Special Insert–PUBLISH! Magazine

PC WORLD

July 1986 $2.95
Canada & Foreign $3.95

The Comprehensive Guide to IBM Personal Computers and Compatibles

Desktop Publishing Comes to the PC

First Impressions– PageMaker and Ventura Publisher

Step-by-Step Guide to PC Typesetting

Accurate Financial Forecasts With Macro-Track

Laser Printing Under $2000

1+1=3

PC Slave II™

The Ultimate Two-User IBM PC® Card

One IBM PC, XT/AT or compatible, plus one Advanced Digital PC-Slave II, now equals a complete 3-user (or more) system.

Do you need a true multi-user PC system?

If so, read on. The Advanced Digital solution will simply add up in your favor.

To add two or more users to your IBM PC, XT/AT or compatible, just plug in our PC-SLAVE II and two low-cost monochrome monitors and keyboards. You can now run PC-DOS™ or MS-DOS™ on each user with PC-NET™ software to support your network. The end result is a true multi-processor system that allows each user to run independently on their own CPU and memory, yet sharing a common data base.

Do you need networking capabilities?

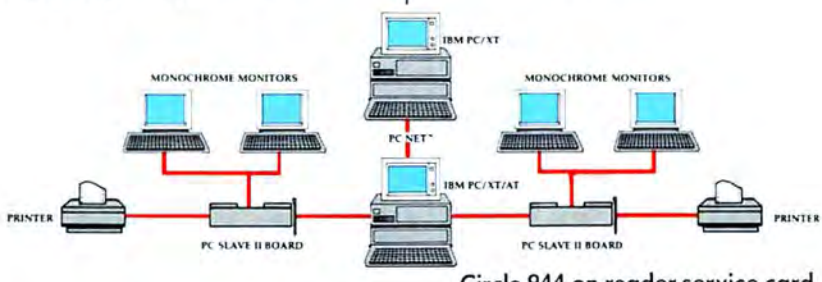
The realm of IBM networks is only a step away with the PC-Slave II and PC-NET software. An expanding network of multi-user PC's is truly cost-effective since you will be sharing data and communication between users and PCs. File and record locking are also provided so each user can run independently of others while still tied through the network.

Do you need additional users?

Expand your existing supply of PC standalones into multi-user systems by simply adding more PC-Slave II's.

The PC-Slave II features two Intel 80188 CPU's @8Mhz, two 512Kb RAM per CPU and two monochrome/keyboard controllers all on a single board.

MS-DOS is a registered trademark of Microsoft
PC-DOS, PC-NET are registered trademarks of IBM Corporation
PC-Slave II is a registered trademark of Advanced Digital Corporation



To learn more about the multi-user solution contact:

ADVANCED DIGITAL CORPORATION
5432 Production Drive
Huntington Beach, CA 92649
(714) 891-4004 (800) 251-1801
Telex 183210 ADVANCED HTBH

ADVANCED DIGITAL U.K. LTD.
27 Princes Street, Hanover Square
London W1R8NQ-United Kingdom
(01) 409-0077 (01) 409-3351
TLX 265840 FINEST

ADVANCED DIGITAL CORPORATION

Circle 944 on reader service card.

KAMERMAN LABS AT-PLUS-1800™

4 BORLAND™ products included, 20 Mbyte fixed disk, 1.2 Mbyte floppy

$1999.*

The IBM AT™ is 100% compatible with the Kamerman Labs AT in every way but one . . . THE PRICE!

Kamerman Labs delivers the power of an IBM AT at a third the price. For $1999, Kamerman Labs' new AT gives you:

- 16 bit 80286 System Unit
- 1 Mbyte 8 MHz motherboard, 1 Mbyte on board
- 20 Mbyte fixed disk and card
- 1.2 Mbyte floppy drive and card
- 192 watt power supply
- AT style keyboard

And that's not all. This high performance, expandable, state-of-the-art system runs all major software written for the IBM AT without modifications and comes with Kamerman Labs 1 year parts and 90 day labor limited warranty.

There's more. The Kamerman Labs AT comes with a "bundle" never seen before. Right inside our package will be Borland International's REFLEX—The Analyst, TURBO LIGHTNING, TURBO PASCAL and SUPER KEY. Once again, Kamerman Labs delivers the Quality and Value that you expect.

Reflex—The Analyst,™ Turbo Lightning,™ Turbo Pascal™ and Super Key™ INCLUDED

Hard to believe? Kamerman Labs has achieved a nation-wide reputation for quality computing equipment at factory direct prices. We build each system with fine quality components purchased throughout the world—then we sell it direct to you. No middle man! No additional markups! And, we stand behind every product we build.

Call us. Ask for more information about the Kamerman Labs AT and XT, and our full line of mass storage systems (hard disks and tapes) and PC compatible peripherals. And, while you're at it, ask us about our 48 hour factory direct service.

TO ORDER CALL: 800-522-2237
In Oregon and Alaska, call 503-626-6877
Dealer and OEM queries welcome.

Kamerman Labs

7861 SW Cirrus Drive, Beaverton, OR 97005
(503) 626-6877 Telex 501 886

©1986 Kamerman Labs, Inc.

Some quantities may be limited. We reserve the right to substitute equivalent items. All prices are subject to change without notice.
Add 3% for credit card purchases. IBM AT is a registered trademark of International Business Machines.
Kamerman Labs AT is a trademark of Kamerman Labs, Inc. Reflex, Turbo Lightning, Turbo Pascal, and Superkey are trademarks of Borland International.
*Monitor not included.

Circle 683 on reader service card

PC WORLD

The Comprehensive Guide to IBM Personal Computers and Compatibles
July 1986

170 **Typesetting Point by Point**

You're handy with a word processor, but can you kern type? Do you know the difference between indents and quads? This primer acquaints you with typesetting basics.

244 **Taking a Page From the Pros**

PageMaker and *Ventura Publisher* promise to bring page makeup power to the PC. Our first report on these two pivotal products examines how they take advantage of that environment to integrate simple design and layout principles with electronic pasteup.

252 **From Soft Fonts to Hard Copy**

A variety of fonts can make all the difference with personal computer publishing on a laser printer. Downloading disk-based fonts to your LaserJet Plus can expand your printer's repertoire and bring cost savings as well.

Getting Started

170 Typesetting Point by Point, *James Felici and Ted Nace*

182 Personal Publishing in Black and White, *Eric Knorr and Robert Luhn*
Personal computer publishing involves more than hooking up a laser printer to your PC. To do the job right you must master the concepts and the programs. *PC World* explores and explains the PC publishing continuum.

Community

190 Corporate Publishing Takes Off, *Barbara Robertson*
The PC already plays a crucial role as a growing number of companies look to cut their in-house publishing costs.

Review

202 MagnaType: The Personal Typographer, *James Felici and Walter Omstead*
On the cutting edge of personal computer publishing, MagnaType turns your PC into a powerful front end for a phototypesetter.

210 The Scenic Route, *Jim Heid*
ScenicWriter takes a tough, command-driven path toward document-length publishing on a laser printer, but the rewards make up for the rough ride.

218 KISSes $2000, *Bill Crider*
Low cost and the ability to run software written for Epson, Diablo, and Qume printers make the QMS KISS a viable entry-level laser printer.

222 Plotting the Big Picture, *John B. Gordon*
Any business depends on the health of the overall economy. *Macro-Track* gives econometrics firms a run for their money with surprisingly sharp projections for the leading economic indicators.

230 For Services Rendered, *Clifford Clouse and David Sandhaus*
For professionals who need to watch the clock, *TimeLog, TBR,* and *The Client Management System* make good time.

State of the Art

244 Taking a Page From the Pros, *Danny Goodman*

Hands On

252 From Soft Fonts to Hard Copy, *Peter Neuhaus*

260 Painless Extraction, *Wayne Rash*
Pouring a little mainframe data into *1-2-3* once required a master's degree in patience. With *Infogate,* you can have your data without resorting to novocaine.

Cover: Screen image prepared with help from Ventura Software, Inc.; illustration by Mark Schroeder.

Departments

13 David Bunnell

35 Letters

61 REMark, *Jonathan Seybold*

78 PC World View, *Edited by Ken Greenberg*

90 From the Software Shelf, *Edited by Robert Luhn*

137 From the Hardware Shelf, *Edited by Eric Knorr*

271 Password: Communicate, *Edited by Eric Brown*

291 The Help Screen, *Karl Koessel*

315 *.*, *Edited by Steven Cook*

345 Kevin Strehlo

Index

358 Advertisers

PC World Directory

362 A classified guide to products and services

134 This special insert offers a practical, in-depth guide to desktop publishing.

PC WORLD

July 1986
Volume 4, Number 7

David Bunnell
Publisher

J. Kelley Younger
Executive Editor

Harry Miller
Editor

Jacqueline Poitier
Associate Publisher/Art & Design

Editorial
Managing Editor: Jon Stewart
Senior Editor: Ken Greenberg
Associate Editors: Eric Brown, Eric Knorr, Robert Luhn, Randall Sutherland
Editorial Mgr.: Cynthia Hamburger
Senior Copy Editor: Tema Goodwin
Technical Editor: Karl Koessel
Product Review Editor: Christine Whyte
Assistant Editor: Christine McGeever
Copy Editors: Barbara Lewis, Bonnie Monte, Peggy Nauts
Editorial Assistant: Wesley Nihei
Editorial Secretary: Lori Bragg
Assistant to the Executive Editor: Gina Vanlue
Contributing Editors: Burton L. Alperson, Stephen A. Blumenthal, Steven Cook, Bill Crider, Eddie Currie, Danny Goodman, Jeremy Joan Hewes, Janette Martin, Reed McManus, Ted Nace, Art Wilcox, Andrew T. Williams

Art
Art Director: Eleanor Leishman
Associate Designer: Monica Ames
Art Associate: Donna Sharee
Design Associates: Barbara Adamson, Laura Stoll
Design Consultant: Spiegelman Design Associates

Production
Production Director: Herbert Linden
Senior Production Mgrs.: Frances Mann, Lee R. Trevino
Editorial Production Mgr.: Ellyn L. Hament
Production Editor: James Felici
Ad Traffic Coordinator: Jayne Boyer
Telecommunicators: Mark L. Duran, Susan M. Ford, Virginia Weir
Display Advertising Supervisor: MaryAnn DePietro
Advertising Billing Coordinator: Hollis Brush
Production Assistant: Otto Waldorf

Advertising Sales & Marketing
Associate Publisher/Director: James E. Martin
Northwest: Margaret O'Reilly *(Western Mgr.)* (415/861-3861)
Northern California (San Francisco): Sharon Van Leuven (415/861-3861)
Northern California (San Jose): Richard Arzaga (415/861-3861)
Southern California (Los Angeles): Susan Curtis *(Southwestern Mgr.)* (213/201-5900)
Southwest: Joanne Gillis (213/201-5900)
New England (Boston): Larry Hilderbrand *(Eastern Mgr.)* (617/879-0700)
Midwest (Chicago): Jeff Edman *(Midwestern Mgr.)* (312/827-4477)
Northeast (New York): Helaine Koffler (201/967-1350)
Mid-Atlantic (Philadelphia): P. J. Boatwright (215/925-1063)
Southeast (Atlanta): Judy Sutter (404/394-0758)
Action Ads/Directory Sales: Carol Watson
Advertising Services Mgr.: Ray Petsche
Assistant to the Director: Loretta Giglione

Circulation
Director of Circulation: Penny Ertelt
Circulation Subscription Mgr.: Gail Egbert
Single Copy Sales Mgr.: George Clark
Newsstand Mgr.: William B. Cox
Fulfillment Coordinator: Phil Semler
Promotions Coordinator: Doug Norde

Research
Associate Publisher: Cheryl Woodard
Research Mgr.: Gary L. Rocchio
Research Analyst: Ralph Ames
Administrative Assistant: Steven York

Corporate Development
Manager: Karen Wickre
Special Projects: Jeffrey S. Glines
Administrative Assistant: Gloria C. Sundin

Communications
Manager: Noreen A. Browning

Administration
Director: Janet D. McGinnis
Accounting Mgr.: Pat Murphy
Facilities Mgr.: Joseph Wollenweber
Personnel: Shelly Ginenthal
Technical Mgr.: Nancy Canning
Assistant to the President: Christina W. Spence

Corporate
PC World Communications, Inc.

David Bunnell
Chairman

Bartlett R. Rhoades
President & CEO

Herbert Linden
Vice President

James E. Martin
Vice President

Jacqueline Poitier
Vice President

Cheryl Woodard
Vice President

Andrew Fluegelman
1943-1985
Founding Editor

PC World™ (ISSN 0737-8939) is published monthly at $29.90 for one year (12 issues), $53.90 for two years (24 issues), $74.90 for three years (36 issues) by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $12 per year for Canada and Mexico; add $25 per year for surface mail or $110 per year for airmail for all other countries. For subscriber service questions call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 55029, Boulder, CO 80322-5029. To place new orders call 800/628-2900 (in Nebraska 402/895-7284). Second-class postage paid at San Francisco. POSTMASTER: Send address changes to PC World, Subscription Dept., P.O. Box 55029, Boulder, CO 80323-5029. Editorial and business offices: 555 De Haro St., San Francisco, CA 94107, 415/861-3861. CompuServe 74055,412 The Source STE908

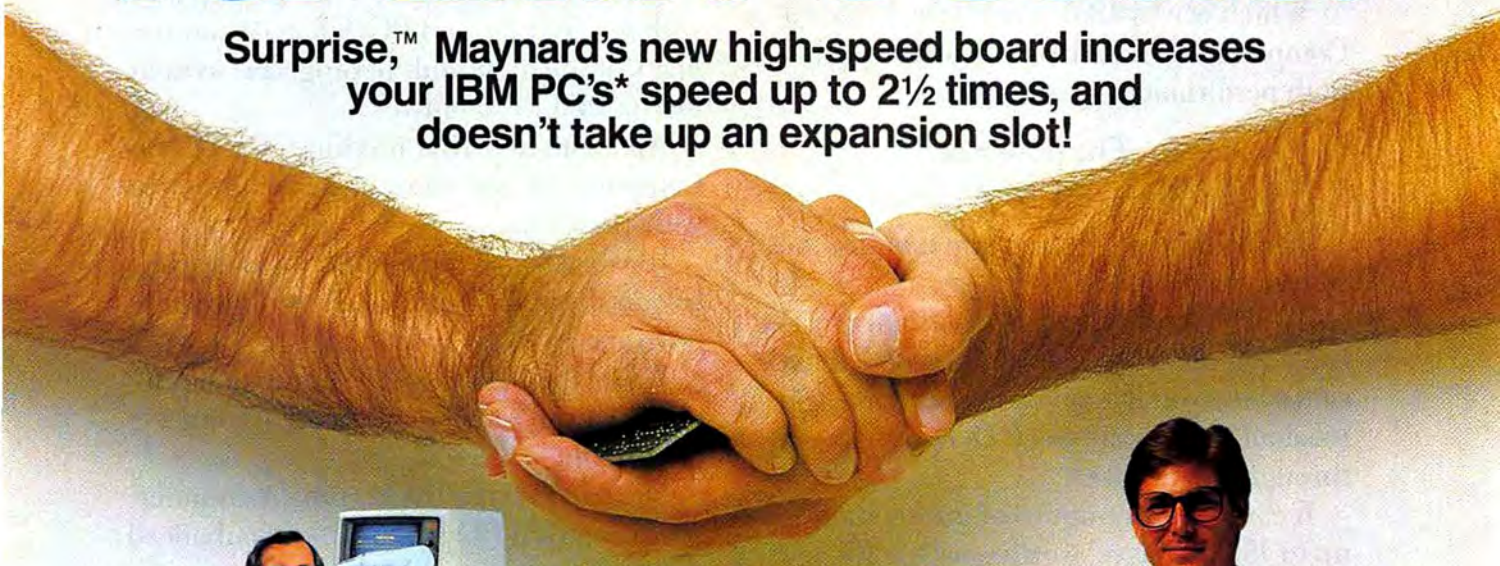
PC World™ is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. Copyright © 1986, PC World Communications, Inc. All rights reserved. The following are trademarks of PC World Communications, Inc.: PC World View, *.*, PC World.

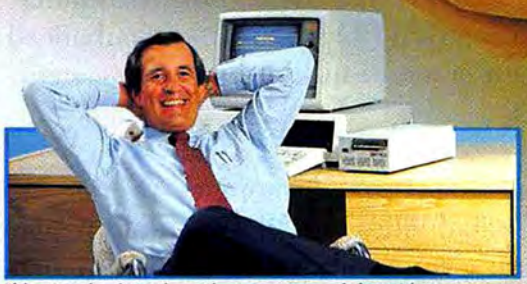
PC World™ is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the group include Argentina: *Computerworld/Argentina;* Asia: *Asian Computerworld;* Australia: *Computerworld Australia, Australian PC World, Macworld;* Brazil: *DataNews, PC Mundo;* China: *China Computerworld, China Computerworld Monthly;* Denmark: *Computerworld/Danmark, PC World, Run* (Commodore); Finland: *Mikro;* France: *Le Monde Informatique, Golden* (Apple), *OPC* (IBM), *Theoreme, Distributique;* Germany: *Computerwoche, Infowelt, PC Welt, Computer Business, Run;* Italy: *Computerworld Italia, PC Magazine;* Japan: *Computerworld Japan;* Mexico: *Computerworld/Mexico;* Netherlands: *Computerworld Netherlands, PC World;* Norway: *Computerworld Norge, PC Mikrodata;* Spain: *Computerworld/España, PC World, Commodore World;* Sweden: *ComputerSweden, Mikro-Datorn, Svenska PC World;* United Kingdom: *Computer News, PC Business World, Computer Business;* Venezuela: *Computerworld Venezuela;* United States: *Amiga World, Computerworld, inCider, InfoWorld, Macworld, Micro Marketworld, PC World, Run, 73 Magazine, 80 Micro, Focus Publications, On Communications.*

A PUBLICATION OF CW COMMUNICATIONS BPA

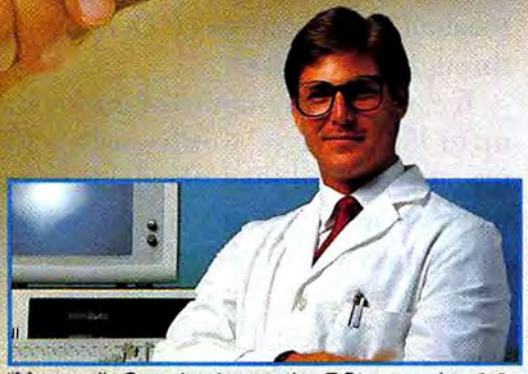
Maynard Has A Little Surprise For IBM PC Users.

Surprise,™ Maynard's new high-speed board increases your IBM PC's* speed up to 2½ times, and doesn't take up an expansion slot!





"I just calculated my Lotus spreadsheet in a fraction of the time it used to take! Maynard's new Surprise is fast!"



"Maynard's Surprise jumps the PC's speed to 2.6 on the Norton SI scale! That's over 2½ times its normal speed!"

"I installed Maynard's Surprise even though I didn't have any expansion slots left! Was I surprised! Now my PC's faster than ever!"

just **$249!** suggested retail price

- increases PC speed up to 2½ times!
- doesn't use an expansion slot!
- installs in seconds!
- works with the IBM PC and XT, Compaq, and NCR Model 4*!
- surprisingly low cost!

Available at the finest computer stores.

*IBM PC and XT are trademarks of International Business Machines. Compaq is a trademark of Compaq Computer Corporation. NCR is a trademark of NCR Corporation. Prices for Compaq and NCR Model 4 are slightly higher.

Maynard Electronics

Shaping tomorrow's technology.

460 E. Semoran Blvd., Casselberry, FL 32707 305/331-6402

Circle 98 on reader service card

The personal computer that continues to raise high performance to new heights.

If you work with high volumes of information, you need answers fast.

Which is why IBM created the Personal Computer AT.® The PC designed to push high performance even higher.

The power of Advanced Technology.

Turn on the power, and you'll notice the advances right away.

To begin with, the Personal Computer AT can compute with astonishing speed. That's something you'll appreciate every time you recalculate a spreadsheet. Or search through a data base.

It can store mountains of information—up to 15,000 pages' worth—with a 30-megabyte "hard file" (fixed disk). And when business gets bigger, you can double your capacity to 60MB with a *second* hard file.

Advanced Technology advances again.

Fast as it is, new models of the Personal Computer AT run up to 33% faster.

Plus, you can now select an enhanced keyboard. It has separate cursor keys, a separate numeric keypad (for easier data entry) and twelve function keys. It also has a main typing section patterned after the classic IBM Selectric® keyboard, which makes word processing easier than ever.

In addition, you can also choose a new option that lets you use 3.5-inch diskettes with your Personal Computer AT.

Family ties.

The Personal Computer AT is compatible with the IBM PC and PC/XT. So it can run many of the thousands of programs written for the IBM PC family.

And with new IBM products, the Personal Computer AT can more easily communicate with other PCs.

IBM's networking options, for example, let you share files from a variety of popular programs.

While the IBM PC 3270 Emulation programs let you retrieve information from a mainframe.

You can also use the Personal Computer AT to run IBM PC XENIX® —an enhanced multi-user, multi-tasking operating system.

A powerful value.

Only the Personal computer AT offers these capabilities *and* IBM's commitment to quality, service and support. A combination that can't be cloned.

Better still, you'll find that the new models offer higher performance without a higher price. And if you qualify, you can conveniently charge your Personal Computer AT on IBM's Credit Card. Or lease one with the IBM Commercial Lease Agreement.

See the Personal Computer AT at an Authorized IBM PC Dealer. Or call your IBM marketing representative.

For the name of a store near you, call 1-800-447-4700. In Alaska, call 1-800-447-0890.

The IBM Personal Computer AT, for Advanced Technology.

Little Tramp character licensed by Bubbles Inc., s.a.
IBM, PC/XT and Personal Computer AT are trademarks of International Business Machines Corporation.
XENIX® is a registered trademark of Microsoft Corporation. Based on System V.

IBM®

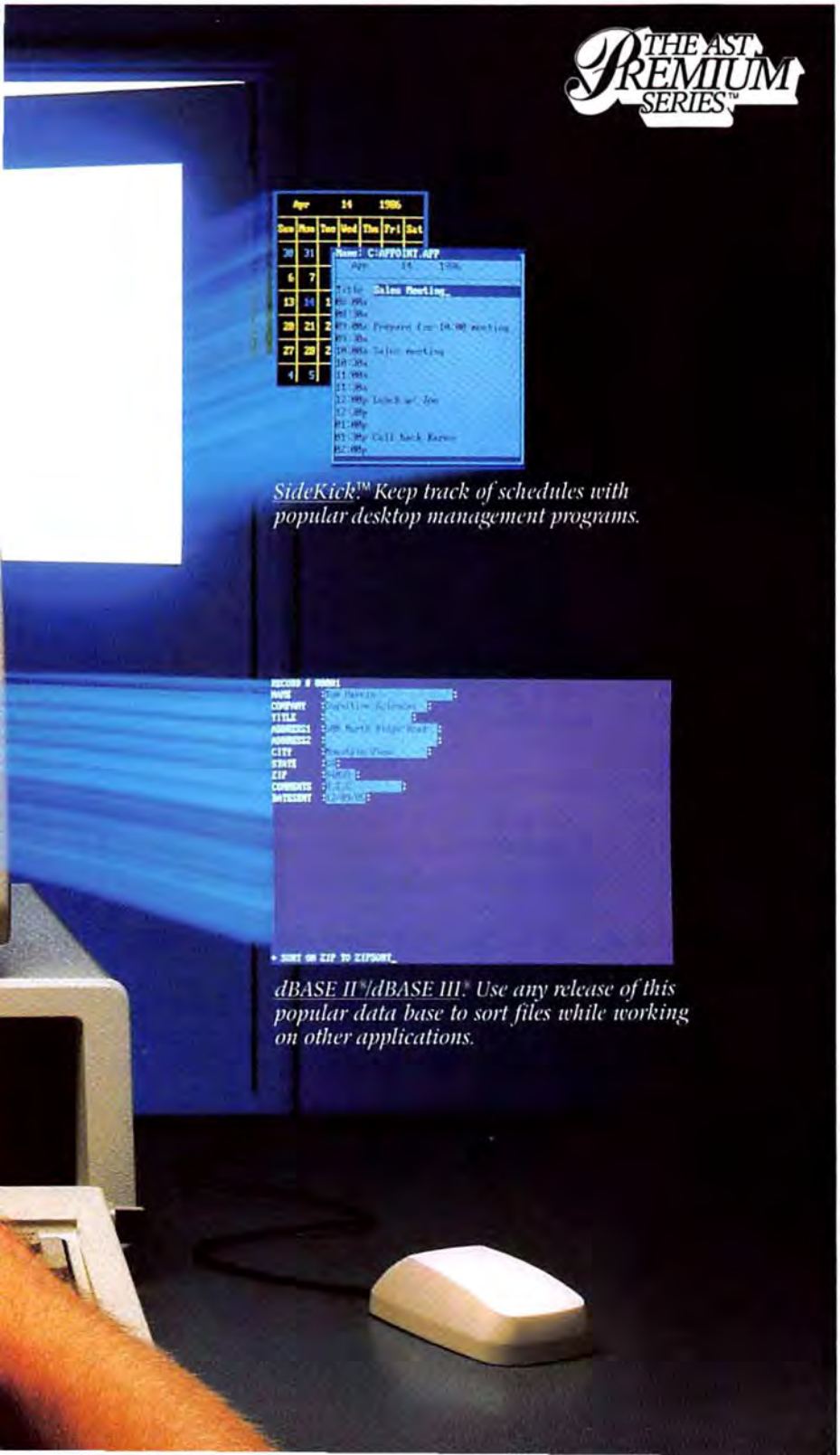
©Copyright IBM Corporation 1986

Introducing Six Finally, Performance

SixPakPremium and SuperPak trademarks of AST Research, Inc. IBM registered trademark of International Business Machines Corp. Lotus 1-2-3 registered trademark of Lotus Development Corp. DESQview trademark of Quarterdeck Office Systems. WordStar registered trademark of MicroPro International Corp. dBASE II and dBASE III registered trademarks of Ashton-Tate. Dow Jones registered trademark of Dow Jones & Company Inc. SideKick trademark of Borland International. Copyright © AST Research Inc. 1986. All rights reserved.

PakPremium.™ Exceeds Demand.

Also Compatible With Original IBM® PCs & XTs



SideKick.™ Keep track of schedules with popular desktop management programs.

dBASE II®/dBASE III.® Use any release of this popular data base to sort files while working on other applications.

SixPakPremium, the new generation multifunction board designed for new generation IBM XTs, is here! Now one person and one PC have the power to meet the demands of business. AST's newest solution for new XTs, existing PCs, XTs and compatibles, SixPakPremium offers all the popular multifunction features plus two megabytes of expanded memory and the powerful software to use it.

Premium Performance. Now, run up to nine applications simultaneously. Sort a data base, write a letter, calculate a spreadsheet, monitor stock quotations and print labels…all at the same time…on the same PC! And, our windows let you view applications instantly.

SixPakPremium is fully compatible with all current PC applications, including expanded memory applications such as Lotus 1-2-3 Release 2.0. And DESQview, our multitasking/windowing environment is compatible with more than 200 of the most popular packages.

Premium Features. SixPakPremium offers up to two megabytes of expanded memory, two serial ports, parallel port, game port, battery-backed clock/calendar, DESQview and SuperPak™ utilities.

Premium Quality. As the leader in PC enhancement, with over a million products shipped, AST is known worldwide for its highly reliable products.

Make The Premium Choice. For performance that exceeds demand, call our Customer Information Center **(714) 863-1333.** Or send the coupon to AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714.

AST RESEARCH INC.

Yes, I want to learn more about Premium Performance. Please send me your special SixPakPremium information package today!

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone ( ) _____

PRINTERS' PROGRESS.

For what you
used to pay for
a 9-pin printer

now, you can buy
our fully-featured
24-pin printer.

Our new Pinwriter™ P6, P7 series dot matrix printers are the first 24-pin printers that list for as little as $699. Or about what you would have paid for an ordinary 9-pin printer a year ago.

Now, that's progress. Especially when you consider our new printers have an advanced 24-pin printhead. And print data at 216 characters per second and crisp, dense letter-quality at up to 65 cps.

Actually these new Pinwriter dot matrix printers surpass every other printer in their price range. In their combination of speed, graphics resolution, the number of built-in fonts and low noise level.

None of which will surprise you if you know NEC printers. Because nobody does more with 24-pin technology than NEC. In fact, we now have more 24-pin printer models than any other manufacturer.

So if you're looking for a printer that will do more and do it better, just progress to your NEC dealer and you'll get it for less than you imagined.

You can see the Pinwriter P6, P7 and our other 24-pin printers at your local dealer. For more information, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

NEC Information Systems, Inc.

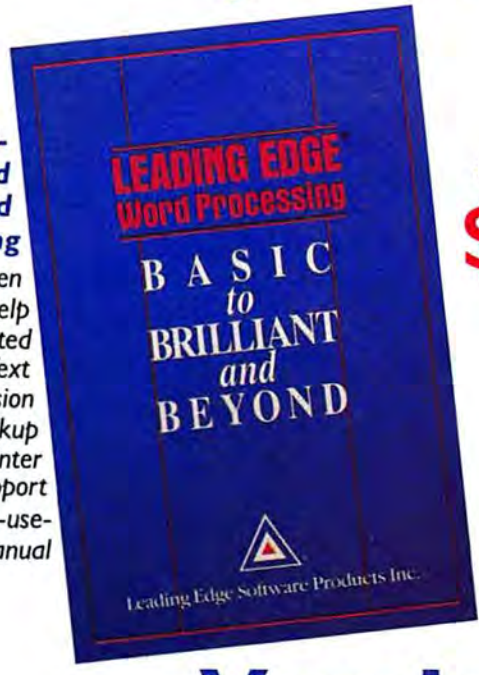
C&C Computers and Communications

© 1986 NEC Corp.

Circle 124 on reader service card

Our Software Isn't Cheap. Just Inexpensive.

Full-featured word processing
- Split Screen
- On-line Help
- Restore Deleted Text
- File Conversion
- Automatic Backup
- Extensive Printer Support
- Easy-to-use-manual



IBM-Compatible

$99.00 Together

Professional-level Spreadsheet
- Reads and Writes 1-2-3® files directly
- 255 by 8192 Worksheet Area
- 15 Types of Graphs
- 2 and 3 Dimensional Graphs
- No Copy Protection

Very Inexpensive.

Even though you can buy both Leading Edge® Word Processing and the Twin™ Spreadsheet for a total of $99, it's not cheap software.

If you don't believe it, read the PC Magazine in which Leading Edge Word Processing was named "Editor's Choice." After that, ask an experienced spreadsheet user if he or she can tell the difference between the Twin™ and Lotus 1-2-3®— which retails at $495.

And if you still don't believe that the only thing cheap about our software is its price, then pick up the phone and place an order. Our software speaks best for itself.

But do it before you consider any other software. You can't afford not to.

Call 1-800-343-3436 for a dealer near you or to order direct.
In MA call (617) 449-4655.

Call Today Hours: Sunday 1PM-6PM, Monday-Saturday 9AM-8PM

Leading Edge Software Products, Inc.
21 Highland Circle Needham Heights MA 02194
1-800-343-3436 in MA (617) 449-4655

☐ **Yes! I'll take a Very Inexpensive Deal! Please rush me ____ sets of Leading Edge Word Processing and the TWIN** **NAG-7**

Name _____
Address _____
City _____
State _____ Zip _____
Telephone _____
System Requirements: IBM PC, XT, AT and Compatibles 256K RAM (LEWP) 384K RAM (TWIN) PC DOS 2.0 or greater. Graphics card optional

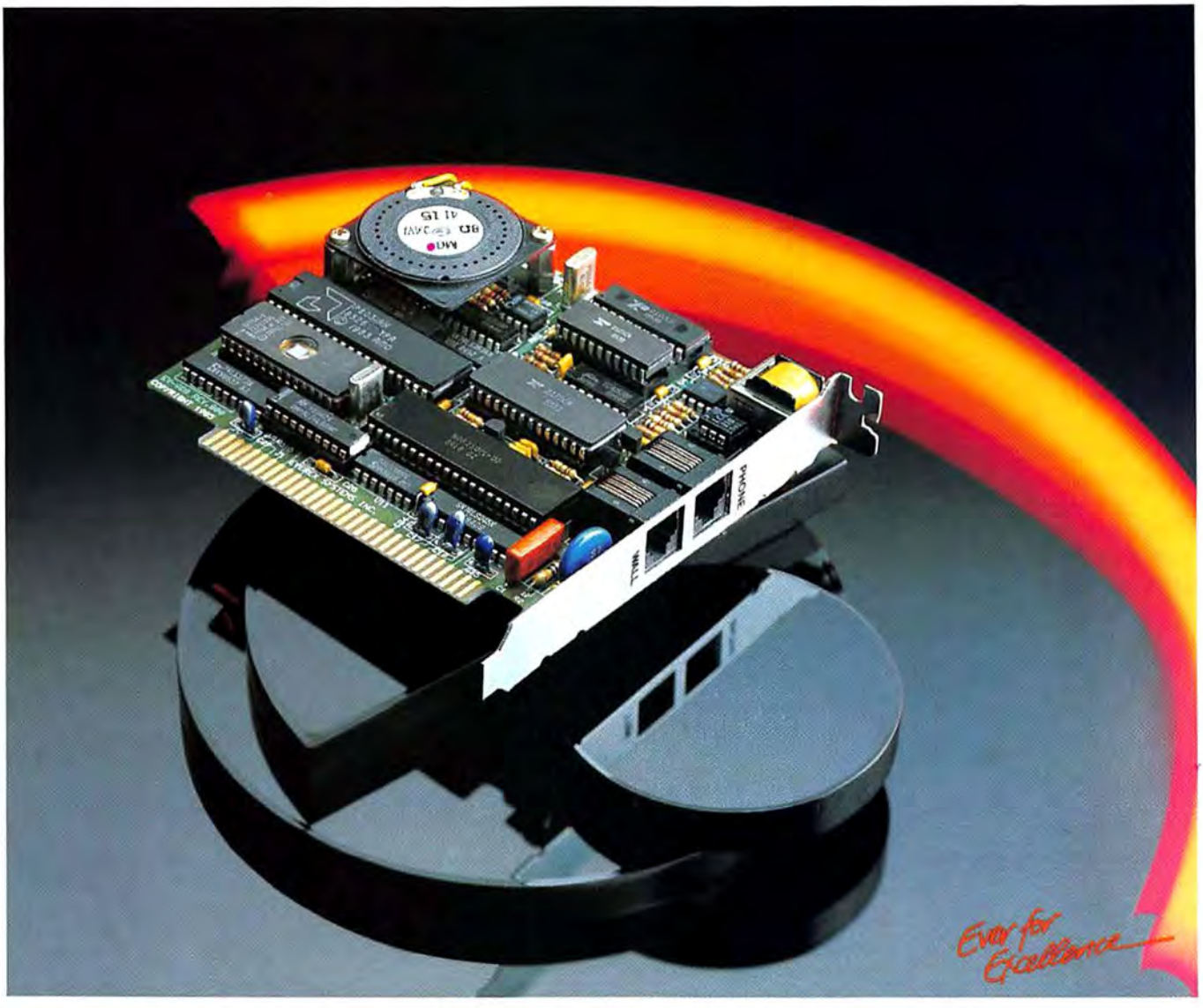
Price Includes Shipping to all U.S. Cities

$99.00 together

Subtotal _____
Mass. Residents Add 5% _____
Amount Enclosed _____
Circle Payment: Money Order

© Leading Edge 1986. Leading Edge is a registered trademark of Leading Edge Products. Twin is a trademark of Mosaic Software, Inc. Lotus 1-2-3 is a registered trademark of Lotus Development Corp.

Circle 593 on reader service card



Evercom™... 1200 baud, $249

Now the EVEREX Evercom modem is available on a half-size card, perfect for the short slots in the IBM XT, Portable, and many compatibles. EVEREX has combined innovative engineering and technology to produce a quality Hayes-compatible 1200 baud modem that out performs the competition at a lower price. EVEREX engineering is the key ingredient that delivers QUALITY and FEATURES without sacrificing PRICE.

Before you buy a modem, check these features:

	EVEREX EVERCOM	HAYES NEW 1200B
• Automatic dialing, answering, and redialing	***YES***	YES
• Half-size card	***YES***	YES
• Call progress monitoring	***YES***	YES
• Works in short slot of XT and PC Jr.	***YES***	NO
• Automatic data-to-voice transition	***YES***	NO
• Reports serial port speed mismatch	***YES***	NO
• Detects receiver off-hook	***YES***	NO
• Configurable from COM1 - COM4	***YES***	NO
• Supports 132 columns	***YES***	NO
• Communications software included	***YES***	$80 extra
• ***List Price***	***$249***	$489

Demonstration -- FREE Brochure

Remember, before you buy a modem, check the features, check the price, and then call EVEREX to set up a demonstration at your local dealer.

When you call, we will also send you the total solution brochure describing EVEREX's complete line of IBM microcomputer peripherals.

1-800-821-0806
in California
1-800-821-0807

EVEREX
EVER for EXcellence

48431 Milmont Dr. Fremont CA 94539
(415) 498-1111

Evercom is a trademark of Everex Systems, Inc. IBM PC and XT are registered trademarks of International Business Machines Corp. Hayes 1200B is a trademark of Hayes Microcomputer Products Inc.

Circle 699 on reader service card

David Bunnell

On the PC Fault Line

As pressure mounts on software publishers to offer more product support, the danger of aftershocks threatens to topple those programs with the weakest foundations.

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

"Unnecessarily unfriendly."

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

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

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

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

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

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

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

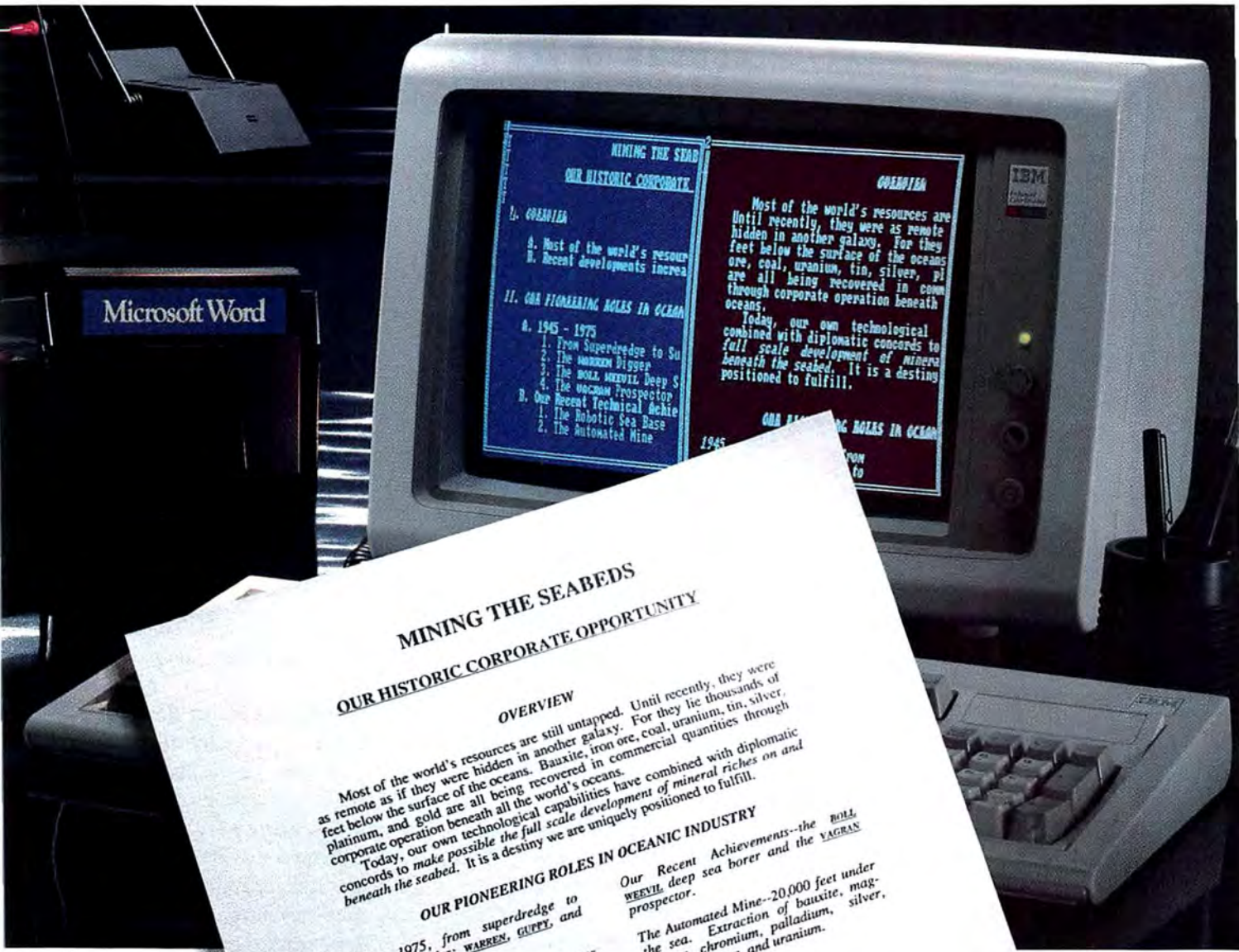
My contention is that the software industry puts a lot of obstacles in the way—especially for beginners. As software grows in complexity, many people become so discouraged that they never grasp the full capability of the programs they have.

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

The problems relate to some of the issues our survey identifies—poor documentation, lack of telephone help lines, lack of knowledgeable support staff on existing

(continues)

The output was



MINING THE SEABEDS

OUR HISTORIC CORPORATE OPPORTUNITY

OVERVIEW

Most of the world's resources are still untapped. Until recently, they were as remote as if they were hidden in another galaxy. For they lie thousands of feet below the surface of the oceans. Bauxite, iron ore, coal, uranium, tin, silver, platinum, and gold are all being recovered in commercial quantities through corporate operation beneath all the world's oceans.

Today, our own technological capabilities have combined with diplomatic concords to *make possible the full scale development of mineral riches on and beneath the seabed.* It is a destiny we are uniquely positioned to fulfill.

OUR PIONEERING ROLES IN OCEANIC INDUSTRY

1945 - 1975, *from superdredge to supersubmersibles:* WARREN, GUPPY, *and* STARFISH.

Our Recent Achievements--the BOLL WEEVIL *deep sea borer and the* VAGRAN *prospector.*

The Robotic Sea Base!--placed in areas of richest potential. Directed from the surface, the bases make practical and efficient long-term, far-reaching explorations.

The Automated Mine--20,000 feet under the sea. Extraction of bauxite, magnesium, chromium, palladium, silver, gold, platinum, and uranium.

TIMETABLE: PROFILE OF A THIRTY-YEAR MISSION

A commercially profitable prototype can be operational by 1989. The beginnings of a network of producing mines in every ocean by the second decade of the 21st Century is not an unreasonable expectation. Below is an estimate of the expenditures necessary to start us toward this goal over the next four years.

PROTOTYPE EXPENDITURES THROUGH 1989

YEAR	MATERIALS	MANPOWER
1986	$1.2 billion	$1.7 million
1987	$2.2 billion	$1.4 million
1988	$2.7 billion	$2.3 million
1989	$4.6 billion	$6.5 million
Totals	$10.7 billion	$11.9 million

...ace internal memorandum #23ERDI, for technical details.

never in doubt.

If what you see on the screen bears a striking resemblance to what you see beside it, that is no coincidence.

Because accelerating your ideas to a superbly printed page is the essential talent of our latest program, Microsoft® Word Release 3.

Microsoft Word 3 gives you a way to create professional-quality documents with speed and efficiency you may not have imagined possible on a PC. Or by any other means.

You'll look organized because you were.

Microsoft Word encourages you to marshal your thoughts right up front. With our exclusive built-in outlining program.

List all the elements of your argument in headings. Juggle the order of headings and their level of priority.

In Word, the outline and the document it frames are linked. You can jump back and forth between the outline and your work. Collapse long manuscripts down to manageable main elements. And restructure your piece by simply moving the headings.

Printers go to the limit for Word.

With Microsoft Word you can create at your desk the kind of documents not usually seen outside of a print shop.

Tap the stunning capabilities locked inside the latest printers. Particularly laser printers with their abundant varieties of **fonts**, type sizes and special printing effects.

And what Word promises on the screen is what it prints. Underlines, **boldfaces**, *italics*, ~~strikethroughs~~, superscripts^{xyz} subscripts$_{xyz}$ and more are all displayed as they'll appear.

A review of our stunning reviews.

Microsoft Word 3 is the most advanced version of a program which, since its introduction, has enjoyed extraordinary acclaim.

PC World picked its predecessor, Word 2.0 for its Pacesetters for '86 awards. And praised our product as "One full-featured giant (that) stands out from the crowd... the most influential product of the year."

Meanwhile, Peter Norton wrote in PC Magazine, "Microsoft's way of handling WYSIWYG [What You See Is What You Get] makes it the ultimate in word processing."

An answer for everything.

If you've ever drawn up a wish list for the ultimate word processor, put it next to our list of other Word features:

An index and table of contents generator. Five math functions. Sorting in columns, numerically or alphabetically, up or down.

Time savers include Word style sheets, glossaries and "windowing." Fully supports over 100 different printers. The ability to print paragraphs side-by-side in parallel format, or in newspaper-style "snaking" columns. And a special version of Word for Local Area Networks.

Whatever it is you need to say, when you want to make an impressive display on the printed page, the means are within easy reach.

With Microsoft Word 3.

A timely incentive to check out Microsoft Word 3.

See a demo of Microsoft Word 3 at your Microsoft dealer and you'll be rewarded with The Computer Desk Reference & Appointment Calendar.

The Desk Reference is leather-bound and crammed full of general information along with data of special interest to computer users. It's available to you right now through your dealer. For the name of the nearest one, call (800) 426-9400. In Washington State and Alaska, (206) 882-8088. In Canada, call (416) 673-7638.

Introducing Microsoft® Word 3

The High Performance Software.™

To receive your free copy of The Computer Desk Reference & Appointment Calendar from Microsoft, attach one of your dealer's business cards to this validated coupon and send to: Microsoft Word Calendar Offer
13221 S.E. 26th Street, Suite L
Bellevue, WA 98005

PWA

Name/Title_____
Company_____
Address (no P.O. Boxes)_____
City_____ State_____ Zip_____
Phone Number (_____) _____ Date of Demonstration_____
Dealer Signature_____
Dealer Name_____ Location_____

Allow 6-8 weeks for delivery. This offer expires 8/31/86. Offer good only in U.S.A. This offer is good only in conjunction with demonstrations of Microsoft Word 3.0 for the IBM® PC and compatibles.

Microsoft is a registered trademark and The High Performance Software is a trademark of Microsoft Corporation.

ANTHROCART.™

MOBILE...

A key reason why people like the AnthroCart. Share your hardware. Move it around. Take it room to room or floor to floor.

AnthroCart. High-tech furniture for high-tech equipment. Space saver. Compact. Rugged.

The AnthroCart is designed to move. Designed so your workspace is as slick as your hardware.

Call us: 800-325-3841

Supports up to 150 lbs.
All steel frame construction
5½ square foot footprint

ANTHRO

Anthro Corporation
Technology Furniture
3221 NW Yeon St.
Portland, OR 97210

Anthro Corporation is a wholly owned subsidiary of Tektronix, Inc. Anthro is a registered trademark of Anthro Corporation.

Circle 953 on reader service card

help lines, lack of money-back warranties, and lack of adequate demo software so a customer can try a program out before buying it.

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

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

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

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

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

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

(continues)

Orchid's TurboEGA™

The world's *fastest* EGA

FREE MS WINDOWS™

Introducing the only Enhanced Graphics Adapter with PCturbo™ speed.

The experts agree: the EGA is the breathtaking new graphics standard, but the sophisticated software written for it places a big burden on the PC's processing speed. Beautiful graphics, crisp text, but t o o s l o w .

Everyone else rushed their EGAs to the market, but Orchid Technology took the time to do it right. Orchid's TurboEGA™, from the *inventors* of PC TurboProcessing, packs a high-speed Turbo and an EGA into one slot, for the world's fastest EGA.

Graphics with Speed

TurboEGA makes IBM PCs and XTs run faster than an AT. It brings dazzling speed to sluggish graphics programs. *All* types of software run faster, so you finish more quickly. Transparent to the user, you won't know it's there *until you see its speed.*

We are so confident that our TurboEGA is the ultimate graphics card that we decided to give away a *free* copy of Microsoft's Windows™ with each TurboEGA*. Even Microsoft recommends that you run Windows on an AT. Now Orchid's TurboEGA gives you AT speed so XT users can use this number one windowing software at the speed they demand.

The Complete Solution

Only Orchid puts this much performance into one slot *and* comes fully loaded with 256K of RAM, so there's no hidden cost. TurboEGA is the *complete* graphics solution.

Pick up the phone and find out how you can have the EGA the competition wishes *they* had: Orchid's TurboEGA, the world's fastest.

If you have an AT or a system with 80286 speed, ask about the Orchid EGA™—four graphic-card compatibility in one slot.

Features:

- Powered by 7.2MHz 80286
- Optional 5 or 8MHz 80287
- 256K of on-board RAM
- Four graphics modes: EGA, CGA, MDA, Hercules
- Supports the long list of EGA software:
  - Microsoft Windows & Word
  - Lotus 1-2-3 & Symphony
  - Topview
  - Framework
  - Chart-Master
  - AutoCAD
  - PC Paint Plus

  and more...

47790 Westinghouse Dr.
Fremont, CA 94536
415/490-8586
Tlx: 709289

ORCHID
The Innovative Leaders

*Offer good only on TurboEGA purchases until July 31, 1986. Please allow two weeks for delivery.

TurboEGA, OrchidEGA, and PCturbo and trademarks of Orchid Technology. Microsoft Windows is a trademark of the Microsoft Corporation. All other product names are trademarks of their manufacturers. CGA screen by PC Paint Plus.

YOUR COMPUTER LANGUAGE IS QUIETLY BREEDING REAL BATS IN YOUR BELFRY.

WE'RE OUT TO SAVE ONE MILLION FRUSTRATED PROGRAMMERS

You're on a roll, really pumped, writing the best code you have ever written and then—AAARGHHH!

Freeze dried in your tracks because the language you're using just won't let you achieve what you can conceive.

And you wanted to be a programmer.

So your choices are:

1) write around the problem by creating six pages of emetic code...

2) leave out that incredible idea that really puts your stamp of excellence on this program or...

3) get yourself a world class headache (or a stroke) by dropping into assembler.

Whatever you choose, by now you feel the language is out to get you—because it is.

Sure, no language is perfect, but you have to wonder, "Am I getting all I deserve?"

And, like money, you'll never have enough.

Pretty dismal, huh?

We thought so, too.

So we did something about it.

We call it CLARION.

You'll call it incredible.

With CLARION you can write, compile, run and debug complex applications in a New York afternoon.

Even if you're in Savannah.

It gives you the power and speed to create screens, windows and reports of such richness and clarity you would never attempt them with any other language.

Because YOU would have to write the code.

With CLARION you simply design the screens using our SCREENER utility and then CLARION writes the source code AND compiles it for you.

In seconds.

Likewise, you can use REPORTER to create reports. Remember, only CLARION can recompile and display a screen or report layout for modification.

And with no time wasted.

All the power and facilities you need to write great programs, faster than you ever dreamed of.

Programs that are easy to use.

Programs that are a pleasure to write.

And to you that means true satisfaction.

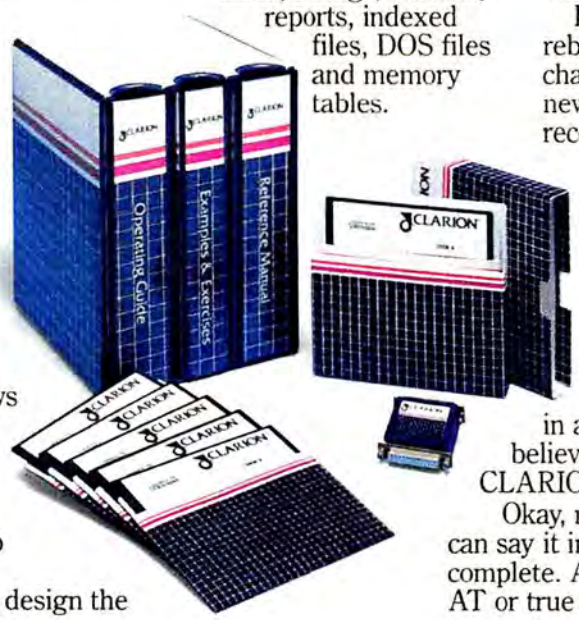
You've coveted those nifty pop-up help windows some major applications feature. But you can't afford the time and energy it takes to write them into your programs.

That's the way it used to be.

So we fixed that, too.

CLARION HELPER is an interactive utility that let's you design the most effective pop-up help screens that you can imagine. And they're "context sensitive," meaning you can have help for every field in your application.

Unlike the other micro languages, CLARION provides declarations, procedures and functions to process dates, strings, screens, reports, indexed files, DOS files and memory tables.



Imagine making source program changes with the CLARION EDITOR. A single keystroke terminates the EDITOR, loads the COMPILER, compiles the program, loads the PROCESSOR and executes the program. It's that easy!

Our data management capabilities are phenomenal. CLARION files permit any number of composite keys which are updated dynamically.

A file may have as many keys as it needs. Each key may be composed of any fields in any order. And key files are updated whenever the value of the key changes.

Like SCREENER and REPORTER, CLARION's FILER utility also has a piece of the CLARION COMPILER. To create a new file, you name the Source Module. Then you name the Statement Label of a file structure within it.

FILER will also automatically rebuild existing files to match a changed file structure. It creates a new record for every existing record, copying the existing fields and initializing new ones.

Sounds pretty complicated, huh?

Not with CLARION's documentation and on-line help screens. If you are currently competent in Basic, Pascal or "C" you can be writing CLARION applications in a day. In two days you won't believe the eloquence of your CLARION programs.

Okay, now for the best part of all. You can say it in CLARION for $295.00—complete. All you need is an IBM® PC, XT, AT or true compatible, with 320 KB of memory and a hard disk drive.

And we'll allow a full 30 day evaluation period. If you're not satisfied with CLARION, simply return it in its original condition for a full refund.

If you're not ready to take advantage of this no-risk opportunity, ask for our detailed 16 page color brochure. It vividly illustrates the elegance of CLARION. Consider it a preview of programming in the fast lane.

Either way, the call's a freebie.

SAY IT IN CLARION™

DEPT. A1WD/2

1-800-354-5444

VISA MasterCard

BARRINGTON SYSTEMS, INC. • P.O. BOX 5580 • POMPANO BEACH, FL 33074 • 305/785-4555

IBM® is a registered trademark of International Business Machines Corporation. CLARION™ is a trademark of Barrington Systems, Inc. ©1986 Barrington Systems.

Circle 504 on reader service card

TYPESETTING
Non-Cents or Common Cents?

This paragraph was typeset on a Compugraphic™ phototypesetter. The adjacent paragraph was typeset on a H-P Laser-Jet using Laser-Press™ — Award Software's new typesetting driver for laser printers. Can you tell the difference?

