.

- Create simulations using values, formulas or moving objects
- Full graphic palette (you can also import designs from any other software)
- Export or import numerical data
- Almost infinite formulas

SHIPPING!

ABVENT

23331 EL TORO ROAD, SUITE 209
EL TORO, CALIFORNIA 92630
FAX: (714) 380-0858 TELEX: 650 319-3233

(714) 380-0333

© 1988, by ABVENT. SpaceEditTM trademark of ABVENT, SimulTM trademark of Soft Technologies

How To/Quick Tips

Word notes how the Clipboard text deviates from the normal character format of the paragraph from which it came, and applies the same deviations to the normal character format of each instance of the text to be found. This method works best if all the text being changed appears in paragraphs that have similar character formats. Applying a character style to text within a paragraph that's already in that character style will cancel out your style selection. For example, if you change a word to italic in a paragraph whose normal style is italic, the word will be in plain text rather than italics in that paragraph. For another method, see the Rich Text tip below.

Those Memory Leftovers

After upgrading my Mac SE's memory from 1MB to 2.5MB, the dealer gave me back the two 256K SIMMs. What can I do with them?

*Eric R. Krebs
San Francisco, California*

Save your leftover SIMMs for a holiday cheese ball. They can't be used in a Mac Plus or an SE because of those machines' memory configuration requirements (see "Installing Memory," May 1988). Four 256K SIMMs (but not just two) can be added to a 1MB or 4MB Mac II, but a Mac II requires 120-nanosecond memory—and memory from an SE or a Plus is usually rated at 150 nanoseconds. The slower memory may work in a II, but then again it may not. Perhaps the two 256K SIMMs in your Mac will die and you can replace them with the extras.

Editing Landscape Pictures

We use Adobe Illustrator to create most of our company's graphics. To get templates, we scan artwork using a Microtek 300A at 72 dots per inch. Some of the artwork is horizontally oriented. Because we must scan it vertically, we need to rotate it in a MacPaint-type program before using it in Illustrator. We can do the rotation in MacDraw, but we can't edit the scanned image there. Are there any paint programs that handle wide documents?

*Mike Penn
Pittsburgh, Pennsylvania*

A *Macworld* contributing editor and resident graphics specialist Erfert Fenton says Canvas (\$195 from Deneba Software, 800/622-6827 or 305/594-6965 in Florida) can do what you want. Before pasting the scanned image, use Canvas's Page Setup command to select Landscape Orientation. After pasting, use the Rotate 90° command from the Effects menu to turn the scanned image.

Control Panel Order

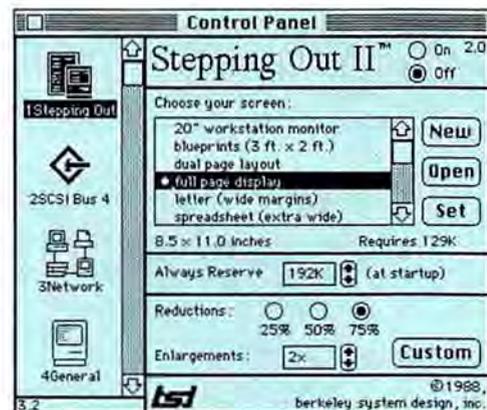
Tip: By renaming files in the System Folder that correspond to options and devices in the Control Panel—using System 4.1 or higher and Control Panel 3.1 or higher—you can easily rearrange them in any order that suits you. (Normally, General appears first, and all other items appear alphabetically after it.) Another method is to put numbers in front of the original names (see "Order Please"). To rename some files—including General, Color, Keyboard, Monitors, Mouse, Sound, and Startup Device—you have to duplicate them (use the Finder's Duplicate command), rename the copy, and throw away the original.

*Paul R. Pudaite
Urbana, Illinois*

Rich Text

Tip: Word 3's ability to save a document in Rich Text Format, which it calls Interchange (RTF), does far more than facilitate communication between computers. It also lets you easily change text attributes (font, size, and style) and make other formatting changes throughout the document.

(continues)



Order Please

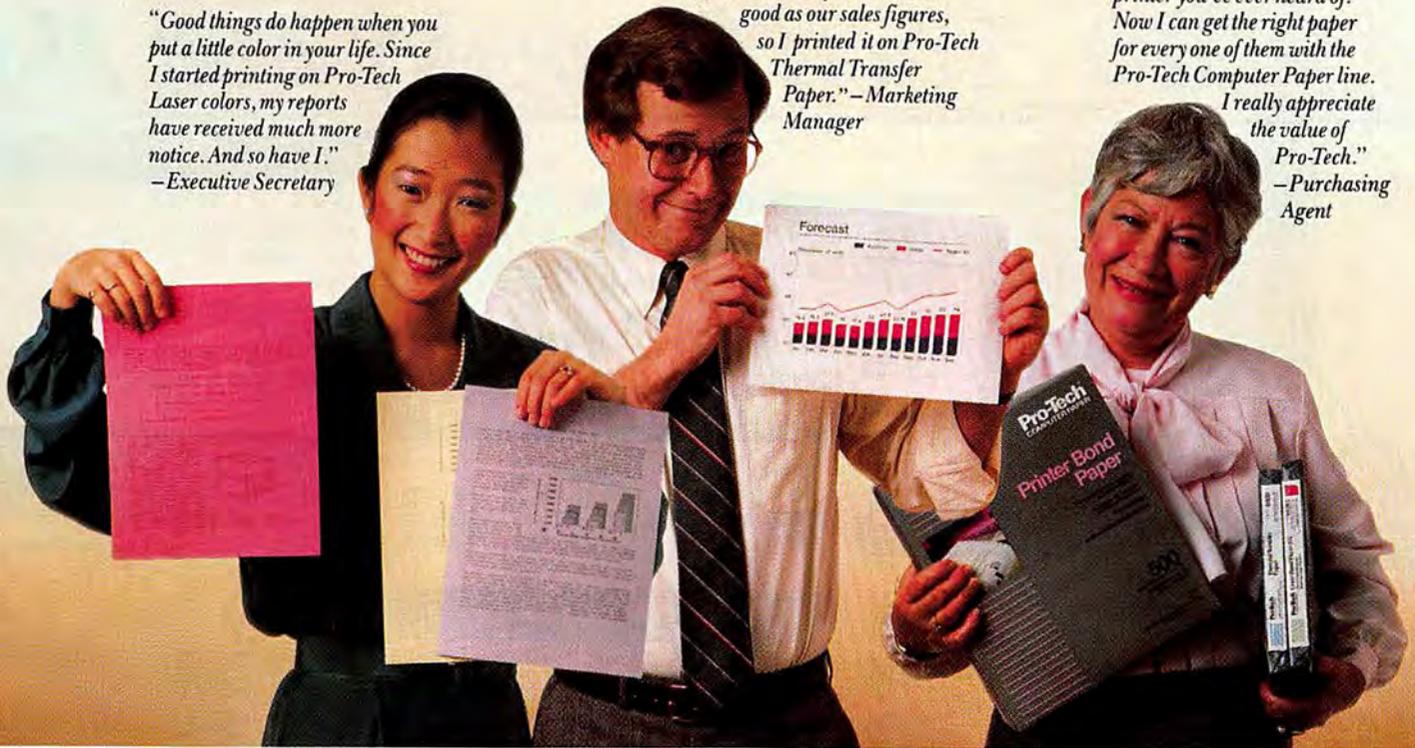
By renaming (or numbering) the appropriate files in the System Folder, you can change the order of the options and devices listed in the Control Panel. Here, *Stepping Out II*, a screen extender, has been placed at the top of the list.

Circle 166 on reader service card

*"Good things do happen when you put a little color in your life. Since I started printing on Pro-Tech Laser colors, my reports have received much more notice. And so have I."
—Executive Secretary*

"We've had a great year. I wanted my Year End Report to look as good as our sales figures, so I printed it on Pro-Tech Thermal Transfer Paper." —Marketing Manager

*"We have every kind of computer printer you've ever heard of. Now I can get the right paper for every one of them with the Pro-Tech Computer Paper line. I really appreciate the value of Pro-Tech."
—Purchasing Agent*



Why people love their Pro-Tech Computer Paper.

Who wouldn't love a computer paper specially designed for the printer they use?

The Pro-Tech family of specialty computer papers and film provides the consistency and reliability required for superior image quality and is specifically designed for dot matrix and daisywheel, ink jet, laser and thermal transfer printers as well as pen plotters. Pro-Tech enhances your printer's performance. And your image.

The complete line includes: Laser Papers for hi-speed and desktop laser printers (in white and colors, 25% cotton and other special finishes), Ink Jet Paper, Thermal Transfer Paper, Pen Plotter Paper, Printer Papers (in bond, 25% cotton and other special finishes) and Transparency Film. You'll love them.

Pro-Tech™

Because the right paper and film makes all the difference.™

Circle 125 on reader service card

Yours Free! For free samples of the right paper for your printer, contact Pro-Tech today. Return this coupon to: Pro-Tech Sampler Kit, c/o James River Corporation, Groveton Division, Groveton, NH 03582 or call toll-free Mon-Fri 8:00-5:00 EST...

1-800-521-5035

In MA: 413-589-7592

Name

Title

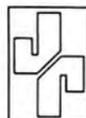
Company Phone

Address

City

State Zip

My computer printer is a
(Manufacturer - Make - Model No.)



JAMES RIVER CORPORATION
GROVETON DIVISION
Groveton, NH 03582

8/88

© 1987 James River Corporation

CMO. YOUR COMPANY FOR MAC



NETWORK SPECIALTIES
Big Top \$1499

MONITORS

Network Specialties	
High Top Full Page Display.....	1099.00
Flat Top LCD.....	1499.00
Nuvotech	
Easyview 14" Monitor.....	319.00
Sigma Designs	
Laserview Display 19" SE.....	1849.00
Laserview Display 19" II.....	1889.00
Power R	
MacLarger 12" Monitor.....	369.00
Radius	
Full Page Display.....	995.00
Two Page Display.....	1595.00
Two Page Grey Scale Card.....	1795.00
Full Page Display Card-Plus&SE.....	495.00
Full Page Display Card-II.....	595.00

MODEMS

Anchor	
2400 Mac Pac w/Software.....	189.00
Everex	
EMAC MD 2400.....	219.00
Practical Peripherals	
Practical Modem 2400E.....	199.00

NETWORKING

NUVOTECH	
Turbonet.....	27.00
Adaptor Cable.....	5.50
Custom Wiring Kit.....	69.00

DRIVES W/TAPE BACKUP

Everex	
EMAC 20/60.....	1499.00
EMAC 40/60.....	1899.00
EMAC 91/60.....	2499.00

HARD DRIVES

CMS	
MacStack 20.....	569.00
MacStack 43.....	839.00
MacStack 60.....	899.00
MacStack 80.....	1399.00
Pro 30 SE/i.....	599.00
Pro 43 II/i.....	699.00
Pro 60 II/i.....	779.00
Pro 80 II/i.....	1299.00

Everex	
EMAC 20ID.....	559.00
EMAC 40ID.....	799.00
EMAC 91ID.....	1499.00
EMAC 40D.....	999.00
EMAC 91D.....	1499.00



EVEREX
EMAC20 \$599

PCPC	
MacBottom HD21.....	829.00
MacBottom HD21M.....	939.00
MacBottom HD32.....	969.00

Tool Kit.....	16.99
SCSI Adaptor.....	119.00
Dip Simms 1x8 1mg.....	479.00

TAPE BACKUP

AST	
AST 2000.....	1499.00
AST 4000.....	3999.00
CMS	
Tapestack 60.....	789.00
Mountain	
20MB Dual Removable.....	1899.00
20MB Removable Bernoulli.....	1499.00



EVEREX
EMAC 60T \$949

UPGRADE

Dove Computer	
MacSnap 2SE.....	339.00
MacSnap 524.....	Call
MacSnap 524E.....	Call
MacSnap 524S.....	Call
MacSnap 548.....	Call
MacSnap 548E.....	Call
MacSnap 548S.....	Call
MacSnap Plus 2.....	Call

Over 90% of orders ship the same or next day.



Our technical support is unequalled.

HARDWARE AND PERIPHERALS.

FLOPPY DRIVES

Central Point	
800k External.....	189.00
Cutting Edge	
800k External.....	189.00
Mirror Technologies	
Magnum 800.....	209.00

DIGITIZERS/SCANNERS

AST	
Turbo Scan.....	1399.00
Data Copy	
Flatbed Scanner.....	1299.00
Mac Interface Kit.....	489.00
Koala	
MacVision 300 DPI.....	199.00

SOFTWARE



**MIGENT
In-House-
Accountant \$99**

ABA	
Draw-It-Again Sam.....	95.00
Ashton Tate	
dBase Mac.....	299.00
Full Write Professional.....	279.00
Berkley System Design	
Stepping Out.....	55.00
Brainpower	
Statview 512 Plus.....	189.00
Borland	
Turbo Pascal.....	69.00
CE Software	
Quick Keys.....	69.00
Cricket Software	
Cricket Draw.....	179.00



**MICROSOFT
Excel \$249**

Cricket Graph.....	119.00
Cricket Presents.....	339.00
Data Tailor	
Trapeze.....	159.00
Data Viz	
MacLink Plus with cable.....	139.00
Deneba	
Coach.....	69.00
Coach Professional.....	139.00
Canvas.....	139.00
5th Generation	
Fast Back.....	69.00
Letra Set	
Ready—Set—Go 4.0.....	289.00
Lundeen & Associates	
Works + Spell.....	55.00
Microsoft	
Works 1.1.....	189.00
Write 1.1.....	139.00
File 1.05.....	129.00
Power Point 1.0.....	Call
Microlytics Inc.	
Word Finder.....	39.99
Nashoba	
Filemaker Plus.....	Call
Silicon Beach	
Silicon Press.....	49.00
Super Paint.....	89.00
Survivor	
MacMoney.....	
Traveling Software	
Laplink.....	99.00
Word Perfect Corporation	
Word Perfect.....	209.00

ACCESSORIES

Allsop	
Disk File 10 Holds 10 3 1/2" Disks... 3.99	
Disk File 30 Holds 30 3 1/2" Disks... 9.99	
Cleaning Kit for 3 1/2" Disks... 15.99	
Curtis	
3 Outlet, Duplex/Filter..... 48.00	
6 Outlet, 6' Cord/Filter..... 48.00	
6 Outlet, 6' Cord/Duplex..... 29.00	
Data Desk International	
Mac 101 Keyboard II + SE..... 155.00	
Mac 101 Keyboard Plus..... 155.00	
Kalmar Designs	
Teakwood Disk Cabinet for 3 1/2" ... 13.99	
Kensington	
Turbo Mouse..... 77.00	
Turbo Mouse ADB..... 77.00	
System Saver..... 63.00	
Tilt/Swivel..... 21.00	
Disk Drive Cleaning Kit..... 19.00	
Microcomputer Accessories, Inc.	
MacIntosh Valet..... 109.00	
PTI/Datashield	
S-85/Surge Protector..... 59.00	
S-100 Surge Protector..... 69.00	

DISKS



**MAXELL
DS/DD Disks \$18⁹⁹**

Maxell	
Maxell 3 1/2" DS/DD.....	18.99
Maxell 3 1/2" SS/DD.....	12.99
Sony	
Sony 3 1/2" SS/DD.....	11.99

CMO MacCenter

In the U.S.A. and in Canada

Call toll-free: 1-800-451-8437

Outside the U.S.A. call 717-327-9575, Fax 717-327-1217

CMO. 101 Reighard Ave., Dept. N1, Williamsport, PA 17701

OVER 350,000 SATISFIED CUSTOMERS • ALL MAJOR CREDIT CARDS ACCEPTED • CREDIT CARDS ARE NOT CHARGED UNTIL WE SHIP.

POLICY: Add 3% (minimum \$7.00) shipping and handling. Larger shipments may require additional charges. Personal and company checks require 3 weeks to clear. For faster delivery, use your credit card or send cashier's check or bank money order. Credit cards are not charged until we ship. Pennsylvania residents add 6% sales tax. All prices are U.S.A. prices and are subject to change, and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be replaced or repaired at our discretion within the terms and limits of the manufacturer's warranty. We cannot guarantee compatibility. All sales are final and returned shipments are subject to a restocking fee.

N108

To convert a document to RTF, use Word's Save As command. In the Save As dialog box, click the File Format button and then select the Interchange (RTF) option. Enter a new document name and click the Save button. You'll then get a new plain-text document with mnemonic codes for every format. For example, the three characters \ul indicate underline style. You can replace one format with another using Word's Change command (changing \ul to \i converts underline to italics).

When you finish changing formats, save the document and close it. Then open it again, answering Yes when Word asks whether it should interpret RTF codes. A little while later, you'll see your document with the formatting changes.

Jan Bruyndonckx
Hove, Belgium

Changing styles and sizes of individual words is easy if you know the RTF codes (see "RTF Character Formats"). Changing fonts of individual words is more complicated. RTF encodes fonts by number and correlates fonts and RTF font numbers in a font table at the beginning of the document. If you want to change to a font that's not listed in the font table, temporarily add some text in that font to the

regular, non-RTF version of the document and then resave it as an RTF document. Immediately following the font table, RTF encodes all the document's style sheets. You shouldn't need to change any of them in the RTF version. Instead, make the changes in the non-RTF version using the Define Styles command.

Note: During the conversion to and from RTF, Word may lose tab settings you've put in paragraphs' formatting rulers. It doesn't seem to lose tab settings in style sheets, however.

For complete RTF documentation, call Microsoft Customer Service at 206/882-8088 or write to Microsoft Corp., RTF Applications, Box 97017, Redmond, WA 98073-9717.

MultiFinder Compatibility

Tip: A few applications don't work properly with MultiFinder. To avoid accidentally opening an incompatible one, set its application memory size to a number larger than the amount of memory on your Mac, such as 9999. This prevents you from launching the application with MultiFinder active but still allows you to open it when MultiFinder is inactive. To change the application memory size, make sure MultiFinder is active, select the application icon,

and choose Get Info from the Finder's File menu.

Christopher Eliot
Leeds, Massachusetts

Multifaceted Excel Macros

Tip: By combining multiple Excel command macros, you can run them in rotation with the same Option-⌘-character key combination. As a simple example, one macro can cyclically change the alignment of the current worksheet selection (see "Schizoid Macro"). Each time you run the macro, it changes to the next alignment in its cycle: left, center, right, and repeat.

Calvin Walker
Potts Point, NSW, Australia

	A
1	ALIGNMENT
2	left
3	=IF(cycle=0,ALIGNMENT(2),GOTO(center))
4	=SET.VALUE(cycle,cycle+1)
5	=RETURN()
6	center
7	=IF(cycle=1,ALIGNMENT(3),GOTO(right))
8	=SET.VALUE(cycle,cycle+1)
9	=RETURN()
10	right
11	=ALIGNMENT(4)
12	=SET.VALUE(cycle,0)
13	=RETURN()
14	cycle
15	0

Schizoid Macro

Each time you run this Excel macro, it changes the worksheet selection to the next alignment in this cycle: left, center, right, and repeat. Cell A15 in the macro keeps track of the cycle. You must name cell A3 "left," A7 "center," and A11 "right."

SuperPaint Line Length

Tip: If you need to shorten or lengthen several lines in SuperPaint's drawing layer, select them all and choose Scale Selection from the Edit menu. Select or enter the amount of scaling needed (for example, scaling by 200 percent doubles the line lengths). Then click OK.

Richard C. Johnson
Baton Rouge, Louisiana

We pay \$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), The Source (BCW440), or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld. □

Code	Format
\plain	Plain
\b	Bold*
\i	Italic*
\strike	Strikethru*
\outl	Outline*
\shad	Shadow*
\scaps	Small caps*
\caps	All caps*
\v	Hidden*
\fx	Font number x**
\fsx	Font size x half-points
\expndx	Expand or Compress x quarter-points (negative x compresses)
\ul	Underline*
\ulw	Word underline*
\uld	Dotted underline*
\uldb	Double underline*
\ulnone	Cancel all underlining
\upx	Superscript x half-points
\dnx	Subscript x half-points

* Can be turned off by repeating the format code with a suffix of zero (0).

** A font table at the beginning of the document correlates fonts and font numbers.

RTF Character Formats

To change the attributes of individual words throughout a Word 3 or MacWrite document, change their text attribute codes in the Rich Text Format (RTF) version of the document. Then convert the RTF version back to the regular Word or MacWrite format.

A

**Tell me more about CG TYPE™ for my Macintosh™. And send me
The Art and Technology of Typography.**

O

I understand that this illustrated resource on the art and technology of communicating with type is free if I complete this card, and that the offer is good while supplies last.

a

Name: _____ Company: _____

Address: _____

City/State ZIP: _____ Telephone _____

e

My primary business is: _____ Number / Manufacturer of fonts I own: _____

Hardware/Software products I use now: _____

i

I intend to purchase ___ additional fonts within 3 months 6 months 12 months

I would buy these fonts (specify): _____

h

Concerning CG TYPE, Have a representative call Send me literature





**NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**

BUSINESS REPLY MAIL

First Class Permit No. 48 Wilmington, MA 01887

Postage will be paid by addressee:



compugraphic®

Compugraphic Corporation

Attn: CG TYPE Support Group, M.S. 90-2-4F

Type Division

90 Industrial Way

Wilmington, MA 01887



Express your style with CG TYPE™



"I COULD SEE RIGHT AWAY THE BROCHURE MEANT BUSINESS. The typography was quality, all the way. The face was CG TYPE™ Antique Olive. Crisp, economical, infinitely readable. A real business type, like me. Obviously the brochure was the product of a designer who understood the evocative power of typography and played it like a Stradivarius.

"From now on, I'll be seeing more and more business publications that look like they mean what they say. Because now all the designers who use Macintosh™ computers can get type—as well as consultation and technical support—from the professionals. From the people whose name is on the type charts that designers have been consulting for years: Compugraphic."

PostScript®-compatible. Competitively priced. Free overnight delivery. Call the type experts, at 800-MAC-TYPE for more information. In Canada, call 800-533-9795.

Compugraphic is a registered trademark and CG TYPE is a trademark of Compugraphic Corporation. Macintosh is a registered trademark of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems Inc.

Introducing a monumental addition to MACWORLD Expo.

The Macintosh market continues to explode. Last year alone, American businesses and consumers spent over \$2.7 billion* on Macintosh hardware and software.

And MACWORLD Expo has grown right along with the Macintosh market. We went from 208 booths at MACWORLD Expo/San Francisco in 1985 to over 1,200 in 1988. While our Boston show has been every bit as successful. In all, more than 250,000 hot prospects have come to MACWORLD/Expo to see, touch, try, and buy thousands of Macintosh products. In fact, the Macintosh market has

expanded so quickly, we've added a third MACWORLD Expo to meet the demand. **Announcing MACWORLD EXPO/Washington.**

This is your opportunity to reach a tremendously important Macintosh market—the federal government.

In 1987, Uncle Sam's budget for information technology was around \$13.5 billion. And according to *Federal Computer Week*, it's headed toward \$20.2 billion by 1991.

The federal government is one of the largest users of Macintosh hardware and software—communications, accounting, education, engineering, office automation, CAD/CAM, database management, and more.

So there's plenty of opportunity for those in the right place at the right time—April 26, 27 & 28, 1989.

The original Macintosh computer show.

MACWORLD Expo/Washington is your chance to expand your reach beyond MACWORLD Expo/Boston and MACWORLD Expo/San Francisco. And sell directly

to thousands of key decision-makers in the federal government.

MACWORLD Exposition is sponsored by *MACWORLD*, the Macintosh magazine, and *Federal Computer Week*, the newspaper for systems decision makers in government.

For information about exhibiting in Washington, Boston, or San Francisco in 1989, return the attached coupon today. After all, you don't want to miss out on this monumental opportunity.

MACWORLD EXPOSITION®

This is your chance to appear before
the federal government.

If you'd like more information about exhibiting at MACWORLD Expo 1989, please fill out and mail this coupon to: MACWORLD Expo, P.O. Box 155, Westwood, MA 02090.

I'm interested in exhibiting at MACWORLD Expo 1989 in:

San Francisco Washington, D.C. Boston
January 20, 21 & 22, 1989 April 26, 27 & 28, 1989 August 10, 11 & 12, 1989

Name _____

Title _____

Company _____

City _____ State _____ Zip _____

Telephone _____ MW

*SOURCE: INTERNATIONAL DATA CORP.



For our up-to-date prices, check our weekly ads in the National editions of the New York Times and Wall Street Journal.

NYC stores open Sun 10-5, Mail Order Dept. 10-4 Mon-Thur 9-6, Fri 9-2. Long Island store open Sun 10-5, Mon-Wed 10-8, Thurs 10-9, Fri 10-4. We accept 47% Photo Card, MC, Visa, & American Express—no additional charge, and personal checks w/o delays if approved. Min. shipping and handling \$6.00. Prices herein are for mail and phone orders only. Store prices may differ. This ad supercedes all previous MacWorld ads. We are not responsible for typographical errors.

47st. Computer[®]

CORPORATE ACCT'S WELCOME
Volume purchase pricing available, call.

Prices valid till August 15, 1988



FREE SHIPPING*

On any software item or on any add-on board listed in this ad.

*If you mention the date of this ad while placing your order

DRIVES & TAPE BACKUPS

(All With SCSI Port)

AST Research	
AST-2000 20MB w/20MB Tape	1395.00
Dayna Communications	
Daynafile Single 5 1/4" 360K	Call
Daynafile Single 5 1/4" 1.2MB	Call
Daynafile Single 5 1/4" 720K	Call
General Computers	
Hyperdrive FX-20 20MB	649.00
Hyperdrive FX-40 40MB	899.00
Hypertape 40MB (DC-2000)	899.00
Rodime	
20 Plus 20MB External	639.00
45 Plus 45MB External	899.00
60 Plus 60MB External	1099.00
100 Plus 102MB External	1199.00

InFocus Systems



LCD Proj. Plate
Hi-res 640x480. Supertwist LCD. Use with overhead projector. No fan required. Color deselect (8 colors). Vertical, horizontal & contrast controls.

PCV 6448AV
For SE & Mac II, req. adaptor (opt.)

\$1595

HARDWARE FOR THE MAC

BEST PC Scan 2020

Image & text scanner. The total desktop publishing solution. Up to 300 DPI res. 256 level grey scale image scanning. Built-in SCSI port.



Call Publish Pac Mac (req.) **\$450**

SHIVA Net Serial X232

Access any RS-232 serial device (printer, modem, scanner, etc) when connected to a Net Serial X232 on an AppleTalk network.



\$289.95

MONITORS

NEC	
Multisync II, Plus, XL	Call
Sigma Design	
Laservision 19" (with display card)	1849.00
Princeton Graphics	
Ultrasync (Cable required)	499.95
KEYBOARDS & INPUT DEVICES	
Datadesk	
MAC 101 (Mac Plus)	139.95
MAC 101/ADB (SE & Mac II)	139.95
Lightgate	
Felix (For Mac Plus)	99.95
Kensington	
New! Turbo Mouse	119.95
New! Turbo Mouse ADB	119.95

MISCELLANEOUS

AST	
MAC-286	1099.00
Sigma Corp.	
Net Serial X-232	289.95
Net Modem-1200	324.95
Net Modem-2400	439.95
Kensington	
System Saver Mac	64.95
Farallon	
Mac Recorder	149.95
PhoneNet Plus (DIN-8 or DB-9)	44.95
Tops	
Teleconnector	42.95
Tagrus	
Carry case for Mac + & SE	69.95

SCANNERS

Dest	PC scan 2020	Call
COMMUNICATION		
Hayes		
Smartmodem 1200, 2400	Call	
Migent		
Pocket Modem	119.95	
DISKETTES		
Sony 3 1/2" DS/DD	19.95	
Maxell 3 1/2" DS/DD	19.95	
Fuji 3 1/2" DS/DD	18.95	
Kodak 3 1/2" DS/DD	14.95	

APPLETALK CONNECTORS

AT-1 Appletalk Kit (DB-9)	59.95
ATV-33 Appletalk Cable 33'	49.95

DATADESK



Enhanced 101 keyboard for Mac with programmable function keys, separate numeric keypad and separate cursor pad.

MAC-101 Mac-101/ADB SE & Mac II **\$139.95**

ABA Software	
Draw It Again Sam 2.0	79.95
Activision	
Focal Point	62.50
Business Class 3.0	31.95
Acclus	
4th Dimension	In Store Only
Affinity	
Tempo	49.95
Tempo II	89.95
Adobe	
Illustrator 88	299.95
Adobe Fonts	Call
Publishing Pack	Call
Aldus	
Pagemaker 3.0	In Store Only
Aegis Development	
Doug Clapp's Word Tools	42.95
Alps	
Mac Proof 3.0	99.95
Ann Arbor	
Full Paint	49.95
Allan Bonadio Associates	
Expressionists	49.95
Ashton Tate	
dBase Mac	289.95
Bedford Systems	
Simply Accounting	199.95
Berkeley Systems Design	
Stepping Out-II	59.95
Blyth	
Omnis 3+ Express	299.95
Borland	
Reflex Plus	179.95
Eureka	129.95
Turbo Pascal	64.95
Brainpower	
StatView 512+	179.95
MathView Pro	149.95
Broderbund	
Videoworks II (Macromind)	119.95
Central Point	
Copy II Mac	23.95
Communication Research	
Blast II	79.95

SOFTWARE FOR THE MAC

Computer Associates (BPI)	
General Accounting	54.95
Cricket Software	
Cricket Draw	167.95
Cricket Graph	115.95
Cricket Pict-O-Graph	99.95
Cricket Presents	289.95
CE Software	
QuickKeys	59.95
Calendar Maker	26.50
Disktop	29.95
Data Tailor	
Trapeze 2.0	199.95
Deneba	
Canvas	109.95
Canvas DA	59.95
Coach	59.95
Coach Professional	109.00
Fox Software	
FoxBase+	209.95
5th Generation	
Fastback Mac	59.95
Suitcase	36.95
Powerstation 2.3	36.95
Insignia Solutions	
Soft PC (MAC II)	449.95
Infospere	
Comserve	122.95
Laserserve	54.95
IDD	
Mac Draft	149.95
Intellisoft	
Bookmark	59.95

Letraset	
Ready Set Go! 4.0	279.95
Image Studio	279.95
Lotus	
Jazz 1A	79.95
Living Videotext (Symantec)	
More 1.1	169.95
Microsoft	
Write	119.95
Works	184.95
Word	199.95
Power Point	234.95
Excel	224.95
Manhattan Graphics	
Ready Set Go	289.95
Monogram	
Dollars & Sense	84.95
Business Sense	279.95
North Edge	
Timeslips III	114.95
Nantucket	
McMax	174.95
Meca	
Managing Your Money	124.95
Oidival	
DA Switcher	26.95
Icon-It	41.95
Postcraft	
Laser FX (DTP Utility)	99.95
Postility	54.95
Silicon Beach	
Super 3-D	154.95

Software Venture	
Microphone II	214.95
Microphone 1.1	114.95
Softsync	
Accountant Inc.	159.95
Solutions Inc.	
SuperGlue	49.95
The Curator	74.95
SuperMac Technology	
Diskfit	52.95
Pixel Paint (Mac II)	254.95
Sentinel	154.50
Superlaser Spool	79.95
Shana	
FastForms	84.95
Symetry Corp.	
Acta 2.0	34.95
Hyper DA	38.95
Picture Base	54.95
Software Research	
MacTree	39.95
Survivor Software	
MacMoney 3.0	64.95
Symantec	
HFS Navigator	34.95
Laserspeed 1.5	54.95
Lightspeed C 2.0	94.50
Inbox Mac	Call
Personal Connection	Call
Mac SQZ	49.95
T/Maker	
Write Now	99.95
Click Art	Call
Tops Inc.	
Tops for Mac	Call
Target Software	
Scoop 2.0	239.95
Traveling Software	
Laplank Mac	79.95
Working Software	
Findswell	28.95
Lookup	28.95
Spellsweil 2.0	39.95
Word Perfect Corp.	
Word Perfect	179.95

To order or for general information

In New York State **1-212 608-6934** Out-of-state, toll-free **1-800 221-7774**

Mail Order Address: 36 East 19th Street, New York, N.Y. 10003

67 W 47 St. 1-212-398-1410 115 W 45 St. 1-212-398-1410 116 Nassau St. 1-212-608-6934
 NYC CA LIC #800189/#891860 NYC CA LIC #800191/#811267 NYC CA LIC #811268
 East Meadow Plaza Shopping Center (Long Island) 1-516-794-3660



Getting Started with CAD

CAD programs are making life easier for engineers, designers, and architects. Here's how.

by Jim Heid

This is not a good time to be in the T-square manufacturing business. Computers are replacing traditional drafting tools in the same way that word processors are supplanting typewriters. *Computer-aided-design* (CAD) programs can turn computers into electronic drafting tables that make it easier than ever to create and revise complex drawings.

CAD was born in the sixties, when some automobile and aircraft manufacturers began using mainframe computers and large graphics terminals to design such complex beasts as cars, planes, and missiles. Since these computer systems cost millions of dollars to buy, and hundreds of dollars an hour to run, CAD's benefits were reserved for the few who could afford them.

As the cost of computers shrank and their capabilities grew, CAD became feasible for smaller firms. Shortly after microcomputers debuted, CAD appeared on desktops, though the Mac, despite its superior graphics, wasn't part of the picture. Using the Mac's 9-inch screen to view blue-print-size CAD drawings would be like viewing the ceiling of the Sistine Chapel through a keyhole. But now with big screens available for nearly every model of Mac, and more important, with the Mac II's increased speed, the Mac is becoming a force in microcomputer CAD.

What is CAD? To answer that question, I had to get started with CAD myself. My guide was David Peltz, a fellow *Macworld*

Jim Heid is a contributing editor of Macworld. He has been writing about the Macintosh since its introduction and is the author of dBase Mac in Business (Ashton-Tate Publishing, 1987).



MICK WIGGINS

contributing editor who operates CAD-ventures, a CAD consulting firm in Chatsworth, California. (For more details on Mac CAD software, see Peltz's feature "2-D CAD: A Landscape View," *Macworld*, July 1988.)

It's Object Oriented

At its foundation, CAD is *object-oriented* drawing, a system that stores drawings as a series of individual objects—circles, boxes, arcs, lines, and so on—that can be easily resized and otherwise altered. The other common form of Mac drawing is *bitmapped* drawing—MacPaint-style drawing, where images are stored as a series of on and off bits corresponding to the black and white pixels on the screen (see "Getting Started with Macintosh Graphics," *Macworld*, August 1987).

CAD's three basic drawing categories are mechanical, architectural, and electrical engineering (see "Three Faces of CAD"). Mechanical CAD is the broadest

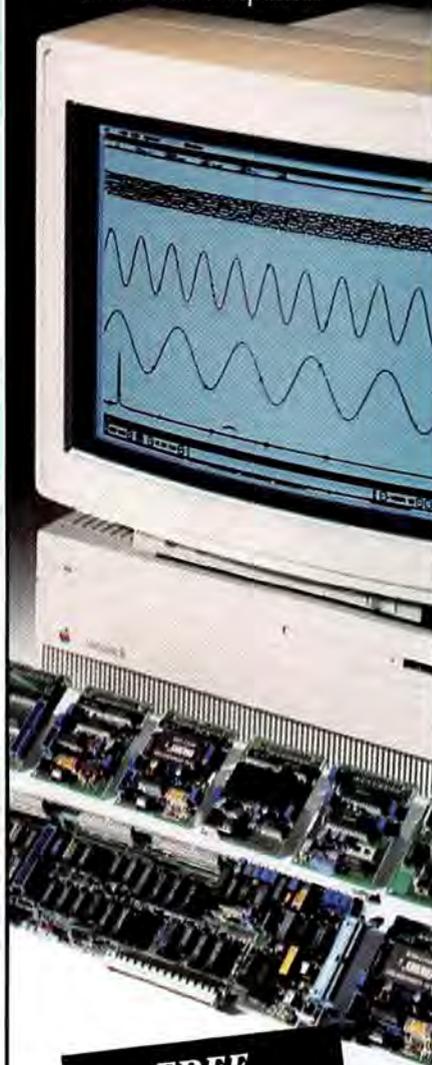
category. It involves the design of objects: cars, planes, trains, machine parts, lamp shades, thumbtacks—you name it. Most mechanical CAD programs create two-dimensional drawings; only a few can create three-dimensional drawings (see "CAD Variations").

Architectural CAD, as you'd guess, involves the design of buildings. Architects create many kinds of drawings: *elevations* depicting a building's profile; floor plans showing room dimensions, door locations, and furnishings; and maps of a building's plumbing, heating, and electrical systems. Many CAD programs provide drawing tools for creating parallel lines, making it easy to draw walls. Some architectural CAD programs let you create a 3-D view that you can rotate and examine from different angles.

(continues)

DATA ACQUISITION ON THE MACINTOSH

Advanced hardware and software solutions for all Macintosh computers.



FREE CATALOG

Write, or call to talk to a GW Engineer

617-625-4096

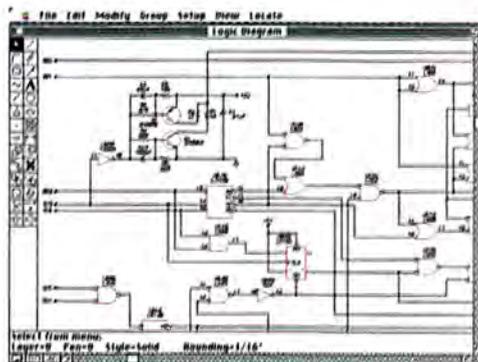
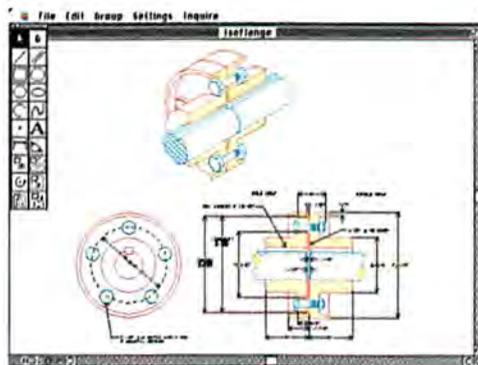
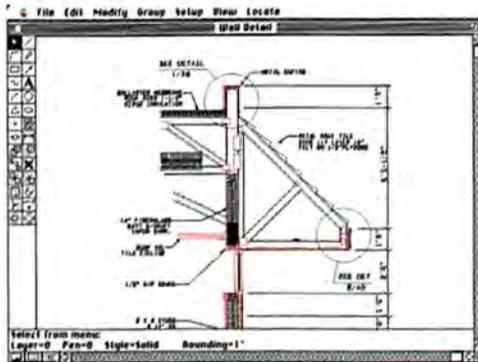
GW Instruments, Inc.
P.O. Box 2145 • Cambridge, MA 02141

The Macintosh Data Acquisition Company

Circle 124 on reader service card

186 August 1988

How To/Getting Started



Three Faces of CAD

Examples of the three primary CAD types: an architectural drawing created in PEGASYS (top), a mechanical drawing created in VersaCAD (middle), a schematic diagram created in PEGASYS (bottom).

Electrical engineers use CAD programs to design circuits and *schematics*—those symbols and lines that show how electronic components interconnect. Special CAD programs called *schematic capture* programs work behind the scenes to keep track of what's connected to what. When you're finished, you have not only a schematic drawing, but also a list of connections that can be used to map out the routes of the copper highways and byways that traverse a printed-circuit board.

At this advanced level, CAD programs play a direct role in executing a design.

Many programs can shuttle their data directly into *computer-aided manufacturing* (CAM) equipment, which uses measurements and specifications in the CAD drawing to control industrial robots or machining tools to create the parts from the drawing. Such Buck Rodgers CAD/CAM is primarily the province of six-figure workstations, but the Mac is making inroads. At a CAD/CAM trade show, a Roland machining mill—connected to a Mac II running MGMStation CAD/CAM—machined an automobile piston rod out of a block of wax, based on a drawing created with VersaCAD.

Life with a CAD

If you suspect software with this kind of power is complex, you're right. Forget diving into a CAD program without opening the manual. You'll need days or weeks of practice to master the hundreds of drawing, measuring, and annotating features that a powerhouse CAD program provides.

If you've used Apple's MacDraw, you have a head start. From the features standpoint, MacDraw is to a CAD program what a tricycle is to a Harley-Davidson, but there are similarities in their basic approaches to electronic drafting. You begin with a blank, untitled document window, and create a drawing by choosing tools from on-screen palettes, using the mouse to draw shapes. (Many CAD devotees shun the mouse in favor of a *graphics tablet*—a flat surface on which you scrawl with a *stylus*. A stylus and tablet feel more like a pen on paper, and they provide greater precision than a mouse.)

To help you draw straight lines and position objects accurately, MacDraw and CAD programs provide a *snap-to* feature that causes the mouse pointer to be drawn to an invisible grid as it moves. But CAD programs offer more ways to snap. For example, most programs let you specify that an object snap to a particular point on another object, or to the point where two objects intersect.

MacDraw provides tools for drawing several different shapes, but a CAD program's palettes bristle with specialized tools that make creating complex drawings easier. *Geometric facilities* replace compasses and protractors and allow you to quickly draw objects requiring calculations or measurements. Need to measure an angle or calculate the midpoint of a line? Want to draw a line perpendicular to a

(continues)

Re-ink Your Printer Ribbon for Less Than 5 Cents

Special Offer: FREE MOUSEPAD or a PhotoArt Disk with any order >60.00, a \$12.00 value



MacInker \$42.00

Imagewriter I & II MacInker, complete with

free bottle of ink, reservoir cover, ink meter and dispenser. Over 100,000 MacInkers sold since 1982

MacInker™, the original, automatic ribbon re-inker. The Imagewriter MacInker (mod 234IM) re-inks Imagewriter I/II black & single color cartridges. The Universal MacInker also re-inks hundreds of different cartridge types (including the Imagewriter LQ) with suitable adaptors. Extra dark, dot matrix, lubricated ink yields a truly better than new print quality and extends print-head life. New feltless dispenser ensures precise ink metering. Number of re-inkings/cartridge is 60-100. With the Multicolor Adaptor (mod M422, \$40.00) MacInker can re-ink the multicolor Imagewriter II cartridges. We have a full range of optional accessories, inks & cartridges, indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. Ask for free catalog. In 1982 we pioneered re-inking technology and are dedicated to its development.

Imagewriter I/II MacInker (mod 234IM)	42.00
Multicolor Adaptor (mod M422)	40.00
Heat Transfer Adaptor	30.00
Epson MacInker (mod 271EP)	42.00
Universal Cartridge MacInker	68.50
Imagewriter cartridges ...3.15/ea.....4-color	10.00/ea
Heat Transfer cartridges	9.00/ea
Extra ink bottle.....3.00/ea.....pint	18.50

Macintosh Diskettes 3.5" dual sided (pack of 10)

Mouse Pad (sale)

DATA SWITCHES



MS4-MAC8, 4 port 8 pin DIN-8 connectors	50.00
MS4-MAC9, 4 port 9 pin connectors	50.00
SCSI Switch 2 port	46.00
SCSI Switch 4 port	59.00
Cables	16.00

Moby Dick 3.5" Disk Storage System



Moby Dick 120 (120 disks)
(4"x9"x10.25") \$29.95



Moby Dick 240 (240 disks)
(4"x13.25"x10.25") \$39.95

Requires no desk space. Wall mountable. Has rubber feet if you wish to keep Moby Dick on your work table. Holds more disks in less space than any other storage system.

Order Toll Free 800-547-3303

in Oregon (503)626-2291- fax(503)643-5379

Immediate shipment - 30 days money back guarantee

Computer Friends, Inc.

14250 NW Science Park Dr. Portland OR 97229

MODEMS

Free Quicklink Software when purchasing modem, a \$30.00 value



\$99.00

All our modems are 100% guaranteed Hayes™ compatible and have a 2 year warranty. Full front panel lights, auto answer, dial, repeat, call progress monitoring and speaker control. Superior signal to noise ratio and noise rejection. Quick Link is very easy to use and is the fastest to learn communication software.

1200 AT 300/1200 baud

Mercury 2400 baud (also supports Europe V21,V22)

Capricorn World Minimodem, 300/1200 baud, pocket size

Bell 103/212A & European CCIT V21,V22 standards.....

Cable Mac to Modem (specify Macintosh type)

QuickLink™ Software (if purchased separately)

Classic PhotoArt™



\$59.00

Latest in clip-art software. Create an original photographic masterpiece without ever picking up your camera!

Classic PhotoArt is a collection of 5 disks containing hundreds of images. All images are saved as MacPaint or TIFF files and are designed for PostScript applications. Wide variety of subject matter, landscapes, animals, buildings, airplanes, dinosaurs etc. Easily pasted into most page layout & graphics programs. Easy to blend images. Specially designed to generate excellent grey scale reductions. \$59.00 complete set, or send \$5.00 for a demonstration disk.

MICRO PLANNER

the power to make your projects happen!

If you are serious about making your projects happen on time and on budget then you need MICRO PLANNER. Most projects fail because of inadequate resources – something MacProject® II does not even consider. Only MICRO PLANNER's combination of Critical Path/PERT and resource analysis allow you to easily compare trade-off's between time, money and resources. Successfully manage your projects with the power of MICRO PLANNER.



\$495.00

MICRO PLANNER
Version 6

\$595.00

Easy to Use?

Only if you are an artist. You have to draw the logic Diagram manually.

Automatically draws the logic diagram for professional quality no matter how complex. You will always look good.

Multiple Archives — No

Multiple Archives to save up to four different scenarios. "What if" your way to success.

Data Interchange — No (Macintosh Clipboard only)

Export and import data to and from mini/mainframe applications and/or other Macintosh® and IBM® PC applications using Project Exchange. You can also build libraries/templates of projects and merge or clone sub-projects.

Who stands behind the product?
Just another software company with only 1 enhanced version in 4 years.

MPI — the leading full service international project management consulting company. Servicing our clients for almost ten years, all we do is project management. We provide training, seminars, program management and consulting as well as software. More than 15 improved versions released over the last 4 years. We are constantly incorporating your suggestions. Most upgrades cost only \$10. Wait until you see what is next!

Resource leveling — No
Multiple Project Resource Leveling — No

Resource leveling for single or multiple projects, since 1978. Trade-off time vs. resources to optimize your schedules. Lots of projects, one resource pool? No problem. Find out who should be doing what and when? Can you complete that additional project on time? What additional resources will be required?

Multi-User — No

New Multi-User version (\$299 per each additional station) including Color, MultiFinder compatible or single launch version.

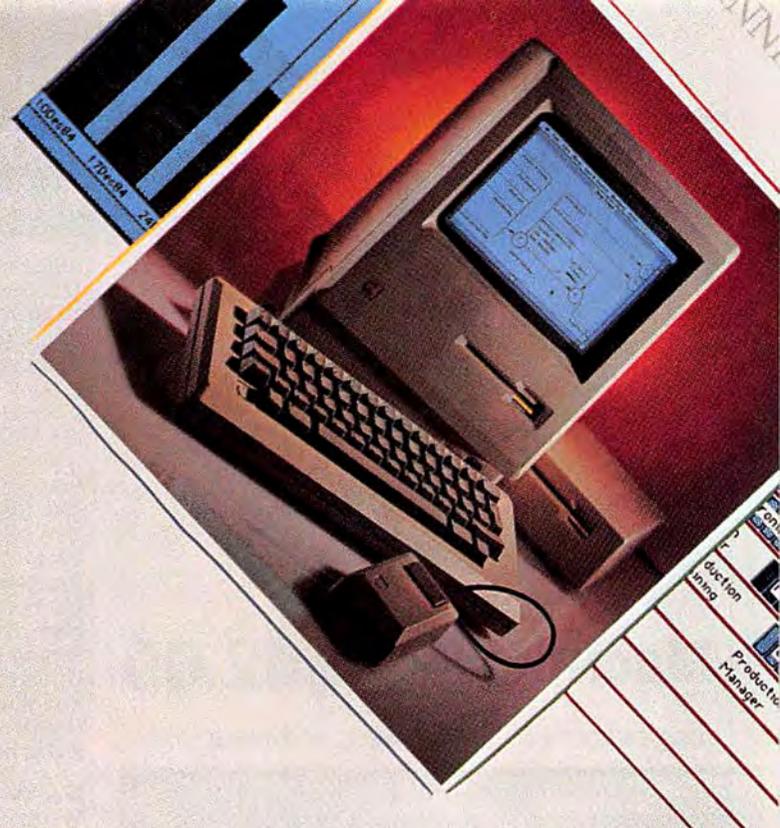
**If you are serious about making your projects happen on time and on budget,
don't toy around. Get MICRO PLANNER Version 6.**

Micro Planning International



235 Montgomery Street, Suite 840
San Francisco, California 94104 USA
Tel: (415) 788-3324 FAX: (415) 788-3405

Circle 409 on reader service card



for
MICRO PLANNER
Macintosh™

Macintosh Today

Macintosh Today Qualified Subscription Card

Note: A free subscription to *Macintosh Today* will be sent to those applicants in the U.S. and Canada who qualify. The publisher reserves the right to limit the number of free subscriptions. Please answer all questions completely. Incomplete forms will not be processed. For questions requesting quantities, use specific numbers. Please sign and date this form.

Please accept my request for a free subscription to *Macintosh Today*. Yes No

Signature _____

Title _____

Please provide your business address below or affix your business card.

NAME
TITLE
COMPANY/DIVISION
MAIL STOP
BUSINESS TELEPHONE
STREET
CITY/STATE/ZIP

Old Address: _____

Date _____

New Subscription Request Free Renewal Address Change (please provide old and new address)

1. Industry (check only one)

Noncomputer-related businesses

- 1. Aerospace
- 2. Agriculture, mining, construction, oil
- 3. Business consulting (noncomputer-related)
- 4. College/university
- 5. Elementary/high school
- 6. Engineering/architecture
- 7. Finance, banking, accounting, insurance, real estate
- 8. Government
- 9. Health/medical services
- 10. Legal services
- 11. Manufacturing
- 12. Military
- 13. Other business services
- 14. Publishing/advertising/public relations
- 15. Research and development
- 16. Retail/wholesale
- 17. Transportation, communications, utilities
- 98. Other (specify) _____

Computer-related businesses

- 18. Computer consultant
- 19. Computer retail
- 20. Distributor/wholesaler
- 21. Manufacturer (computers, software, peripherals)
- 22. Service bureau
- 23. VAR/systems house/integrator
- 99. Other (specify) _____

2. Title (check only one)

- A. Chairman/president/owner/partner
- B. Vice president
- C. Controller/treasurer/accountant
- D. Director/supervisor/manager
- E. Project manager/chief/group leader
- F. Art director/writer/chief/group leader
- G. Engineer/scientist
- H. Administrator
- I. Consultant/advisor
- J. Microcomputer specialist/manager/analyst
- K. Programmer
- L. Educator
- M. Professional (lawyer, doctor, etc.)
- Z. Other (specify) _____

3. Department or function (check only one)

- A. Accounting/finance
- B. Administration/management/personnel
- C. Consulting
- D. Education/training
- E. Engineering/R&D
- F. Manufacturing/production
- G. Microcomputer center/office automation
- H. MIS/DP
- I. Purchasing
- J. Sales/marketing/distribution
- Z. Other (specify) _____

4a. Does your company own or lease any mainframe computers at this location?

- Yes (indicate quantity below) No
- | | Existing (quantity) | Plan to buy (quantity) |
|--|---------------------|------------------------|
| <input type="checkbox"/> 1. IBM | _____ | _____ |
| <input type="checkbox"/> 99. Other (specify) _____ | _____ | _____ |

4b. Does your company own or lease any mini-computers at this location?

- Yes (indicate quantity below) No
- | | Existing (quantity) | Plan to buy (quantity) |
|--|---------------------|------------------------|
| <input type="checkbox"/> 1. IBM | _____ | _____ |
| <input type="checkbox"/> 2. DEC VAX | _____ | _____ |
| <input type="checkbox"/> 3. Sun/Apollo | _____ | _____ |
| <input type="checkbox"/> 99. Other (specify) _____ | _____ | _____ |

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?

- Yes (indicate quantity below) No
- | | Currently own | Plan to buy within 1-12 mos. |
|---------------------------|---------------|------------------------------|
| 1. Macintosh 128/512 | _____ | _____ |
| 2. Macintosh Plus | _____ | _____ |
| 3. Macintosh SE | _____ | _____ |
| 4. Macintosh II | _____ | _____ |
| 5. IBM or compatible | _____ | _____ |
| 6. Sun/Apollo workstation | _____ | _____ |
| 99. Other (specify) _____ | _____ | _____ |

6. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply)

	Macintosh	Software	Networks & Peripherals
A. Approve purchase	A. ___	A. ___	A. ___
B. Develop/manufacture	B. ___	B. ___	B. ___
C. Evaluate/select vendor	C. ___	C. ___	C. ___
D. Own one	D. ___	D. ___	D. ___
E. Own two or more	E. ___	E. ___	E. ___
F. Purchase or acquire	F. ___	F. ___	F. ___
G. Establish specifications	G. ___	G. ___	G. ___
H. Recommend to others	H. ___	H. ___	H. ___
I. Sell	I. ___	I. ___	I. ___
J. Train people to use/ or provide support	J. ___	J. ___	J. ___
K. Use	K. ___	K. ___	K. ___
L. No involvement	L. ___	L. ___	L. ___
Z. Other (specify by name and quantity) _____	Z. ___	Z. ___	Z. ___

If you have no involvement with any of the above, skip to question 8.

7. Do you recommend, buy, specify or approve microcomputers, software, and/or peripherals?

- Yes No
- If yes, please indicate for how many Macintosh personal computers you have this involvement. (check only one)
- A. 1-3 E. 50-99
 - B. 4-9 F. 100-499
 - C. 10-19 G. 500+
 - D. 20-49 H. None of the above

8. How many people are employed by your entire company? (check only one)

- A. 1-9 D. 100-499 G. 2500-4999
- B. 10-24 E. 500-999 H. 5000-9999
- C. 25-99 F. 1000-2499 I. 10,000 or more

Macintosh Today

9. Please list below any individuals at this location who also help to recommend, specify, acquire or approve the purchase of computer systems, peripherals, software or services to whom you would like us to send a complimentary subscription of Macintosh Today.

Name: _____ Title: _____
Name: _____ Title: _____
Name: _____ Title: _____
Name: _____ Title: _____

Please fold, tape and mail.
PLEASE DO NOT STAPLE.

Name

Company

Address

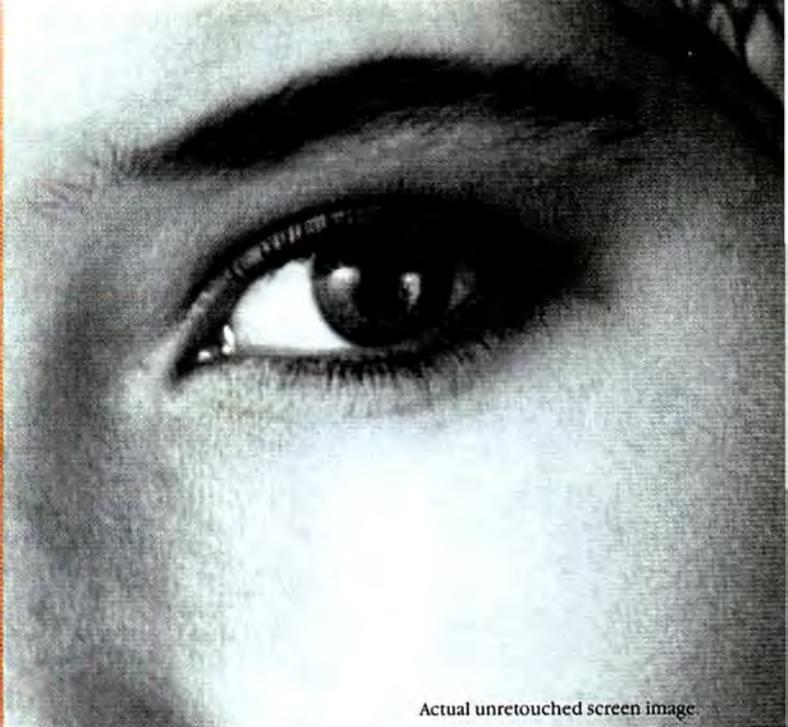
City/State/ Zip

AFFIX
POSTAGE
HERE

Macintosh Today
Subscription Department
P.O. Box 5456
Pasadena, CA 91107-0456



Actual unretouched screen image.



Actual unretouched screen image.

Screen stars with The Visible Edge.

What gives Princeton's new generation of screen stars the Visible Edge is a screen image of incomparable clarity and resolution. Where brilliant colors and infinite shades of gray, with striking contrast and dimension, are commonplace.

The versatility of the Princeton family of monitors gives the new generation (and present generation) of computers, the greatest autosynchronous horizontal/vertical scan range combination available (ULTRASYN and MAX-15). The clarity of .28mm dot pitch (ULTRASYN and PSC-28). 1024x750 display resolution (MAX-15). And the entire spectrum of color, with the ease and comfort that can only accompany an ergonomically designed monitor.

Experience a world of unlimited vision. And the technology that's made our high level of quality, service, value and performance, second nature. Experience the Visible Edge. And see what we do best. For more information call (609) 683-1660 Ext. 110.

PSC-28



PSM-03



ULTRASYN



MAX-15



Compatibility: IBM PC, XT, AT, PS/2, Apple Macintosh SE

Compatibility: IBM PC, XT, AT, PS/2, Apple Macintosh II, SE

PRINCETON
GRAPHIC SYSTEMS
THE VISIBLE EDGE

601 Ewing Street, Building A, Princeton, New Jersey 08540 (609) 683-1660

Circle 89 on reader service card

The Second Generation Hard Disks are Here!



Using newly-released technology, our drives offer up to three times better performance and reliability than other manufacturers' products.

External and Internal 31 to 80 megabyte models available; prices start at \$595.

Free Catalog

Write or call for full product description and independent test results.

(413) 256-1257



OPTIMAL
TECHNOLOGY

650 Main Street, Amherst, MA 01002

Circle 197 on reader service card

How To/Getting Started

CAD Variations

CAD doesn't always mean blueprints and schematics. Computers can aid the design process in other ways.

■ **Three-dimensional modeling** Programs such as Silicon Beach Software's Super 3D, Enabling Technologies' Pro3D, Advent's SpaceEdit, and Visual Information's Dimensions series let you create drawings that simulate 3-D objects (see "3-D, Take 2," *Macworld*, May 1987). One 2-D CAD program, MiniCad, also includes 3-D features. A 3-D program lets architects see their latest creations before they're built. Super 3D and SpaceEdit also provide animation.

■ **Finite-element analysis** You've designed a bridge and want to know how it will endure rush-hour stress. If you

know the steel's basic properties, you can use this CAD technique to divide the bridge's surface into a finite number of tiny sections called *elements*, then electronically apply stress to the elements and see how they fare.

■ **Specialized CAD** Independent IBM PC developers have created AutoCAD *templates* for designing everything from kitchens to piping systems to oil wells. *Vertical-market* applications—ones tailored to specific professions—are just debuting now for Macs. Some will be template collections for general-purpose programs such as VersaCAD. Others, such as CompServeCo's \$2250 Planit, a 3-D kitchen-design package, are designed from the disk up for specific trades.

slanted line? Or parallel to it? Or tangent to an arc (such as a belt connecting two pulleys)? Such chores are a common part of an engineer's or architect's life. A CAD program reduces them to a mouse click.

CAD programs also simplify altering the objects you draw. As with MacDraw, you can move or resize an object by selecting it and dragging the mouse. Some CAD programs also let you enter measurement or position values from the keyboard for greater precision. You can rotate objects in 1-degree increments (versus MacDraw's 90-degree increments), and you can create mirror images of objects. An architect could use a mirror-image feature to turn a left-hinged door into a right-hinged one. Most CAD programs also provide on-screen rulers and *coordinate windows* that display the mouse pointer's position as you work.

A more advanced level of object altering involves creating *chamfers* and *fillets*. A chamfer is a beveled corner formed by a diagonal line that connects two other lines. Chamfer all four corners of a box, and you get an octagonal shape similar to a

stop sign. A fillet (pronounced *fill-it*) is similar, except the object connecting the two lines is an arc. If you fillet all four corners of a box, you get a box with round corners or, if the arcs are big enough, a circle.

Making It Easier

CAD programs also give you more ways to tame complex drawing jobs. One that nearly all CAD programs provide is a *layering feature*. Engineers and architects often assemble drawings using layers of transparent acetate, each showing a particular component or system. An architect might show a plumbing system on one layer, walls on another, electrical systems on a third, and room dimensions on a fourth. CAD layering features work similarly. You can move objects between layers and selectively show and hide layers, depending on how much detail you want to see. On a Mac II, you can usually assign a color to each layer to color-code parts of a drawing.

(continues)

SOFTWARE

BUSINESS & PRODUCTIVITY

- ABA Software**
 Draw It Again_Sam (2.0).....\$74.00
Access Technology
 Mindwrite.....\$99.00
 Trapeza.....\$159.00
Aegis Development
 Doug Clapp Word Tools.....\$44.95
Affinity
 Affinfile.....\$39.95
 Tempo II.....\$79.95
Aldus
 Pagemaker (3.0).....CALL
 Freehand.....TODAY!
Ashton-Tate
 dBase Mac.....\$269.00
 Fullwrite Professional.....\$CALL
Batteries Included
 Disk Tools Plus.....\$29.95
 Thunder 1.1.....\$27.95
Berkeley Systems
 Stepping Out II.....\$54.95
Blyth Software
 Omnis 3+ w/Express.....\$299.00



- Eureka.....\$127.00
 Reflex Plus.....\$158.00
 Sidekick 2.0.....\$59.00
 Turbo Pascal.....\$59.95

- CE Software**
 DiskTop 3.0.....\$29.95
 QuickKeys.....\$59.95
 Quickmail.....\$CALL

- Central Point Software**
 Copy II Mac.....\$24.00
 Copy II PC Deluxe Bnd.....\$109.00

- Chang Labs**
 C.A.T. (2.0).....\$219.00
 Rags to Riches 3 pak.....\$287.00

- Crickit Software**
 Cricket Draw (1.1).....\$159.95
 Cricket Graph.....\$119.95
 Device Driver.....\$299.00
 Presents.....\$269.00

- Dataviz**
 Mac Link+ w/cable.....\$129.00

- Deneba**
 Canvas (2.0).....\$CALL
 Coach.....\$57.95
 Coach Thesaurus.....\$34.95
 Comment.....\$55.95

- Dubl-click**
 Calculator construction set.....\$39.95
 Wet Paint vols 1 & 2.....\$39.95
 World Class Fonts Bundle.....\$39.95

- Fifth Generation**
 Fastback (1.02).....\$54.95
 Powerstation.....\$37.95
 Suitcase.....\$37.95

- Free Soft**
 Red Ryder (10.3).....\$47.00

- Letraset**
 Image Studio.....\$279.00
 Ready Set Go (4.0).....\$279.00

- Macromind**
 Video Works II.....\$129.00

- Macropac**
 101 Macros for Excel.....\$42.95

- Microlytics**
 GOfar.....\$39.95
 Word Finder (2.0).....\$29.95

- Microsoft**
 Basic.....\$59.95
 Char.....\$69.95
 Excel.....\$239.00
 File.....\$109.00
 Fortran.....\$167.00
 Powerpoint.....\$244.00
 Word (4.0).....\$CALL
 Works.....\$189.00
 Write.....\$129.00

- Monogram**
 Dollars & Sense (4.0).....\$89.00

- Nashoba Systems**
 Filemaker 4.....\$179.00
Odesta
 Double Helix II.....\$339.00
Olduvai Software
 Icon-It! (1.1).....\$44.95
 Post Art.....\$44.95
 Post Art II.....\$CALL
PCS
 Versafarm Pro.....\$194.00
Satori
 Bulk Mailer +.....\$199.00
 Legal Billing.....\$329.00
 Project Billing.....\$369.00
Silicon Beach Software
 Super Paint.....\$79.00

- Avalon Hill**
 MacPro Football.....\$27.95
Broderbund
 Print Shop.....\$34.95
Bullseye
 Ferrari Grand Prix.....\$32.95
 Fokker Triplane.....\$32.95
Davidson & Associates
 Math Blaster.....\$27.95
 Speed Reader II.....\$37.95

- Microsoft**
 Flight Simulator.....\$32.95
Mindscape
 Balance of Power.....\$29.95
 Defender of the Crown.....\$29.95
 Deja Vu.....\$29.00
 King of Chicago.....\$27.95
 Uninvited.....\$29.95

- P.C.A.I.**
 Lunar Rescue.....\$CALL
 MacCourses.....\$29.95
 MacGolf.....\$34.95
 MacRaguelball.....\$34.95

- Silicon Beach Software**
 Airborne.....\$19.95
 Beyond Dark Castle.....\$CALL
 Dark Castle.....\$27.95
 World Builder.....\$39.95
Simon & Schuster
 Typing Tutor IV.....\$29.95

- Spectrum Holobyte**
 GATO.....\$27.00
 Falcon.....\$24.95

- Electronic Arts**
 Chessmaster 2000.....\$29.95
 Patton vs Rommel.....\$26.95
 Scrabble.....\$25.95
 Starfleet I.....\$34.95
 Venture's Business Simulator.....\$44.95

- EPYX**
 Sub Battle Simulator.....\$22.95

- APPLE**
 Call For Pricing On: Mac Plus, Mac SE, & Imagerwriter II.

- MODEMS**
 Everex 2400 Baud, 100% Hayes Compatible.....\$219.00
Migent
 Pocket Modem.....\$109.00

- Mouse Systems**
 A+ Mouse.....\$62.95
 A+ Mouse ADB.....\$79.95

- Datadesk**
 Mac 101 Keyboard.....\$139.00

- Blohard**
 MACFAN.....\$79.95

- Ergotron**
 Mouse Cleaner.....\$14.95
 MacTilt.....\$69.00
 MacTilt SE.....\$69.00

- I/O Design**
 MAC+/SE Bag.....\$59.95
 Mac SE Ext Bag.....\$69.95
 Imagerwriter II Bag.....\$44.95

- Kensington**
 Drive Cleaning Kit.....\$19.95
 Filter.....\$29.00
 Mouse cleaning kit & pkt.....\$16.00
 Mouseway.....\$9.95
 System Saver.....\$59.00
 Tilt/Swivel.....\$19.95
 Turbo Mouse.....\$77.00

- MAC CABLES**
 \$Call for Price & Configurations
MAC RIBBONS
 Imagerwriter Ribbons.....\$5.95

EDUCATIONAL & CORPORATE ACCOUNTS:
 We offer a full line of services catering to your needs. To reach our Educational & Sales Department Call 1-800-533-1131 For Information Call 814-234-2236

- Software Ventures**
 Microphone (1.1).....\$115.00
 Microphone II.....\$CALL
SuperMac
 Super Spool.....\$44.95
 Super Laser Spool.....\$84.95
 Diskrit.....\$49.95
Springboard
 Certificate Maker.....\$24.95
Syantec
 More.....\$149.00
 Utilities For Macintosh.....\$57.00
T/Maker
 Write Now.....\$99.00
Word Perfect Corp.
 Word Perfect.....\$199.00

- Microsoft**
 Flight Simulator.....\$32.95

- Mindscape**
 Balance of Power.....\$29.95
 Defender of the Crown.....\$29.95
 Deja Vu.....\$29.00
 King of Chicago.....\$27.95
 Uninvited.....\$29.95

- P.C.A.I.**
 Lunar Rescue.....\$CALL
 MacCourses.....\$29.95
 MacGolf.....\$34.95
 MacRaguelball.....\$34.95

- Silicon Beach Software**
 Airborne.....\$19.95
 Beyond Dark Castle.....\$CALL
 Dark Castle.....\$27.95
 World Builder.....\$39.95
Simon & Schuster
 Typing Tutor IV.....\$29.95

- Spectrum Holobyte**
 GATO.....\$27.00
 Falcon.....\$24.95

- Electronic Arts**
 Chessmaster 2000.....\$29.95
 Patton vs Rommel.....\$26.95
 Scrabble.....\$25.95
 Starfleet I.....\$34.95
 Venture's Business Simulator.....\$44.95

- EPYX**
 Sub Battle Simulator.....\$22.95

- APPLE**
 Call For Pricing On: Mac Plus, Mac SE, & Imagerwriter II.

- MODEMS**
 Everex 2400 Baud, 100% Hayes Compatible.....\$219.00
Migent
 Pocket Modem.....\$109.00

- Mouse Systems**
 A+ Mouse.....\$62.95
 A+ Mouse ADB.....\$79.95

- Datadesk**
 Mac 101 Keyboard.....\$139.00

- Blohard**
 MACFAN.....\$79.95

- Ergotron**
 Mouse Cleaner.....\$14.95
 MacTilt.....\$69.00
 MacTilt SE.....\$69.00

- I/O Design**
 MAC+/SE Bag.....\$59.95
 Mac SE Ext Bag.....\$69.95
 Imagerwriter II Bag.....\$44.95

- Kensington**
 Drive Cleaning Kit.....\$19.95
 Filter.....\$29.00
 Mouse cleaning kit & pkt.....\$16.00
 Mouseway.....\$9.95
 System Saver.....\$59.00
 Tilt/Swivel.....\$19.95
 Turbo Mouse.....\$77.00

- MAC CABLES**
 \$Call for Price & Configurations
MAC RIBBONS
 Imagerwriter Ribbons.....\$5.95

DISKS
 per box of 10

	1-4	5-9	10+
SONY SS/DD	12.45	11.95	11.45
DD/DD	16.95	16.45	15.95
MAXELL SS/DD	11.95	11.45	10.95
DD/DD	17.95	17.45	16.95
VERBATIM SS/DD	14.45	13.95	13.45
DD/DD	18.95	18.45	17.95

DON'T SETTLE FOR LESS... tcp SHIPS IT



Software orders over \$100 & Accessories under 6 pounds will be shipped FEDERAL EXPRESS

(Yes even at these prices). You only pay TCP's standard shipping charge of \$4.00 per order. Orders arriving before 3:00 PM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground for FREE.