Cost $100
per page

This paragraph took 2 days and 3 revisions, dealing with a professional typesetting house.

This paragraph was typeset on a H-P LaserJet using Laser-Press[tm]— Award Software's new typesetting driver for laser printers. The adjacent paragraph was typeset on a Compugraphic[tm] phototypesetter. Can you tell the difference?

Cost 45¢
per page

This paragraph took 10 minutes on an IBM Personal Computer.

NOW! You can handle your typesetting needs in a *cents-able* way!

Laser-Press[tm] is a **powerful**, easy to use typesetting program for H-P LaserJets that will cut your typesetting costs substantially. Prepare copy like this—**at your desk!**

And with WS2LP— our new WordStar[tm] translation program, you can automatically convert your Wordstar files into typeset copy. For those using Wordstar, **WS2LP** is available for an additional $69.95

Laser-Press[tm] **at only $695.00 your cost effective solution to your typesetting requirements!**

ORDER YOUR COPY TODAY

LASER-PRESS™

AWARD SOFTWARE, INC.
236 N. Santa Cruz Ave. Los Gatos, CA 95030
408-395-2773 -or- 714-961-0522

Compugraphic is a trademark of Compugraphic Corporation.
Wordstar is a trademark of MicroPro International, Inc.

Circle 595 on reader service card

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

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

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

Who's kidding who!

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

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

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

For example, beginners may try out a word processor and find learning the command sequences very complicated. They'll discover how confusing it is to make the whole program work and that it doesn't do what was claimed.

(continues)

Introducing MICROGRAFX® Windows "DRAW!"

Create brilliant presentations in minutes

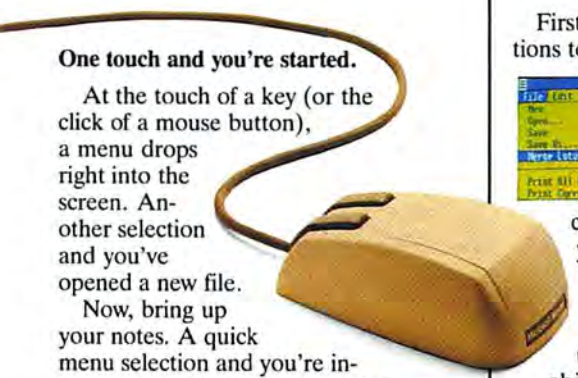
An hour left till the big board meeting. And all you've got to present is a stack of blank paper.

The end of the line? Hardly. Because in a few short minutes, you're going to turn that paper into a brilliant business presentation — thanks to *"DRAW!"*, the software that turns plain paper into plain genius. And you'll even have some fun doing it.

With *"DRAW!"* and Microsoft® Windows you're ready to go. Simply touch your keyboard (or grab your mouse) and you're off!

One touch and you're started.

At the touch of a key (or the click of a mouse button), a menu drops right into the screen. Another selection and you've opened a new file.



Now, bring up your notes. A quick menu selection and you're instantly transforming your outline into a powerful text chart, adding bullet points where you need them. Then select from a variety of text fonts, styles, sizes and colors to highlight your thoughts.

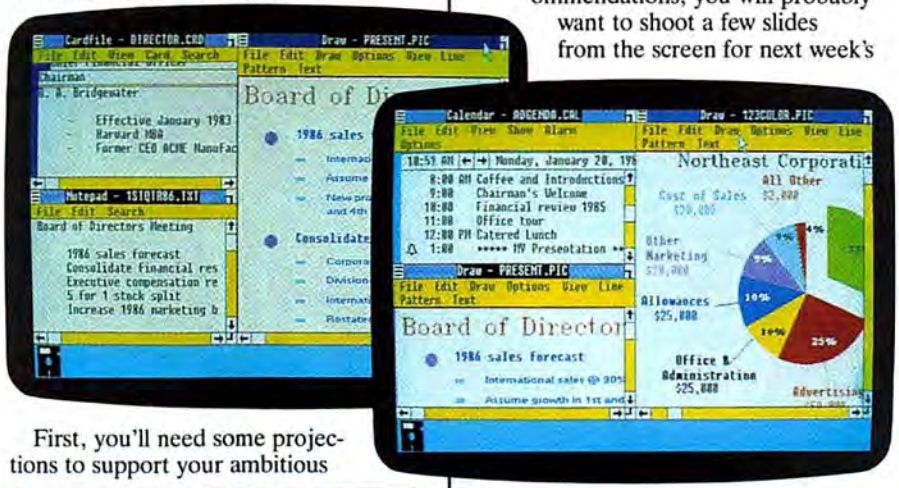
Windows and *"DRAW!"* — a winning combination.

Missing some names? Remember, you're in the Microsoft Windows operating environment. Two more clicks and your list of corporate directors, stored in another file, appears in the corner of your screen. Now you can edit your presentation and refer to the list simultaneously.

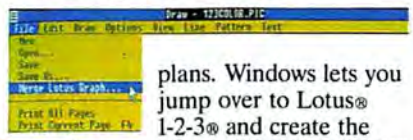
That takes care of the text chart.

Now what about your ideas for the future?

Add some brilliance to your Lotus® 1-2-3® or Symphony™ graph.



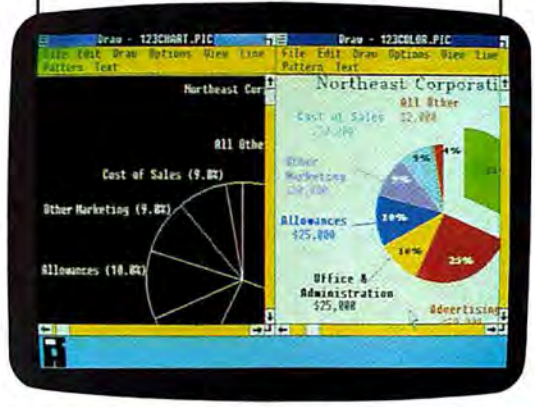
First, you'll need some projections to support your ambitious plans. Windows lets you jump over to Lotus® 1-2-3® and create the charts you'll need. With *"DRAW!"* you pull them right from the Lotus file and place them squarely in your presentation.



Now it's time to dress them up a little. You use *"DRAW!"'s* object-oriented editing to make them really jump off the page. Scale the chart to fit your presentation. Change some text fonts, styles and sizes here, add a few colors there, and it's done.

Now that's a convincing presentation. In fact, after the board accepts your recommendations, you will probably want to shoot a few slides from the screen for next week's presentation to the investors.

But that's next week. You give *"DRAW!"* the print command and it's out the door. One more step up the ladder for you — and Windows *"DRAW!"*.



ORDER TODAY!

only

$199.00

introductory price

Don't wait another minute to *"DRAW!"* your own brilliant presentations! DIAL 800-272-3729 TO ORDER, or for demo disk* or brochure. In Texas or for customer support, call (214) 234-1769.

MICROGRAFX, Inc.
1820 N. Greenville Avenue
Richardson, Texas 75081.

*Windows *"DRAW!"* and the *"DRAW!"* demo disk require Microsoft® Windows.

MICROGRAFX®

The Picture of Success.

Microsoft Windows required. Call for specific operating environment requirements. (IBM EGA or compatible needed for color.)

Windows and Microsoft are trademarks of Microsoft, Inc.

MICROGRAFX Windows Draw and MICROGRAFX are trademarks of MICROGRAFX, Inc.

Lotus 1-2-3, Lotus and Symphony are trademarks of Lotus Development Corp.

Circle 718 on reader service card.

"Fast and powerful... like NewsNet."

"Some kind of fancy import?"
"Made in the U.S.A. NewsNet is my online business news service with round-the-clock access."
"Power steering?"
"Power everything, with NewsNet."

Once I'm online with NewsNet, I have access to over 300 business journals, as well as wire services, credit reports, stock quotes and airfares. I just tell NewsNet to SEARCH, if I'm looking for a certain topic, SCAN, if I want to read headlines, or READ, if I want to read articles or reports. Every day, I make better business decisions because of NewsNet.

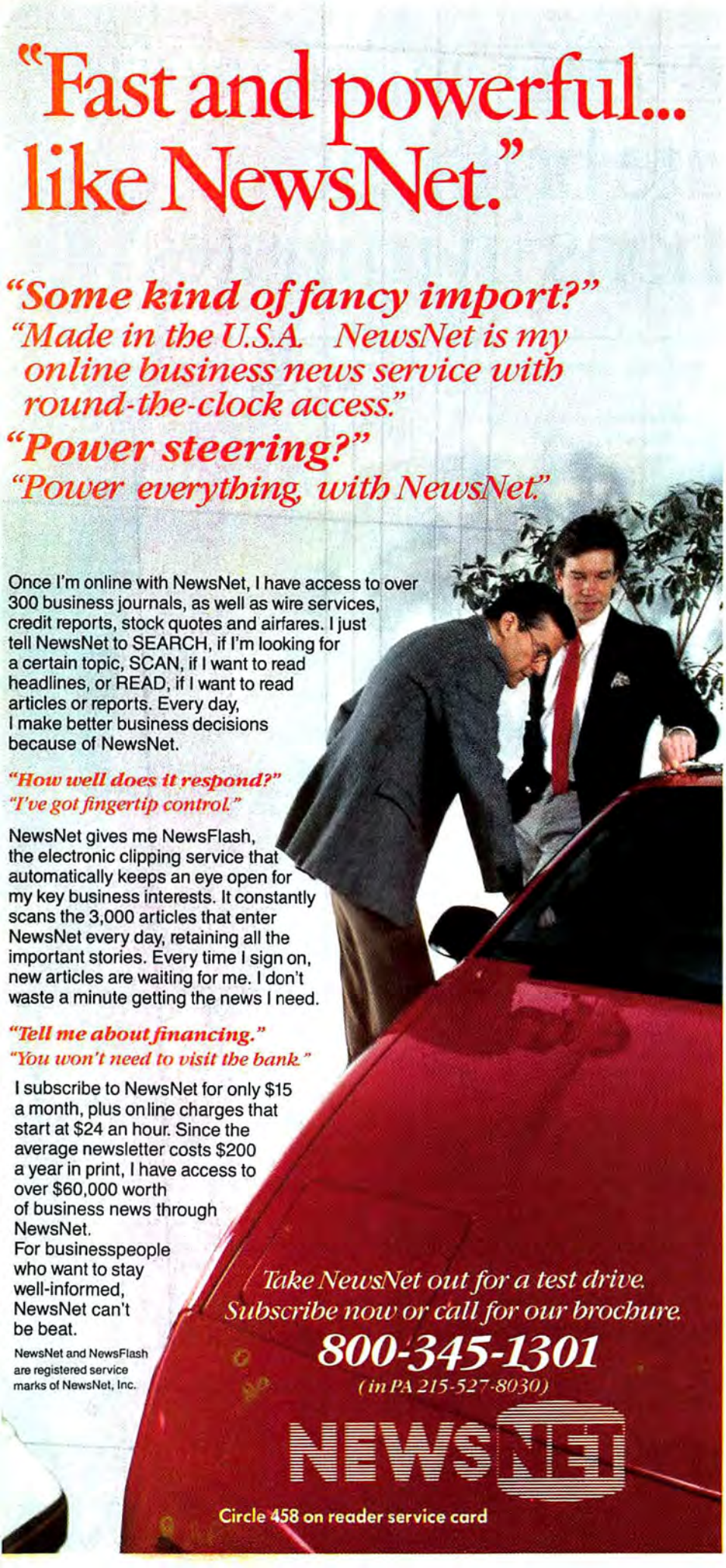
"How well does it respond?"
"I've got fingertip control."

NewsNet gives me NewsFlash, the electronic clipping service that automatically keeps an eye open for my key business interests. It constantly scans the 3,000 articles that enter NewsNet every day, retaining all the important stories. Every time I sign on, new articles are waiting for me. I don't waste a minute getting the news I need.

"Tell me about financing."
"You won't need to visit the bank."

I subscribe to NewsNet for only $15 a month, plus online charges that start at $24 an hour. Since the average newsletter costs $200 a year in print, I have access to over $60,000 worth of business news through NewsNet.
For businesspeople who want to stay well-informed, NewsNet can't be beat.

NewsNet and NewsFlash are registered service marks of NewsNet, Inc.



Take NewsNet out for a test drive. Subscribe now or call for our brochure.

800-345-1301
(in PA 215-527-8030)

NEWSNET

Circle 458 on reader service card

David Bunnell

[redacted]

They'll end up thinking that computer software is difficult and slow and that it has a host of frustrating problems associated with it.

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

Thus, the hardware is found guilty by association.

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

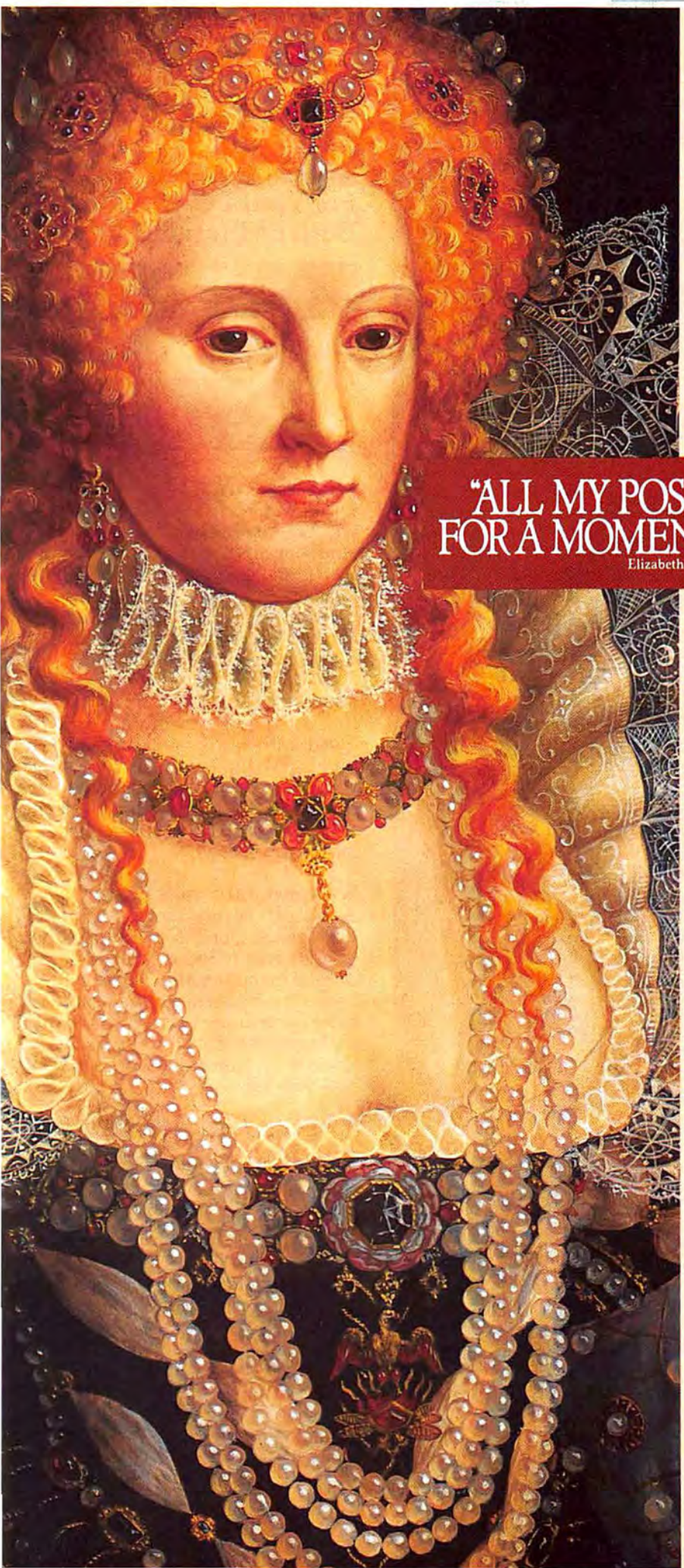
Actually, hardware manufacturers are not immune from blame. For that matter, even computer magazines are guilty when we publish articles with jargon you can't understand unless you're a so-called power user.

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

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

Often, even after you take the time, you can't make full use of

(continues)



"ALL MY POSSESSIONS FOR A MOMENT OF TIME."
Elizabeth I

The ITT XTRA XP desktop personal computer

You can't buy time.

Long before Queen Elizabeth I, man began his quest to hoard that most precious and elusive of commodities. Time.

He can only make better use of the few hours he already has.

Hence, the development of today's business computer.

The ITT XTRA™ XP. Our crowning achievement.

By matching memory to the muscle of the Intel 80286 microprocessor, we're able to achieve "no wait states."

Processing never pauses for slower memory.

Making the ITT XTRA XP thirty percent faster than the IBM AT. And fully XT-compatible.

Giving you speed and flexibility.

Because, being a corporation of many businesses, we're in a unique position to better understand what you need to grow.

Today, as well as tomorrow.

	ITT XTRA XP	COMPAQ 286	IBM PC/AT
Lotus 1-2-3	11sec	13sec	15sec
dBase	36sec	52sec	56sec
FormSort	52sec	1min 5sec	1min 10sec

All comparisons are for purposes of illustration only. User's application performance is dependent on application.

A moment's investment today can pay off royally tomorrow.

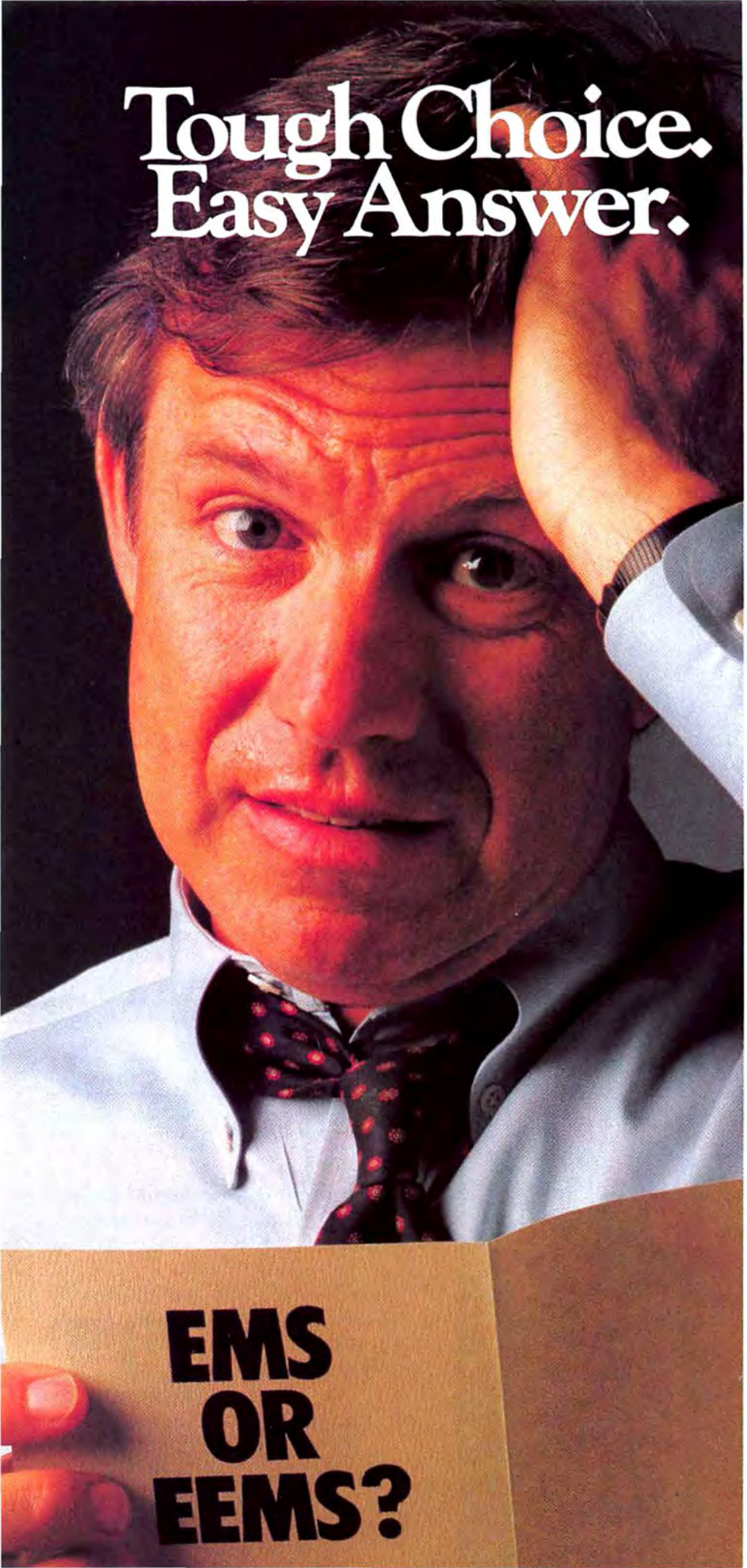
Call (800) 321-7661. In California, (800) 368-7300.

And call quickly. Every moment wasted is a potentially profitable moment you'll never possess again.

ITT
PERSONAL COMPUTERS

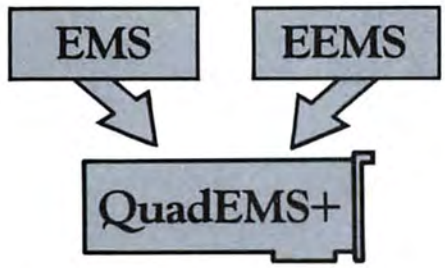
BECAUSE TIME IS THE ULTIMATE BOTTOM LINE.

© 1986, ITT Information Systems. IBM, PC/AT and PC/XT are registered trademarks of International Business Machines. Intel 80286 is a registered trademark of Intel Corporation. Compaq 286 is a registered trademark of Compaq Computer Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. dBase is a registered trademark of Ashton-Tate.



QuadEMS+™

The Only Memory Board For Your PC-XT With Both EMS and EEMS.



Memory And I/O

QuadEMS+ delivers 2Mb RAM when you move up to expanded memory. And supports both expanded memory specifications: EMS and EEMS. Each is independently engineered into the board. Plus, there's a printer port, communications port, and clock/calendar to enhance your system.

Memory Only

If all you're after is memory, QuadEMS+ also comes without I/O. Pure RAM. Either way, QuadEMS+ lets your system take advantage of the power of expanded memory without worrying about compatibility problems that might crop up later.

So Smart, It Installs Itself

Available now for your PC-XT and XT work-alikes, QuadEMS+ is easy to use. Just plug it in. It does the rest. It's designed to automatically configure itself to your system requirements. For more information visit the Quadram dealer nearest you. Or contact us at One Quad Way, Norcross, Georgia 30093; 404-564-5566.

QuadEMS+ is a trademark of Quadram Corp. Quadram and the Quadram logo are registered trademarks of Quadram Corp.

Circle 616 on reader service card

QUADRAM®
An Intelligent Systems Company

Dac-Easy Accounting "Best Software Value"

InfoWorld
1985 "Product of the Year" Awards

InfoWorld 1985 PRODUCT OF THE YEAR

"Trendsetting Accounting Product of the Year"

PC World
December, 1985

100,000 and more every day. That's how many smart buyers have already streamlined their accounting with the fastest-selling, most highly praised accounting package ever introduced.

Dac-Easy offers seven full feature accounting modules in a perfectly integrated package, with instant access to:

- General Ledger
- Accounts Receivable
- Accounts Payable
- Forecasting
- Inventory
- Purchase Order
- Billing

You can generate over 300 reports from 80 different routines. And best of all, Dac-Easy Accounting can be used to manage either service- or product-based businesses.

Now the Dac-Easy Series expands with the addition of the widely acclaimed Dac-Easy Payroll and Dac-Easy Word. Dac-Easy Accounting and Payroll are even more powerful and flexible with the company of Dac-Easy Mate and Dac-Easy Port. Also new for 1986 are Dac-Easy Accounting Tutor and Dac-Easy Payroll Tutor.

The best-selling business solution is now complete. Read what the experts say. Compare power, features, ease of use and price. Then join more than 100,000 people who have said "Yes!" to Dac-Easy.

All the Dac-Easy products are non-copy protected, fully documented, and come with a 30-day money back guarantee.

30-day money back guarantee

Dac Software offers an unconditional guarantee on all Dac-Easy products (less shipping charges). There is a $10 restocking fee if the disk seal is broken. This guarantee is available on all products bought directly from Dac Software.

Minimum Hardware Requirements:
IBM or other compatibles. 256K memory, two disk drives, MS-DOS, PC-DOS 2.0 or later, 132 column printer in compressed mode, color or monochrome monitor.

MS-DOS is a trademark of MicroSoft Corp. IBM and PC-DOS 2.0 are registered trademarks of International Business Machines Corp.

$69.95

NEW!

Dac Easy/Payroll $49.95

The best in personnel and payroll processing. Automatic tax calculations for all 50 states. Tremendous report features. Multi-departments, after-the-fact payroll, interfaces with Dac-Easy Accounting or can stand alone.

Dac Easy/Word $49.95

Powerful, easy and flexible. Includes 70,000 word spell checker, mail merge, windows for up to four documents, cut and paste, search, word-breaking, word count, and much more.

Dac Easy/Mate $39.95

The perfect companion to our best-selling accounting and payroll programs. Add the Dac Road Map, calculator, color or intensity selection, macros, print to screen option, and file windowing. Dac-Easy Mate makes your accounting fun.

Dac Easy/Port $29.95

A great program that sends your accounting and payroll files to your favorite spreadsheet. Pick from your customer, vendor, chart of account, inventory, or employee files. Select ranges and select individual fields. Fast, easy operation.

Dac Easy/Accounting Tutor $19.95

Dac Easy/Payroll Tutor $19.95

These two programs make accounting and payroll a snap to learn. Can be used by the beginner or by the current user as a handy, stand-alone supplement to the user's manual.

"Dac-Easy is a genuinely amazing deal."
PC Magazine
October 15, 1985
"Editor's Choice"

"I've never before in a review come right out and told readers to buy a product, but I'm doing it now. Dac-Easy is an incredible value."
PC Week
August 27, 1985

Call toll free or return coupon below today

1-800-992-7779
Ask for Operator #206
In Texas or
for more information call
214-458-0038
TELEX: 5106000715 dac software

dac software, inc.
4801 Spring Valley Rd., Bldg. 110-B
Dallas, TX 75244

Please rush me the following products:

Product	#Copies	Price	Total
DAC-EASY ACCOUNTING	____	$69.95	____
DAC-EASY PAYROLL	____	$49.95	____
DAC-EASY WORD	____	$49.95	____
DAC-EASY MATE	____	$39.95	____
DAC-EASY PORT	____	$29.95	____
ACCOUNTING TUTOR	____	$19.95	____
PAYROLL TUTOR	____	$19.95	____
Add Shipping Charge			$7.50
Texas Residents Add Sales Tax (6¼%)			____
TOTAL			____

☐ Check ☐ Money Order
☐ AMEX ☐ VISA ☐ MASTERCARD

Account # _____
Expires _____
Name _____
Company _____
Street Address _____
City _____
State _____ Zip _____
Phone _____
Computer brand _____
Signature _____

#206

CALL 1-800-992-7779 FOR IMMEDIATE RESPONSE

Circle 33 on reader service card

At last! - Fast, On-screen

FLOWCHARTS

And Organization Charts

Finally! An on-screen flowchart processor that knows about flowcharts and organization charts - not just another "screen draw" program that makes you do most of the work.

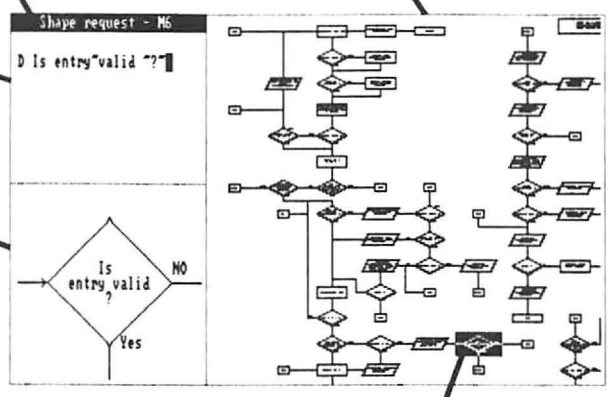
Interactive EasyFlow is a powerful full-screen graphics program dedicated to flowcharts and organization charts. With this program you can quickly compose charts on the screen. More important, you can easily modify charts so they are always up to date.

Features: • Text is automatically centered, character by character, within shapes as you type it • Text formatting controls allow you to over-ride the automatic formating where desired • Lines are created by specifying the starting and ending points - the program automatically generates the route • Powerful editing facilities allow shapes and even entire rows and columns of shapes to be inserted or deleted; lines are automatically re-routed as necessary • Large chart size (up to 16 shapes wide by 16 shapes high) allows very large flowcharts and organization charts to be handled with ease • Charts can be larger than the screen - the window into the chart scrolls both horizontally and vertically as necessary • Flexible printer interface allows it to work with all printers, not just dot matrix printers. Wide charts can be printed in strips Also works with Hewlett-Packard 7475A (and compatible) plotters • Twenty standard flowcharting shapes included • Common shapes supplied in three sizes • Extensive manual (125 pages) includes many examples • Context sensitive "help" facility provides immediate assistance at any time • Any number of titles can be placed on a chart • Commentary text blocks can be placed anywhere in the chart • Fast: written in 8088 assembler • Plus many more features than we can mention here.

Requires at least 256K memory, DOS-2 or higher and an IBM or Hercules compatible graphics card.

Order direct for only **$149.95** + $2.00 S&H (USA/Canada), $10.00 (foreign). Payment by MO, check, VISA, COD or Company PO. Rush orders accepted ($15.00 S&H; USA/Canada only). Rush orders received by noon will be delivered the next business day (to most locations).

The sample screen display shown below is typical of what you see while editing a chart. Other screen displays are provided for entering titles, changing options, getting "help" and so on.



HavenTree Software Limited
P.O. Box 1093-M
Thousand Island Park, NY 13692
(613) 542-7270 ext 47

Circle 489 on reader service card

your computer without someone to give you advice and hold your hand. It's almost impossible to learn everything you need to know just by reading the documentation or calling the help line.

People come away feeling intimidated and helpless.

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

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

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

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

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

(continues)

Multiuser & LAN Solutions
For IBM PC/XT/AT

Now!

MULTIUSER

KT-7/PC[2] PC Work-a-like Terminal
Compatibility: Multilink Advanced[3], PC-Slave/16[4]
Display: 80 x 25, IBM PC character set, PC look-a-like attributes, 14" green or amber
Keyboard: AT style std. IBM scan/ASCII codes. 5161/AT and RT style opt.
Pages of memory: 1 std. 2 or 4 opt.
Communications: 2 bi-directional RS-232C serial (data & printer) ports
Operating systems: works with PC-DOS[1], MS-DOS[5], QNX[6], UNIX[7], XENIX[5], THEOS[8], PICK[9], and Concurrent DOS[10].
Retail price: $695.00

QUARTET[2] 4-port I/O card, RS-232C
Retail price: $299.00

LAN

K-Net[2] Local Area Network
Compatibility: NETBIOS, Token-Ring[1] software, (Advanced Netware[11] 8/86)
Data Rate: 1 million bps
Cable: Twisted-pair/phone wire
Distance: Up to 4000 ft.
Addressable users: Up to 255
Physical: Half-sized card
Operating systems: PC-DOS[1]/MS-DOS[5] 2.0 or later
Dedicated file server: Not needed
Message communication: Interactive
Multiuser solutions supported: Multilink Advanced[3] PC-Slave/16[4]
Other features: electronic mail, network data management, and print spooling
Retail price: $395.00

WORKSTATIONS

KW-1 8088, 4.77 MHz, 512 Kbytes
Retail price: $995.00

KW-2 8088-2, 8 MHz, 512 Kbytes
Retail price $1,195.00

KW-3 80286, 6 or 8 MHz, 640 Kbytes
Retail price $1,995.00

All the above include: monochrome monitor with video board, AT style keyboard, 8 slots, built-in K-Net[2] with remote boot, upgradeable to "complete" PC.

(800) 828-8899
(408) 436-6550 (In CA)
1705 Junction Ct., Bldg. #160
San Jose, California 95112

Kimtron

Trademarks: [1]IBM [2]Kimtron [3]Software Link [4]Alloy [5]Microsoft [6]Quantum [7]Bell Labs [8]THEOS Software [9]PICK Technologies [10]Digital Research [11]Novell © Copyright 1986 by Kimtron Corp.

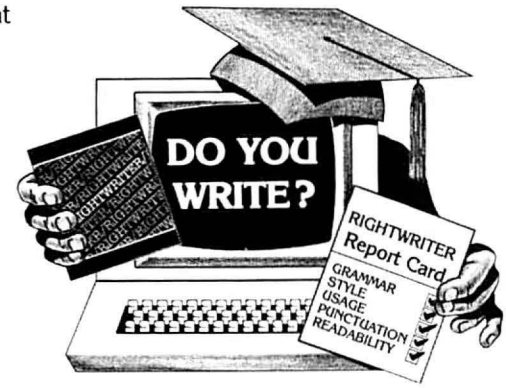
See us at PCEXPO Booth #1529 and NCC Booth #A-1750

Circle 941 on reader service card

NEW!
For Your IBM PC or Compatible
RightWriter® Version 2.0

THE Intelligent
Grammar and Style Checker

RightWriter is a new tool to help you produce lean, powerful BUSINESS WRITING. RightWriter uses advanced artificial intelligence technology to flag errors in GRAMMAR, STYLE, USAGE, and PUNCTUATION. RightWriter is the first office automation package aimed at producing better writing, not more writing.



- **Messages are Inserted** directly into text to point out possible errors and problem areas.
- **Easy to Use** — only one command to learn, your word processor does the rest.
- **Works with Leading Word Processors** — including WordStar®, Volkswriter®, PFS:write®, MultiMate®, and others.
- **Readability Index** — measures the reading grade level of the document using the D.O.D. standard Flesch-Kincaid formula.
- **Uncommon Word List** — lists misspelled, slang, and uncommon words.
- **Recommends** — never decides. RightWriter is a writing aid. The final decision is always left to you.

"...RightWriter is an idea whose time is long overdue."
Phil Wiswell — PC Magazine

"RightWriter is an excellent, low-cost, eye-opening software package..."
Inside Word Management

"The documentation is among the best I have seen."
Jim Pile, Soft Sector

Price $95.00

Available from your local dealer or:
DECISIONWARE, INC./RightSoft Division
2033 Wood St. • Suite 218
Sarasota, FL 33577
Phone Orders Call: (813) 952-9211
Add $4 for shipping and handling.
VISA & MASTERCARD accepted
30 Day Money Back Guarantee

RightWriter is a trademark of DecisionWare, Inc.. WordStar is a trademark of MicroPro International Corporation. MultiMate is a trademark of MultiMate International. PFS:write is a trademark of Software Publishing Corporation. Volkswriter is a trademark of Lifetree Software, Inc.

Circle 365 on reader service card

Get In on the PC Market Action

Your *PC World* Action Ad takes you to the heart of the IBM PC marketplace. These ⅑-page gems provide a cost-effective way to reach over 275,000 *PC World* readers. Place your ad with Carol Watson at 800/435-7766 (800/435-7760 in California).

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

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

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

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

We're due for a Big One soon.

IRMA isn't getting older. She's just getting better.

Four years ago the first PC talked to a mainframe in the 3270 environment. And it was DCA's IRMA™ that made it happen. Since then over 250,000 IRMA boards have been sold to businesses here and abroad, including virtually all Fortune 500 companies.

But the real success of any technology is whether it can stand the test of time. From the outset we knew that if IRMA was to last, she would have to grow. Users of IBM® PCs, XTs, ATs and compatibles would demand more and more enhancements to the basic IRMA technology. And their demands would have to be satisfied.

Which is exactly what we've done.

Family planning.

Our first concern was to make IRMA's file transfer capability faster. That's why we developed IRMAlink FT/TSO & FT/CMS™.

Bundled together and free with the purchase of an IRMA board, it's flexible enough for the inexperienced user to initiate file transfers easily and the more experienced to customize transfers to the mainframe environment.

IRMA. It made PC-to-mainframe communications possible.

If your PC uses PROFS/PCC, PS/PC or 3270 file transfer you can now use IRMAlink FT/3270™ to send and receive mail and document files.

Some of our customers wanted software that would enable them to view their PC and terminal screens simultaneously.

We gave them IRMAlink Windows™. It increases user productivity dramatically by managing PC, mainframe and notepad applications on the same screen.

Many of our customers who already were accustomed to the keyboard of the 3278 felt awkward with the PC keyboard. And vice versa. We responded with the IRMAkey/3270™. It's a keyboard that places all the 3278 and PC functions together. No matter whether users learned on an IBM PC or 3278, they'll feel comfortable and be more productive with the IRMAkey/3270.

IRMAlink. Software that extends IRMA's power.

With all these enhancements, IRMA was truly becoming a more powerful business tool.

But what about the PC user who was remote from the mainframe?

Life without IRMA.

The idea was to put IRMA technology in the hands of remote PC users without the unreasonable cost of buying another controller. Enter IRMAcom™.

IRMAcom is a board that gives your remote PC users economical, high-speed access to the front-end processor. Instead of having to buy a controller to handle one or several remote locations, you can now use IRMAcom and a synchronous modem

for communications with the host over switched or leased lines. And it comes with one of four versatile software packages.

IRMAcom. A board that makes remote PCs communicate with the mainframe without the need for a controller.

If you do have a port available on your controller, all you really need for remote communications is IRMAline.™ It provides remote PCs or asynchronous terminals with dial-up access to 3270 controllers.

There is also another extremely useful standalone emulation unit that can be used without IRMA. It's called IRMAprint.™

IRMAprint. It allows just about any printer you want to work in the 3270 environment.

IRMAprint quite simply convinces the mainframe that it's talking to a 3287 printer. So now you can buy the printer that best satisfies your needs, workflow and budget instead of being forced to buy the 3287.

IRMA has powerful friends.

One of the most crucial criteria used in deciding on a technology that will be used in your company is also one of the hardest to answer. Does it have staying power?

Others have answered that. Others like Cullinet Software,™ Lotus Development Corporation,™ Information Builders, Inc.,™ MSA,™ McCormack & Dodge,™ On-Line Software International,™ Micro Tempus™ and a host of others. All of these companies have invested their time, expertise and money into developing applications software that extends the power of IRMA and makes it even more productive.

IRMAkey/3270. It combines the best features of IBM PCs and terminals.

Put it all together. The 250,000 IRMAs installed. The continuing development of new product enhancements. Our third-party software vendors. Once you do we think you'll agree that there is no smarter, safer or better choice than the industry standard in 3270 micro-to-mainframe communications. The IRMA family.

Put that family to work for you now. And in the future.

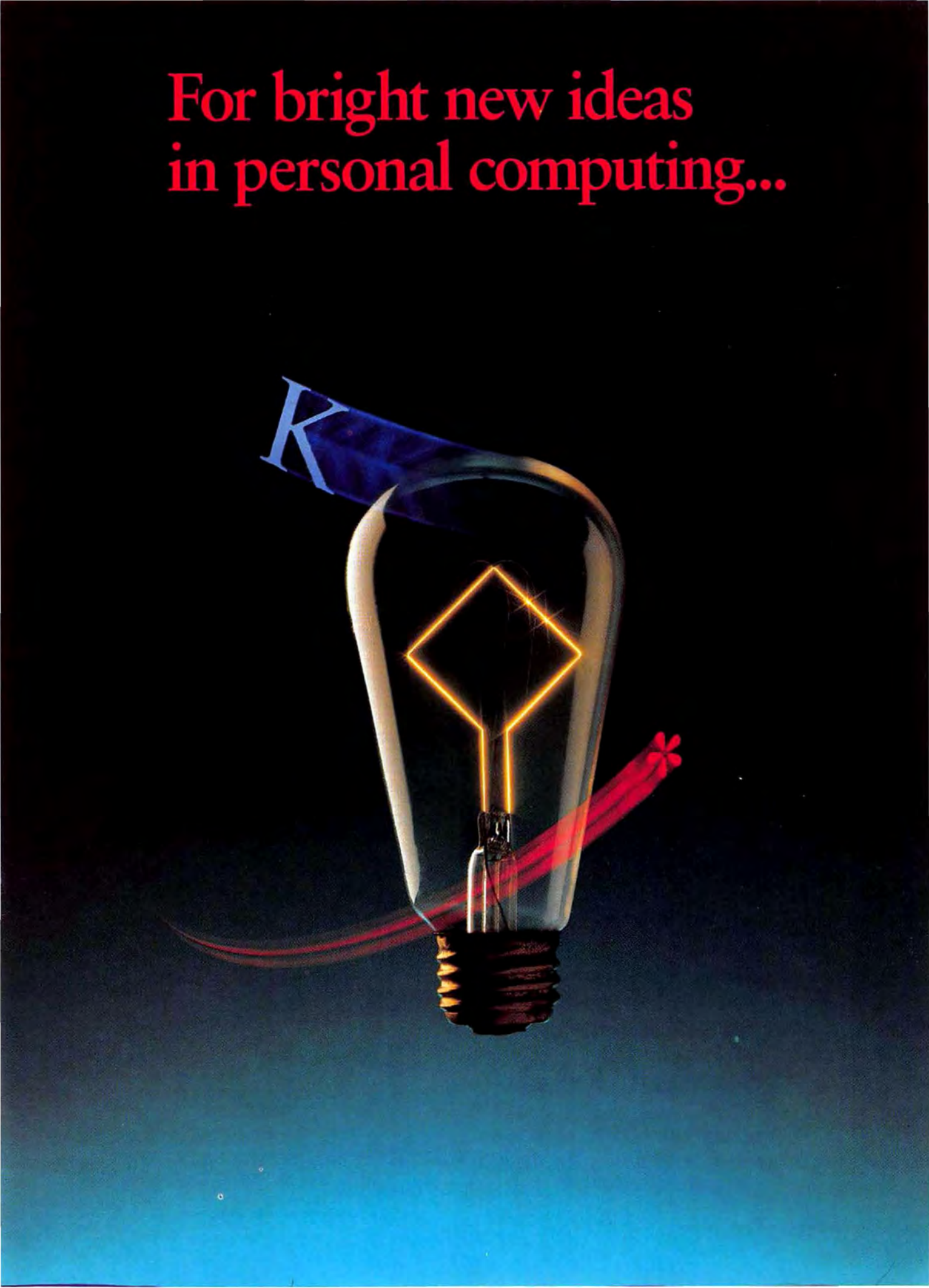
Call DCA direct at 1-800-241-IRMA, ext.520. Or write us at 1000 Alderman Drive, Alpharetta, Georgia 30201.

dca

IRMA, IRMAlink FT/TSO & FT/CMS, IRMAlink FT/3270, IRMAlink Windows, IRMAkey/3270, IRMAcom, IRMAline and IRMAprint are trademarks of and DCA is a registered trademark of Digital Communications Associates, Inc. IBM is a registered trademark of International Business Machines Corporation. Cullinet Software is a trademark of Cullinet Software, Inc. Lotus Development Corporation is a trademark of Lotus Development Corporation. Information Builders, Inc. is a trademark of Information Builders, Inc. MSA is a trademark of Management Science America, Inc. McCormack & Dodge is a trademark of McCormack & Dodge Corporation. On-Line Software International is a trademark of On-Line Software International. Micro Tempus is a trademark of Micro Tempus, Inc. ©1988, Digital Communications Associates, Inc.

Circle 534 on reader service card

For bright new ideas in personal computing...



...subscribe to PC WORLD today.

You'll save $17 and ensure access to the best new ideas in business and personal computing!

VISA and MasterCard accepted—
call TOLL-FREE:
800/628-2900
(from Nebraska call 402/895-7284)

YES! Enter my subscription for 12 issues of *PC World* at just $17.97. I'll save $17 off the single copy price!

☐ Payment enclosed ☐ Bill me

Name _____

Company _____

Address _____

City, State, Zip _____

Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires December 31, 1986.

PC WORLD

4BMA6

YES! Enter my subscription for 12 issues of *PC World* at just $17.97. I'll save $17 off the single copy price!

☐ Payment enclosed ☐ Bill me

Name _____

Company _____

Address _____

City, State, Zip _____

Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires December 31, 1986.

PC WORLD

4BMA6

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 51833
Boulder, Colorado 80321-1833

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

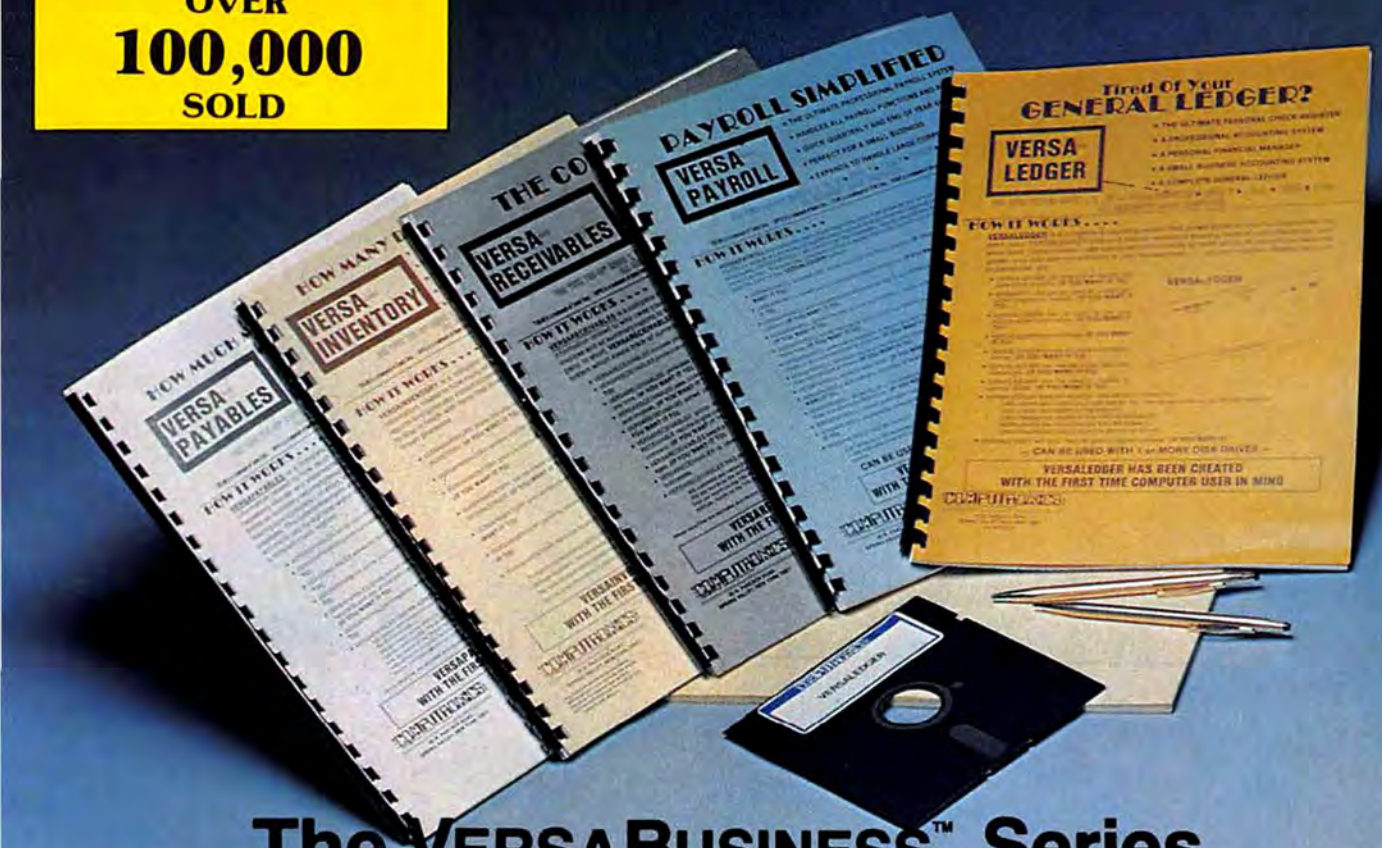
POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 51833
Boulder, Colorado 80321-1833

Introducing the Most Powerful Business Software Ever!

FOR YOUR IBM • APPLE • MAC • TRS-80 • KAYPRO • COMMODORE • MSDOS OR CP/M COMPUTER*

OVER 100,000 SOLD



The VERSABUSINESS™ Series

Each **VERSABUSINESS** module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.
All CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

To Order:
Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

DEALER INQUIRIES WELCOME
All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

Circle 891 on reader service card

Maxell Corp. of America, 60 Oxford Drive, Moonachie, NJ 07074
maxell
maxell®
FLOPPY DISKS
THE GOLD STANDARD

Letters

Reactions and responses from the PC World community

Be Kind to Beginners

I second David Bunnell's assertion in "The Battered PC User" [*PCW*, April 1986] that, on the whole, computer companies ignore new users. Manufacturers expect new users to begin from a base of general computer literacy, but fledgling PC users need what new users of any product need—clear explanations of first steps so that using a PC is easy, productive, and enjoyable. Unfortunately, user frustration and anger directed at computer companies is all too common.

Dwight Stewart
Lexington, Kentucky

I have suffered the slings and arrows of outrageous documentation and now know that when something goes wrong, manuals never address the problem! By the way, tell [David Bunnell's friend] Mr. Armstrong to try *WordPerfect*.

Daniel Pokorny
Clayton, Missouri

Choices for a New Generation

I manage the product support front lines for a hardware manufacturer and have dealt with many battered PC users. I've found that people who bought PCs when the initial wave of products hit the marketplace are generally experimenters. For these technically oriented individuals, program glitches, poor documentation, and even mediocre support pose no insurmountable problems. These users have supported the present personal computer retail industry, which is well suited to their needs as long as the price is right.

However, a new wave of users tantalized by PC power has been seduced by ads from low-cost-at-all-cost retailers who maintain profitability by shaving overhead in the form of sales and technical support staff. The old adage is true: You get what you pay for. Consumers should use common sense when they see bargain-basement prices.

David K. Jackson
Washington, D.C.

Beginners struggling with hardware or software should know that first-generation users who have survived the early trials by fire can be experienced, empathetic, and helpful resources. We're still enthusiastic about PCs and are willing to help.

Jeffrey Ellis
South Portland, Maine

Horseless PCs

"The Battered PC User" is right on target and long overdue. An automobile, like a PC, is a tool intended to solve a problem. When you buy a car, the dealer doesn't just include four tires. The tires come properly mounted so the car is ready to use. If you need special tires, you advise the dealer, who, at an additional cost, mounts them on the car. You get in and drive away. A PC never comes equipped to do a job, and learning how to use it takes a great deal of time and effort. When computer manufacturers, software publishers, and dealers supply the same level of convenience to PC users as the auto industry does to its customers, they'll find users eager and willing to pay any extra cost.

(continues)

Two Powerful Networks...

LAN or Multi-User System? Until now, you've been forced to choose between these two, normally incompatible, types of networks for your company. And that's too bad, because multi-user systems are usually less costly to install since they use inexpensive terminals, instead of PCs, as workstations. For a wide variety of applications, a multi-user system makes more sense than a LAN.

On the other hand, the ability of a local area network to share programs, files, and peripherals among PCs has made it an invaluable productivity tool in the workplace.

Thanks to the synergy (and 100% compatibility) of MultiLink Advanced™ and LANLink,™ you can choose the networking solution you need today and let it evolve into the system you'll need in the future.

MultiLink Advanced™..The Software-Driven, Multi-User System That Runs Programs Under PC-DOS. MultiLink Advanced™ represents the next generation of multi-user systems. The software package transforms a single XT or AT into the CPU of a multi-tasking, multi-user network. Programs, files, and peripherals can be shared by multiple users locally, or by using a modem.

Designed to take advantage of the AT, the system enables as many as eight terminals, connected to a single computer, to emulate IBM PCs having up to 420K RAM. Our PC-Shadow™ Workstation (shown left) even has an AT look-alike, as well as work-alike, keyboard, display, and serial printer port.

A wide range of off-the-shelf software which includes WordStar 2000, dBASE III, Multimate, and Lotus 1-2-3 is fully supported.

Nine Workstations for the Price of an AT. Additional PCs and Kilobuck "Network Interface Boards" aren't required. All that's needed is an everyday RS-232 port for each user.

Instead of spending $3,000 per workstation for a PC with a network board, you can use inexpensive terminals... nine of which cost less than an IBM AT. Even if you need only one additional workstation, you'll realize significant savings.

MultiLink Advanced™ is the ideal departmental networking solution for small businesses and departments of large corporations, alike. And because it's fully compatible with LANLink,™ each multi-user cluster can be linked together, as well as connected to the LAN, in order to access network disks, files, programs, and peripherals.

IBM NETBIOS COMPATIBLE

MultiLink®

ADVANCED

THE SOFTWARE LINK, INC./CANADA 400 Esna Park Drive
Suite 18 Toronto (Markham), Ont. L3R 3K2 CALL: 416/477-5480

LANLink,™ MultiLink Advanced™ & PC-Shadow™ are trademarks of The Software Link, Inc.
IBM, PC, XT, AT, & PC-DOS are trademarks of IBM Corp. WordStar & WordStar 2000, dBASE III, Lotus 1-2-3, Lotus Symphony, and Multimate are trademarks of MicroPro, AshtonTate, Lotus Development Corp., & Multimate International, respectively.

One Powerful System.

LANLink™..A Powerful, Software-Driven Local Area Network That Uses RS-232 Ports. In development for over three years, LANLink™ represents a major breakthrough in local area networks. All of the intelligence which has traditionally resided on costly network interface boards is on LANLink's Server and Satellite diskettes.

Instead of claiming to be the *NEW* standard, LANLink™ utilizes the RS-232 standard which has been in widespread use almost since the inception of microcomputers. Inexpensive RS-232 ports are used for all network communications, making installation costs ⅓ that of a traditional network.

Because most PCs already have communications ports, setting up a LANLink™ network can be as easy as plugging in the cable and inserting the diskettes. LANLink™ has a collision-free data transfer rate which exceeds 115,000 BPS.

If You Know DOS, You Already Know How To Use LANLink™ LANLink™ is a totally transparent network environment. COPY transfers files among users, and a 2-drive PC Satellite boots 1-2-3 from the Server's hard disk with the entry c:lotus.