DOVE COMPUTER CORPORATION
MACINTOSH MEMORY UPGRADES

MacSnap 524S.....\$269.00
 MacSnap 548S.....\$469.00
 MacSnap Plus 2.....\$299.00
 MacSnap 2S CMOS.....\$CALL
 MacSnap 4S CMOS.....\$CALL
 MacSnap 2 SE.....\$329.00
 Mach II/SE.....\$549.00
 Toolkit.....\$14.00

FileMaker 4
 Single & Multi-User Database
 Single Pack.....\$179
 4 Pack.....\$359

PRINT FOR LESS ...
Orange Micro Inc.
 Grappler Interface.....\$69.95
 Grappler LQ Interface.....\$89.95

Panasonic Office Automation
PRINTERS
 1080I II w/Grappler.....\$229.00
 1091I II w/Grappler.....\$259.00
 1092I w/Grappler.....\$379.00
 1524 (24 pln) w/Grappler LQ.....\$749.00

Microsoft
 EXCEL (1.5).....\$239.00
 POWERPOINT (2.0).....\$244.00
 WORD (4.0).....\$CALL
 WORKS.....\$189.00
 WRITE.....\$129.00

ThunderScan
 \$189

"Draw it again, Sam..."
 \$74

EVEREX
HARD DRIVES
 EMAC 20D.....\$499.00
 EMAC 20D Deluxe.....\$579.00
 EMAC 40D.....\$849.00
 EMAC 40D Deluxe.....\$899.00
 EMAC 60T
 Tape Backup.....\$879.00
 EMAC 40/60 DT (40MB Dr/60MB Tape Bkup)\$CALL
 2400 Bd Ext Modem.....\$219.00

Qume
ScriptTEN
LASER PRINTER \$3995
 ■ 3MB RAM
 ■ 10 Pages/Minute
 ■ 35 Resident Fonts
 ■ HP-Laser Jet Compatible
FREE FEDERAL EXPRESS DELIVERY!

TOLL FREE 1-800-468-9044

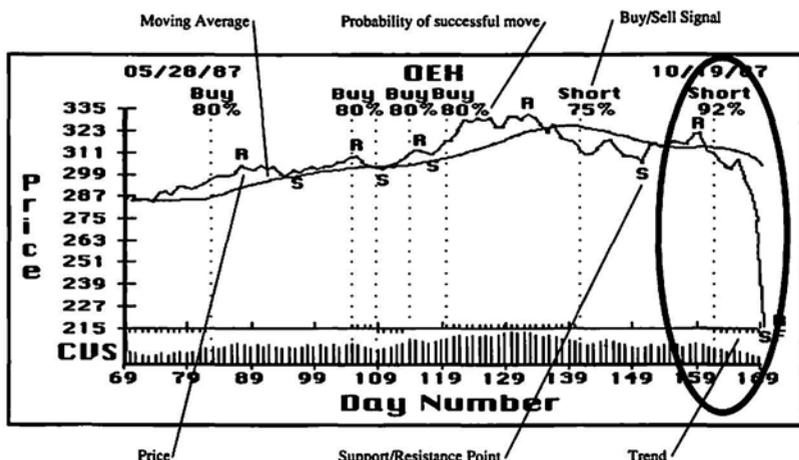
To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear. Shipping: \$4.00 for software. FOR ALL HARDWARE AND ANY ACCESSORY OVER \$100 Call our Toll Free Number 1-800-468-9044 for shipping charges. Add \$3.00 per box shipped COD. Additional shipping required on APO, FPO, AK, HI. Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA. YOUR CREDIT CARD IS NOT CHARGED UNTIL YOUR ORDER IS SHIPPED. ALL SALES ARE FINAL. Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.



TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

"I made \$800,000 in 12 days using the Index Program."

L.B., L.A., CA



Profitable Buy/Sell signals with about 80% accuracy.

The **Right Time™** computerized trading system was developed by an expert portfolio manager for his own personal use. Over the last eight years of in-market use the software has been perfected and made easy to use. Now it's available for any smart trader who wants to make quick profits from quick decisions.

Not only is **The Right Time™** the best decision support system ever devised for traders, it's the only software that analyzes volume/price, support/demand, and global market trends - all at the same time.

Amazingly Precise.

The **Right Time™** programs run on IBM (and compatible), Apple II and Macintosh personal computers. The software is easy to use, amazingly precise, and very, very clear in its signals.

It's also fast. If you decide to download from Dow Jones with a modem, you'll retrieve and update signals for your stocks, commodities, indexes or funds in less than five minutes per day. What's more, you can play "What If" games with individual stocks, commodities, indexes, funds or options.

Results: Winning Trades.

There are four **Right Time™** programs available to help you make the right decisions at the right time.

Stock Program: "The program is amazing. Profitable trades have developed out of nowhere!" M.C., brokerage firm vice president.

Index Program: "Computer whiz finds program for success. This program really works." A.G. financial columnist.

Futures Program: "Very profitable with four out of five winners. Paid for itself the first trade." B.L., investment advisor.

Mutual Funds Program: "Accurately picked my last seven profitable trades. I couldn't trade without it." L.S., individual investor.

For More Information.

Call (213) 312-0154 today for our free twelve page brochure, or place an order with a 30-day guarantee. Each program costs \$399, any two \$599, any three \$899, or invest in all four for just \$1199.

T.B.S.P. INC.

The Better Software People

2265 Westwood Blvd., Suite 793, Los Angeles, CA 90064

* The Index Program generated a short signal for the OEX for execution on 10/08/87, thus 100 OEX puts with a strike price of 300 were purchased on 10/08/87. The profits thru 10/19/87 are approximately \$800,000.

Future results may vary.

Guarantee details available upon request

How To/Getting Started

Many CAD programs also let you open bit-mapped graphics and place them on one layer, then trace over them using the CAD program's tools. Innovative Data Design's *Dreams*, due out this summer, will allow you to create or change color patterns for both pen tools and objects (see "Dreams in Color").

Mechanical drawings and architectural blueprints always show the dimensions of their components. CAD programs provide *auto-dimensioning* features that label those dimensions for you. Simply choose a command or click a palette icon, select the item you're measuring, and the CAD program adds the dimension to the drawing, complete with arrows and *extension lines* (see "CAD Dimensions").

The kinds of objects you can measure vary between programs. Some programs, such as *PowerDraw*, provide only *linear* dimensioning—measuring the distance between two points. Others, including *VersaCAD*, *MGMStation*, and *MiniCad*, also support *angular* dimensioning—measuring the size of angles. *MGMStation* also offers *radial* dimensioning—the ability to measure the radii of circles.

Drawings and schematics often contain multiple copies of the same object, be it a bolt, a sink, or a transistor. Most CAD programs offer *symbol libraries* that make it easy to create, store, and reuse often-used symbols of your trade. Some programs come with libraries of common architectural or electronic symbols; with others, libraries are options that cost extra. With many programs, you can assign a name to each symbol, such as "3-inch carriage bolt" or "conference chair." *ArchiCAD*, an architectural CAD program, can use those names to print parts lists showing how many times a given component appears in a drawing. Other CAD programs will soon offer similar features, which are often called *attribute tracking* or *associativity*.

And because even a large-screen monitor can't show an entire blueprint-size drawing at actual size, all CAD programs offer *zoom* commands that let you move in for a close-up look or zoom out to get the big picture. But redrawing an image containing thousands of objects takes time, even on a Mac II. To eliminate the wait, most programs offer a *redraw halting* feature that lets you stop the redrawing process at any point. You can use redraw halting to stop further redrawing after the object you've zoomed in to see appears.

(continues)

Circle 41 on reader service card

How to Buy the Right Monitor.

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

What size and shape monitor is best?

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

What resolution is required?

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

Should I get a monochrome or color monitor?

We recommend our 19-inch gray-scale monitor for



Viking 2400 24" monitor.

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

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

Get the facts from the source.

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



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

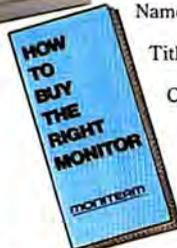
Name _____
 Title _____
 Company _____
 Address _____
 City, State, Zip _____
 Telephone _____

- Please Check:
- Apple User
 - IBM User
 - _____ No. of micro-computers
 - Apple Reseller
 - IBM Reseller

MONITERM

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

Circle 133 on reader service card



PAYROLL

for the
Macintosh



At last

... a payroll accounting program that takes full advantage of the power and ease-of-use of the **Macintosh**. With this program, you'll be up and running in a fraction of the time it takes other payroll programs to lead you through their mazes of tutorials and set-up procedures.

State and federal tax tables are built-in, making payroll calculations a fast and easy job. Paychecks and W-2's can be printed on both the LaserWriter and ImageWriter. Many useful reports can be viewed and/or printed in seconds, including the quarterly tax information needed for the 941 form.

Don't let the low \$295 price mislead you. This is definitely the finest payroll program you'll find. Some users tell us it's one of the very best reasons for having a **Macintosh** in a small or medium-sized business!



Runs on the 512, 512E, Plus, SE, and II
Hard disk not required but recommended for companies with 200 or more employees.



CheckMark's **Payroll** can be used as a stand-alone program or it can be integrated with either of our line ledger programs.



MultiLedger™ is a complete integrated accounting program which combines General Ledger, Accounts Receivable, Accounts Payable, and inventory tracking. The program generates invoices, statements, checks and a wide variety of valuable reports.

Cash Ledger is our full-featured accounting system for businesses using cash-basis reporting. It can also be used by accountants and other professionals requiring "write-up" capability.

Demos are available for all three programs.

CHECK MARK
SOFTWARE INC.

1-800-444-9922 ext 222
DEALER INQUIRIES INVITED

Circle 581 on reader service card

How To/Getting Started



Dreams in Color

IDD's *Dreams* provides a pop-up menu of user-customizable color fill patterns. Included are three color matrices—8 by 8, 16 by 16, and 32 by 32—that allow for fill patterns that closely resemble the random patterns preferred by graphics professionals.

Exchanging and Printing

If your company already uses a CAD system—whether a large workstation or an IBM PC—you'll want to investigate the data-exchange options that Mac CAD programs provide. There is no single standard for moving CAD drawings between systems, but there are some established formats. Perhaps the most popular is IGES (Initial Graphics Exchange Specification). You'll find support for IGES files in CAD systems running on micros, minis, and mainframes.

Another popular format is the DXF file, popularized by Autodesk's AutoCAD package for IBM PCs. Only one Mac program, VersaCAD, includes a file-exchange program that lets you translate between its own and other CAD formats. With most other CAD programs, file-translation programs cost extra. Kandu Software's CAD Mover is a translation program that translates between IGES, MiniCad, MacDraw, PICT, DXF, and other formats.

A CAD drawing's final destination is a piece of paper, and some CAD programs can get it there in more ways than others can. In the CAD world, the dominant output device isn't a LaserWriter or an ImageWriter, but a *pen plotter*, which prints by zipping special pens across a sheet of paper or mylar film. Most plotters can hold between 4 and 12 different colored pens in a turretlike mechanism, switching between them as instructed by the CAD program. Plotters are often described according to their maximum paper size, with each size labeled by a letter: an *A-size* plotter creates 8½-by-11-inch drawings. *B-size* drawings measure 11 by 17; *C-size*, 17 by 22; *D-size*,

22 by 34; and *E-size*, 34 by 44. Nearly all Mac CAD programs can print to plotters from such industry leaders as CalComp, Hewlett-Packard, Houston Instrument, and Roland.

Plotters take too long to render the subtle serifs and fine details of Mac fonts, so most CAD programs with plotter support include *stroke fonts* for their output. Stroke fonts allow the plotter to draw characters quickly using—you guessed it—single strokes of its pens.

Mac CAD programs also support ImageWriters and LaserWriters, but to varying degrees. Some, such as PEGASYS and Pentagon CAD, print in only low-resolution draft modes. Others, including VersaCAD, MGMStation, PowerDraw, and MiniCad, offer both low- and high-resolution ImageWriter and LaserWriter output. Low-resolution output is useful for producing quick proofs of a drawing. High-resolution requires more time, but takes advantage of a printer's maximum resolution.

CAD's Costs

If you're drooling at the prospect of working CAD into your life, dry up—at least until you check your bank balance. Software with the capabilities I've described doesn't come cheap, and it does come with a voracious appetite for hardware.

Some CAD companies claim their wares run on a 512K, floppy-drive Mac, but the verb *stroll* might be more accurate.

(continues)

"... the clear leader 4th DIMENSION..."

MacUser

"Although this category, unlike spreadsheets and word processors, had a lot of new players this year, one seemed to us to be the clear leader.

4th Dimension, the powerful first product from ACIUS, takes the kudos."

MacUser, February 1988 ■

"Congratulations! InfoWorld's readers have chosen 4th Dimension as the Product of the Year in the Macintosh Database Systems category."

Jonathan Sacks, InfoWorld, April 1988 ■

"I can't imagine a data-management problem that you won't be able to solve with 4th Dimension."

Steve Mann, Macintosh Today August 11, 1987 ■

"Users with no experience or interest in programming can build a barebones database in 4D's 'Design Environment' just by pointing, clicking, and naming files and fields."

"For searches and sorts - database operations that are performed interactively - 4D's performance curve is probably the best of the four programs (Omnis 3 Plus, Double Helix II, dBASE Mac, and 4th Dimension)."

David Brandt, MacWEEK, January 19, 1988 ■

"It will do everything you need, and then some, and will prove itself well worth the cost."

Jan L. Harrington, MacUser, November 1987 ■

"I'm convinced that many users of other Mac databases and even PC databases will want to switch over to 4th Dimension."

Adam Green, Macworld, July 1987 ■

"In general, Macintosh software is better than software for other personal computers..."

4th Dimension redefines those high standards."

Andrew Gore, The Macintosh Buyer's Guide, Spring 1988 ■

"4th Dimension from ACIUS, Inc. of Cupertino, California, outshines the other databases we tested both in number of features and in rich database development environment."

Don Crabb, InfoWorld, January 11, 1988 ■

Want to try it out ?

For \$20, we'll send you a demo disk and comprehensive 50-page user's manual.

Call today and find out what 4th Dimension can do for you.

- Relational database
- Multi-user
- Intuitive interface
- Graphics and pictures
- Automatic forms & reports

Yes you can !

\$20 Demo Offer

1-800-952-6300 Ask for Dept. A22



Demo version bundled
on all Jasmine
Hard Disk Drives.



ACIUS

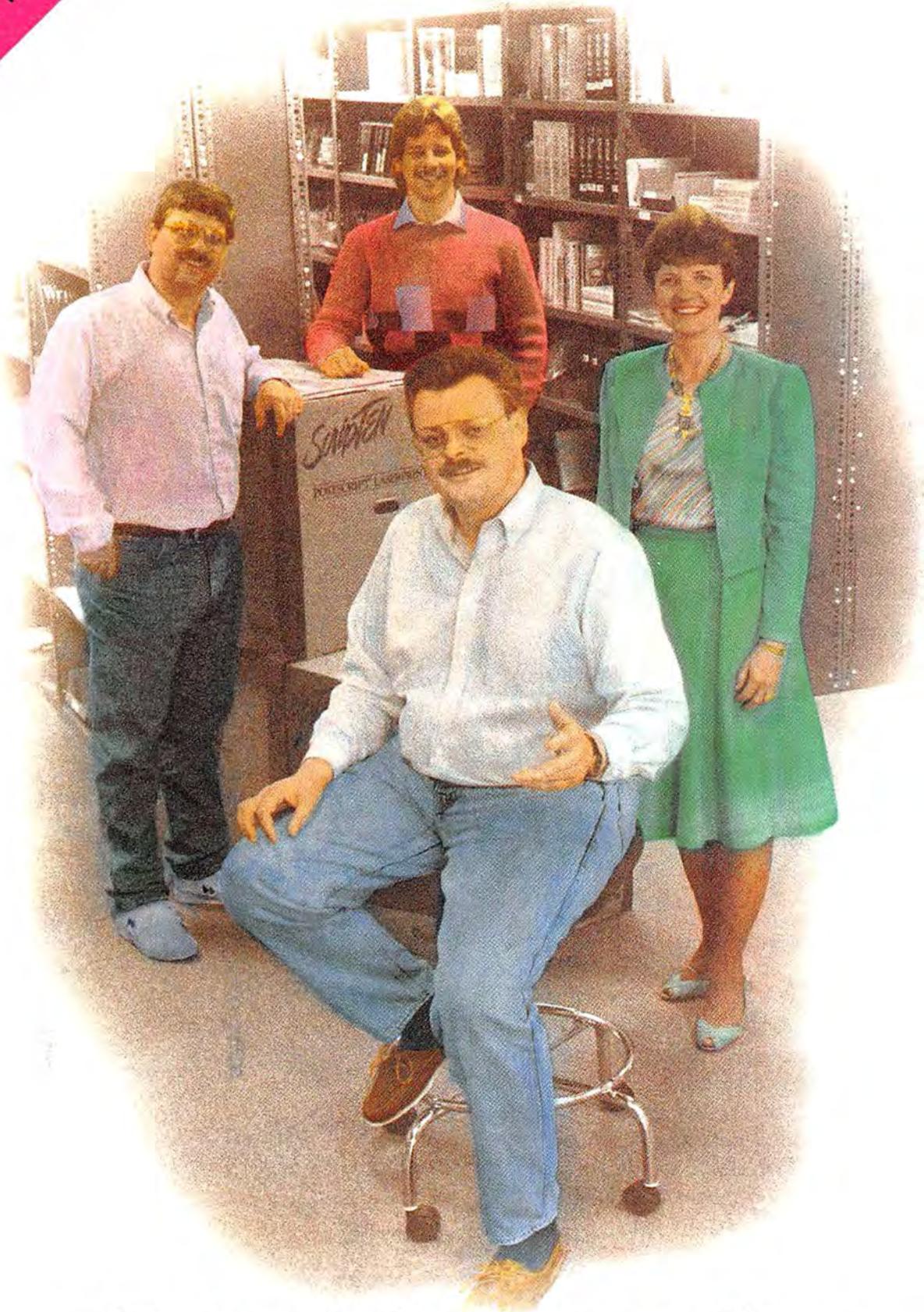
4th DIMENSION is a trademark of ACIUS, Inc. and ACI. All other brand names are trademarks of their manufacturers.

20300 Stevens Creek Blvd., Suite 495
Cupertino, CA 95014 (408) 252-4444

“Buy it right,
or,
we’ll take
it back.”

–Réal Provencher

Please
open here



*People you'll like...prices you'll love...
and a return policy that can't be beat.*



"More and more large companies are calling to set up accounts with us. Many of these people are changing over from traditional mail order companies, because of our return policy, both for trial purchase, and outright sale. And, they've always appreciated that we don't charge their account, until the order's been shipped. It doesn't make sense to do it any other way."

-Sarah

WORD & PAGE LAYOUT

Coach 3.0	57.00
Coach Professional	109.00
Coach Thesaurus	36.00
Findswell	29.00
Fluent Fonts 2.0	42.00
Fluent Laser Fonts (ea.)	42.70
Fontographer	239.00
FullWrite Professional	269.00
MergeWrite	30.00
More 1.1	175.00
Pagemaker 3.0	475.00
Read It! (OCR)	233.00
Read It! (Thunderscan)	87.00
ReadySetGo! 4.0	279.00
Spellswell	44.00
WordPerfect	229.00
Works Plus Spell	43.00
Write Now	98.00

CASES & COVERS

High Trek Case (IW II)	50.95
High Trek Case (512/Plus/SE)	59.95
High Trek Case (SE Extended Keyboard)	69.95
Dust Covers (Most)	19.95

When you're sure of the software you want, buy it with our promise...if there's something you don't like, we'll take it back. When you're not sure, ask about trial purchase. You can look at one, or several competing programs, and save with our Try-Pack specials. Either way, we'll help you get Software That Fits.

DISK DRIVES

Dayna File	Call
CMS Pro 45 SE/r	719.00
CMS Pro 60 II	719.00
CMS Pro 140 II	1269.00
CMS SC 30	639.00
CMS SD 20	569.00
CMS SD 60	839.00
CMS SD 102	1269.00
CMS SD 140	1395.00
CMS TS 60	769.00
EMAC-20D	529.00
EMAC-40D	849.00
EMAC-60T	929.00

OTHER PERIPHERALS

Personal Laser Printer Plus	1669.00
Qume ScripTEN Laser Printer	3895.00
Thunderscan 4.0	199.00

COMMUNICATION HARDWARE

Anchor 2400 Modem	169.00
Everex 2400 Modem	225.00
TurboNet	27.00

MONITORS

Laserview 19" - Mac II	1799.00
Moniterm Viking 1 (Hi-Res)	1650.00
Moniterm Viking 10 (Color)	3995.00
Moniterm Viking GS	2579.00
Moniterm Viking 2400	1995.00

SYSTEMS

Mac II System: Pro 60 hard drive, Mac 101 Keyboard, Viking 1 monitor	5595.00
Mac II Color System: Pro 140 hard drive, Mac 101 Keyboard, Viking 10 monitor	8395.00

Hundreds More . . . No surcharge on Visa or MasterCard. Purchase orders accepted on approved accounts. Sorry, no COD's or personal checks. Trial purchase based on a 10-day minimum, plus six free days for shipping. All hardware sold with a 30-day money-back guarantee. Prices subject to change without notice.

**SONY and KAO disks
at BIG Savings...Call Now!**

SOFTWARE THAT FITS™

1-800-972-3018

(713) 540-2300

PO Box 4028•Humble, Texas 77347

Circle 172 on reader service card

We'll do everything we can to get you the right software at the right price. And, if it turns out to be something you don't want, we'll take it back.

"Our Proof of Performance Pledge is unique in the industry. Buy any program you need. If you decide you don't like it, send it back, and pay only the regular daily trial. You can buy at discount, mail-order prices, and still be sure you're not going to get stuck. And, we have a 30-day money-back guarantee on all hardware, too."



-Real

ACCOUNTING

Aatrix Payroll 3.0	115.00
Business Sense	279.00
Checkmark Payroll	209.00
In Sight (GL/AR/AP/IV/Time Billing) (ea.)	579.00
In-House Accountant	112.00
Managing Your Money	129.00
Quicken	32.00
Rags to Riches 3-Pack (GL/AR/AP)	299.00
Simply Accounting	199.00

"Most people these days have done their homework, and pretty well know which program they want. Now, we've made it even easier to buy software. Call us with the program you need. Once you've used it awhile, you may find something you weren't aware of, that you don't like. No problem... just send it back. We'll treat it as a trial purchase, and refund the difference between what you paid to buy the software, and what it would cost if you had taken it on trial. (10-day minimum, and we provide six free days for shipping)."



-Mike

BUSINESS

CAT	239.00
Cricket Graph	119.00
Cricket Pictograph	105.00
Cricket Presents	290.00
Fast Forms	96.00
Focal Point	59.00
Mac Calc	81.00
Mathview Pro	149.00
MicroPlanner + 6.0	359.00
WillMaker	36.00

COMMUNICATIONS & NETWORKING

CompuServe Starter Kit	24.00
In Box Starter	209.00
MacLink Plus	145.00
MacNet Starter Kit	36.00
Microphone 2	209.00
Red Ryder	59.00

"We get software back every day, and people tell us, 'Boy, am I glad I had a chance to try this out first'. These are customers who really thought they wanted a certain program, but later found it wouldn't fit their particular application. And, they'll often take a competing program on a trial purchase. Then, when they decide to keep it, they're sure they've got the right one."



-John

DATABASES

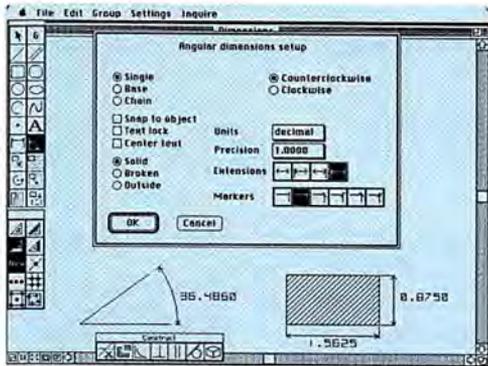
DBase Mac	329.00
Double-Helix II	329.00
McMax	169.00
Omnis 3/ Express	329.00
Record Holder Plus	45.00
Reflex Plus	165.00

DESK ACCESSORIES & UTILITIES

Disk Express	35.00
Disk Fits	58.00
Disk Tools Plus	33.00
Expressionist	46.00
HyperDA	41.00
MacTree	41.00
Power Station	38.00
QuickDEX	36.00
Quickeys	59.00
Sentinel	179.00
Sidekick 2.0	59.00
Stepping Out II	54.00
Suitcase	38.00
Super Glue	55.00
Super Laser Spool	89.00

GRAPHICS

ClickArt Graphics (ea.)	29.00
Canvas	109.00
Cricket Draw	172.00
Curator	79.00
Draw It Again Sam	89.00
Freehand	381.00
Graphic Works	89.00
Illustrator '88	269.00
Image Studio	279.00
MacDraft	159.00
Modern Artist	141.00
myDiskLabeler (Color)	32.00
Picture Base	59.00
Pixel Paint	289.00
Post Art	41.00
Print Shop	36.00
Video Works II	118.00



CAD Dimensions

Most CAD programs provide auto-dimensioning features that add dimensions to drawings. VersaCAD, shown here, provides linear (point-to-point) and angular (angle size) dimensioning. The dialog box shows the variations of extension lines and arrows that VersaCAD provides.

CAD programs crave memory and CAD drawings devour disk space. For serious, day-in, day-out CAD, you need a hard disk and at least a Mac Plus. Best of all is a Mac II or an SE with an accelerator board such as Radius's Accelerator, General Computer's

HyperCharger, or Levco's Prodigy SE (see "Beefing Up the SE," *Macworld*, September 1987). If you'd prefer to spend your time drawing rather than scrolling, consider a large-screen monitor. If you use MultiFinder, you may also need a memory upgrade.

Then there's the cost of the programs themselves. VersaCAD tops the list at \$1995, with PEGASYS II coming in second at \$1795. MGMStation is a more palatable \$799; PowerDraw costs \$795; and MiniCad, which includes three-dimensional drawing features, goes for \$495. Dreams is expected to retail for about \$500. But many programs in the under-\$1000 ballpark lack the plotter support and file-exchange features included with their high-priced brethren. If you need those features, be sure to tally up the total cost with any add-on modules before buying.

The most reasonable CAD program is Lionshead Software's Pentagon CAD for \$99. Pentagon CAD can't match the talents of a VersaCAD or MGMStation, but it's the most economical way to explore CAD, and it has some powerful mapping features that civil engineers and surveyors may find useful. Generic Software, which makes Generic CAD for the PC, has announced

plans to release a Mac version that will cost between \$99.95 and \$199.95, depending on options.

Where Mac CAD Fits In

Despite the amazing talents of today's CAD programs, the Mac isn't about to send ultra-expensive CAD workstations to the scrapheap. CAD systems exist that can show animated, three-dimensional views of a jetliner in one window, while you zoom in on single rivets in another. Today's Macs lack the processing speed required for such tasks.

Still, Mac CAD programs can lighten the load on those expensive workstations by handling the simpler jobs that can monopolize a workstation's time—freeing it up to do what it does best. As David Peltz says, "I see a lot of Ferraris on the road, but many of them are only doing 55 miles per hour." The Mac may still be only a CAD Chevy, but even a Chevy beats a horse and buggy. □

See *Where to Buy* for contact information.

CompuNet has PhoneNet Plus beat.

Two to one

FlashTalk Compatible!!

At half the price of *PhoneNet Plus, The CompuNet System is unbeatable. CompuNet is a local area network (LAN) system that conforms to AppleTalk LAN standards. It has the convenience of using ordinary telephone wire and RJ 11 modular phone connectors. All of CompuNet's connections are positive locking and make it easy to create custom length cables by using simple materials and crimping tools found at most hardware and telephone accessory stores. With an unamplified limit of 3000 feet and a signaling speed of 1 megabit per second, the CompuNet System is able to function at three times the rated distance and speed of a comparable AppleTalk Network. **Suggested Retail price: \$29.95**

COMPUNET Dealer inquiries invited
 Trimar USA, Inc. 236 W. 15th Street New York NY 10011 212-645-7008 800-872-4454
 FAX 212-645-8786
 In Canada call DataSpace Corp. 416-474-0113 800-378-0492
*Based on suggested retail price of \$59.95 effective October 1, 1987

Circle 26 on reader service card

MathType
 The Mathematical Equation Editor

Edit equations like this:

$$\frac{4}{\pi} \int_0^{\infty} \int_0^{\infty} e^{-(x^2 + y^2)} dx dy = 1$$

And get LaserWriter output like this:

$$\frac{4}{\pi} \int_0^{\infty} \int_0^{\infty} e^{-(x^2 + y^2)} dx dy = 1$$

Build equations by clicking on any of 62 templates and 80 special symbols – MathType™ automatically determines spacing and selects typefaces according to the rules of mathematical typesetting. Works as an application or as a desk accessory with any word processor or page layout program. MathType is available now for only \$149. Call or write for a free demo disk and brochure with sample output. Ask about our new TEX interface capability.

Design Science See us in booth 542 at the **MACWORLD Expo**
 6475-B E. Pacific Coast Hwy., Suite 392, Long Beach, CA 90803 • (213) 433-0685

MathType is a trademark of Design Science, Inc. Macintosh is a trademark of Apple Computer Inc.

Circle 165 on reader service card

DESKTOP PUBLISHING

Publish!

The How-to Magazine



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

SUBSCRIBE NOW AND

**SAVE
25%**

POSTAGE WILL BE PAID BY ADDRESSEE

Publish!

Subscription Department

P.O. Box 51966

Boulder, Colorado 80321-1966



SAVE \$1745!

Off the
Cover
Price

When you subscribe today



YES! I want to expand my desktop publishing potential. Please send me one year (12 monthly issues) of *Publish!* at the introductory rate of \$29.95. That's a savings of 25% off the regular subscription rate.

Please Bill me later.

Name

Company

Street

City

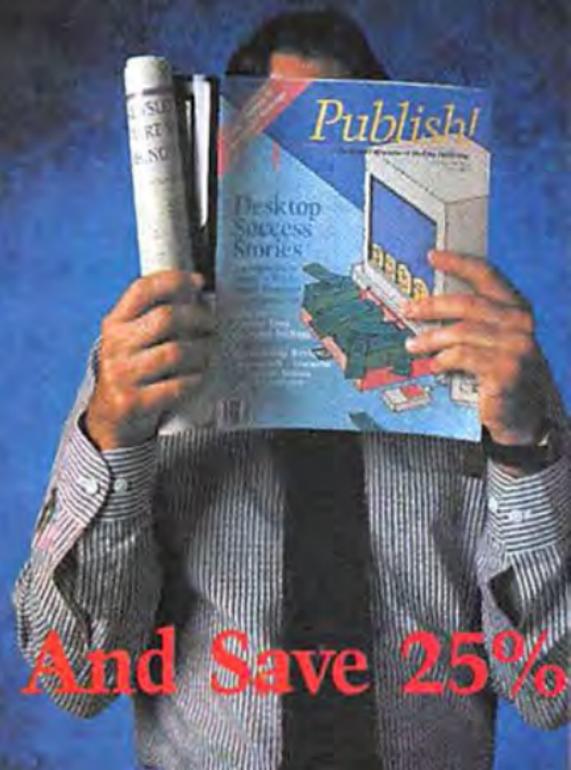
State

Zip

By regular subscription, *Publish!* is \$39.90 for 12 issues. The annual cover price is \$47.40 (12 issues). Offer available to new subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue. **5CB56**

Publish!

HANDS ON!

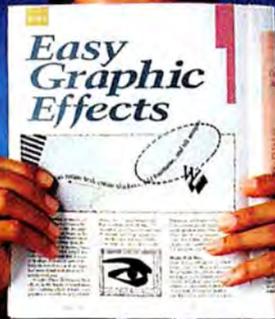


DESKTOP PUBLISHING

FOR THE MANAGER

FOR THE DESIGNER

**Hands On
Solutions in
Publish!**



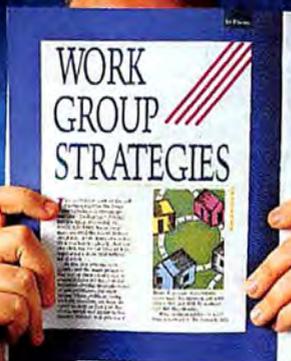
Each month in *Publish!* you'll find features, reviews and departments providing:

- Tips on the fundamentals of graphic design, typography and publishing.
- Professional designers offering creative ideas to enhance layout with page makeover suggestions.
- Information and reviews on the industry's latest hardware and software along with innovative applications.
- Shortcuts and tips on technical matters to cut costs while enhancing quality of communication.
- Techniques to build networks and share files electronically.

All this and more when you subscribe to *Publish!* Now!

FOR THE PUBLISHER

FOR THE EDITOR



SUBSCRIBE NOW AND

SAVE 25%

YES! Send me one year (12 monthly issues) of *Publish!* at the Special Subscription rate of \$29.95. That's almost \$10.00 off the regular subscription rate.

Bill me later Payment enclosed

Name _____

Street _____

City _____

State _____ Zip _____

Mail to:
Publish! Subscription Dept.
P.O. Box 51966
Boulder, CO 80321-1966

Offer valid in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.

Publish! regular subscription rate \$39.90 for 12 issues.
5CEBO

DESKTOP PUBLISHING

Publish!

The How-to Magazine

Produced by desktop publishers, for desktop publishers. *Publish!* serves as a laboratory for the industry—employing techniques and applications on the cutting edge of computer communications. Don't limit your desktop publishing potential—expand it with *Publish!*

Low prices, great service

Hard Drives

CMS Mac Stack SD Series

(Mac Plus, SE, II)

SD 20 Megabyte	\$549
SD 43 Megabyte	\$789
SD 60 Megabyte	\$825
SD 80 Megabyte	\$1249
SD 102 Megabyte	\$1289
SD 140 Megabyte	\$1389

CMS Pro Series Internal Mac SE/II

20 Megabyte SE rear	\$489
30 Megabyte SE rear	\$529
45 Megabyte SE rear	\$689
43 Megabyte Mac II	\$645
60 Megabyte Mac II	\$699
80 Megabyte Mac II	\$1145
100 Megabyte SE rear	\$1489
102 Megabyte Mac II	\$1189
140 Megabyte Mac II	\$1389
150 Megabyte Mac II	\$1879
300 Megabyte Mac II	\$2799

Everex

External 20D	\$509
External 40D	\$929
91D (II, SE, Plus only)	\$1445

Zero Footprint

20 DLX	\$575
40 DLX	\$989
91 DLX	\$1549
40/60 DTL	\$1795

Everex Internal for Mac II

20 ID	\$445
40 ID	\$845
91 ID	\$1395

Tape Back-up

Everex 60 Megabyte External

60T	\$895
-----	-------

CMS 60 Megabyte External

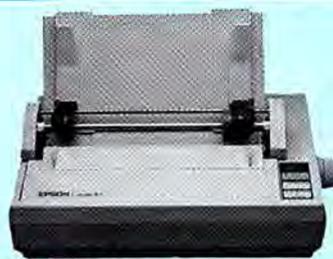
TS-60	\$729
-------	-------

800K External

Disk Drive	\$175
------------	-------

Epson Printers

FX-86e, FX-286e, LQ-500, LQ-850
LQ-1050, LQ-2500, Call for prices



Epson LX-800

9 pin, 180 cps	\$199
Grappler C/Mac	\$65

Epson LQ-500

24 pin, 180 cps	\$369
Grappler LQ	\$79

Beverly Hills

External 1200	\$99
External 2400	\$189



SmarTeam

External 1200	\$149
External 2400	\$229

Everex

2400 with cable	\$229
-----------------	-------

Migent

Pocket Modem	\$115
--------------	-------

DCA

Mac Irma-Mac II or SE	\$795
-----------------------	-------

New Epic Technology

Internal 2400 Baud Modem
for Mac II and SE

5 year warranty	\$299
-----------------	-------

New Orchid Technology

Color for your Mac SE
680 x 480 resolution

16 colors	\$598
-----------	-------

SHIPPING

All items in stock will ship in 24 hours. We offer daily service from Federal Express, UPS, U.S. Postal Service. UPS ground shipments, please add 50¢ per pound. UPS Air shipments, please add \$1 per pound. Minimum shipping and handling charge \$4.00.