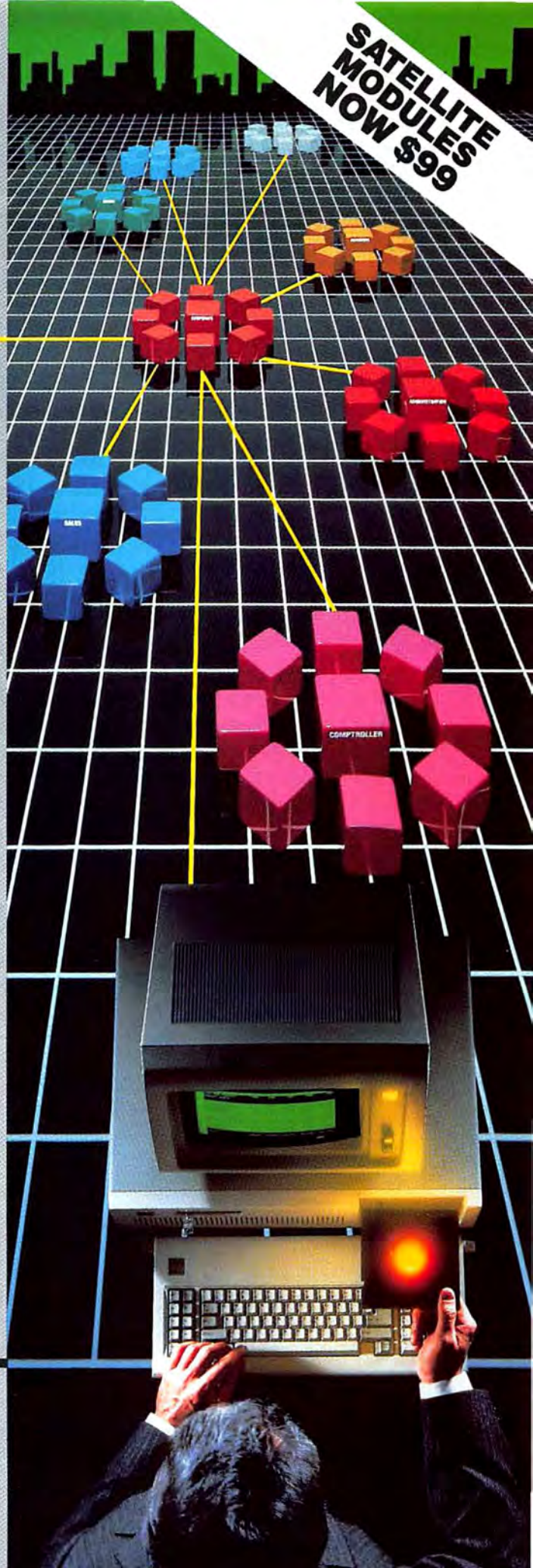
99% of all PC-DOS software runs on the system. Lotus Symphony and 1-2-3, dBASE III, and WordStar are just a sampling of off-the-shelf software that can run under LANLink™

A Constellation of Configurations. Although a number of configurations are possible, LANLink™ is most often set up as a "star," where up to eight satellites are connected to a single server. Larger networks can have multiple servers. Because the Server's not dedicated, a total of 73 or more network users can be supported.

In addition, dumb terminals can be used with LANLink™ simply by running MultiLink Advanced™ on a Satellite and connecting the desired number of terminals to it. This gives each terminal access to network disks, files, and programs.

Make Your Power Play Today. Call The Software Link TODAY for complete details and the dealer nearest you. MultiLink Advanced™ and the LANLink™ Starter Kit are immediately available at the suggested retail price of $495, each. Both come with a money-back guarantee.

The LANLink™ Starter Kit comes complete with network software for both a Server and a Satellite computer. For a limited time, 50 feet of shielded, RS-232 cable will be included free of charge with each Starter Kit. Satellite modules are available at $195, each. VISA, MC, AMEX accepted.



LANLink™

THE SOFTWARE LINK, INC.

Developers of LANLink™ and MultiLink Advanced™

8601 Dunwoody Place, Suite 632, Atlanta, GA 30338 Telex 4996147 SWLINK

CALL: 404/998-0700

Dealer Inquiries Invited

Circle 526 on reader service card

If drivers were required to know as much about cars as users must know about PCs, most of us would still be using horses as our primary means of transportation.

Robert Levin
Los Angeles, California

Much Pain, Little Gain

Having had an experience similar to that of "The Battered PC User," I thoroughly sympathize with the poor devil. When I bought my XT, the dealer promised training, but that turned out to mean formatting the hard disk, installing the word processing program, and answering a few naive questions. It has taken me a tough six months to attain entry-level competency.

Switching from a typewriter to a computer is like graduating from elementary math to calculus. It's not so much acquiring different skills as it is acquiring a new perspective. That's where good training is essential. Producers and purveyors of hardware and software must recognize their responsibility toward the user in this regard. The situation as it exists now is a disgrace to the industry and a sure way to discourage future customers.

Peter Selby
Lomas Santa Fe, California

I think most software publishers live in their own world and are incredibly naive about the lack of user sophistication.

Philip Namy
Bloomington, Indiana

A Guru's Lament

David Bunnell's editorial on the problems of new PC users certainly struck home. When members of our local user group press the panic button, I answer.

I field calls from novices and pros alike. Some problems occur from not reading the manual, but others stem from poor documentation or misinformation from dealers and manufacturers. The function of a user group is to provide moral support and advice to new users, but every call I get from a frustrated beginner who has no dealer support intensifies my support for Assemblywoman Molina's bill to make dealers accountable to consumers for their advertising.

In the meantime, a growing number of disenchanted users feel manufacturers have ripped them off. This isn't good for the personal computer industry, and it doesn't help conscientious manufacturers who try to do more than take someone's money.

C. Henry Depew
Tallahassee, Florida

Some Things Never Change

I received my first issue of your magazine today and after reading "The Battered PC User," I'm in total agreement with David Bunnell. I sympathize with battered users, but I'm surprised that people in the PC community think this is something new. I've worked in data processing for 26 years, and nothing's changed.

In the DP arena, nothing comes easy. If a product is simple to use, it usually does simple things, and people can handle it. But when a product is complex, additional education is needed, if not from documentation, then from classes or one-on-one consultation. This is true whether the product's a PC, a car, or a build-it-yourself toy.

PC users are beginning to understand that despite personal computing's phenomenal growth over the last six years, this isn't some dream world.

Kenneth Branch
Fort Worth, Texas

"User-friendly" is the biggest lie since "The check is in the mail."

Bo Reahard
Atlanta, Georgia

Consume at Your Own Risk

"The Battered PC User" was right on target, but no piece of legislation will force hardware and software vendors to be any more helpful or honest than they already are. I bought a used car with a bad speedometer, and neither the dealer nor the previous owner was responsible—I was. The old axiom "Let the buyer beware" still holds true, and consumers must start from that premise.

Sandy Tate
Pasadena, California

Let the Publisher Beware

Sadly, software publishers have ignored the fact that end users provide the cash that keeps them in business. Now, with plummeting prices, more novices are buying

(continues)

Pick a card and get $50.00

Putting your money on a Hercules™ Graphics Card or a Hercules Color Card has always been a safe bet.

After all, Hercules is the industry standard in high resolution graphics hardware. And we back each of our cards with a full two-year warranty.

Which explains why we've already sold more than 500,000 cards to owners of IBM® PCs, XTs, ATs and many compatibles.

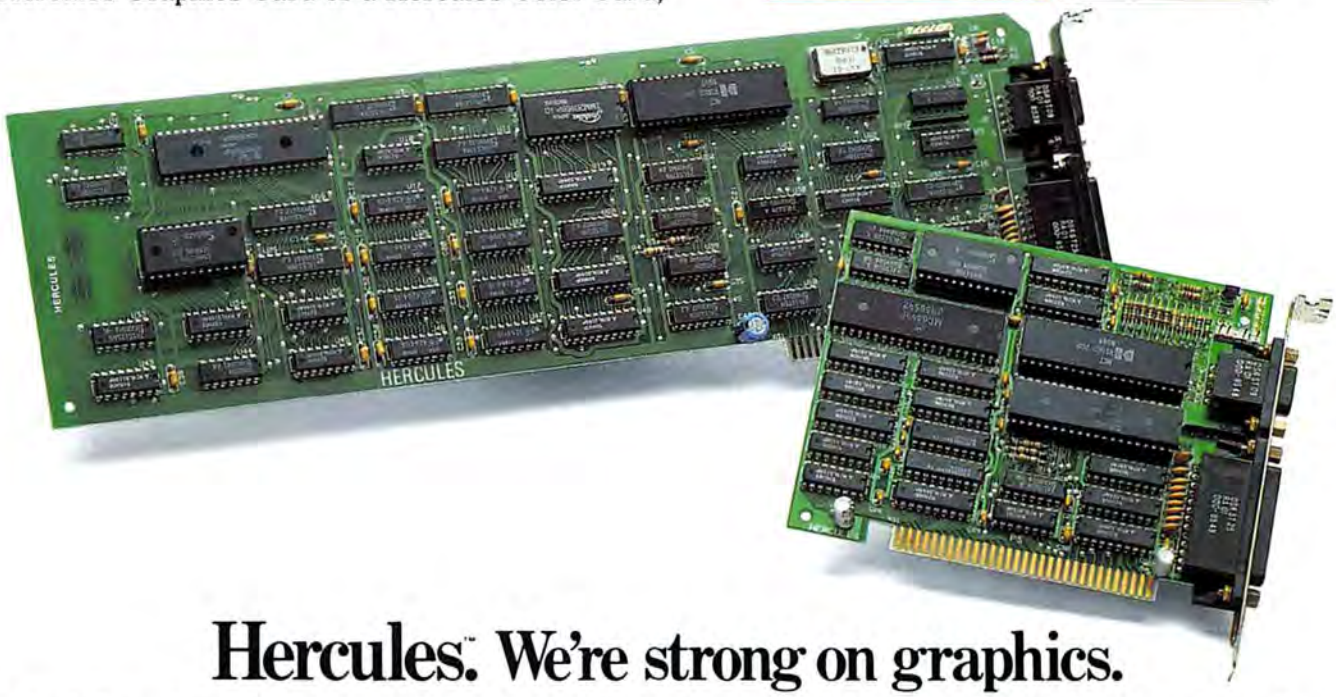
But there are still some people out there who have yet to buy a Hercules card.

So we're sweetening the pot.

Between now and August 31, when you buy a Hercules Graphics Card or a Hercules Color Card, we'll send you a check for $50.00.

See your local Hercules dealer. When you've made your best deal, ask him for one of our rebate applications and send it in with your Purchaser Registration Card and dated sales receipt.

We'll pay off in short order. Your Hercules card, on the other hand, will pay off for a lot longer than that.



Hercules. We're strong on graphics.

Trademarks/Owners: Hercules/Hercules Computer Technology; IBM/IBM. Offer valid in the United States, U.S. Territories and Canada from May 1 through August 31, 1986. Rebate application, accompanied by Purchaser Registration Card and dated sales receipt must be sent to Hercules Rebate Offer, PROMARK Depot, P.O. Box 3947, Milford, CT 06461-0397 no later than September 15, 1986. Applications received after that date will not be honored. Rebate will be paid in the same currency in which the card was purchased. Offer void where prohibited, taxed or restricted. Dealers are not eligible to claim rebate. Offer limited to one rebate per product serial number and original Purchaser Registration Card. Each rebate must be applied for on an individual basis. Other application constitutes fraud. Rebate offer applies to Hercules Graphics Card (model GB102) and Hercules Color Card (model GB200). Other Hercules products are not eligible. Allow 6-8 weeks for redemption. **For additional information in the United States call (800) 532-0600 ext. 701. In Canada call (800) 323-0601 ext. 701.**

Circle 77 on reader service card

TELECAT 286
110
100
90
80
70
60
50
40
30
20
10
0
Size Performance Price
PC/AT
PC/XT
TeleVideo
TeleVideo

AT performance at an XT price. Introducing the TeleCAT-286. $2995. Complete.

With TeleVideo, you always settle for more.

Up till now, with a mid-range budget, you had to settle for mid-range performance. And a mid-range set of features.

But not anymore. Because now, there's the new TeleCAT-286,™ from TeleVideo. An IBM AT-compatible machine that lets you settle for an entirely new concept in medium-priced PCs: more.

More Performance.

The TeleCAT-286 retails for $2995, roughly the same as a comparably-equipped IBM XT. But the similarity ends there. Instead of starting you off with a stripped-down box, we've loaded up the TeleCAT-286 with everything you need. Like a 20MB hard disk. A 1.2MB floppy. An Intel 80286 CPU that runs at either 6 or 8 MHz clock speed. There's even a high-resolution monitor for text and graphics.

28% Smaller Footprint:

What you do with the extra desk space is up to you, but as you can see here, the TeleCAT-286 gives you a lot more of it than the IBM AT.

To make even better use of internal space, we socketed the TeleCAT-286 for one MB of RAM, and also included serial and parallel ports on the motherboard. As a result, we can still give you three extra expansion slots.

More Productivity.

Using our experience in building terminals and systems for 750,000 users worldwide, we've designed a machine that's the last word in ergonomics. With sculptured keycaps on a high-quality keyboard. LEDs on the three critical locking keys. And a footprint that's 28% smaller than the IBM AT's. So you get more of your desk back, too.

LEDs On Locking Keys:

For maximum visibility, we put our LEDs right on top of the three critical locking keys, so they won't get covered up by overlays.

Find Out Even More: 1 (800) TELECAT.

There's a whole lot more we could tell you about the TeleCAT-286. But it's an even better idea to get your hands on it. So call us at 1 (800) TELECAT, Dept. 204, and we'll tell you the nearest place you can try one.

The TeleCAT-286. Our 20MB version is $2995; 30MB, $3495. For high performance at a low price, don't settle for less.

TeleVideo®
Settle for more.

TeleVideo Systems, Inc. 1170 Morse Avenue
Sunnyvale, California 94088-3568 • (408) 745-7760

©1986 TeleVideo Systems, Inc. IBM is a registered trademark of International Business Machines, Inc.
Screen graphics by Chartmaster ©Decision Resources, Inc.

Circle 701 on reader service card

Innovative Barcode Data Collection Systems,

DISPLAY WAND Model PBD-10
- Data input/output terminal (RS232).
- Extended operation (up to 5 hours) on NiCd Battery.
- Applications programs easily developed using IBM's Basic interpreter.
- Light weight – 2.2 oz/90 g.
- Compact – Less than 7.5 in./186 mm. "Pocket" size.
- 40KB internal RAM for date, time and applications.
- 16 character LCD display for date, time, data and operator prompts.

IBM PC/AT/XT keyboard reader Model BM-BAR
- Autodiscriminates all popular symbologies.
- High clearance (up to 2mm).
- Install inline with keyboard and main unit without affecting keyboard operation.

IBM-PC/XT/AT internaly mounted barcode reader Model BMBD – 51
- Autodiscriminates all popular symbologies.
- Decoded output to host is 8 bit ASCII

THERMAL PRINTER with reader Model BW-200T
- High density printing.
- Quiet operation.
- RS232 of Centronics type interface to host computer.
- Internal reader permits barcode duplication without computer connection.

TOUCH SCANNER Model BD-500
- No manual scanning.
- Autodiscriminates all popular symbologies.
- No dangerous Laser.

Other products:

Pen type scanners	BS-Series
	BL-Series
Fixed Scanners	BX-Series
Barcode writers	BW-110T

IBM-PC/XT/AT are registered trade marks of IBM Corporation.
Centronics is a Registered trade mark of Centronics Corporation.

BarCompInc.
US. Exclusive Distributor of Mekano Systems, Tokyo Japan,
410 W. BELL AVE.
SANTA ANA. CA92707
PHONE: (714)545-7733
FAX : (714)545-8542

Circle 372 on reader service card

personal computers. These individuals view the PC as a time- and labor-saving tool. The more organized, lucid, and complete a manual is, the sooner a beginner can master the basics and use the program. This means satisfied customers. The sagging computer industry needs new users now more than ever.

Barbara Spear
Flushing, New York

You should send copies of your article to software publishers, although it's so straightforward they probably wouldn't understand it.

Mark Diamond
Brooklyn, New York

Value-Wise Shopping

PC World carries numerous ads for relatively inexpensive personal computers that promise PC, XT, and AT compatibility. The ads are tempting, but as a computer rookie, I'm unable to determine the true quality of these low-cost machines. How about reviewing these PC clones for us neophytes? If they're good enough to advertise in a reputable publication like *PC World*, they should receive the same scrutiny as products from IBM, Compaq, and other major manufacturers.

R. G. Knoerlein
Hanover, Pennsylvania

Keep an eye on future editions of From the Hardware Shelf. *We plan to thoroughly examine inexpensive XT and AT compatibles from established manufacturers and mail-order outlets. –Ed.*

Shareware's Fair Share

Now that shareware pioneers Jim Button, Bob Wallace, and Patricia Fluegelman have directed their energies away from user-supported software and into commercial distribution ["Shareware Grows Up," *PC World View, PCW,* March 1986], I hope *PC World* will focus attention on shareware products other than *PC-File, PC-Talk,* and *PC-Write*. These are fine programs, but they're a tiny fraction of the shareware market. Of the hundreds of packages available, few are ever reviewed or even mentioned in personal computer magazines. A welcome exception was your review of *FANSI-Console* from Hersey Micro [*From the Software Shelf, PCW,* February 1986].

For every commercial software package, there is an equally capable, less expensive shareware product, and the consumer doesn't pay until the program works. How about giving shareware the recognition it deserves?

Cleve E. Corlett
Arlington, Virginia

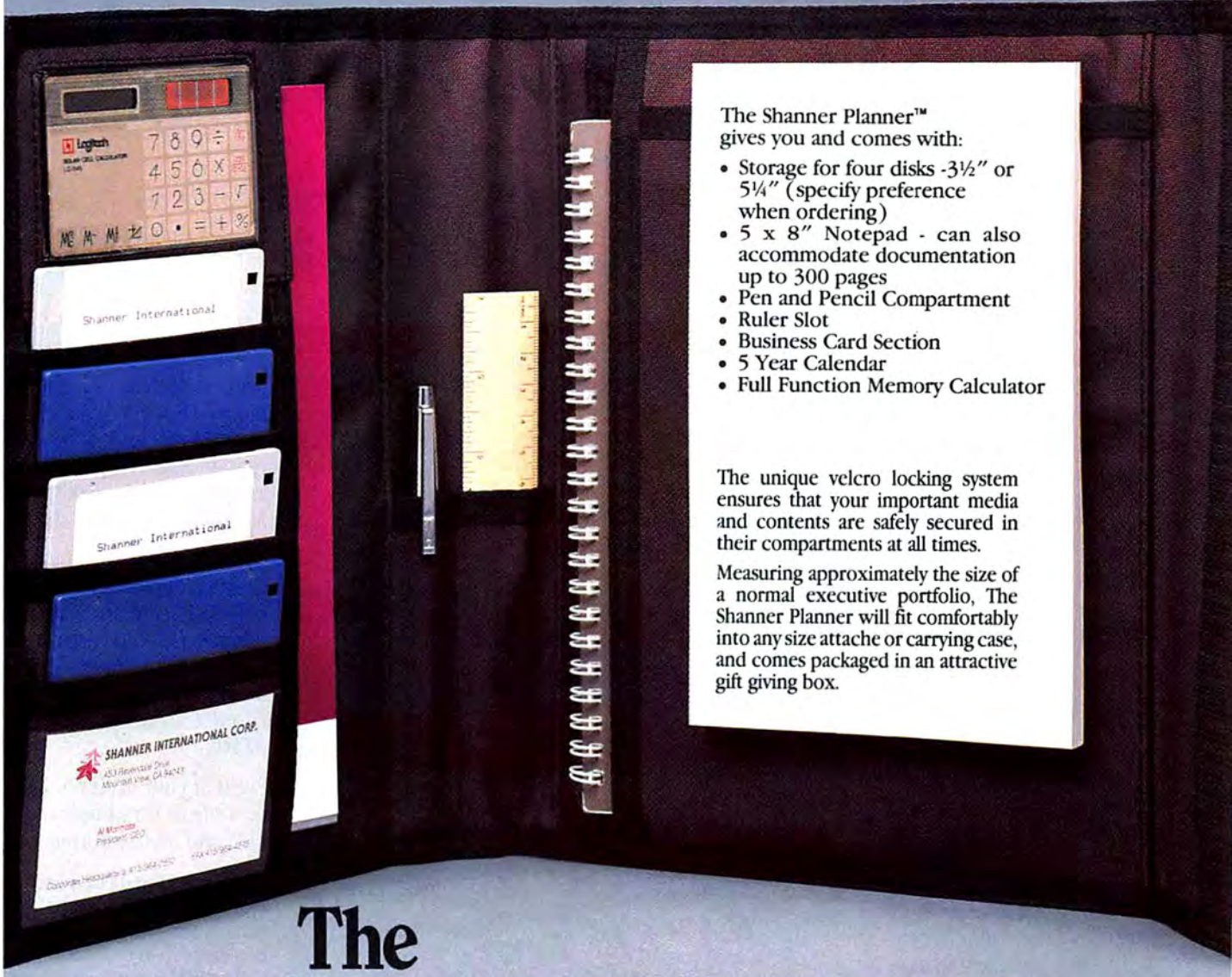
We certainly agree that shareware deserves its due. From the Software Shelf *will continue to examine worthy shareware, freeware, and otherware entrants that catch our eye. –Ed.*

A Project Re-Framed

"A New Way to Frame Projects" [*PCW,* September 1985] is a good introduction to the concepts behind project scheduling and an excellent demonstration of the power of *Framework*. However, I

(continues)

It speaks for itself.



The Shanner Planner™ gives you and comes with:

- Storage for four disks -3½" or 5¼" (specify preference when ordering)
- 5 x 8" Notepad - can also accommodate documentation up to 300 pages
- Pen and Pencil Compartment
- Ruler Slot
- Business Card Section
- 5 Year Calendar
- Full Function Memory Calculator

The unique velcro locking system ensures that your important media and contents are safely secured in their compartments at all times.

Measuring approximately the size of a normal executive portfolio, The Shanner Planner will fit comfortably into any size attache or carrying case, and comes packaged in an attractive gift giving box.

The Shanner Planner™

$39.95

Dealer Inquiries Accepted
Call 800/828-6637

Remember the expression "A picture is worth a thousand words?" Take a second look. The Shanner Planner™ is the first ever full system portfolio created specifically for the computer user. Designed to address the individual needs of the computer industry, The Shanner Planner is tastefully constructed of long lasting, durable, textured nylon *(it's the in thing today)* to maintain its smart appearance over time.

SHANNER INTERNATIONAL CORP.

The Shanner Planner™ is a creation of, marketed worldwide by, and is a Trademark of SHANNER INTERNATIONAL CORP.

Circle 429 on reader service card

See the local authorized dealer nearest you or use this *SPEEDY* order form.

Please send me _____ Shanner Planner(s) at $39.95 each, plus $6.00 postage & handling. (CA residents add $2.60 per Planner for sales tax.)
Please indicate method of payment and media size required:

☐ Check ☐ Money Order ☐ VISA ☐ Mastercharge

Media ☐ 3½" ☐ 5¼" Size

Orders may be sent to:
Shanner International Corp.
453 Ravendale Drive, Mountain View, CA 94043

Account No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Prices subject to change without notice. PCW7/86

For direct orders:
Call our **HOTLINE 1-800-423-8673**. In CA **1-800-626-9273**.

Turn your IBM PC into a Personal Publisher

Desktop publishing has finally come to your PC with ClickArt Personal Publisher.

Now you can move from first thoughts to finished copy easily and directly—with the professional quality fonts and images, and the sophisticated editing, page-layout and graphics tools of ClickArt Personal Publisher.

The graphical what-you-see-is-what-you-get interface makes creating and editing your layout almost intuitive. ClickArt Personal Publisher gives you sophisticated page formatting ranging from one to four columns, whether you enter your text directly or read it in from a word processing file. Column widths are variable and each line can be individually sized and positioned. There's even a unique PictureWrap feature which flows text automatically around images.

As the first Apple Macintosh picture- and font-compatible program for your PC, ClickArt Personal Publisher gives you access to thousands of images and hundreds of fonts already created for the Macintosh. We've included hundreds of images and a dozen fonts in the basic package.

Special Quarterly Edition

TRAVEL TODAY!

A newsletter bringing you the best in travel entertainment.

Wild Maui Adventure

What are you waiting for? Why not explore semi-submerged lava-formed caves of Lamea Island, tour the mystical town of Hana, or feast at the famous Hasegawa's General Store. A brisk trail hike through bamboo forest leads you to the 300 foot level and the fabulous Waimoku Falls. A short mule ride to the Kala Peninsula will leave you breathless and gasping for more. A spectacular sunrise at Haleakala Point, a picnic lunch at the Lao Needle, snorkeling on the Olawalu reef, and much more will make your *Maui Adventure* perhaps the most special and memorable vacation experience you'll ever live through!

Includes: Round trip air to Maui from San Francisco International; Traditional flower lei welcome at Maui Airport; 6 night hotel accommodations; 2 days of escorted adventures; land transportation or 5 days car rental; 12 continental-style meals and a day pack; All pre-paid tax and service charges. Does not include: Gas and insurance for rental car, personal expenses, inter-island airfare, mule transportation, swim and snorkel gear.

Departure times: Every Monday, Tuesday, and Thursday March through September.

Prices: See your local travel agent for details.

If you like this brochure, see your local computer retailer for details.

Climate

Spring Temperatures are mostly mid 70's to high 80's. Most days are sunny and the island flowering plants are beginning to blooom.

Summer Temperatures range from high 70's to low 90's. During August and September, temps can get in to the 100's.

Shopping

Hawaiian style clothing is ever popular. Aloha shirts and Muumuus are the top items, and can be purchased inexpensively in the local market. Shell leis and jewelry are imported from the Orient. Prices can vary widely from store to store, so expect to shop around before you buy.

Dining

Due to the ethnic and cultural diversity of Hawaii, the choice of foods is almost unlimited. Most tourist restaurants specialize in seafood and steak. If you find yourself at a luau, you will discover a whole menu of foods you've never heard of. Wild Maui Adventurers will want to sample the entire menu. To the indiscriminate tourist, the luau feast will taste much better than it will initially look. *Aloha!*

This brochure was created and designed with ClickArt Personal Publisher
For more information, contact:
T/Maker Company
2115 Landings Dr., Mt.View, Ca 94043

You can print your results on most popular dot matrix printers such as Okidata and Epson. Or if you want the professional look of near-typeset quality, options are available to support the Apple Laserwriter or the HP Laserjet.

ClickArt Personal Publisher is ***$185*** for the dot matrix version. Optional accessories for either the Apple LaserWriter™ or the HP LaserJet are an additional ***$150.***

See it at your dealer or call or write us for sample outputs and more information.

ClickArt Personal Publisher requires an IBM PC, XT, AT or compatible with 512K RAM, two disk drives or a hard disk and an IBM Color Card, Hercules Monochrome Graphics Card or EGA Card (in color card mode). Mouse recommended but not required.

ClickArt®
PERSONAL PUBLISHER

T/Maker Graphics
1973 Landings Drive
Mountain View, CA 94043
415-962-0195

IBM is a registered trademark of International Business Machines. ClickArt is a registered trademark of T/Maker Company. Macintosh is a trademark licensed to Apple Computer, Inc.

Circle 252 on reader service card

Flashy Programs.

dBASE • Turbo Pascal • BASIC • C • COBOL • Fortran • Lotus 1-2-3...

FLASH CODE™

The most powerful program developer for dBASE II and dBASE III ever developed.

DRAW any screen design with our advanced screen editor. Use Flash Code and see how incredibly easy screen design can be.

GENERATE complete programs automatically. Based on your screen designs, Flash Code can write your whole dBASE program.

FLASH-UP WINDOWS™. Menus and Help Windows add a new dimension to your dBASE programs. Create them instantly with our window editor. Use the FlashUp™ module to have windows pop-up throughout your dBASE applications.

For dBASE II and dBASE III. $150.

"...a truly remarkable product. Brand-new, state-of-the-art and actually fun to use. The windows make it an even more amazing product."
Cary N. Prague, Author
"Beyond programming with dBASE III"

"Destined to replace QUICKCODE™"
MicroNews/Views, Nov. 85

SCREEN SCULPTOR™

You can create screens in minutes...then Screen Sculptor writes the program.

Move pieces of the screen around, select colors from a menu, draw boxes and lines, paint, repeat last character in any direction. And more!

Specify variable names, data types, acceptable data ranges, pictures for edit checking, etc.

Screen Sculptor then generates an actual program source code based on your screen design. Use it as is or modify it.

For BASIC, Turbo Pascal, IBM/Microsoft Pascal. $125.

"...so well done that you may not need to refer to the manual."

"...an exceptional product that fills a real need in the development of new programs."
Computer Language

NEW! FLASH-UP WINDOWS™

An incredibly flexible and powerful tool for Flash-Up Menus and Flash-Up Help Windows!

Every program, every application becomes more sophisticated and easier to use with Flash-Up Windows.

Use the window editor to instantly create windows. Change their size, location, color...all automatically. Specify a string of characters or control codes to send back to your application program.

The windows can be flashed-up directly by your program OR by the user with the keyboard. Windows can even call other menus or help windows.

An absolute necessity for BASIC, Turbo Pascal, C, R:BASE, COBOL, Fortran, dBASE, Lotus 1-2-3...

Introductory price. Only $75.

NOT COPY PROTECTED!

Circle 862 on reader service card

No Risk Demo Offer!

Here's a no-risk offer. Order now and you'll also get a full demo disk. Use the demo and the manual for 30 days. If you don't love it, return the package for a full refund.

Credit card orders call 24 hrs/day 1(800) 824-7888, operator 268.

All other orders and inquiries call or write Software Bottling Co., 6600 L.I. Expwy, Maspeth, NY 11378. 718-458-3700.

THE SOFTWARE BOTTLING COMPANY OF NEW YORK

Requires an IBM PC, XT, PC AT or true compatible, 256K

UNLOCK™ Removes Copy Protection

RUNS YOUR SOFTWARE ON ANY HARD DISK

Guaranteed to work only with programs below:

UNlock ALBUM "A"
$49.95 (Plus $4 ship/handling. Foreign orders $10)

- LOTUS 1-2-3™ (1.A, 1.A*, 2.0)
- dBASE III™ (1.0, 1.1, 1.2 & PLUS)
- FRAMEWORK™ (1.0, 1.1, II)
- SYSTAT™ (1.3 & 2.0)
- SPOTLIGHT™ (1.0 & 1.1)
- GRAPHWRITER™ (4.3 & 4.31)
- REALIA COBOL™ (1.2, 2.0)

UNlock ALBUM "B"
$49.95 (Plus $4 ship/handling. Foreign orders $10)

- SYMPHONY™ (1.1)
- CLIPPER™ (Winter '84, Summer '85)
- ELECTRIC DESK™ (1.04)
- DOUBLEDOS™
- MANAGING YOUR MONEY™ (1.5 & 1.51)
- smARTWORK™ (1.0 REV 8 thru 10)
- DATA BASE MANAGER II™ (2.0, 2.02)

UNlock ALBUM "C"
$49.95 (Plus $4 ship/handling. Foreign orders $10)

- MICROSOFT WORD™ (1.5, 2.0, 2.01)
- MULTILINK ADVANCE™ (3.02 & 3.03)
- IBM WRITING ASSISTANT™ (1.01)
- LOTUS 1-2-3 REPORT WRITER™ (1.0)
- PARADOX™ (1.0)
- PFS ACCESS™ (1984 Edition)
- THINKTANK™ (2.0)

"Best of UNlock" ALBUM "D"
$74.95 (Plus $4 ship/handling. Foreign orders $10)

- MICROSOFT WORD™ (1.5, 2.0, 2.01)
- dBase III™ (1.0, 1.1, 1.2 & PLUS)
- LOTUS 1-2-3™ (1.A & 1.A*, 2.0)
- SYMPHONY™ (1.1)
- FRAMEWORK™ (1.0, 1.1, II)
- CLIPPER™ (Winter '84, Summer '85)
- MULTILINK ADVANCE™ (3.02 & 3.03)

- ***Produce non-protected DOS copies from popular software programs***
- ***For IBM® PC, XT, AT, compatibles***

TranSec UNlock is a unique software copying disk **that removes copy protection,** providing standard non-protected DOS copies. UNlock runs on IBM® PC, XT, AT, and compatibles with at least 256K (or more required for some programs), DOS 2.1 or higher.

BACKUP COPIES. UNlock safely and easily makes backup copies.

RUN ON HARD DISK. Programs load faster, use less disk space and work with any hard disk, including Bernoulli Boxes. No longer do you need the original in drive "A".

RUN ON RAM DISK. UNlock is the only software that can run copy protected software on a RAM disk or micro-floppy.

EASY TO USE. 1) Type UNlock. 2) Select program destination. 3) Insert program disk.

SAFE ORIGINAL. UNlock does not alter your original distribution disk. UNlock works by creating a copy of your distribution disk on a hard or floppy disk. It then removes copy protection **from the copy!**

Choice of the Critics!

BYTE *"UNlock 4.7 defeats the latest Prolok and SuperLock type of copy protection scheme. It's menu-driven and works fine on the programs it's supposed to work on: Lotus 1-2-3, dBase III, Framework, Symphony, Paradox, and several others."*
Jerry Pournelle, BYTE, Feb. '86

PERSONAL COMPUTING *"UNlock has two particularly endearing characteristics: it works, and works simply. I was able to quickly produce unprotected copies of Lotus 1-2-3 release 2, Symphony 1.1, Microsoft Word 2.0, dBase III 1.1, and Framework II. These copies performed flawlessly, as did copies of these copies."*
Christopher O'Malley, PERSONAL COMPUTING, April '86

NEW! SPECIAL OFFER "Best of UNLOCK™"

ORDER BY TELEPHONE TODAY!
1-305-474-7548

TRANSEC UNLOCK™

TranSec Systems, Inc., 1802-200 North University Drive, Plantation, FL 33322
Trademarks are the sole property of their respective owners. • UNlock is For Use Only to Improve the Useability of Legally Acquired and Operated Software.

noticed some typographical errors in a few of the cell formulas. The formula in Activity List cell E2 on page 218 should read +Project Scheduling Parameters.C4, and on that same page, Activity List cell H2 should contain +G2+B2. Activity List cell E10 on page 221 should read @MAX(H8,H9). Otherwise, thanks for a very useful program.

Frank Zbozny
Pittsburgh, Pennsylvania

Volkswriter 3

Just as consumers deserve quality products, they deserve quality reviews. When it comes to *Volkswriter 3*, *PC World* has let its readers down. Janet Crider's review in *PC World*'s June issue ["The More Things Change . . . "] and David Bunnell's column in the April issue ["The Battered PC User"] were superficial, biased, and inaccurate. In the limited space allowed for our reply, we will address the most grievous errors in these articles.

The simplistic framework of Ms. Crider's article is that computer users value features above all other program characteristics. She evaluates *Volkswriter 3* solely from the viewpoint of the power user. How features are implemented, how usable they are and how easy to learn, how expensive a program is, and what features are meaningful for what kinds of users—all these considerations are ignored in the course of a tasteless exercise in flippant headlines.

Ms. Crider fails to note that *Volkswriter 3* is the only word

(continues)

Turbo Pascal and the Turbo Pascal family give you a perfectly integrated programming environment and unbeatable speed, power, and price

Turbo Pascal® is *faster* than any other Pascal compiler, and at only $69.95, a distinctly better deal. But it offers much more than speed, power, and price.

There's also the complete Pascal family of products that's grown from 1 to 9 products in just 3 years.

- Turbo Pascal 3.0
- Turbo Pascal with the 8087 support
- Turbo Pascal with Binary Coded Decimal, (BCD)
- Turbo Pascal with 8087 *and* BCD
- Turbo Database Toolbox™
- Turbo Graphix Toolbox™
- Turbo Tutor™
- Turbo Editor Toolbox
- Turbo GameWorks

Turbo Pascal is backed by a complete range of "toolboxes" that give you most of the programming tools you'll ever need.

The Turbo Pascal family is never static, but is continuously expanding, with new products like Turbo Editor Toolbox™ and Turbo Gameworks.™

The secret of software success is not merely low price, but top quality, allied with complete documentation, like our 400-page reference manual.

All of which are some of the reasons why Turbo Pascal is clearly the leader, and the recipient of awards like PC Week's "**Product of the Year**" and PC Magazine's "**Award for Technical Excellence.**" And some of the reasons why Turbo Pascal has now become a *de facto* worldwide standard with more than half a million users.

Turbo Pascal has grown from a single product 3 years ago to a family of 9 today.

Success breeds success, so the Turbo Pascal family has flourished. Your choices now include:

☐ Turbo Pascal 3.0 combines the fastest Pascal compiler with an integrated development environment.

☐ Turbo Pascal with 8087 math co-processor support for heavy duty number-crunching, and/or **Binary Coded Decimals** to eliminate rounding-off errors for business applications.

☐ Turbo Database Toolbox is a perfect complement to Turbo Pascal. It includes a complete library of Pascal procedures that allows you to search and sort data, and build powerful database applications.

☐ Turbo Graphix Toolbox a library of graphics routines for Turbo Pascal programs. Lets even beginning programmers create high-resolution graphics with an IBM,® Hercules,™ or compatible graphics adapter. Does complex business graphics, easy windowing, and stores screen images to memory.

☐ Turbo Tutor teaches you step by step how to use Turbo Pascal, with commented source code for all program examples on diskette.

Save $109.70 when you choose the Turbo Jumbo Pack. 6 different Turbo Pascal products for only $245.00!

For only $245.00, you get Turbo Pascal 3.0 *and* Turbo Editor Toolbox *and* Turbo Tutor *and* Turbo Graphix Toolbox *and* Turbo GameWorks *and* Turbo Database Toolbox!

All 6 for only $245.00, which saves you $109.70. This limited offer is good through September 1, 1986, so act now.

NEW! Amazing value! Turbo Editor Toolbox includes MicroStar,™ a full-blown editor that also does windows!

Turbo Editor Toolbox not only gives you ready-to-compile source code and a 200-page manual that tells you how to integrate the editor procedures and functions into your programs, but also includes MicroStar, a complete editor with full windowing capabilities. (You could pay $100.00 or more for a program like MicroStar, but you get it free as part of our Turbo Editor Toolbox.) You can also use Turbo Editor (which of course integrates with Turbo Lightning™) to build your own word processor!

NEW! Turbo GameWorks gives you the games you can write, rewrite, bend and amend! **Turbo GameWorks** reveals the secrets of game design and the strategies. You're given source code, a 200-page manual, and the insight needed to write and customize your own irresistible games.

Turbo GameWorks also includes ready-to-play Chess, Bridge, and Go-Moku—an ancient Japanese game that can divert you from reality for hours on end.

"Language deal of the century . . . Turbo Pascal"
Jeff Duntemann, PC Magazine

"Turbo Pascal has got to be the best value in languages on the market today"
Jerry Pournelle, BYTE Magazine

"This compiler, produced by Borland International, is one of the best programming tools presently available for the PC"
Michael Covington, PC Tech Journal

YES! I want the best

To order by phone, or for a dealer nearest you.

call (800) 255-8008

in CA call (800) 742-1133

Copies	Product	Price	Totals
___	Turbo Pascal 3.0	$69.95	$ ___
___	Turbo Pascal w/8087††	$109.90	$ ___
___	Turbo Pascal w/BCD††	$109.90	$ ___
___	Turbo Pascal w/8087, BCD††	$124.95	$ ___
___	Turbo Database Toolbox	$54.95	$ ___
___	Turbo Graphix Toolbox†	$54.95	$ ___
___	Turbo Tutor	$34.95	$ ___
___	Turbo Editor Toolbox†	$69.95	$ ___
___	Turbo GameWorks†	$69.95	$ ___
___	Turbo Jumbo Pack†	*$245.00	$ ___
	Outside USA add $10 per copy CA and MA res. add sales tax		$ ___
	Amount enclosed		$ ___

Prices include shipping to all US cities

Carefully describe your computer system:

Mine is ___ 8-bit ___ 16-bit

I use ___ PC-DOS ___ MS-DOS ___ CP/M-80 ___ CP/M-86

My computer's name and model is

The disk size I use is: ☐ 3½" ☐ 5¼" ☐ 8"

Payment: VISA MC Bank Draft Check

Credit card expiration date ___/___

Card #

NOT COPY PROTECTED
****50-DAY MONEY-BACK GUARANTEE**

Name

Shipping Address

City

State Zip

Telephone

COD's and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by credit card or International Postal Money Order.

*Limited Time Offer until September 1, 1986.

**YES, if within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.

Minimum System Requirements:
Turbo GameWorks, Turbo Graphix Toolbox, & Turbo Editor Toolbox—192K. All other products, 128K.
†IBM PC, PC*jr*, AT, XT, and true compatibles.
††16-bit only

TF23

BORLAND INTERNATIONAL
Vive la différence

4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX 172373

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

Turbo Pascal and Turbo Tutor are registered trademarks, and Turbo GameWorks, Turbo Editor Toolbox, Turbo Database Toolbox, Turbo Graphix Toolbox, Turbo Lightning, and MicroStar are trademarks of Borland International. IBM is a registered trademark of International Business Machines Corp. Hercules is a trademark of Hercules Computer Tech.
Copyright 1986 Borland International. BI-1086C

Circle 477 on reader service card

ACT 1
SERIES

THE COMPLETE INCLUDING PAYROLL FULLY INTEGRATED
PROFESSIONAL ACCOUNTING SYSTEM
FOR PC-DOS* & MS-DOS*

Here's the best accounting value in the US today! Really professional accounting that is powerful, flexible, and full of integrity.
Compare the features — then call (800) 344-2540 to order.
Our guarantee is your assurance of quality!

PARTIAL LIST OF FEATURES:

GENERAL FEATURES
Menu driven with 2 help references.
Multi company and report generator.
User can easily install in minutes.
Sample data files included.
Complete audit trail.
All modules can post to multiple profit centers.
Fully integrated with single source entry.
Date sensitive user-defined fiscal calendar.
User defined financial reports.
User can categorize Accounts Receivable, Vendors, Payroll & Inventory by user defined type.
User can design checks, invoices, statements and W-2s.
User defined chart of accounts, account numbers and stock numbers up to 15 alphanumerics.

GENERAL LEDGER
Allows for multi-company ledgers.
Unlimited multi-level accounts for departmentalized reporting.
Allows daily automatic posting to appropriate accounts.
Allows recurring journal entries.
User can process transactions two periods into next year.
Unlimited number of accounts.
Up to 10 year account history.
Allows budgeting.

ACCOUNTS RECEIVABLE
Open invoice and/or balance forward.
Allows unapplied payments and multi-company accounts receivable.
Handles credit limits, collection status and payment discounts.
Supports partial payments and finance charges.
Allows unapplied credit memos.
Up to 5 user-defined aging periods.
Customized text on user-designed statements.
Mailing labels and reports with 7 different sorts.

INVENTORY
Supports LIFO, FIFO, weighted average or standard cost.
Supports markup, margin or list.
Allows up to 4 places to right of decimal for units, cost & price.
Supports any unit of measure.
Supports quantity price breaks.

SALES INVOICING
Supports service or product oriented businesses.
User defined tax tables, including multiple sales taxes.
User defined sales discount tables.
Prints packing slips.
Prints immediate invoices if needed.
Alerts user to customer exceeding credit limit.
Sales History Reports.
Customized text on user-designed invoices.
Automatic updating of inventory daily.
Prints sales journals.
Allows return credit memos.
Interfaces with General Ledger, Accounts Receivable & Inventory.

ACCOUNTS PAYABLE
Can post to 200 general ledger expense accounts per invoice.
Automatically updates inventory and general ledger daily.
Automatically prepares payments.
Supports partial payments and handwritten checks.
Supports prepaid expenses and future liabilities.
Processes credit and debit memos.
Computes discounts and records discounts taken.

PAYROLL
Generates automatic payroll.
Automatically posts to General Ledger and Accounts Payable.
Provides up to 15 user-defined rates.
Allows post facto payroll.
Allows distribution of payroll expenses to user-defined departments.
Benefits and deductions are calculated on fixed amounts, hourly amounts, percentage of gross or variable.
Allows additions to gross which may be taxable, nontaxable, or partially taxed.
Handles sick leave and vacations.
All tax tables easily updated by the user.
Handles payroll draws, per diem pay, contract and piece work, hourly and salary.
Handles tip accounting.
Prints 941As and W-2s.

HARDWARE REQUIREMENTS
IBM PC* or compatible.
HARD DISK REQUIRED.

ALL THESE FEATURES
ONLY
$99.50
+ Shipping & Handling
Introductory Price

To order CALL
(800) 344-2540
8:00 - 5:00 MST
Monday - Friday

COUGAR MOUNTAIN
S·O·F·T·W·A·R·E™
2609 Kootenai, Box 6886, Boise, ID 83707, 208-344-2540

CP/M* also available.

30 DAY MONEY BACK GUARANTEE
We guarantee the software to perform all of the features listed or money will be returned within 30 days.

250 PAGE DOCUMENTATION INCLUDED
MANUFACTURER'S SUPPORT AVAILABLE

*TRADEMARKS
IBM-International Business Machines
PC-DOS — IBM MS-DOS — Microsoft
CP/M — Digital Research

Circle 612 on reader service card

processor to offer automatic and accurate hyphenation. *Volkswriter 3*'s spelling checker is also maligned in the publisher's April column. Believe it or not, our dictionary does know the words *praetorian guard, West Covina,* and *Gardena.*

Ms. Crider criticizes *Volkswriter 3* throughout her review without an explicit reference point, only her personal preferences. We do not know if she is using a meaningful standard that is applicable to most users. The overall impression is that the program won't meet your needs.

But in *PC World*'s sister publication *InfoWorld,* John Lombardi, a professional reviewer who has tracked *Volkswriter* for years, described *Volkswriter 3* as "an ideal combination of ease of use, accessibility, power, and price." The program was given a rating of 7.7, 3 points higher than *1-2-3!* And Datapro Research Corporation, the watchdog of corporate America, concluded its painstaking ten-page lab analysis with, "For only $295, less than the price of any of its competitors, *Volkswriter 3* has become a powerful, full-featured word processing program that can rival any on the market as to ease of learning and use."

In David Bunnell's April column, Lifetree is unfairly criticized for abandoning the novice user. Our company has a tradition of concern for the plight of the user. Our free customer support team responds to 99 percent of all calls either on the spot or within 24 hours, earning us the rarely given rating of "excellent" in *InfoWorld.*

(continues)

Using Lotus 1-2-3 without Reflex is like driving at night without lights

If you use Lotus 1-2-3® you need Reflex, The Analyst,™ because it shows you what 1-2-3 either hides in the dark or can't show you at all. Reflex shows you relationships and interrelationships in your data that you can't afford to miss.

Reflex includes the best Report Generator for Lotus 1-2-3

Reflex includes the Report Generator that 1-2-3 should have included—but didn't. With Reflex, you can generate reports, graphs, charts and diagrams *from* your 1-2-3 worksheets that are impossible to generate *with* 1-2-3.

You can do sales reports, letters, memos, invoices and mailing labels—to name a few—and you can see a few of them on this page.

Generates professional reports instantly

Reflex is the best database for 1-2-3 users and it's also the easiest to use

Reflex is the first database that separates the trees from the forest. The first database that understands that what you see depends on how you look at it.

The first database that probes relationships, then shows them to you in various graphic forms: scatter, line, bar, stacked bar and pie charts. The first database to break the bonds of traditional database management and give a dramatic visual turn to data analysis.

Reflex makes graphic leaps far beyond 1-2-3. With Reflex, when you look, you see.

Reflex gives you five new and different views of what's hidden in your 1-2-3 worksheets

Form View, List View, Graph View, CrossTab and Report View.

Form View lets you create your database. List View shows you your data in tabular list form, just like a spreadsheet. Graph View gives you instant interactive graphic representations. CrossTab View gives you amazing "cross-referenced" pictures of the links and relationships hidden in your data. Report View allows you to use information from 1-2-3, and then print out reports in all sorts of different formats.

The commands for all five Views are consistent—so you're not stuck learning five different ways to get something done. And because Reflex uses advanced windowing techniques, you can see several views on the screen at the same time—without having to switch back and forth. You get the picture, and the pictures, all at once.

Whether you're a 1-2-3 user or not, Reflex answers all your "What Ifs?" and leads you to the right conclusions

With Reflex when you modify a number all your Views—List, Form and Graph—are immediately updated, on-screen.

Let's say you're analyzing "Traveling Expenses by Salesperson" and you ask, "What if they stayed at a Motel 6¼ instead of the Presidential Suite of the Hotel Chic?" "Show me." So Reflex shows you.

"What if they could no longer order $100 wines, but had to stick to the stuff that matures in the truck?" "Show me." So Reflex shows you. Instant answers. Instant pictures. Instant analysis. Instant understanding.

Of course Reflex can do all of the above with or without 1-2-3. Reflex is a *complete* database management and analysis tool that stands on its own feet, and helps you stay on yours, because it's only $149.95!

Borland's $149.95 Reflex could be the best business investment you'll ever make

Buying 1-2-3 was a good idea. Reflex is an even better idea, because now you can see what you're doing, what you've done, and what you need to do.

Think of Reflex as an "automatic product," a "standard" that every up-to-speed PC owner should have on hand. It's only $149.95, and you get our 60-day money-back guarantee.**

We don't believe in copy-protection, but we do believe in quality, performance, and reasonable software prices. So keep driving your old 1-2-3, but get Reflex today, because then you can see where you're going.

"Everyone agrees that Reflex is the best-looking database they've ever seen"

Adam B. Green, InfoWorld

The next generation of software has officially arrived

Peter Norton, PC Week

YES! I want the best.

Rush me Reflex at:

$149.95

To order by phone, or for a dealer nearest you,

call (800) 255-8008

in CA call (800) 742-1133

____ Reflex(s) at $149.95 $ ____

Outside USA add $10 per copy
CA and MA res. add sales tax* $ ____

Amount enclosed $ ____

This price includes shipping to all U.S. cities

Payment: VISA MC Bank Draft Check

Credit card expiration date ___/___

Card # |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

You must have an IBM or true compatible running DOS 2.0 or later.*
My computer's name and model is:

The disk size I use is: ☐ 3½" ☐ 5¼"

NOT COPY PROTECTED
****60-DAY MONEY-BACK GUARANTEE***

Name: _____

Shipping Address: _____

_____

City: _____

State _____ Zip _____

Telephone _____

CODs and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by credit card or International Postal Money Order.

**YES, if within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.

Minimum System Requirements:
384K, runs on IBM PC, XT, AT, PCjr and true compatibles.

R23

BORLAND INTERNATIONAL

Vive la différence

4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX: 172373

Reflex is a trademark of Borland/Analytica Inc. 1-2-3 is a registered trademark of Lotus Development Corporation. IBM, PCjr, and AT are registered trademarks, and XT is a trademark of International Business Machines Corp.

Borland products include Turbo Pascal, Turbo Prolog, Turbo Database Toolbox, Turbo Lightning, Turbo Graphix Toolbox, Turbo Tutor, Turbo GameWorks, Turbo Editor Toolbox, Word Wizard, Reflex, The Analyst, SideKick, SideKick, The Macintosh Office Manager, Traveling SideKick, and SuperKey—all of which are trademarks or registered trademarks of Borland International, Inc. or Borland/Analytica, Inc. Copyright 1986 Borland International BI-1031D

©Copyright 1985 Licensed Material-Program property of BORLAND/Analytica, Inc., 4585 Scotts Valley Drive Scotts Valley CA 95066. Unauthorized use, duplication or distribution is strictly prohibited by Federal Law.

Circle 481 on reader service card

ACTUAL SIZE.

ACTUAL PRICE.

Introducing The Turner Hall™ Card. The lowest priced complete 256K memory expansion board you can buy.

We made it so inexpensive by using the very latest 256K RAM chips instead of four times as many 64K chips.

That same technology makes the Card fit in a half-length PC/XT™ slot. And the reduced chip count increases reliability, so we can offer a 30-day money-back guarantee and 1-year warranty.

The Card comes with a clock/calendar with replaceable battery backup, illustrated Owner's Manual, and software including clock, print spooler, and disk emulator.

That's everything the most popular multifunction boards have. Except a couple of extra ports and a lot of extra cost.

IBM® or Compaq® owners will find the Card remarkably easy to install. And if you have any questions after you buy, call our Help Hotline.

The Turner Hall Card is just $99.95, plus $2.00 shipping ($12.00 outside of U.S.A.).*

Order by phone. We accept MasterCard or Visa. Or send us a check or money order with your business card attached.

Turner Hall Publishing
10201 Torre Ave., Cupertino, CA 95014

1-800-556-1234 x526.
(In CA 800-441-2345 x526).

**CA residents add 7% sales tax ($7.00). Requires IBM PC, PC/XT, Portable PC, or Compaq with at least 256K of memory. Turner Hall is a trademark of Turner Hall Publishing. IBM is a registered trademark, and PC/XT is a trademark of International Business Machines Corp. Compaq is a registered trademark of Compaq Computer Corp.*

Circle 415 on reader service card

Two years ago, when warranties were not the standard industry practice, Lifetree began offering a money-back guarantee on defective software.

While we sympathize with Armstrong's trials in learning to use a word processor for the first time, we assert that his chief problem was caused by numerous PC incompatibilities in the Tandy 1000. Let us conclude by reiterating that the reader has been misled by *PC World*'s comments on *Volkswriter 3*. Editorial freedom implies a responsibility to provide the user with meaningful, hard-hitting, fair, and accurate reviews of products, not ones built on prejudice, half-truths, and outright errors. *PC World*'s irresponsibility hurts not only Lifetree but the users we so happily support, and we are saddened at being the victim of a magazine we have supported from its infancy.

Camilo Wilson
President
Lifetree Software

The purpose of a review is to convey the highlights—negative and positive—of a given product and to evaluate its performance and appropriateness. Novice and expert users alike depend on the recommendations of reviewers. They likewise understand that reviewers' opinions differ and that features or bells and whistles are ultimately less important than how well the product can meet the users' needs.

Today's word processor users are more sophisticated and less

(continues)

Because you need the right word, the right phrase, the right meaning, and the right answer, *right now*, you need Borland's Turbo Lightning

Since you write, think, work, live, breathe, and ask questions, you need the instant electronic support of Turbo Lightning™—the fastest, most amazing information system since your brain.

You need the power of an astonishing program that checks your spelling *as you type*. The versatility of a program that gives you instant access to the 50,000-word Random House® Thesaurus and the 80,000-word Random House Concise Dictionary. The retentiveness of a program that remembers your name and any other words you teach it. The adaptability of a program that lets you do all of the above—while you run other programs. And of course the growth path of a program that is rapidly developing into a body of fully-fledged electronic reference works called the Turbo Lightning Library.™

Turbo Lightning checks your spelling as you type and while you run other programs

You could be running Lotus 1-2-3,® MultiMate,™ MicroStar,™ Reflex,™ SideKick,® WordStar,® or WhatEver,* it doesn't matter which one, because as you write, Turbo Lightning watches how you spell every word, and is ready to alert you to any mistakes.

So let's say your neighbor, who already has 23 unmatched sets of plastic flamingos on his front lawn, a broken boat trailer, and a mattress, has now brought back a coyote from a hunting trip. It howls all night, and you're writing a letter involving the word IDIOT, but you accidentally typed IDOIT. What happens then? You immediately *hear* a beep, so you know something's up. You instantly *see* a window that doesn't list IDOIT, but it does list IDIOT and its sound-alike words, so your screen window looks like this:

```
A. IDIOT
B. IDIOTS
C. IDIOM
D. IDIOTIC
E. INDICT
F. IDIOMS
G. ADD WORD TO AUXILIARY DICTIONARY
```

So you move your cursor to A, which is the correct spelling for IDIOT, hit return, and the spelling mistake is instantly fixed.

Turbo Lightning also gives you instant synonyms

IDIOT was the word you planned to use in your note next door, but is it the best word? And should you use that particular word since your neighbor fools around with his guns when he's full of whisky (which is every night), and besides that, he's 6'10", a black belt, *and* your cousin?

Because you have Turbo Lightning's Random House Thesaurus at your fingertips, you can look at the *synonyms* for IDIOT. Type in IDIOT and what you see is:

```
- NOUN -
A. CRETIN
B. MORON
C. HALF-WIT
D. BLOCKHEAD
E. JERK
F. NITWIT
G. FOOL
```

Any one of which expresses your opinion of your cousin's mental stature. So write the letter, but *don't mail it!*

Turbo Lightning won't forget your name

Teach Turbo Lightning your name and it's there—correctly spelled—forever. So are all the other names and words you teach Turbo to help run your business and personal life.

You can get Turbo Lightning for an incredibly low $99.95

Just $99.95 gets you Turbo Lightning, which is an incredible deal when you look at what you're getting: the access system or *engine* that powers the first two volumes and *future volumes* of the Turbo Lightning Library.

And for only $149.95, you can get *both* Turbo Lightning and the Word Wizard, which is so intriguing, you'll probably be up half the night. And if that happens, sneak next door around 4A.M., unchain the coyote, and let it run away!

NEW INTRODUCING WORD WIZARD,™ KEY TO THE LIGHTNING ENGINE™

Word Wizard shows you how to access, hook into, and work with Turbo Lightning's engine. It's the technical reference guide to the Turbo Lightning engine—but a guide which we've lightened up with games.

You get Turbo Pascal® source code with the Word Wizard, and all the technical guidance you'll need to start and run Lightning's engine.

Word Wizard's games include thousands of ways to jumble, scramble, unscramble, twist, turn, and boggle your mind. It solves what seem to be unsolvable crosswords and even lets you write cipher from the standard numbers on your telephone dial. Word Wizard challenges you, your family, the entire office—or whomever—to new tests of mental agility and wordsmanship. Sold separately, Word Wizard is only $69.95, or get it with Turbo Lightning ($99.95 separately) for only $149.95!

BORLAND INTERNATIONAL

Vive la différence

4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX: 172373

"No other spelling checker I've used even begins to approach Lightning in speed, convenience, and versatility

Henry Kisor, Chicago Sun Times

Lightning's good enough to make programmers and users cheer, executives of other software companies weep

Jim Seymour, PC Week"

YES! I want the best.

Send me Turbo Lightning and Word Wizard at:

$149.95*

To order by phone, or for a dealer nearest you,

call (800) 255-8008

in CA call (800) 742-1133

___ Turbo Lightning(s) and Word Wizard(s) at $149.95	$ ___
___ Turbo Lightning(s) at $99.95	$ ___
___ Word Wizard(s) at $69.95	$ ___
Outside USA add $10 per copy CA and MA res. add sales tax	$ ___
Amount enclosed	$ ___

This price includes shipping to all U.S. cities

Payment VISA MC Bank Draft Check

Credit card expiration date ___/___

Card #

†You must have an IBM or true compatible running DOS 2.0 or later.

My computer's name and model is:

The disk size I use is: ☐ 3½" ☐ 5¼"

NOT COPY PROTECTED

****60-DAY MONEY-BACK GUARANTEE**

Name:

Shipping Address:

City:

State: Zip:

Telephone:

CODs and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by credit card or International Postal Money Order.

*Special Bundle Price

**YES, if within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department and we will gladly arrange a refund.

†**Minimum system requirements:** 256K Hard disk recommended. Runs on IBM PC, AT, XT, PCjr, and true compatibles. Word Wizard requires Turbo Lightning software.

L23

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

Turbo Lightning, Turbo Lightning Library, MicroStar, Reflex, and Word Wizard are trademarks, and SideKick is a registered trademark of Borland International, Inc. IBM is a registered trademark of International Business Machines Corp. Lotus 1-2-3 is a registered trademark of Lotus Development Corp. MultiMate is a trademark of MultiMate International Corp. Random House is a registered trademark of Random House, Inc. *Whatever is not anyone's trademark.
Copyright 1986 Borland International BI-10380

Circle 480 on reader service card

frightened by full-featured programs than they once were; they frequently push those programs to the limits of their functionality. Novices and experts demand and deserve good performance, especially in a competitive environment.

Despite Mr. Wilson's comments, my reference point is first-hand experience with dozens of programs. My judgment also results from having written several books on word processing and having trained hundreds of people to use word processors on the IBM PC. I have used Lifetree products for more than two years and am quite familiar with their strengths and weaknesses as well as those of competing products. —Janet Crider

Unfortunately, nothing in Mr. Wilson's letter can change the performance of Volkswriter 3 *as our reviewer evaluated it. Thus, we stand by our review.*

There is, of course, an element of subjectivity in any product review. We believe that the author's framework and perspective are absolutely appropriate; her viewpoint is that of an experienced and professional reviewer who has used many competing products. Furthermore, most, if not all, of the considerations Mr. Wilson found lacking were addressed in the review. In the author's defense, the "flippant headlines" were ours. Were they totally without foundation, they would indeed be tasteless. Alas, that is not the case.

Regarding the reviews in other publications Mr. Wilson cites, those really can't have any effect on our findings. Each publication or testing organization develops its own criteria for product evaluations.

We are sorry that Mr. Wilson feels he was victimized. However, when we provide "meaningful, hard-hitting, fair, and accurate reviews," we can't consider whether the manufacturer has supported us

(continues)

Network Your PC For Only $79.95

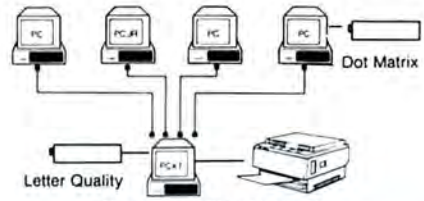
EasyLAN gives you the benefits of networking your PCs at a fraction of the cost—*$79.95 per computer.*

- *EasyLAN* lets you share expensive printers using standard print commands—at prices comparable to A-B switch boxes.
- *EasyLAN* operates across a single communications line, allowing you to transfer files in any direction. Every PC can be both a workstation and a server.
- Network operations are user transparent and take place in the background.
- Modem access with auto-dial and auto-answer is standard. *EasyLAN* provides password protection, disk/directory access restrictions and file locking.

"If it does all you need why spend more! It is the ultimate example of practicality in a local area network."
—PC Magazine.

Installation and Operation

Thousands of *EasyLAN* networks have been installed using our Network Install Process. *EasyLAN* commands such as EZDIR, EZCOPY, and EZTYPE are almost identical to DOS.



EasyLAN Office Network

"I brought access to a laser jet printer for $80."—**CONOCO Oil user.**

Specifications

- *EasyLAN* connects up to 18 PCs, XTs, ATs, PCjrs or compatibles using RS232 cables and ports. PCs can also be connected using port selectors, and digital PBXs.
- PCs operate to 19,200 baud; ATs to 56,000 baud.
- Memory required—20K bytes per attached PC.
- It's not copy protected.

"I look for products that make my job easier and save my company money. EasyLAN does both."
—Mini Micro Magazine.

Product Support

EasyLAN users have access to our responsive, professional support staff and the 24-hour on-line Product Support Center.

"The value is high, 🖳🖳🖳🖳 *"*
—InfoWorld Report Card

For Ordering & Configuration Help Call

1-800-835-1515

In CA 408/738-8377

Ask about the *EasyLAN* evaluation package

VISA **MasterCard** **COD**

Sample Prices & Order Form

			Amount
2 PC Network		$159.90	_____
3 PC Network		$239.95	_____
Additional PC's	@	$79.95 ea.	_____
2 Port Board		$219.95	_____
30' Cable		$49.95 Qty.____	_____
		TOTAL ORDER	_____

Server Technology, Inc., 1095 E. Duane Ave. Suite 107, Sunnyvale, CA 94086, Telex 5106003481

In Canada, GK Industries 514-694-7676
In England, Tashkl Computer Ltd 040-231 423

Circle 457 on reader service card

Step-by-step tutorial, demo programs with source code included!

Borland introduces Turbo Prolog, the natural language of Artificial Intelligence.

Prolog is probably the most powerful computer programming language ever conceived, which is why we've made it our *second* language—and "turbocharged" it to create Turbo Prolog.™

Our new Turbo Prolog brings supercomputer power to your IBM® PC and introduces you step-by-step to the fascinating new world of **A**rtificial **I**ntelligence. And does all this for an astounding $99.95.

Turbo Prolog is to Prolog what Turbo Pascal® is to Pascal!

Our Turbo Pascal astonished everyone who thought of Pascal as "just another language." We changed all that—and now Turbo Pascal is the de facto worldwide standard, with hundreds of thousands of enthusiasts and users in universities, research centers, schools, and with professional programmers, students, and hobbyists.

You can expect at least the same impact from Turbo Prolog, because while Turbo Prolog is the most revolutionary and natural programming language, it is also a complete development environment—just like Turbo Pascal.

Turbo Prolog radically alters and dramatically improves the brave new world of artificial intelligence—and invites you into that fascinating universe for a humanly intelligent $99.95.

Even if you've never programmed before, our free tutorial will get you started right away

You'll get started right away because we have included a complete step-by-step tutorial as part of the 200-page Turbo Prolog Reference Manual. Our tutorial will take you by the hand and teach you everything you're likely to need to know about Turbo Prolog and artificial intelligence.

For example: once you've completed the tutorial, you'll be able to design your own expert systems utilizing Turbo Prolog's powerful problem-solving capabilities.

Think of Turbo Prolog as a high-speed electronic detective. First you feed it information and teach it rules. Then Turbo Prolog "thinks" the problem through and comes up with all the reasonable answers—almost instantly.

If you think that this is amazing, you just need to remember that Turbo Prolog is a 5th-generation language—and the kind of language that 21st century computers will use routinely. In fact, you can compare Turbo Prolog to Turbo Pascal the way you could compare Turbo Pascal to machine language.

You get the complete Turbo Prolog programming system for only $99.95

You get a complete Turbo Prolog development system including:

- The lightning-fast Turbo Prolog incremental compiler and the interactive Turbo Prolog editor.
- The 200-page reference manual which includes the step-by-step Turbo Prolog tutorial.
- The *free* GeoBase™ natural query language database including commented source code on disk—ready to compile. GeoBase is a complete database designed and developed around U.S. geography. It includes cities, mountains, rivers, and highways, and comes complete with natural query language. Use GeoBase immediately "as is," or modify it to fit your own interests.

So don't delay—don't waste a second—get Turbo Prolog now. $99.95 is an amazingly small price to pay to become an immediate authority—an instant expert on artificial intelligence! The 21st century is only one phone call away.

Turbo Prolog 1.0 Technical Specifications

Programming System Features

- ***Compiler:*** Incremental compiler generating native in-line code and linkable object modules. The linking format is compatible with the PC-DOS linker. Large memory model support. Compiles over 2500 lines per minute on a standard IBM PC.
- ***Interactive Editor:*** The system includes a powerful interactive full-screen text editor. If the compiler detects an error, the editor automatically positions the cursor appropriately in the source code. At run-time, Turbo Prolog programs can call the editor, and view the running program's source code.
- ***Type System:*** A flexible object-oriented type system is supported.
- ***Windowing Support:*** The system supports both graphic and text windows.
- ***Input/Output:*** Full I/O facilities, including formatted I/O, streams, and random access files.
- ***Numeric Ranges:*** Integers: −32767 to 32767; Reals: 1E−307 to 1E+308
- ***Debugging:*** Complete built-in trace debugging capabilities allowing single stepping of programs.

YES! I want the best

Turbo Prolog at only:

$99.95

To order by phone, or for a dealer nearest you,

Call (800) 255-8008

in CA call (800) 742-1133.

Send me ___ Turbo Prolog at $ ____

Outside USA add $10 per copy
CA and MA res. add applicable sales tax $ ____

Amount enclosed: $ ____

This price includes shipping to all US cities

Payment: VISA MC Bank Draft Check

Credit card expiration date: ___/___

Card # | | | | | | | | | | | | | | | | |

*You must have an IBM or true compatible running DOS 2.0 or later.***
My computer's name and model is:

_____

The disk size I use is: ☐ 3½" ☐ 5¼"

NOT COPY PROTECTED
****60-DAY MONEY-BACK GUARANTEE***

Name: _____

Shipping Address: _____

_____

City: _____

State: _____ *Zip:* _____

Telephone: _____

CODs and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by credit card or International Postal Money Order.

**YES, if within 60 days of purchase this product does not perform in accordance with our claims, please call our customer service department and we will gladly arrange a refund.*

***** Minimum system requirements:***
IBM PC, XT, AT, PCjr, and true compatibles
384K RAM

SU23

BORLAND INTERNATIONAL

Vive la différence

4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX: 172373

Other Borland Products include Turbo Pascal, Turbo Tutor, Turbo Lightning, Turbo Database Toolbox, Turbo Graphix Toolbox, Turbo Editor Toolbox, Turbo GameWorks, SuperKey, SideKick, SideKick, The Macintosh Office Manager, Reflex, The Analyst, and Traveling SideKick—all of which are registered trademarks or trademarks of Borland International, Inc. or Borland/Analytica, Inc.
Turbo Prolog and GeoBase are trademarks and Turbo Pascal is a registered trademark of Borland International Inc. IBM and AT are registered trademarks of International Business Machines Corp. Copyright 1986 Borland International BI-1046D

Circle 479 on reader service card

or not. After careful scrutiny, we have found that no charge of unfair treatment can be substantiated. –Ed.

My column accurately reported on the experiences of a new user. It was not intended to be a review of a specific product or an attack on either Lifetree Software or Tandy. My target was the entire personal computer industry, which has failed miserably to make products that new and experienced users can operate without a great deal of frustration. This state of affairs is evidenced by over 200 letters from PC World *readers recounting similar experiences with a multitude of products. In general, Lifetree and Tandy are two of the better companies in our industry.*
–David Bunnell

Corrections

In the review of *Volkswriter 3* ("The More Things Change . . . ," *PCW*, June 1986), the statement that the program uses <Ctrl>-*key* commands like *WordStar*'s was inaccurate. While the menu is reminiscent of *WordStar*'s, commands are invoked with a single key. The review also stated erroneously that *Volkswriter 3*'s automatic reformatting feature assembles columns of numbers into a paragraph when reformatting a page. The reviewer suggests a more accurate phrasing: "The numbers will be shifted from the decimal tabs on which they were aligned." We regret any inconvenience caused by these errors.

Letters should be mailed to Letters, PC World, *555 De Haro St., San Francisco, CA 94107, or sent electronically to MCI Mail PCWORLD, CompuServe 74055,412, The Source STE908, or Direct-Net 500. We reserve the right to edit letters. All letters must include the writer's name, city, and state and should not exceed 300 words.*

THE BEST PC TEXT EDITOR JUST GOT BETTER.

ANNOUNCING SPF/PC™ 1.82

The best full screen editor for the IBM PC now extends support for large files to all PC's, not just the IBM/AT. Invoke your favorite program/compiler from within Edit at any time regardless of file size. CTC's SPF/PC™ 1.82 still looks like its mainframe cousin but executes faster with more options.

NEW FEATURES

- **PAGING** - Editing limited only by capacity of expanded/extended memory or hard disk.
- **SPEED** - Search 1,500,000 byte file with IBM AT in less than 13 seconds. By comparison, the IBM 3081 mainframe takes 48 seconds.

$195
UPGRADES only $50
ADD $6 shipping
Canada $10, Foreign $15

MasterCard VISA

Payment in U.S. funds by check or bank wire (Bank of America, San Francisco account 05583-05454). Net 30 to D&B rated firms.

- Compatible with IBM and Novell Networks
- Modifiable HEX display
- Line length to 954 bytes

Minimum Requirements: DOS 2.00-3.10, 192KB memory, any IBM PC or true compatible or TI Professional.

CTC
Command Technology Corporation
1900 Mountain Boulevard
Oakland, California 94611

TO ORDER SPF/PC . . . . .
Telephone: (415) 339-3530
Telex: 509330 COMMAND TECH

Circle 879 on reader service card

Borland is radically changing Games by letting *you* radically change the Games. Source code included for Chess, Bridge, and Go-Moku!

With Turbo GameWorks™ and your IBM®PC (or compatible), you quickly learn all the shortcuts, secrets, and strategies of playing, writing, and rewriting state-of-the-art computer games—and have fun doing it.

Turbo GameWorks includes 3 games you can play today

1. Turbo Chess: Maybe you're the chess expert Bobby Fischer's been hiding from, and you figure "*No computer's going to beat me.*" Right? Wrong. While it's true that until now computer chess games belonged in arcades, Turbo Chess is much more sophisticated and cunning.

You can play at 6 different levels—from beginner to master—and either learn the game from scratch or discover new strategies that will improve your already great game. Your computer can "go first" or you can—in fact, you can trade places. Turbo Chess can solve "mate" puzzles, and you can create game situations, then watch the computer play out every possible move.

George Koltanowski, Dean of American Chess and former President of the United States Chess Federation said, "*What impressed me most was the fact that with this program you can become a computer chess analyst. You can add new variations... make the program play stronger and stronger chess... there's no limit to how it can help you improve your game.*"

2. Turbo Bridge: You can play Turbo Bridge against your computer or against up to 3 living/breathing humans. You decide which hands the computer should play, and if you're feeling generous, you can elect to let the computer cheat by looking at all the hands on the table.

You can ask the computer for a hint or tell it to play out the hand automatically. A screen window lets you quickly check current scores, and Turbo Bridge will keep score for the entire rubber. If you're a bridge nut, you'll love it.

3. Turbo Go-Moku: Some people call the game "five in a line," and some call it "Pente®" or "fancy tic-tac-toe," but for centuries the Japanese have called it Go-Moku. An intriguing strategy game, Go-Moku is played on a 19X19 squares board. You and your computer take turns placing O's and X's on a grid. Five in a row—horizontally, vertically or diagonally—wins the game, *but don't bet the farm against the computer!*

Whether you plan to simply play the games or play around with the games, you get all three games *and* the source code *and* the manual *and* our 60-day money-back guarantee** for only $69.95.

Turbo GameWorks shows you how to tinker with your new toys

Let's say you've got house guests who've already stayed a month and *you* thought they'd be there a week. They love to play games every night, which is nice—but they hate to lose as much as they hate to leave.

So when they're not looking, *fix* the games. Rig 'em. Get into the source code. Have *your* version of Turbo Chess make moves they've never seen before. Or do the same to Bridge or Go-Moku. Make them crazy. It's easy to do.

You have all the Turbo Pascal® source code, a simple 143-page instruction manual, *and* the desire.

Deny sabotage, be gallant in victory—say you're sorry to see them get so upset over losing every night, say that it's "*only a game*" and that they're always welcome to come back "*some day.*" And even if you don't have a House Guest Crisis, fool around with the games anyway. Changing them is as much fun as playing them. With Turbo GameWorks and only $69.95, all things are possible.

"With Turbo GameWorks, you're on your way to becoming a master chess player.

George Koltanowski, Dean of American Chess; former President, United States Chess Federation

Now play the world's most popular card game—Bridge... even program your own bidding or scoring conventions.

Kit Woolsey, author; twice Champion of the Blue Ribbon Pairs"

YES! I want the best

Rush me Turbo GameWorks at:

$69.95

To order by phone, or for a dealer near you,

call (800) 255-8008

in CA call (800) 742-1133

Send me ____ Turbo GameWorks at $ ____

Outside USA add $10 per copy
CA and MA res. add sales tax $ ____

Amount enclosed $ ____

Prices include shipping to all U.S. cities

Payment: VISA MC Bank Draft Check

Credit card expiration date ____/____

Card #

†You must have an IBM or true compatible running DOS 2.0 or later.

My computer's name and model is:

The disk size I use is: ☐ 3½" ☐ 5¼"

NOT COPY PROTECTED
*****60-DAY MONEY-BACK GUARANTEE***

Name:

Shipping Address:

City:

State: *Zip:*

Telephone:

CODs and purchase orders WILL NOT be accepted by Borland. Outside USA make payment by credit card or International Postal Money Order.

***YES, if within 60 days of purchase this product does not perform in accordance with our claims, please call our customer service department and we will gladly arrange a refund.*

†Minimum System Requirements: *192K Runs on IBM PC, XT, AT, PCjr, and true compatibles.*

GM23

BORLAND INTERNATIONAL

Vive la différence

4585 SCOTTS VALLEY DRIVE
SCOTTS VALLEY, CA 95066
(408) 438-8400 TELEX: 172373

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

IBM is a registered trademark of International Business Machines Corporation. Pente is a registered trademark of Parker Brothers. Copyright 1986 Borland International BI-1054

Circle 552 on reader service card

From the Father of Personal Computers Comes...

A New Set of Building Blocks For The Creative Mind.

Introducing DataBlocks™ – A Modular Computerized Personal Control System.

Dr. Ed Roberts, creator of the first personal computer, the Altair, introduces a new functional concept for Robotics and Computer Enthusiasts, OEM's and Engineers.

The DataBlocks A-II™ modular control system features stackable modules (blocks), which plug together in any customized combination.

The A-II Control System interfaces with any standard data terminal or terminal program.

The unique DataBlocks hardware, coupled with its user-friendly PCL™ (Process Control Language) make monitoring and personal control of virtually any device or function, easier and more affordable.

To order your A-II control system and a **free software tool kit**, call today: DataBlocks toll-free **1-800-652-1336**. Georgia residents call **1-912-568-7101**.
VISA and Mastercard accepted.

DataBlocks

DataBlocks, Inc.
579 Snowhill Road
P.O. Box 449
Alamo, GA 30411

Circle 591 on reader service card

Available blocks include:
1. Central Processor Unit
2. System Memory
3. PROM/RAM Memory
4. RAM Disk
5. PROM Disk
6. PROM Programmer
7. Parallel Input/Output
8. Dual Serial I/O
9. Stack Power Supply
10. Floppy Disk Controller
11. Floppy Disk Drive
12. Hard Disk Controller
13. Hard Disk Drive
14. Voice Synthesizer
15. Voice Recognition
16. Control Master
17. Interrupt Expander
18. Stack LCD Display
19. Stack CRT Controller
20. Stack Graphics Control
21. Stack Relay
22. Stack 16 channel A/D
23. Stack Dual D/A Driver
24. Stack Dual D/A
25. Stack 1Amp Driver
26. Stack 4Amp Driver
27. Stack Wire Wrap Board
28. Slave Relay
29. Slave 16 channel A/D
30. Slave Dual A/D Driver
31. Slave Dual D/A
32. Slave Universal
33. Slave LCD Display
34. Slave Parallel I/O
35. Slave DC Driver 1Amp
36. Slave DC Driver 4Amp

Specifications subject to change without notice.

Starter set (not shown) from $480.
Additional blocks from $100.

THE COMPETITION IS GOOD SO WE HAVE TO BE BETTER!

NOW YOU HAVE THE BEST CHOICE

IN IBM PC/XT COMPATIBLES AT BIG SAVINGS.

$597

$799

TURBO-JET PC

Dual Speed 8088-2 (4.77 & 8 Mhz) 70% faster than regular PC. Runs all major IBM PC/XT Software
640 K RAM installed on board
One 360 K Half-height DS/DD Drive
Floppy Disk Controller
AT style Keyboard (84 Keys-3 LED indicators) 135 Watts Power Supply w/4 connectors
8 slots Motherboard w/8087 Socket
Can be expanded with any option. Please call.

ABOVE COMPUTER WITH 20 MB HALF-HEIGHT HARD DISK SUB-SYSTEM

NSTALLED & FORMATTED... **$1097**

30 Day Money-Back Guarantee
Completely Assembled & Tested

For Orders Call
1 (800) 447-0441
inside California call
1 (818) 901-0441

ONE YEAR LIMITED WARRANTY
Assured by COMPUTER SERVICE CENTER Granada Hills, Ca.

Vogue Imports Inc. Since 1973
16123 Valerio Street, Van Nuys, CA 91406

* Monitor not included — IBM is a trademark of International Business Machines

Dealer inquiries welcomed

TURBO-JET PC-2

- Dual Speed 8088-2 with NEC V-20
  3 Times faster than regular PC/XT
- Runs all major IBM PC/XT Software
- Mono/Graphics/Printer Card (Hercules Compatible) on board. Or if you prefer Color/Graphics/PrinterCard can be installed at no extra charge.
- Floppy Disk Controller for up to 4 Drives.
- For our new MULTI I/O Card on board combining Floppy Disc Controller, Clock/Calendar, 2 Serial Ports (1 Optional), a second Printer port and a game port add $59.
- 640 K RAM installed on mainboard. Combined with above cards, makes our TURBO-JET PC-2 the most complete as there is no need for expensive add-on cards for memory or I/O options.
- One 360 K Half-Height Best Rated TEAC or MITSUBISHI floppy drive with gray bezel to match the AT Style Case. Additional Drive $109 installed.
- Choice of KEYBOARDS (5160 or 5151 Type)
- 135 Watts Power Supply w/4 connectors.
- Beautifully designed AT Style Steel Case.
- 8 Expansion Slots, of which 5 or 6 are vacant (depending on configuration desired) for plenty of future expansion for Hard Disk, Modem, Tape backup, etc. Of course, we will help you expand.

OPTIONS

1. HIGH RESOLUTION TTL MONITOR (GREEN OR AMBER), NON-GLARE SCREEN WITH ITS OWN TILT & SWIVEL STAND $129.
2. 20 MB HARD DISK SEAGATE ST-225 HALF-HEIGHT WITH SHORT CONTROLLER CARD. INSTALLED & FORMATTED $495.
3. INTERNAL 300/1200 EVEREX MODEM, HAYES COMPATIBLE, INSTALLED $199.

FOR OTHER OPTIONS...PLEASE CALL

WANT TO UPGRADE YOUR PRESENT PC ? WRITE OR CALL FOR OUR COLOR CATALOG FULL OF THE NEWEST PC PERIPHERALS AT TREMENDOUS SAVINGS.

Circle 522 on reader service card

THE FASTEST LINK

FROM MICRO TO MAINFRAME

BARR/HASP: POWERFUL, VERSATILE, EASY TO USE

for the IBM PC, XT, AT and compatibles includes software, synchronous adapter board and manual

The BARR/HASP Intelligent Communications package provides more than just a connection— it's powerful enough to drive multiple high-speed printers for volume printing, yet versatile enough to print checks and invoices on any size printer. With the menu-driven software, you can perform all program functions accurately, easily, and without lengthy training.

BARR/HASP emulates a full function IBM 3777-2 and HASP on the 360/20. Print speeds on single and multiple printers range from 30 cps to beyond 2,400 lpm (7,000 lpm on the PC AT). Line speeds range from 1,200 to 9,600 Baud on dial-up and to 19,200 Baud on a dedicated line. With the PC AT, you can achieve a new speed record for a microcomputer—*56,000 Baud*—and drive even the fastest laser printers at maximum efficiency.

All tasks—printing, plotting, sending jobs, and using the console—operate simultaneously from a single PC. Such high performance translates into instant savings. BARR/HASP now replaces expensive, cumbersome Remote Job Entry workstations —and does it for a fraction of the cost.

Host Systems:	MVS/JES2 MVS/JES3	VM/RSCS VS1/RES	NOS/RBF MVT/HASP
Requires:	128K synchronous modem		

You'll find the BARR/HASP manual complete and refreshingly intelligible. But should you have a question, BARR's technical experts are just a toll-free phone call away.

FREE 30-DAY TRIAL

See for yourself how the BARR/HASP Link can work for you. For a free 30-day trial, call

800-BARR-SYS
(800-227-7797)
in FL, call 904-371-3050

$890

BARR SYSTEMS, INC.
Suite M, 2830 NW 41st Street
Gainesville, FL 32606

Circle 317 on reader service card

Control Systems ARTIST™ Series

A Family of High Performance Graphic Display Controllers

ARTIST 10™	ARTIST 1 PLUS™	ARTIST Transformer™	ARTIST Monochrome™	ARTIST 1™	ARTIST 2™
1024 x 1024 256 Colors 64MHz	1024 x 1024 16 Colors 64 MHz	640 x 480 16 Colors 30 MHZ	1024 x 768 4 Shades 64 MHz	1024 x 768 16 Colors 40 MHz	640 x 400 16 Colors 24 MHz

42 Software Products to Back Us.

3D—Shaded Images	Architectural CAD	Graphic Art	Mechanical CAD	Electronic CAD	Business Graphics
Personal Designer Software *by Computervision*	CADVANCE *by CalComp*	ARTBRUSH *by Control Systems*	AutoCAD *by Autodesk*	RGRAPH *by APTOS Systems*	Speaker Support PLUS *by Meta-4, Inc.*

Call Toll Free for Sales and Service
1-800-826-4281
in Minnesota call
612-631-7800

Control Systems™

2675 Patton Road
P.O. Box 64750
St. Paul, MN 55164

Circle 562 on reader service card

Before you invest in a DEC*VT240 terminal, consider the software alternative.

Stop and think about what you really need: A text terminal. Tektronix* graphics. ReGIS* graphics. File transfer capabilities. Communications.

Purchasing a state-of-the-art terminal may be one option, but Persoft has a smarter solution—**SmarTerm® 240,** the ultimate in terminal emulation software.

SmarTerm can do everything the state-of-the-art terminal can do—and more. That's why we call it **state-of-the-smart.**

With SmarTerm 240, the emulation is so exact you'll forget you're using a PC. It features superior text emulation, ReGIS graphics, Tektronix graphics, outstanding communications and file transfer capabilities.

You also get on-line help screens, remappable keyboard layouts and programmable softkeys which can simplify your most frequently performed tasks. You can even customize your own menus!

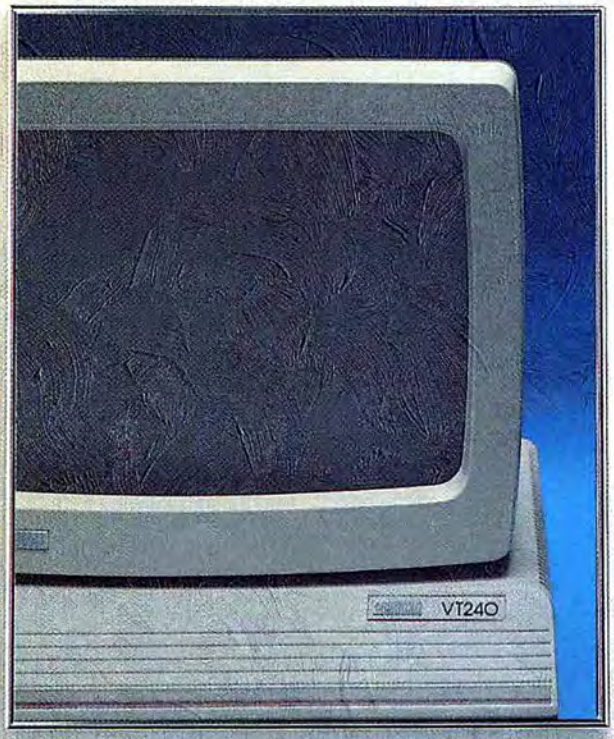
And because SmarTerm runs on your PC, you've always got a wealth of computing power right at your fingertips.

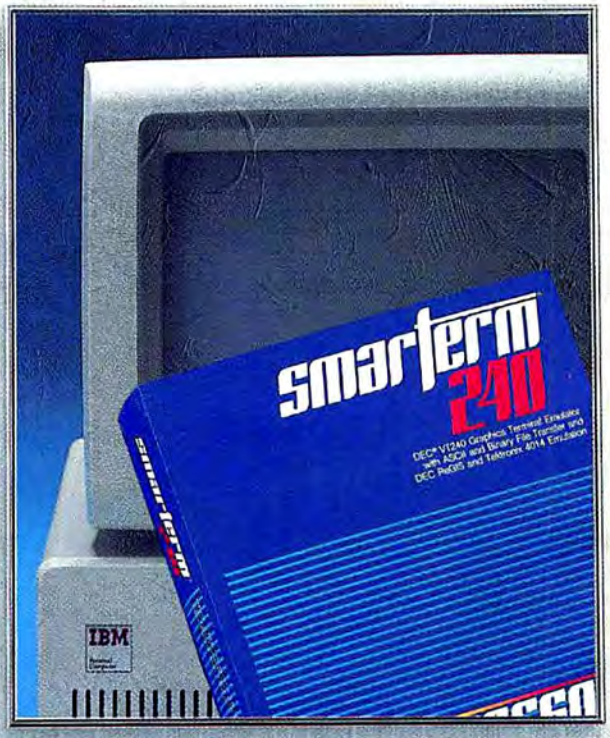
All SmarTerm products are backed by Persoft's strong technical support network. It's a service you expect from the industry leader in terminal emulation software.

No matter which terminal you're currently using—Data General Dasher* D400, Tektronix 4010/4014, DEC VT100, VT125, VT220 or even the new VT240, SmarTerm has a state-of-the-smart solution for you.

To find out more about the SmarTerm family of terminal emulation software, see your local dealer. Or contact:
Persoft, Inc.
2740 Ski Lane
Madison, WI 53713
(608) 273-6000 – Telex 759491

STATE OF THE ART VS STATE OF THE SMART





*SmarTerm is a registered trademark of Persoft, Inc. *DEC, VT and ReGIS, are trademarks of Digital Equipment Corp. *DASHER is a registered trademark of Data General Corp. *Tektronix is a registered trademark of Tektronix, Inc.
© Persoft, Inc., 1986. All rights reserved.

persoft

Circle 142 on reader service card

Jonathan Seybold

REMark: Desktop Publishing Fulfills Its Promise

This year's fad or an important new market? The dean of personal computer publishing thinks that this burgeoning new field will have a profound impact on the way people work and communicate.

About a year ago, John Scull stopped by my office for a visit. John had just been appointed to the then newly created post of manager of desktop publishing at Apple, and he wanted to talk about the market. He also wanted to talk about what to christen this new phenomenon of publishing via personal computers. At the time the concept was so new that there was no accepted vocabulary to describe it.

I argued strongly in favor of the phrase *desktop publishing*. John did not need much convincing; he was already leaning in the same direction.

Within six months the topic that had been so new it didn't have a name was suddenly on everyone's lips. Desktop publishing is the hottest thing since hula hoops. But will the interest fade as quickly as it materialized? Last year, windows. This year, desktop publishing. Next year, something else?

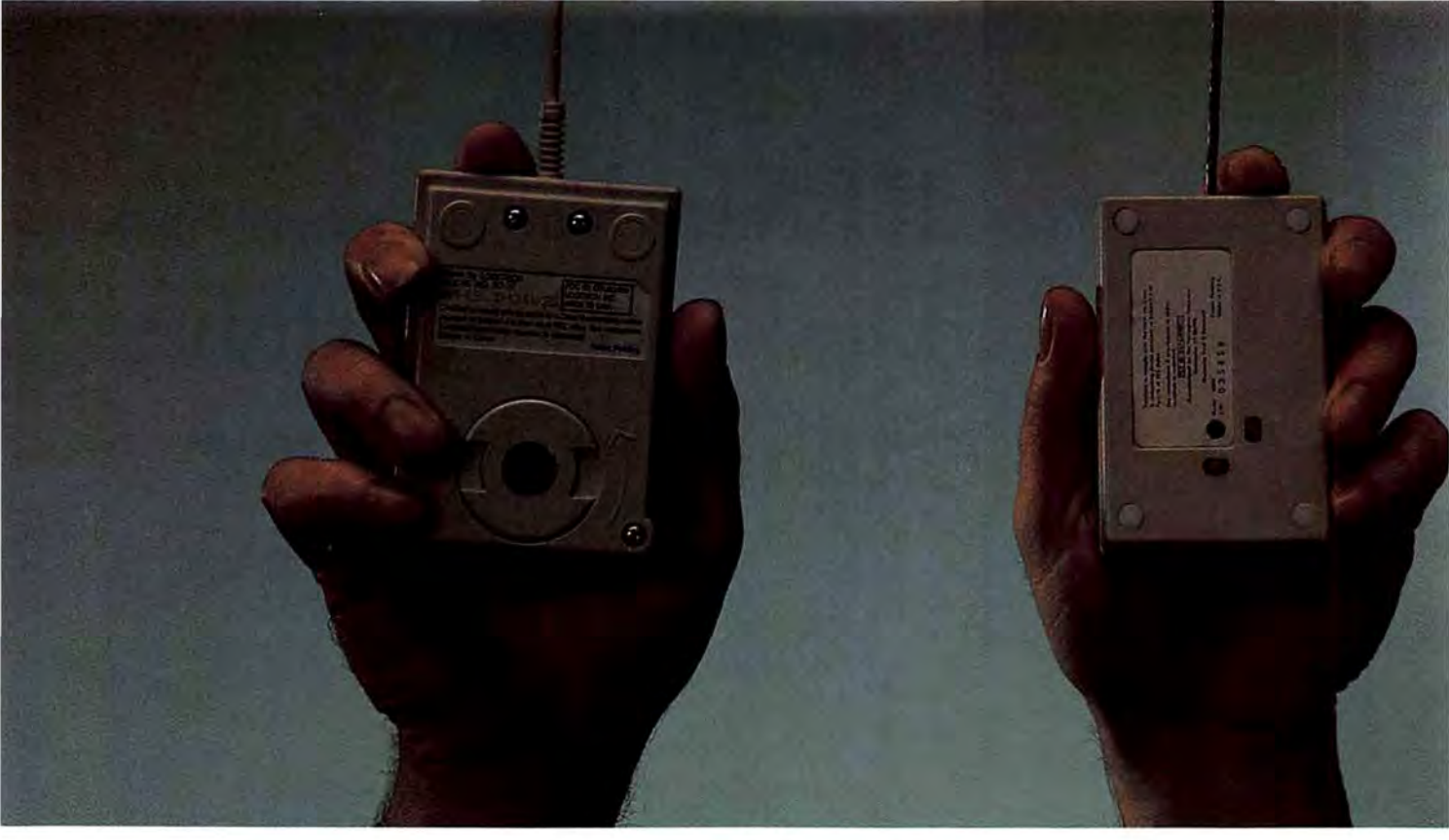
I don't think desktop publishing is a passing fancy. As with any hot new technology, there will be some excessive enthusiasm and more than a little uninformed conjecture. But I believe that the desktop publishing revolution is real and that it will have a significant impact on the way people communicate, on the publishing industry, and on the computer industry.

What distinguishes desktop publishing from word processing? Primarily, the quality of the output. The printers available for personal computers run the quality gamut from inexpensive dot matrix and daisy wheel printers to simple laser printers such as the HP LaserJet, more sophisticated machines like the Apple LaserWriter, and even phototypesetters.

But output quality calls for more than just a fancy printer. It implies the need for relatively sophisticated software that will set typographic characters, create and edit graphics, and format pages.

Can you do real publishing on a PC? You bet. When I started in this business more than 20 years ago, I used an RCA 301 computer with 20K of 6-bit memory. It filled

(continues)



PC MOUSE. THE

"...PC MOUSE offers the best combination of performance and software on the market," according to a recent INFOWORLD review.

It's the most accurate. It's the easiest to use. It works with the most software. It works best with your favorite software. It's the most trouble-free. And it's backed by the longest warranty.

All of which makes the right choice so obvious you could find it in the dark.

Works longest.

Turn over a mechanical mouse, and you'll see a rubber tracking ball. Unfortunately, it's also a dust and debris-attracting ball, which can gum up its own inner works.

But PC Mouse is optical. It uses light, not rubber, to measure movement, so it's always 100 percent accurate. There's no skipping. No slipping. No jitter. No moving parts to wear out. No cleaning. No maintenance. *And the only three-year warranty.*

Works hardest.

"Unlike Microsoft...the PC Mouse performs well with both mouse-based and keyboard-based software. The pop-up menus...are especially useful, and the PC Mouse is the only mouse we have found that satisfactorily supports spreadsheet work." — INFOWORLD 2-24-86

PC Mouse makes any software designed for a mouse perform at peak — from our own PC Paint Plus business graphics software to Microsoft™ programs like Word™ and Windows.™

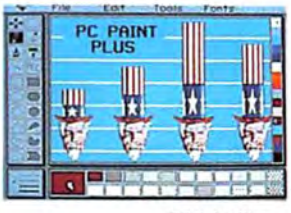
As for popular programs that were designed to work without a mouse, you'll wonder why they were.

Using Lotus 1-2-3™ with PC Mouse and our Pop-up

"...the only mouse we have found that satisfactorily supports spreadsheet work."
— INFOWORLD

Lotus 1-2-3

Microsoft Windows



PC Paint Plus

BRIGHT CHOICE.

The precision Mouse pad assures accuracy and a reliable work surface.

Menus you can now skip the function keys and commands. Just point at menu items. Forget tedious shifting in and out of numlock, too. Speed instantly from cell to cell. Create formulas faster. And get to the bottom line almost as quickly as you can move your finger to it.

PC Mouse lets you create or custom-tailor your own menus, too.

Works easiest.

"...and it rates a very good score in ease of use." — INFOWORLD again.

PC Mouse is easy to install and get started with. The precision Mouse pad insures accuracy and allows the mouse to take up less room on your desk than a mechanical mouse.

Put PC Mouse on the Mouse pad. PC Mouse is quieter. Easier to move. More comfortable to grip. The sculpted buttons are right where you want them.

And you're right where we want you. Because frankly, we don't believe you can buy another mouse after trying ours.

See the light.

Find out what we mean at your computer store. Just ask for PC Mouse — the mouse with the light.

And for substantial savings, buy PC Mouse together with PC Paint Plus and Ready!™

PC Mouse. Works longest. Works hardest. Works easiest. Insist on the bright choice.

Mouse Systems Corporation
2600 San Tomas Expressway
Santa Clara, CA 95051 408/988-0211

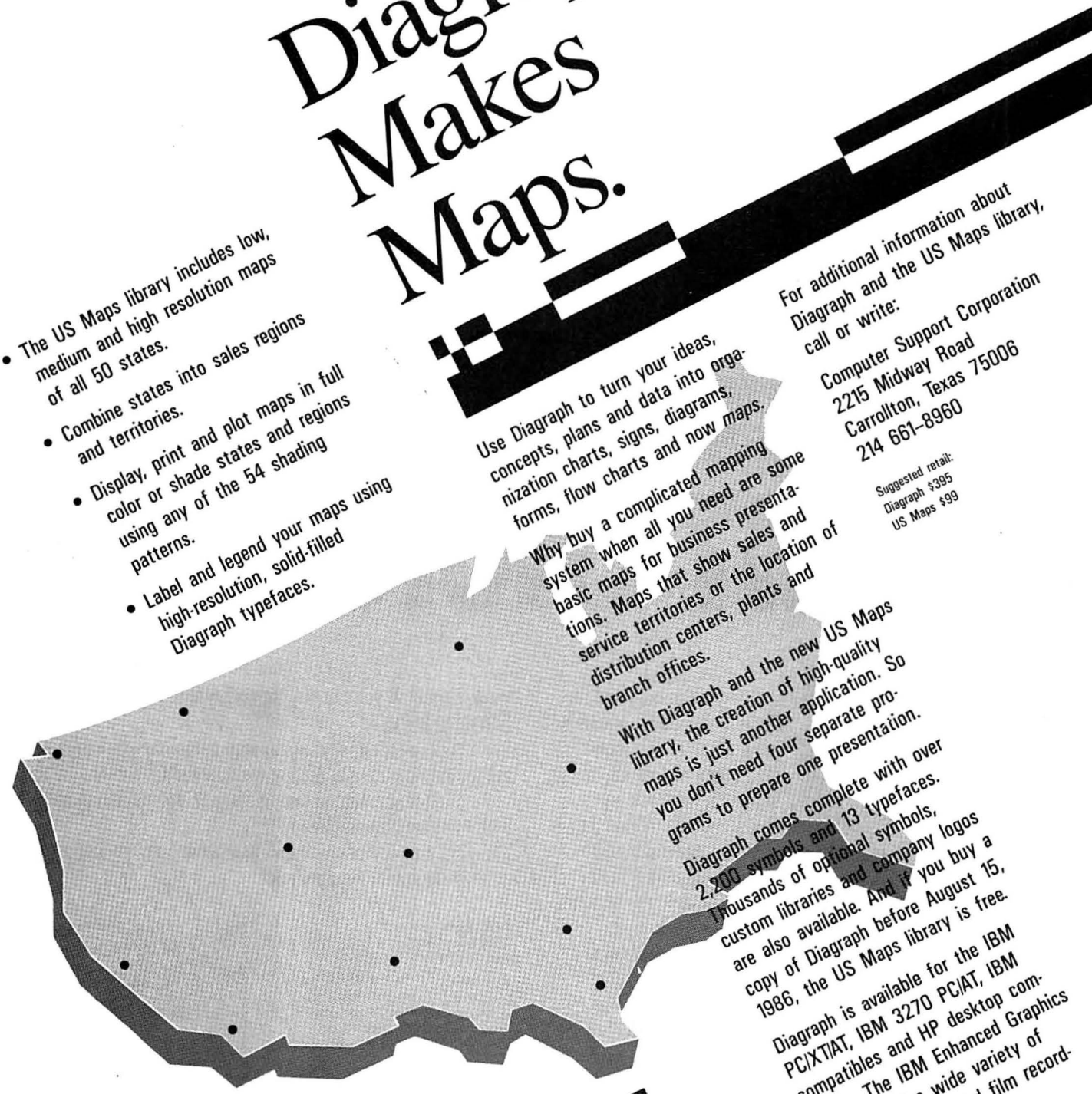
Mouse Systems is a trademark of Mouse Systems Corporation. Lotus 1-2-3 is a trademark of Lotus Development Corporation. Microsoft, Word, and Windows are trademarks of Microsoft Corporation. Ready! is a trademark of Living Videotext.

The mouse that's a system. From Mouse Systems Corp.

Circle 678 on reader service card

Diagraph® Makes Maps.

- The US Maps library includes low, medium and high resolution maps of all 50 states.
- Combine states into sales regions and territories.
- Display, print and plot maps in full color or shade states and regions using any of the 54 shading patterns.
- Label and legend your maps using high-resolution, solid-filled Diagraph typefaces.



Use Diagraph to turn your ideas, concepts, plans and data into organization charts, signs, diagrams, forms, flow charts and now *maps*.

Why buy a complicated mapping system when all you need are some basic maps for business presentations. Maps that show sales and service territories or the location of distribution centers, plants and branch offices.

With Diagraph and the new US Maps library, the creation of high-quality maps is just another application. So you don't need four separate programs to prepare one presentation.

Diagraph comes complete with over 2,200 symbols and 13 typefaces. Thousands of optional symbols, custom libraries and company logos are also available. And if you buy a copy of Diagraph before August 15, 1986, the US Maps library is free.

Diagraph is available for the IBM PC/XT/AT, IBM 3270 PC/AT, IBM compatibles and HP desktop computers. The IBM Enhanced Graphics Adapter and a wide variety of plotters, printers and film recorders are supported.

For additional information about Diagraph and the US Maps library, call or write:

Computer Support Corporation
2215 Midway Road
Carrollton, Texas 75006
214 661-8960

Suggested retail:
Diagraph $395
US Maps $99

Diagraph is a trademark licensed to Computer Support Corporation.

IBM is a registered trademark of International Business Machines Corporation.

Circle 257 on reader service card

an entire room. Today's PCs are infinitely more powerful, and contemporary software can produce first-class, professional-looking documents. The real trick (which the industry is still learning) is to combine the sophistication required to produce professional results with ease of use: That will make the technology available to ordinary mortals.

Who needs it? OK, so you can produce high-quality documents on a PC-based system. Isn't that a fairly specialized activity? Until now, it has been. Publishing has required expensive dedicated systems that in turn required considerable experience to operate. Now, all that has changed, and the floodgates have opened.

Not everyone needs a publishing system, but a great many people do. You do not need a desktop publishing system to write a letter or even a college term paper. Good clean typewriter-quality output is sufficient for those applications. But often you can communicate more effectively if you use typography, graphics, and aesthetic page layout. Until now, you have had two choices: Pay a high price in time, money, and loss of control to have documents typeset professionally, or (more likely) do without.

Now, almost anyone with a little bit of design sense can produce professional-looking documents.

What does desktop publishing mean to society? Desktop publishing is in keeping with the populist tradition that fueled the original PC revolution. Current technology enables small organizations, small

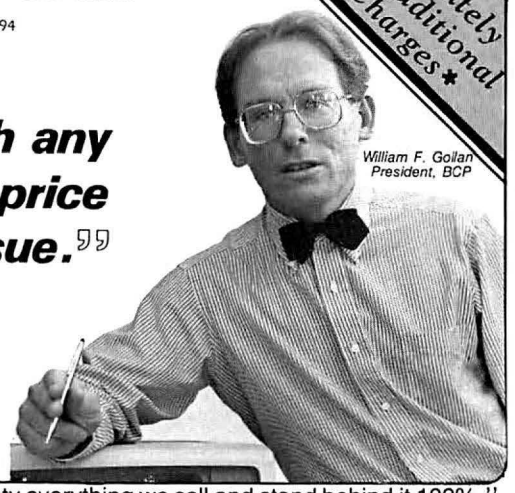
(continues)

BUSINESS COMPUTERS
OF PETERBOROUGH Gollan Co., Inc.
Upper Union St. P.O. Box 94
W. Peterborough, NH 03468-0094

Absolutely NO Additional Charges*

"We will match any mail order price in this issue."

"Our prices hide nothing*"



"We'll support, service, and warranty everything we sell and stand behind it 100%."