Dove Computer

MacSnap Tool Kit	\$15
MacSnap 524	\$170
MacSnap 524S	\$215
MacSnap 548	\$395
MacSnap 548S	\$450
Mach II/SE Accelerator	\$589

Co-Processor

68881	\$295
-------	-------

Call for SIMM prices

Data Desk Keyboard

101-key layout, 15 Function keys, separate numeric and cursor pads, positive Tactile feel \$139

Accessories

Mouse Systems

A+ Mouse	\$65
A+ ADB Mouse	\$79

Dust Covers

Mac/+SE	\$14
Mac Keyboards (specify type)	\$9
Mac II CPU only	\$10
Mac II with mono monitor	\$19
Mac II with color monitor	\$19
Mac II with color monitor and stand	\$19
Apple Imagewriter	\$9
Apple Imagewriter LQ	\$12

Carrying Cases

CM7 Tall Bag for extended keyboard	\$75
CM6 for standard +/SE keyboard	\$69

Kensington Microware

System Saver	\$63
System Saver SE	\$52
Tilt & Swivel	\$22
Superbase	\$33
Masterpiece Mac II	\$105
System Stand Mac II	\$19
Printer Stand	\$15
Mouse Pad	\$8

Aldus

Pagemaker	\$395
-----------	-------

OUR POLICY

- Plain and simple. Hardware; your satisfaction guaranteed or your money back.
- Software; defective software will be replaced immediately. Manufacturers policies prohibit us from offering refunds on opened software.
- 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.
- California, Texas and Georgia residents please add the appropriate local sales tax.
- To place orders call Monday thru Friday 7AM to 7PM P.S.T.
- Prices and Availability subject to change



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

Circle 5 on reader service card



Insights on MacDraw II

Become a quick-draw artist with tips for the Mac's classic drawing program

by **Kenneth S. Hulme**

When Apple introduced MacDraw in mid-1984, it represented a striking alternative to MacPaint's bitmapped graphics. Because MacDraw treats lines, shapes, and text as objects, it's a better tool than a bitmap program for mixing text with graphics. MacDraw quickly became a hit with people who pushed it beyond drawing and into the realm of desktop publishing, forms design, and even drafting.

MacDraw II, recently released from Claris Corporation, Apple's software spin-off, offers phenomenally fast screen redraw and dozens of new features, like arbitrary font size selection, customizable arrowheads and line widths, greater text-formatting flexibility, and much more. Though there's decidedly more competition for MacDraw than when it first arrived, its relative ease of use and its value suggest it will continue to have a loyal following.

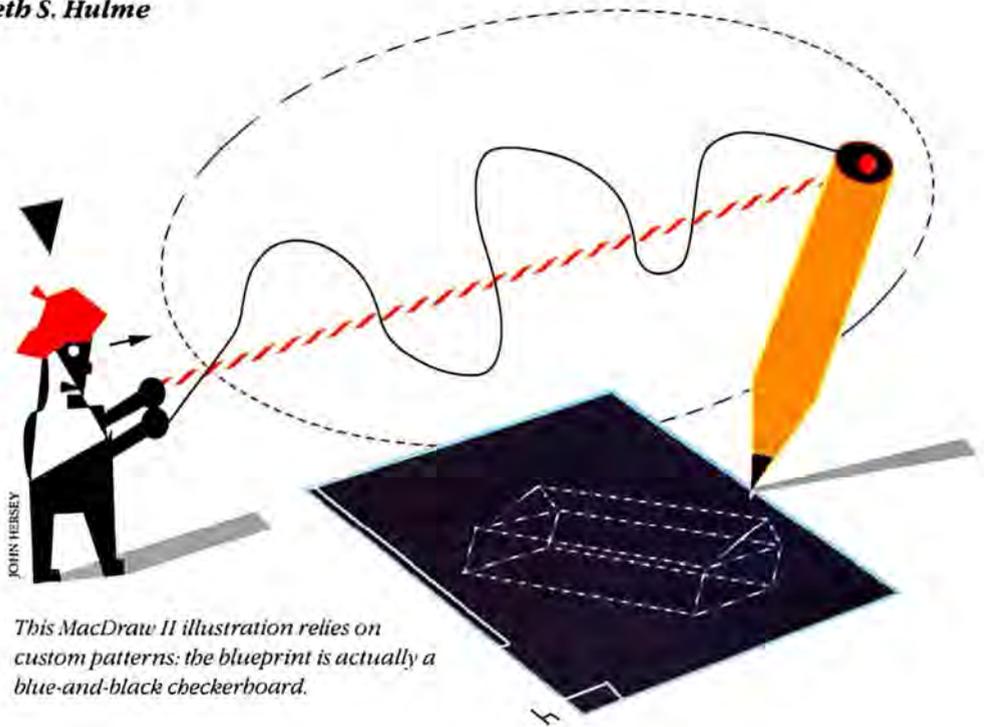
To coincide with the long-awaited debut of MacDraw II, here's a collection of tips and techniques to speed your work at the electronic drawing board. Many of the tips apply to the old version as well; the tips that work only with the new version refer to the program with its full name—MacDraw II.

You need an original program disk (of any of the previous versions) to obtain a new version for the \$100 upgrade fee. For complete details about the MacDraw upgrade, call Claris at 800/544-8554.

Working on the Whole Page

In MacDraw you can use all of the tools to create or modify text or objects on any view level. That means MacDraw lets you see the whole page and create both text and graphics while in Fit to Window

Ken Hulme teaches Macintosh graphics and desktop publishing at the University of Utah's Computer Center. He uses MacDraw to produce plans for white-water river boats and bonsai trees.



This MacDraw II illustration relies on custom patterns: the blueprint is actually a blue-and-black checkerboard.

view (Reduce to Fit in original MacDraw). Rough in a drawing at that view so you can see its position on the page, and then zoom in for detail work by choosing a view you've preset or by clicking the Enlarge tool at the bottom of the tool palette (use Normal Size and Enlarge in the original MacDraw). Even on large drawings that span several pages you can work on the whole composition at once.

To zoom in on part of a drawing, select what you want to see up close before you choose a different view; the desired object will then be centered in the new view.

Aligning Objects

Aligning irregular objects or setting an exact amount of space between parts of a drawing can be a real pain. The easy

way to do this is to "pencil in" guidelines, as you would on paper at a drawing board.

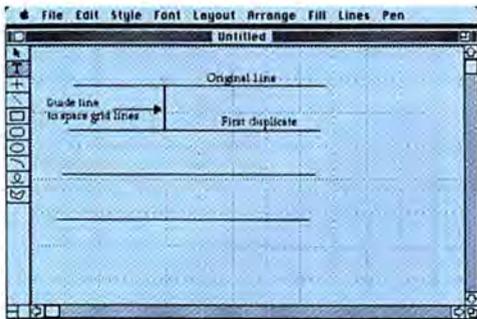
The best tool for guidelines in MacDraw II is the line tool, constrained by holding down the Shift key to create a horizontal or vertical line parallel to the edge of your drawing (in the original MacDraw, use the plus-shaped tool). With Show Size on and the Autogrid off, you can create lines of exact sizes, to the nearest ten-thousandth of an inch. Guidelines can help you to establish even spacing between lines in a form, to measure along part of an irregular object, or to help line things up wherever necessary (see "Guide to Alignment").

Don't forget to erase guidelines when they're no longer needed—choose a line style that is easy to pick out when you finish a drawing.

(continues)

Duplicating at Exact Intervals

MacDraw is wonderful for creating forms, questionnaires, or objects in precise arrays if you know the following trick. Create a master line or object. Then create a guideline that's the length of the spacing you want and butt one end against the master. Select the master and choose the Duplicate command. Drag the duplicated object to the other end of the guideline and position it carefully. With the duplicated object still selected (don't deselect, then select again or the technique won't work), use the Duplicate command to make the number of objects you need. New duplicates appear at the interval you set when dragging the first duplicate. If things don't line up exactly horizontally or vertically, select them all and use the Align or Alignment commands (Align Objects in the original) to put them in their place.



Guide to Alignment

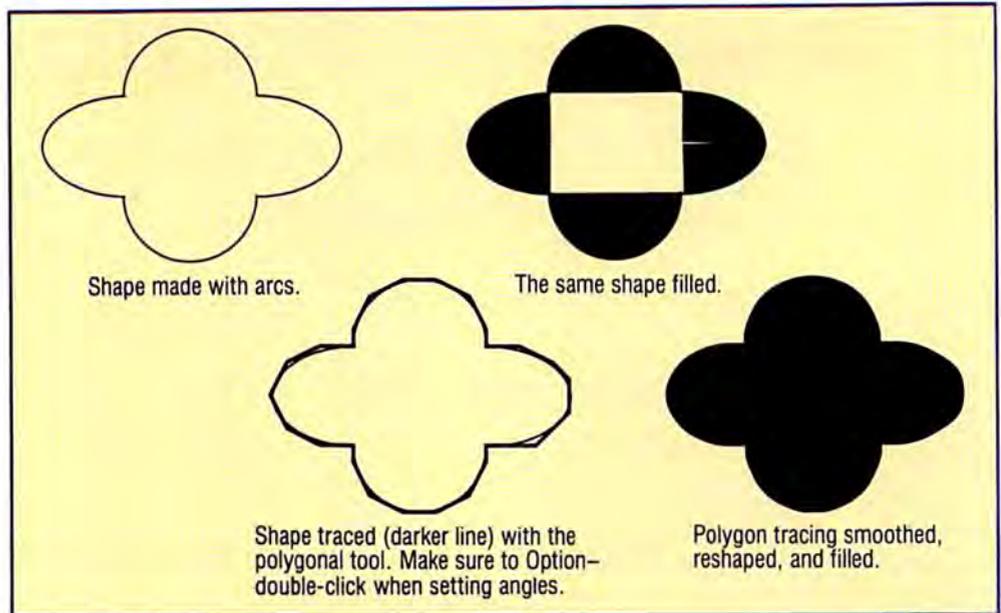
Construct temporary guidelines to aid in aligning objects. Here, a guideline helps set up lines for duplicating at exact intervals.

Patterns

In MacDraw you're stuck with the patterns that the program gives you, but MacDraw II lets you create any pattern you want. Double-click on an existing pattern and a dialog box appears with a pattern editor (see "Custom Patterns"). Modify the pattern, click OK, and the altered pattern appears in place of the original. You can also reorder the pattern bar by selecting a pattern and choosing Move Left or Move Right until the order suits you.

Creating Patterned Lines

In MacDraw II it appears that you can't fill a line or object border with a pattern, as you can in the original version. But you can add a pattern to lines or borders by selecting the object, holding down the Option key, and clicking on a pattern.



A Pattern Technique

Because you often can't fill a grouped collection of arcs or shapes created with other tools, outline a group of shapes with the polygon tool to create a single object that you can fill.

Use this technique with a striped pattern to create the appearance of a dashed line for a circle or square; the Dashes command on the Pen menu works only with lines, not object borders.

icious use of the Reshape and Smooth commands lets you fine-tune almost any shape. Unfortunately, neither MacDraw nor MacDraw II allows you to fill characters with a pattern.

Filling Complex Shapes

MacDraw won't fill shapes created with line and arc segments because the program fills only shapes created with the object tools. Even if you group a collection of lines or shapes created with various tools, the program doesn't view them as an object, and when you try to fill the group you'll probably find patterns where you don't intend them (see "A Pattern Technique").

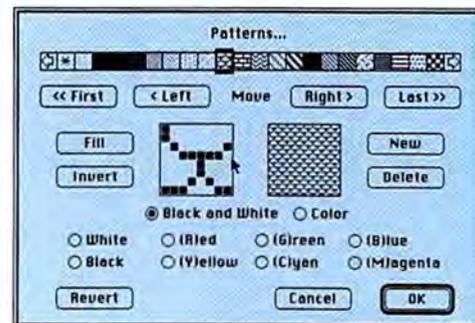
To fill such a shape, trace it with the polygon tool and then fill the polygon. Ju-

Drawing by Polygon

The polygon tool is the single most useful tool in either version of MacDraw. Every time you click while using the polygon tool, you create a handle that you can grab to manipulate the shape. The more often you click, the more handles you can manipulate. Use the tool to rough in complex shapes, then select Reshape to fine-tune the object. For objects that need true curves, choose Smooth on the Edit menu to convert the curves you approximated with the polygon tool into actual bezier curves—then Reshape. The handles now allow you to change the shape of the curves.

Reshaping Polygons

In MacDraw II, you can easily add or subtract handles to reshape objects created with the pencil or polygon tool. Select an object, choose the Reshape function, then hold down the Option key and click on a point to remove it. Click instead on the line itself to add a point.

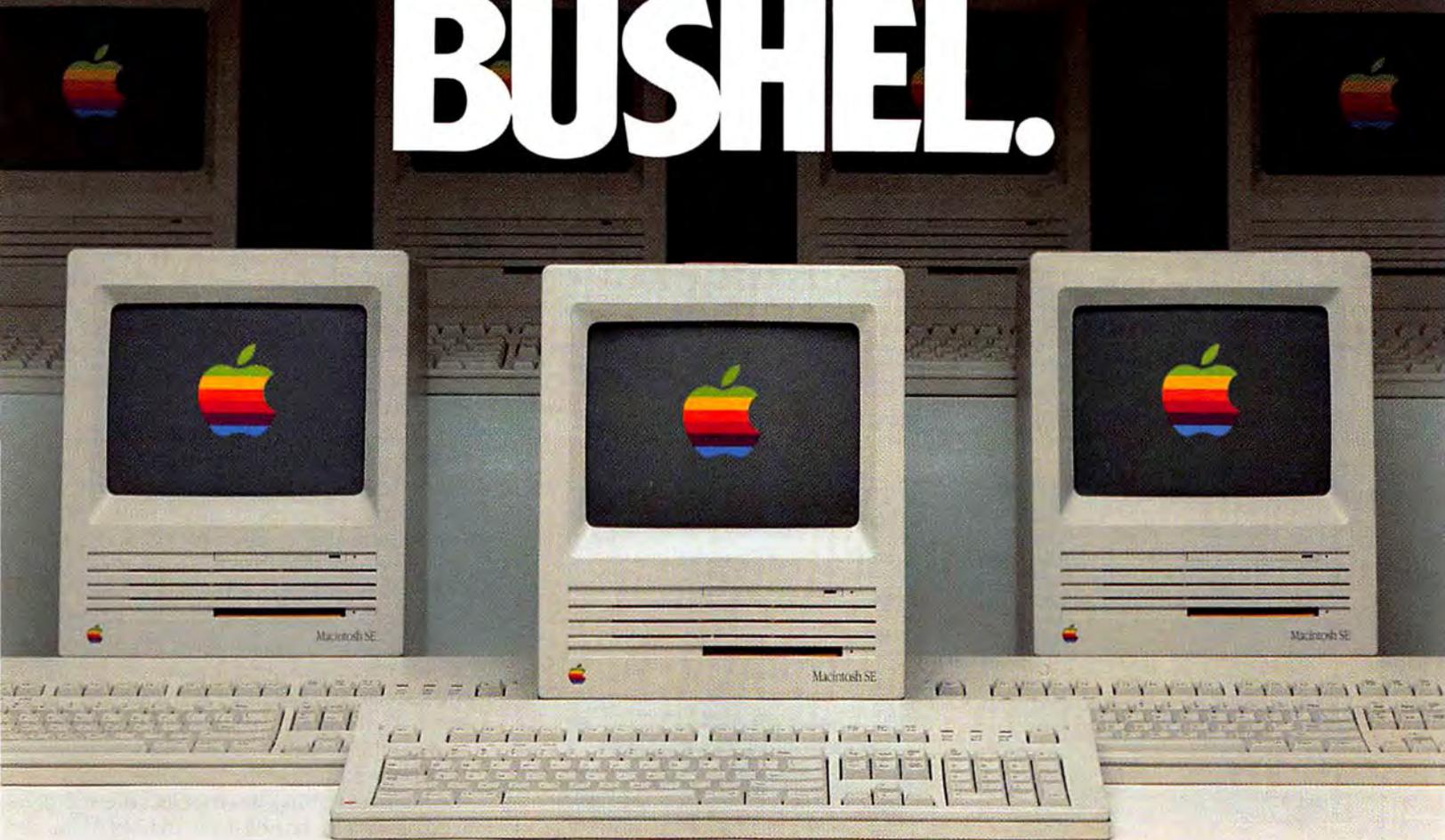


Custom Patterns

MacDraw II lets you alter its patterns. When you double-click on a pattern, this editing window opens to allow you to change a pattern and change its position on the pattern bar.

(continues)

GE RENTS APPLES BY THE BUSHEL.



IBM AND COMPAQ, TOO.

When you need an Apple® Macintosh™ computer or peripheral for a short-term project, like a presentation, trade show or training session—shake our tree first. We have bushels of Apple, IBM, Compaq and compatible PCs, as well as quality peripherals for rent. And, with our extensive inventory and overnight shipment, we make sure the equipment you want is available and gets there fast. One free phone call is all it takes. Call 1-800-GE-RENTS.

CATCH THIS SUPER DISCOUNT, TOO!

Rent a PC or a peripheral from GE Rental/Lease before October 31, 1988, and we'll take 15% off your first rental order. Call us today and catch this special offer—1-800-GE-RENTS, Dept. K.

Call 1-800-GE-RENTS, Dept. K. Or Mail This Coupon.

- Yes! I'm interested in learning more about your offer of 15% off my first PC or peripheral rental. I understand I am not obligated in any way.
 Please send your FREE catalog of GE Rental/Lease products and services.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Ext. or Dept. _____



GE Rental/Lease

Send to: GE Rental/Lease, P.O. Box 405625, Atlanta, GA 30348

"Macintosh" and the "Apple" logo are registered trademarks of Apple Computer, Inc. Compaq is a registered trademark of Compaq Computer Corp.

Circle 195 on reader service card

MacDraw II Shortcut Key

Selected keyboard shortcuts, at a glance



Open as Library: ⌘-Shift-O



Fit to Window: ⌘-M



Save As: ⌘-Shift-S



Select a View (by preset view number):
⌘-1 through ⌘-9



Rescale when pasting: ⌘-Shift-V



Alignment: ⌘-Shift-K



Reshape: ⌘-R



Rotate: ⌘-T



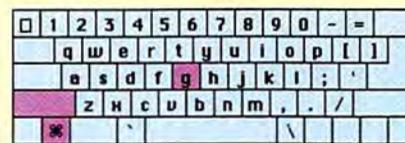
Smooth: ⌘-E



Group: ⌘-G



Unsmooth: ⌘-Shift-E



Ungroup: ⌘-Shift-G

Improved Visibility with Polygons

In MacDraw II, if you press down the Option key and mouse button together as you draw a polygon segment, the segment remains invisible until you release the mouse. That way you see the underlying drawing clearly as you move the cross-hair cursor around to position the next handle.

Shift-⌘ Key

MacDraw II adds a number of ⌘-key equivalents not found in the original. Many functions, such as Ungroup and Unlock, are performed by using Shift-⌘ sequences (see "MacDraw II Shortcut Key").

Mixing Type Styles

MacDraw artists often mix text and graphics in a project. Many times you want to change the style of a word or two in the middle of plain text, but the original MacDraw allows you to type only one text style in a paragraph. In MacDraw II, you can select some text and then change its style, but for subscripts and superscripts you have to use the somewhat laborious method developed to mix styles in the original MacDraw.

Start by making a space for the specially formatted text; leave extra blank spaces for each letter because bold and italic characters are wider than plain text (for subscripts and superscripts choose a size or two smaller than the main text). Go somewhere else on the document and type the special characters in the style you want. Create a guideline at the baseline of the plain text, spanning the gap you left for the special characters. Drag the special text to the space and position it by lining it up with the guideline. Tweak the spacing, if necessary, and erase the guideline. Select the main text, shift-click to select the stylized bit, and then use Group to hold them together.

White Type

Though you can't shade characters in MacDraw, you can make reversed type—white (or in MacDraw II, a contrasting color) lettering against a shaded background. Type the text and choose Outline style. With the text block selected, choose the background pattern you want; the text appears as white letters against the background. For maximum legibility, choose a serif font with wide strokes, such as Bookman.

(continues)

DISCOVER THE NEW CAD STANDARD FOR ARCHITECTURE AND THE BUILDING INDUSTRY



MAC ARCHITRIONTM 3.5

MAC ARCHITRIONTM 3.5 is an integrated professional CAD package with 3 modules :

- Real volumetric 3D (Space ProcessorTM),
- Very powerful and versatile 2D,
- Quantifier.

GIMEOR INC.



1815 H. Street N.W.
Washington D.C. 20006
(202) 223-4373 or (202) CAD HERE

130 Pleasant Street
Brookline MASS 02146
(617) 566-6315

Circle 129 on reader service card

Please send me more information on MAC ARCHITRION 3.5

Name _____
Title _____ Phone : () _____
Company _____
Address _____ State _____ ZIP _____
City _____
Mail to : GIMEOR INC., 1815 H. Street N.W., Washington D.C. 20006
or 130 Pleasant Street, Brookline, MASS. 02146

RED LINE

GIMEOR IN CANADA :
B.A.G.H. Consultants - 411 St. Dizier
Suite 104 H2Y2Y1 MONTREAL P.Q. (514) 843-4397

**We need
someone
with the
confidence
of a surgeon,
the dedication
of a
marathoner
and the
courage of
an explorer.**

We need someone to fill a unique job opening.

Someone to spend two years in another country. To live and work in another culture. To learn a new language and acquire new skills.

We need someone who wants to help improve other people's lives. Who's anxious to build lasting friendships. To gain memories and experience that will last a lifetime. And a sense of fulfillment few jobs can match.

We need a Peace Corps volunteer. Interested? The first step is easy. Call 1-800-424-8580, Ext. 93.

Peace Corps.

The toughest job you'll ever love.



Smooth Sailing in Color

This sketch of a 14th-century Hansa cargo ship uses both custom-designed patterns and standard patterns that have been "colorized."

Reselecting the Last-Used Tool

MacPaint artists who try MacDraw are often frustrated at first because after they use a tool, it automatically reverts to the pointer. To circumvent this in the original MacDraw, you'd hold down the ⌘ key and draw again. In MacDraw II, double-click when selecting a tool to draw with it continuously.

Saving Steps with Drawing Tools

When you choose a tool, set its attributes—line width, Pen, Fill, and so on—before you start drawing if you want the custom attributes to stay in effect for every tool. This method saves a lot of time and trouble when you set out to draw a number of objects with attributes that differ from the defaults of a MacDraw document.

What Happened to the Middle Handles?

In the original MacDraw, if you wanted to lengthen a rectangle, you clicked on the middle handle of the top, bottom, or side edge and then dragged in the direction you wanted. MacDraw II shapes lack the middle handles. In MacDraw II, you hold down the Shift key and grab any corner handle of an object; then drag it to widen or lengthen the shape.

Scaling Objects Proportionally

Shrinking or enlarging an object to a particular size is easy. Make a duplicate of the object, so that if you goof you won't mess up the original. Turn on Show Size and select the copy. Hold the pointer down on one of the corner handles to see the horizontal and vertical dimensions of the object. Then drag the corner handle to re-

size; when the size bar shows the dimensions you want, release the mouse button. Text grouped with an object doesn't scale with the object, so you'll have to resize text separately.

Saving Custom Setups

Preferences, tool settings, font and line definitions, and other attributes are *document specific* in MacDraw II, but you can create Stationery to save unusual settings for specific tasks: create a blank document with the settings you want and save it as Stationery. Then instead of opening the program to create a drawing, open the Stationery file to get an Untitled document complete with those settings.

A New World of Color

MacDraw II lets you create and define color patterns; you won't see them on screen unless you have a color monitor, but even if you don't you can print color images on an ImageWriter II with color ribbons. To keep both color and standard black-and-white patterns available, add colored versions to the pattern bar. Start by double-clicking a pattern to reach the pattern editor, and then choose New. This creates a duplicate of the pattern, which you can color and otherwise modify. If you plan to do a lot of color work, take the time to create a full palette of colored patterns and save the blank document as Stationery (see "Smooth Sailing in Color"). Then, when you need to create a color drawing, just rip off a piece of the color stationery and start drawing, modifying the colored patterns as necessary. □



The Macworld Catalog

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*.



The Macworld Catalog

Accessories

- Furniture211
- Supplies211

Hardware

- Bar Code213
- Data Acquisition213
- Emulators213
- Expansion Chassis213
- Memory Upgrade213
- Miscellaneous214
- Networking214
- Peripherals214
- Plotters215

Hypercard Stacks

215

Services

- Computer Insurance . . .215
- Data Conversion216
- Desktop Publishing216
- Disk Duplication216
- Laser Recharge217

Software

- Accounting217
- Architecture217
- Artificial Intelligence . .217
- Business217
- Business Mgmt.218
- Clip Art218
- Communications218
- Desktop Publishing219
- Educational219
- Engineering220
- Entertainment220
- Fonts221
- Genealogy221
- Graphics221

- Health221
- Input Devices222
- Investment222
- Languages222
- Mail Order222
- Medical223
- Music/Midi223
- Office Mgmt.223
- Payroll223
- Printer Drivers224
- Programming Tools . . .224
- Public Domain224
- Real Estate224
- Rental225
- Sales/Marketing225
- Scientific225
- Security225
- Statistics225
- Utilities226
- Word Processors226

Miscellaneous

- Mailing Lists226
- Publications226
- Video Instruction226

Categories are subject to change

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 \$322 per issue (\$965 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.

The Biggest Small Investment You Can Make.



Take advantage of the direct link with your buyers that maximizes exposure at a low cost.

The *Macworld Catalog* reflects the expanding corporate Macintosh audience whose purchasing activities increasingly include mail order. The cost-effective direct response advertising available monthly in *The Macworld Catalog* links you instantly with nearly 500,000 qualified buyers.

Get into the link. Call 800.888.8622 and place your ad now!

800.888.8622

The Macworld Catalog

Accessories

Furniture

MAG DESK ORGANIZER



HARWELL SERVICES
386 FREEMAN SUITE 3
LONG BEACH, CA 90814
(213) 433-3807

MACINTOSH COMPUTER STAND MADE OF 100% WOOD FINISHED IN WALNUT OR CHERRY. ORGANIZE YOUR MAC AND PUT YOURSELF IN A COMFORTABLE POSITION WHILE AT WORK OR PLAY. HOLDS BOTH EXTERNAL AND HARD DISK DRIVES. KEYBOARD AND OTHER PERIPHERALS FIT UNDERNEATH. WHY BUY PLASTIC AGAIN? OUR REMARKABLY LOW PRICE IS ONLY \$30 PLUS SHIPPING AND HANDLING. DON'T HESITATE TO ORDER YOURS NOW!! CALL FOR FURTHER INFORMATION.

CIRCLE 672 ON READER SERVICE CARD

Supplies

Mouse Pads

Company Logo Specialist
Grey, Green & Red Pads
Size: 9 1/4" x 8" x 3/8"

- 12 pads \$9.50 w/logo
- 72 pads \$6.90 w/logo
- 144 pads \$4.70 w/logo
- 500 pads \$4.14 w/logo
- 1000 pads \$4.02 w/logo

ENTIRE pad imprintable.

GUARANTEED to last.

MULTI-COLOR jobs OK.

SAMPLES w/logo \$12.50.

Computer Expressions, 3833

Chestnut Street, Philadelphia, PA
19104, 800/443-8278

LASEREDGE® Paper/Film

Get high resolution from plain paper laser printers and color plotters. LASEREDGE® high resolution Papers/Films are waxable for paste-up. The bright white background, denser image, and finer edge of line will allow enhanced capability for 300 dpi to reproduce on camera. Call or write for samples today. MC/VISA accepted.

CG Graphic Art Supply, Inc., 481
Washington St., NY 10013,
800/342-5858

FUJITSU/SONY

3 1/2" DS/DD \$1.00 ea.

DATASAFE 5 1/4 DS DD
W/TYVEK .39¢

OUR FULL LINE OF SUPPLIES
& PRODUCTS INCLUDE:

- Mousepads • Covers
- Modems • Head Cleaners
- Plastic & Teakwood Disk Boxes
- Hard Drives
- Public Domain Software

Comp-U-Save

414 Maple Ave., Westbury, NY 11590
(516) 997-6707

800-356-9997

CIRCLE 621 ON READER SERVICE CARD



Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive. Available in six colors. Extended Keyboard version also available. For a dealer near you call toll free

1-800-548-0053

1236 N.W. Flanders,
Portland, OR 97203

CIRCLE 681 ON READER SERVICE CARD



SE SILENCE!

Reduce irritating noise and eliminate screen 'flicker' in the Macintosh SE with the effective, affordable SE Silencer™ replacement fan. Easy solderless installation in less than 15 minutes. Available now for only \$49.95.

Call 800/432-7775 (in California call 415/654-0556).

Mobius Products
6020 Adeline Street
Oakland, CA 94608

**SE
Silencer™**



CIRCLE 643 ON READER SERVICE CARD

Peace of Mind

Our Surelock Security System guards your Mac with high quality steel components that are both attractive and functional. Installation is a snap since Surelock is designed specifically for the Mac. Everything is included to guard your computer, keyboard, ext. drive, printer and even your mouse. We give you a generous amount of vinyl-coated cable that matches your Mac.

- 90 days money-back, 1 yr warranty
- Mac, Mac Plus, Mac SE, Mac II
- 8 ft. coated aircraft cable
- Snap-in inserts for back of Mac and keyboard
- Optional hardware for other peripherals available (hard disk, digitizer, etc.)

\$39.95 Send check or call (24 hrs)
(Plus \$2.50 800-628-2828, ext. 872
shipping) Visa • MasterCard



REIKO

2341 Eastlake Ave. E., Seattle, WA 98102

Dealer inquiries welcome.
Institutional discounts available.

CIRCLE 670 ON READER SERVICE CARD

MDMac Lock/Mac Cables

Mac Lock, finest security kit for Mac +, Mac SE, Mac II, secures Mac, keyboard, mouse, 2nd drive, modem, & printer. Attractive red vinyl-covered steel 3/8" cables. Lock included. No tools req. \$-back guarantee. Also, all IBM, Apple \$49.95. Mac Cables provide any length custom cables for Mac/+ (incl. keyboard) or almost any computer need. \$20 & up.

Mac Products, 20231 San Gabriel
Valley Dr., Walnut, CA 91789,
714/595-4838

SECURITY

PADOLOCK™ physically secures your computer from theft without cables or bolts. Two interlocking steel pads use high-bond acrylic adhesive technology to protect your equipment with 10,000 lbs. of strength. Easy to install. Order keyed different or alike. \$ 79.95 + \$5.00 shipping

CONTROL POWER™ gives you control over the use of your computer with a key. No unauthorized access. Control Power attaches to any electronic device with a removable, 3 prong power cord. Order keyed different or alike. \$69.95+\$3.00 s/h

(415) 861-2223

DOSS INDUSTRIES

1224 Mariposa St. SF. CA 94107

CIRCLE 669 ON READER SERVICE CARD

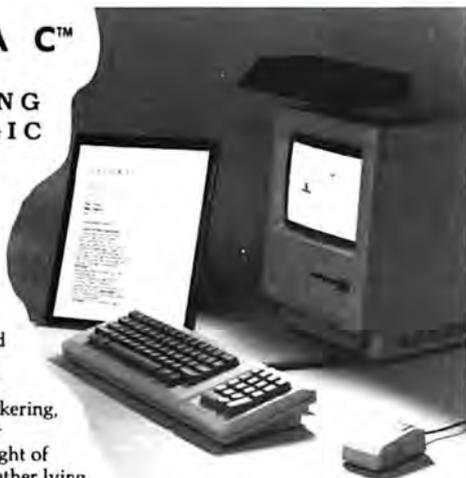
The Macworld Catalog

OPTIMAC™

AN EYE SAVING OPTICAL MAGIC SPACELIGHT™

For Your Mac Space (MAC I thru SE)

The precision optics of the **OPTIMAC** spacelight causes paper information and other things on your desk to glow magically with true full spectrum, glare free, non-flickering, tungsten halogen light. Paper information to the left and right of your Mac is fully lit whether lying flat or on stands. First time users ask, "Where is the light coming from?". **OPTIMAC** takes up no desk top area . . . puts light where it belongs . . . throws no "washout" light on the computer screen . . . creates no reflected bright spots in the screen, no direct glare from the spacelight itself and no reflections of your white blouse or shirt in the screen.



OPTIMAC is not an ordinary light bulb in a shade. It utilizes an **OPTICAL LIGHT MODULE™** (patent applied for) which consists of complex super reflectance mirror systems behind, and in front of, a controlled diffusion tempered glass lens. Each of the two 18-watt, low voltage, tungsten halogen microbulbs will last an average of 8000 hours (two years of typical use . . . longer if the push button standby level is used frequently). The compact, thin line housing is precisely and durably constructed of black anodized aluminum . . . crisp, clean, functional styling . . . clear acrylic swivel mounting interlocks with Mac handle slot . . . no effect on Mac heat vents . . . hinged cover opens easily for convenient lamp replacement (two spare lamps included).

OPTIMAC™ spacelight™ #8803 \$155.00

including shipping within continental U.S. by UPS. Add 6% sales tax for deliveries within California. Check or money order. Allow 15 days for delivery. Full refund if not satisfied upon return in good condition (within 30 days of receipt).

SPACE LIGHTING INC.
37 Commercial Blvd. Novato, CA 94949 (415) 382-7816

CIRCLE 645 ON READER SERVICE CARD



Precision Data Products™
Complete Line of Quality Supplies for Your Computer

WHOLLY KAO.



3.5" DISKETTES

SS Boxed \$.99 ea.
DS Boxed \$1.39 ea.
HD Boxed \$3.21 ea.
DS Bulk \$1.09 ea.

CALL FOR FREE CATALOG

MINIMUM ORDER: \$25.00. S&H: Continental USA. Foreign Orders, APO/FPO, please call. MI residents add 4% tax. C.O.D. Add \$4.00; payment with cash, certified check or money order. Prices subject to change. Hours: 8:30 AM—7:00 PM ET.

Precision Data Products™

P.O. Box 8367, Grand Rapids, MI 49518
Cust. Service & Info.: (616) 452-3457 • FAX: (616) 452-4914
Toll Free Order Lines: MI 1-800-632-2468
Toll Free Order Lines: Outside MI 1-800-258-0028

COD

CIRCLE 663 ON READER SERVICE CARD

Mouse Pads

Custom Printing Available Cloth: Blue, Gray, Burgundy, Red, Brown, Green, Black

Size: 8 × 7½, 8 × 9½, 8½ × 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

Size: 8½ × 11
12 Pads 6.50 36-6.00
72-5.75 144-5.25

CALL AND ASK US ABOUT OUR EXCITING NEW VIEW PAD.

Precision Line Inc., 14100 23rd Ave N., Minneapolis, MN 55441
1-800/328-0077, 612/557-1917

MacChimney

Wish your Mac was quiet and cool at the same time? Here's a silent and effective solution for your Macintosh Plus or 512. MacChimney boosts airflow by 60% using natural principles of convection. Made of a durable, color coordinated paper fiber laminate. Installation is easy and satisfaction guaranteed!

Price includes postage and taxes. Add \$5 for foreign orders. We ship promptly.

Silicon Comforts, 2560 Bancroft Way #117
Berkeley, CA 94704
(415) 658-9543

CIRCLE 678 ON READER SERVICE CARD

OREGON WASHINGTON

Mac Only Store

EVERYTHING For Your Mac. From A Group of SPECIALISTS, DEDICATED To The Mac

NORTHWEST'S LARGEST PRODUCT SELECTION AND LOWEST MAIL ORDER PRICES

Mac FRIENDS

"A NEW KIND OF COMPUTER STORE"
800 331-1322 503 661-2699
189 th. E. BURNSIDE PORTLAND, OR.

CIRCLE 682 ON READER SERVICE CARD

The Macworld Catalog

LOCKS FOR MAC II GS

SAM III
MODEL M-18

\$28.50

MANY MODELS • GROUP KEYING

SAM SYSTEMS, INC. • (219) 844-2327
P. O. BOX 2339 HAMMOND, IN 46323

CIRCLE 644 ON READER SERVICE CARD



Reclaims Desk from Disks

The VDS 240

- Vertical Disk Storage
- Holds 240 disks
- Mounts on wall
- Easy Disk Space



"It's the only way to store disks"
— Jay Walker, owner, Alne Orchard

To Order: 1-800-942-4008

Vertical Disk Storage • P.O. Box 7541 • Olympia, WA 98507 • 206-352-2977
100 Standard Disk Storage on Desk
CIRCLE 653 ON READER SERVICE CARD

Call Up Your Ad On Our Screen.

The Macworld Catalog
800.888.8622

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

- Magnetic encoder
- Code 39 Bar Code Printing Program
- Portable Bar Code Reader

TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
415-856-6833

Telex: (Graphnet) 371 9097
FAX: 415-856-3843

CIRCLE 613 ON READER SERVICE CARD

Emulators

II in a Mac

An Apple II/e computer
...all in software!

Run Apple II software on your Macintosh.
Convert Apple II files to Macintosh files.

\$149.95 Add \$3 for P&H

COMPUTER:applications, Inc.
12813 Lindley Drive Raleigh, NC 27614
(919) 846-1411

CIRCLE 640 ON READER SERVICE CARD

Expansion Chassis

Have you heard about the 4-SLOT MACINTOSH?

Open up your Macintosh SE and Plus with an expansion chassis system from Second Wave, Inc. **ExpanSE & ExpanSE Plus** allow you to custom configure your SE & Plus with 4 SE option cards:

- Accelerator card • Monitors
- MS-DOS card • Communications
- Data Acquisition boards • Transputer

Second Wave, Inc.
9430 Research Blvd., Bldg. II, #260
Austin, TX 78759
(512) 343-9661

CIRCLE 687 ON READER SERVICE CARD

Memory Upgrade

Memory Enhancements

Upgrade your Mac to 512K, 1024K, or 2048K of contiguous memory. SCSI port & fans available. Factory flow-solder techniques used for high reliability. 120-day warranty. Local 20-minute installation or mail order. Dealer inquiries welcome. Call for pricing and information.
Ebman Engineering, Box 2126, Evanston, WY 82930, 800/257-1666

RAM/ROM Upgrades

128K to 512Ke	512K to Plus
128K to Plus	SCSI Port
128K to 2MB+	

Apple ROM/800K Drive.
Free Internal Fan with upgrade. We sell new Macintosh SE's & Mac II's. Seikosha Printers \$269, Rodine 20MB hard drive \$499, Internal Macintosh® Fans \$45.
Simmons Consulting, 5526 Pemberton St., Philadelphia, PA 19143, 215/471-9242

1 Meg SIMMS Available NOW!

Get off the waiting list and start computing! Video Installation Guide available so anyone can do it.



COMPUTER CARE
210 Second Street North, Suite 301
Minneapolis, Minnesota 55401
(612) 375-9238

CIRCLE 622 ON READER SERVICE CARD

SIMM CITY

Wide Variety of SIMMS IN STOCK
Call for Best Price

(213) 838-3356

3440 Motor Ave., Suite 103
West Los Angeles, CA 90034

Prices will vary

CIRCLE 652 ON READER SERVICE CARD



The Macworld Catalog

Do you need

MORE MEMORY

for your Mac Plus, SE, or II?
PSI has the one megabyte SIMMS that are necessary to upgrade your Macintosh's RAM to the maximum.

Call for current pricing

Call today for fast delivery.

800-MAC-1PAC

408-942-8188 in CA

PSI 1609A S. Main • Milpitas, CA 95035

Price subject to change

Visa/MC

CIRCLE 617 ON READER SERVICE CARD

Macintosh Service Parts / Systems

Service parts & systems for the entire Apple line bought and sold. Send for free a catalog. Call for a quote on your system.

Logic boards / Power supplies / Custom chips
CRTs / Disk drives / Systems / Board exchanges & more

Pre-Owned Electronics, Inc.

30 Clematis Ave, Waltham, MA 02154

Voice: (617) 891-6851/Fax: (617) 891-3556

CIRCLE 654 ON READER SERVICE CARD

Networking

Ethernet for the Mac

Kinetics provides Ethernet hardware & software for all Macintosh® computers. Products include:

- FastPath: AppleTalk Ethernet gateway
- EtherSC: SCSI-Ethernet controller
- EtherPort SE: Internal Ethernet card for the Mac SE.
- EtherPort II: Internal Ethernet card for Mac II. AppleTalk, TCP/IP & DECnet supported.

Kinetics, Inc. 2500 Camino Diablo, Walnut Creek, CA 94596
415/947-0998

PhoneNET® System

The PhoneNET System creates an AppleTalk network w/convenience, added distance, & flexibility of telephone wire. PhoneNET supports AppleTalk & can use standard telephone cabling, even existing wiring. Components incl: PhoneNET PLUS Connectors, PhoneNET Star-Controller w/StarCommand DA & PhoneNET Manager software, TrafficWatch network analysis package & PhoneNET CheckNET DA. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704, 415/849-2331

Peripherals

MacRecorder™

MacRecorder records *real* sound into your Mac. Simple to use. Just hold it in your hand & speak into built-in microphone, or record directly from your TV or stereo. Pkg. incl: *HyperSound™* stackware lets you record & work w/sound from within HyperCard. *SoundEdit™* software records sound, then lets you edit & save files in a variety of formats. MacRecorder is compatible with *HyperCard*, *Studio-Session™*, *VideoWorks™* & *Beep INITS*.

Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704, 415/849-2331

MAC SIMMS

Add memory to your Mac Plus, SE or Mac II. One megabyte SIMM modules available in 2 MB sets. We offer the lowest price you'll find anywhere—any quantity. Call for quote. MC/VISA. Immediate delivery. Product satisfaction guaranteed. We've been in the RAM business since 1982.

Palo Alto RAM, P.O. Box 50690, Palo Alto, CA 94303, 415/858-0125

Porta CELL

Give Porta CELL to route drivers, meter readers for any remote data capture. Data is easily stored and later "dumped" into a Mac or PC serial port. Presto! It's now an *Excel* or *1-2-3* file. Unit is 4" x 7" x 2". Host software and cable included. Cells for \$229 + \$5 s/h. MC/VISA. ADEPT Inc., P.O. Box 9183, Ft. Collins, CO 80525, To Order: 800/288-4410

Miscellaneous

Mac-cessory™

EVEREX Hard Drives

20 MB \$514 EMAC-20D Hard Drive

EMAC-91D 18MS Access \$1399

EMAC-60/60 Call!

29MS 60MB Drive/60MB Tape

EMAC-40D \$799

Toll Free 800-634-1497

or call Valley Computers 216-543-1952

16744 W. Park Circle

Chagrin Falls, OH 44022

We DO NOT charge credit cards until order ships

Visa/MC

CIRCLE 619 ON READER SERVICE CARD

MACsimize

your

Lisa/Mac XL

New!! MacWorks™ Plus

800k Drive/New Int'l Hard Disks/RAM

Orders & Information call: 800-323-1751

or 215-574-0357

For Latest Info Call our Hotline

Toll Free at 800-782-7823

Dafax14 North Drive, Malba NY 11357

CIRCLE 616 ON READER SERVICE CARD

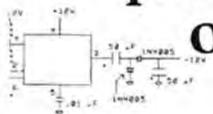
The Macworld Catalog

Plotters

The Zericon Model 3600-D Plotter

Astounding price and performance for only \$2295. (including stand)

INTRODUCTORY OFFER \$1,695 Call Now!



Zericon dares to compare value

- **Price:** a full \$1,000 less than our nearest competitor.
- **Compatibility:** operates with all popular CAD software supporting DM/FL™.
- **Speed:** at 7 inches per second, the 3600-D offers the best price-performance ratio in its class.
- **Repeatability:** 200 cycles assures you of drawing quality you can be proud of.
- **Unique:** X & Y axis scaling allows you to calibrate to 1 part in 10,000. Ideal for applications where scale is critical.
- **Vacuum paper hold down** assures perfect registration.
- **High Resolution Circles:** Suitable for PCB artwork.

CALL NOW AND WE'LL SEND YOU A FREE SAMPLE PLOT. (15) 490-8180

Dealer inquiries invited.

ZERICON

Stevenson Business Park
Box 1669
Fremont, CA 94538
DM/FL is a trademark of Houston Instrument

CIRCLE 684 ON READER SERVICE CARD

Hypercard Stacks

Bible-Stack™

Bible "King James" Version on HyperCard™. Beautiful screen design, chapters and verses called on screen instantly with the touch of a button. Search timing 1 min. 7 sec. from beginning of Genesis to Revelations. By copying, pasting and printing out, you can make your own topics designed for custom purposes in a fraction of the time. \$120 US, all charges included. NN ver. available soon.
Alpha & Omega, P.O. Box 81056, South Burnaby, B.C. Canada, V5H 4K2, 604/732-7171

Bed & Breakfast Inns!

Ever dreamed of staying at a Victorian mansion, Southern plantation, or Seaside resort? The informative and entertaining *InnServ* B & B *HyperGuide*™ tells about hundreds of B & B and Country Inns nationwide—plus state maps. Toll free reservation line and free newsletter! \$15.95. Credit card phone orders accepted.
InnServ, Rt. 1 Box 47-A, Redkey, IN 47373, 317/369-2245

Learn HyperTalk™ with *HyperTutor*™

An interactive tutorial stack for learning the language of HyperCard™. 41 lessons take you step-by-step through all HyperTalk's commands. Includes pop-up windows with advanced tips.

MacUser™ APRIL 88

\$49.95 plus 2.50 p/h (CA residents add 3.00 sales tax)
VISA • MC • CHK

teligraphics (415) 454-7519
936 Sir Francis Drake Blvd. #R
Kentfield, California 94904

CIRCLE 646 ON READER SERVICE CARD

Relationship Astrology

StarCross™ stackware lets you generate detailed birth charts and revealing relationship analysis charts quickly and easily. *StarCross*™ includes birthdays for 1500 famous people with room to add 1500 more. Easy-to-use entertainment for everyone. \$24.95 includes all costs.

Starby Software, 5 Town & Country Village 576, San Jose, CA 95128-2026, 408/275-8356

HyperTools™

Add Versatility to stacks with HyperTools™ #1 & #2. Each set includes 16 Tools which can be installed easily into most stacks. Great for novices & experts.

Set #1 includes: Icon Editor, Scan Cards, Alignment & Array Creation Tools, Script & Font Tools, plus 10 other tools!

Set #2 includes: Choice Lists for Fields, Field Sorting, Formatting & Data Validation, Sound Tools, Group Tools, plus 10 more tools!

Each Set of Tools \$99+Shipping Call (203)926-1116

Softworks Inc
PO Box 2285
Huntington, CT 06484

CIRCLE 612 ON READER SERVICE CARD

Wordwise-Stack Indexer

Creates an index of the words in any stack. Index(s) are on file for your reference and access in the Wordwise master. Better than a tutorial! Any particular word can quickly and easily be found in any stack. Beginner or expert will love this powerful, new extension of Hypercard. \$59.95. Order now! *HyperAnnex*™—MW, P.O. Box 1354, Saugus, MA 01906, 617/289-9801

Services

Computer Insurance

SAFWARE

INSURES YOUR COMPUTER. Safeware provides full replacement of hardware, media, and purchased software. As little as \$39 a year provides comprehensive coverage. No lists of equipment needed. One call does it all! Call 8 a.m. to 10 p.m. ET (Sat. 9 to 5). SAFWARE, The Insurance Agency Inc. 2922 N. High St., PO Box 02211, Columbus, OH 43202
800-848-3469
(Local - 614-262-0559)

CIRCLE 635 ON READER SERVICE CARD

Data Security Insurance offers two policies for computers, each with essential coverages not available elsewhere. As low as \$35/year.

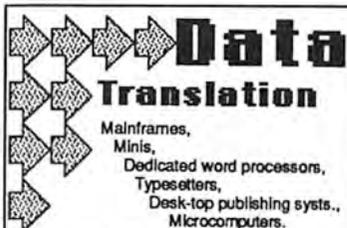
INSURE YOUR COMPUTER AGAINST ACCIDENTAL BREAKAGE
1-800-822-0901

CIRCLE 624 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog

Data Conversion



Mainframes,
Minis,
Dedicated word processors,
Typesetters,
Desk-top publishing systs.,
Microcomputers.

Convert and translate features of DBMS, spreadsheet and word processing files stored on disks or tapes to or from your Macintosh!

CompuData Translators, Inc.
3325 Wilshire Blvd., Suite 1202
Los Angeles, CA 90010
800/825 8251 213/387 4477

CIRCLE 605 ON READER SERVICE CARD

Tape/Disk Conversions

Conversion services for your Macintosh, to or from over 1,000 computer systems:

- Mag tapes
- Microcomputers
- Word Processors
- Typesetters

Our conversion capabilities include to or from 3½-inch, 5¼-inch, and 8-inch disks & mag tapes.

Pinar Computing Services, Inc.,
165 Arlington Heights Rd., Dept
MC, Buffalo Grove, IL 60089,
312/459-6010

Desktop Publishing

MacTypeNet™

Mac/PC typesetting. Disk or modem. 300-dot LaserWriter™ output; 635-, 1270-, or 2540-line Linotype™ L300P output. Composition, page makeup, printing/bindery services. Hardware/software sales, services, and support; beginning and advanced training and seminars for Macintosh®, PC, and Linotype 100/300 users.

*MacTypeNet,™ P.O. Box 52188,
Livonia, MI 48152-0188,
313/477-2733*

Laser Printing Services

LaserWriter (300-dpi)/Linotype L100 (1270-dpi) output of your Mac/IBM files. Disk or modem. 24 hr. service. Linotype \$7 per page (\$3.50 volume discount). LaserWriter \$.50 per pg. Desktop publishing specialists in consulting & design services. Hardware/software sales. Offset printing & bindery services available. Rent IBM/Mac \$5 hr. Adobe font dealer. Check our low price.

*Laser Printing Services, 26058 W.
12-Mile Rd., Southfield, MI 48034,
313/356-1004 (MI),
800/722-3475 (Nat'l.),
Modem: 313/356-3186*

Waldman graphics Printers + Typographers

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.

- 1270 & 2540 dpi pages from Linotype L300s
- Repro, Pos. & Neg. film • Disk or modem • Color separations • Scitex system • Award-winning prepress, 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.
212 925-2420 / 201 522-8778 / 215 627-7200 / 609 662-9111

CIRCLE 637 ON READER SERVICE CARD

**LINOTRONIC 300
TYPESET OUTPUT
FAST
RELIABLE
INEXPENSIVE**

FAST - TYPICALLY LESS THAN 24 HOURS
RELIABLE - EXPERT STAFF • 2 L300 S
INEXPENSIVE - AVERAGE \$5 PER PAGE

LAZER GRAPHIX
3250 B POLLUX • LAS VEGAS, NV 89102
1-702-871-5511

CIRCLE 647 ON READER SERVICE CARD

Desktop Publishers...

FREE DISK

It's our way of introducing you to the most advanced graphic art service available, created specifically for Macintosh™ and compatible with Page-Maker®.

For **FREE DISK**, send your business card to:
Media Marketing Services
P.O. Box 642
St. Charles, IL 60174
(312) 584-4486



CIRCLE 655 ON READER SERVICE CARD

The NeoLine™

New on-line information and consultation service for typographers, designers and desktop publishers. Expert answers within 24 hours on system configurations, research, or simple problem-solving. Product listings. Support for DTP software, fonts and PostScript. Message/question board and classified. Call toll-free for info and an initial browse!

*Neoscribe International, P.O. Box 633, East Haven, CT 06512,
800/432-TYPE (24-hour modem)
203/467-1357 (modem in CT),
203/467-9880 (voice)*

Disk Duplication

ATTRACTIVE DUPLICATION



COMPLETE DISK DUPLICATION
SERVICES AND EQUIPMENT SALES
LABELING • PACKAGING
DISTRIBUTION • HIGHEST QUALITY
FAST TURNAROUND
COMPLETELY GUARANTEED

We sell Mountain Computer duplication equipment if you prefer in-house production.

**FORMATS
UNLIMITED INC.®**
East Farmingdale, NY 11735
1 (800) 645-8461 • (516) 249-9200

CIRCLE 626 ON READER SERVICE CARD

The Resolution Solution™

- 1300 hi-res output up to 2540 dpi
- Output to paper or film
- Macintosh or IBM-PC compatible disks
- 24-hour modem
- Complete Adobe Type library
- 24-hour turnaround
- Free pick-up and delivery in 1-888 Comdor

Call 312/844-0030
DEE-SIGNER IMAGSETTING
5014 Lakeside Ave. Suite 100
74 W. Congress
St. Charles, IL 60174

CIRCLE 625 ON READER SERVICE CARD

Type/Imaging

Island Color Productions has so many advantages:

- High-resolution typesetting
- Linotronic imagesetting
- Laser printing
- Computer graphics & design
- Speedy turnaround time
- From MAC, IBM or any ASCII file
- Whether keyboard, disk, or modem

Why not take advantage of us?
*Island Color Productions, 11
Stony Brook Ave., Stony Brook,
NY 11790, 516/751-0485 (voice),
516/751-0430 (24-hr. modem
on line)*

The Macworld Catalog

Perfect Replication

3.5" duplication is 100% guaranteed. Specialists in reproduction of all 3.5", 5.25" & 8" diskettes, plus 1/2" data cartridges and 1/2" magnetic tapes. Full production services including labeling, serialization, copy protection, package assembly & shrinkwrapping, fulfillment & shipping, warehousing. Your Complete Computer Software Production service.

DisCopyLabs, 2610-B North First St., San Jose, CA 95134, 408/433-0900, ext. 15

Laser Recharge

Recharge Dealerships!!

Hot New Field! Recycle laser printer & copier toner cartridges. Join our network & make money now. Train at our location or at home. "MASTER DISTRIBUTORSHIP" now available. High profit, low overhead. Established company. Learn it right—no drill & fill! Factory-like recharge method. Receive tools, supplies, trade secrets, marketing strategy & technical support. Free call for information.

Laser Charge Co., 11782 Jollyville Rd., Austin, TX 78759, 800/223-8134 or call collect 512/335-8191

National Laser Recharge

Save your money! Let us recharge your toner cartridges for HP Series I & II, Apple, Canon, QMS & others. Also Canon, PC models 10, 14, 20 & 25. 100% Guaranteed Factory-Like recharge method. No drill & fill! Long Life method for only \$49 incl. s/h. Up to 30 to 50% more printing & up to 7 charges per cartridge. Color avail. We buy empties in orig. box, styro & wand—\$10 (you pay shipping). Send cartridge w/check or Money Order.

National Laser Recharge, 1413 Loop 281 W., Ste. 101, Longview, TX 75604, 214/297-0200

reconditioned **TONER** cartridges!
for laser printers & Canon PC Copiers

BETTER THAN NEW!
● 20% MORE TONER
● DARKER PRINT
● 100% GUARANTEED

\$44.95
We buy empties-\$10
call for brochure
800-426-8196

Willow Products Corp.
3857 Willow Ave., Pgh, PA 15234



CIRCLE 638 ON READER SERVICE CARD

PC COPIER & LASER PRINTER OWNERS



TONER SERVICE COMPANY
2128 Dolman
St. Louis, Missouri 63104
(314) 776-1155 • 800-88-TONER

CIRCLE 665 ON READER SERVICE CARD

GO WITH THE BEST - 2 DAY AIR Return Delivery

Toner Cartridge Remanufacturer
Jumbo Refills - Colors - Specials
Volume Rates - Bulk Available

\$44.50 for most cartridges

LASERquick 1-800-777-8444

7707 Flying Cloud Drive
Eden Prairie MN 55344

CIRCLE 604 ON READER SERVICE CARD

Software Accounting

ACCOUNTING JUST BECAME EASIER!
Now there are 3



Includes G.L., A.R., A.P., and Inventory DEMOS AVAILABLE

The best payroll program for the Macintosh PLUS two excellent general ledger programs

CHECK MARK SOFTWARE INC.
1-800-444-9922 ext 422

CIRCLE 603 ON READER SERVICE CARD

Architecture

Desktop Architect

Professional detailing system by architects. Pre-drawn components to assemble custom details with minor editing. Parts kits combine bitmapped and object-oriented graphics. Includes wall and cross sections, details and interior elevations. 8" x 10" format for working drawings. \$149.00 Super Paint required.

Desktop Architect Co. 634 N. High St., Columbus, OH 43215 614/469-9906



Artificial Intelligence

Instant Expert™

A simple and powerful *Expert System Shell* designed to be the easiest to use. The powerful inference engine provides an easy-to-use expert system application query. Forward and backward chaining as well as a unique mixed strategy gives real flexibility to users. The system can explain *how* and *why* a conclusion was reached and give the user special *Solution* information. \$49.95. *Human Intellect Systems*, 1670 S. Amphlett Blvd., San Mateo, CA 94402, 415/571-5939

Business

Business Plan on diskette

BizPlan Builder™

A working business plan template — Over 85 pages of outlines, headlines, started sentences and paragraphs, lists, financial statements, suggestions... 200K already typed into 29 MacWrite files. Fill in the blanks and edit into a comprehensive plan. A big head-start for consultants & entrepreneurs.

From **Tools For Sales™**

\$79.00 (415) 941-9191

CIRCLE 636 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Business Plans & Forecasts

New **Infoplan Business Plan Toolkit™** version 2.0 includes spreadsheet models, texts, even an optional HyperCard™ text builder and optional sample plans on disk. Use with Excel, Works, MultiPlan, or other spreadsheets. Practical, easy-to-follow manual. \$89.95 + \$5 shipping and handling.

Ask us about **Infoplan Business Toolkits™** for cash flow, loan applications, sales and market forecasts, manufacturing and inventory planning... from \$69.95 + \$5 shipping and handling.

Palo Alto Software

(415) 325-3190 155 Forest Ave. Palo Alto, CA 94301 (800) 336-5544

CIRCLE 628 ON READER SERVICE CARD

Clients & Profits.™ Advertising Agency Management



Designed by advertising professionals for ad agencies: job management; traffic; job costing; payables; time sheets; estimates; receivables; POs; flexible billing; exporting; Customizable! \$1895. Trial-Size \$40.

Working Computer
San Diego CA
619 721-0501

CIRCLE 675 ON READER SERVICE CARD

PacerLink (was pcLINK)

Connects Macs to VAX (VMS and ULTRIX), Stratus and UNIX systems. Supports serial line, remote modem, direct Ethernet, and AppleTalk bridged to Ethernet communications media. Provides terminal emulation (VT220, VT100, VT240/241), file transfer, virtual disk, and print services. *PacerShare* extension enables the VAX/VMS system to act as an AppleShare compatible file server.

Pacer Software, Inc.
7911 Herschel Ave. #402, La Jolla, CA 92037, 619/454-0565

MacInvoice™

Fill in, print, & save invoices. Cut typing time in half. Print summary journals, multiple copies, blanks. LaserWriter / ImageWriter. Recall & update. Auto-numbering. Customize to your business needs. Save to disk as text files. Macros.

Check/MO \$69.95 + \$3 s/h (NY add tax)

MacEnvelope™

Print envelopes with LaserWriter or ImageWriter quickly and easily. No more layout headaches! Save addresses and layouts. Use any fonts in your system. Use styles to add spice and sophistication to your envelope printing.

Check/MO \$29.95 + \$3 s/h (NY add tax)
Not copy-protected. 512k or larger.
SYNEX (718) 499-6293
692 Tenth St Brooklyn NY 11215

CIRCLE 656 ON READER SERVICE CARD



MAX SOLUTIONS™

CounterWorks™

Point-of-Sale, Inventory, Invoicing for small business. Optional cash drawer and bar code reader. Customizable. Includes Omnisc 3™ Runtime. \$450

Concept-to-Completion™

Cost Breakdown Application for Fund Control, Project Mgrs, Developers, Lenders, Contractors, Subcontractors. Customizable. Requires Excel™. \$495

DEMO DISKS \$20

CUSTOM PROGRAMMING

241 12th St. Del Mar, CA 92014
Visa (619) 481-0479 MC

CIRCLE 674 ON READER SERVICE CARD

Business Mgmt.

All New! Timeminder™ 1.7

Auto time tracking program and D/A. TimeMinder offers time and project billing, auto project tracking & employee productivity reporting. Includes: Invoice printing, Client receivable ledgers, 2-pg. work notes, Manual Entry, Pause/Time D/A, Variable Project Search & Auto Warning of projects coming due. Unlimited number of client or employee files. And more! \$199.

Aatrix Software™, P.O. Box 5359,
Grand Forks, ND 58206-5359,
Order line: 800/426-0854

Clip Art

High Resolution Clip Art created w/ Adobe Illustrator For Mac or IBM

ARTWARE

- Business & Commercial \$69.95
- Borders \$129.95 (4 disk set)
- Christmas \$89.95 (2 disk set)
- Equestrian \$89.95 (2 disk set)
- US Maps w/Counties \$229.95 (4 disk set)

Artware Systems Inc. • 3741 Benson Drive • Raleigh, NC 27609
For inquiries (919) 872-6511

To Order 1-800-426-3858

CIRCLE 662 ON READER SERVICE CARD

Communications

Session HP CRT Emulators

The Session family of HP terminal emulators lets your Mac talk to the HP3000, 9000, and 1000. Business Session™ (formerly Mac 2624; \$199) emulates an HP 2392 block mode CRT. Graphic Session™ (\$299) adds HP 2393 graphics. Color Session™ (\$399) emulates the HP 2397. File transfer included. **Tymlabs Corporation**, 811 Barton Springs Rd., Austin, TX 78704, 512/478-0611, Telex 755820

Mactell 3.3

Superior int'l. communications software for all Macs features:

- Minitel mode for access to more than 6,000 online services worldwide
- ASCII compatibility for standard US services
- Sophisticated macro language
- Multi-protocols: Macterminal, MacBinary, X & Y Modems
- Unique File Server: set up your own Bulletin Board
- And much more! \$97.

Quantity pricing avail. Order today!
Baseline, 838 Broadway, New York, NY 10003, 212/254-8235, 800/CHAPLIN

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 & Sperry terminal emulation.

Avenue Software Inc.
1173 W. Charest Blvd. #390, Québec, Qc
Canada, G1N 2C9 – Tel. (418) 682-3088

CIRCLE 642 ON READER SERVICE CARD

The Macworld Catalog

Desktop Publishing

MacPalette

By Microspot prints multicolored graphics & text from most Macintosh® software using the Image-Writer II. MacPalette will colorprint documents from MacDraw, MacDraft, MiniCad, MacProject, MacWrite, JAZZ, Microsoft Chart, Word, Excel etc. (not MacPaint.) It prints black as a true black instead of mixing a black. \$69. CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

MicroSetter® II

This QuickDraw driver resides in the Macintosh allowing Compu-graphic, Varsity, CRTonic type-setters to be driven directly from the Macintosh. Output from Page-Maker, XPress, RSG, MacDraw, Word and others. Retains all formatting including graphics, without need for coding. \$1490 - \$3500. Demo \$50. TeleTypesetting Company, 474 Commonwealth Ave., Boston, MA 02215, 617/266-6637, FAX 617/266-3062

Educational

An all new edition of the Macintosh Educational Software Collection

- Hard-to-Find & Best Sellers
 - HyperCard / Shareware
 - Over 150 Titles
 - All Subject Areas
 - Teachers, Students, Parents
- Send for Free Catalog!**

CHARIOT • 3659 India St. • San Diego, CA 92103 (619)298-0202

CIRCLE 685 ON READER SERVICE CARD

Brainchild Grade™

Unique graphic interface, like paper grade book, extremely easy to use. Total integration of spreadsheet, database, & report-generating software. Free-form class structure. enormous capacity, & speed! Complete stats & graph program. Intricately detailed user's manual. Value-priced at \$25. No other program comes close! Brainchild Corp., avail. through the Kinko's Academic Courseware Exchange. To order, call 800/235-6919, 800/292-6640 (in CA)

Kieran

Integrated learning program for children 2-6 yrs. Uses child's name in speech and pictures. Totally mouse driven interactive program with iconic interface. Covers alphabet training, time telling, counting skills, upper-lower case, and mystery door! 4-mice rating in Mac-User. Great gift! MC/VISA \$39.95. Ohm Software, 163 Richard Dr., Tiverton, RI 02878, 401/253-9354, 800/346-9034

Algebra Homework Tutor

Revolutionary Homework Tutor™ lets you do your Algebra homework or classwork on a Mac. Checks each step you enter, gives hints, poses practice problems, solves and explains examples, and prints completed homework. Easy editing, standard Mac interface and too much more to tell. Send for free brochure. Missing Link Software, Box 3280, South Amboy, NJ 08879, 201/721-2569

QUED/M™

macro editor \$119

Powerful text editor/database manager. Many convenience editing features: e.g., unlimited undos. Find files with key words, find/replace with wildcard characters, type or record macros, count lines, sentences, words, extract any data from text files. Search unopened files, etc. Paragon Concepts, Inc., 4954 Sun Valley Rd., Del Mar, CA 92014 619/481-1477, 800/922-2993.

CIRCLE 609 ON READER SERVICE CARD

TEST GENERATION AND SCORING!

LXR•TEST™ - the only Logic eXtension Resources complete testing system for the Mac! Rated "best testing tool on the market." (714) 980-0046 AppleLink: D0626

CIRCLE 649 ON READER SERVICE CARD

Typing Made Easy

The finest typing software in the world. Touch type in 3 weeks. #4 on Macworld Best-Seller chart for Education Software. It diagnoses your needs; tailors the drills. 8 lessons start with home row keys and end with paragraph drills. Lessons include drills and a test. Results are displayed and saved. A game gives a break from straight typing. 20 students can use the course. It runs on all Macintosh computers. \$49.95 QED Information Sciences, Inc., 170 Linden St., P.O. Box 181 Dept. MW, Wellesley, MA 02181, 800/343-4848, outside MA 617/237-5656 inside MA

Teacher's Rollbook

Teachers: The first program that handles all your record keeping needs. Grade averaging and reporting. • Full attendance records and totals • Records disciplinary actions • Class size reports • Up to 315 students per file • Remembers birthdays & checked out items • Requires Mac 512K, +, SE, II, 2 drives • \$149 Current Class Productions, 22824 Berendo Ave., Torrance, CA 90502, 213/326-4246

MacKids™

Call or write for your free catalog of Macintosh™ educational programs. Written especially for pre-school to elementary students. **\$39.95 each, VISA/MC accepted.**

800-228-0417
NORDIC SOFTWARE
3939 North 48th
Lincoln, NE 68504
402-466-6502

CIRCLE 657 ON READER SERVICE CARD

the Manhole™
a HyperCard stack for children

Give your child a journey to an imaginative and whimsical world!

PROLOG

5 disk set-\$39.95 + 2.00 postage
"the Fire Hydrant"(1 disk set)-\$14.95 + 1.00

214-657-7394
P.O. Box 1446 • Henderson, Texas 75653
HyperCard required. Hard disk required for 5disk set

VISA & MasterCard orders welcome.
HyperCard software by Apple Computer, Inc. Macintosh and Prolog are trademarks of Apple Computer, Inc.

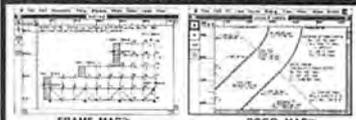
CIRCLE 650 ON READER SERVICE CARD



The Macworld Catalog

Engineering

STRUCTURAL-SURVEYING



NEW!! COGO MAC...
for surveying & land & road layout.

- Enter, edit, and adjust traverses interactively.
- All information is displayed graphically at all times.
- Points, lines, curves, boundaries and traverses can be added, changed, copied, pasted, and duplicated.
- FRAME MAC, BEAM MAC II, BEAM MAC: for structural analysis of 2-D frames, trusses, and beams.
- MacCOGO for calculating structural properties.

All programs have full Macintosh interfaces. Money-back guarantee, free support. From \$145-\$595.

Compunering Inc. - (416) 738-4601
113 McCabe Crescent
Thornhill, Ontario L4J 2S6 CANADA

CIRCLE 660 ON READER SERVICE CARD

CADMOVER™
GRAPHIC TRANSLATION UTILITY FOR MACINTOSH CONNECTIVITY

KANDU SOFTWARE CORP. 703-532-0213

CIRCLE 661 ON READER SERVICE CARD

Electronic CAD

Experience powerful, easy-to-use electronic CAD w/the Douglas CAD/CAM Professional System. Fully integrated eng'g. tool takes you from schematic drawing to the final routed board.

- Color support on Mac II
- Unltd. multi-layers
- SMT capability
- Parts placement facility
- Schematic capture w/digital simulation
- Flexible, multi-pass router.