MODEMS

D.C. Hayes		Maxwell 1200B w/sw	244.95
Smartmodem 1200	374.95	Maxwell 2400	459.95
Smartmodem 1200B w/sc	349.95	Maxwell 2400B	454.95
Smartmodem 1200B½ w/sw	345.95	**US Robotics**	
Smartmodem 2400	579.95	Password 1200	209.95
Smartmodem 2400B	549.95	Courier 2400	399.95
Prometheus		**Ventel**	
Pro 1200	289.95	1200 ½ Card w/Crosstalk	354.95
Pro 1200B w/sc	249.95	2400 ½ Card w/Crosstalk	454.95
Racal-Vadic		2400 +	454.95
Maxwell 1200 w/sw	244.95		

PERIPHERALS

Amdek		P760	574.95
Color 600 RGB	399.95	3550	769.95
Color 722 EGA	529.95	8850	1079.95
AST		Multisync 1401 Monitor	559.95
Rampage PC w/2mB	529.95	**Okidata**	
Rampage PC w/256k	299.95	84	659.95
Rampage AT w/2mB	639.95	192	349.95
Rampage AT w/512k	444.95	193	484.95
Ramvantage AT w/3mB	679.95	292	509.95
Ramvantage AT w/128k	299.95	293	639.95
Advantage AT w/128k	369.95	**Orchid**	
Preview w/Flight Sim.	239.95	Conquest w/0k	264.95
6 Pac Prem. w/DV w/512k	CALL	Conquest w/2mB	529.95
6 Pac Prem. w/DV w/2mB	CALL	ESCELL AT w/Ok	379.95
EGA 3G MOD I	344.95	PC Net Starter	749.95
Citizen		PC Turbo 286E w/1mB	729.95
MSP 10 160	209.95	Tiny Turbo 286 (specify)	439.95
MSP 15 160	429.95	**Persyst**	
MSP 20 200	359.95	Bob 16	489.95
MSP 25 200	529.95	Bob	269.95
Premier 35	509.95	Bob MG w/P	189.95
Curtis Mfg.		Short MEM w/384k	199.95
Diamond	34.95	Stretch w/Ok	209.95
Emerald	39.95	Stretch w/2mB	479.95
Keyboard Ext. Cable 9'	29.95	**Plus Development**	
Mono Ext. Cable	37.95	Hard Card 10mB	659.95
PC Pedestal	34.95	**Princeton**	
Portable Pedestal	49.95	Max 12 E	174.95
Ruby	59.95	HX 12	429.95
System Stand	19.95	HX 12 E	499.95
Univ. Tilt	37.95	SR 12	569.95
Epson		**Quadram**	
LQ 800	569.95	EGA +	369.95
LQ 1000	699.95	Gold w/0k	359.95
LX 80 F/T	279.95	Gold w/640k	479.95
FX 85	409.95	Liberty PC w/Ok	224.95
FX 286	579.95	Liberty PC w/2mB	479.95
Hercules		Liberty AT w/128k	334.95
Color	159.95	Liberty AT w/2mB	589.95
Graphic's	294.95	Microfazer w/128k	169.95
Intel		New Exp. w/384k	244.95
Above Brd. PC w/64k	264.95	Q Vad Board AT w/128k	349.95
Above Brd. PC w/2mB	534.95	Silver w/0k	229.95
Above Brd. PS w/64k	294.95	Silver w/64Ok	339.95
Above Brd. PS w/1.5mB	499.95	**Sigma**	
Above Brd. AT w/128k	384.95	Color 400	429.95
Above Brd. AT w/2mB	654.95	Color EGA	399.95
Above Brd. AT w/4mB	1079.95	**Silver Reed**	
Iomega		Exp 400 P	219.95
Bernoulli 10 + 10	2229.95	Exp 500 P	219.95
Bernoulli 20	1999.95	Exp 550 P	319.95
Bernoulli 20 + 20	2799.95	Exp 800 P	669.95
Bernoulli 10mb (3 pac)	149.95	**STB**	
Bernoulli 20mb (3 pac)	189.95	Chauffeur	209.95
Kensington		EGA +	289.95
Master Piece +	124.95	**Tall Tree**	
Master Piece	97.95	Jram II w/Ok	159.95
Memory		Jram II w/2mB	409.95
64k & 256k (9)	CALL	Jram III w/Ok	209.95
Microsoft		Jram III w/2mB	469.95
Mouse Bus. w/PC Paint	134.95	Jram II AT w/Ok	209.95
Mouse RS232C w/PC Paint	134.95	Jram II AT w/2mB	469.95
Mountain		Jram III AT w/Ok	249.95
Drive Card 20mb	769.95	Jram III ATP w/2mB	529.95
Race Card-286	529.95	**Taxan**	
Mouse Systems		122 Amber	159.95
PC Mouse w/DR Hallo II	129.95	630 RGB (Reg. BOB)	449.95
NEC		640 RGB (Reg. BOB)	509.95
Elf 360	399.95	**Toshiba**	
560 XL Color	1099.95	321	509.95
P560	929.95	351	1019.95
P660	449.95		

BUSINESS SOFTWARE

Addison Wesley		Think Tank	99.95
True Basic	99.95	**Lotus**	
Alpha		1-2-3- V 2.0	CALL
Keyworks	53.95	**Meca**	
Arrays		Mng. Your $ V 2.0	104.95
Home Accountant +	69.95	**Micropro**	
Ashton-Tate		Wordstar Pro	244.95
All Products	CALL	Wordstar 2000	244.95
Borland		Wordstar 2000 + V 2.0	289.95
Holiday Pack (3)	79.95	**Microrim**	
Reflex DBMS	62.95	Clout 2.0	124.95
Sidekick CP	37.95	R Base 5000	339.95
Sidekick NCP	52.95	**Microsoft**	
Sidekick & Superkey	89.95	Access	159.95
Superkey	42.95	Basic	234.95
Traveling Sidekick	42.95	Basic Inter.	214.95
Turbo Game Wks.	41.95	Business Basic	259.95
Turbo Graphics	34.95	C	234.95
Turbo Lightning	59.95	Chart V 2.0	184.95
Turbo Lightning w/ww	CALL	Cobol 2.0	409.95
Turbo Pascal V 3.0	41.95	Fortran	204.95
Trubo Prolog	59.95	Macro Assem.	109.95
Turbo Tool Box DB	34.95	Multiplan V 2.0	119.95
Turbo Tool Box Editor	34.95	Pascal	179.95
Turbo Tutor	23.95	Project V 2.0	239.95
Word Wizard	34.95	Quick Basic	69.95
BPI		Windows	69.95
AR/GL/AP/PR (ea)	289.95	Word V 2.01	244.95
IC	394.95	**Microstuff**	
Break Through		Crosstalk V 3.6	99.95
Timeline V 2.0	244.95	Remote	99.95
Broderbund		Transporter	154.95
Graphics Lib. #1	27.95	**Monogram**	
Print Shop	39.95	$ & Cents V 2.0	104.95
Central Point		**Multimate Int'l.**	
Copy II PC	27.95	Advantage	254.95
Option Board	84.95	Multimate 3.31	214.95
PC Tools	27.95	**Norton Utilities**	
Compuserve		Norton Util. V 3.1	59.95
Subscription Kit	21.95	**Open Systems**	
Consumers		AR/AP/GL/PR/IC (ea)	309.95
Auditor V 2.0	94.95	Resource Mng. 1	159.95
Decision Resources		**Quarterdeck**	
Chartmaster	229.95	Deskview	69.95
Diagram Master	199.95	Desq	119.95
Map Master	229.95	**Satellite Software**	
Signmaster	149.95	Wordperfect 4.1	229.95
Digital Research		**Softstyle**	
Gem Collection	124.95	Print Works	43.95
Gem Desktop	34.95	Print Works Laser V 2.1	74.95
Gem Draw	144.95	**Software Group**	
Gem Word Chart	94.95	Enable	329.95
Entertronics		**Software Publishing**	
Chart	169.95	Harvard Total PM	244.95
Graphic's V 2.0	294.95	Harvard Pres. Graphics	239.95
Merge	104.95	PFS: PL, FL, GR, RP (ea)	79.95
Plotter	54.95	PFS: 1st Success	199.95
Evergreen		PFS: Write w/Spell	84.95
One Write +	149.95	**Sorcim/IUS**	
AR/AP/PR	159.95	AR/GL/AP/PR/IC (ea)	294.95
Fifth Generation		SuperCalc III V 2.0	194.95
Fast Back	119.95	SuperProject V 2.1	194.95
Fox & Geller		SuperProject +	269.95
dGraph III	149.95	**Springboard**	
dUtility III +	84.95	Clip Art V1, V2 (ea)	23.95
Quick Code III	149.95	Newsroom	39.95
Quick Index	54.95	**State of the Art**	
Quick MAC	64.95	AP/AR/GL/IC	359.95
Quick Report III	149.95	Invoicing	299.95
Funk		**Summit**	
Sideways V 3.1	42.95	Better Basic V 2.0	124.95
Graphics Communication		Btrieve Interface	69.95
Freelance	199.95	Clink Interface	69.95
Graphwriter Combo	309.95	Lotus 1-2-3 Interface	CALL
Howard Soft		Math Module 8087/80287	69.95
RE Analyzer	239.95	Run Time	164.95
Infocom		Virtual Memory Mng.	CALL
Cornerstone	89.95	**T Maker**	
Innovative		Clickart Publisher	109.95
SmartSystem	419.95	Laser Option	89.95
Spell Checker	79.95	**Unisom**	
Lifetree		Art Gallery I	25.95
Volkswriter Deluxe 3.0	149.95	Print Master	39.95
Volkswriter Scientific	264.95	**Wang**	
Living Videotext		Wordprocessor w/Key	439.95
Ready	54.95	**Xanaro**	
		Ability	279.95

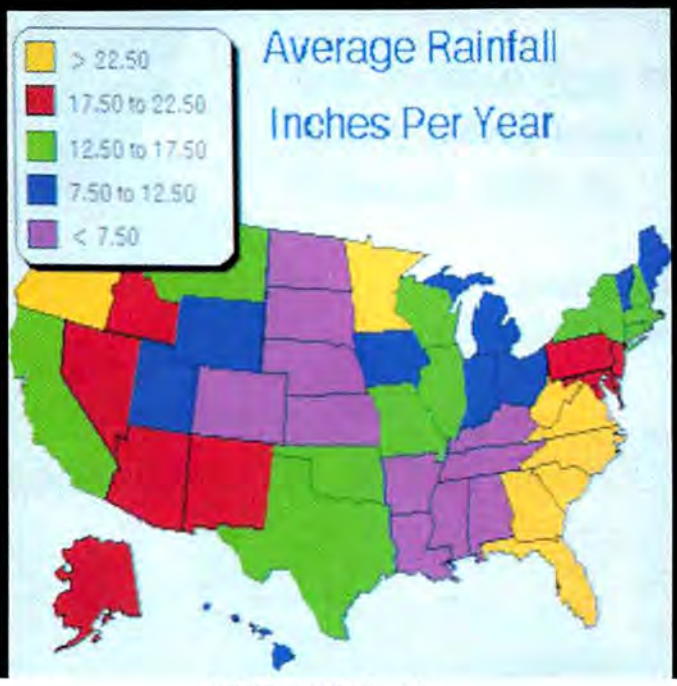
* Our Terms and Conditions
* Shipping UPS. Incl. in our price
* Handling. Incl. in our price

* Credit Card Surcharge 0%
* Purchase Orders: FOB NH, and hdlg

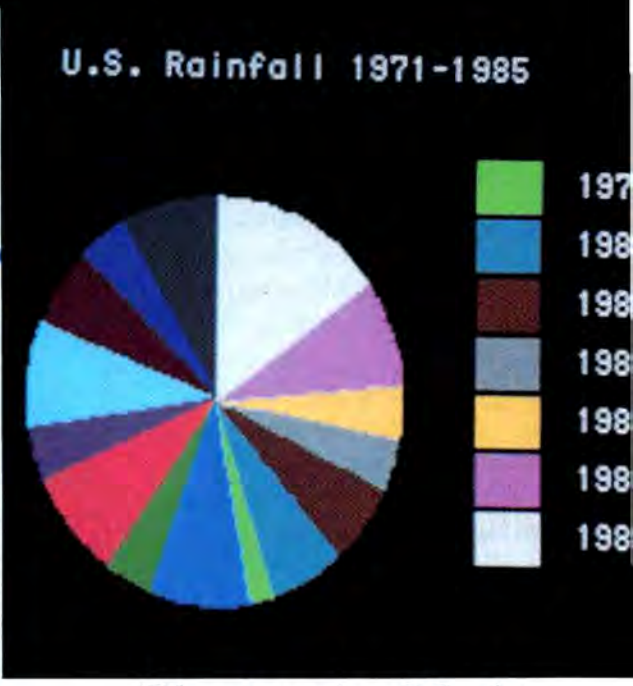
Customer Service (603) 924-9406

CALL TODAY—ORDERS ONLY 1-800-845-3003

Circle 235 on reader service card



EGA Mode



Plantronics Mode

Finally, An EGA Ca
Responds To Yo

Introducing The Paradise AutoSwitch™ EGA Card.

You've decided you want an EGA Video Card because it offers the best quality text with high resolution color graphics. The problem is that older versions of popular software, like Lotus 1A, (and some current versions too) won't work with the EGA standard. That's a problem because in the course of your workday you'll need to use software written for different video modes.

Paradise has the answer. The Paradise AutoSwitch EGA works with every popular PC video mode. And is smart enough to switch to the right mode every time you change programs. Automatically.

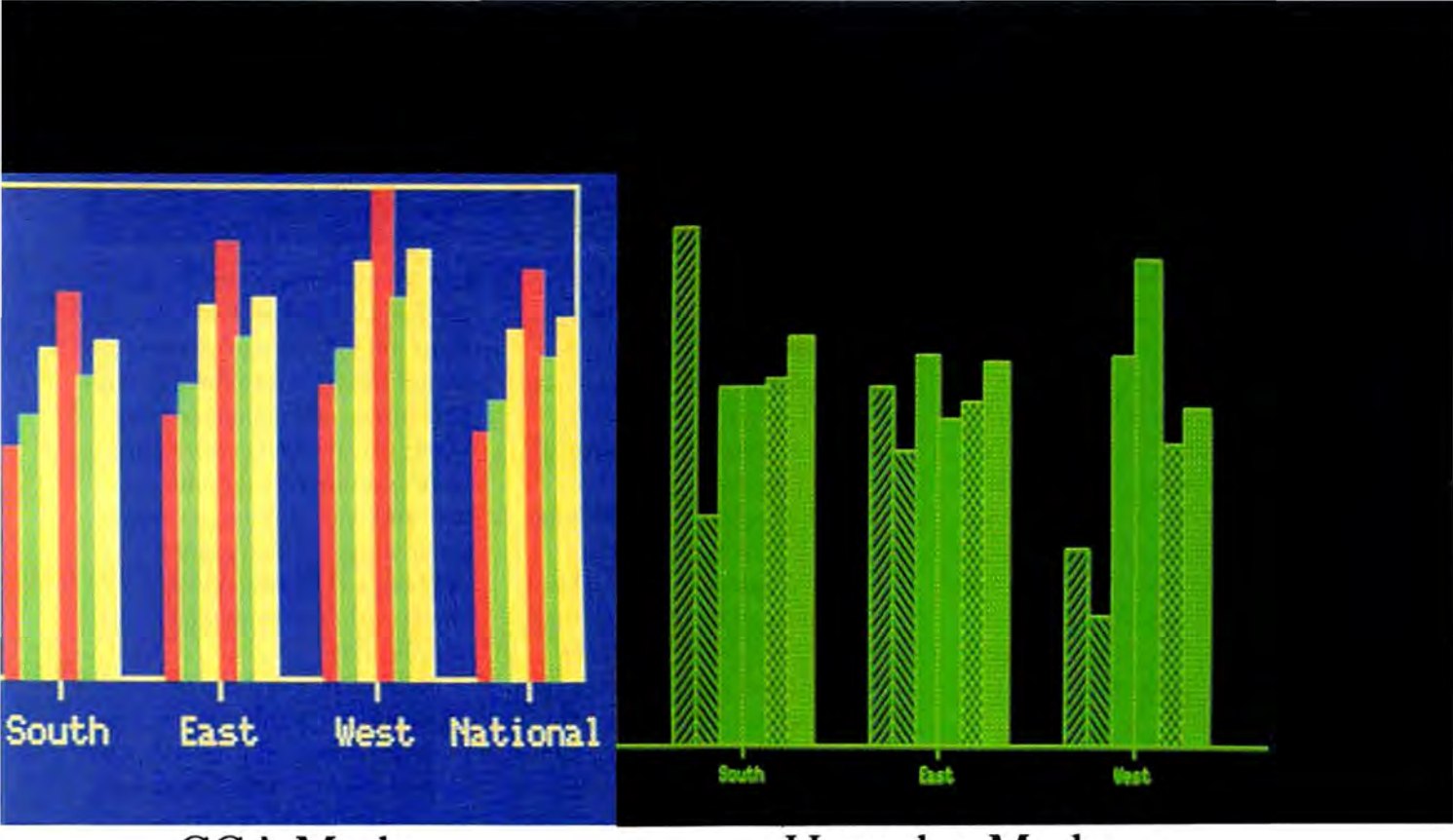
AutoSwitch. Only Paradise has it.

The Paradise AutoSwitch EGA changes video modes automatically to work with your software. No Mode commands. No special software to run. On RGB monitors it "autoswitches" between EGA, CGA (IBM Color Graphics) and Plantronics modes; on monochrome monitors between EGA, MDA (IBM Mono Text) and Hercules modes. The Paradise AutoSwitch EGA runs any PC software you want. Immediately. Automatically. That's something ordinary EGA Cards can't do.

Runs all EGA, CGA, MDA and Hercules Software with true hardware level compatibility.

True hardware compatibility makes the Paradise AutoSwitch EGA Card different from other EGA Cards. No other EGA Card offers the

Trademarks: Paradise, AutoSwitch EGA Card-Paradise Systems, Inc.; Lotus 1-2-3-Lotus Development Corporation; Registered trademark: IBM-International Business Machines Corporation.



CGA Mode

Hercules Mode

d That Automatically ur Every Mode.

6845 CRT controller included in the IBM Monochrome, IBM Color and Hercules Cards. The Paradise-designed PEGA video controller chip has the equivalent of a 6845 inside. That means when the Paradise AutoSwitch EGA runs EGA software, it's an EGA card; when it runs IBM Color Graphics (CGA) software, it's a CGA card; when it runs Hercules software, it's a Hercules card. No "batch files," special software or complicated installation. No incompatibility hassles. EGA with true 6845 hardware compatibility. Only from Paradise.

The Simpler the Better.

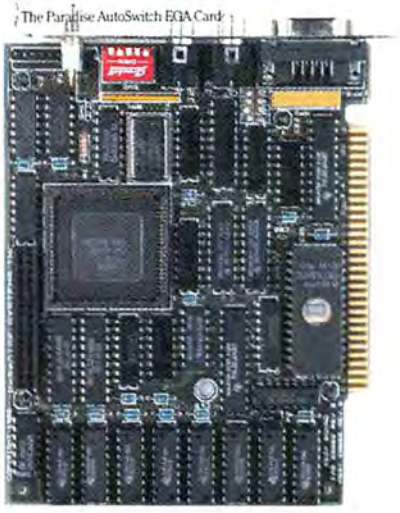
Paradise's exclusive AutoSwitch feature and true 6845 hardware compatibility make using the Paradise AutoSwitch EGA simple and hassle free. The Paradise-designed single chip EGA video controller makes possible all this functionality and intelligence on a short card. In fact, even the users manual is short. Only 24 pages.

The Paradise AutoSwitch EGA Card. Just what you would expect from the innovators in Video Technology.

PARADISE

SYSTEMS, INC

The Paradise AutoSwitch EGA Card



For more information call 800-527-7977 Ext. 349, toll free. From California, 800-822-2020 Ext. 349. Or stop by your favorite computer store.

work groups or departments within large organizations, and even individuals to take responsibility for publishing their own documents. The outcome will be shorter production cycles and a substantial improvement in the appearance of documents. In fact, the evidence suggests that desktop publishing technology has already brought an overall increase in the number of documents produced and in the variety of points of view expressed.

What does this mean for the computer industry? Justifying the purchase of a PC in terms of hard, measurable dollar savings is often difficult. But a desktop publishing system *can* be cost-justified. The price of a handful of outside typesetting jobs would easily pay for the equipment, and once you have it, you can use it for all those things that would never have been typeset in the past.

I think that desktop publishing systems will evolve into pretty substantial configurations. Most publishing applications are group activities: A number of people create text and graphics and page formats. This suggests that many systems will become part of multiuser networks that will have generous amounts of disk storage, devices such as input scanners, and a variety of printers.

I've made a list of all the technologies that should be included in a comprehensive look at desktop publishing. Besides PC hardware and publishing software, there's software for drawing, business forms, and computer-aided design; local area network hardware and software; graphic scanners and optical character recognition readers; add-on graphic displays; CD ROMs; and of course, printers, typesetters, fonts, and the like.

It's clear that desktop publishing is not just another application program to run on your computer. It represents an entirely new market for equipment purchases as well as software sales—just the

(continues)

"IF YOU'RE LEARNING C AND NOT USING ECO-C88, *YOU'RE WORKING TOO HARD!"*

Eco-C88 is a full C compiler for MSDOS machines. Everything you need is included in the low price of $59.95, including a full-screen editor. Here's what some reviewers are saying about the Eco-C88 C Compiler:

"Eco-C performed well on all the benchmarks, generating code that was quite comparable to that of compilers 10 times as costly."
Christopher Skelly, Computer Language, Feb., 1986

"This compiler does handle syntax errors much better than average - no avalanche of spurious messages here."
William Hunt, PC Tech Journal, Jan., 1986

"Eco-C88 is a high-quality package... convenient to use..."
Dr. David Clark, Byte, Jan., 1986

"Eco-C is definitely a bargain... it includes both the compiler and an excellent Turbo-style editor... a useful compiler for advanced applications, and will serve far beyond the beginning phase."
Gary Entsminger, Micro Cornucopia, April-May, 1986

The compiler comes with a standard library of over 200 functions, cc and "mini-make" utilities, ANSI language enhancements (e.g., prototyping), expanded user's manual, plus much more, all for the low price of only $59.95. Also ask about our support products!

If ordered with the compiler, the C library source code (excluding transcendentals) is $10.00 and the ISAM file handler (as published in the **C Programmer's Library,** Que Corp) in OBJ format is an additional $15.00. Please add $4.00 for shipping and handling. To order, call or write:

We've continually improved Microstat since it was introduced in 1978, and the latest release includes many new features you've wanted.

- Interactive and Batch Processing
- Expanded Data Management Subsystem with New Data Transforms
- Reading data files created by other programs (e.g., Lotus)
- 3 types of Analysis of Variance
- Time Series
- Crosstabs and Chi-Square
- Factorials, Permutations, and Combinations
- Hypothesis Tests
- Data sets that can exceed memory
- Multiple Regression (including Stepwise)
- Scatterplots (including best fit regression)
- Correlation Analysis
- 12 Nonparametric tests
- 8 Probability Distributions
- Descriptive Statistics
- Easy Installation

Microstat's algorithms have been designed to prevent numeric overflow errors and yield unsurpassed accuracy. Microstat's price is $375.00 including the user's manual and is available for the Z80, 8086, 8088 CPU's and CP/M80, CP/M86, MS-DOS, and PC-DOS. To order, call or write.

Ecosoft Inc.
6413 N. College Avenue
Indianapolis, IN 46220
(317) 255-6476 · 8:30-4:30

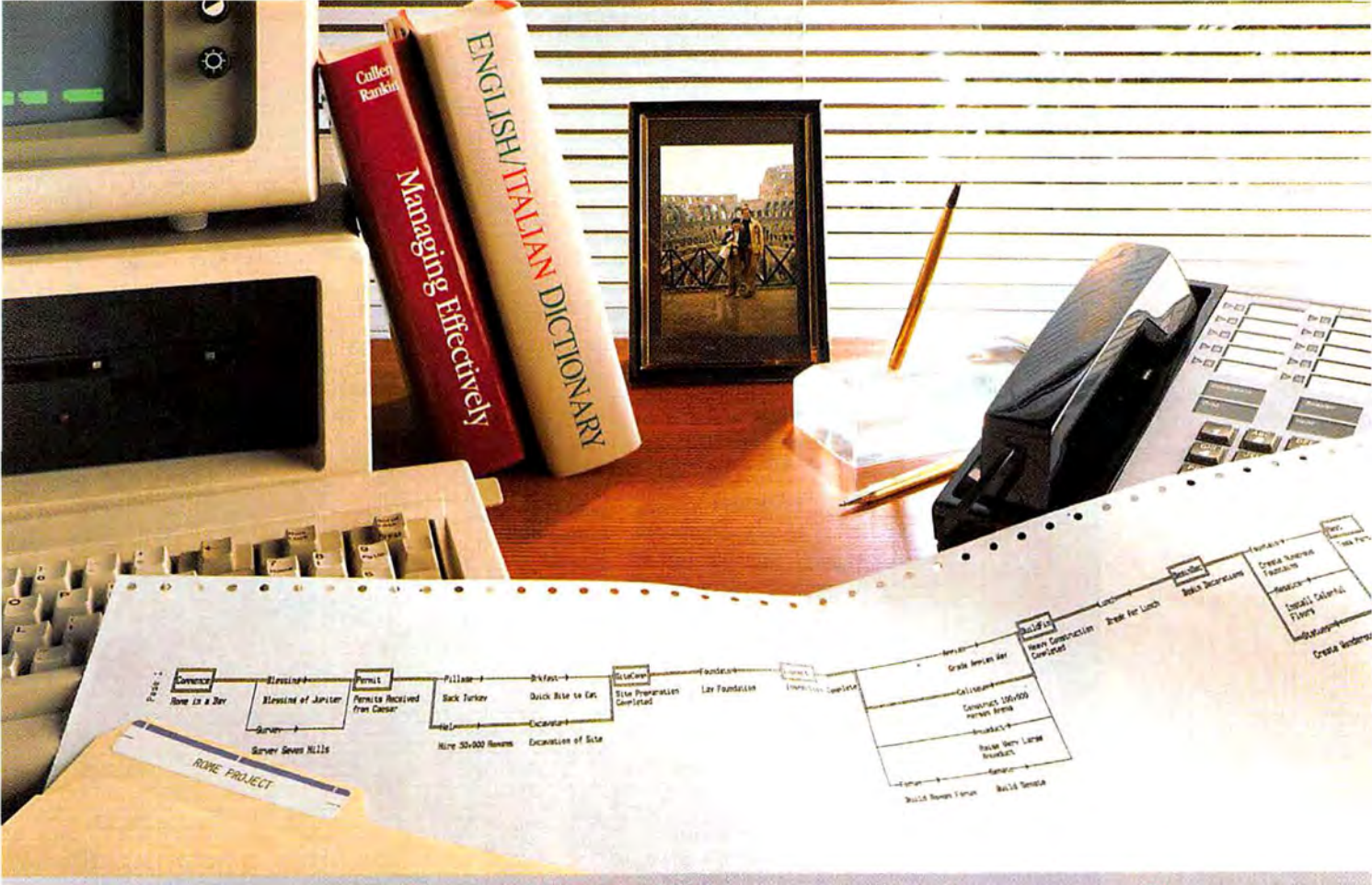
1-800-952-0472
(orders only)

ECOSOFT INC.

MasterCard VISA AMERICAN EXPRESS

Trademarks: Eco-C88, Microstat (Ecosoft), CP/M (Digital Research), MSDOS (Microsoft), PC-DOS (IBM), Z80 (Zilog), 8086, 8087, 8088 (Intel).

Circle 493 on reader service card



How to build Rome in a day.

Use the best project management software for empires of all sizes.

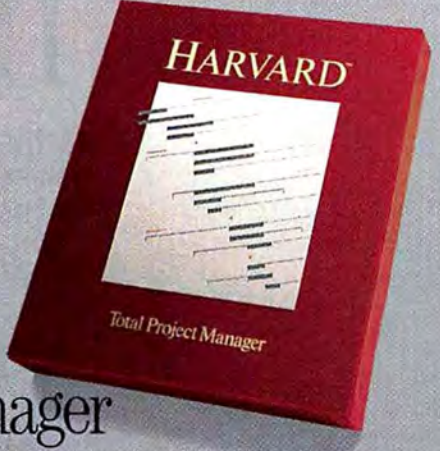
Whether you're launching a new product, constructing an office complex or planning to make history, Harvard™ Total Project Manager (HTPM) is the complete PC software program for anyone who wants to manage more effectively.

Successful project management starts with HTPM's intuitive roadmap (PERT Chart) which graphically demonstrates relationships between tasks and offers a clear view of the critical path. HTPM's Gantt Charts allow you to modify the project for the most efficient scheduling and resource allocation. You can also budget each task and compare actual costs to planned costs. If necessary, cost data can be transferred easily to Lotus™ spreadsheets. The flexible Project Calendar gives you the ability to define your workdays and tailor a project to fit your schedule.

Because most managers must juggle more than one project at a time, HTPM supplies a special feature that alerts you to over-committed resources, both within a project and across multiple projects, and helps you reallocate resources accordingly.

When a project requires the coordination of many people, good communication is vital. With HTPM you can produce comprehensive, presentation quality reports to keep the entire organization informed of the latest developments.

Any project can take on epic proportions when *you* are responsible for bringing it in on time and on budget. That's why every project manager needs HTPM. For planning, scheduling, controlling, and reporting, no PC software is as effective as Harvard Total Project Manager.



Graduate to Harvard Total Project Manager

Runs on IBM PC, Compaq, AT&T, Tandy, and other compatible MS-DOS computers. A product of Software Publishing Corporation, P.O. Box 7210, Mt. View, CA 94039-7210

Call for a **FREE** trial size disk today! Call 1-408-848-4391.

Smart.
Power *and* friendliness for custom applications.

The difference is power.

If there's one thing dBase users have learned — the hard way — it's that there's a huge difference between *power* and *usable power*.

Which, in a nutshell, is the difference between dBase III Plus and The Smart Data Base Manager.

Both are full-featured, multiuser data bases. But Smart is much easier to learn, easier to use, and easier to program. Not to mention faster and more functional.

That's not just our opinion. In March, *Software Digest* ranked Smart as the Most Powerful among all 15 leading relational data bases. Smart also topped dBase III Plus in tests of speed, versatility, error handling, and ease of learning.

Custom applica-

dBase III Plus is a trademark of Ashton-Tate.

The difference is more than power.

	Smart Data Base	dBase III Plus
• Reviseable Applications	Yes	No
• Multi-table Access	Yes	No
• Nested Menus	Yes	No
• Custom Reports	Yes	No
• Automatic Protection Against LAN "Deadly Embrace"	Yes	No
• Built-In Communications	Yes	No
• Not Copy Protected	Yes	No
List Prices:		
single-user	$ 495	$ 695
4 user-LAN	1,290	1,690
10 user-LAN	3,060	3,680

Ask for a Smart Demo-Pack.

Now for just $19.95, you can experience the complete Smart System on your single-user PC or on up to three LAN workstations.

The Demo-Pack includes all of Smart's powerful features, along with a complete set of disk tutorials. To order, just call toll-free 800-438-7627 and ask for Dept. WD (in Canada or Kansas call 913-492-3800).

Once you see the difference, you'll get Smart.

tions are painless with Smart. Its built-in programming language relies on simple English commands.

A powerful "Remember" feature lets anyone, even non-programmers, reduce long-winded routines to a single keystroke.

Smart also includes built-in asynchronous communications, custom menus, password protection, and a time-saving "Browse" mode.

There *are* two ways you could make Smart more powerful than it already is: (1) by adding it to any number of workstations on a local area network, and; (2) by integrating it with *The Smart Spreadsheet,* and *Smart Word Processor.*

The Smart Data Base Manager

© 1986 Innovative Software, Inc.

Circle 788 on reader service card

kind of thing that gets manufacturers interested in developing products.

Is desktop publishing for you? It depends. If you buy typesetting outside, you should definitely look at desktop publishing solutions. If you would like your documents to look more professional, you should consider desktop publishing. If you simply have to bang out letters and brief memos, it would be overkill.

But even if you never actually publish anything, you will benefit from the attention being paid to desktop publishing applications. Distinctions are blurring, and the PC publishing continuum embraces everything from crude dot matrix printer output that has monospaced fonts to the most complex high-quality output. Hardware and software capabilities will expand, and the cost of producing higher-quality documents will diminish.

This means that the distinctions between word processing and publishing will largely disappear, and virtually everyone will migrate toward higher-quality output and integration of graphics and text.

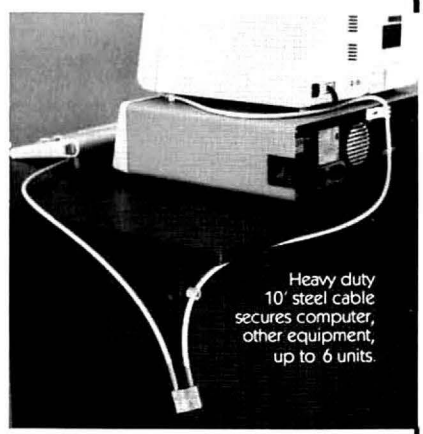
This year's fad? I sometimes worry that we see the evidence that we want to see. After all, we have been predicting the boom in desktop publishing for more than a decade, and there is a seduction in seeing your predictions come true. But even upon reflection, it seems to me that the current surge of interest in desktop publishing is really an example of the market suddenly catching up with long-standing trends. It's a vision that goes well into the future. ●

Jonathan Seybold has been working with computer-based publishing systems for more than 20 years. He is editor in chief of The Seybold Report on Publishing Systems *and president of Seybold Seminars, sponsor of The Desktop Publishing Conference.*

Prevent Computer Theft!

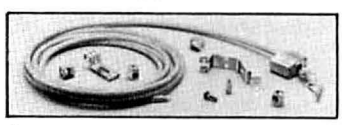
Käblit Systems

Unique Käblit fasteners attach to equipment without drilling, using existing screws. Cable passes through fasteners preventing removal. Cable is then locked. When ordering multiples, specify locks keyed differently or alike. Installs in 10 min. Over 80 college installations.



Heavy duty 10' steel cable secures computer, other equipment, up to 6 units.

Käblit works with: •Computers •Printers •Disk Drives •Typewriters •Stereos •Monitors •Lab Equip. •Televisions •Other



$54.95 postage paid. Quantity pricing also avail. for schools, institutions, businesses, etc. Send P.O. Money back if returned in 30 days.

EXCLUSIVE! Proprietary components prevent removal of mounting screws. (Pat. Pend.)

SECURE-IT Inc. 10 Center Square • E. Longmeadow, MA 01028
Phone orders 413-525-7039
Dealer Inquiries Invited

MasterCard VISA

Circle 886 on reader service card

AccountMate™

Easy, Effective, Flexible dBase III Software for all your accounting needs.

AccountMate+ Clipper

"One of the best dBase accounting packages available."
"The program is so well organized and well designed that it is almost possible to run the system without the documentation."
Paul Christiansen
Data Based Advisor

"I recommend AccountMate to all my clients. It is an excellent dBase III package."
Dan Du Port
Systems Consultant
Little Systems

Now you can sample AccountMate programs for yourself for only $25.00.

Free Source Code.
Now Available for UNIX PC.

General Ledger	395
Sales Order / Inventory	195
Purchase Order / Inventory	195
Accounts Receivable/Inventory	295
Accounts Payable	295
Payroll / State Tax Program	495
Time & Billing	295
Fund Accounting	395
Manufacturing Inventory Control	795
Working Demo	25

Multi-User dBASE III Plus™ Version Now Available! Call For Details

Integrated Accounting Software

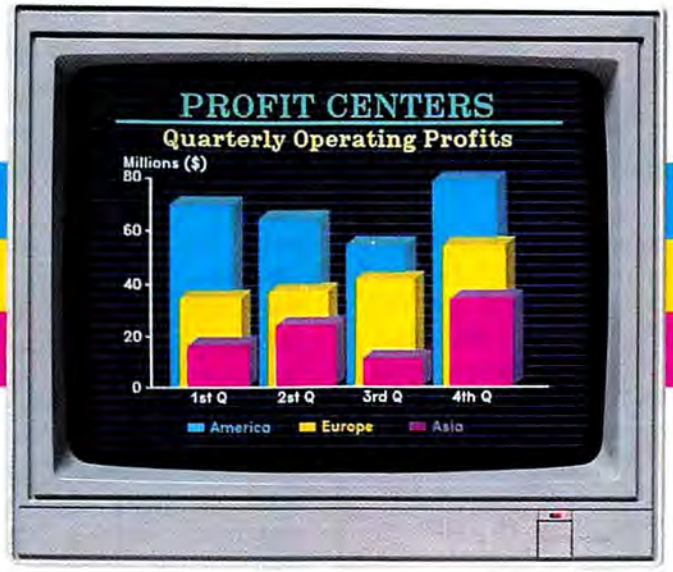
SourceMate™ INFORMATION SYSTEMS, INC.

800-762-7788 / 800-228-8896 CALIF. OUTSIDE CALIFORNIA

20 SUNNYSIDE AVE. MILL VALLEY, CA 94941 (415) 381-1011

Circle 449 on reader service card

Now with Freelance™



VideoShow MAKES Presentations

With VideoShow you'll make the best presentations of your career.

VideoShow is the only complete hardware and software presentation system available today. VideoShow:

Makes Your Presentations Powerful

Use 1000 colors to brighten your images... hundreds more than with any other PC-based system. Plus 5 times better resolution. Add VideoShow's dynamic visual effects and you are guaranteed high impact and professional quality.

Makes Presentations Easy

Select from a variety of software, and use your IBM® PC or compatible to create or update any chart, graph, diagram, or illustration in minutes. Even if you've never used a computer before and can't draw a straight line. All you do is fill in the blanks.

Makes Any Kind of Presentation

VideoShow lets you use any color monitor or video projector. Plus, you can get slides, overheads, or hardcopy. All in 1000 brilliant colors.

VideoShow Makes Sense

At $3150* it pays for itself after just a few presentations. And you get the superior quality previously available only from expensive services.

VideoShow Puts You in Control

No longer will your presentations be a terrific struggle. They'll just be terrific!

Find out about it. Call 1-800-556-1234, Ext. 234. In Calif., call 1-800-441-2345, Ext. 234.

VideoShow™
from General Parametrics, Berkeley, CA

*Suggested retail price for VideoShow 150.
IBM is a registered trademark of International Business Machines Corporation.

Circle 877 on reader service card

CAD — $299 !

Finally you can get a complete CAD package at a reasonable price! For only $299, ProDesign II provides the advanced features you get on CAD systems costing thousands of dollars. But there is another, very important reason you should get ProDesign II. ProDesign II is very unique among CAD packages. It is easy to learn and use. When we call ProDesign II "The Easy to Use CAD System", we're not joking. You will be productive with ProDesign II in an hour or two instead of a week or two.

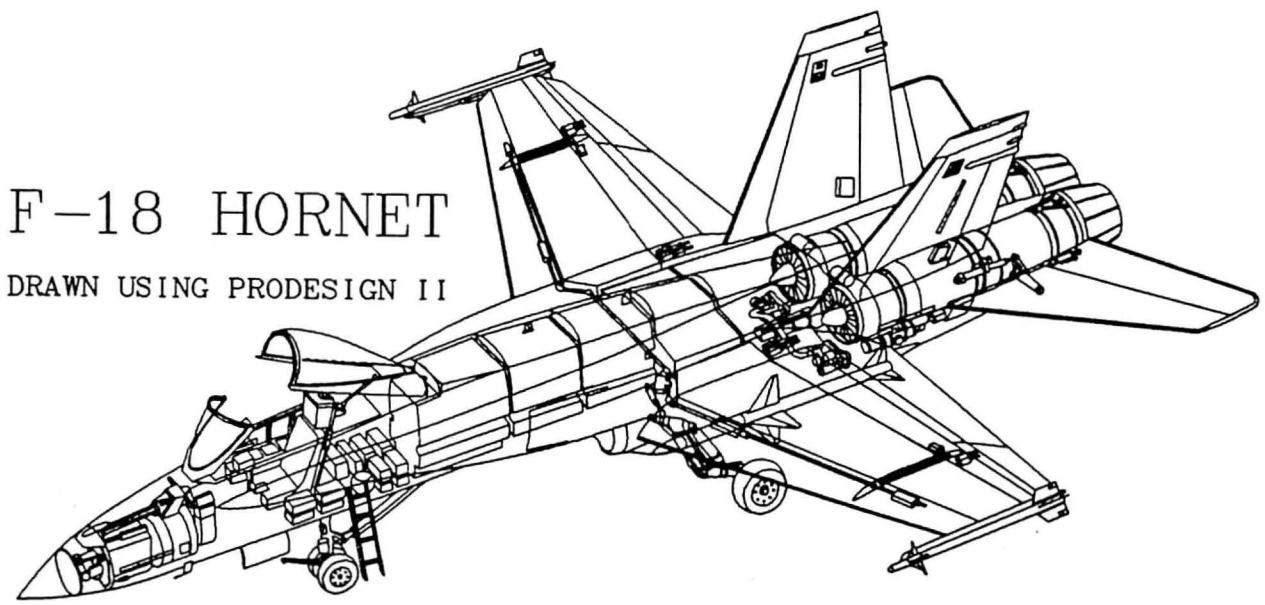
What else does ProDesign II offer? Compatibility. Compatibility with over 100 printers. Compatibility with over 50 plotters. Compatibility with most graphics adapters, digitizing tablets, and mice. Compatibility with most display adapters. Compatibility with any software that can produce HP plotter commands. Compatibility with mainframe CAD systems (IGES). All at no extra charge!

What additional hardware do you need? None! An IBM PC compatible and 512K RAM is all you need. ProDesign II produces high resolution drawings on your dot matrix printer — better than .005" resolution on an IBM/Epson compatible printer. In fact, the drawings on this page were printed on a $299 dot matrix printer! You don't have to get a mouse or digitizing tablet. ProDesign II is designed for easy and efficient keyboard use. You won't even need a math coprocessor, although it is supported. From a small drawing on a dot matrix printer to an E-Size drawing on a large plotter, ProDesign II is the one to use!

ProDesign II
Affordable, Compatible, and Usable!

Where can you get ProDesign II?
See your local computer dealer, or contact:

American Small Business Computers
118 South Mill
Pryor, OK 74361
(918) 825-4844
IN GERMANY CALL 69-295111



Circle 543 on reader service card

The single best way to turn your PC-AT into a multi-user system.

Introducing the Wyse WY-60.

Now there's a perfectly compatible, reliable, economical, Wyse way to get multi-user mileage from your PC-AT. Wyse WY-60 terminals give you complete compatibility for your IBM Personal Computer AT systems, right down to the exact keyboard layout, character set and display features.

The only thing different is how much cleaner and more readable your information is with the WY-60's high resolution and flat, non-glare, 14" tilt/swivel screen.

Multiple display formats go up to 132 columns and 44 lines on one screen, to get the most out of applications such as Multiplan and WordStar.

And a 512-character downloadable soft font is also there when you need mathematical symbols or customized character sets.

The adjustable arm is optional, and you can choose a green, white or amber screen.

No wonder we ship more terminals than anybody but IBM.*

Call toll-free or write, today, for more information. Wyse Technology, Attn: Marcom Department 60-AT, 3571 N. First St., San Jose, California 95134.

Call 1-800-GET-WYSE

WYSE

YOU NEVER REGRET A WYSE DECISION.

*Wyse is a registered trademark of Wyse Technology. WY-60 and the "V" shaped design are trademarks of Wyse Technology. IBM and IBM Personal Computer AT are trademarks of International Business Machines Corporation. WordStar is a registered trademark of MicroPro International. Multiplan is a registered trademark of Microsoft Corporation. © 1986 Wyse Technology. *Dataquest 1985 terminal shipment update.*

See Us at PC Expo Booth # 947

Circle 438 on reader service card

When you're ready to get serious about surge suppression.

Here's important advice for PC users. With test after test proving that 70-90% of all PC malfunctions can be traced to disturbances in the power supply, a surge suppressor is the first accessory you should buy for your PC.

But don't put your trust in just any surge suppressor. Get one that gives your whole system superior protection. One that's engineered to the highest specifications.

Get a Kensington Master Piece or Master Piece Plus. Computer dealers will tell you they're the most popular PC surge suppressors. And the most serious. Because at Kensington, we're dedicated to giving your PC the best possible protection.

That's why Master Piece contains a unique two-stage surge suppression circuit incorporating a high-speed silicon semiconductor for the quick reaction necessary and a heavy-duty metal oxide varistor for the brute force required to keep even the largest surges from penetrating into your system.

	Master Piece and Master Piece Plus
Meets IEEE 587-1980 Category A	✓
Meets IEEE 587-1980 Category B	✓
UL approved	✓

The right surge suppressor passes all the tests.

And that's why Master Piece Plus is the communications user's dream-come-true. Its additional circuitry smoothes surges, spikes and noise on the telephone line, protecting your modem and increasing the reliability of your data communications.

The circuitry in both Master Piece and Master Piece Plus is designed to exceed Category A of IEEE* specification 587-1980, as well as those established by UL†.

Sound good? Keep reading, it gets even better. Our circuitry also exceeds Category B of IEEE specification 587-1980. Under this category, created to guard against the severe spikes near the main power distribution panel of a building, Master Piece will even protect your PC from a simulated 6,000 volt lightning strike with a 3,000 amp follow-on current.

Now, this may look to you like we're taking more than the necessary precautions. And actually, we are. But after all, isn't that what you expect from the best?

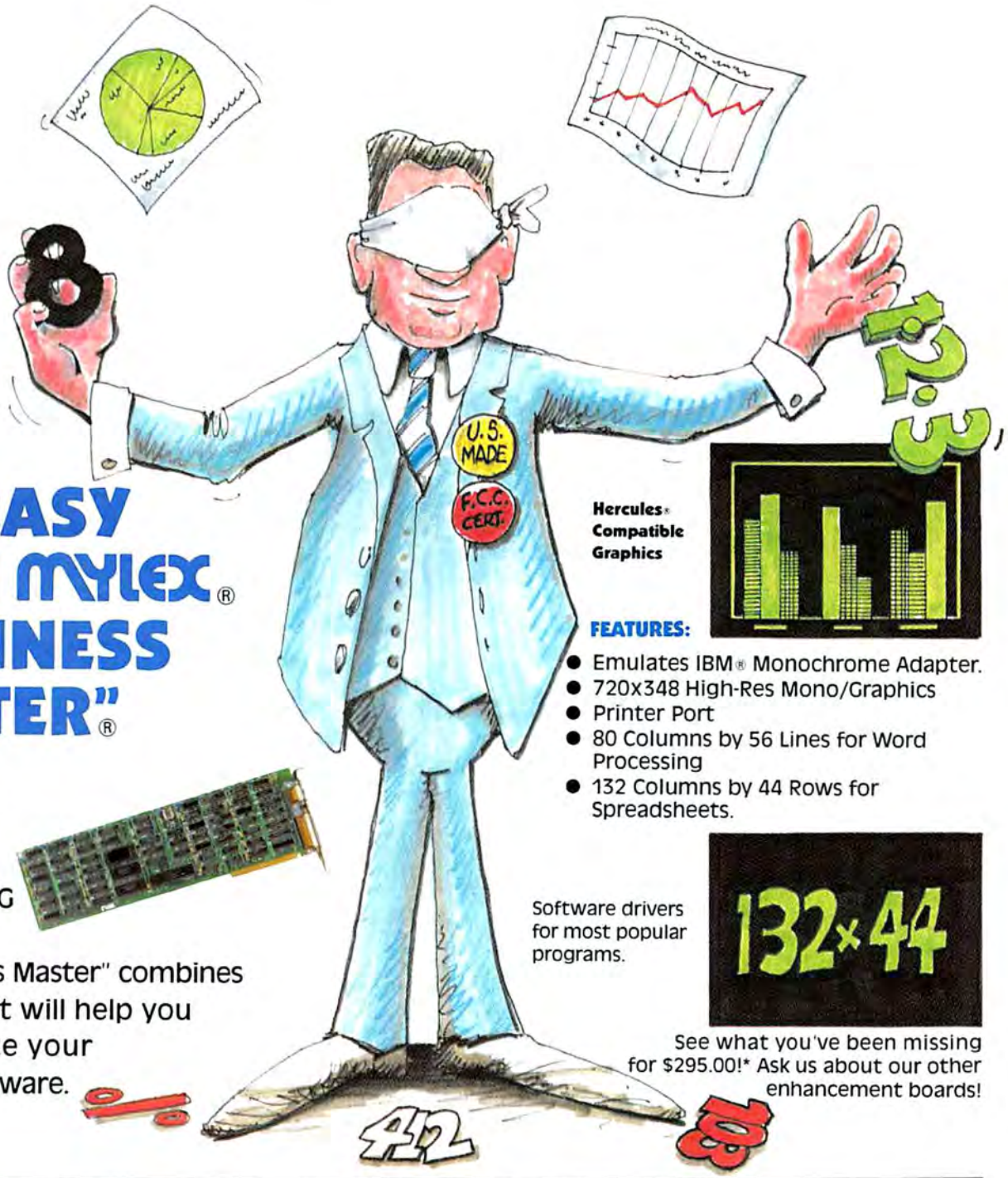
Master Piece ($149.95) and Master Piece Plus ($179.95). For the dealer nearest you, or to speak to a Kensington sales representative, call (800) 535-4242.
In NY (212) 475-5200.

KENSINGTON

*The Institute of Electrical and Electronics Engineers. †Underwriters Laboratory. Master Piece is UL Approved. © 1986 Kensington Microware Ltd.

Circle 474 on reader service card

IT'S HARD TO JUGGLE GRAPHS & NUMBERS YOU CAN'T SEE



IT'S EASY WITH MYLEX® "BUSINESS MASTER"®

Let Mylex® give you an advantage in MASTERING your P.C.
The "Business Master" combines features that will help you better utilize your business software.

Hercules® Compatible Graphics

FEATURES:

- Emulates IBM® Monochrome Adapter.
- 720x348 High-Res Mono/Graphics
- Printer Port
- 80 Columns by 56 Lines for Word Processing
- 132 Columns by 44 Rows for Spreadsheets.

Software drivers for most popular programs.

See what you've been missing for $295.00!* Ask us about our other enhancement boards!

MYLEX 5217 N.W. 79th Avenue, Miami, Florida 33166 • Toll Free: 1-800-446-9539 • In Florida: (305) 592-9669

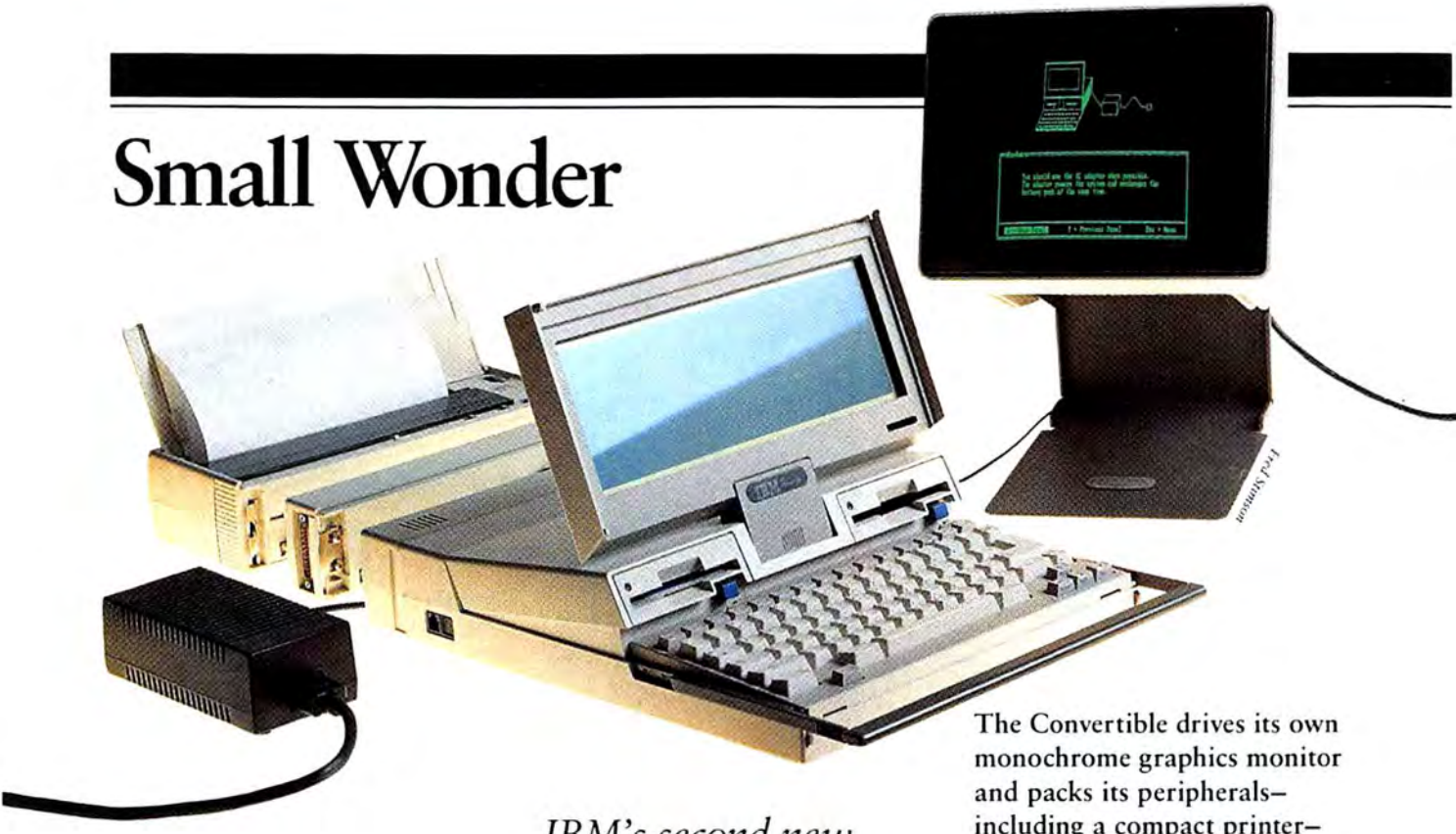
Hercules is a registered trademark of Hercules Computer Technology, Inc. IBM is a registered trademark of International Business Machines Corp. *Suggested Retail.

MYLEX IS A LEADING SUPPLIER TO MAJOR OEMS.

Circle 55 on reader service card

PC WORLD

Small Wonder



The Convertible drives its own monochrome graphics monitor and packs its peripherals—including a compact printer—in the trunk.

IBM's second new personal computer of 1986 is good news for mobile professionals—and, initially, for other laptop makers.

PC World View *reports new developments in computer technology, items of interest to computer enthusiasts, and the most significant and enticing insights about industry trends and personalities. We've reserved the "Grapevine" section of this column for industry reports that are still at the speculative stage.*
—Ken Greenberg

Shaking off a year-long hibernation, IBM's hardware bear is once again wide awake and moving at a respectable gait. Within a seven-week period, the company threw coming-out parties for its RISC-based RT PC and the PC Convertible, a 12-pound laptop that, following a series of false starts, made it to market after all.

IBM's base model "work-anywhere" machine is driven by a CMOS 80C88 microprocessor and contains dual 3½-inch, 720K floppy disk drives; 256K of CMOS RAM expandable to 512K; a printer interface; an AC adapter/battery charger; and a 25-line-by-80-character detachable liquid crystal display (LCD) that supports the PC's standard 640-by-200- and 320-by-200-pixel graphics. So configured, the Convertible lists for $1975.

View

News and notes for the computing community

This new IBM portable—which supplants the phlegmatic 28-pound Portable PC—sports a redesigned full-size 78-key keyboard. The revamped layout features independent cursor control keys and the customary ten function keys (arrayed across the top of the keyboard). An eleventh function key converts part of the keyboard to a numeric keypad.

The Convertible can be powered from a wall socket, a car's cigarette lighter (with the optional attachment for that purpose), or its own rechargeable internal nickel-cadmium battery. The unit reportedly can squeeze up to 10 hours of operation from a single charge—longevity enhanced by an ability to sleep between keystrokes and IBM's decision not to rely on a power-gobbling backlighted LCD. Instead, the screen features a new bonding process and glare-filtering elements that provide readability under a variety of ambient light conditions and viewing angles.

The litany of options for the Convertible is even more extensive than its retinue of standard equipment. Extras include DOS 3.20 (which features a facility for two-way data transfer between 3½-inch and 5¼-inch floppy disks), a serial/parallel adapter, an external 720K 3½-inch disk drive, and a display adapter for an outboard color graphics-compatible monitor or the Convertible's own monochrome graphics monitor (which can replace the removable LCD—hence the unit's name). The laptop cannot, however, drive the PC's monochrome display.

Given these add-ons, there's more to the Convertible's price tag than the purported $2000; outfitting the machine with two 128K expansion boards, a compact Convertible thermal transfer printer, the monochrome graphics monitor, and an internal 300/1200-bps modem bumps its price to $3800. Like the lamented PCjr, the Convertible's chassis can expand as you add goodies; unlike the PCjr, add-ons become a caboose rather than a sidecar.

For $20, IBM tosses in a healthy supply of software. Like the Hewlett-Packard laptop's PAM, IBM's *Application Selector* is a desk manager that includes NoteWriter, Schedule, Phone List, and Calculator modules. Software heavyweights the likes of Lotus, Ashton-Tate, Microsoft, Living Videotext, MicroPro, Satellite Software International, Microstuf, and Microrim—not to mention IBM itself—immediately rallied to the Convertible with 3½-inch versions of their hits.

When the Convertible is being manufactured, human hands never touch it. Robots are getting their digits dirty at IBM's new assembly plant in Austin, shepherding the machine from receiving dock to shipping platform. The Texas plant showcases the company's six-station Automated Logistics and Production System (IBM ALPS).

For laptop veterans Grid, Data General, Kaypro, and Hewlett-Packard, the other shoe has dropped; the sound you hear may be a market finally gaining credibility. "The Convertible will help further define this marketplace," affirms Mark Eppley, president of Traveling Software, a developer whose business is confined to laptops. "A lot of good should come from this—there's no longer a blue cloud over [other companies'] heads." Or, as an industry executive once quipped, "IBM's products are always more exciting before they're released." At the very least, the Convertible conferred instant legitimacy on the 3½-inch

(continues)

Garlands and Glitches

World View's *picks and pans in the PC parade.*

▲ ***Garland*** IBM, for elevating quality as it reduced prices significantly. The XT has been endowed with 512K and a 20MB hard disk, all for $2895. The latest AT runs at 8MHz, packs a 30MB hard disk, and—at $5295—is $700 cheaper than its predecessor. Both models can take advantage of a redesigned RISC-like 101-key keyboard; the new layout adds separate cursor- and screen-control keypads, an extra <Ctrl> key, two additional function keys, plus <Pause> and unshifted <PrtSc> keys.

Small Wonder
(continued)

disk drive format; IBM is even encouraging users to pop its new internal 3½-inch unit into ATs and XTs. To drive the point home, Big Blue has declined to release an external 5¼-inch drive for the Convertible.

Suggesting that the best laptop is no more than a peripheral to a desktop, Eppley predicts sales of 30,000 Convertibles by year's end—a quarter of the projected total for the entire laptop segment. The old bruin is definitely back.
—Bill O'Brien

▼ ***Glitch*** Hewlett-Packard, for turning its "What if" inducement for the AT-compatible Vectra into a promotional gimmick better suited to Detroit. HP's four-month offer, which expires June 30, consisted of a $1000 trade-in allowance on functioning Compaq and IBM computers. The Vectra, the object of all this puffery, is left to look less appealing. What if the company simply sold the machine on its merits?