Layout \$1500, Schematic \$700, AutoRouter \$700, Full-featured Demo \$25.

Douglas Electronics, 718 Marina Blvd., San Leandro, CA 94577, 415-483-8770

Schematic Entry/Digital Simulation Design Works™

Fully integrated and fully functional schematic and simulation on the Macintosh, featuring:

- fully interactive digital simulation with logic-analyzer style timing display
- fully compatible with Douglas CAD/CAM™ PCB layout
- full 7400, 4000, LSI, analog libraries
- full high level language PLD support when used with LPLC logic compiler
- dot-matrix, laser, pen plotter output
- user-definable device symbols with full simulation

DesignWorks: \$685 LPLC: \$535
Low-cost educational versions also available

Capilano Computing
345 108th St., Suite 6
Bellevue, WA 98004
(604) 669-6343

CIRCLE 602 ON READER SERVICE CARD

Scientific Plotting Package

SoftWear Plot produces publication-quality plots using multi-column ASCII file (e.g., program outputs, text editors, spreadsheets). Linear or logarithmic formats in either axis, overlays, zoom, on-line measurements, custom labels and tokens. Number of points limited only by disk space. Laser-Writer and big-screen compatible, \$99.95 + \$5 s/h.

SoftWear Products, 7230 Oliver St., Lanham, MD 20706, 301/577-9207

New version 2.0!
µASM™
A family of 8-bit cross-macro-assemblers for the Macintosh™

- .400 COP400 family
- .1802 1802 family
- .6502 6502/C00/C02
- .6801 6801/6800/6301 families
- .6804 6804/H04
- .6805 6805/H05/6305
- .6809 6809/6309
- .HC11 68HC11/6800/6801 families
- .8048 8048 family
- .8051 8051 family
- .Z8 28 family
- .Z80 Z80/64180 family

US \$99.95 ea plus s/h*

Fast, Easy to use - takes full advantage of the Macintosh interface. S or Hex file output/downloads to most EPROM programmers. Features macros, conditional assy, local and automatic labels, symbol table cross-ref, module sectioning. Editor included. MC/V

Micro Dialects, Inc.
34001 USA PO Box 30014
5450 Can. AK, Ill. Cincinnati, OH 45230
515 Overseas (513) 271-9100
MCI Mail MICRODIALECTS

CIRCLE 608 ON READER SERVICE CARD

Electronics CAD/CAE

Free 56-page Application Guide & Catalog • Circuit Analysis

- Root Locus • Thermal Analysis
 - Plotter Drivers • Engineering Graphics
 - Signal Processing
 - Active/Passive Filter Design
 - Transfer Function/FFT Analysis
 - Logic Simulation • Microstrip Design
 - PC/MSDOS
 - Macintosh® VISA/MC accepted.
- BV Engineering Prof. Software, 2023 Chicago Ave. #B13, Riverside, CA 92507, 714/781-0252*

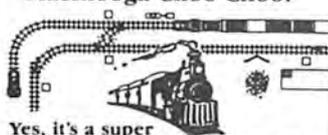
Road Design

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 73566271*

Entertainment

Pardon me, boys, is this the MacInooga Choo-Choo?



Yes, it's a super true-to-life electronic train set!

You can build elaborate model railroad systems on your Macintosh and bring them to life with the click of a switch. You simply place desired images of tracks, engines, cars, and terrain on a grid in any configuration. Build layouts of one screen or more. Run your train at night! Use MacPaint to create more scenery.

Abacadata \$49.95
Box 2440, Dept. M-4 + 3.55 Shipping
Eugene, OR 97402 VISA/MC/AMEX
(503) 342-3030

CIRCLE 676 ON READER SERVICE CARD

Crapmaster for Mac!

The #1 PC Craps game is now avail. for Mac. 4000+ users have learned to play w/o risk! Vivid table display w/mouse controlled betting. Supports all casino bets, including multiple Come, Don't Come, & Odds. Manual w/compl. rules & strategy. Only \$39 ppd. Chk/MC/V, telephone orders accepted.

Hitech Mgt. Corp., P.O. Box 2121, Boca Raton, FL 33427, 1-800/848-2424, 407/392-3678 in FL.

MAPS

Maps of the USA, all 50 states, and World in Paint, Draw (PICT), EPSF, and HyperCard formats!

Call for free brochure: 800-334-4291
MicroMaps, Box 757, Lambertville, NJ 08530 In NJ cal 609-397-1611



CIRCLE 666 ON READER SERVICE CARD

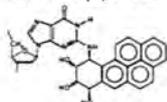
The Macworld Catalog

Fonts

DOWNLOADABLE LASERWRITER FONTS

FOR SCIENCE

α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ σ τ υ φ χ ψ ω



FOR FOREIGN LANGUAGE TEXTS

Μήνιν ἄειδε θεά, Πηληϊάδεω Ἀχιλῆος
α ε ζ ε ι σ ῆ Α Ε Ζ Σ Ζ Ε Σ Ν

ALLOTYPE TYPOGRAPHICS

1600 PACKARD ROAD SUITE 5
ANN ARBOR, MICHIGAN 48104
(313) 663-1989

Compatible with all Macintosh systems

CIRCLE 615 ON READER SERVICE CARD

Beverly Hills 1.5

"Best Imagewriter™ font available!"

- Professional, "typeset" appearance
- Provides better quality photocopies
- 11 sizes: 6-12, 14, 18, 24 & 36 pt.
- 72 fractions from 1/2 through 9/9
- Horizontal lines of varying length
- 2-/1-pixel leading/space adjustment
- Additional mathematical symbols
- Two manuals provided on-disc
- Save cost of expensive printer, only \$15 (\$15.98 in CA) + blank disc!

ADH Software
P.O. Box 67129
Los Angeles, CA 90067-0129

CIRCLE 648 ON READER SERVICE CARD

Custom Laser Typography

Complete line of LaserPerfect™ Fonts. Distinctive, downloadable fonts features legibility, good fit, kerning, *Fine type*: adaptations of Bembo, Gill Sans, Granjon, many others. *Foreign*: Hebrew, Ancient & Modern Greek, Hindi, Cyrillic. Also: Fractions, Bar code, Phonetic, OCR-A, LCD. \$55-125. Logo conversions, custom fonts. Free samples and estimates.

Neoscribe International, P.O. Box 633, East Haven, CT 06512, 203/467-9880

Genealogy

MacGene™ (version 2.9)

70% faster & 100% complete. Designed specifically for the Mac. One program for data entry, find, list & charting. Features: History, Hints, Mail-List, Family Tree, Pedigree, Statistics, Biography, etc.

- LDS compatible • Mac's & Mac-XL
- Extensive Notes • User Fields
- Custom Reports • Import/Export
- No copy protect • 80-pg. manual
- \$-back guarantee \$145. Demo \$25.

Applied Ideas, Inc., P.O. Box 3225, Manhattan Beach, CA 90266, Free info: 213/545-2996

FAMILY ROOTS™

Do it YOUR way! Huge variety and capacity for your family history. Makes pedigree charts, person sheets, group sheets, and indices. Phased releases will add searches and much, much more. Standard Mac screens/mouse. Free brochure and sample printouts. Satisfaction guaranteed. Currently \$95, add \$22.50 per each new release (total \$185) MC/VISA/AE.

Quincept, Box 216, Lexington, MA 02173, 617/641-2930, 800/637-ROOT

Graphics

MacPerspective™

Allows architects, draftspeople, and artists to rapidly construct perspective drawings of houses, buildings, or other objects. Viewpoint can easily be changed. Drawings can be printed in any size up to 100 inches. Easy to learn and use. Fast, professional program with many features, thorough manual. \$219. B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

MGMStation—Prof. CAD

By Micro CAD/CAM, Inc. is a high powered CAD program for the Mac similar to AutoCAD. MGM boasts over 140 powerful functions including: x-y coordinate input, polar or digital data input, 100 power zoom accurate to 4 decimals, tangent drawing tools and much more! \$799. Demo disk and/or VCR tape available.

CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

VersaCAD

VersaCAD, with more than 40,000 systems in use worldwide, is now available on the Macintosh®. Floating point precision guarantees 16 decimal place accuracy. Features include: DXF & IGES translators included, directly accesses the math coprocessor, sophisticated object attributes grouping, & 250 layers. CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

MiniCAD 3.0

By Diehl Graphsoft boasts 1000+ power zoom, symbol library, 40 layers, auto-dimensioning, double-line tool, clip/add/intersect polygons tools, object snap, fillet & trim-lines tools, object sizer & locator, 9 decimals accuracy, full 2-D & 3-D modes, etc. It reads MacDraw & MacDraft files. \$495. Demo avail. CompServCo., 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

MacPlot & MacCAD

MacPlot by Microspot is a powerful plotter driver that will plot any object-oriented graphics produced on the Mac in up to 30 colors/pens. MacPlot supports over 50 plots. MacCAD is a series of 12 separate architectural & engineering template symbol libraries for use with MacDraw, MacDraft, MiniCAD, etc.

CompServCo, 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

GraphPainter™

For desktop publishing to data analysis. Does scatter, line, area, bar, column, overlays, log, semilog, multiaxis, multiseriers & more. You control scaling, grids, markers, patterns, etc. Finish with the paint tools & 7 curve fits. I/O with popular programs and LaserWriter. 512K+ req. \$60, MC/VISA. Brasel Software, P.O. Box 4274, Chesterfield, MO 63006, 314/256-3317

Health

Nutritional Software

Take steps to eat more sensibly. Analyze diets for nutritional content (calories, sodium, etc.) NutriCalc Plus™ includes 32 nutrients, 1700+ foods (3000 avail.). Does RDA comparison, energy analysis, tracks histories, \$225. NutriCalc™ analyzes 8 nutrients, 900+ foods, plots progress, analyzes recipes. \$65. Both have brand names & fast foods. NCP

Camde Corporation, 4435 S. Rural Rd. #331, Tempe, AZ 85282, 602/821-2310



The Macworld Catalog

MAC OUTPUT

Send your Macintosh files to us to output on the highest resolution typesetter available on the market.

- High resolution output from L-300
- 635, 1270, & 2540 scan lines/inch
- 24 hour modem
- Output to paper or film
- Fast turnaround
- Other Services include: colorkeys and Letrachromes, step and repeat film work, and photopolymer printing plates for the flexo industry.

DOUGLAS GRAPHICS

1410 Ball Park Road, Thomasville, NC 27360
Phone: (919) 472-3500

Out-Of-State 1-800-523-4381

CIRCLE 680 ON READER SERVICE CARD

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., 2265 Westwood Blvd.
#793, Los Angeles, CA 90065,
213/312-0154

Profits!

... get the profitable trades, cut losses with dozens of trend and momentum studies. Includes moving averages, relative strength, stochastic, point & figure, and many more. Great charts, automatic download. Acclaimed by investors, brokers, and traders. Profits™ \$495 plus \$4.95 shipping and handling. California residents add 6% tax. MC/Visa order by calling 1-800-628-2828 ext. 403.
Free information

Button-Down SOFTWARE
P.O. Box 19493
San Diego, CA 92119

CIRCLE 620 ON READER SERVICE CARD

Languages

FORTRAN in MPW

Language Systems FORTRAN is a full featured FORTRAN 77 compiler integrated w/MPW. Full ANSI FORTRAN 77 plus VAX-type extensions. SANE numerical calculations & data types incl. COMPLEX*16. 68000, 68020 and 68881 object code. Arrays greater than 32K. Link with Pascal, C, MacApp. \$304 w/MPW via air. Mac+, SE, MacII. Language Systems Corp.
441 Carlisle Drive, Herndon, VA 22070, 703/478-0181

Input Devices

Customize The Speed And Accuracy Of Your Cursor Control With Hyper Control Panel



Hyper Control Panel is easy to install and fully compatible with the Apple Mouse and System Control Panel. It lets you customize and calibrate the acceleration velocity and tracking sensitivity of your input device: Mouse, Trackball, Tablet, etc.

If your frustrated with the limitations of the Mouse control panel and it just takes too long to get around the screen (especially if you have a full page display or large monitor)—then you need Hyper Control Panel. Get the precision and speed you want from your input device. Just \$20.

(408)647-9671

VISA or Master Card
Or Send Order To:
P.O. Box 359
Pacific Grove, CA
93950-0359

CIRCLE 671 ON READER SERVICE CARD

Mail Order

COMPUTER COURTESY WARE

- Vol. 1: 200+ Fonts \$22.00
- Vol. 2: 200+ Desk Accessories \$22.00
- Vol. 3: Games \$22.00
- Vol. 4: Utilities \$20.00

Add \$3 to total order for postage and handling. Above prices are for double-sided disks. Add \$6 per volume for single-sided disks. Massachusetts residents add 5% sales tax.

Send SASE for free list of other software (Software authors wanted.)

Send check or money order to:

COMPUTER COURTESY WARE
P.O. BOX 1355
BOSTON, MASSACHUSETTS 02205

CIRCLE 623 ON READER SERVICE CARD





The Macworld Catalog

16 Day Rental on Mac Software Telecom Software Review

1-800-MAC-TSR0

(1-800-622-8770)

All Fees Apply To Purchase

Bus.Sense-65.90, CalendarMaker-7.90, Canvas-23.90, CricketGraph-24.90, Coach-12.90, dBaseMac-64.90, DeskPaint-18.90, Fast Back-12.90, Fonts-9.90, Games-7.90/up, GraphicWorks 1.1-15.90, Image Studio-59.90, In-House Acct.-19.90, Jam Session-7.90, MacProof-23.90, McMax-38.90, MGMS-149.90, MicroPlanner+-65.90, MiniCad-74.90, Pixel Paint-61.90, Post Art-10.90, Pro3D-49.90, QuickKeys-13.90, RSC4-61.90, Sentinel-21.90 Suitcase-8.90, Video Works II-26.90, MS Works-35.90, MS Write-23.90

Plus Hundreds More In Stock

And Hardware Too!

CMS SCSI Drive & Tape Units

CALL FOR LOWEST PRICES AVAILABLE ANYWHERE

TS60E Tape Back Up - \$799.00 - MacScan LS 300 \$1189.00

Our Second Year for the Business Mac

TSR - 3723 East 83rd Street, Tulsa, OK. 74137

MasterCard In Ok. 918-496-1140 Visa & COD

CIRCLE 614 ON READER SERVICE CARD

Music/Midi

Call 1/800/FOR MIDI

MIDI for everyone! Start your computer/MIDI system today with discount prices & expert help from FUTURE MUSIC. You don't have to be a PRO—most of our customers are just "plain folks" with a home computer and a love of music. Call for FREE CATALOG of Hardware, Software, Synthesizers, 4-tracks and more. All major brands avail. *Future Music Inc., 900 W. First St., P.O. Box 1090, Reno, NV 89504, 702/826-6434*

Mac to Midi Made Easy!

Make the Right Choices

We have designed MAC based system for headline superstars and 1st time users. We offer: • Expert advice • Complete systems design. We sell: • All midi interfaces, software, accessories • All major synths & samplers • At discount prices. Why settle for less than the best?

TekCom Corporation, 1020 N. Delaware Ave., Philadelphia, PA 19125, 215/426-6700

Payroll

Time Saver Payroll™ V.4.0

NOW EVEN BETTER • COMPLETE FULL FEATURED Payroll system.

• Salaried, hourly, comm. & tip wages • 11 deductions, incl. fed., state & local taxes • 401k deductions • Tax tables easily edited by user • Monthly & quarterly reports, incl. 941, FUTA/940, SUTA • Prints checks and W-2 forms • *Flexible—easy to use!* Requires Microsoft Excel \$99.50 + \$3 s/h. MC/VISA/Chk. Demo \$15 + \$3 s/h (applied to purchase).

Western Software Associates, 110 El Dorado Rd., Walnut Creek, CA 94595, 415/932-3999

Two Powerful Programs!

Aatrix Payroll 3.01

Automatically calculates, accumulates 12 deductions including FICA, Federal, State, Local taxes and 8 deductions. Various reports, including 940, 941 and State Unemployment reports. Use any paycheck form. Tax tables may be edited. Prints W2 forms. Payroll record backup. 3-sec. paycheck processing. More! \$179.

Aatrix Payroll Plus

Features include everything in Aatrix Payroll 3.01 as well as: Payroll Ledger, 10 income sources, Employer contribution & Tip sections. Prints form 1099 & miscellaneous checks. Itemizes different hourly types and tracks vacation, holidays, sick pay & anniversary dates. And more! \$295.

For either program call or write to: Aatrix Software; P.O. Box 5359, Grand Forks, ND 58206-5359, Order line: 800/426-0854

Office Mgmt.

Order House™

Integrated business environment, *Order House* is a multiuser, multi-station application that integrates all the functions of a business. Includes sales and purchase orders, invoices, inventory, and accounting. Also features notes and list-mgmt., pictures, forms-mgmt., labels, and merged letters. We specialize in custom tailoring. Demo with video training tape avail. Call or write: *Elefant Software, 724 Allston Way, Berkeley, CA 94710, 415/843-7725*

Medical

MAC
MART

P.O. Box 15521
Ann Arbor, MI 48106

dBaseMac	295.00
Reflex Plus	163.00
Full Write Professional	169.00
Ready, Set, Go! V4.0	283.00
Works	180.95
Excel V1.04	221.50
Word V3.01	232.95
PowerPoint	244.00
Lightspeed CV2.0	93.50
Wordperfect Mac	189.00
Dove Mdl 524s	215.00
Dove Mdl 548s	435.00
CMS 20MB SCSI Extn.	560.00

800-622-3008

in Michigan (313) 485-6278

Prices and availability subject to change without notice.

CIRCLE 664 ON READER SERVICE CARD

CMA Medical
CMA Dental

CMA

CMA Micro Computer
55988 Yuca Trail, Suite 5
Yuca Valley, CA 92284

MulerPhase CMA
MulerWave CMA

Solo and multipractitioner office management systems for the Macintosh 512KE, Plus, SE and II. Compare these features:

Paper Claims	Appointments with Recall	Multi User
Electronic Claim Files	Management Reports	Multi Tasking
SuperBill	Production	Networks:
Patient Ledgers	Analysis	AppleShare, Corvus, TOPS, MacServe
Financial Histories	Responsible Party Billing	File Interchange with other Data programs
Diagnostic Data Base	Audit & Backup Patient Labels	

Please Call
(619) 365-9718

1977
11th
Year
1988

CIRCLE 673 ON READER SERVICE CARD

Medical Office Mgmt.

Tess System™ software for insurance and billing. Expandable line to grow with your needs. Our \$650 package outperforms software selling at three times that price. Multi-user & electronic claims available. Call for Demo software, VHS tape, or documentation. System prices from \$650 to \$5000. *Wabash Medical Resources, Inc., 4727 Shireton Court, Indianapolis, IN 46254, 317/299-7800*

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Printer Drivers

Printer choice on your Mac



The PRINT-LINK™

For graphic printing with a wide variety of Ink Jet or Dot Matrix printers. (9 & 24 pin.)

\$62

MAC DAISY LINK™

For letter quality printing, with typewriters, Daisywheel printers and lasers (in Qume or Diablo emulation).

\$82

Cables optional \$22.95

GDT Software Inc. P.O. Box 1865, Point Roberts, WA. 98281
Inquiries: (604) 291-9121 To Order: 800-663-6222

Macintosh™ is a trademark licensed to Apple Computer, Inc. The PRINT-LINK™ & MAC DAISY LINK™ are trademarks of GDT Software Inc.

CIRCLE 627 ON READER SERVICE CARD

Programming Tools

POWER DEVELOPMENT TOOLS

- Programmer's EXTENDER
Vol 1: Macintosh User interface
Vol 2: lists, printing, graphics, tiling, popups
- EXTENDER GRAFPAK
high quality color graphs - bar, line, log; customizable symbols, grid patterns

Invention Software
313-996-8108

CIRCLE 629 ON READER SERVICE CARD

Public Domain

The Good Stuff

Compact public domain library contains just the good DAS, Educational, Fonts, Games, Graphics, Sound & Music, Stacks, and Utilities. All are SE and MultiFinder compatible. Complete library of 16 double-sided disks for \$120. (You would spend \$500+ to search competitors' 100+ disks for the same good stuff.) Library is licensable to clubs. Catalog is \$1.
The Good Stuff, P.O. Box 6883, Salinas, CA 93912

Your Ad Gets More For Less.

Call *The Macworld Catalog* and see why.



800.888.8622

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

Real Estate

Property Management

Comprehensive program for managing residential and commercial properties. Many management reports, including operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses - \$245.

Yardi Systems, 930 Laguna St., Santa Barbara, CA 93101, 805/966-3666

Loan Amortization

AmPack is a straightforward loan-amortization software package designed by a CPA & tax attorney. *AmPack* supports variable rates, graduated, skipped, & principal-only payments. Also includes balloons, negative amortizations, customized schedules, loan analysis, & more. \$49.50 + \$5 s/h. MC/VISA.

Softflair, Inc., 8753 Park View, Milwaukee, WI 53226, 414/778-7200

Property Management



MacLord™

- Complete Accounting
- Repair Manager
- Tenant Manager

Demonstration version available
(714) 687-1919

9487 Magnolia Avenue
Riverside, CA 92503

CIRCLE 606 ON READER SERVICE CARD

Real Prospects™

Farming, mailing, & prospect data all in one. Track buyers, sellers, others. Only product with flexibility of 54 user-definable, searchable items. Saves time reminders, notes, mail labels. Form letters with Word & Works. Commercial/Industrial/Residential/Land. Call for demo disk. Single & multi-user \$499-\$1299.

Data Workshop 935 Main St., Suite H-9, Manchester, CT 06040-6050, 203/647-8625

HyperPAK 100
(Volumes I, II, III, or SoundPAK 150)
Recipe Box from the HyperPAK 100™

DeskPAK 200
Samples from the DeskPAK 200™

GamePAK 100
A.T.C. (SW) from the GamePAK 100™

FontPAK 200
Several fonts from the FontPAK 200™

LaserPAK 100
Several laser fonts from the LaserPAK 100™

UtilityPAK 150
Layouts from the UtilityPAK 150™

ArtPAK 250
Art samples from the ArtPAK 250™

Each PAK only \$25.00

Each PAK on 4 double sided disks. Save even more: take any 3 for only \$69.95, or any 6 for only \$129.95!

(800) 356-3551 (913) 271-6022

ORDER TOLL FREE! CUSTOMER SERVICE

Ordering hours: 8-6M-F, and 12-5 Sat (CST). Add \$4.00 per order S&H (\$7 Canada, \$12 foreign). 2nd day & overnight delivery available. KS orders add 5%. Thousands of satisfied customers in over 60 countries have made Budgetbytes their #1 choice for Macintosh Public Domain and Shareware. You'll find the best service, the best selection, and the best prices. Choose from over 4,000 programs on over 600 disks, and never pay more than \$3.50 per single sided, or \$6.50 per double sided disk again! No membership fees or no club to join. Just great software at honest prices. Send \$2.00 (refundable with your first order) for our new 240 page catalog and start getting more bytes for your buck, today!

Budgetbytes

P.O. Box 2248, Topeka, KS 66601

Please support Shareware by sending registration fees to programmers!

CIRCLE 601 ON READER SERVICE CARD



The Macworld Catalog

New from RealData —

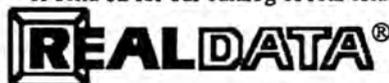
Real Estate Investment Analysis, Version 6.0

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* allows you to make ten-year projections of the income, expenses, cash flows, re-sale 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.



78 North Main St.
South Norwalk, CT 06854
(203) 255-2732

CIRCLE 610 ON READER SERVICE CARD

Scientific

Geological Software

Great graphics, low prices!

- Lithologic log plotting
- Gridding • Contouring
- Piper/Stiff plots • Oil & Gas economics • Stereonet plots
- Plate tectonics • Geophysical modelling, + 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 595, Wheat Ridge, CO 80033, 303/423-6171, Telex: 9102504964

Statistics

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. \$75 + \$3 s/h.

Clear Lake Research, 5615 Morningside #127, Houston, TX 77005, 713/523-7842

Rental

Original MacLibrary

Try before you buy... low 16-day rental rates that apply towards purchase—no obligation to buy. We offer a huge selection of Mac software. All the popular programs plus plenty of hard-to-find titles. No fees. Free membership. Special discounts for rapid returns. Plus FREE assistance HOT LINE. Whatever you're looking for, if it was made for the Mac, we probably have it... at LOW RATES.

The Original MacLibrary, Inc., 17280 Newbope St. #3, Fountain Valley, CA 92708, 714/957-5767, 800/426-2777 (CA), 800/622-4774 (Nat'l.)

Sales/Marketing

MarketMaster for Mac

Automatic Sales Inquiry Follow-up! Enter leads whenever you get them and *MarketMaster™* contacts the right people the right way at the right time. Prints letters & envelopes, phone lists, scripts, and NEVER FORGETS! Easy to learn and use. Frees salespeople to SELL and supports them to SELL MORE! *Breakthrough Productions*, 10659 Caminito, Cascara, San Diego, CA 92108, 619/281-6174

REMS Investor Series

CCIM recommended. Multi-year cash flow projections and analysis, amortization, depreciation, tax calculations, and export to Excel.

REMS Investor 3000 imports from Excel, handles partnerships, ground leases, participation loans and more. Not a template. Call for free demo.

REMS Investor 2000

\$395

REMS Investor 3000

\$795

GOOD Good Software Corp.
13601 Preston Rd. Suite 500W, Dallas, Texas 75240
(214) 239-6085

CIRCLE 679 ON READER SERVICE CARD

Real Estate Software

Ten Minute

Property Manager

Accounting system for multiple properties. Ideal for investors who manage their own properties.

ProAnalysis

A Sophisticated investment analysis program designed for the investor who demands professional quality analysis.

Demos Now Available!

Metropolis
Software

14555 DeBell Road
Los Altos Hills, CA 94022
(415) 322-2001

CIRCLE 689 ON READER SERVICE CARD

typeset quality

Equations Made Easy

Expressionist™ 2.0

2 Way T_X Interface

A powerful application and desk accessory that generates equations for word processing and Desktop Publishing

$$B = \frac{\mu_0}{4\pi} \int \frac{J \times \hat{r}}{r^2} dt$$

alan bonadio associates 814 Castro #56, SF, CA 94114, (415) 282-5864 \$129.95

CIRCLE 690 ON READER SERVICE CARD

Security

The world's leading software manufacturers depend on Softguard copy protection systems. Your FREE DISKETTE introduces you to SuperLock™ — invisible copy protection for Macintosh and IBM-PC (and compatibles).

- Hard disk support
- No source code changes
- Customized versions
- LAN support
- New upgrades available

(408) 773-9680

SOFTGUARD SYSTEMS INC.
710 Lakeway, Suite 200
Sunnyvale, California 94086
FAX (408) 773-1405



CIRCLE 677 ON READER SERVICE CARD

COPY PROTECTION

RATS! Version 2.1

Best-selling econometrics software program. Now available on the Mac. Multiple regression, including stepwise, 2SLS, logit, probit, and much more! Forecasting with AR-IMA, VAR. Exponential smoothing, model simulations, support for daily/weekly data. \$300. VISA/MC. 512K + external drive.

VAR Econometrics, Inc., P.O. Box 1818, Evanston, IL 60204-1818, 312/864-8772, 800/822-8038



For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

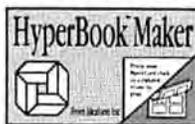
Utilities

New! New! New!

HyperBook™ Maker

\$59.95

- Prints your HyperCard stack as a collated, ready-to-staple book.
- Your book can show the cards full size, half size, or 1/4 size.
- Another print option: both sides, 8-1/2" X 11" notebook format.
- For LaserWriter or ImageWriter.
- Scripts not protected.
- Bonus utility: select cards from any stacks, in any order, and create a new stack automatically.



MacLabeler®

\$49.95

- Labels disks fast.
- Lists files under each folder.
- Lets you choose and edit names.
- Shows date and remaining space.
- Eight borders.
- 512k, Plus, SE.
- ImageWriter.
- 60 QuickLabels*



DiskQuick™

\$49.95

- Catalogs hard disks and floppies.
- Powerful "Subset" file locator.
- Shows info box comments.
- Exports catalog to database.



- 512k to Mac II.
- iW or LaserWriter
- MacGuide rates it a 96... "Essential for anyone who uses a hard drive or owns more than two floppy disks."

Ideaform Inc. (515) 472-7256
PO Box 1540, Fairfield, IA 52556

HyperBook Maker, DiskQuick, MacLabeler, and QuickLabels are trademarks of Ideaform Inc.

CIRCLE 658 ON READER SERVICE CARD

HyperCONTROL™

Report Generator...

- print selected cards
- manipulate data field layouts
- print faster than H-Card reports
- save data in text files

Perfect for mailing labels.
Just \$59.95, P&H included.

Works within HyperCard. Installation included.



800-228-0417
NORDIC SOFTWARE
3939 North 48th
Lincoln, NE 68504
402-466-6502

CIRCLE 659 ON READER SERVICE CARD

Copy II Mac

Great disk utilities (Mac Tools) featuring Disk recovery program that support floppy & hard disks. Backs up nearly all protected software quickly, easily! Includes Copy II Hard Disk, which copies many protected programs direct to your hard disk so you can run them without a key disk. For Mac/Mac Plus, 1 or 2 drives. All 3 for \$39.95 + \$3 s/h. VISA/MC/Chk.

Central Point Software, Inc., 9700 SW Capitol Hwy. #100, Portland, OR 97219, 503/244-5782

Word Processors

MacΣqn/Equation Writer

MacΣqn is a desk accessory equation processor that lets you include complicated mathematical equations in your technical documents, MacΣqn supports integrals, sums, products, multiline expressions, roots, super & subscripts on the same character. Automatic character sizing etc., \$44.95. Educational discount available. Version 2.1 now being released.

Software for Recognition Technology, 55 Academy Dr., Rochester, NY, 14623, 716/359-3024

Multi-Window Outlining

with Idealiner 2.5:

Organize your work in an Outline window, changing subordination with a keystroke, moving whole sections of topics at once. Write in Text windows, with undo, tools. WYSIWYG Preview; custom topic numbering; multiple clipboards, on-line tutorial. \$40.00; \$3.00 for demo.

Attic Software, P.O. Box 25695, Jacksonville, FL 32241, 904/733-7272

Japanese Software

• New *EGWord 3.0* is Japanese WP software. Converts romaji or kana to kanji/kana sentences automatically. Supports JIS level I and II. \$499. • New *EGBook 1.2* is a DTP software. It supports vertical Japanese text format. \$599. • *EGBook & EGWord* bundle set. \$799. All comes with *Kanji Talk 2.0* and *EG Bridge 3.0* 2MB RAM req. for Mac Plus & SE. 4MB RAM req. for Mac II. Developed by ERGOSOFT Corp. Japan. Distributed by: Qualitas Trading Co. 6907 Norfolk Rd., Berkeley, CA 94705, 415/848-8080 or 415/848-5815

Publications

MACMENU™ GUIDE to 2,600 software titles

Available from MENU®, this guide lists the title, vendor name, retail price, system requirements and brief description of each program..... JUST \$ 9.95

1-800-THE-MENU

CIRCLE 631 ON READER SERVICE CARD

Video Instruction



The Cricket Draw Master
Create Stunning Documents with Cricket Draw 1.1

Complete Training System includes:
2 1/2 hr. VHS tape, Users' Guide, Samples & Nitney Help Desk Accessory
\$79.00 + \$5.00 p&h

NITNEY SYSTEMS
22500 Muirlands, El Toro, CA 92630
Visa/MC Phone Orders (714) 472-8167

CIRCLE 634 ON READER SERVICE CARD

Miscellaneous

Mailing Lists

MAILING LIST of Mac Users



Over 400,000 names to choose from!

Use our \$50/1,000-name low-cost list with no charge for selecting, sorting, media, or delivery. Choose any quantity. Or use our 25c/name complete mailing service, postage included! Ask for our state counts. Semaphore Corporation, 207 Granada Dr., Aptos, CA 95003, (408) 688-9200.

CIRCLE 611 ON READER SERVICE CARD

Hypercard Video Tutorials

"GETTING STARTED"

- Loaded with graphic examples
- Professionally written, tested & produced
- Create cards, stacks, buttons, & short scripts
- 1 hour 40 minutes
- "ADVANCED SCRIPTING TECHNIQUES"
- Creating stacks from scratch
- Lots of hints & shortcuts
- Purchase \$49-14-day rental \$19
- VISA/MC/AMEX accepted.
- Voice & Video, 5038 Ruffner St., San Diego, CA 92111, 800/621-5640, (tone) 353597

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.

Cognate and Cognate Developer's Kit versions 1.5 are significantly faster. They support MultiFinder and execute in the background. The Developer's Kit now includes C source code to the inference engine. Peridom, Inc., P.O. Box 1812, Bowie, MD 20716, 301/390-9570. Free; Cognate \$150, Cognate Developer's Kit \$250 new.

Design/OA version 2.15 has over 50 new interface routines, a User Data Library, and an ASCII Database Library. Supports construction, display, manipulation, and analysis of diagrams. Meta Software Corp., 150 CambridgePark Dr., Cambridge, MA 02140, 617/576-6920. Free; \$5000 new.

Dial-in Network Access version 1.3 offers Chooser access for password security, as well as greater flexibility in remote connection setup. Improves compatibility with Microcom, Hayes, and Telebit high-speed modems. Shiva Corp., 222 Third St., #1200, Cambridge, MA 02142, 617/661-2026. Dial-in Network Access upgrade alone is free; complete NetSerial upgrade, including hardware, password security, new Dialer, and NetSerial software \$50; NetSerial hardware and software \$399 new.

Expressionist version 2.0 includes presettable default fonts and palette symbols, two-way TeX interface, auto-baseline (only with WriteNow 2.0), and improved graphics. Allan Bonadio Asso-

ciates, 814 Castro St., San Francisco, CA 94114, 415/282-5864. \$29.95 with return of original disks; \$129.95 new.

Icon-It version 1.1 allows you to design custom icon bars and open two icon bars simultaneously. Maps icons to the function keys of the Apple extended keyboard and includes more templates. MultiFinder compatible. Olduvai Corp., 6900 Mentone, Coral Gables, FL 33146, 305/665-4665. Free with return of disk, otherwise \$10; \$79.95 new.

MacSmarts version 3 uses HyperCard as a front end and adds seamless integration with HyperCard stacks. Cognition Technology Corp., 55 Wheeler St., Cambridge, MA 02138, 617/492-0246. \$25; \$195 new.

MacTran Plus version 3.0 has an integrated environment, an intelligent symbolic debugger, and language extensions for handling large code and data sizes. Supports the Mac II, color, MultiFinder, and inline code generation for the 68020/68881. DCM Data Products, 1710 Two Tandy Center, Fort Worth, TX 76102, 817/870-2202. \$99; \$399 new. Educational discounts available.

Market Master for the Macintosh version II increases speed. Offers an automated search feature and automatic file updating. Market Master with results analysis (R/A) also available. Breakthrough Productions, 10659 Caminito Cascara, San Diego, CA 92108, 619/281-

(continues)



Insurance For Fried Apples?