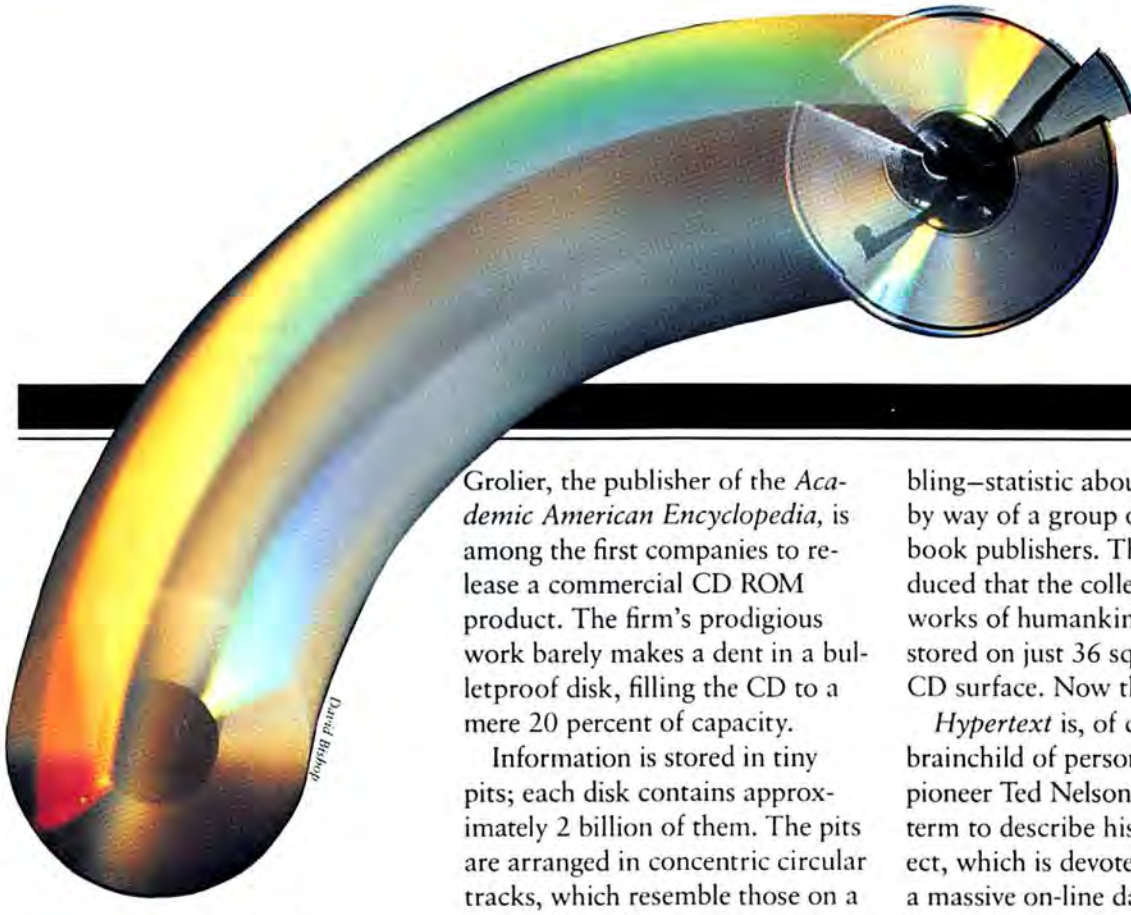
▲ ***Garland*** Compaq Computer, a strapping 4-year-old, for being the youngest enterprise ever to crack the Fortune 500. The Houston-based firm steamed into the rankings with 1985 sales topping $500 million and earnings growth that shows no sign of abating. Compaq CEO Rod Canion has become a vocal proponent of a PC-based "grass roots movement driving the industry [toward office automation] from the bottom up."

▲ ***Garland*** Microsoft, for stripping copy protection from its entire line of application software for the PC. In removing protection from *Microsoft Access* and omitting it from the recent release of *Microsoft Word 3.0,* the company bowed to corporate pressure—and common sense.

▼ ***Glitch*** Dog-Gone Computers, for its package *As the Crow Flies,* which embodies the esoteric nadir in vertical market software. The program figures the shortest flight distance between two points, using latitude and longitude coordinates stored in a Dog-Gone data base. The package was developed for peripatetic judges of dog shows staged under arcane American Kennel Club travel regulations. If only the firm evinced the same compassion for Spot.

▲ ***Garland*** Gene Amdahl, head of Trilogy, for working on behalf of U.S.-Japanese cooperation while the American semiconductor industry resonates with jingoism. Amdahl enlisted a handful of leading Japanese executives in forming Advanced Information Technology, a trading company chartered to balance the flow of high technology products between the U.S. and Japan. AIT will fund fledgling American ventures in Japan.

▼ ***Glitch*** Consumer Electronics Group, for responding to the computer industry's apathy with antipathy. Last spring, Jan Lewis of the Palo Alto Research Group alerted partisans that CEG, organizer of this summer's Consumer Electronics Show in Chicago, intended to park computer exhibits in a distant hall—a mite cozy with purveyors of adult films. The rationale, said Lewis, is the computer industry's alleged waning interest in the expo.



They Shoot Disks, Don't They?

Lately there's been a lot of hoopla about CD ROM—you know, the little plastic platter that holds billions of bits on its shimmering surface. Much of the lore surrounding compact disks is intriguing and even borders on the outrageous.

CDs, for instance, are covered with a particularly hardy breed of plastic—the same coating, as it happens, that's used to bulletproof windows. If your .357 Magnum accidentally discharges at one of these disks, don't despair: According to Microsoft's CD guru Min Yee, "We have software that will recover the bullet hole data."

Completely intact, a CD holds about 500MB of data, the equivalent of 1000 200-page novellas.

Grolier, the publisher of the *Academic American Encyclopedia,* is among the first companies to release a commercial CD ROM product. The firm's prodigious work barely makes a dent in a bulletproof disk, filling the CD to a mere 20 percent of capacity.

Information is stored in tiny pits; each disk contains approximately 2 billion of them. The pits are arranged in concentric circular tracks, which resemble those on a floppy disk. If the tracks on one CD were straightened out, they'd extend up Pikes Peak and part way down the other side.

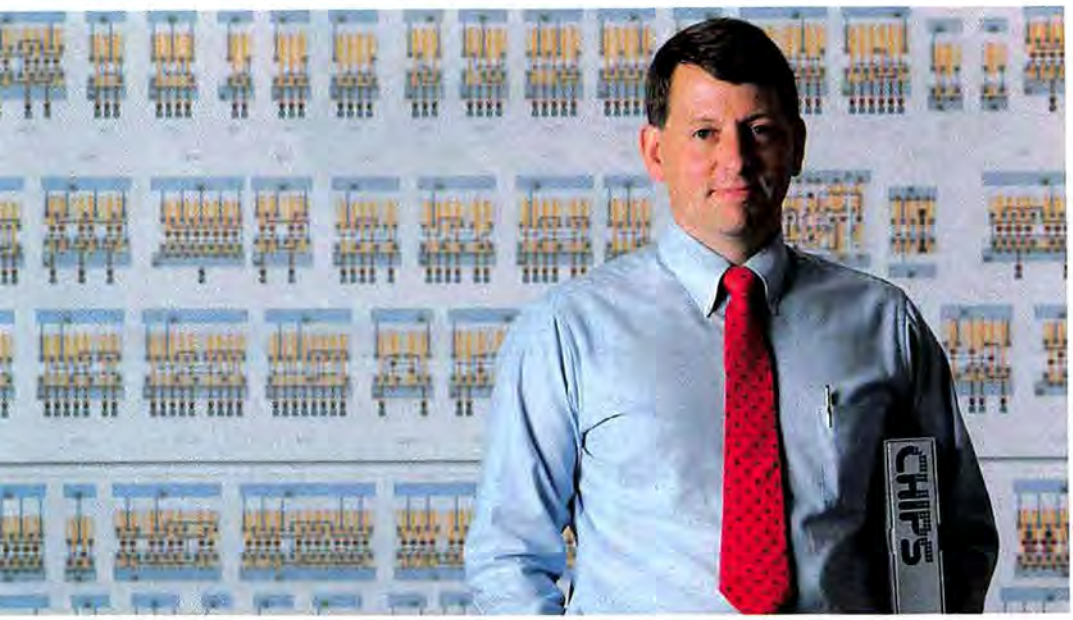
But perhaps the most impressive—and in a way, the most humbling—statistic about CDs comes by way of a group of West Coast book publishers. The group deduced that the collected written works of humankind could be stored on just 36 square feet of CD surface. Now that's hypertext.

Hypertext is, of course, the brainchild of personal computer pioneer Ted Nelson, who used the term to describe his Xanadu project, which is devoted to compiling a massive on-line data base of human knowledge. What Ted couldn't do with a brace of CDs, some dynamite software, and a few speedy modems ... *—Jeremy Joan Hewes*

Around Lotus Land

TK!Solver lives! The venerable equation processor, which was developed by Software Arts and became Lotus Development property following the Software Arts acquisition, recently touched down in Rockford, Illinois, under the Universal Technical Systems logo. UTS has trimmed the price of the package from $400 to $250, reportedly boosted speed by 300 to 400 percent, added hard disk and color support, and made way for IF ... THEN rules. Current users can upgrade for $50.

Elsewhere in Lotus's garden, Signal—the company's real-time stock market quotation system that heretofore was confined to FM sideband transmission—is now but a dish away. Selected Lotus dealers are bundling Signal with Equatorial Communications' C-100 Satellite Data Receiver (see "Data on Your Dial," *PCW,* February 1986). Packing the 2-foot Equatorial dish with the Signal receiver and software extends the product's reach well beyond the 12 cities currently on Signal's FM sideband network.



John Marriott

Chips and Technologies mentor Gordon Campbell relies on VLSI technology to shorten the odds against semiconductor success.

In the Chips

Silicon Valley is still populated by pioneers with enough gumption to buck a trend. Consider Gordon Campbell's latest venture.

Who'd be crazy enough to start a semiconductor company in the midst of a highly publicized slump in the chip market? Former Seeq executive Gordon Campbell and a crew of fellow formers from Seeq, Intel, Amdahl, and Apple Computer laughed in the face of competitors and doomsayer analysts when they founded their own custom chip house. Now, Chips and Technologies, the wily start-up, is also having the last laugh.

Proof of the company's success can be found on 18 of the 20 boards that now emulate IBM's EGA (Enhanced Graphics Adapter); four chips on each board bear the "Chips" imprimatur. Attracted by the reduced chip count as well as a reduced price, established board makers and newcomers alike are using the Chips and Technologies Enhanced Graphics Chipset to undercut the $982 IBM EGA by as much as $700.

Board manufacturers AST, Tecmar, Quadram, Genoa, STB, Video 7, and a handful of others are certainly snapping up the Chips and Technologies' CMOS and gate array chips because of price. But Chips's chips also boast VLSI (very large scale integration) circuitry, which fits easily on a half-size board, and full compatibility with the EGA and three other graphics standards.

This recent success marks the second winning hand for Chips and Technologies. The premier Chips product, the PC/AT Chipset, lies under the hood in Tandy's new 3000 and in an AT compatible yet to be announced. The 5-chip set replaces 58 chips on the AT motherboard, reducing the overall chip count to 36 and boosting clock speed to 10MHz.

With its success in the graphics market, the upstart semiconductor company has found itself, figuratively speaking, in the chips. Chips and Technologies began turning a profit with the first shipment of Enhanced Graphics Chipsets last December, a mere 11 months after incorporating.

Chips and Technologies' Ron Yara attributes the company's lickety-split launch to luck and good timing, but that explanation seems a bit modest. The firm's ability to shrink both circuitry and prices should keep vendors—and their customers—content, and may even infuse a little pluck into a forlorn industry. Luck indeed.
—Christine McGeever

Follow That Story!

PS: Don't Forget to Print

Some five centuries after Johannes Gutenberg proved that movable type is mightier than the quill, John Warnock's PostScript may be helping to usher in a change almost as fundamental: putting the publishing process itself into general circulation.

PostScript, marketed by Warnock's Adobe Systems, is a page description language (PDL) designed to harness the talents of the laser printer (see "Master of the Raster," *PCW,* August 1985). The language has sparked excitement because of its unique ability to combine on a single page the three basic constituents of graphic design: text, images, and halftones (shades of gray).

Early last year PostScript made its formal debut on a ROM chip inside Apple's LaserWriter. Since then it has been licensed for use in laser printers from QMS, Dataproducts, Wang, DEC, and NBI. Three more firms are waiting in the wings, according to Warnock, who expects some 20 printer manufacturers to sign up this year.

Even companies that haven't licensed PostScript remain watchful. Several laser printer manufacturers—including Hewlett-Packard, Cordata, and AST Research—are in the process of evaluating the language for their product lines, but they're not likely to jump on the bandwagon en masse.

Whatever the reservations among printer manufacturers, however, PostScript is winning converts by the score among software publishers. More than 100 programs—including *1-2-3, Microsoft Word,* and *WordStar 2000*—now contain drivers that enable them to take full advantage of laser printers using PostScript. "PostScript is becoming a de facto industry standard," claims Tangent Technologies president Roland Bates, whose PC MacBridge interface board enables PC owners to access the LaserWriter via *WordStar.*

According to Ajit Kapoor, a personal publishing specialist at the market research firm Dataquest, the major substantive criticism of PostScript is that it's a bit sluggish, particularly when compared to Interpress, Xerox's PDL. But what PostScript lacks in speed, says Kapoor, Interpress lacks in graphics capability.

Is PostScript destined to dominate this budding industry? "It will definitely be one of the top contenders," predicts Kapoor. "I don't see the competition hurting PostScript, because the installed base of printers is large and growing. But the battle has just begun."

But then, Gutenberg didn't have the market entirely to himself back in 15th century Mainz, either.

—Anita Amirrezvani

It Only Hurts When I Laugh

Loving *1-2-3* isn't easy when, like a stranger in a strange land, you first begin groping your way around a spreadsheet, or even worse, when you accidentally exit without saving and lose an hour's worth of intensive number-crunching. A remedy for each ailment is offered, respectively, in *Templates of Doom* and *Chuckle Pops*. The first enables you to puzzle your way through *1-2-3* commands, the second to laugh your macro cares away. Of course, there's a chance the cure may be worse than the disease.

Templates of Doom is a *1-2-3* tutorial thinly disguised as an adventure game. Your quest is to discover the answer to a riddle—"Find the name of the hero" or "Find the hero's weapon"—hidden somewhere in the spreadsheet. You'll supposedly master some basic *1-2-3* commands after hacking your way through the jungle of rows and columns—but by then you may not give a cat's whisker. If you don't relish the idea of getting caught with your game showing, pressing <Alt>-B summons a fake spreadsheet and hints at instant Lotus proficiency.

Moving from the sublime to the silly, take *Chuckle Pops*—please. Imagine Henny Youngman writing *Turbo Lightning* and you've just about got it. *Chuckle Pops* lurks in RAM until a grueling *1-2-3* session compels you to seek solace in mirth, however feeble. Invoking any one of the program's hundreds of chuckles is akin to being stranded at the Oshkosh Holiday Inn during a blizzard, with the lounge manager supplying the evening's entertainment.

It's enough to give you a warm feeling for circular references.
—Miriam Medom

Grapevine

* * * * * * * * * * * * * * * * * * * *

If You Can't Beat 'em, Buy 'em

While IBM's hardware supremacy has become an article of faith among industry participants, its software presence continues to be modest bordering on meek. Conceding a 15 percent cut of the PC software pie to IBM, the market research firm Communications Trends expects Big Blue to swallow "one or more" independent PC software firms by 1987—a forecast consistent with IBM's public pledge to earmark more funds for software development than for hardware. IBM is said to be perusing only companies whose annual sales exceed $50 million. You can tally that prey on one hand.

* * * * * * * * * * * * * * * * * * * *

A Marriage Made in Redmond?

Do good neighbors make good partners? Don't be too surprised if Microsoft fills out its product line by swallowing a noted venture located just down the block. Consider the compelling factors behind a Microsoft acquisition of Microrim, purveyor of *R:base 5000* and Microsoft's neighbor in a new Redmond, Washington, business park. Microsoft currently lacks a data management product; the company is swimming in cash following a rip-roaring initial public stock offering; Microsoft sells *R:base* as its own in Europe; and nobody will have to move so much as a paper clip.

Big Blue's News

IBM abhors a vacuum—read any market in which it's not an active participant—and so is moving to fill one such vacancy posthaste. Computer industry savants have pronounced an end to the days when IBM idly watched dealers and value-added resellers stuff other people's hard disk drives into its personal computers. Although Big Blue's legal remedies appear nil, its marketing and manufacturing machine is already shifting into high gear.

The first decisive move came in late January, when IBM introduced its RT PC with 40MB and 70MB hard drives built by the company's independent business unit in Rochester, Minnesota. The second volley was let fly in early April, with new AT and XT models similarly outfitted with IBM's own drives. There's even talk that IBM may one day make a homegrown hard disk standard equipment on every PC.

Tim Bajarin, vice president of San Jose market watcher Creative Strategies, is among those who believe IBM will ultimately be its own biggest hard drive supplier. Bob Katzive, vice president of Disk/Trend, a market research firm dedicated to the mass storage business, agrees.

"IBM's increasing activity as a drive manufacturer is taking away half the [market's potential] business," he says. Most of IBM's long-standing suppliers are already testifying to the change. Seagate Technology claims IBM now accounts for only 28 percent of its business, down from 49 percent just months ago. At Computer Memories, once the sole supplier of AT hard disk drives, the plunge has been even more precipitous—from 80 percent to zilch in a year's time.

Besides entering—and dominating—the hard disk drive business, IBM may be primed to crack the whip at dealers who shove other manufacturers' drives into its PCs. Core International, an authorized IBM dealer and hard disk manufacturer, estimates that 70 percent of the ATs and XTs on dealers' shelves contain cheap hard disk drives. Seagate boss Al Shugart expects IBM to "do something" to counter that trend. Core International's John Simonds bemoans the poor quality of many such drives, labeling the widespread dealer practice "legitimate fraud."

For its part, IBM is characteristically evasive. Says spokesperson Rob Wilson, "The open architecture of our systems encourages third-party add-ons, and I can't speak hypothetically of what will happen down the road."

Wilson acknowledges, however, that IBM requires its dealers to notify customers of any third-party products packaged with the basic IBM unit. Because that requirement is often honored in the breach, IBM could use such violations as a way to rebuke some dealers. But here's the catch: Dealers earn heftier margins by selling non-IBM hard disks, and consumers continue to save money on third-party drives. Those are incentives even IBM may have a tough time dampening. *—John Eckhouse*

Bill O'Brien writes about technology from New York City; John Eckhouse is a business correspondent for the San Francisco Chronicle; *Anita Amirrezvani is a freelance writer in Berkeley, California; Jeremy Joan Hewes is a Contributing Editor for* PC World; *Christine McGeever is the magazine's Assistant Editor; and Miriam Medom continues to be bad news for blarney in software.*

Chuckle Pops
Enlighten
P.O. Box 2037
Ann Arbor, MI 48106
800/447-1771, 313/668-6678
List price: $14.95
Requirements: 23K, one disk drive

Templates of Doom
Solar Systems Software
8105 Shelter Creek
San Bruno, CA 94066
415/952-2375
List price: $39.95
Requirements: 256K, two disk drives, 1-2-3 (release 1A or 2) or VP-Planner

Hard Disk vs. the BERNOULLI BOX®

Before You Make the 'Hard' Choice, Make the Easy Comparison.

DO YOU NEED	IOMEGA Cartridge Disk Drive	Conventional Floppy Disk Drives	Fixed Hard Disk Drives	Removable Hard Disk Drives
Unrestricted PC Storage Capacity that grows to meet new uses?	■	■		■
Protection from sudden loss of data or models?	■	■		
Quick, on-line response to commands or requests for data?	■		■	■
Fast, complete back-up for data?	■			
Inherent ability to withstand accidental drops or jars?	■			
Low-cost Library Storage?	■			
The transportability of a floppy—in a high speed format?	■			

Many Thousands of PC Users Have Already Stopped Doing Things The "Hard" Way.

More than 60,000 business PC users now store their data on Bernoulli Boxes instead of hard disk drives.

Why? Because they wanted storage performance that didn't limit their own performance.

They wanted speed, reliability, expandability, security and transportability... without compromising one for the other.

They didn't make the "hard" choice. Instead, they chose the technology that's turning Personal Computers into Corporate Assets.

Hard Disk Performance...With Get Up And Go.

The Bernoulli Box is a PC storage subsystem consisting of a drive and high performance cartridges. Each cartridge holds up to 20 megabytes of data—and, because the cartridges are removable, you can run an unlimited amount of data without adding drives. The drive itself stays in place—performing at hard disk speeds. But your data is free to go wherever information goes to work: down the hall, around the world, or even into a locked drawer...so work that's done can't come undone.

Reliability Isn't Just a Promise... It's A Revolution In Design.

Bernoulli Technology dramatically reduces the possibility of head crashes. It does that *in fact* because it does that *in principle*. The very design of the Bernoulli Box separates the head from your data in the event of either power outage or surface contamination.

But that's only the beginning of Bernoulli Box reliability. Inside or outside the drive, your data is more secure...because the Bernoulli cartridges were designed both to give more performance *and* to take more punishment. Don't believe it? Just "Test-Toss" a cartridge.

Your data has never been safer ... whether it's running at high speeds, walking through an airport or resting securely in a drawer.

You'll Outgrow Your Offices, Your Business Plan And Maybe Even The Name On Your Door...Before You Outgrow Your Bernoulli Box.

The more you use a hard disk, the less you have left to use. Because your data is always expanding toward a finite—and very final—limit.

With The Bernoulli Box, you store up to 20 megabytes of data on a single cartridge—and an unlimited amount on a single drive. You can organize your data according to your needs, departments and functions. And each of those can expand to reach opportunities—not the physical limits of a drive.

Whether you're working with a single PC or in a large network environment, The Bernoulli Box lets you build the most complete data base you require.

For America's Toughest Decision-Makers, The Bernoulli Box Was An Easy Choice.

Iomega Corporation has shipped more than 200,000 Bernoulli Drives—and almost one million cartridges.

What kinds of customers buy them? For the most part, they are businesses—and many of them are the kinds of businesses you would count on to make strategic business decisions. They number many of the FORTUNE 500...as well as foremost financial institutions, transportation specialists, communications experts and the like. The companies with the most sophisticated data processing needs were the first to recognize the benefits of the Bernoulli Box. But whether the customers were large or small...*A full 97% of them not only purchased Bernoulli subsystems, but are ready to recommend Bernoulli technology to others.*

PRODUCT OF THE YEAR. For Years To Come.

Computing Magazines, Business Journals and Independent Analysts have all acclaimed Bernoulli performance...out loud and in print.

"...combines rugged durability with high speed. It offers the portability and low cost for which floppies are noted plus the huge storage capacity and snappy access speed that are the hallmarks of hard disk."

New York Times–June 23, 1985

"World Class Hard Disk Storage Award"

PC World–November 4, 1985

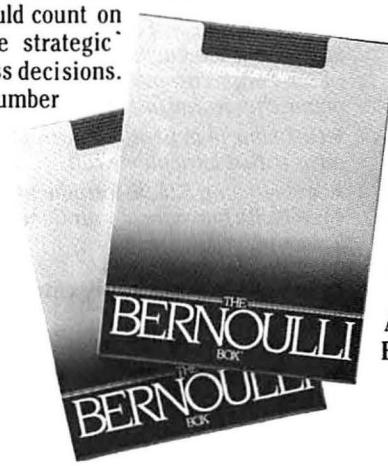
"On a computer that was once limited to 720K bytes of mass storage, we now have unlimited storage capacity with greater performance than that available on the IBM XT."

Datapro Research Report–June, 1985

You've Made The Comparison. Now Make The Right Choice.

Do you need PC storage that expands according to your needs? Or that gives you fast, convenient back-up? Or that goes wherever business opportunities do? Or that's more reliable whether it's running, walking, locked in a desk or bouncing down a flight of stairs?

Why settle for "hard" times...when the easy way is also the right way.



THE BERNOULLI BOX AND CARTRIDGES.

AVAILABLE FOR IBM, IBM-COMPATIBLE AND APPLE PC's.

AT BETTER PC DEALERS EVERYWHERE.

IOMEGA

BERNOULLI TECHNOLOGY

Iomega Corporation Holly Pond Plaza 1281 Main Street Stamford, CT 06902 (203) 359-9858

Circle 353 on reader service card

USE THE BRAINS YOUR IBM WASN'T BORN WITH.

Right at your fingertips in CompuServe's IBM® Forums.

In the **IBM New Users Forum** you'll swap ideas with other new PC users, learn to use Forum features, and pose even basic questions to PC experts.

Our **IBM Junior Forum** gives PCjr® users a reliable source for tips on software, hardware, telecommunications, games and other interests.

In the **IBM Software Forum** you'll trade tips with other IBM PC and AT users on utility software, word processing, DOS and other operating systems.

Visit the **IBM Communications Forum** for advice on the features and compatibility of communications software and hardware, PC Bulletin Boards, micro-mainframe interfaces and more.

The **IBM Hardware Forum** addresses hardware topics of all types, plus product updates and announcements.

Easy access to free software.

- *Download first-rate, non-commercial, user-supported software and utility programs.*
- *Take advantage of CompuServe's inexpensive weeknight and weekend rates (when Forums are most active, and standard online charges are just 10¢ a minute).*
- *Go online in most major metropolitan areas with a local phone call.*
- *And receive a* ***$25.00 Introductory Usage Credit*** *with purchase of your CompuServe Subscription Kit.*

Information you simply can't find anywhere else.

Use the Forum *Message Board* to send and receive electronic messages, and pose specific questions to other IBM and compatible owners.

Join ongoing, real-time discussions in a Forum *Conference.*

Search our unparalleled Forum *Data Libraries* for free software, user tips, transcripts of online conferences and more.

Enjoy other useful services like:

- ***Popular Computer Magazines****—electronic editions, for your reading pleasure. Including Dr. Dobb's Journal and Computer Language.*
- ***Other CompuServe Forums****—supporting LOTUS® products like Symphony™ and 1-2-3.™ Borland International,® Ashton-Tate,® Digital Research,® MicroPro,® Microsoft® and other software. Also Pascal, Basic, C, Forth, Assembly and other programming languages.*

All you need is your IBM or IBM-compatible computer and a modem ...or almost any other computer.

To buy your Subscription Kit, see your nearest computer dealer. Suggested retail price is $39.95. To receive our free brochure, or to order direct, call 800-848-8199 (in Ohio, call 614-457-0802). If you're already a CompuServe subscriber, type GO IBMNET (the IBM Users Network) at any ! prompt to see what you've been missing.

CompuServe®

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, Ohio 43220

800-848-8199

In Ohio, Call 614-457-0802
An H&R Block Company

Circle 856 on reader service card

LOOKING FOR THE BEST VALUE IN PC/AT COMPATIBLES?

INTRODUCING THE $1495 A★STAR™

Looking for a lower priced, higher quality PC/AT compatible than our new A★Star™ is like looking for a needle in a haystack. You're more apt to come up with a case of hayfever.

A★Star gives you features you won't get from *any* other vendor. Not IBM. Not Compaq. Not even those foreign manufacturers. Features like a 220 watt power supply, eight *available* expansion slots and "network ready" multi-user operation. All for only $1495. And that price includes a 1.2MB diskette drive, 512KB memory, a fixed disk/diskette drive controller, a tactile feedback keyboard (you'll love it!) and a 6/8MHz switch/software selectable 80286 CPU.

Best of all, A★Star is quality built right here in America by Wells American Corporation - an American Stock Exchange manufacturer. So now you can buy with confidence from a vendor you can trust, just like you've trusted IBM. And you'll get a genuine, top quality product (not a cheap imitation) for a price even less than those "questionable" mail order clones. And if that's not enough, it's all money-back guaranteed!

The $1495 Wells American A★Star.™

A PC/AT FOR ONLY 1495?
THAT'S NOTHING TO SNEEZE AT!

[Hurry! This offer *is* limited.]

☐ I'm tired of sneezing! Have someone call me immediately to take my order.

☐ A★Star sounds terrific. Tell me more.

Name: _____

Company: _____

Phone: _____

Address: _____

City: _____

State: _____ Zip: _____

Wells American
803/796-7800•TWX 510-601-2645
Sunset Boulevard • West Columbia, SC 29169

IBM, Personal Computer AT and AT are trademarks of International Business Machines Corporation

Circle 486 on reader service card

From the Software Shelf

PC World offers first impressions of recent software releases

This month: a medley of programs for the casual and dedicated personal computer publisher, plus WordStar 2000 revisited

Edited by Robert Luhn

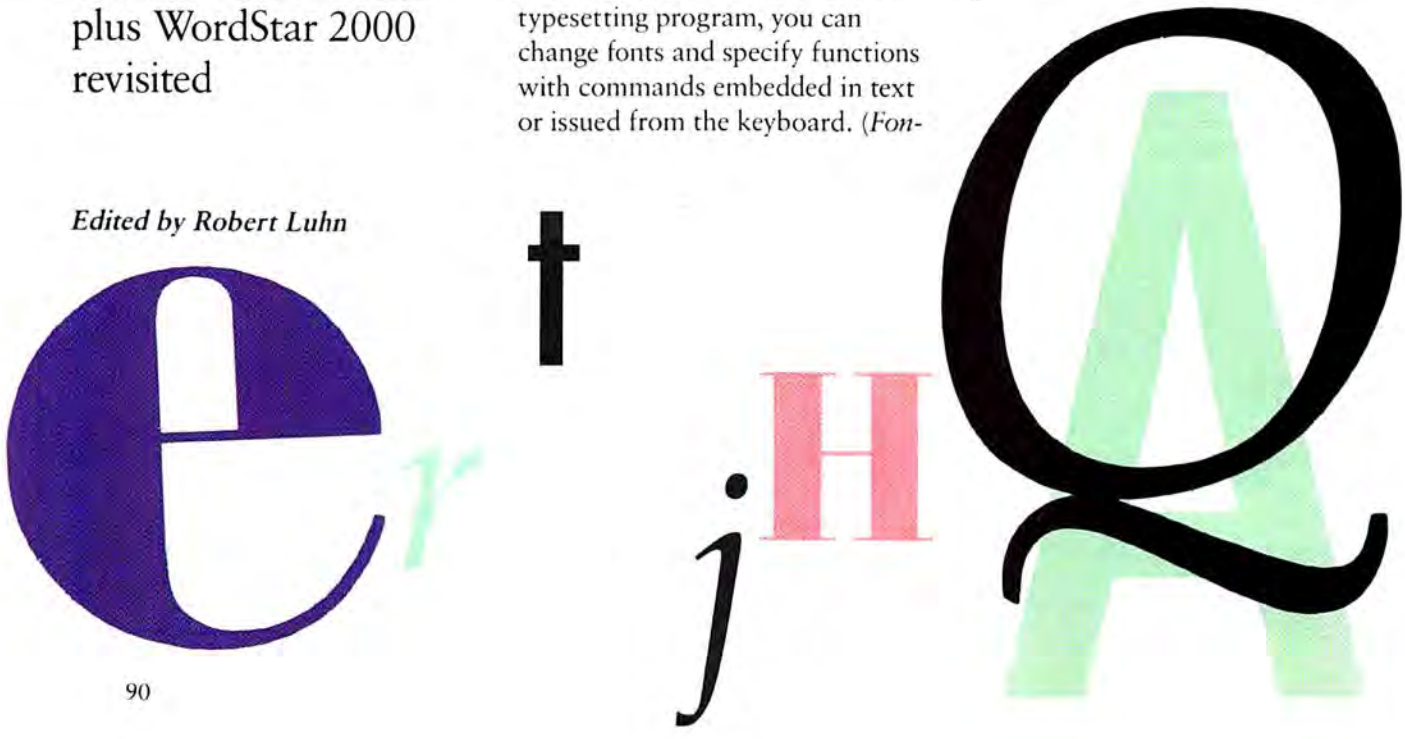
Fontasy

We should be careful to get out of an experience only the wisdom that is in it—and stop there; lest we be like the cat that sits down on a hot stove-lid. She will never sit down on a hot stove-lid again—and that is well; but also she will never sit down on a cold one anymore.
—Mark Twain

Like Mark Twain's cat, I sat down on a hot stove lid by agreeing to review *Fontasy* in two weeks—a task I shouldn't have taken so lightly. *Fontasy* is not a simple font package but an ambitious and formidable publishing program that Prosoft claims is capable of producing a near typeset quality company newsletter, brochure, or report on the Hewlett-Packard LaserJet and 18 other printers. Depending on your temperament, the program may also double your blood pressure when your efforts result in little more than gibberish—in 278 font styles.

Fontasy is an uneasy mix of traditional typesetting and PC-oriented approaches. As with a typesetting program, you can change fonts and specify functions with commands embedded in text or issued from the keyboard. (*Fontasy* does not support printer-resident fonts.) Like some contemporary word processors and PC page-composition programs, what you format on screen closely resembles printed output. But like so many programs with good intentions, *Fontasy* smothers you with an avalanche of sophisticated features that turn the learning experience into a *Zork*-like adventure.

Although I am a newspaper editor and designer and an experienced computer user, my first attempts at laying out a page with *Fontasy* were interrupted by repeated trips to the user manual for details on the program's nearly 200 commands. I discovered I could force out a simple invitation or advertising flyer (see Figure 1), but designing a page, importing and formatting ASCII text, and integrating graphics were a nightmare. Unlike Twain's feline, I let the stove cool and sat down again. Silly me. I should have been wearing asbestos jodhpurs. After a week of trying to make the program perform as advertised on three different PC compatibles and an AT, I finally gave up.



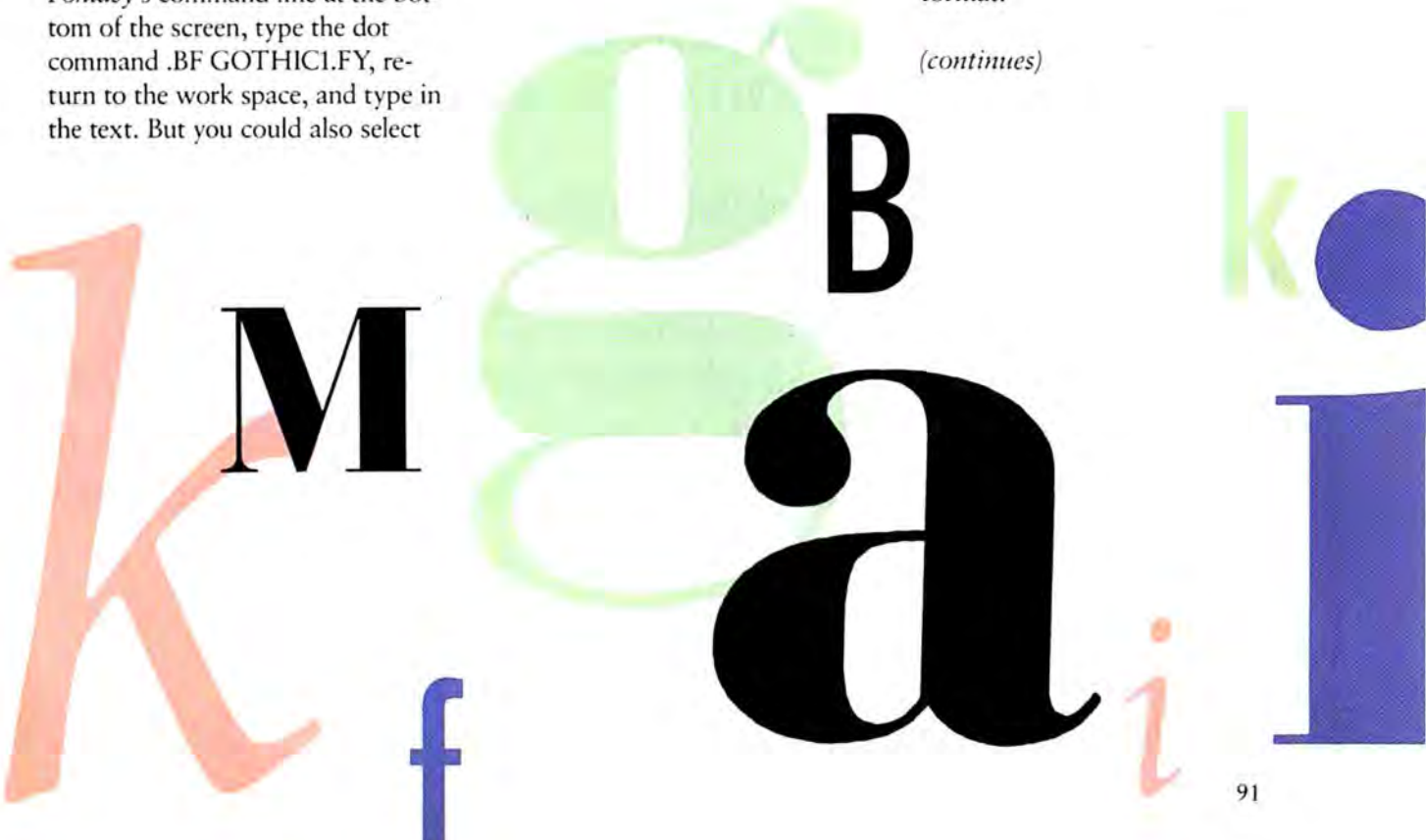
Yet the package's allure is hard to resist. For a small fistful of dollars, *Fontasy* provides an incredible number of production tools: design and layout functions that should allow you to cut and paste text and graphics, design and scale fonts, wrap text around illustrations, and so on. Twenty-eight fonts are included, with another 250 fonts and 150 ho-hum clip art images sold separately. The typesetting pro will find a host of familiar functions—kerning, variable margins, justification, and line joining. The program's ersatz *MacPaint* drawing option includes reverse and mirror-image functions, automatic box and circle generation, fill-in patterns, and more, all governable with a mouse or the cursor keys.

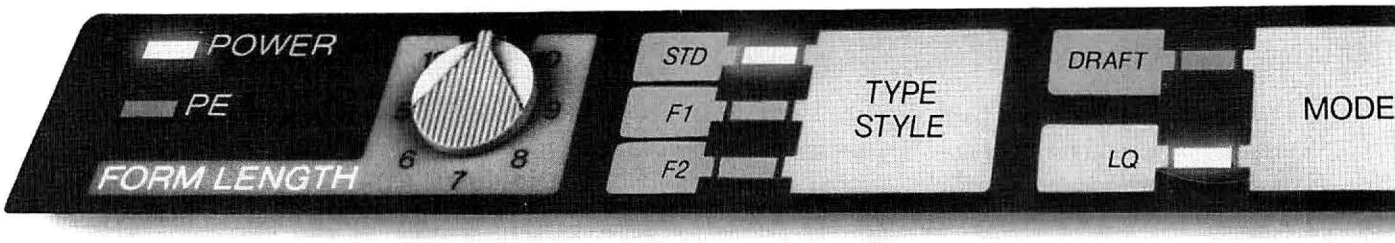
Unfortunately, *Fontasy* confuses matters by offering several means for accomplishing the same end. For example, to set text in Gothic, you could press <Esc> to display *Fontasy*'s command line at the bottom of the screen, type the dot command .BF GOTHIC1.FY, return to the work space, and type in the text. But you could also select the font from a *Fontasy* menu or press the appropriate function key assigned to the font. You could also type .BF GOTHIC1.FY into text created with a word processor and later import the file into the *Fontasy* environment. While the program might win an award from the Department of Redundancy Department, *Fontasy*'s programmers should heed Thoreau and simplify, simplify.

According to the manual and a demonstration file, you first create headline banners, illustrations, circles, rectangles, and other images with *Fontasy*. Then you build a template that contains margin, page length, line length, and column settings and save it to disk. Next, you create text with a word processor in ASCII mode and embed the appropriate *Fontasy* dot commands for loading the template, fonts, and other functions. From *Fontasy*, you merely issue the read command, .RD *filename*.ASC, and the program will supposedly import the text file, pour it into designated columns, drop graphics into the right slots, insert the banner, and so on.

In reality, the process isn't quite so smooth. The program provides no grid for gauging column or line width, so manipulating elements is like pasting up a page in a darkroom. Worse still, you can view only one-sixth of a page at once, and must jump around the page using a ludicrous system of <F4> and cursor keys. After wrangling with *Fontasy* and its obdurate user manual for hours on end, all I had to show for my efforts was a banner (see Figure 2). Trying to import ASCII text from a word processor ended in disaster; text overwrote the banner and ignored commands for a two-column format.

(continues)





no other printer is th

Add up everything that's up front:

No other letter-quality printer is this easy, this fast and this good—all three at once! If you thought that was impossible, you were right…up until Star created the new NB-15!

It makes everything so easy for you. Because everything's where you want it. Right at your fingertips. Up front. On the front panel.

And we mean everything: You can select from 3 font styles, 4 print pitches, 2 print modes, and 8 form lengths—19 functions in all. And you can choose additional font cartridges, too.

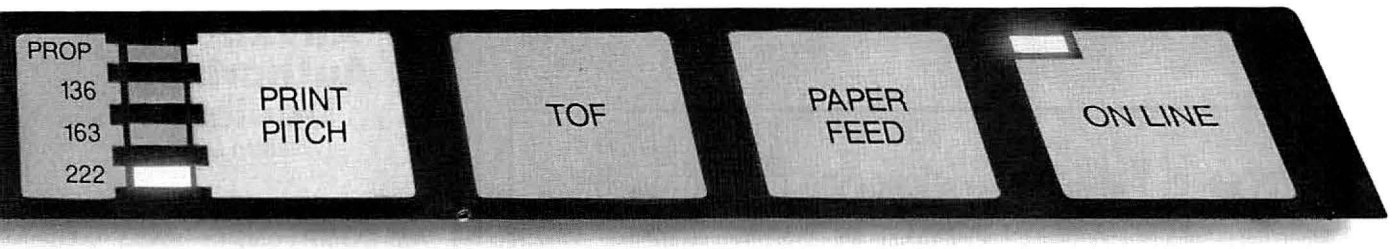
There's also an exclusive software override. Full software compatibility.

And IBM® PC compatibility, of course.

Both tractor and single sheet feeds are standard. And there are optional automatic sheet feeders, single and dual bin. With button-control paper alignment right up front, too.

Circle 319 on reader service card

IBM is a registered trademark of International Business Machines, Inc.



is up front with you.

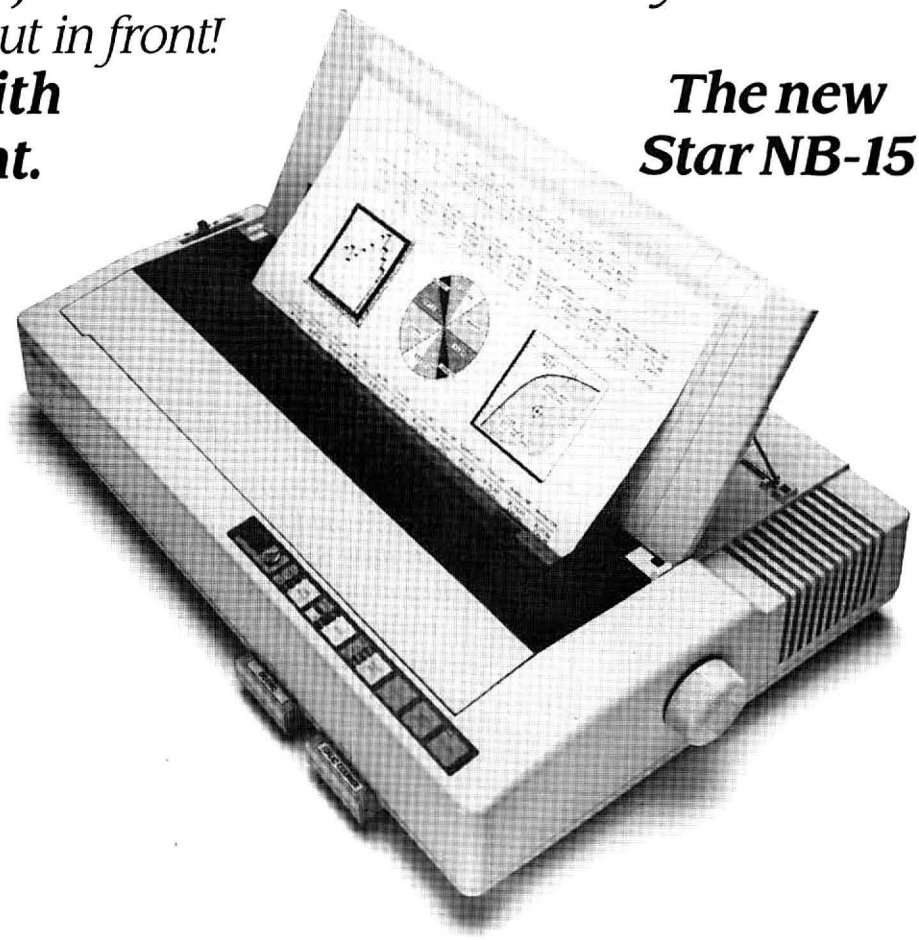
Best of all, the NB-15™ gives you all this with 24-wire quality printing. All at top speeds of 300 cps draft and a full 100 cps with true letter quality.

Plus a 16K buffer. That's all the memory you could hope for.

The all-new NB-15 business printer. The newest and brightest Star has just come out at a dealer near you. And it's already out in front!

In front with quality up front.

The new Star NB-15



star
MICRONICS

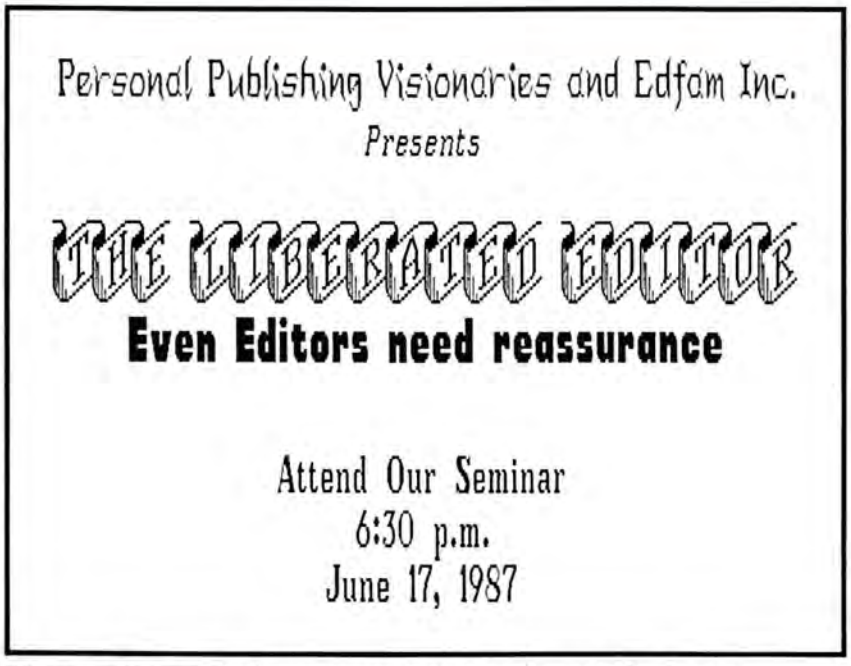


Figure 1: A Fontasy figure created straight from the keyboard

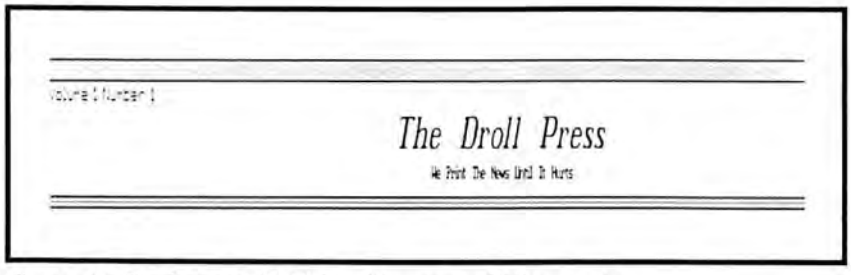


Figure 2: Desktop publishing Sturm und Drang. A banner produced with Fontasy—after two weeks of struggle.

No page-composition program—including the lionized *PageMaker*—is perfect. But *Fontasy* is far too fallible and complex for my taste. It's possible that the only person who can use *Fontasy* effectively is its programmer. Unless you are willing to spend weeks learning and relearning the program, keep your distance—it's a hot stove lid. *—Jason Durbin*

Fontasy version 1.06
Prosoft
7248 Bellaire Ave.
North Hollywood, CA 91605
818/765-4444
List price: $49.95, version 2 $69.95; additional font and clip art disks $24.95 each
Requirements: 256K (448K recommended, 512K-640K recommended for HP LaserJet or 24-pin printer); two disk drives; DOS 2.00 or later

(continues)

Advanced Authorized Dealers
(Western U.S.)

AM-COMP
2432 West Peoria, Suite 1119
Phoenix, AZ 85029
602/371-0931

Buzzwords International
1524 Good Hope Street
Cape Girardeau, MO 63701
314/335-3853

Complete Business Systems
18141 Beach, Bldg. #285
Huntington Beach, CA 92648
714/841-5868

Data Quest Hawaii
Manoa Marketplace,
2752 Woodlawn Drive
Honolulu, HI 96822
808/988-7813

Integrated Analysis, Inc.
1940 Garnet Ave., Suite 100
San Diego, CA 92109
619/483-7000

MicroAge Computer Stores
1081 S. Saratoga-Sunnyvale Rd.
San Jose, CA 95129
408/255-2881

NOVA Technology, Inc.
7277 Flying Cloud Drive
Eden Prairie, MN 55344
612/944-6785

Security Software, Inc.
21220 Ventura Boulevard
Woodland Hills, CA 91364
818/704-6393

Thompson Business Computers
3633 Allen Parkway #215
Houston, TX 77019
713/523-7660

THE SOFTWARE LINK, INC.

0486W

Circle 526 on reader service card

Conceived on a Mainframe... Born on an AT

Ask a CPA about accounting software for PCs, and chances are he'll recommend an accounting package with multiple modules. If the package runs under PC-DOS, it probably won't support multiple users... at least in terms of supporting multiple users *within* each module.

But ask him what would be ideal for your organization, and he'll probably tell you that a true multi-user accounting system would be perfect.

Until now, this kind of system couldn't be found... couldn't run under PC-DOS, and couldn't run on hardware other than minis and mainframes. That is, until NetProfit™

NetProfit™ Will Change The Way You Think About Accounting Software...Forever. In use on large systems for over eight years, NetProfit™ enables you to use your accounting database as a powerful decision-making tool.

Financial reports can be user-customized. You can group accounts together, such as multiple checking accounts, and combine data from up to 99 companies, branches, or divisions.

Because the system is designed for multiple users, accounting files and records can be shared among all users and departments—with three levels of security and password protection.

This means that salespeople using *Orders & Invoicing* can be continually updated by *Accounts Receivable* regarding a customer's sales and payment history. In addition, *Inventory* can keep Sales appraised of the availability and current cost of goods.

Up to 30 Simultaneous Users Under PC-DOS... With 72 or More Able to Access the System. Forget everything you've ever heard about the limitations of accounting software for the IBM PC. When combined with MultiLink® Advanced or LANLink,™ NetProfit™ becomes a multi-user, multi-tasking accounting system that runs under PC-DOS 3.1 and better.

Running under MultiLink® Advanced, inexpensive terminals connected to host PCs, XTs, and ATs can be used as workstations in the system.

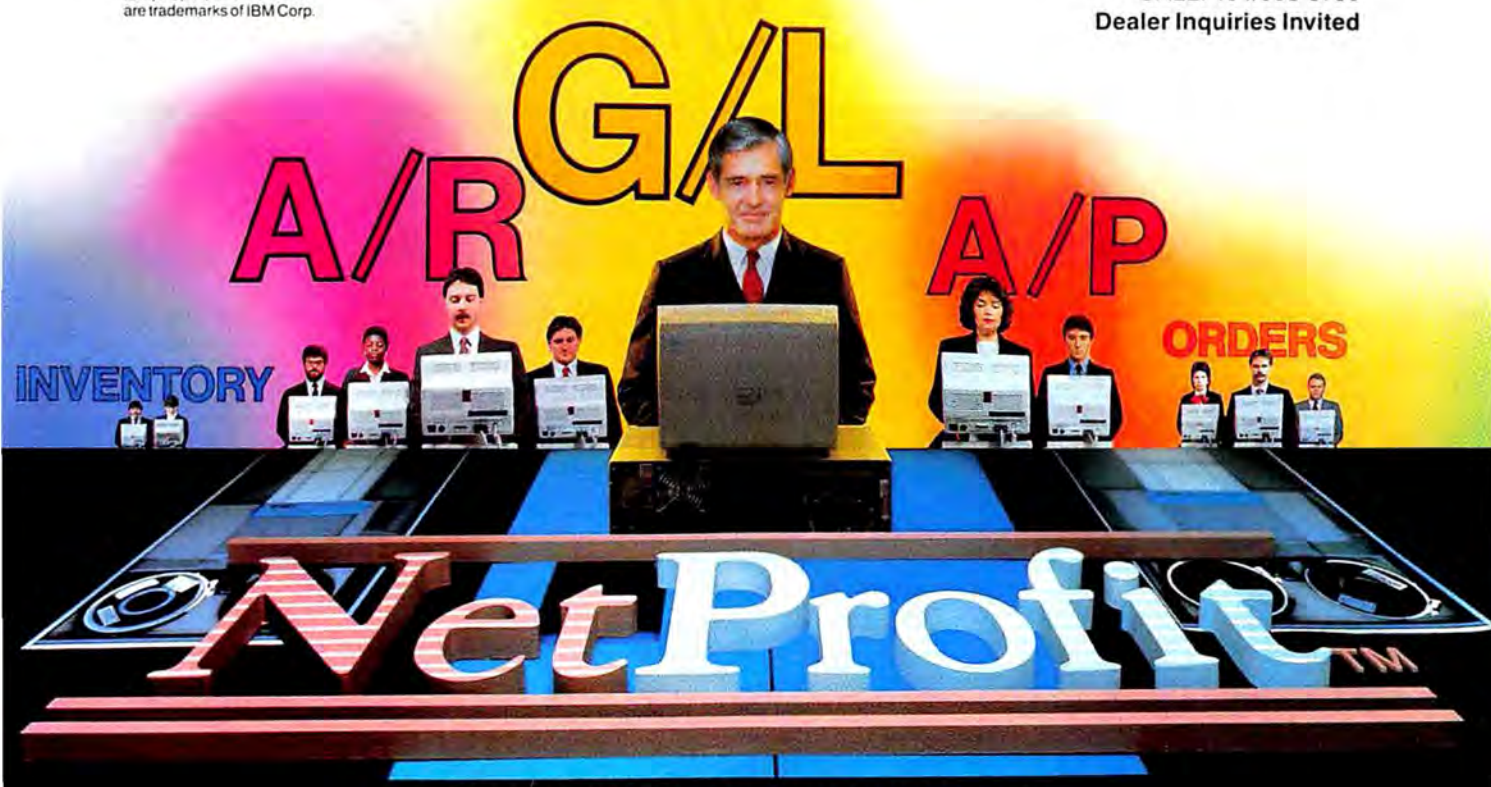
Don't Be Held Single-User Accountable. For complete details about the NetProfit™ Multi-User Accounting System and the authorized dealer nearest you, contact The Software Link today.

NetProfit™ is immediately available at a cost per module of $795. Evaluation disk available. Complete satisfaction is guaranteed or your money will be promptly refunded. VISA, MC, AMEX accepted.

THE SOFTWARE LINK, INC./CANADA
400 Esna Park Drive, Suite 18, Toronto (Markham), Ont. L3R 3K2
CALL: 416/477-5480

MultiLink® is a registered trademark of The Software Link, Inc. NetProfit™ LANLink™ and MultiLink Advanced™ are trademarks of The Software Link, Inc.
IBM, PC, XT, AT & PC-DOS are trademarks of IBM Corp.

THE SOFTWARE LINK, INC.
Developers of LANLink™ & MultiLink® Advanced
8601 Dunwoody Place, Suite 632 Atlanta, GA 30338
Telex 4996147 SWLINK
CALL: 404/998-0700
Dealer Inquiries Invited



The Multi-User Accounting System

Circle 526 on reader service card

A lot of great software . . .

Introducing 8 EndUser\Software anthologies

Why EndUser\Software?

EndUser Software is a new concept in PC software–a way to build your software library without depleting your cash. We're the publishers of *I.B. Magazette*, the disk magazine distributed to IBM PC users since 1982. We've developed anthologies of the best, most useful programs from the thousands that our end users have tested–plus several new programs in response to users' requests.

Each EndUser Software anthology disk is literally filled with software. All programs are easy to use, with clear menus and plain-English instructions. All documentation is included on disk–you can read it on screen or print it out. Get far more productivity, learning, and fun from your PC than you ever expected–for only $29.95 per anthology. With EndUser Software, end user satisfaction is guaranteed.