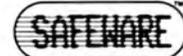
When your surge protector fails will your insurance save you? SAFEWARE® computer insurance covers power surges, lightning, theft, fire, accidental damage and more! Full replacement of hardware, media and purchased software for as little as \$39 per year.

Total Value, Hardware, Media & Purchased Software	Annual Premium
up to \$2,000	\$ 39
\$ 2,001-\$ 5,000	\$ 69
\$ 5,001-\$ 8,000	\$ 89
\$ 8,001-\$11,000	\$109
\$11,001-\$14,000	\$129

For immediate coverage, information and rates on higher coverages, call

1-800-848-3469

Locally 614-262-0559 On CompuServe, GO SAF



SAFEWARE, The Insurance Agency Inc.
2929 N. High St., P.O. Box 02211, 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.

Ashton-Tate announces the most powerful database ever

Project Edit Windows View Snapshot

Company Data

Ashton-Tate Customer Information

Global Info, Inc.

Address: 2121 67th Street
City: New York
State: NY City: 07480
Phone: 912-555-1212

Company ID: 6108
8-189
181-258
231-289
388-1888
Employee: 18877
Alt Code: 5555
Vendor Rating: 73
Current Customer: Yes

Edit

New Field for the 'Invoices' File

Field Name: Total Sales
Field Type: Date
Contents are: Single Valued
Justify: Right
Format: Fixed
Decimal: .
Thousands: -n
Currency: \$
Initial Value:
Range:
Index:
Required:
Post:
Logical:
Choices:
Graphic:
Save
Done
Clear

Project Edit Windows View Design

Invoice Entry

Take 2 Videos

Invoice #
Date
Patron ID
Last Name
Videos
Sales Tax

Project Edit Windows Database

Create New File or Structure

Create New File
Create Structure for Existing File

File Type: Foreign
Record Terminator: Carriage Return
Field Size: Variable Size, Unlimited
Field Delimiter: Tab



Project Edit Windows View

Retail Video System/Database Structure

Patrons
Invoices
Videos
Sales Tax

Invoice Entry Form

Fields: Invoice #, Date, Date Due, Sales Tax, Amount, Videos Return, Patrons

Project Edit Windows View Snapshot

Call History

Call History Report

Content Record Number

Last Name: TOWSE
First Name: TOM
Title: PURCHASING
Phone: 713-434-0559

Date	Type	Results	Next Call
4/4/87	Outgoing	Intro Call - Set Appointment for 4/18	1 Week
4/10/87	Presentation	Presented product, set up demo 8/17	1 Month
4/17/87	Demonstration	Demo product, closed sale	3 Month Later
7/15/87	Outgoing	Follow up call, get interest	1 Month
7/21/87	Outgoing	Weekly LAKEBO game	
10/5/87	Presentation	Presented annual contract, signed	

Project Edit Windows Database

Retail Video System/Database Structure

Patrons
Invoices
Videos
Sales Tax

Global

Project Edit Windows View Snapshot

Contacts by Company

Company Name	City	Address	State	Zip	Last Name	First Name
Global Info, Inc.	New York	2121 67th Street	NY	10480	CLAYBORN	JAY
	Seattle	6969 14TH Street	WA	98145	JONES	DAW
	Chicago	1372 Maple Blvd	IL	10384	LAWRENCE	BILL
	Cupertino	50101 Magnolia	CA	95014	JACKSON	HOW
	Los Angeles	4321 Main Street	CA	49584	SALDANHA	NAR
	Dallas	9645 Avenue K	TX	49589	MORTON	DAN
	FT WORTH	1938 PUNKET A.	TX	94899	BREWSTER	BRN
	Dallas	564 Ross Ave	TX	75201	COOSENERY	DEB
	San Francisco	1448 Lincoln Road	CA	97326	SOUTHERLAND	HAR
					ROSS	ROD
					JONES	ROD
					ARTHUR	LOU
					CHESLEY	TAM
					JOHNSON	BRN
					SMITH	TOP
					PALMER	ROD
					BAKER	ROD
					LINDEN	ROD
					BOYD	ROD
					PARRELL	ROD
					JACKSON	ROB
					MONTGOMERY	ROD
					DAVIDSON	ROD

Project Edit Windows View

Transfer Proj/Database Structure

McClient
Company Clients

From: [Company Name]
To: [Company Name]

Record Number	FIRSTNAME	LASTNAME	ADDRESS	CITY	STATE	ZIPCODE

Project Edit Windows View Snapshot

Invoice Lookup

Widget Corp.

Invoice # 35241
Date 7-9-87
Customer Piken Hfg
Comment Client needs complete subassembly kit for AG70 as well as the technical specifications for G08-215 and 08-512. Complete order promised for delivery within three weeks. Service contract still under negotiation.

Edit

Change Procedure for the 'Invoice Entry Form' Window

When 1 00
When 2 00
When 3 00

Fields: Invoice #, Date, Sales Tax, Amount, Patrons, Video Inventory

Path: Invoices

Announces the most used by man or mouse.

It's called dBASE® Mac.

And it's the most powerful relational database designed for the Macintosh™.

Especially since, unlike other databases, you can get that power without knowing a thing about programming.



Begin by creating and relating your files.

Not just linking them,

but relating them. So when you update one file, all your related files will be updated. Automatically. Immediately.

And remember, with dBASE Mac you can do all this without programming.

With a few clicks of your mouse, you can quickly redesign and rearrange your files to look at your data in any number of ways. Without disrupting it.

And without any programming.

Also using the selection of fonts and MacDraw®-like tools, you can design reports from the very simple to the very sophisticated. Right on the screen.

So you'll know how it looks before you print it.

We're not talking about just text and graphics. With dBASE Mac, you can incorporate photos of people, parts and places into your database.

You can even import data from Ashton-Tate's dBASE III PLUS™, dBASE III®, or dBASE II®, as well as ASCII files.

All without programming.

And all with the help of Macintosh's on-screen prompts and pull-down menus.

But if you want to go still deeper, the powerful dBASE Mac programming language will take you into a world of power and capability where no Macintosh has ever gone before.

If you would like a demo disk* for \$4.95,† or the name of the dealer nearest you, call (800) 437-4329, extension 2400.††

You'll see how this Ashton-Tate relational database will

make your Macintosh office work smarter.

Whether you are a huge organization.

Or a one-mouse shop.



 ASHTON-TATE®

*Hardware requirements: Macintosh Plus, Macintosh SE, Macintosh II with at least 1MB memory. †While supplies last. ††In Colorado, call (303) 799-4900, Extension 2400. Trademarks/owner: dBASE, dBASE II, dBASE III, dBASE III PLUS, Ashton-Tate/Ashton-Tate Corp.; MacDraw/Macintosh/Apple Computer Inc. © 1988 Ashton-Tate Corp. All rights reserved.

Circle 220 on reader service card

Eight Megabytes FREE Clip-Art with every diskette order!



Order 50 KAO DSDD diskettes from us and we include EIGHT MEGABYTES OF FREE Mac Clip-Art! (This month it's Victorian Era.)

KAO diskettes are certified for 20,000,000 passes and carry a lifetime warranty. For the past decade, KAO has supplied materials and diskettes to the world's leading manufacturers.



Order today: 50 KAO DSDD diskettes with EIGHT MEGABYTES OF FREE SOFTWARE!

\$69⁹⁵

50 KAO DSDD diskettes with EIGHT MEGABYTES FREE Clip-Art. Shipping included. FREE catalog of \$1.99 PD software.

MacOnly, Inc.
1-312-433-8796
P. O. Box 256
Highland Park
IL 60035

Circle 218 on reader service card



Score One For Our Team.

Cleaning up the environment is easy when we work together! So, Team Up and take the Woodsy Pledge: We Give a Hoot, so We Won't Pollute!



Forest Service-USDA

Updates

6174. Market Master version II \$20, Market Master R/A \$100; Market Master version II \$295, Market Master R/A \$395 new.

MathType version 1.53 improves spacing and fixes bugs. Design Science, Inc., 6475-B E. Pacific Coast Hwy., #392, Long Beach, CA 90803, 213/433-0685. Free if upgrading from 1.50 or 1.51, otherwise \$15; \$149 new.

MicroPhone II is fully compatible with MultiFinder. Enhances communications performance. Supports Cut, Copy, Paste, Quit, and other menu commands in scripts, and can map them to the keyboard. Allows import and export of scripts as text files. Supports KERMIT, including remote server commands. Supports Ymodem batch and Ymodem-G. Offers modem drivers for complete control of Hayes, non-Hayes, and PBXs. Supports extended keyboard; screen buffer command; Copy Table, Append to File, and Launch; variables and an expression analyzer for string/arithmetic manipulations. Allows you to change baud rates and all other settings in scripts. Allows screen addressing in scripts. Enhances VT100 emulation. Supports host printing commands. Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232. \$50; \$295 new.

Professional Composer version 2.2 corrects playback speed. The Cancel button in the small dialog box that is present during printing now functions. You can specify page range when printing. Beams are thicker. Dots on whole notes and semibreves are spaced correctly. Arrow keys on Mac Plus, SE, and II now function. Several problems with printing parts have been fixed. Check Range functions correctly. Measure numbers

at beginning of systems will be correct even if starting measure isn't numbered 1. Endings draw to the end of the bar. After selecting a document and printing from the Finder, you return to the Finder. The intermittent crash when deleting staves no longer occurs. Mark of the Unicorn, Inc., 222 Third St., Cambridge, MA 02142, 617/576-2760. Free; \$495 new.

QT Backup Software version 1.02 provides Apple read-write compatibility, multiple tape backup, and a PowerTag file selection feature. Tecmar, Inc., 6225 Cochran Rd., Solon, OH 44139-3377, 216/349-0600. Free; \$1395 new.

Roundup version 2.0 adds ReadySet-Go version 4.0 files. It also runs in the background under Multi-Finder. Virginia Systems Software Services, Inc., 5509 West Bay Ct., Midlothian, VA 23112, 804/739-3200. \$10; \$49.95 new.

V.I.P. version 2.5 includes C language translators that extend HyperCard by automatically producing external commands. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301, 818/991-6540. \$30; \$149.95 new. □

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

Send software upgrade announcements to Updates, Macworld, 501 Second St., San Francisco, CA 94107.

TRACK TIME. CAPTURE CASH. NO SWEAT.

If you bill for your services by the hour, you need **TIMESLIPS® III**

Without a good time and billing system, your business isn't collecting all the money it's earned. You have to manage the billing process by tracking your expenses and accounts receivables. You need to know who is being billed and why.

Automatically Tracks Time And Expenses.

TIMESLIPS® III gives you faster, more accurate billing, recovering cash that could have fallen through the cracks.

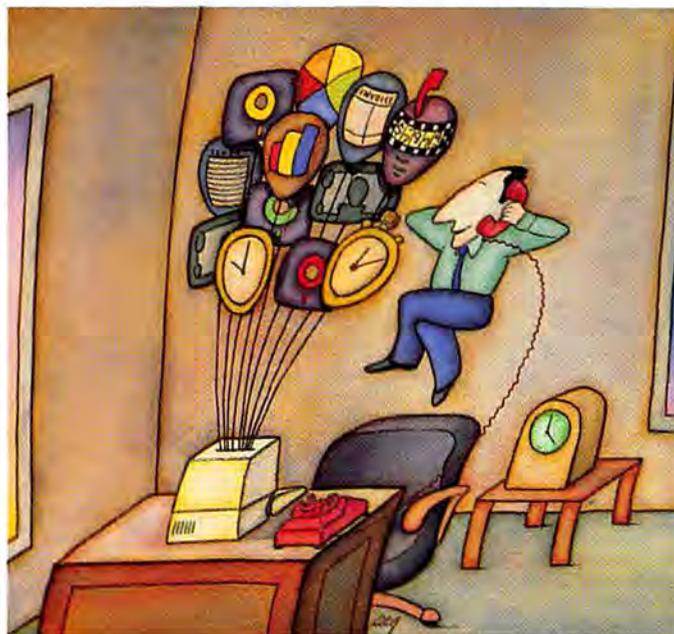
It's A Desk Accessory. TIMESLIPS III runs concurrently with other programs, and can be called up whenever you need it.

A built-in "stopwatch" times any phone call or activity as you work. Then automatically calculates the total fee and updates your client file. Instantly.

A unique "dollar clock" can appear in the corner of your screen to keep a running tab of time and billable dollars.

Understands Your Needs. Unlike other billing systems, TIMESLIPS III allows for *real-time* entry of expenses information while within another program.

Like time and billing systems costing lots more, it provides expanded description on each timeslip. It exports data to virtually any program that accepts tab-delimited files, such as Excel,™ Jazz,™ and Microsoft Works.™



© 1987. North Edge Software Corp. All Rights Reserved.

Generates Custom Bills And Reports.

With over 5,000 ways to create a bill, you can satisfy any client demand, or meet any office need.

TIMESLIPS III generates transaction reports, client history, aged receivables, and management reports.

Tables, bar graphs, pie-charts, easy-on-the-eye formats leap to the screen, giving you masterful control and analysis capabilities. Information, intelligently organized so you don't have to be.

TIMESLIPS III Is A Productivity Tool.

It gives you a clear picture of your business: an activity-by-activity breakdown for each project. What was accomplished. How long it took. And the actual fee.

You Probably Can't Outgrow

TIMESLIPS III. It lets 250 of your colleagues handle 2,000 clients, with up to 128 projects per client. And track all simultaneously.

30-Day Money-Back Guarantee.

If you're not happy, we'll return your money.* In the meantime, you'll find our level of technical support virtually unparalleled.

Send for TIMESLIPS III. It's one of the most powerful, yet easy to use time and billing systems ever offered. Compare it to any other, at any price.

CALL TOLL-FREE 1-800-338-5314

In Mass. and for rush service or technical information, call 617-768-6100.

Please rush me _____ copies of TIMESLIPS III at **\$199.95** plus \$7.00 s/h. For a total of \$ _____ (Mass. residents add 5% sales tax.)

Enclosed is my check.

Please charge my Visa _____ M/C _____

Card No. _____

Exp. _____

Name _____

Company _____

Address _____

City _____ State _____

Zip _____ Tel. (____) _____

MAC 888

**NORTH EDGE
SOFTWARE CORP.**

239 Western Avenue, Essex, MA 01929

TIMESLIPS is a registered trademark of North Edge Software Corp. Excel is a trademark of Microsoft. Jazz is a trademark of Lotus Development Corp. Microsoft Works is a trademark of Microsoft.



Minimum Requirements: Macintosh Computer with at least 512K and either 2 floppy disks or 1 floppy and 1 hard drive. Compatible with MAC II.

*If purchased directly from North Edge Software Corp.

Circle 559 on reader service card

Product Index

Reader
Service
Number

■ Software

Business

- Acius, Inc., 195
 - Adobe Systems, 30-31
 - 146 Alpha Micro, 146
 - 462 AST Research Inc., 53
 - 199 Borland International, 11
 - 183 Bravo Technologies, 33
 - 147 CE Software, 134
 - 581 Check Mark Software, Inc., 194
 - Claris Corporation, 164-165
 - Compugraphic, 181
 - 165 Design Science, Inc., 200
 - 155 DUBL Click, 140
 - 152 Fox Software Inc., 36
 - 156 Great Plains Software, 236-237
 - 409 Micro Planning International, 188
 - 175 Microsoft Press, 24
 - Microsoft, IFC-1
 - 160 M/H Group, 46
 - 559 North Edge Software, Inc., 231
 - 229 Paracom Inc., 124
 - 223 Personal Training Systems, 166
 - PMC Telesystems Inc., 32
 - 48 Software Ventures, 14
 - 215 Symantec Corp/Living Videotext, 8
 - 96 Symantec Corp/Think Technology, 7
 - 41 T.B.S.P., Inc., 192
 - 332 T/Maker, IBC
 - 126 WordPerfect, 34-35
- Vertical**
- 166 Abvent, 176
 - 581 Check Mark Software, Inc., 194
 - 41 T.B.S.P., Inc., 192

Data Management

- Acius, Inc., 195
- 220 Ashton-Tate, 228-229
- 73 Ashton-Tate, 42-43
- 152 Fox Software Inc., 36
- 72 Nashoba, 160-161
- 223 Personal Training Systems, 166

Word Processing

- 73 Ashton-Tate, 42-43
- 180 Deneba, 25
- 165 Design Science, Inc., 200
- 175 Microsoft Press, 24
- 160 M/H Group, 46
- 223 Personal Training Systems, 166
- 215 Symantec Corp/Living Videotext, 8
- 332 T/Maker, IBC
- 126 WordPerfect, 34-35

Reader
Service
Number

CAD/CAM

- 166 Abvent, 176
- 129 Gimeor Inc., 207
- 209 Micro CAD/CAM Systems, Inc., 40
- 229 Paracom Inc., 124

Communications

- 462 AST Research Inc., 53
- Compugraphic, 181
- 281 DataViz, 142
- 48 Software Ventures, 14
- 96 Symantec Corp/Think Technology, 7
- 81 TOPS, 12-13

Educational

- 165 Design Science, Inc., 200

Graphics/Desktop Publishing

- 166 Abvent, 176
- Adobe Systems, 30-31
- Compugraphic, 181
- 50 Copy Rite, 233
- 384 Cricket Software, Inc., 47
- 15 Cricket Software, Inc., 45
- 122 Data Translation, 118
- 282 Deneba, 21
- 217 Deneba, 23
- 155 DUBL Click, 140
- 124 G.W. Instruments, 186
- 222 Image Club Graphics, Inc., 62
- 125 James River Corporation, 177
- 226 Letraset, 174-175
- 225 Letraset, 122
- 218 MacOnly Inc., 230
- 205 Manhattan Graphics, 144
- 229 Paracom Inc., 124

Personal Business/Home

- 112 Survivor Software, 138

Entertainment

- 219 HiTech Management Corporation, 52
- Spectrum Holobyte, 136

Networking

- 150 Farallon Computing, 54

Utilities

- 199 Borland International, 11
- 21 Olduvai, 22

Reader
Service
Number

Miscellaneous

- 581 Check Mark Software, Inc., 194
- 57 CompuServe, 116
- 125 James River Corporation, 177
- 293 Safeware, 227
- 537 UpTime, 5

■ Hardware

Computer Systems

- 8 Atlantic Research Corp, 120

Printers

- 177 General Computer, 128

Boards

- 462 AST Research Inc., 53
- 69 Computer Friends, 187
- 122 Data Translation, 118
- 161 Micron Technology, 56
- 585 Microtek, 114
- 196 National Semiconductor, 112

Digitizers/Scanners

- 107 Abaton, 16-17
 - 585 Microtek, 114
- Display**
- 101 E-Machines, 126
 - 133 Moniterm, 193
 - 89 Princeton Graphic Systems, 189
 - 117 Sigma Designs, 60

Hard Disk/Storage

- 97 Apple Crate, 163
- 82 Irwin Magnetics, 130
- 457 Jasmine, 150-151
- 102 Jasmine, 38-39
- 145 La Cie, 28
- 207 Mass Micro, 41
- 62 Microtech, 157, 159
- 45 Open Mac Enterprises, 234
- 197 Optimal Technology Corporation, 190
- 149 Rodime, 58
- 191 Ruby Systems, 6
- 6 Tallgrass Technologies, 110

Miscellaneous

- 91 Asher Engineering Corp., 132
- 173 Dove Computer (512K), 167
- 174 Dove Computer (SNAP), 167
- 194 Eastman Kodak AV Products Div., 18
- 86 MacProducts USA, 158
- 228 Mirus Corporation, 154-155
- 26 Trimar USA, Inc., 200
- 27 VeloBind, 66

Reader
Service
Number

■ Accessories

Floppy Disk/holders

- 562 Diskette Connection, 156
- 218 MacOnly Inc., 230
- 236 Royale Data Products, Inc., 239

Furniture

- Anthro, 20

Miscellaneous

- 91 Asher Engineering Corp., 132
- 9 Bede Tech, 44
- 243 Cahners Exposition Group, 148
- 148 Ergotron, 64
- 11 Kensington, BC
- 192 Kensington, 26-27
- 239 Secure-It, 156

Services

- 50 Copy Rite, 233
- 195 General Electric PC Rental & Lease Division, 205

■ Mail Order

- 97 Apple Crate, 163
- 9 Bede Tech, 44
- 32 CDA, 238
- 14 Computer Mail Order, 178-179
- 562 Diskette Connection, 156
- 134 47th St Computers, 184
- MacConnection, 68-73
- 218 MacOnly Inc., 230
- 86 MacProducts USA, 158
- 78 MacWarehouse, 168-171
- 44 Programs Plus, 48-51
- 335 Public Domain Exchange, 162
- 236 Royale Data Products, Inc., 239
- 172 Software That Fits, 196-199
- 53 Tussey, 191
- 54 USA Flex/Comark, 32
- Warehouse Mac Products, 152

MACWORLD

Please print or type all information.

FREE PRODUCT INFORMATION

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

(1-200)	1	2	3	4	5	6	7	8	9	10
1	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	
71	72	73	74	75	76	77	78	79	80	
81	82	83	84	85	86	87	88	89	90	
91	92	93	94	95	96	97	98	99	100	
101	102	103	104	105	106	107	108	109	110	
111	112	113	114	115	116	117	118	119	120	
121	122	123	124	125	126	127	128	129	130	
131	132	133	134	135	136	137	138	139	140	
141	142	143	144	145	146	147	148	149	150	
151	152	153	154	155	156	157	158	159	160	
161	162	163	164	165	166	167	168	169	170	
171	172	173	174	175	176	177	178	179	180	
181	182	183	184	185	186	187	188	189	190	
191	192	193	194	195	196	197	198	199	200	

Expires 11/20/88

S1

AUGUST 1988

Name _____ Title _____

Company _____

Address _____ City, State, Zip _____ (zip code needed to ensure delivery)

Phone: Area code/Number _____

Check this box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.00 for a 1-year (12-issue) subscription (U.S. only)

CATALOG INFORMATION

601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700

WHERE TO BUY

701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950

MACWORLD

Please print or type all information.

FREE PRODUCT INFORMATION

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

(1-200)	1	2	3	4	5	6	7	8	9	10
1	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	
71	72	73	74	75	76	77	78	79	80	
81	82	83	84	85	86	87	88	89	90	
91	92	93	94	95	96	97	98	99	100	
101	102	103	104	105	106	107	108	109	110	
111	112	113	114	115	116	117	118	119	120	
121	122	123	124	125	126	127	128	129	130	
131	132	133	134	135	136	137	138	139	140	
141	142	143	144	145	146	147	148	149	150	
151	152	153	154	155	156	157	158	159	160	
161	162	163	164	165	166	167	168	169	170	
171	172	173	174	175	176	177	178	179	180	
181	182	183	184	185	186	187	188	189	190	
191	192	193	194	195	196	197	198	199	200	

Expires 11/20/88

S2

AUGUST 1988

Name _____ Title _____

Company _____

Address _____ City, State, Zip _____ (zip code needed to ensure delivery)

Phone: Area code/Number _____

Check this box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.00 for a 1-year (12-issue) subscription (U.S. only)

CATALOG INFORMATION

601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700

WHERE TO BUY

701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890
891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910
911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950

MACWORLD

Please print or type all information.

FREE PRODUCT INFORMATION

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

(1-200)	1	2	3	4	5	6	7	8	9	10
1	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	
71	72	73	74	75	76	77	78	79	80	
81	82	83	84	85	86	87	88	89	90	
91	92	93	94	95	96	97	98	99	100	
101	102	103	104	105	106	107	108	109	110	
111	112	113	114	115	116	117	118	119	120	
121	122	123	124	125	126	127	128	129	130	
131	132	133	134	135	136	137	138	139	140	
141	142	143	144	145	146	147	148	149	150	
151	152	153	154	155	156	157	158	159	160	
161	162	163	164	165	166	167	168	169	170	



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

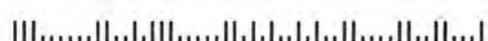
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



Advertiser Index

Reader
Service
Number

Reader
Service
Number

- | | |
|---|---------------------------------------|
| 107 Abaton, 16-17 | — MacConnection, 68-73 |
| 166 Abvent, 176 | 218 MacOnly Inc., 230 |
| — Acius, Inc., 195 | 86 MacProducts USA, 158 |
| — Adobe Systems, 30-31 | 78 MacWarehouse, 168-171 |
| 146 Alpha Micro, 146 | — Macworld Expo, 182-183 |
| — Anthro, 20 | 205 Manhattan Graphics, 144 |
| 97 Apple Crate, 163 | 207 Mass Micro, 41 |
| 91 Asher Engineering Corp., 132 | 209 Micro CAD/CAM Systems, Inc., 40 |
| 73 Ashton-Tate, 42-43 | 409 Micro Planning International, 188 |
| 220 Ashton-Tate, 228-229 | 161 Micron Technology, 56 |
| 462 AST Research Inc., 53 | — Microsoft, IFC-1 |
| 8 Atlantic Research Corp, 120 | 175 Microsoft Press, 24 |
| 9 Bede Tech, 44 | 62 Microtech, 159 |
| 5 Beverly Hills Computer, 102 | 62 Microtech, 157 |
| 199 Borland International, 11 | 585 Microtek, 114 |
| 183 Bravo Technologies, 33 | 228 Mirus Corporation, 154-155 |
| 243 Cahners Exposition Group, 148 | 133 Monitem, 193 |
| 32 CDA, 238 | 160 M/H Group, 46 |
| 147 CE Software, 134 | 72 Nashoba, 160-161 |
| 581 Check Mark Software, Inc., 194 | 196 National Semiconductor, 112 |
| — Claris Corporation, 164-165 | 559 North Edge Software, Inc., 231 |
| — Compugraphic, 181 | 21 Olduvai, 22 |
| 57 CompuServe, 116 | 45 Open Mac Enterprises, 234 |
| 69 Computer Friends, 187 | 197 Optimal Technology Corp., 190 |
| 14 Computer Mail Order, 178-179 | 229 Paracom Inc., 124 |
| 50 Copy Rite, 233 | 223 Personal Training Systems, 166 |
| 15 Cricket Software, Inc., 45 | — PMC Telesystems Inc., 32 |
| 384 Cricket Software, Inc., 47 | 89 Princeton Graphic Systems, 189 |
| 122 Data Translation, 118 | 44 Programs Plus, 48-51 |
| 281 DataViz, 142 | 335 Public Domain Exchange, 162 |
| 180 Deneba, 25 | 149 Rodime, 58 |
| 217 Deneba, 23 | 236 Royale Data Products, Inc., 239 |
| 282 Deneba, 21 | 191 Ruby Systems, 6 |
| 165 Design Science, Inc., 200 | 293 Safeware, 227 |
| 562 Diskette Connection, 156 | 239 Secure-It, 156 |
| 173 Dove Computer (512K), 167 | 117 Sigma Designs, 60 |
| 174 Dove Computer (SNAP), 167 | 172 Software That Fits, 196-199 |
| 155 Dubl Click, 140 | 48 Software Ventures, 14 |
| 194 Eastman Kodak AV Products Div., 18 | — Spectrum Holobyte, 136 |
| 148 Ergotron, 64 | 112 Survivor Software, 138 |
| 101 E-Machines, 126 | 215 Symantec Corp/Living Videotext, 8 |
| 134 47th St Computers, 184 | 96 Symantec Corp/Think Technology, 7 |
| 150 Farallon Computing, 54 | 6 Tallgrass Technologies, 110 |
| 152 Fox Software Inc., 36 | 81 TOPS, 12-13 |
| 177 General Computer, 128 | 26 Trimar USA, Inc., 200 |
| 195 General Electric PC Rental & Lease
Division, 205 | 53 Tussey, 191 |
| 129 Gimeor Inc., 207 | 41 T.B.S.P. Inc., 192 |
| 156 Great Plains Software, 236-237 | 332 T/Maker, IBC |
| 124 G.W. Instruments, 186 | 537 UpTime, 5 |
| 219 HiTech Management Corporation, 52 | 54 USA Flex/Comark, 32 |
| 222 Image Club Graphics, Inc., 62 | 27 VeloBind, 66 |
| 82 Irwin Magnetics, 130 | — Warehouse Mac Products, 152 |
| 125 James River Corporation, 177 | 126 WordPerfect, 34-35 |
| 102 Jasmine, 38-39 | |
| 457 Jasmine, 150-151 | |
| 11 Kensington, BC | |
| 192 Kensington, 26-27 | |
| 145 La Cie, 28 | |
| 225 Letraset, 122 | |
| 226 Letraset, 174-175 | |

A Perfect Image

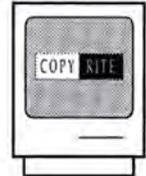
A Complete Desktop Publishing Center

• LINOTRONIC 300

Typeset quality output
from your Macintosh
or IBM PC/XT/AT
or compatible
up to 2540 dpi.

• HIGH RESOLUTION SCANNING

Scan photographs,
diagrams, drawings etc.
you want to put in
your documents.
OCR software available.



• \$ 6.00 / page

(8 1/2 x 11), any resolution,
with this ad, expires 01/10/1988

• \$ 6.00 / hour

(computing time)

• NEW SAN FRANCISCO LOCATION

More equipped,
more versatile, in the heart of the
downtown, San Francisco.

"We present you with a Perfect Image"

COPY RITE

2154 University Avenue
Berkeley, CA. • 94704
(415) 548-4433

74 New Montgomery Street
San Francisco, CA. • 94105
(415) 546-1177

*Linotronic 300 is a Registered Trademark of Linotype company.

Circle 50 on reader service card

GET MORE FROM YOUR MACINTOSH™ INVESTMENT



PERFORMANCE ENHANCERS THAT WON'T BREAK THE BANK.

INTERNAL DRIVES

ONE YEAR WARRANTY

MASS STORAGE

For Macintosh SE,II

OME 45i- 45 Megabytes \$899.95

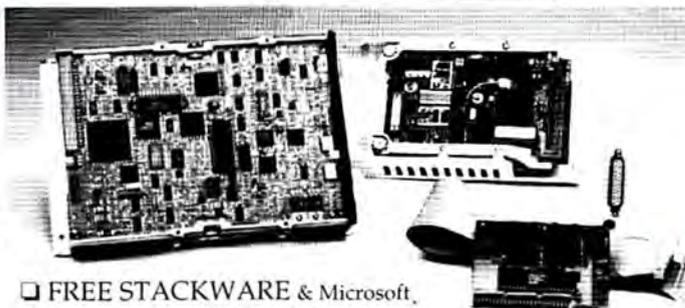
For Macintosh II

OME 100i- 100 Megabytes \$1199.95

OME 140i- 140 Megabytes \$1599.95

EXTERNAL MODELS AVAILABLE

- 110/220V Power
- < 30 ms access



FREE STACKWARE & Microsoft Excel Templates by Heizer Software.

**THEY'RE FAST!
THEY'RE RELIABLE!
THEY'RE INEXPENSIVE!**

**TRY OUR SCSI PORT
FOR THE MAC 512E**

MEMORY

YES! We've Got It! Guaranteed!

For Macintosh Plus,SE,II

Ram II+II - Cost Effective \$CALL
4 Megabytes RAM, 120ns, CMOS.

Ram II - Cost Effective \$CALL
Expands to 2.5 Megabytes RAM. SE & Plus

For Macintosh Plus

RamPlus 2- Cost Effective \$CALL
Expands to 2 Megabytes RAM. Plus Only

RamPlus 4- \$CALL
Expands to 4 Megabytes RAM. Plus Only

NOTE: RamPlus may not be physically compatible with internal devices.



**- 2 YEAR GUARANTY! -
- RELIABLE! -
- AVAILABLE! -
THOUSANDS IN USE
ALREADY!**

**MOST ORDERS SHIP
IN UNDER
10 BUSINESS DAYS**

VIDEO

NOW WITH GENLOCK!

Mac II to NTSC (Television) Converter Connects your Macintosh II to NTSC video.

Record your Macintosh images to video tape, or use for live presentations. Compatible with Apple & Spectrum Video Cards.

STANDARD \$599.
GENLOCK \$999.



GREAT FOR ANIMATION & PRESENTATION

All OPEN MAC products are Guaranteed:

- Are Manufactured by OPEN MAC Enterprise - Are User Installable - Preserve Manufacturer's Warranty - Carry a minimum 1 Year Warranty - Are stocked for rapid shipment -
- Are listed at a Cash Discount Price - Credit Cards not charged until shipment - Prices may vary

OPEN MAC Enterprises

415/682-0440

2280 Bates Avenue, Suite J, Concord, CA 94520

VISA/MC/AMEX
Discover
Accepted

GOVERNMENT & FORTUNE 1000

Purchase Orders Encouraged
FAX: 415-686-4244

VideoEx- \$149.95

Expand the Mac II
to full color capability

DON'T HAVE A MAC II?

Try our Hi-resolution composite video adapters for the Mac SE & Plus. (Sorry, not TV!)

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

- A**
- 701 **A+ Mouse.** MSC Technologies, Inc., 2600 San Tomas Expwy., Santa Clara, CA 95051, 408/988-0211.
- 702 **ADBridge.** Olduvai Corp., 7520 Red Rd., Ste. A, South Miami, FL 33143, 305/665-4665, 800/822-0772.
- 703 **AnyGraph.** Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308, 303/444-9532, 800/356-0283.
- 704 **AnyPC.** Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308, 303/444-9532, 800/356-0283.
- 705 **AnyText.** Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308, 303/444-9532, 800/356-0283.
- 706 **Apple 2MB Memory Expansion Kit.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 707 **Apple File Exchange.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 708 **Apple MIDI Interface.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 709 **Apple PC 5.25 Drive.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 710 **AppleColor High-Resolution RGB Monitor.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 711 **ArchiCAD.** Abvent, Inc., 23331 El Toro Rd., #209, El Toro, CA 92630, 714/380-0333.
- 712 **ArtRoom.** Image Club Graphics, Inc., 2915 19th St., #206, Calgary, Alberta, Canada T2E 7A2, 403/250-1969, 800/661-9410.
- B**
- 713 **Business LaserPrinter Upgrade.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- C**
- 714 **Calculus.** Sensei Software, published by Bröderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903-2101, 415/492-3200.
- 715 **Chameleon.** Spectrum Computing, Inc., P.O. Box 141097, Coral Gables, FL 33114, 305/665-0404.
- 716 **Cirrus 40MB Drives.** La Cie, 16285 S.W. 85th, #306, Tigard, OR 97224, 503/684-0143.
- 717 **Cirrus 60MB Drives.** La Cie, 16285 S.W. 85th, #306, Tigard, OR 97224, 503/684-0143.
- 718 **Color Space II.** Mass Micro Systems, Inc., 550 Del Rey Ave., Sunnyvale, CA 94068-3528, 408/522-1200, 800/522-7979.
- 719 **Conrac Model 7250/7351.** Conrac Corp. Displays Products Group, 1724 S. Mountain Ave., Duarte, CA 91010, 818/303-0095.
- D**
- 720 **DaynaFile.** Dayna Communications, Inc., 50 S. Main St., 5th Floor, Salt Lake City, UT 84144, 801/531-0203, 800/531-0600.
- 721 **Digital Darkroom.** Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956.
- 722 **Dimensions.** Visual Information, Inc., 16309 Doublegrove St., La Puente, CA 91744, 818/918-8834.
- E**
- 723 **Electrohome ECM 1900 Series.** Electrohome, Ltd., Display Systems, 809 Wellington St., Kitchener, Ontario, Canada N2G 4J6, 519/744-7111.
- F**
- 724 **Flat-Top.** Network Specialties, 296 Elizabeth St., New York, NY 10012, 212/995-2224.
- G**
- 725 **Generic CAD.** Generic Software, 8763 148th Ave. NE, Redmond, WA 98052, 206/885-5307.
- H**
- * **ImageStudio.** Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9703.
- 726 **Imagizer.** Comurex, P.O. Box 1450, El Toro, CA 92630, 714/855-6600.
- I**
- 727 **JamBox Series.** Southworth Music Systems, Inc., 91 Ann Lee Rd., Harvard, MA 01451, 617/772-9471.
- 728 **Jump 020.** Network Specialties, 296 Elizabeth St., New York, NY 10012, 212/995-2224.
- K**
- * **Kwikce Inhouse Graphic Services.** Multi-Ad Services, Inc., 1720 W. Detweiller Dr., Peoria, IL 61615-1695, 309/692-1530, 800/322-3941.
- L**
- 729 **Lap-Link Mac.** Traveling Software, Inc., 19310 N. Creek Pkwy., Bothell, WA 98011, 206/483-8088, 800/343-8080.
- 730 **LaserWriter IINT.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 731 **LaserWriter IINTX.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 732 **LSI Pentagon CAD.** Lionshead Software, Inc., 1911 Hollyhock Rd., West Palm Beach, FL 33414, 407/790-1157.