Special offer–free bonus
Order at least four anthologies and get a FREE BONUS–*31 Useful Utilities*, a disk full of time-saving productivity tools for end users and programmers alike. Normally costs $29.95.

Productivity

Office Organizer #EU-101
22 programs—Increase your productivity at work. *Memobook/Tickler-File* writes and stores memos and reminds you about appointments. Maintain mailing lists and generate form letters with *Address Book/Form Letter Maker*. *Do List* prints a neatly formatted daily agenda. *Filer* is a data base system. *Tax Fax* tracks deductible expenses, then figures monthly and year-end totals. Also includes 17 more programs.

Home Organizer #EU-102
10 programs—Enjoy a more efficient household. *Financier* helps you develop personal investment strategies. *Auto* tracks car expenses. Keep a well-stocked kitchen with *Shop List*. *Job Jar* makes it fun and easy to assign household tasks. Also includes a handy label maker plus five more programs.

Teacher's Aid #EU-103
16 programs—A unique collection assembled in response to teachers' requests for productivity tools. *Gradebook* stores grades for tests and papers, then computes totals and averages (weighted and unweighted). Use *Quizmaker* and *Quizgiver* to create and print interactive true-false and multiple-choice tests, then automatically assess students' scores. Your system becomes a typewriter with *Typewriter Simulator*. Also includes *Banner Maker, Address Book/Form Letter Maker, Memobook/Tickler-File*, and nine more programs.

Learning

Try CAI #EU-104
16 programs—Try computer-assisted instruction (CAI) in nine subjects and see how easy, fun, and effective it can be. Improve reading speed and comprehension with *FASTREAD*. *Vocabulary* builds knowledge of Spanish, French, and German, or any language you choose. *Speed-Spell* tutors spelling and allows changes in word selection. Enjoy learning facts about the United States with *State Map*. Also includes *Typing Tutor, Graphic Locator, Morse Code Tutor, Triangle Solver, World Time*, and seven more programs.

BASIC Before Your Eyes #EU-105
Tutorial—BASIC has evolved into a powerful language, and whether you stay with it or go on to other languages, here is a fun, nearly effortless way to learn an important skill. Created by a veteran BASIC instructor, this entertaining, interactive tutorial is like having a personal teacher. You'll see BASIC programs work before your eyes, heightened with sound and animation. By the end you'll be programming on your own.

Sorting Made Simple #EU-106
Tutorial—An excellent tutorial on a critical and fascinating element of programming. Start by learning and observing simple, slow sorting techniques–then move on to faster, more complex methods. When done, simply adapt any of the sorting techniques to sort your own data.

Pure Fun

Supernova #EU-107
Adventure—Explore a mysterious planet. This challenging interactive adventure game provides many hours of entertainment as you attempt to locate buried wealth on a remote mining planet. Direct all the action using plain-English sentences. *Supernova* is so full of detail, it's our only program that takes up an entire disk by itself. Play as long as you like, then save to continue later.

Our Favorite Games #EU-108
9 games—These games have been chosen from hundreds as the most intriguing, challenging, and fun. Includes arcade games (*Gunner, Snakes, King of the Mountain, PC Downs*, and *Fireman*), card games (*Concentration* and *Solitaire*), a fantasy game (*The Caverns of Kroz*), and *MAGIE*, a Bingo-like game that also prints out game cards. Several games offer varying skill levels for increased challenge.

Hardware requirements:
IBM PC family or compatibles, 128K memory, monochrome or color monitor (no graphics board required for most programs), DOS 2.00 or higher.

A great little price: $29.95

Order Now 800/222-2990

(Credit card orders only)
Technical assistance: Call 318/797-5991

NO POSTAGE, HANDLING, OR CREDIT CARD SURCHARGES on U.S. and Canada orders!

·EndUser\Software

P.O. Box 10120
Palo Alto, CA 94303-0976

Rush me the EndUser Software anthologies indicated below.

Please indicate quantity:

_____ #EU-101	_____ #EU-104	_____ #EU-107
_____ #EU-102	_____ #EU-105	_____ #EU-108
_____ #EU-103	_____ #EU-106	

Charge to my ☐ Visa ☐ MasterCard
Account number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Expiration date ☐☐ / ☐☐
Signature _____

For fastest service call 800/222-2990 (Credit card orders only)
Technical assistance: Call 318/797-5991

Name _____
Address _____
City/State/Zip _____

I'm ordering _____ (total quantity) anthologies at $29.95 each. Total $ _____

☐ I'm ordering at least four anthologies.
Send my free EndUser Software anthology, *31 Useful Utilities*.

California residents add sales tax $ _____

No shipping, handling, or credit card surcharges in U.S. or Canada! $ ~~_____~~

Orders outside U.S. and Canada only: Add $15.00

Total amount enclosed $ _____

(Check or money order in U.S. funds payable through a U.S. bank only)

ACT NOW! QUANTITIES LIMITED

What's a CD-ROM and what will it mean for YOU?

Find out fast in...

CD-ROM Review

Here it is. The full story on CD-ROM (Compact Disc—Read Only Memory)—one of the most important data storage developments in the history of the personal computer.

With a storage capacity of *550 megabytes* (up to 250,000 pages on a single 4¾" compact disc!)... and with the added capability for sound and images... CD-ROM promises to revolutionize personal and business computing. A full, 20-volume encyclopedia fits on a single disc with room to spare. The entire card catalog of the Library of Congress fits on three discs. What will it mean for you? Where is it headed? You'll find out in ***CD-ROM Review***—the first major publication devoted solely to this startling new way of storing and using information.

From ***CD-ROM Review***, you'll get a thorough understanding of CD-ROM technology... examine its applications, present and future... and learn what to look for in the purchase of CD-ROM discs and drives with ***CD-ROM Review***'s valuable *Buyer's Guide*.

BE THERE FIRST with ***CD-ROM Review***—the special issue devoted exclusively to the emerging CD-ROM technology! Complete and mail the attached order form to learn the details of CD-ROM and the future of personal computing! Or, call 1-800-258-5473.

Articles include:

- A Guided Tour of Grolier's Electronic Encyclopedia
- How CD-ROMs Work
- Buyer's Guide to CD-ROM Drives
- Business Databases on CD-ROM
- Professional Applications—Law and Medicine
- CD-ROMs for Science and Engineering
- Education and CD-ROMs
- Library Applications
- Compatibility—Can my computer use CD-ROMs?
- CD/I—Compact Disc/Interactive

YES, Send my copy of CD-ROM Review!

Please send _____ copies of **CD-ROM Review** at $3.95 per copy (includes postage & handling).

( ) Payment enclosed ( ) Visa ( ) Amex ( ) MC

Card # Exp. Date

Signature

Address

City State Zip

Make check payable to CD-ROM Review

CD ROM Review • CW Communications/Peterborough • Elm St. • Peterborough, NH 03458 PCCD86

Circle 561 on reader service card

version; IBM Color/Graphics Adapter or Hercules Graphics Card; Microsoft Bus or Serial Mouse, Mouse Systems Mouse optional
Not copy protected

The Print Shop

Are you trying to publicize your garage sale and unload your old Altair? Do you need to make amends in a hurry for forgetting a loved one's birthday? Could your letterhead use a snazzy new logo? And are you tired of sticky press-on letters? Fret no more. *The Print Shop*, a graphics-studio-on-a-disk from Brøderbund Software, may be the answer.

The Print Shop is versatile enough to turn out a sign, banner, greeting card, or letterhead in less than 10 minutes. The package includes a library of 140 clip art images and patterns, a dozen fonts from the calligraphic Reporter to the ornate Alexia, and 16 border styles. These elements can be combined and previewed on screen, then stored to disk and printed out.

The Print Shop is ideal for generating quick "in-house" graphics. It's simple enough for both PC novices and those with little patience for mastering layout and typesetting intricacies. Although it will easily suffice for home and small business needs, it's definitely not a replacement for a graphics department. Much of *The Print Shop*'s clip art belongs in an encyclopedia of computer kitsch, and

(continues)

IMAGINE WHAT YOUR COMPUTER COULD SAY WITH PC DIAL/LOG™

PC DIAL/LOG™ consists of an expansion card, software and a cable that connects a Touch Tone® telephone directly to your computer. When installed the PC Dial/Log™ automatically dials and answers the phone, saves and sends telephone messages and stores and forwards telephone calls.

IT'S SIMPLE, with direct installation and a menu-driven program. These features make PC Dial/Log™ convenient and easy to use.

UNPARALLELED VOICE QUALITY made possible by the Votrax® voice digitization process enables PC Dial/Log™ to deliver the best low-cost voice reproduction.

VOTRAX'S® SOFTWARE INTERFACE PROGRAM, THE TOOL KIT, created especially for the developer whose application includes PC Dial/Log™, will help save valuable programming time.

Other Votrax® Products
—Personal Speech System™,
Type 'N Talk™ Stand-Alone Devices
—IBM, Apple II, Commodore 64
Plug In Board Synthesizers
—Votrax® Speech Chips

APPLICATIONS including appointment scheduling, telemarketing, marketing surveys, financial updates, inventory status reports, dispatching and order entry are just some of the many ways that PC Dial/Log™ can be used.

WE WELCOME DEALERS AND DISTRIBUTORS to contact Votrax® regarding our complete line of products. Our reputation has been built on quality products and outstanding customer service that are sure to satisfy you.

AN UNBEATABLE PRICE at only $495*, PC Dial/Log™ is the lowest priced digital board available today. Please contact Votrax® directly for additional information.

*Plus shipping and handling

votrax

VOTRAX/CMC Int'l, Inc.
"Technology That Talks"
1394 Rankin, Troy, MI 48083
1-800-521-1350
In Michigan 313-588-0341
TWX 810 232 4140 Votrax-TRMI
For a voice demonstration call
313-588-2926

Circle 700 on reader service card

Your PC Market-Maximizer Account

The *PC World* Directory is a highly cost-effective way to enter the profitable IBM PC market—available in three- and six-month contracts. This comprehensive listing is your best bet for high returns with a minimal advertising investment. See this month's Directory for details.

In house.

This slide was made in house in under an hour for under $1.00.

Poor house.

This slide was made by an outside service in over 24 hours for over $20.00.

Presentations are on time, on budget with the Polaroid Palette.

Sending out for slides is expensive. And if you need them in a hurry, the prices can go through the roof.

But now you can change the whole picture with a brilliant solution from Polaroid.

It's called the Palette Computer Image Recorder, and it's a cost-effective way to produce color 35mm slides, as well as overheads and prints. In house. In minutes. For as little as 60¢ per slide.

Just hook it up to a compatible personal computer, and in minutes you can create colorful presentation materials. The Palette system includes a computer image recorder, the Polaroid 35mm Instant Slide System, as well as 35mm and instant print camera backs. All for just $1,999.*

What's more, Palette, as its name suggests, allows you to "paint" your PC images almost any color you want. Even if you don't have a color monitor. Imagine what that can do for your presentations.

And now try Palette for 21 days, satisfaction guaranteed.

For a limited time, you can try Palette for 21 days, and if you're not completely satisfied, we'll refund your money in full. And, since Palette works with so many popular graphics packages, we're offering some of them – Microsoft® Chart,™ LCS/Telegraphics TelePaint,™ and BPS® 35mm Express™ – at a 20% discount – with the same 21 day satisfaction guarantee.

So don't let your next presentation drag you off to the poor house. Stay in house with Palette instead.

For the name of the participating Polaroid Palette dealer nearest you call toll free 800-225-1618, 9 a.m. to 6 p.m. Eastern Time.

Polaroid

For more information, mail this coupon to Polaroid Corporation, Dept. 661, P.O. Box 5011, Clifton, NJ 07015.

☐ I'd like a demonstration
☐ Please send me more information
PC make and model _____

Name _____

Company _____

Address _____

City _____

State _____ Zip _____

Telephone _____ PCW 7/1

©1986 Polaroid Corporation "Polaroid" * "Microsoft" is a registered trademark of Microsoft Corporation. "BPS" is a registered trademark of Business & Professional Software, Inc. * Suggested list price.

UPS SYSTEMS
200 – 1500 WATT AS LOW AS $259
PRINTER SOUND COVERS
FOR ANY PRINTER AS LOW AS $99
NETWORK
LAN $295 PER NODE
An IBM® compatible, local area network, with ring topology that can link up to 250 stations (including PC's, XT's, AT's & compatibles) using IBM or Novell software.
DISKETTES
BASF maxell.
PC $11 BX $15 BX
AT $24 BX $33 BX
3½DS $15 BOX OF 5 $35 BOX OF 10
Minimum Diskette Order $100
½ CARD INTERNAL MODEM
300/1200 Baud Hayes Compatible With LYNC Software $199
TILT & SWIVEL POWER CENTER
$77
• 5 Outlets
• Surge Protection
• Tilt & Swivel
SWITCH BOX
2–Way Serial $66
RACORE
PCjr LIVES
NOW WITH DMA
• 2nd 360K, 10MB Or 20MB Drives
• Memory Plus Upgrades
• Keyboard Cables
FREE Catalog of Racore and other PCjr products
This Ad Supercedes All Previous Ads. IBM is a registered trademark of International Business Machines
MICRO MARKETING 404-441-1081 GA 800-652-9289 USA
875 GLEN RIDGE DR• LILBURN, GA 30247
Circle 102 on reader service card

output quality is severely limited by the 120 by 72 dots per inch resolution possible with dot matrix printers supported by the program. As you might expect, curved or detailed images don't reproduce well. But don't write off *The Print Shop* too quickly: With a little discretion in choosing or designing graphics, aesthetically pleasing and utilitarian cards, signs, and letterheads can roll out of your trusty Epson printer in no time (see Figure 3).

The Print Shop's designers have kept the neophyte user firmly in mind. The program is menu-driven, and its options are so obvious that the thoughtfully crafted user manual is hardly needed. The program's modest price tag will likely appeal to budget-conscious educators and home computerists. Installation, however, won't appeal to anyone. The INSTALL routine only recognizes a dual-floppy system (A: and B:) or a system with a single floppy and a hard disk (drive C:)—*The Print Shop* is adamant on this point. If the hard disk isn't configured as drive C:, issue the command ASSIGN C = *d*, where *d* is your hard disk drive's designator, before running INSTALL. (When finished, the command ASSIGN will restore your system's normal

(continues)

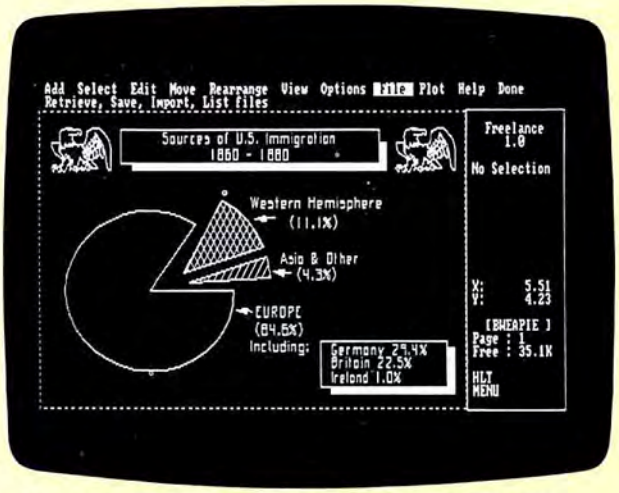
Figure 3: The Print Shop is just the ticket for cards, announcements, and flyers.

If you want to know who holds a world's record,
you go to Guinness.

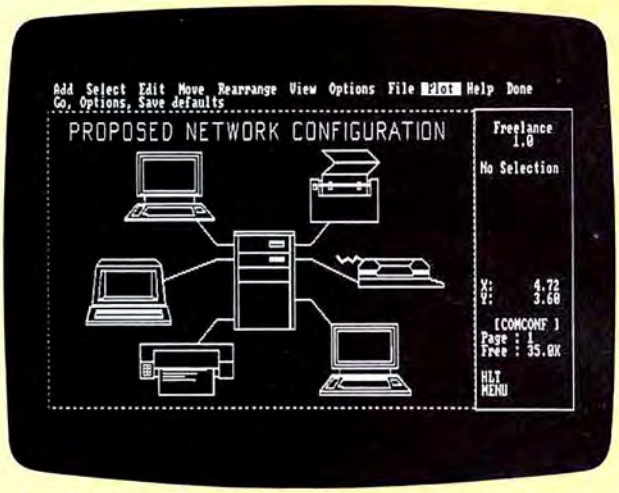
If you want the final word on a point of law,
take it to the Supreme Court.

If you want to find the best graphics software,
ask Datapro.

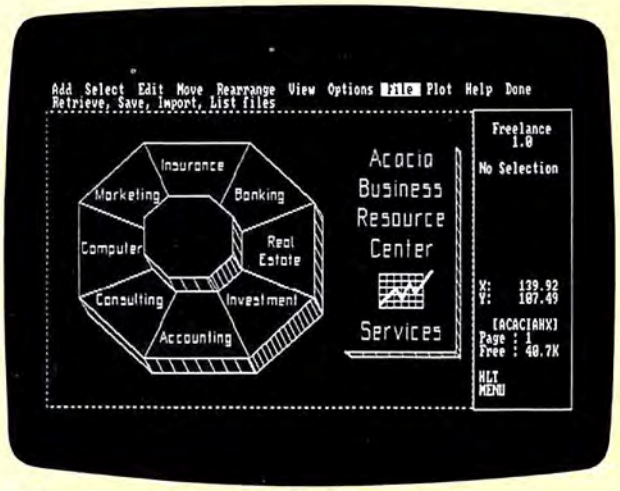
FREELANCE



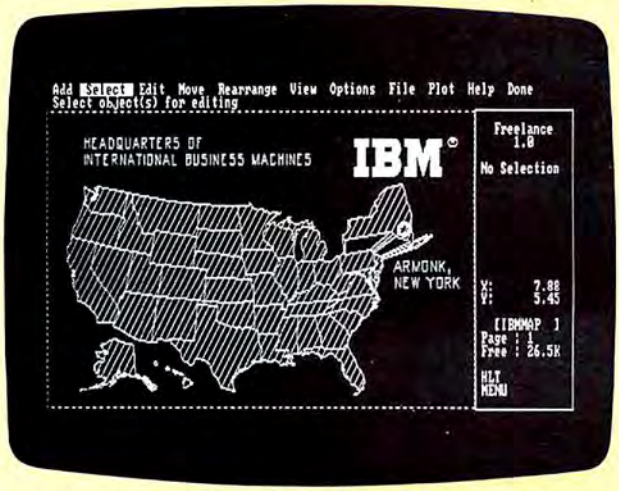
This used to be a 1-2-3® chart. Freelance adds presentation quality and unlimited freedom to your Lotus® graphics.



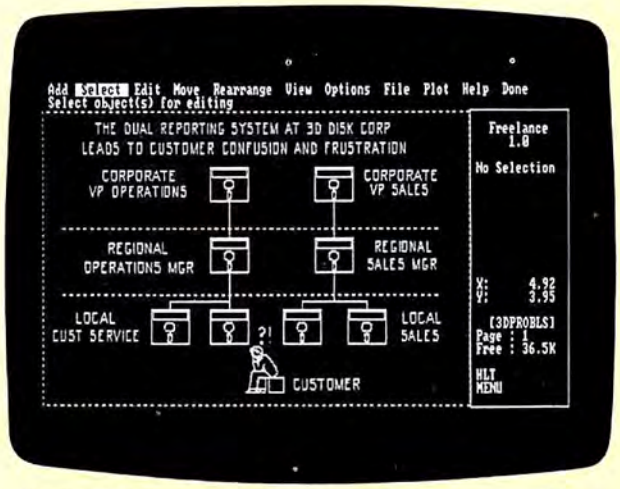
Freelance offers a library of over 300 symbols – including stars, arrows, computers, human figures and industrial symbols. You can even make your own symbols.



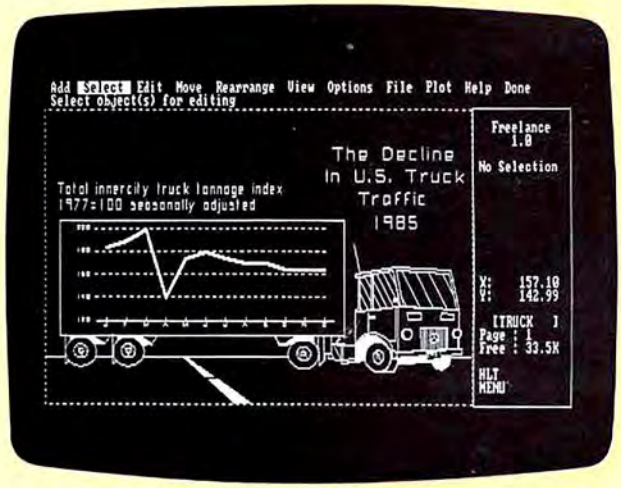
There's more to great word charts than just words. With Freelance, you can combine your text with drawings, symbols and an array of other special effects.



Freelance does mapping. And lets you create your own logo and add it to your charts.



"Freelance is flexible. Try doing this organization chart, with a dual-reporting structure, using a typical business graphics program." Datapro Research Corporation.



You can create detailed drawings with Freelance, using powerful features such as zoom and edit.

"Because of its flexibility, its quality, and its ability to edit 1-2-3 charts, there aren't many products which can be considered competitive with Freelance. In many ways, Freelance represents a completely new conception of what a graphics program should be." Datapro Research Corporation.

Datapro Research Corporation is the biggest, toughest, most respected group of computer product evaluators in the industry. They know a thing or two about computer graphics. Their job is to render independent and highly objective assessments. They don't owe anyone any favors. Datapro just conducted an in-depth, hands-on evaluation of Freelance, a recently-introduced graphics package from Graphic Communications. They subjected Freelance to a barrage of tests, appraising everything from basic and advanced functions to the instruction books. They looked at it from every angle.

Then, they rated Freelance the Number One business graphics package.

Here are a few more of Datapro's conclusions.

On Freelance and Lotus 1-2-3: "Here is a program that can not only create free-form charts, but it can also edit the graphs produced by Graphwriter,® 1-2-3 and Symphony® to produce quality images that rival those produced by expensive graphics services."

On Ease Of Use: "Freelance really is different. It is a powerful graphics program that can produce high-quality images, but it handles graphics in a way that will seem natural to even the most novice user."

On Freelance's Symbol Library: "The range of graphic elements offered by Freelance is incredibly powerful, and the ability to use and create special symbols means that even the most pedestrian user can create impressive looking charts."

On Love at First Sight: "Here at Datapro, we use a good many programs in the course of our software testing but there are only a few that become our favorites. Freelance has been in constant use ever since we got our first prerelease copy in late last summer, and we will continue to turn to it again and again."

What is it about Freelance that can drive such a rigidly objective group of researchers to such heights of enthusiasm? Whatever it is, it's worth investigating.

In the words of Datapro, "To anyone interested in presentation-quality graphics, Freelance is worth a serious look." For your free copy of the full Datapro Report on Freelance, just call or write Graphic Communications, 200 Fifth Avenue, Waltham, Massachusetts 02254.

GRAPHIC COMMUNICATIONS, INC.

1-617-890-8778

Circle 502 on reader service card

Buy an FT-156 light pen and PXL-350 Hi Res Light Pen Board from FTG and get Microsoft's Windows™ - **free!**

It's a tidy $99 savings, plus you get the tools you need to take advantage of power Windows. Gathering your software together under a consistent, graphical interface is what Windows does best. Manipulating graphical software is what our light pen and board do best. Windows gives you a whole set of desktop management applications. The FT-156 and PXL-350 let you use them easily, quickly, and efficiently. And our product delivers single-pixel resolution for your graphics.

SPECIAL PACKAGE PRICE*

FT-156/PXL-350 standard configuration board/Windows
(IBM PCs, PC-XT, PC-AT and most compatibles).....$349

FT-156/PXL-350 expanded configuration board/Windows
(AT&T 6300 and COMPAQ computers).....$379

Use our toll-free numbers to order or get more information about FTG's products.

FTG DATA SYSTEMS

(714) 995-3900
(800) 962-3900
(800) 972-3900 (Calif.)

10801 Dale St., Suite M-2, P.O. Box 615, Stanton, CA 90680 Telex: 887840

*Offer expires October 31, 1986 and is void where prohibited, taxed, or restricted by law. Offer redeemable only through FTG Data Systems.

Circle 610 on reader service card

PC World Creates a Long Buy-Line for You

Queue up! *PC World* readers mean big business—for you. Call your Account Manager to reserve your advertising space today—please see page 4 for phone numbers.

drive letters.) One floppy disk backup is allowed, or you can install the program on as many as four hard disks, the latter procedure rendering the master floppy permanently useless.

From *The Print Shop*'s main menu you are prompted to create a card, headline, sign, or letterhead. If you opt for a greeting card, for example, *The Print Shop* displays 16 standard borders. Inserting a piece of clip art entails moving the cursor to the desired spot on the card, paging through the images in a special window, and pressing <Enter> to confirm the choice. To generate your own graphics or modify clip art, select Graphics Editor from the main menu. The program sets aside a third of the screen and allows you to build or edit an image pixel by pixel and save it to disk.

The Print Shop can use single sheet or sprocket-fed 9½- by 11-inch paper, generating greeting cards measuring 4¼ by 5½ inches (2 folds), 8½- by 11-inch signs and letterheads, and sideways banners of any length. If you use form-fed paper, the program can print a row of very faint dots for alignment purposes.

Page layout functions are relatively crude. An illustration can be either large, medium, or small. Large images must be located in the exact center of the card, and you can rubber-stamp the medium and small pictures around the card and overlay them with text. On the front of a card, messages can run 14 characters across and 11 lines down. Text likewise comes in three sizes and can be centered, right- or

(continues)

AMERICA'S NEXT FAVORITE MOUSE.

The best price: $99

Experience AUTOCAD at 9600 baud with LOGIMOUSE

THE BEST HARDWARE:

LOGITECH has been the leading OEM mouse company for years, quietly providing mice to companies like AT&T, DEC, and H-P. We've designed LOGIMOUSE C7 just for the retail marketplace. And poured all our years of hardware engineering into it. You simply can't find a better mouse.

- IBM PC/XT/AT compatible through any serial port
- NO pad, NO external power supply
- HIGH (200 dpi) resolution
- Tactile feedback switches

LOGIMOUSE® C7

THE BEST SOFTWARE:

LOGIMOUSE is now available with all new software that sets new performance standards for the mouse:

LOGIMOUSE Base Package $99

- LOGIMOUSE Driver Version 3.0: Faster and smaller. Makes LOGIMOUSE compatible with all Microsoft applications.

LOGIMOUSE Plus Package $119

- LOGIMENU—Programmable Pop-Up Menu System: Customizable for all your favorite keyboard-based applications. Fully compatible with Microsoft Menu, only better.
- CLICK: A new concept in mouse software! It resides in memory, detects which application you are running and sets the mouse to your predefined setting. You define macros for the mouse buttons, set the mouse baud rate and protocol, define the pop-up menus to be used by LOGIMENU. Just add CLICK to your autoexec file and LOGIMOUSE will be ready to go with each of your favorite applications. So you can get down to work.
- POINT-AND-CLICK SHELL for Lotus 1-2-3: No more jerky cursor movement, no more delays, no more beeping. To select a cell, execute a command, scroll your spreadsheet, or call up context sensitive pop-up menus, just point with the mouse and click!
- POINT EDITOR—Mouse Based Program Editor: If you think a mouse was not meant for editing, POINT will change your mind.

LOGIPAINT SET
With Base Package $149
With Plus Package $169

LOGIMOUSE C7 plus PC Paintbrush 3.0 is the most advanced paint set available for the PC. Use LOGIPAINT to design a logo, paint, or draw a picture of a product you're developing. You won't believe its power with either free hand drawing or graphics.

To place a credit card order call our special toll-free number: **800-231-7717**

Call toll-free in California: **800-552-8885**

YES! I want America's next favorite mouse!
Please send me:

☐ LOGIMOUSE Base Package	$ 99
☐ LOGIMOUSE Plus Package	$119
☐ Plus Package Software	$ 29
☐ Base LOGIPAINT SET	$149
☐ Plus LOGIPAINT SET	$169

*Add $6.50 for shipping & handling. Calif. residents add applicable sales tax.

MONEY BACK GUARANTEE

☐ VISA ☐ MASTERCARD ☐ CHECK ENCLOSED

Card Number _____ Expiration Date _____

SIGNATURE _____

NAME _____

ADDRESS _____

CITY, STATE _____

ZIP _____ PHONE _____

DEALER INQUIRIES WELCOME

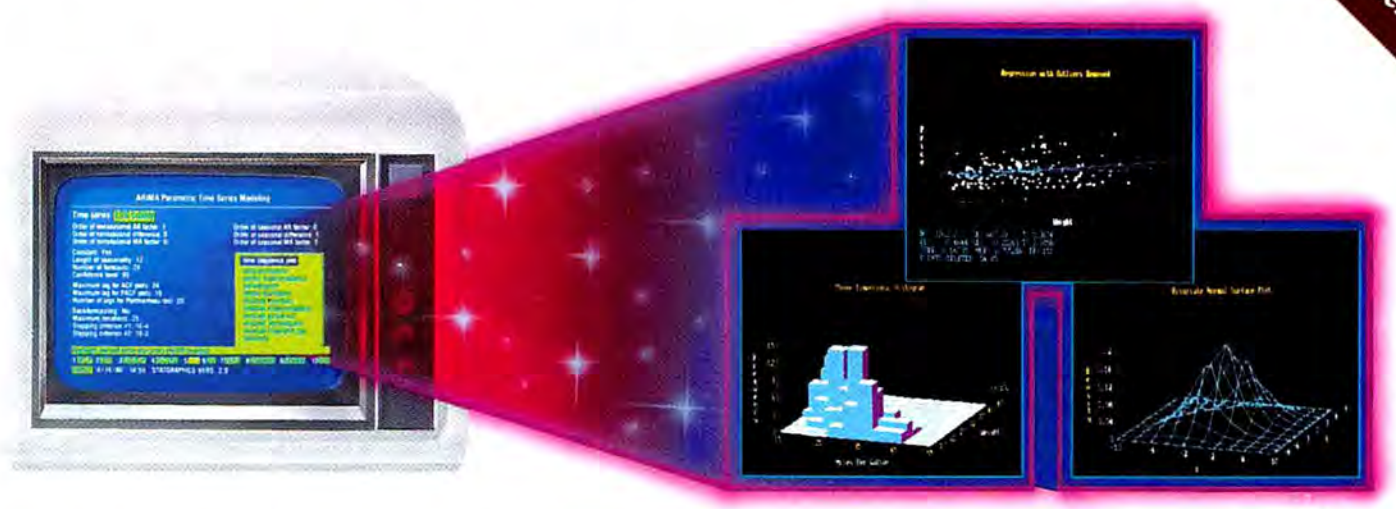
LOGITECH

LOGITECH, Inc.
805 Veterans Blvd., Redwood City, CA 94063, USA
Telephone: (415) 365-9852

LOGIMOUSE is a registered trademark of LOGITECH, Inc. Lotus and 1-2-3 are trademarks of Lotus Development Corp. Microsoft is a trademark of Microsoft Corp. PC Paintbrush is a registered trademark of ZSoft Corp.

STATGRAPHICS®

NOW! Faster, More Procedures, Improved Data Management!



Powerful Statistics, Sophisticated Graphics In One Complete Software System

STATGRAPHICS from STSC is simply the most complete and powerful statistical software available for your PC. STATGRAPHICS integrates powerful statistics with high-resolution color graphics—in one single software system—to give you an extraordinarily powerful analytical environment.

"[STATGRAPHICS] is unusually complete as software systems go in terms of statistical capabilities."
(PC Week)

With more than 250 statistical and mathematical procedures, STATGRAPHICS offers you the power and precision of mainframe software—right on your PC. All the tools you need for comprehensive statistical analysis: ANOVA, complete regression analysis, experimental design, quality control procedures, multivariate techniques, nonparametric methods, and extensive forecasting and time series analysis, including Box-Jenkins.

"I've found STATGRAPHICS to be one of the most complete and easy-to-use statistics programs that I have come across."
(Whole Earth Software Catalog)

All this statistical power is even more valuable with STATGRAPHICS' unique interactive environment. STATGRAPHICS is completely menu-driven so you can get into your statistical analysis work quickly and be productive right from the start. You can easily go back and forth between your numerical and graphical analysis—change variables as many times as you want—and see the effect immediately.

You can also enter and access data easily. STATGRAPHICS has a full-screen data editor and interfaces with standard ASCII files, Lotus® 1-2-3® and Symphony® worksheets, and dBASE® files.

"Verdict: [STATGRAPHICS is] a model PC software system which will set standards for PC statistical software."
(PC User Magazine)

STATGRAPHICS offers you a wide variety of graphics capabilities to help you visually analyze your data—more options and more sophistication than any other PC statistical software. Included are histograms, two- and three-dimensional line and surface plots, scatter plots, time sequence plots, quality control charts, as well as bar and pie charts. STATGRAPHICS supports a wide range of graphics boards, printers, and plotters.

For the most complete, advanced statistical graphics software system available, order STATGRAPHICS today. To order, contact your local dealer. If they don't have it, tell them to call STSC toll-free.

(800) 592-0050
In Maryland or Canada call (301) 984-5123.

STATGRAPHICS—the best overall choice!

	Integrated Statistical Graphics	Direct Lotus & dBASE Interfaces	Menu-Driven	Minimum Hardware Required	Helpline Support	U.S. Suggested Retail Price
STATGRAPHICS	✓	✓	✓	Dual Floppy Disk	✓	$795*
SPSS/PC +™	NO	NO	NO	10 Meg Hard Disk	✓	$1385
SAS®/PC	NO	NO	✓	20 Meg Hard Disk	✓	$2700+ Annual Maintenance Fee

Data compiled as of April 1986

STSC

Available nationally through Softsel and distributors worldwide. Dealer inquiries welcome.

*International prices slightly higher. STATGRAPHICS, SAS, and dBASE are registered trademarks of Statistical Graphics Corporation, SAS Institute Inc., and Ashton-Tate, respectively. Lotus, 1-2-3, and Symphony are registered trademarks of Lotus Development Corp. PLUS*WARE and SPSS/PC + are trademarks of STSC, Inc. and SPSS Inc., respectively.

A PLUS★WARE™ PRODUCT

Circle 618 on reader service card

A Fitting Solution . . .

The face of the template displays the type of information you want handy all the time, such as menu structures, key assignments or cursor control information.

The Mini-Manual is a specially condensed guide to your software, containing the references, examples and tables you need most often.

The 10 function keys are directly referenced by the "U" portion of the template. Colors are used to indicate if a key is to be used in conjunction with the Alt, Ctrl, or Shift Key.

Each template is made of high-impact polystyrene especially molded to snugly fit most popular MS-DOS personal computers (IBM® PC, XT & AT, the COMPAQ® portable and Deskpro, NCR®, AT&T®, IT&T® and Sanyo® PCs, etc.)

Templates Available for. . .

- WordPerfect™ 3.0
- WordPerfect™ 4.0/4.1
- Lotus 1-2-3™
- Symphony™
- DBase III™
- WordStar® Professional
- WordStar® 2000
- MultiMate™
- Microsoft® Word 2.0
- DisplayWrite 3™

Suggested Retail
$19.95
(WordPerfect™ 4.0/4.1—$22.95)
(Symphony™ & DBASE™—$24.95)
DEALER INQUIRIES WELCOME

The TDA Template Series

"Answers at your fingertips"

TDA, Inc., 445A Carlisle Drive, Herndon, VA 22070 (703) 437-4148

Circle 713 on reader service card

left-justified, and set in a standard, outline, or three-dimensional font.

The Preview option lets you view a completed card in its entirety. If you're unhappy with the fruit of your labor, you have the option of reversing each step of the creation process by pressing <Esc>—flexibility seldom found in even the most expensive page-composition programs. When you're completely satisfied with the design, you can print the card immediately or save it.

Printing speed naturally varies with the printer, but a one-page sign with seven lines of text and a medium-size piece of clip art emerged from an Epson FX-100 in less than 3 minutes. Printers supported by *The Print Shop* include the Epson RX, MX, FX, and JX series, C. Itoh's 8510 Prowriter, the NEC 8023A, the Citizen MSP15, the Legend 880, the Blue Chip M120/10, the Mannesmann Tally Spirit 80, the Star Gemini 10X/15X, the Panasonic KX-P1090, the Centronics GLP, and the Okidata Microline 92/93.

The Print Shop is a helpful, inexpensive program that can quickly and competently handle any number of simple printing projects. It's simple and it works—and in the world of PC-based publishing, that's no small feat. —*Peter Feldmann*

The Print Shop
Brøderbund Software
17 Paul Dr.
San Rafael, CA 94903
415/479-1170
List price: $59.95, additional clip art disk $34.95

(continues)

ACCOUNTING FOR MICROS

$395 Set of Four
$325 Set of Three
$465 Set of Five

ACCOUNTING FOR MICROS is a set of integrated accounting programs which meet professional standards. They're fast and easy to use, with complete instructions. Our manual (shown above) also includes helpful information on bookkeeping and computers.

GENERAL LEDGER $125
Allows up to 1,000 accounts & 1,000 transactions/month. Retains mo/end balances for Last year, This Year and Forecast. Includes Cash Disbursements, Cash Receipts and General Journals. Reports include Balance Sheet, Income Statement, Annual Summaries and Journal Reports.

ACCOUNTS RECEIVABLE $125
Allows up to 2,500 customers and 1,000 invoices per month. Invoicing can access Inventory Module. Keeps customer names and addresses. Invoice prints on plain paper or any pre-printed form. Statements can be printed at any time.

INVENTORY $125
Allows up to 4,000 parts. Keeps 3 month history of unit sales as well as year to date. With AR, can be used as point of sale system (prints invoices, handles cash). Reports include Inventory Value and Stock Report, Internal and Customer Price List.

ACCOUNTS PAYABLE $125
Allows up to 500 vendors and 800 invoices/mo. Records invoices and hand-written checks. Prints computer checks on any pre-printed form. Keeps vendor names and addresses.

PAYROLL $125
Will handle up to 100 employees with eight deductions per employee. Deductions may be determined as fixed dollar amounts or percentages, or referred to a table for automatic look-up. Tax tables are easily entered, or purchased separately. Prints checks and W2's.

SET OF FIVE $465
SET OF FOUR $395
SET OF THREE $325

RUN ON MOST CPM AND MSDOS

Apple CPM	IBM PC,XT,PC jr,AT	Sanyo (all)
Columbia	Kaypro (all)	Tandy (all)
Compaq	Morrow (all)	TeleVideo
Corona	Osborne (all)	Zenith 100 & 150
Eagle (all)	Panasonic	8" CPM
Epson QX-10	Radio Shack CPM	Other compatibles

DEMO DISK
$18.00

Try all 5 programs above (GL, AR, AP, IN, PR). Order our DEMO DISK for $18.00 (includes shipping). Condensed versions of the programs give you the "feel" of data entry and access. Includes sample reports and instructions. Specify machine.

TMAN $125
The "Catch-All" program. Files any type of information for quick access. Name or subject oriented with 15 lines of notes per name. Use TMAN as a mailing list, filing system, notebook, etc. Can be used alone or with data from our other programs.
Try **TMAN DEMO $15**

HOW TO ORDER: Please specify machine and disk format. You can pay by check, by VISA or MasterCard (we need your expiration date and card number), or by UPS COD (add $2.50 COD charge). Our price includes shipping. Minnesota residents, add 6% sales tax). We ship most orders the same day.
or **ORDER BY PHONE: 1-800-654-6903**

James River Group
INCORPORATED

(612)339-2521

125 North First Street
Minneapolis, MN 55401

64K ■ 128K ■ 256K
DRAMS
80287-8 ■ 80287-3
8087-3 ■ 8087-2
8087-1
BITTNER
ELECTRONICS
899 SOUTH COAST HIGHWAY
LAGUNA BEACH, CA 92651
(714) 497-6200
CALL NOW FOR **FREE** CATALOG

Circle 622 on reader service card

CHANGING SYSTEMS?
What Happens to Your Data?
Does JUST Media Conversion Solve Incompatibilities?

WHAT IF . . .
everything is changing, including your software, hardware, operating systems and media? What happens to your **spreadsheet** data and formulas, **database** structures and/or word processing documents and codes?
What do you do, and what is the cost?

We Make Incompatible Data Compatible!
The source can be mainframes, minis, micros, dedicated word processors or typesetters. **ADAPSO** member.

CompuData Translators, Inc. 213-462-6222
6565 Sunset Bl., #301 Hollywood, CA 90028

Circle 28 on reader service card

Never have so many paid so little for so much.

There's a triumphant feeling that comes with buying the **Victor VPC II.**® A feeling that you've found the very best IBM-compatible computer—with the best support—at the best price. It's faster yet smaller than the IBM PC XT. It runs all the same programs flawlessly. Its keyboard is comfortable rather than confusing. And it gives you every bit of memory (640K) that can be put in a PC. We've even included features that IBM offers only as options. And the VPC II gives you an option all its own: a 30-Day **Money-Back Guarantee.*** You're also guaranteed prompt nationwide service through Xerox Americare. All for as little as **$1095.** To get an even better feeling for what the Victor VPC II can do for you, or to locate your nearest Victor dealer, call Bob at 1-800-248-5252.

*At participating Victor dealers.
Xerox Americare is a trademark of Xerox Corporation.
IBM PC XT is a trademark of International Business Machines Corporation.

VICTOR®
Scotts Valley, CA (408) 438-6680

Circle 590 on reader service card

New *scLASERplus*™ does so much for your LaserJet™ printer...

you could write a book on it!

scLASERplus™...The Most Powerful Document Publishing Software Available. Designed to unleash the power of your IBM† Personal Computer and Hewlett-Packard LaserJet‡ printer.

Cost Savings...Plus Flexibility

With scLASERplus you can publish large-volume documents — from corporate reports to technical manuals — at less than half the cost of outside printing.

And instead of having to assemble text, graphs and charts to send outside for printing, you can do it in-house at your computer screen — then print the finished product, assured of the highest quality results. scLASERplus allows you the flexibility of last minute revisions and as many originals as you wish. And frees you from outside printer schedules.

Professional Publishing Features

- Full integration of text and graphics
- Screen Snapshots and spreadsheets from packages like Lotus 1-2-3+
- Powerful Text Editor with Spellchecker
- Icon Editor to design your own symbols
- Automatic or user-defined formatting
- Automated Table of Contents, and Index
- Kerning, leading, micro-justification, tables, shading, boxes, bar codes, bar graphs and more.

scLASERplus. The only software product that turns your IBM PC and LaserJet printer into a professional in-house publishing system.

SOFTWARE CHANNELS INC.
A Graham Software Company
212 King Street West, Toronto, Ontario Canada M5H 1K5
Four Kingwood Place, Kingwood, Texas 77339
(713) 359-1024 (416) 591-9131 (Canada)

SC LASERplus
The Professional Publisher™

Circle 168 on reader service card

As listed in the Hewlett Packard "LaserJet Printer Family Software and Hardware Solution" catalogue, under Publishing Tools. †Trademark of International Business Machines. ‡Trademarks of Hewlett-Packard Company. +trademark of Lotus Development Corporation.

THE ONLY DRIVE WORTH ASKING FOR BY NAME.

We'll let you in on a secret. If the small computer you're using has a hard disc drive memory, chances are that drive was made by Seagate.

There's a reason for this—actually over 2½ million reasons. (That's the number of hard disc drives Seagate has shipped to quality-conscious customers throughout the world.)

Why are we telling you this?

So you can be sure you get Seagate quality in your new computer, disc memory upgrade or add-on.

The name on the outside may be different, but now that you know the difference, make certain that the name on the inside is SEAGATE.

Seagate Technology, 920 Disc Drive, Scotts Valley, CA 95066. 800-468-DISC (800-468-DISK in California)

Seagate

Circle 425 on reader service card

TURN YOUR
P.C.
INTO AN
M.D.

HOUSECALL
THE COMPUTERIZED
HOME MEDICAL ADVISOR

- Written By Physicians.
- Over 400 Diagnoses.
- Concise Information accessed directly or through branching questionnaire.
- Educational—background and treatment for each condition diagnosed.
- Closely Related Diagnoses follow computer's initial choice.
- A Ready "Second Opinion".
- Fast, Easy and Fun to use.
- Self Contained—Multiple disk data base—no modem needed.
- Always Current—yearly updates available at nominal cost.

Great For Business Offices As An Employee Benefit. Also Helps Reduce Absenteeism

HOUSECALL Will Run On APPLE II +, c, e, IBM PC Family, and 100% Compatibles. *Dealer inquiries invited.*

Rocky Mountain Medical Software, Inc.

To Order Call Toll Free
(800) 233-3556
For More Information Call
(303) 773-1237

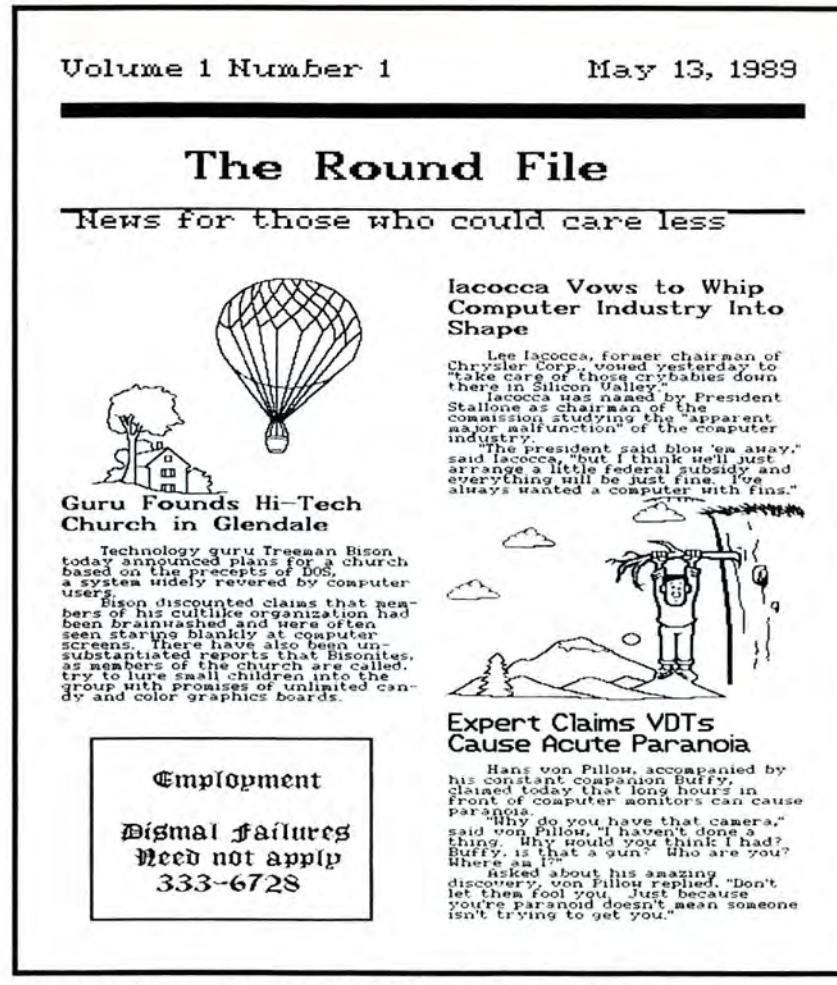
List Price $79.95 *SPECIAL $49.95*

Please send_____copies of HOUSECALL @ $49.95 + $5.00 shipping ($12.00 foreign). (Colorado residents add $1.80 tax). 20 Day Money Back Guarantee. For Unprotected Add $20.00.

Type of Computer _____
Name _____
Address _____
City/State/Zip _____
☐ Check ☐ VISA ☐ MC Exp. Date _____
No. _____
Signature _____

Rocky Mountain Medical Software, Inc.
5680 S. Syracuse Circle, Suite 500R
Greenwood Village, CO 80111

Circle 265 on reader service card



Volume 1 Number 1 May 13, 1989

The Round File

News for those who could care less

Guru Founds Hi-Tech Church in Glendale

Technology guru Treeman Bison today announced plans for a church based on the precepts of DOS, a system widely revered by computer users.

Bison discounted claims that members of his cultlike organization had been brainwashed and were often seen staring blankly at computer screens. There have also been unsubstantiated reports that Bisonites, as members of the church are called, try to lure small children into the group with promises of unlimited candy and color graphics boards.

Employment

Dismal Failures Need not apply
333-6728

Iacocca Vows to Whip Computer Industry Into Shape

Lee Iacocca, former chairman of Chrysler Corp., vowed yesterday to "take care of those crybabies down there in Silicon Valley."

Iacocca was named by President Stallone as chairman of the commission studying the "apparent major malfunction" of the computer industry.

"The president said blow 'em away," said Iacocca, "but I think we'll just arrange a little federal subsidy and everything will be just fine. I've always wanted a computer with fins."

Expert Claims VDTs Cause Acute Paranoia

Hans von Pillow, accompanied by his constant companion Buffy, claimed today that long hours in front of computer monitors can cause paranoia.

"Why do you have that camera," said von Pillow, "I haven't done a thing. Why would you think I had? Buffy, is that a gun? Who are you? Where am I?"

Asked about his amazing discovery, von Pillow replied, "Don't let them fool you. Just because you're paranoid doesn't mean someone isn't trying to get you."

Figure 4: A sample newsletter layout with The Newsroom

Requirements: 128K; one disk drive; DOS 2.00 or later version; IBM Color/Graphics Adapter, Hercules Graphics Card, or compatible board
Copy protected

The Newsroom

"Gosh gang! Let's start a newspaper! Judy says we can use Old Man McPhelan's barn, and I just got my copy of *The Newsroom!*"

An early entry in the PC publishing market, *The Newsroom* is perhaps better suited for the burgeoning "kitchen-table" publishing niche. *The Newsroom* enables you to write and electronically paste up a newsletter (including headline banner and graphics) on a PC and publish it on a dot matrix printer. The result, however, is cute at best and adolescent at worst.

The sample layout in Figure 4 illustrates what the Idaho Falls Begonia Club might possibly create

(continues)

NOBODY DELIVERS LIKE LOGICSOFT.

Buy it today, use it tomorrow!
Only Logicsoft ships your order the same day via overnight courier.* Free.

Nobody beats Logicsoft prices.
In fact, if you find a lower price (advertised or a bonafide quote) on any of the hundreds of products we stock, we'll beat it by $10.† Our Corporate Accounts Program offers attractive volume discounts. Credit cards and PO's accepted.

Outstanding customer service and technical support.
It's only a toll-free phone call away. Another reason why Logicsoft is a major hardware and software supplier to over 50,000 companies, including over 90% of the Fortune 1000.

See inside for the lowest prices on over 800 products for IBM-PC's and compatibles.

LOGICSOFT®

To order or receive technical assistance, call our National Hotline:

1-800-645-3491

Customer Service: 1-800-431-9037
NY STATE: 1-800-235-6442 (516) 249-8440
FAX# 516-249-5289

*Applies to order totaling over $100. If under $100, shipped UPS—FREE (Within Cont. U.S.). Due to weight restrictions, printers and monitors are also shipped UPS—FREE. †This offer does not apply to items under $100, American Express or Terms orders. In these instances, we will *meet* any lower price. We reserve the right to request a current written price quote.

NOW LEASE OR PURCHASE SYSTEMS FROM LOGICSOFT.

THE ECONOMY AND FLEXIBILITY OF A LOGICLEASE.

High tech without high cost. Outstanding flexibility. Plus substantial tax benefits. Logicsoft's new leasing program gives you them all and much more. Lease the computer system you need now for 36 months (customized lease programs also available) at one of our low, low rates. At the end of the term, you can purchase the system for only 10% of the original purchase price. Or negotiate a lease extension. Give Logicsoft a call. **We'll process your lease application in 24 hours.** And deliver your system within three days. First and last lease payments required in advance. Lease proposals subject to credit approval. Rates based on current cost of funds.

FREE 90-DAY, ON-SITE SERVICE ON ALL SYSTEMS.

Whether you lease or purchase a system from Logicsoft, you get a unique bonus: *a free 90-day, on-site system hardware service contract.* We've contracted with one of the nation's largest and most respected independent computer maintenance firms to provide you free service in most metropolitan areas. If a problem arises, it will be corrected quickly and efficiently. *At your facility. And at no additional cost to you.* There's no inconvenience of transporting your system to and from a service center. Wherever you are. Whatever the problem. Expert assistance is only a phone call away.

LOGICSOFT®

To order or receive technical assistance, call our National Hotline:

1-800-645-3491

Customer Service: 1-800-431-9037
NY STATE: 1-800-235-6442 (516) 249-8440
FAX # 516-249-5289

110 Bi-County Blvd., Dept. 5432
Farmingdale, NY 11735
CANADA: 416-283-2354
Domestic/Int'l Telex
286905 SoftUR

EUROPE: 020-83 48 64
Telex: 10759 Logic NL
Mail orders to:
LOGICSOFT EUROPE BV
pb 9460, 1006 AL Amsterdam, Holland

Circle #400 on reader service card.

Leading Edge Model D

• 256K Memory • Two 360K Half/Height Floppy Drives • Four Expansion Slots • Keyboard • Text Display Card • High-Resolution Monochrome Monitor • One Parallel And Serial Port • Color option available

• **Purchase Price: $1,375**

Lease For **$59** per month

New IBM AT—30 Mb

8 MHz • 512K • 30 Mb Hard Drive (Full Height, w/controller) • 1.2 Mb Half/Height Floppy • Eight Expansion Slots • IBM Enhanced PC Keyboard • Serial/Parallel Adapter • Free 90-Day, On-Site Service Contract • Color or Monochrome Monitor Available as Option

• **Purchase Price: $4,299**

Lease For **$167** per month

New IBM XT—20 Mb

512K • 20 Mb Hard Drive • 360K Floppy Drive Half Height • Eight Expansion Slots • IBM Enhanced PC Keyboard • Asynchronous Communications Adapter • Free 90-Day, On-Site Service Contract • Color or Monochrome Monitor Available as Option

• **Purchase Price: $2,369**

Lease For **$99** per month

New Compaq Deskpro 286—30 Mb

• 512K RAM Memory • 80286 Based CPU • One 30Mb Hard Drive (w/controller) • One 1.2 Mb Half/Height Floppy Drive • Eight Expansion Slots • Compaq Keyboard • Graphics Card • One parallel port • Free 90 Day On-Site Service Contract • Color or Monochrome available as option

• **Purchase Price: $3,899**

Lease For **$154** per month

New Compaq Deskpro 20Mb

• 640K RAM Memory • One 20Mb Hard Drive (w/Controller) • One 360K Floppy Drive • Eight Expansion Slots • Compaq Keyboard • Graphics Card • One Parallel port • Asynchronous Communications/Clock Board • Free 90-Day, On-Site Service Contract • Color or Monochrome Monitor Available as option

• **Purchase Price: $2,319**

Lease For **$99** per month

New Compaq Portable II 20Mb

• 640K RAM Memory • 80286 Based CPU • One 20Mb Half/Height Hard Drive (w/controller) • One 360K one/third Height Floppy Drive • Two Expansion Slots • Compaq II Keyboard • Text/Grahics Display Card • 9" Text/Graphics Monochrome Monitor • One Serial and Parallel Port • Free 90-Day, On-Site Service Contract

• **Purchase Price: $3,899**

Lease For **$154** per month

New Compaq Portable 286—20Mb

• 640K RAM Memory • 80286 Based CPU • One 20Mb Hard Drive (w/controller) • One 1.2 Mb Half/Height Floppy Drive • Five Expansion Slots • Compaq Keyboard • Graphics Display Card • 9" Text/Graphics Monochrome Monitor • One Parallel Port • Free 90-Day, On-Site Service

• **Purchase Price: $4,269**

Lease For **$169** per month

AT&T 6300 Total Business System

• 256K RAM Memory, Expandable to 640K On Mother Board • One 10 Mb Half/Height Hard Drive (w/Controller) • One 360K Floppy Drive • Seven Expansion Slots • AT&T-Keyboard • High-Resolution Graphics Card • High-Resolution Monochrome Graphics Monitor • Serial & Parallel Ports • Toshiba P-351 Printer And Cable • Software Bundle (dBase III Plus, Lotus 1-2-3, Word Perfect, SideKick, G.W. Basic and MS-DOS) • Free 90-Day, On-Site Service Contract

• **Purchase Price: $4,247**

Lease For **$167** per month

100% Burn-In and Testing.