Where to Buy

Reader
Service



- 733 **Mac-101 Keyboard.** DataDesk Int'l, 7651 Haskell Ave., Van Nuys, CA 91406, 818/780-1673, 800/826-5398.
- 734 **MacAccelerator.** Spectra Micro Development, P.O. Box 41795, Tucson, AZ 85717, 602/884-7402.
- 735 **MacAstrologer.** Full Phase Software, P.O. Box 17045, Seattle, WA 98107, 206/325-2113.
- 736 **MacDraw.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/962-8946 (product information), 800/544-8554 (upgrade information), 800/334-3535 (dealer information).
- 737 **MacDraw II.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/962-8946 (product information), 800/544-8554 (upgrade information), 800/334-3535 (dealer information).
- 738 **MacEngine GT.** Ryad, 2521-F N. Grand Ave., #950, Santa Ana, CA 92701, 714/558-0662.
- 739 **MacEngine Turbo.** Ryad, 2521-F N. Grand Ave., #950, Santa Ana, CA 92701, 714/558-0662.
- 740 **MacFace.** Sonus Corp., 21430 Strathern St., Ste. H, Canoga Park, CA 91304, 818/702-0992.
- 741 **MacImage.** Datacopy, Inc., 1215 Terra Bella Ave., Mountain View, CA 94043, 415/965-7900.
- 742 **MacLink Plus.** DataViz, Inc., 16 Winfield St., Norwalk, CT 06855, 203/866-4944.
- 743 **MacPaint 2.0.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/962-8946 (product information), 800/544-8554 (upgrade information), 800/334-3535 (dealer information).
- 744 **MacProject II.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/962-8946 (product information), 800/544-8554 (upgrade information), 800/334-3535 (dealer information).
- 745 **MacProof 3.0.** ALP Systems, Inc., 295 Chipeta Way, Salt Lake City, UT 84108, 801/584-3050, 800/354-5656.
- 746 **MacTablet.** Summagraphics Corp., 777 Commerce Dr., Fairfield, CT 06430, 203/384-1344, 800/243-9388.
- 747 **MacViewFrame.** nView Corp., 11835 Canon Blvd., #C-101, Newport News, VA 23606, 804/873-1354.
- 748 **MacWrite.** Claris Corp., 440 Clyde Ave., Mountain View, CA 94040, 415/962-8946 (product information), 800/544-8554 (upgrade information), 800/334-3535 (dealer information).
- * **Magic 020.** MacProducts USA, 9709 Brown Ln., Ste. E, Austin, TX 78754, 512/832-0335, 800/622-3475.
- 749 **McSink.** Signature Software, 2151 Brown Ave., Bensalem, PA 19020, 215/639-8764.
- 750 **MGMStation CAD/CAM.** Micro CAD/CAM, Inc., 5900 Sepulveda Blvd., Van Nuys, CA 91411, 818/376-0008.
- 751 **Microphone II.** Software Ventures Corp., 2907 Claremont Ave., #220, Berkeley, CA 94705, 415/644-3232.
- 752 **Microsoft Excel.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 753 **Microsoft Word.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.

The obvious power of Great Plains



GENERAL LEDGER



ACCOUNTS PAYABLE



ACCOUNTS RECEIVABLE



PAYROLL



INVENTORY



PURCHASE ORDER

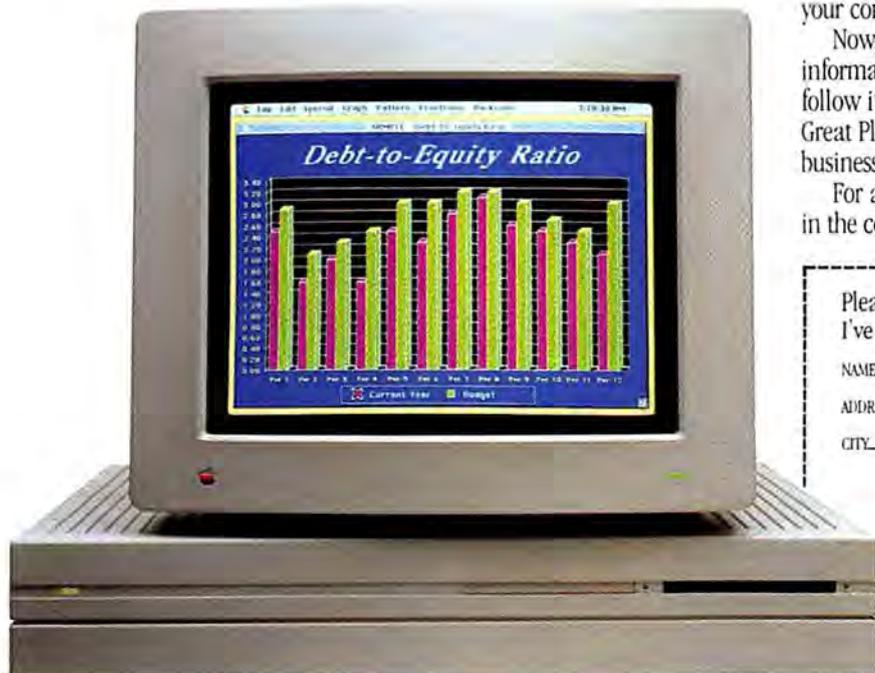


ORDER ENTRY

© 1988 Great Plains Software®

- 754 **MIDI Transport.** Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94109, 415/726-0280.
- 755 **MIDiface II.** Austin Development, 227 Marin St., San Rafael, CA 94901, 415/454-9620.
- 756 **MiniCAD.** Diehl Graphsoft, 8370 Court Ave., #202, Ellicott City, MD 21043, 301/461-9488.
- 757 **Mitsubishi FHF 3500.** Mitsubishi Electronics America, Inc., 991 Knox St., Torrance, CA 90502, 213/515-3993.
- N**
- 758 **Nanao FLEXSCAN 8060S.** Nanao USA Corp., 23510 Telo Ave., #5, Torrance, CA 90505, 213/325-5202.
- 759 **NuVision.** Perceptics, Inc., P.O. Box 22991, Knoxville, TN 37933, 615/966-9200.
- P**
- 760 **Passport MIDI Interface.** Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94109, 415/726-0280.
- 761 **PC Viewer PCV 6448AV.** In Focus Systems, Inc., 7649 S.W. Mohawk St., Tualatin, OR 97062, 503/692-4968, 800/327-7231.
- * **PCPC HD-20 WSI.** Personal Computer Peripherals Corp., 4710 Eisenhower Blvd., Bldg. A, Tampa, FL 33634, 813/884-3092, 800/622-2888.
- * **PCPC II Graphics System.** Personal Computer Peripherals Corp., 4710 Eisenhower Blvd., Bldg. A, Tampa, FL 33634, 813/884-3092, 800/622-2888.
- 762 **PEGASYS II.** IGC Technology Corp., 305 Lennon Ln., Walnut Creek, CA 94598, 415/945-7300.
- * **Planit.** CompServeCo, 800 Freedom, Slidell, LA 70458, 504/649-0484, 800/272-5535.
- 763 **PowerDraw.** The Computer Shoppe, P.O. Box 18344, Greensboro, NC 27419, 919/299-4843.
- * **Prodigy 4.** Levco, 6160 Lusk Blvd., #C-203, San Diego, CA 92121, 619/457-2011.
- 764 **Professional Plus.** Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025, 415/321-8977.
- 765 **ProViz.** Pixelogic, Inc., 800 W. Cummings Park, #2900, Woburn, MA 01801, 617/938-7711.
- Q**
- 766 **QuickCapture.** Data Translation, Inc., 100 Locke Dr., Marlboro, MA 01752, 617/481-3700.
- 767 **QuickShare.** Compatible Systems Corp., P.O. Drawer 17220, Boulder, CO 80308, 303/444-9532, 800/356-0283.
- R**
- 768 **Radius Accelerator 16.** Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134, 408/434-1010.
- 769 **Radius Two Page Display.** Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134, 408/434-1010.
- 770 **RasterOps ColorBoard 104.** RasterOps Corp., 10161 Bubb Rd., Cupertino, CA 95014, 408/446-4090.
- 771 **RasterOps ColorBoard 64.** RasterOps Corp., 10161 Bubb Rd., Cupertino, CA 95014, 408/446-4090.
- 772 **Red Ryder.** Freesoft Co., 150 Hickory Dr., Beaver Falls, PA 15010, 412/846-2700.

...made even more obvious.



Introducing Executive Advisor

The Great Plains Accounting Series is a powerful business tool which gives you the edge you need to stand out from your competitors.

Now, with Executive Advisor, you can use your financial information to lead your company's growth... not just follow it. Because Executive Advisor taps your records in the Great Plains Accounting Series and converts them into business ratios and analysis reports — over 75 in total.

For a demo disk, call us at **1-800-345-3276**. Or send in the coupon below. Either way, the benefits will be obvious.

Please send me a demo disk of Executive Advisor.
I've enclosed \$10.00.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____

Mail to: Great Plains Software
P.O. Box 9739; Fargo ND 58109

 **GREAT PLAINS SOFTWARE**
GROW YOUR BUSINESS ON GREAT PLAINS

MW-888

Circle 156 on reader service card

CDA

computer sales

- ORDER VIA FAX 201-832-9704
- ORDER VIA COMPUSERVE GO-CDA
- No Sales Tax Collected (N.J. Residents Add 6%)
- Visa, MC, Amex, Discover Accepted

MONTHLY SPECIALS

- Rodime 20 Plus Hard Drive (Beige Case) \$ 599
- E-Machines Big Picture 17" 1495
- Imagewriter II Package complete w/dust cover, pkg. of paper, cable and 2 extra ribbons. Package #8850 499

Write or call for our 56-page color catalog.

Complete Ready-To-Run Systems

Guaranteed to be complete and ready to run (no missing parts or cables). If these systems do not meet your needs, please call our systems sales division and they will help you design a system to meet your specific needs.

ORDER TOLL FREE 800-526-5313 • In NJ and Outside US 201-832-9004

APPLE HARDWARE

Macintosh Plus	\$1349
Macintosh SE Keyboard	2249
Macintosh SE/20 Keyboard	2899
Macintosh w/Extended Keyboard	3149
Mac II/40 w/Extended Keyboard	4399
Extended Keyboard	199

EXTERNAL HARD DRIVES

CMS
Our Pricing is so outrageously low, that we have been requested by CMS not to publish our pricing. **Please call.**

Cutting Edge	
Everex	
E-MAC 20D	\$ 529
E-MAC 20 Deluxe	595
E-MAC 40D	975
E-MAC 40 Deluxe	1049
E-MAC 40/60DT	1849
PCP	
MacBottom 21 Meg (65ms)	\$ 729
MacBottom 32 Meg (65ms)	849
MacBottom 45 Meg (29ms)	1149
MacBottom 70 Meg	1495
SuperMac	
DataFrame 30 Meg (65ms)	\$ 679
DataFrame 30XP Meg (65ms)	899
DataFrame 60XP Meg (29ms)	1249
DataFrame XP60+40 (29ms)	2149
DataFrame XP60+B (29ms)	2599
DataFrame XP105 (28ms)	1999
DataFrame XP150 (16.5ms)	2499
DataStream 40 Tape Backup	995

INTERNAL HARD DRIVES

CMS Enhancements
High quality internal hard drives install easily into the Mac SE or Mac II—from 20 to 300 Megabyte sizes! **Please call for pricing.**

SuperMac	
150 Internal for Mac II (16.5ms)	\$2249
PCPC	
144 Internal for Mac II	\$1959

INPUT DEVICES

Abaton ProPoint Mouse	\$135
Apple Extended Keyboard	199
Asher Engineering Turbo Trackball	82
Cutting Edge 105 Keyboard-ADB	135
Data Desk 101 Keyboard-ADB	135
Data Desk 101 Keyboard-Plus	135
Kensington Turbo Mouse-ADB	89
Kensington Turbo Mouse-Plus	89
Lighthouse Felix	99
Mouse Systems A+ Mouse ADB	89
Mouse Systems A+ Mouse Plus	79

SURGE PROTECTORS

EPD EC-1 Surge Protector	\$ 39
Kensington Masterpiece Mac	115
Kensington System Saver SE	59
Kensington System Saver Plus/512	69

SCANNERS

Microtek MS-300C Sheet Feed	\$1449
Microtek MSF-300C Flatbed	1599
Microtek MSF-300C Flatbed SCSI	1769
Microtek MSF-300G Flatbed	2899
Microtek MSF-300G Flatbed SCSI	3049
Microtek MSF-400G New	CALL
Microtek SCSI Option	199
Thunderware Thunderscan 4.0	199

PRINTERS

<i>(Prices include required cable)</i>	
Apple ImageWriter II	\$ 479
Image II Sheetfeeder	179
Apple ImageWriter LQ	1099
Image LQ Sheetfeeder	239
Apple LaserWriter IISC	2299
Apple LaserWriter II NT	3799
Apple LaserWriter II NTX	5295

PRINTER ACCESSORIES

ImageWriter II Ribbon	\$ 5
ImageWriter LQ Ribbon	17
LaserWriter Toner Cart	79
LaserWriter II Toner	109
Orange Grappler Mac	79
Orange Grappler MacLQ	89

DISK DRIVES

Apple 3.5 Disk Drive	\$ 319
Central Point 3.5	195
Cutting Edge 800K	189

MONITORS

Apple	
Mac II Monochrome Monitor*	\$ 329
Mac II RGB Monitor*	799
*Requires Video Display Card	
E-Machines	
Big Picture-Plus, SE, Mac II	\$1595
Big Picture IQ Grey Scale	2349

Sigma Designs

LaserView SE	\$1799
LaserView II	1799

SuperMac

Hi-Res 19" Mono w/Superview II Card	\$1669
Hi-Res 19" GreyScale w/Spectrum/8 Video Card	2399
Hi-Res 19" Color w/Spectrum/8 Video Card	3599
Hi-Res 19" Trinitron Color w/Spectrum/8 Video Card	4399

Video Display Card

For Mac II:	
Mac II Video Adapter w/Video Upgrade	\$499
Mac II Video Upgrade	109

MODEMS & COMMUNICATIONS

Epic Internal 2400/Mac II	\$349
Epic Internal 2400/Mac SE	349
Mignet Pocket Modem	169
Practical 1200SA	129
Practical 2400SA	199
Red Ryder 10.0 Com Software	65
Modem Cable Hayes Compatible	19

MEMORY & ENHANCEMENT

1 Megabyte Simm Modules	CALL
Apple	
1 Megabyte Upgrade Mac II	\$ 279
AST	
Mac 286 Coprocessor	1099
Dove	
MacSnap 524-Mac 512	230
MacSnap 524E-Mac 512E	200
MacSnap 524S	270
MacSnap 548-Mac 512	470
MacSnap 548E-Mac 512E	460
MacSnap 548S	520
MacSnap Plus 2-Mac Plus	340
MacSnap 2SE-Mac SE	359
MacSnap SCSI Option-Mac 512	110
SuperMac	
One + One-MacPlus	309
Speed Card - Mac SE	309
Prodigy SE 1 Megabyte	1139

No-Risk 30-Day Satisfaction Guarantee—If you're not 100% satisfied with any Hardware or Accessories purchased from CDA Computer Sales, we will refund the purchase price 100%! (Software excluded.)

Warranty—On top of the manufacturer's warranty, we offer a 30-day defective exchange policy—if hardware or accessory fails in the first 30 days, we will replace that item with a brand new product.

Apple Product—We are not an authorized Apple dealer, therefore during the 90-day warranty period, the product must be returned to CDA for warranty repair.

Shipping Charges—UPS Ground Shipping, add 2% (\$3.50 minimum); UPS Blue Service, add 5% (\$5.50 minimum); APO/FPO Shipping, add 4% (\$4.50 minimum); Alaska, Hawaii, Puerto Rico and Canada, add 6% (\$6.50 minimum). Foreign Orders, please call.

Payment—Major Credit Cards Accepted at no additional charge! Cashier Checks and Money Orders shipped promptly; personal checks are held 10 days for clearing. NO COD's please.

Prices are subject to change. Apple is a registered Trademark of Apple Inc. IBM is a registered Trademark of International Business Machines. Macintosh is a registered Trademark of Apple Inc.

CDA Computer Sales

One CDA Plaza, PO Box 533, Califon, NJ 07830
Monday thru Friday 9 am to 10 pm EST
Saturday 10 am to 5 pm EST

Macintosh Plus Entry System with MacWrite

- Complete System Includes:**
- Macintosh Plus Computer w/1 Megabyte of Memory & 1 Internal 800K Drive
 - Keyboard and Mouse
 - Cutting Edge 800K External Drive
 - ImageWriter II Printer
 - ImageWriter Cable
 - MacWrite Word Processing Software
 - HyperCard Software
 - Sony Diskettes—Box of 10
 - Computer Paper—Pkg of 500
 - Dust Cover for Macintosh Plus
 - Dust Cover for ImageWriter II
 - Mouse Pad

Suggested list price \$3017
CDA Price \$2199

When ordering specify package #8815

Macintosh SE Super System

- Complete System Includes:**
- Macintosh SE Computer w/2 Internal 800K Drives & 1 Megabyte of Memory
 - Keyboard and Mouse
 - ImageWriter II Printer
 - ImageWriter Cable
 - HyperCard Software
 - Maxell Diskettes—Box of 10
 - Computer Paper—Pkg of 500
 - Dust Cvr for Macintosh SE
 - Dust Cvr for the ImageWriter II
 - Head Cleaning Kit
 - Mouse Pad

Suggested list price \$3689
CDA Price \$2749

When ordering specify package #8802

Macintosh SE/20 Super System

Same as the above system but includes Macintosh SE with built in 20 megabyte hard disk and 1 internal 800K floppy.

Suggested list price \$4489
CDA Price \$3349

When ordering specify package #8803

Macintosh SE/45 Deluxe System NEW!

- Complete System Includes:**
- Macintosh SE Computer w/2 800K Internal Drives
 - 1 Megabyte of Memory
 - CMS 45 Megabyte Internal Hard Drive
 - Ext Keyboard & Mouse
 - ImageWriter II Printer
 - ImageWriter Cable
 - HyperCard Software
 - Sony Diskettes—Box of 10
 - Dust Cvr for the Mac SE
 - Dust Cvr for ImageWriter II
 - Computer Paper—Case of 1200

Suggested list price \$4684
CDA Price \$3499

When ordering specify package #8811

Macintosh II/40 Graphic System Now with 256 Color Option!

- Complete System Includes:**
- Macintosh II Computer w/40 Megabyte Hard Drive
 - 1 Megabyte of Memory
 - Ext Keyboard & Mouse
 - Macintosh II Video Card
 - Expanded Video Option
 - Apple Color High Resolution RGB Monitor
 - ImageWriter II with Cable
 - HyperCard Software
 - Maxell Diskettes—Box of 10
 - Case of Computer Paper—1100 Sheets
 - Dust Cvr for Macintosh II/Mon
 - Dust Cvr for Ext Keyboard
 - Head Cleaning Kit
 - Mouse Pad

Suggested list price \$7849
CDA Price \$5999

When ordering specify package #8825

Above system with 20 Megabyte Hard Disk specify package #8824.

CDA Price \$5499

Above system with 80 Megabyte Hard Disk specify package #8826.

CDA Price \$6999



Where to Buy

Reader Service

- S**
- 773 **Sensible Grammar 1.1a.** Sensible Software, Inc., 335 E. Big Beaver, #207, Troy, MI 48083, 313/528-1950.
- 774 **Smartcom II.** Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617.
- 775 **Sony GDM-1602.** Sony Corp. of America, 1 Sony Dr., Park Ridge, NJ 07656, 800/222-7669.
- 776 **Sony GDM-1952.** Sony Corp. of America, 1 Sony Dr., Park Ridge, NJ 07656, 800/222-7669.
- 777 **SpaceEdit.** Abvent, Inc., 23331 El Toro Rd., #209, El Toro, CA 92630, 714/380-0333.
- 778 **Spectrum/8 Video Board.** SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884.
- 779 **Studio Plus Two.** Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025, 415/321-8977.
- 780 **Super 3D.** Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956.
- T**
- 781 **Taxan MultiVision 770 Plus.** Taxan USA Corp., 18005 Courtney Ct., City of Industry, CA 91748, 818/810-1291.
- 782 **Timecode Machine.** Opcode Systems, Inc., 1024 Hamilton Ct., Menlo Park, CA 94025, 415/321-8977.
- 783 **TOPS.** TOPS, A Sun Microsystems Co., 950 Marina Village Pkwy., Alameda, CA 94501, 415/769-9669, 800/445-8677.
- * **TrueVision NuVista VideoGraphics Adaptor.** TrueVision, Inc., 7351 Shadeland Station, #100, Indianapolis, IN 46256, 317/841-0332, 800/858-8783.
- 784 **TSI-020.** Total Systems Integration, 99 W. Tenth Ave., #333, Eugene, OR 97401, 503/345-7395, 800/874-2288.
- U**
- 785 **Ultrasync.** Princeton Graphics Systems, 601 Ewing St., Bldg. A, Princeton, NJ 08540, 609/683-1660, 800/221-1490.
- * **UnWS.** Public domain software.
- V**
- 786 **VersaCAD/Macintosh Edition.** VersaCAD Corp., 2124 Main St., Huntington Beach, CA 92648, 714/960-7720.
- 787 **Video JamBox.** Southworth Music Systems, Inc., 91 Ann Lee Rd., Harvard, MA 01451, 617/772-9471.
- 788 **WordPerfect 1.0.** WordPerfect Corp., 288 W. Center St., Orem, UT 84057, 801/225-5000, 800/321-4566.

Public Domain/Shareware. Available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Budgetbytes (800/356-3551 for orders, 913/271-6022 in Kansas), Educomp (800/843-9497, 619/259-0255 in California), or the Public Domain Exchange (800/331-8125, 408/496-0624 in California). □

HOW DO YOU GET A JOB WITHOUT EXPERIENCE? AND HOW DO YOU GET EXPERIENCE WITHOUT A JOB?

Most young people have one answer to this problem. They avoid it until they're out of college. But they could be getting solid work experience while they're still in college. With your company's help. And ours.

We're Co-op Education. A nationwide program that helps college students get real jobs for real pay, while they're getting an education.

But we can't do it without you. Those real jobs have to

come from real companies. Like yours.

For more information on how you can participate in this valuable program, write Co-op Education, Box 775E, Boston, MA 02115.

Not only will you be giving students a chance to earn money and pick up the most valuable kind of knowledge, you'll be giving yourselves a chance to pick up the most valuable kind of employee.

Co-op Education.

You earn a future when you earn a degree.

Royale Data Products, Inc.

Quality Customer Service from Roberta Wirtel & Ann Deaver
3350 Scott Blvd. Suite 1903 • Santa Clara, CA 95054 • Bldg 19 Koll Oakmead Park

Hours: M-F 8:30 am - 6 pm Sat 12 pm - 4 pm Call For Directions

3.5" DISK BONANZA

No Shortage • In Stock • Best Prices
Double Sided-Boxes of 10

SONY® Kodak Syncom

The One and Only®



Platinum Perfect

\$14.92 \$14.79 \$13.29

Bulk 3.5" Disks	100	400
3.5" SONY Double Sided	CALL	CALL
3.5" SONY Single Sided	\$1.05	.99
3.5" High Density	\$3.50	CALL
Verbatim Double Sided	.98	CALL

QUEEN'S SPECIAL

3.5" Double Sided
In Plastic Case
10 Disks
Blank Labels
\$12.25

CAPT. KIRK'S SPECIAL

and his dog Scotty
3.5" High Density
In Plastic Case
10 Disks • Blank Labels
\$37.00



24 HOUR SHIPPING

While Supplies Last
& Prices Good Thru 8/31/88
Visa, MC, Amex or COD
Minimum order-50 Disks.
All orders plus shipping.

Buy over 100 disks and receive a DiskFile 3 Case for \$4.75. Holds 40 3.5" disks. Reg. \$9.95. Limit 1 per customer.



800 544-3472

408 727-9022
or (415) 494-2758 FAX

Circle 236 on reader service card

Macworld Best-Sellers

Months on chart	Last month	This month	
Business Software			
18	3	1	Microsoft Works <i>Microsoft</i>
38	2	2	Microsoft Word <i>Microsoft</i>
30	1	3	Microsoft Excel <i>Microsoft</i>
26	4	4	PageMaker <i>Aldus</i>
16	5	5	MacWrite <i>Clariss</i>
31	-	6	MacDraw <i>Clariss</i>
4	-	7	FileMaker Plus <i>Nashoba Systems</i>
2	6	8	Quark XPress <i>Quark</i>
4	7	9	WordFinder <i>Microlytics</i>
16	8	10	SuperPaint <i>Silicon Beach Software</i>

Months on chart	Last month	This month	
Education Software			
22	1	1	Math Blaster <i>Davidson & Associates</i>
6	2	2	Reader Rabbit <i>The Learning Company</i>
22	3	3	KidsTime <i>Great Wave Software</i>
19	-	4	Typing Tutor III <i>Simon & Schuster Computer Software</i>
11	5	5	Early Games <i>Springboard Software</i>

Months on chart	Last month	This month	
Entertainment Software			
18	4	1	Dark Castle <i>Silicon Beach Software</i>
22	1	2	Flight Simulator <i>Microsoft</i>
22	2	3	MacGolf <i>Practical Computer Applications</i>
2	3	4	Beyond Dark Castle <i>Silicon Beach Software</i>
4	5	5	Falcon <i>Spectrum Holobyte</i>

Months on chart	Last month	This month	
Networking/Data Communications			
18	1	1	TOPS <i>TOPS</i>
14	2	2	AppleShare <i>Apple Computer</i>
22	3	3	LocalTalk (formerly AppleTalk) <i>Apple Computer</i>
9	4	4	PhoneNet <i>Farallon Computing</i>
20	-	5	MacServe <i>Infosphere</i>

Months on chart	Last month	This month	
Hard Disks*			
11	1	1	Macintosh Internal 20SC Hard Disk <i>Apple Computer</i>
18	2	2	Apple Hard Disk 20/20SC <i>Apple Computer</i>
3	3	3	Macintosh Internal 40SC Hard Disk <i>Apple Computer</i>
11	4	4	Rodime 20 Plus <i>Rodime</i>
2	-	5	Compact SC 40 <i>CMS Enhancements</i>

Months on chart	Last month	This month	
Add-in Boards			
9	4	1	Radius Accelerator <i>Radius</i>
9	1	2	Apple 2MB Memory Expansion Kit <i>Apple Computer</i>
9	2	3	Apple 1MB Memory Expansion Kit <i>Apple Computer</i>
5	3	4	Macintosh II Video Card <i>Apple Computer</i>
5	-	5	MacSnap Plus 2 <i>Dove Computer</i>

Months on chart	Last month	This month	
Product Watch			
Editors' choice: Other recent products of particular interest.			
			Dreams <i>Innovative Data Design</i> 2-D color computer-aided-design software
			FoxBase+/Mac <i>Fox Software</i> relational database manager compatible with dBase II and dBase III Plus
			SuperPaint 2.0 <i>Silicon Beach Software</i> color paint/draw program

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order suppliers. Covers sales during April 1988.

* Does not include hard disks installed at the factory.

The WriteNow difference: *Ease, Performance, and...*



	WriteNow 2.0	MacWrite 5.0	MS Write	MS Word 3.01
Spelling checker size	100,000 words	100,000 words	80,000 words	80,000 words
Font size range	4-127 pts.	7-24 pts.	7-72 pts.	2-127 pts.
Maximum recommended document size (in pages)	Over 2,000	240	50	500
Number of open documents	Unlimited*	1	30	30
Mail merge	Yes	No	No	Yes
Number of editable, on-screen columns (WYSIWYG)	4	1	1	1
On-screen auto-numbering footnotes	Yes	No	No	No
Automatic repagination	Yes	Yes	No	No
Graphics in same line as text	Yes	No	Yes	Yes
Multiple headers and footers	Yes	No	No	Yes
Extensive Undo	Yes	No	No	No
Variable line spacing (in points)	Yes	No	No	Yes
Selective font, size, style, and ruler changes	Yes	No	No	Yes
MacUser Magazine's Best New Word Processor	Yes	No	No	No
Search for a word	2.4 sec	7.6 sec	9.5 sec	9.7 sec
Spell Check document	6.3 sec	2 min 34.0 sec	2 min 2.3 sec	1 min 48.0 sec
Copy & Paste large area	6.8 sec	1 min 0.9 sec	12.4 sec	12.3 sec
Change font size of document	10.7 sec	50.2 sec	17.6 sec	16.2 sec
Change font of document	10.8 sec	37.1 sec	14.1 sec	15.2 sec
'Save As' a 12-page document	3.6 sec	9.4 sec	20.3 sec	19.6 sec
Retail Price	\$195	\$125	\$175	\$395
Happy Users	Yes	?	?	?



...Happy Users!

Our users love WriteNow—a claim our competition can't easily make for their products.

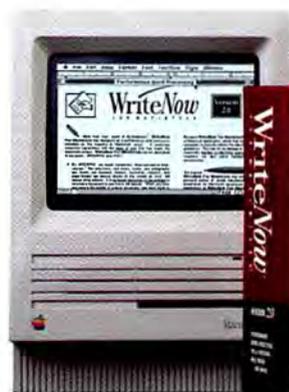
How do we know? Because our users tell us—on registration cards, on the telephone, on bulletin boards, and in letters.

We've heard dramatic stories about how WriteNow has significantly reduced training and support costs. And how clean, fast, and enjoyable it is to use. And how WriteNow got the job done when our competition sputtered.

You see, at T/Maker we feel 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.

And from their overwhelmingly terrific response, it's clear our users agree.

WriteNow 2.0 is the user's choice for best Macintosh word processor—and we'll show anyone our customer registration cards to prove it!



T/Maker

What's new with WriteNow 2.0?

Mail merge, 100,000-word dictionary, Cursor key support, Direct Import/Export of Text, MacWrite, and RTF (Word, Write, and Works option) files, Window menu, Decimal tabs, Hide pictures option, MultiFinder and network compatibility, ...and more!

Registered users will receive upgrade details in the mail. Non-registered users should call or write for details.

T/Maker Company • 1973 Landings Drive • Mountain View, CA 94043 • 415-962-0195

All timing tests performed by an independent testing organization on a 12-page document using a Macintosh SE and a 20 megabyte hard disk.

* Number determined by Macintosh system constraints.

© 1988 T/Maker Company. All rights reserved. The following are registered and unregistered trademarks of the companies listed: WriteNow, licensed to T/Maker Co.; Macintosh, Apple Computer, Inc.; MacWrite, Claris Corp.; Microsoft, Microsoft Corp.

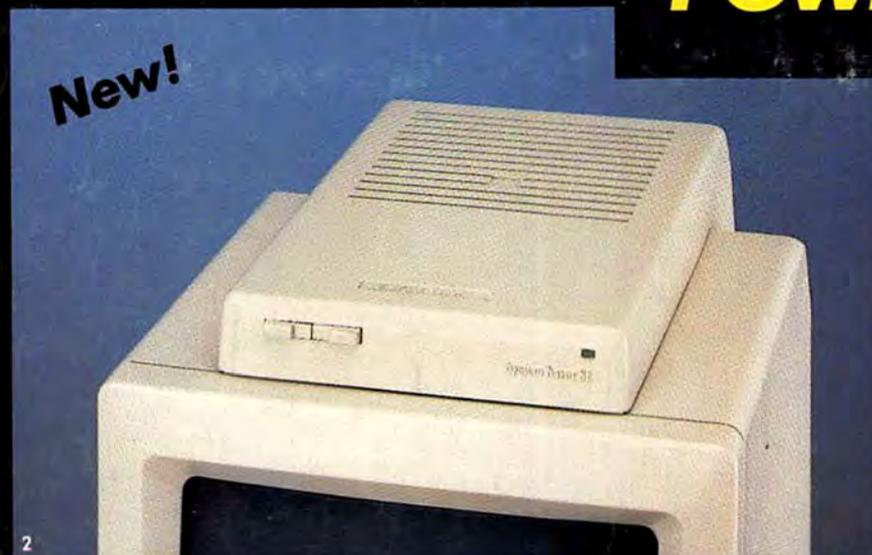
Demo version of WriteNow included on all Jasmine hard drives.

Circle 332 on reader service card



He had a reputation as a power user. But deep down he knew it wasn't true. Oh, he had the software alright. But the real power, the electrical power that ran his Mac was another story. He lived in fear of its surges and spikes. He lacked the proper outlets. He knew he was out of control...

KENSINGTON POWER CONTROL



A Kensington power center will get your power under control. We organize and protect your entire system with extra outlets, convenient front-mounted switches, and the best surge suppression and noise filtering available.

1. **Master Piece® Mac II** starts with five protected outlets. Added modem surge suppression protects against surges and spikes on the phone line. And a built-in swivel lets you adjust your monitor. \$159.95

2. **System Saver® SE** offers two protected outlets and a replacement for your SE's power cord, a choice of 1 or 2 switches, and modem/phone line surge suppression. \$79.95

3. **System Saver Mac** not only gets your power under control, it keeps your Mac or Mac Plus cool. Two protected outlets, a replacement power cord, a quiet fan, and a choice of 1 or 2 switches. \$99.95

For more information, call (800) 535-4242. In NY, call (212) 475-5200. Or write Kensington, 251 Park Ave. S., New York, NY 10010.



See Us at Macworld Expo,
Bayside #1636

KENSINGTON™ 

© 1988 Kensington Microware Ltd.

Circle 11 on reader service card