All systems undergo a 48-hour configuration, testing and burn-in period. We configure system boards, set DIP switches, format hard drives, perform memory diagnostics and check system with monitor.

IBM PC™, AT™, PC/XT™ are trademarks and IBM® is a registered trademark of International Business Machines Corporation.

AND A HUGE SELECTION OF PERIPHERALS.

PRINTERS*

EPSON
LQ 800 ..... $579
LQ 1000 759
RX-100 365
FX-85 399
FX-286 589

JUKI
6100 359
6300 699

NEC
8800 1045
Pinwriter P-5 **Low Price Call!**
Pinwriter P-6 485
Pinwriter P-7 619

MANNESMAN TALLY
MT-86 499

OKIDATA
182 Plug & Play 224
192 Plug & Play 349
193 Plug & Play 545
2410 P Plug & Play 1759

PANASONIC
KX 1091 255
KX 1595 ... **Low Price Call!**

TOSHIBA
P 321 469
P 341 795
P 351 999

CITIZEN
MSP 10 259
MSP 15 369
MSP 20 339
MSP 25 519
Premier 35 479

LASER PRINTERS*

CANON
Laser Printer $1995

HEWLETT PACKARD
Laser Printer 2579
Laser Printer Plus 3399

PLOTTERS*

HEWLETT PACKARD
7475A 1699

HOUSTON INSTRUMENTS
DMP 40 875
DMP 41 2699
DMP 42 2699
DMP 51 3999
DMP 52 3999

MONITORS*

AMDEK
Color 600 ..... $389
Color 722 509
Color 725 .. **Low Price Call!**
12" Green 300 G 125
12" Amber 300 A 135
12" Amber 310 A 149

NEC
JC—1401P 3A
Multi-sync color
w/swivel base 569

IBM
Color Monitor 545
Monochrome Monitor .. 225
Enhanced Color Display . 679

PRINCETON GRAPHICS
RGB HX-12 419
RGB HX-12E 535
RGB SR-12 569
RGB SR-12P 625
Amber Max 12 165

QUADRAM
Amberchrome 12" 145
Quadchrome 499

TAXAN
122 145
620 415
640 535

MULTI-FUNCTION BOARDS

AST RESEARCH
Six Pack Premium $389
Six Pack Plus (384K) ... 239
Rampage w/128K 329
Rampage (AT) w/512K .. 459
Advantage (128K) 389
I/O Mini Half Card 119
I/O Plus II 129

EVEREX
Magic Card II w/384K .. 199

TECMAR
Captain (384K) 229

QUADRAM
Quadboard (384K) 269
Silverboard 225
Goldboard 399
Liberty (AT) w/128K 315

INTEL
Above Board (PC) 275
Above Board (AT) 439
Above Board (PS) 64K .. 319
Above Board (PS) AT
256K 429
8087 Math
Co-Processor 129
80287 Math
Co-Processor 215

GRAPHICS BOARDS

AST
Preview $249

EVEREX
Graphics Edge 249
The Edge 239

HERCULES
Monochrome Graphics
Card 299
Color Card 155

PARADISE SYSTEMS
Multi-Display Card 189
Modular Graphics Card . 219
Color/Mono 139

QUADRAM
EGA Plus Graphics 389

SIGMA
Color 400 (Princeton) .. 489

STB
Chauffeur 255
Graphics Plus II 229
EGA Plus 329

TECMAR
Graphics Master 419

COMMUNICATIONS BOARDS

AST
5251-11 ..... $645

DCA
IRMA Board 839

MODEMS

AST
Reach 1200 Half Card . $345

EVEREX
Evercom II 149

HAYES
Smartmodem 300 145
Smartmodem 1200 389
Smartmodem 1200 B
w/Smartcom II 359
Smartmodem 2400 599
Smartmodem 2400B
w/Smartcom II 559

PROMETHEUS
Pro-modem 1200 289
Pro-modem 1200 B
w/software 239

QUADRAM
Quadmodem Series
..... **Low Price Call!**

VEN-TEL
PC Modem 1200 Half
Card 375
1200 Plus 339
PC Modem 2400 Half
Card 499

MOUSE INPUT DEVICES

MOUSE SYSTEMS
PC Mouse w/DR
Halo 2 ..... $135

MICROSOFT
Microsoft Mouse (Serial) 135
Microsoft Mouse (Buss) . 125

SURGE PROTECTORS

KENSINGTON MICROWARE
Masterpiece ..... $ 95
Masterpiece Plus 119

CURTIS
Diamond 39
Emerald 45
Ruby 59

KEYBOARDS

KEYTRONIC
5151 (Deluxe) 169
5153 (w/touch Pad) 289
3270 PC ... **Low Price Call!**
Keytronic Jr. 5151 169

MEMORY STORAGE

IOMEGA
Bernoulli Box
(10+10) $2349
Bernoulli Box
(20 Mb) 2299
Bernoulli Box
(20+20) 3299

HARD DISK DRIVES

MOUNTAIN COMPUTER
Hard Drive Card
(20 Mb) 975
Hard Drive Card (30Mb)
..... **Low Price Call!**

PRIAM CORP
60 Mb Internal Hard Drive
..... 1489
Innerspace ID 40Mb ... 1299

PLUS+
Hard Card
10 Mb $699

TALLGRASS TECHNOLOGY
Tc 5525i 25 Mb Int 849

SEAGATE
10 Mb ½ Ht Int 465
20 Mb ½ Ht Int 525
20 Mb Full Ht (AT) 675
30 Mb Full Ht (AT) 789
40 Mb Full Ht (AT) 899
60 Mb Full Ht (AT)
..... **Low Price Call!**

CORE
20 Mb Int (AT) 1435
30 Mb Int (AT) 1795
40 Mb Int (AT) 2325
72 Mb Int. (AT) 3999

CARTRIDGE TAPE BACK-UP

EVEREX
Excel Stream 20 Mb Int . 639
Excel Stream 60 Mb Int . 799
Excel Stream 60 Mb Ext 929

IRWIN
Irwin 110 10 Mb Int 499
20 Mb Int. 645
20 Mb 325 (AT) Ext. D .. 799

MAYNARD ELECTRONICS
Maynstream 20 Ext 999
Maynstream At-20 Int ... 799

SYSGEN
Image Tape Backup
10 Mb Int 835
Image Tape Backup
20 Mb Int 599
Image Tape Backup
20 Mb Ext 699

TECMAR
QIC 60 AT 1250
QIC 60 Ext Tape
Backup 1599

CORE
60 Mb Ext 1599

FLOPPY DISK DRIVES

Panasonic 360 K
½ Ht. $119
Tandon TM-100 360 K
F/Ht 125
Tandon TM-100 360K ½ Ht 119
Toshiba 360 K ½ Ht 115

BACK UP POWER SUPPLIES

DATA SHIELD
200 Wt (PC) $249
300 Wt (XT) 359
500 Wt (AT) 569
800 Wt (AT) 655

*Due to weight restrictions, Printers and Monitors are shipped UPS—free. **Parallel interface req. ..... Ask sales agent. All prices and policies subject to change without notice.

CAN'T FIND IT? ASK FOR OUR SPECIAL ORDER DEPT.

There's a good chance we do carry the product (we're adding new ones every day). Or, we can get it for you from one of our suppliers—still at our low direct-to-you prices.

LOGICSOFT ALSO OFFERS SOFTWARE FOR VIRTUALLY EVERY IBM PC APPLICATION...

WORD PROCESSING

DISPLAY WRITE III	**$369**
Easy Writer II	199
MICROSOFT WORD	**229**
MULTIMATE	**229**
MULTIMATE ADVANTAGE	**279**
Office Writer	245
Pfs: Write	85
Samna III	295
VOLKSWRITER 3	**149**
WORD PERFECT	**209**
Wordstar	179
Wordstar Pro Pak	239
WORDSTAR 2000	**249**
Wordstar 2000 Plus	295
XY WRITE III	**239**

WORD PROCESSING ADD-ONS

Fancy Font	$145
Punctuation & Style	75
TURBO LIGHTNING	**59**
Word Finder	59

DATABASE MANAGEMENT

Cornerstone	$ 85
d Base II	279
d BASE III PLUS	**395**
Knowledge Man 2	299
Paradox	519
Pfs: File	85
Pfs: Report	79
Powerbase	209
R:BASE 5000	**339**
Revelation	495
REFLEX	**59**
Think Tank	109
Q & A	229

DATA BASE MGMT. ADD-ONS

Clipper (D Base)	$359
Clout 2 (R:Base)	139
DB III Compiler (Wordtech)	**Low Price Call!**
Ext. Report Writer (R:Base)	99
Quickcode III (D Base)	149
Quickreport (D Base)	139

SPREADSHEETS/ INTEGRATED

Ability	$ 75
Enable	339
FRAMEWORK II	**389**
Javelin	579
LOTUS 1-2-3	**315**
Multiplan	119
Supercalc III	199
SYMPHONY	**439**

SPREADSHEET ADD-ONS

LOTUS REPORT WRITER	**$109**
Cambridge Spreadsheet Analyst	119
Sideways	45
Spreadsheet Auditor	109
Quickcode for 1-2-3	95

GRAPHICS

CHARTMASTER	**$209**
Diagram Master	195
Energraphics	169
Gem Draw	159
Graph Writer	219
Harvard Presentation	299
MICROSOFT CHART	**179**
PC Draw	209
Pfs: Graph	85
Sign Master	149

CAD/CAM

Auto CAD	$829
Pro Design II	239

PLOTTERS AVAIL.
See hardware listings

LANGUAGES

Business Basic (MS)	$309
C COMPILER (MS)	**239**
COBOL COMPILER (MS)	**395**
Fortran Compiler (MS)	219
Lattice C Compiler	269
MACRO ASSEMBLER (MS)	**99**
Pascal Compiler (MS)	185
Quick Basic (MS)	69
TURBO PASCAL	**45**

PROJECT MANAGEMENT

HARVARD TOTAL	**$279**
MICROSOFT PROJECT	**229**
Project Manager Workbench	**Low Price Call!**
SUPER PROJECT PLUS	**259**
Timeline	259

FINANCIAL

MANAGING YOUR MONEY	**$105**
Dollars N' Sense	109

ACCOUNTING

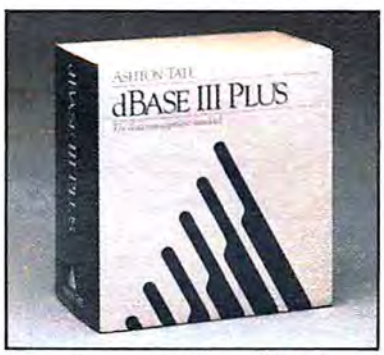
BPI	from $319
COMPUTER ASSOCIATES (Formerly IUS)	**from 319**
CPA + (GNP)	429
Great Plains	from 449
Open Systems	from 319
State of the Art Mas	from 579
TCS Client Write Up	895
Real World	from 529

MISC/UTILITIES

COPY II PC	**$ 35**
Crosstalk XVI	99
FAST BACK	**99**
Microsoft Windows	65
NORTON UTILITIES	**55**
Prokey 4.0	79
Remote	105
RESIDENT	**75**
SIDEKICK	**49**
Superkey	45

OVER 200 OTHER SOFTWARE TITLES IN STOCK AT LOW DISCOUNT PRICES.

#1 Rated productivity software.



dBase III Plus $395

Add-Ons for dBase III Plus

Clipper
dBase III compiler. **$359**

Quickcode III
Quickcode III reduces programming time by over 70%. **$149**

Quickreport
The most powerful report writer for dBase III. **$139**

LOTUS 1-2-3 $315

Add-Ons for LOTUS 1-2-3

Sideways
Sideways lets you create extra wide printouts of reports without staples, glue or tape. **$45**

Spreadsheet Auditor
The most powerful error trapping program available. (Includes side print utility.) **$109**

LOTUS 1-2-3 Report Writer
Now you can format your own reports, forms and mailings from 1-2-3 files. **$109**

Word Perfect $209

Add-Ons for Word Perfect

Turbo Lightning
Random House Thesaurus & Spell-checker. **$59**

Punctuation & Style
Helps improve the quality of your writing. **$75**

Fancy Font
Lets you use multiple fonts to enhance the appearance of your letters & reports. **$145**

INTRODUCING LOGICWARE. FULLY COMPATIBLE COMPUTER PRODUCTS.

5-Year Unconditional Warranty • Made in U.S.A. Immediate Replacement or Repair Policy • Low Power Consumption

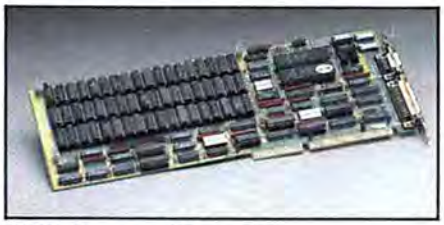
Now Logicsoft gives you a logical choice.

We're manufacturing a complete line of computer products called LogicWare. They're fully compatible with major manufacturers.

The boards pictured here are part of a vast array of ultra-reliable computer products.

We save you money—not by using inexpensive labor or parts—but through state-of-the-art technology, which reduces part requirements and increases reliability. Eac product has a 5-year unconditional warranty plus our immediate replace or repair policy.

LogicWare. It's the logical way to get high quality without paying high prices.



AST Compatible AT Multifunction Board w/128K—$229

• Expandable to 2 Megabytes on Board • Install Either 64K or 256K Chips to Customize the Memory to your Existing Memory Configuration • Software RAM Disk • Printer Spooler/Buffer • One Parallel Port • Two Serial Ports • Game Port

Hercules Compatible Monochrome Graphics Board—$119

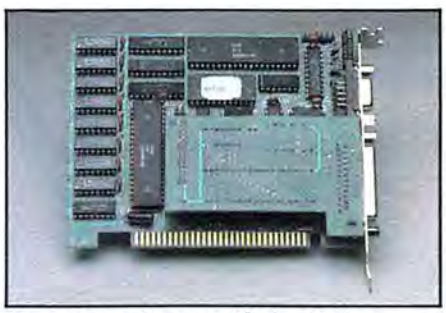
• 720 × 348 Pixel Graphics • Parallel Printer Port • Lotus 1-2-3 Compatible • TTL Monochrome Output • ATD Software Supplied For Direct Emulation of Hercules Graphics Card • Low Power Consumption

AST Compatible Six Function Card w/384K—$159

• One Parallel Port • One Serial Port • One Game Port • Clock Calendar • 384K RAM Memory • Low Power Consumption • Software • Printer/Spooler Buffer

AST Compatible 576K RAM Board Half Card with ØK—$69

• Expandable to 576K • Supports 64K or 256K Memory Chips • Fits in Short Slot • Low Power Consumption • Clock Calendar Option
loaded w/384K $135
loaded w/576K $149



Hercules Compatible Color Graphics Board—$99

• 320 × 200 Color Pixels • 640 × 200 Monograph Pixels • Parallel Printer Port • Low Power Consumption • Fits in Short Slot • Will Drive a Medium Resolution Color & Monochrome Monitor

Hayes 1200 B Compatible Ha Card Modem w/Software—$14

• 300/1200 Baud • Bell 103/212A Compatible • Auto Dial/Auto Answer • Pulse or Touch Tone Dialing • Full or Half Duplex Operation • Fits in Short Slot • Low Power Consumption

Hayes 2400B Compatible Hal Card Modem w/Software—$29

LOGICSOFT®

To order or receive technical assistance, call our National Hotline:

110 Bi-County Blvd., Dept. 5432
Farmingdale, NY 11735
CANADA: 416-283-2354
Domestic/Int'l Telex
286905 SoftUR

1-800-645-3491
Customer Service: 1-800-431-9037
NY STATE: 1-800-235-6442 (516) 249-8440
FAX # 516-249-5289

EUROPE: 020-83 48 64
Telex: 10759 Logic NL
Mail orders to:
LOGICSOFT EUROPE BV
pb 9460, 1006 AL Amsterdam, Holland

No surcharge for MasterCard, VISA, American Express. C.O.D., money order, check or PO's (please call for price verification) • No sales tax on orders shipped outside N.Y. State • Please add 2% insurance and handling ($3.00 minimum) (Int'l orders add'l) • We do not bill until we ship. All products covered by mfg's warranty. Defective merchandise may be returned for repair or exchang We do not guarantee compatibility. Any goods returned for credit are subject to a 15% restocking charge. All prices and policies subject to change without notice.

Circle #400 on reader service card.

with the program. But to be fair, Springboard Software promotes *The Newsroom* as just the ticket for high school and club newsletters and small business flyers—though I suspect that even the smallest business would quickly crave more sophisticated graphics and design features.

The Newsroom limits you to five fonts: large Old English type and large and small sans serif and serif. Although the clip art selection is generous—600 pieces come with the program—the illustrations are cartoonlike. *Clip Art Collection Volume 1* and *Volume 2* provide an additional 600 and 800 images, respectively, but the quality is much the same.

Learning the program is child's play; you can probably lay out a page in an hour and a half. Aided by on-screen icons and decent documentation, you can easily design a headline, pull together clip art graphics, write stories using the program's simple word processor, format the page, and print out your creation.

To avoid hardware headaches before you buy the program, make sure *The Newsroom* works with your printer and that your system uses an IBM Color/Graphics Adapter or compatible board. A soon-to-be-released version of the program also supports a hard disk.

For such a simple program, *The Newsroom* has its share of quirks. For some unknown reason the program relies on the <Alt> key instead of <Enter> for selecting options. Worse still, the program lacks an exit option and prevents you from resetting the system with <Ctrl>-<Alt>-<Del>. The only way to break out of *The Newsroom* is to turn off your machine.

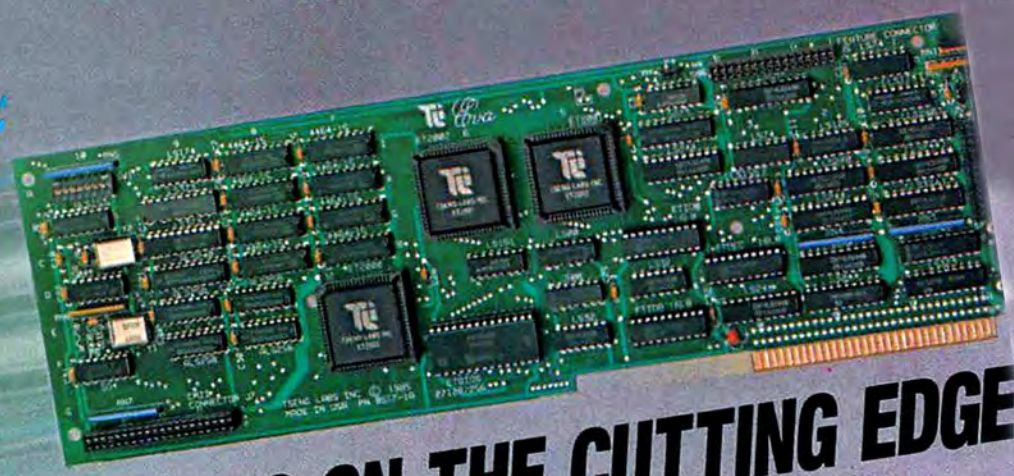
The Newsroom has limited application unless you're advertising a crab feed or a flea market. If you want to turn out a first-class newsletter or wow the boss with a

(continues)

Circle 608 on reader service card

INTRODUCING

Eva™



ENHANCED GRAPHICS ON THE CUTTING EDGE

IBM EGA COMPATIBLE

- 100% Full 256K Feature Set
- 16 Dazzling Colors
- 64 Color Palette
- Smooth Scroll
- Pixel Panning
- Split Screen
- Custom VLSI ET2000 Chip Set From Tseng Labs Provides 100% EGA Hardware Compatibility

132 COLUMN TEXT

- 132x25/28/44 SUPPORTS: Spreadsheets, Word Processing Terminal Emulators
- FREE Font Editor
- Up to 16x32 Pixel "Superfont" For Desktop Publishing Applications

Tseng Labs Inc.
205 Pheasant Run, Newtown, PA 18
(215) 968-0502, TELEX 705179

Suggested List:
Eva™ $525.00

Suggested List:
CM II Option $50.00

ZOOM WINDOW

- Exclusive Power Graphics Superset includes:*
- VLSI Based Hardware Zoom (8/X axis, 16/Y axis)
- Viewport Zoom Window
- Window Scroll and Pan
- Micro—Sequencer For Turbo Raster Operation

256K Eva™ Only $1.00 More Than 64K IBM EGA Comparable EGA Almost $1,000.

OPTIONAL DOWNWARD COMPATIBILITY

- CM II Modular Daughter Card Emulates Previous Generation Hardware
- SUPPORTS: Hercules™, IBM CGA, IBM MDA Modes

Corporate Custome Call About Our Fre Evaluation Progra

Media Cybernetics—Dr. Halo Example of:
ET 2000 Hardware Zoom/Viewport

PARALLEL PORT

- Printer Port That IBM Forgot Is Standard On Eva™

IBM EGA is TM of IBM Corp.
EVA™—Enhanced Video Adapter
Dr. Halo is TM of Media Cybernetics
Hercules is TM of Hercules Computer Technology
ET 2000 is TM of Tseng Labs, Eva is TM of Tseng Labs
*Superset Features are Fully Software Programmable

NCEMENT TECHNOLOGY FOR PERSONAL COMPUTERS • MADE IN THE US

Circle 707 on reader service card

ENGINEERED TO EXCEED INDUSTRY STANDARDS

Tech PC Desktop computers are engineered to exceed industry standards. Each unit is housed in an attractive and sturdy steel case designed to blend in with the office or home environment and at the same time protect the system components from damage. The units' built in fans are designed for maximal cooling and minimal noise. A full compliment of expansion slots and extra capacity power supply give each of the Four Desktop models the ability to add additional accessory boards and peripherals to the unit without difficulty. The Intel 8088 and 80286 microprocessor based motherboards used in the Tech Personal Computers meet or exceed IBM compatibility standards with respect to processing speed and memory capabilities. All of the four desktop models are designed to function for a wide variety of people in a wide variety of situations.

TECH PC DESKTOP COMPUTERS are available now in 4 different base models:

TECH PC/XT DESKTOP .....$ 749
Options:
Tech PC/XT with 20MB Hard Disk ..$1249
Tech PC/XT with 20MB Hard Disk, Monochrome Monitor, Hercules® Compatible Mono/Graphics Card.....$1449

TECH TURBO PC/XT DESKTOP $899
Options:
Tech Turbo PC/XT Desktop with 20MB Hard Disk $1399
Tech Turbo PC/XT 20MB Hard Disk, Monochrome Monitor, Hercules® Compatible Mono/Graphics Card $1599

TECH PC/AT DESKTOP $1699
Options:
Tech PC/AT with 20MB Hard Disk ...$2099
Tech PC/AT with 20MB Hard Disk, Monochrome Monitor, Hercules® Compatible Mono/Graphics Card.....$2299

TECH TURBO PC/AT DESKTOP $1799
Options:
Tech Turbo PC/AT Desktop with 20MB Hard Disk $2199
Tech Turbo PC/AT with 20MB Hard Disk, Monochrome Monitor, Hercules® Compatible Mono/Graphics Card.....$2399

All TECH PC DESKTOPS available with tape backups, hard disks up to 280 megabytes, networking systems, and hundreds of other hardware and software accessories.

TECH PERSONAL COMPUTERS is a full service manufacturer of Micro Computer Products and offers a complete line of Desktop, Portables and Multi-User Computer Systems as well as an accessory line of over one hundred enhancement products. **TECH PERSONAL COMPUTERS** are all backed by a full one year warranty with additional maintenance coverage and extended maintenance contracts available through Mohawk Data Sciences. For more information concerning hundreds of MDS Service Centers throughout the United States, contact **TECH PERSONAL COMPUTERS** at **(714) 754-1170.**

TECH PC
714/754-1170
2131 S. Hathaway, Santa Ana, California 92705
TELEX: 272006 Answer Back-TECH FAX: 714/556-8325
Dealers Circle 329, End users Circle 331 on reader service card

sharp-looking report, scrape together the money for *PageMaker* and borrow a laser printer. *–Jason Durbin*

The Newsroom
Springboard Software, Inc.
7808 Creekridge Circle
Minneapolis, MN 55435
612/944-3915
List price: $59.95, Clip Art Collection Volume 1 $29.95, Clip Art Collection Volume 2 $39.95
Requirements: 256K, two disk drives, DOS 2.00 or later version, IBM Color/Graphics Adapter or compatible graphics board, dot matrix graphics printer
Copy protected

FontGen

When I first heard about font editing programs, I thought, who needs 'em? My experience with typography had taught me that designing attractive, readable fonts from scratch was an area best left to the experts. Each character must reflect the overall design concept of the typeface and look good at the resolutions permitted by laser printers. Beyond this, the character set as a whole should achieve a subtle visual harmony, meaning that the symbols must look good in any conceivable combination.

That's a tall order even for someone with training and experience in design and typography. Thus I concluded that anyone in the market for a program like *FontGen* must be either a specialist or a naif. But as the mist cleared, I realized that a program that edits fonts can be quite accessible to the average PC user. The most common applications are creating special characters and adding them to an existing font or deleting unused symbols to conserve printer memory. Another might be changing a proportionally spaced font (such as the HP LaserJet's soft font TMS RMN) to fixed spacing for use in a *1-2-3* worksheet.

(continues)

STATS-2™
A COMPLETE STATISTICAL PACKAGE
$149

- **EASY ACCESS TO DATA FROM SPREADSHEET FILES (1-2-3, SYMPHONY, ETC.)**
- **A POWERFUL TOOL FOR DATA ANALYSIS AND FORECASTING**
- Easy to use, no commands to memorize (menu driven)
- Super-fast (8087 support)
- Can be used as a stand-alone, full-featured statistical package (comes with its own Data Editor for entering/editing of data); can process data from many spreadsheet programs and data bases
- Descriptive statistics, t-tests, Correlations (including "economically" formatted matrices), Crosstabulations, Comparisons of Distributions, Significance Tests, Powerful General Multiple Regression module (up to 50 predictors, Durbin-Watson statistic, autocorrelation of residuals, forecasting subprogram, and more), Flexible General Analysis of Variance/Covariance module (up to five factors, repeated measures, unequal n, contrasts, and more), 10 Nonparametric Statistics, Bargraphs, Scatterplots, and much more
- Requires IBM-PC (or compatible), two disk drives, 256k

To order send check or money order for $149 (plus $5.00 shipping and handling) to:

MasterCard **StatSoft™** VISA
(the developers of STATFAST)
2832 East 10th Street, Suite 4, Tulsa, OK 74104. (918) 583-4149

Lotus 1-2-3 is a registered trademark of Lotus Development Corp.

Circle 175 on reader service card

For All IBM PC & XT & Compatibles . . .
ELIMINATE NUM-LOCK !
Now Available - IBM AT

KEYPATCH™ -10 - A full travel mini-keyboard. Plugs between keyboard connector and CPU. Automatically activates NUM-LOCK placing your IBM™ keyboard into the number pad mode while **KEYPATCH™ -10** provides separate cursor and screen control functions without the use of the NUM-LOCK key. Saves time — eliminates errors. **KEYPATCH™ -10** requires no software. A must for spread sheets; word processing; graphics; etc.

For Immediate Shipment
Genest Technologies, Inc.
1331 E. Edinger Ave.
Santa Ana, Calif. 92705
(714) 547-0880

IBM PC/XT **$84.95**
IBM AT **$92.95**
Compatibles **$89.95**
*Zenith - ITT - Columbia - NCR Leading Edge - Sperry - Desk Pro — PLEASE SPECIFY SYSTEM—
(Cal. Res. Add 6% Sales Tax)
Visa, Master Card, Check, Money Order
Plus $2.00 Shipping

™Patents Pending
KEYPATCH™ is a trademark of Genest Technologies, Inc.
IBM™ is a trademark of International Business Machines Corp.

Circle 78 on reader service card

Two great reasons to buy Turbo Pascal:

System Builder™ $99.95 and Report Builder™ $75.00

From the Designer Series™ by Royal American Technologies.

Now, experience the magic of 5th generation software.

It's a state-of-the-art program generator that automatically builds a relational database application for you in just seconds. You just paint your screen and datafile layouts.

SO EASY. . . ideal for entry level "coders" to produce relational database systems without coding. (Entry level guide with sample On-disk systems is provided.)
SO POWERFUL . . . it provides programming professionals with more flexibility and horsepower than any development tool on the market (guide is provided.)

"I think it's wonderful . . . prospective buyers should seriously consider DESIGNER even before dBASE III." *Mr. Greg Weale, Corporate Accounts Manager, Computerland*

"We used DESIGNER last year to program a major application. It saved our programmers so much time. We now use DESIGNER instead of dBASE III as our development standard." *Mr. Peter Barge, Director Services Division, Horwath & Horwath*

"DESIGNER has resulted in significant time savings . . . We use it on classical database applications." *Mr. Andy Rudevics, Director Andrasoft Corporation*

REPORT BUILDER CYCLE:

Key in the report parameters on screen

Print your listings
- New report format for reference
- Report element layout

Press a key, wait 6 secs*

Key in the report data elements on screen

Report Builder automatically writes the program code and links it to your datafile

Print your listing
- Report program source code listings

Compile the report builder code using the Turbo Pascal™ compiler

Attach the new report module to your system menu

SYSTEM BUILDER CYCLE:

Paint the menu screens

Paint the application screens

Press a key, wait 6 secs*

Define the datafile(s) on the screen

System Builder automatically writes the program code and combines the datafiles into a relational database

Print your listings
- Program source code listing
- Datafile layouts
- Self-documenting program (includes screen schematics)

Compile the System Builder code using Turbo Pascal™ compiler

Start using the completed system

*System Builder will generate 2,000 lines of program code in approximately 6 seconds.

REPORT BUILDER FEATURES:

- Automatically generates Indented, Structured Source Code ready for compiling Turbo Pascal (no programming needed)
- Automatically interfaces to a maximum of 16 Datafiles created with System Builder
- Supports Global Parameters such as Headings, Footers, Lines Per Page, Print Size and Ad Hoc Sorting
- Produces reports containing an unlimited number of Sub-Headings, Sub-Totals and Totals
- Page breaks on Sub-Totals
- Report Builder will generate Report Programs which can contain Report Elements not just restricted to Data Elements. Reports can also include Text Strings, Variables or Computed expressions containing references from up to 16 Datafiles
- Use range input screens produced by System Builder to allow End Users to select portions of a report as needed (i.e. specific account ranges can be requested)
- Produces standalone Report Modules
- Easy-to-use Interface Program to access dBase Files

SYSTEM BUILDER PERFORMANCE

(Typical 10 screen 8 file/index application)

TASK	SYSTEM BUILDER	DBASE III™
Planning and Design	60 minutes	60 minutes
Screen Painting	15 minutes	3 hours
Programming	2 minutes	10 hours
Elapsed time to completed system	**1 hour and 17 minutes**	**14 hours**

SYSTEM BUILDER FEATURES:

- Automatically generates Indented, Structured, Copy Book Source Code ready for compiling with Turbo Pascal (no programming needed)
- Paint Application and Menu screens using Keyboard or Microsoft Mouse™
- Finished Application screens all use System Builder's In-Line machine code for exceptional speed
- Use fully prompted Screen Guidance Templates™ to define up to 16 Datafiles per application, each record having an Unlimited Number of fields
- Define up to 16 Index Keys per application database
- Paint functions include:
  - —Center, copy, move, delete, insert or restore a line. Go straight from screen to screen with one keystroke
  - —Cut and paste blocks of text screen to screen
  - —Draw and erase boxes. Define colors and intensities
  - —Access special graphic characters and character fill
- Supports an unlimited number of memory variables
- File Recovery Program Generator to make fixing of corrupted datafiles an automatic process
- Automatically modifies datafiles without loss of data when adding/deleting a field
- Menu Generator with unlimited Sub-Menu levels
- Experienced developers can modify the System Builder
- Develop systems for Floppy or Hard Disk
- Modify System Builder's output code to include External Procedures, Functions and Inline Code
- Easy-to-use Interface to access ASCII and dBase Files

VARS, System Integrators and Dealers, your inquiries are always welcome.

Head office: (415)397-7500

ROYAL AMERICAN *Technologies Corporation*™

Royal American Technologies
201 Sansome, Suite 500
San Francisco, CA 94104

(800) 654-7766
In California (800) 851-2555
Ask for Operator 100.

Please rush me: ____ copies of SYSTEM BUILDER at $99.95 per copy; ____ copies of REPORT BUILDER at $75.00 per copy. I've enclosed $5.00 for postage and handling. California residents add 6% sales tax.

Name _____

Address _____

_____

City _____

State _____ Zip _____

Phone _____

Payment: ☐ Check ☐ Money Order
☐ Cashiers Check ☐ AMEX
☐ VISA ☐ MASTERCARD

Expiration date _____

Card Number _____

Signature _____

30-Day Money-Back Guarantee
(less postage and handling). There is a $10 restocking fee if the disk envelope is opened. **Not copy protected.**

System Requirements—System Builder/Report Builder: IBM PC/XT/AT[1], or similar, with minimum 256K RAM, dual floppy drives, or hard disk, color or monochrome monitor, MS[2] or PC DOS[1] version 2.0 or later, Turbo Pascal Version 2.0 or later (Normal, BCD or 8087 versions).

[1]Trademarks of International Business Machines Corp.
[2]Trademark of Microsoft Corp.
™Turbo Pascal is a registered trademark of Borland International.
™dBASE is a registered trademark of Ashton-Tate.

Circle 451 on reader service card

The task I put to *FontGen* was modifying an HP LaserJet soft font for a logo I was creating for my fledgling book company. (The program works only with downloadable fonts—those sold on floppy disks and copied into the printer's memory—because cartridge fonts are burned into ROM chips and can't be edited.) The first step is creating a header for the font file that tells the printer it is not receiving a graphic to immediately print, but rather a font to be stored in memory. The header also details the number of font characters, whether the font is fixed or proportional, character dimensions, and other typographic information. *FontGen* guides you through this relatively straightforward process.

If you're merely altering an existing font, the program displays a single character at a time on a grid, with pixels corresponding to printed spots. Of course, this magnifies the character, since a pixel is many times larger than the single dot a laser printer can produce on a page. Note too that pixels on most monitors are rectangular, while printed dots are square. Consequently, fonts look taller on screen than when printed. Unfortunately, *FontGen* doesn't compensate for this difference, which complicates the editing process.

The simplest way to modify a character is to move the cursor around the screen, editing the figure one pixel at a time. Because the program doesn't support a mouse, you must use the cursor keys. More sophisticated editing commands allow you to move or delete blocks of pixels; zoom, shrink, and rotate a character; center it on screen; draw ellipses and circles; turn black pixels white and vice versa; change the forward or backward slant; and increase the weight (darkness) of a character. Useful functions all, but my wish list would definitely include the ability to repeat a vertical or horizontal line of pixels.

(continues)

NO MANUFACTURE LABEL OR PRETTY BOX

DISKETTES

"Quality Bulk"

LIFETIME WARRANTY

Factory sealed in packs of TEN with white Tyvek Sleeves, Write Protect Tabs and ID Labels.

Single Side Double Density .54 ea. (MIN. 50)

Double Side Double Density .63 ea.

Manufactured 100% by one of the BIG BOYS

Old Reliable the Diskette Connection™

*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 1213 Boulder City, NV. 89005

TERMS: (Order Total, 30⁰⁰ Min.) VISA or MasterCard accepted C.O.D. orders add 2⁰⁰ for special handling. SHIPPING: 3½" & 5¼" Diskettes; Add 3⁰⁰ for every 100 Diskettes or any fraction thereof. 8" Diskettes; Add 4⁰⁰ for every 100 Diskettes or any fraction thereof. We ship UPS; orders requiring other delivery methods add shipping, plus 2% of total order.

AMERICAN MADE

Circle 691 on reader service card

OUR COMMUNITY NEEDS MORE CORPORATE HEROES.

The United Way volunteer gives a gift that's hard to measure.

Because without his or her contribution of time, energy and dedication, the community services and local programs of United Way simply cannot exist.

United Way has much to do in our community. From day care for the young to services for the elderly.

So this year, be generous.

Give yourself.

United Way

THANKS TO YOU IT WORKS FOR ALL OF US

What's easier than Dac-Easy™?

BALANCE™...the Self Teaching Accountant from Royal American Technologies.

The package that is now helping HUNDREDS of companies in a broad range of industries to run more efficiently and profitably.

ORDER ENTRY AND SALES ANALYSIS

$99.95

- Instant Invoicing
- Unlimited number of Vendors
- Handles Active, Future, Back Orders and On-Hold for Credit Orders
- Automatic credit limit verification
- Ad Hoc Order Status inquiries
- Packing Slips/ Picking Slips
- Order Confirmations, Credit Notes
- Complete Order History and Sales Management reports

INVENTORY CONTROL AND ANALYSES

- Develop your own stock code number (alpha-numeric)
- Physical inventory count sheets
- Flexible stock label printing for items or stock bins
- 6 pricing levels
- Complete inventory management reports

ACCOUNTS PAYABLE

- Produces cash requirements report
- Supports unlimited number of vendors
- Check printing supports most standard check formats (design your own check format on screen if needed)
- Produces complete Accounts Payable Reports

ACCOUNTS RECEIVABLE

- Full control over receivables
- Automatic posting of recurring customer charges or interest
- Flexible year-end closing dates
- Customized inquiry and report
- Complete set of Accounts Receivable Reports

BILLING

- Automatic plus last minute invoicing
- Uses standard invoices (customized formats that you design on screen)
- Statements and Reminders
- Design your own
- Flexible ageing 30/60/90/120 or 7/10/14/21 days or any combination
- Complete Reports

GENERAL LEDGER AND FINANCIAL REPORT WRITER

- A 20-digit alpha numeric account code allows unlimited number of Department Accounts and Sub-Accounts
- Handles Multi-company and Divisions easily if needed
- Specific General Ledger accounts may be accessed by Name Key search if account number is not known
- Standard Chart of Accounts can be easily modified as needed
- Design your own Reports. Six Standard G/L Reports are provided:
- Chart of Accounts Report
- Transaction Audit Report
- Trial Balance
- Profit & Loss Report
- Balance Sheet
- Budget Comparison Report
- The G/L Module may be used as a Stand-Alone Cashbook system
- A customized Report Writer feature gives easy access to the financial report format you need

BILL OF MATERIALS

- All files are always in balance
- Modules can run integrated or stand-alone
- Supports service or product related companies
- Load and Go in 15 minutes

SALES LEAD MANAGEMENT

- Tutorials provided On-Disk for sample companies
- Password options on any function
- LAN version available
- Custom Report Writer provided

CLIENT TIME AND BILLING/ JOB COSTING

POINT OF SALE

- Payroll Management for large or small companies
- Hourly or salaried employees
- Multiple deductions
- Weekly, Bi-Weekly, or Monthly
- Built-in Federal and State Tax tables (all States)
- Pay Check, Pay Slip and W-2 printing
- A unique Pay Slip "Spreadsheet" image onscreen
- Unlimited number of departments or cost centers
- Complete set of Payroll Management Reports
- The Payroll Module is extremely efficient. (Typical processing time for 80 employees paid weekly is 2 hours per week.)

PAYROLL MODULE

FEATURES	BALANCE SERIES $99.95	DAC-EASY™ $69.95	EASY BUSINESS™ $595.00 per module
On screen context sensitive help available at all times	YES	NO	YES
On screen editing for errors	YES	NO	YES
Multi-client/Multi-company capabilities	YES	NO	YES
Payroll available	YES (extra)	YES (extra)	YES
On disk tutorial	YES	NO	YES
Custom report writer	YES	LIMITED	YES
Upgrade path to multi-user LAN version of package	YES	NO	YES

VARS, System Integrators and Dealers, your inquiries are always welcome.

Head office: (415)397-7500

"We have been using BALANCE Series for 2½ years. Our staff were able to use it with no previous PC experience."
Mr. John Tilley, Accountant
Textiles Division, Dunlop Group

BALANCE Series was our first PC accounting system. Our financial reporting requirements were extensive. The package performed extremely well in this area."
Mr. Bruce Cook, Manager
Air Conditioning Division, Hitachi

"We have over 100 client companies. BALANCE Series is extremely easy to install. We have most of our clients on the system within 2-3 days."
Mr. Mike Kuhn, Accountant
Micro Management Services

"The Payroll is superb. We have 30 employees. It saves us hours each week."
Maurice Silver, President
Tower Knitwear

Royal American Technologies
201 Sansome, Suite 500
San Francisco, CA 94104
(800) 654-7766
In California (800) 851-2555
Ask for Operator 100.

Please rush me: ____ copies of BALANCE at $99.95 per copy; ____ copies of PAYROLL at $75.00 per copy. I've enclosed $5.00 for postage and handling. California residents add 6% sales tax.

Name _____

Address _____

_____

City _____

State _____ Zip _____

Phone _____

Payment: ☐ Check ☐ Money Order
☐ Cashiers Check ☐ AMEX
☐ VISA ☐ MASTERCARD

Expiration date _____

Card Number _____

Signature _____

30-Day Money-Back Guarantee on BALANCE and PAYROLL (less postage and handling). There is a $10 restocking fee if the disk envelope is opened. **Not copy protected.**

System Requirements: IBM (PCjr, PC, XT or AT)[1] or other compatibles. 128K RAM, 80 or 132 column printer, 80×24, monitor, MS-DOS[2], PC DOS[1] 2.0 or later.

[1]Trademarks of International Business Machines Corp.
[2]Trademark of Microsoft Corp.
Dac-Easy is a trademark of DAC Software, Inc.
Easy Business is a trademark of Easy Business.

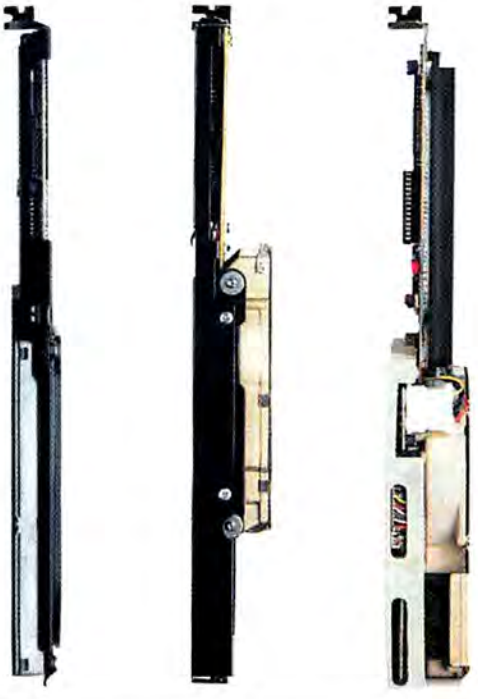
ROYAL AMERICAN *Technologies Corporation*™

Circle 453 on reader service card

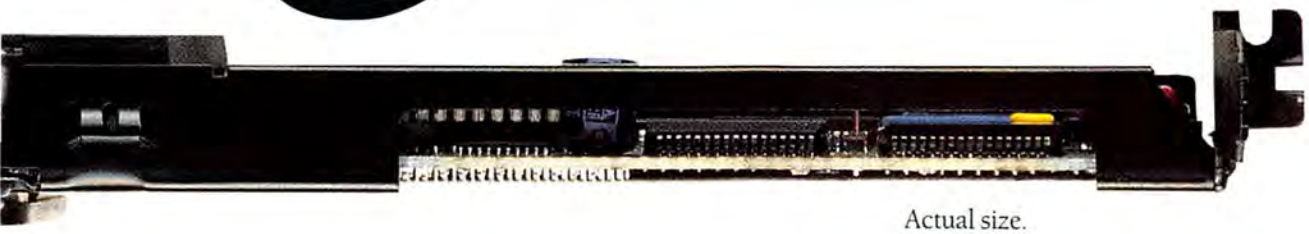
You don't
over

It took two years.
And lots of self control.
But making Hardcard™ thin was the only way to make it right.
And the only way to make 10MB or 20MB fit in a single slot.
The other plug-in hard disks, because of their portly profiles, take up one and a half or two slots. Hogging precious space you may need in the future for modems, memory boards, network cards and turbo-chargers. Not to mention all the peripherals that are just now being invented.

Hardcard (left) is the only hard disk drive on a card thin enough to fit in a single slot inside your IBM® PC, PC/XT or PC-compatible. The other plug-ins take up to two slots. They should try our reducing program.



get thin night.



Actual size.

Fat drives also tend to move slower. Gobble up more power. And endanger the health of your data.

So it's good to know that the same meticulous engineering that makes Hardcard slim makes its chances of failing even slimmer.

In fact, Hardcard has a reliability rating (MTBF) two to four times that of other plug-in drives.

So see your local computer dealer for a demonstration.

Or call (800) 826-8022 for the dealer nearest you.

But do it now.

A product this thin can move pretty fast.

Hardcard™ from Plus™

© 1986 Plus Development Corporation. Plus and Hardcard are trademarks of Plus Development Corporation. IBM is a registered trademark of International Business Machines Corp.

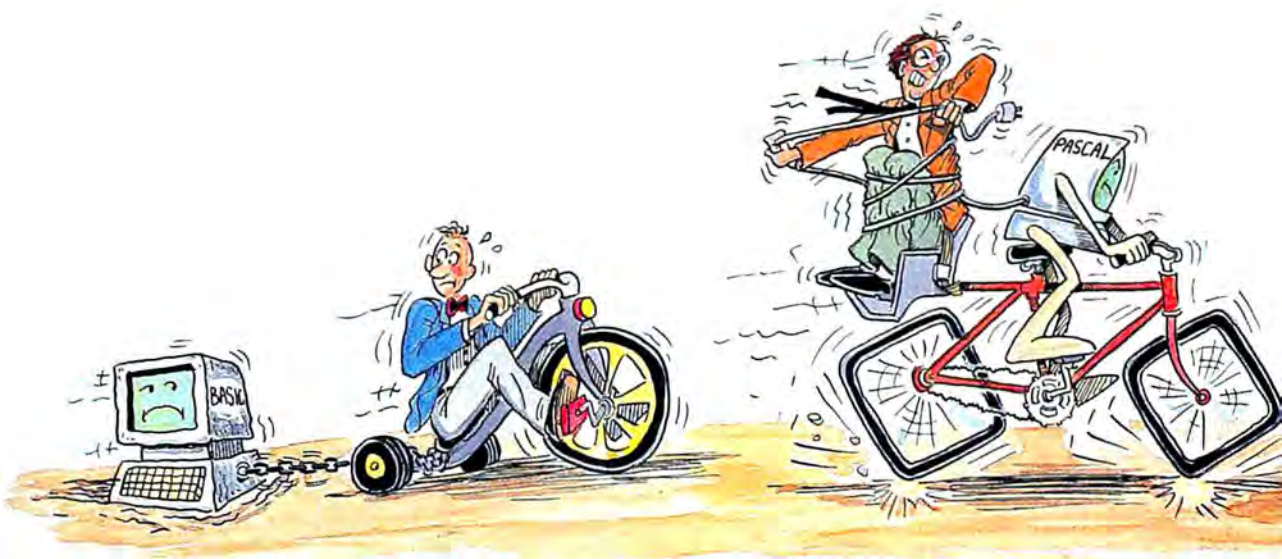
Circle 455 on reader service card

Once you've finished modifying a font or creating a new one, the problem is getting your word processing program to recognize it. Here, the otherwise thorough user manual cops out, referring you to your printer manual. If you've downloaded soft fonts on the LaserJet Plus, you won't find adding new characters to an existing font all that difficult. But getting a word processor to recognize an entirely new font is difficult—and *FontGen* doesn't show you how to create the necessary driver. (It should be noted that fonts available from the company also lack drivers.) But as a font editor, *FontGen* is relatively easy to use and lets you create special symbols without much trouble. If nothing else, designing even a single character will give you a new appreciation of the fundamental building blocks of printing. *–Ted Nace*

FontGen
VS Software
P.O. Box 6158
Little Rock, AR 72216
501/376-2083
List price: $250, fonts $50 to $250 per set
Requirements: 384K, hard disk drive, DOS 2.00 or later version
Laser printers supported: Hewlett-Packard LaserJet Plus, Cordata LP-300, Qume LaserTEN in HP LaserJet Plus emulation mode, Canon LBP-8 A1/A2, NCR 6416
Not copy protected

WordStar 2000 Release 2

When MicroPro announced the imminent release of God's gift to word processing in late 1984, I eagerly expected to shelve my faithful *WordStar 3.3* for a more powerful,



A Personal Language

When it comes to problem solving, the
'L*PLUS System is the undisputed leader.
That's because the APL*PLUS System
rks with you. It goes far beyond what
)lication software like Lotus® or dBASE®
ild possibly ever offer. And, it won't tie
down with the details of standard
gramming languages.
he APL*PLUS System is a personal
iuage, with productivity features that
you concentrate on getting answers,
rather than struggle with intricate calculations and modeling.

With it you can manipulate tables of numbers as easily as single numbers and get quick results from your computer using short, simple statements.

When you've reached the limits of other packages, move up to the APL*PLUS System. It's a powerful and flexible tool that grows with you as your needs become more sophisticated. With over 200 built-in applications—like graphics, report formatting and communications—you have all the tools at your fingertips to quickly and easily solve those seemingly impossible problems.

Best of all, the APL*PLUS System interfaces well with software packages you're already using—like databases, spreadsheets, and graphics packages. The APL*PLUS System also makes it easy to link those packages that aren't

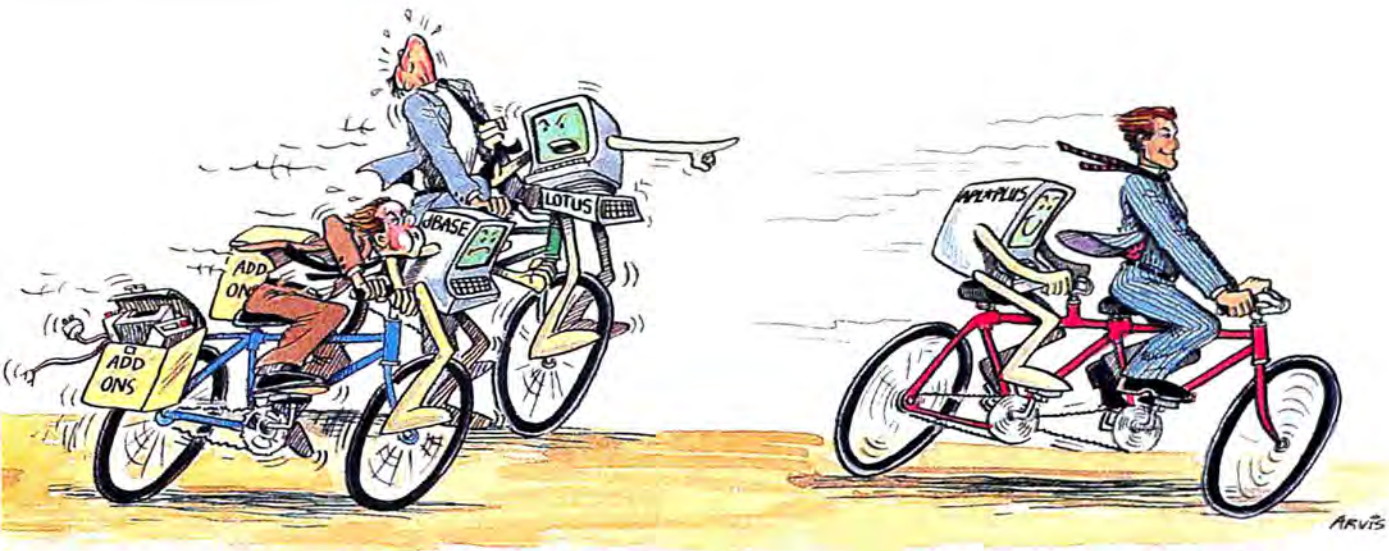
feature-filled program that corrected its predecessor's flaws and knew the meaning of mnemonic. What I got instead was *WordStar 2000*, a copy-protected program that couldn't display double-spaced or justified text and ran like a snail in army boots.

But MicroPro has finally (more or less) done it right. *WordStar 2000* release 2 has remedied many of these problems while adding some helpful new features. The most welcome change is a much needed performance boost. The program runs appreciably faster and doesn't access the disk for simple editing functions. *WordStar 2000* can also be installed to run in a RAM drive—provided your system packs 512K. On-screen justification has been reinstated, and you can now change top and bottom margins, page length, and page offset anywhere in a document. You can also print out a specified range in a *1-2-3* or *Symphony* worksheet entombed in a *WordStar 2000* document.

One clever change you'll discover during installation is that several printers can be configured for the program, a revolutionary idea for the *WordStar* line. Better still, you can link formats to specific printers; fonts available with the printer can be selected within the document. Unfortunately, once a format is bound to a printer, untying the knot is difficult. The easiest solution is to open a new file with the format (and printer) you want, then copy the existing document into the file with the Block Insert command.

MicroPro has made other significant changes to document formats. Margins, tabs, and page offset (the space between the edge of the paper and the left margin) are set in inches rather than spaces, compelling *WordStar 2000* to realign text and adjust the ruler line whenever fonts change or proportional spacing is used. A format can finally specify whether footnotes are printed en masse at the end of the document (as they are with the first

(continues)



The APL★PLUS® System and You.

currently talking with each other.

With all this problem-solving power, it's no wonder STSC's APL*PLUS System is the personal choice of so many business professionals—financial planners, business analysts, actuaries, scientists, mathematicians, engineers, statisticians, and consultants. Especially since the APL*PLUS System is available on a full range of computers from desktops to mainframes.

Put the power, speed, and flexibility of the APL*PLUS System to work for you. See your local dealer today to get your APL*PLUS System. If they don't have it, refer them to STSC or call STSC toll-free, **(800) 592-0050.** In Maryland or Canada, **(301) 984-5123.**

Available nationally through Softsel, Micro Central, and distributors worldwide. Dealer inquiries welcome.

Circle 282 on reader service card

Problem-Solving at the Speed of Thought

STSC STSC, Inc.
2115 East Jefferson St.
Rockville, MD 20852

APL*PLUS is a service mark and trademark of STSC, Inc. PLUS*WARE is a trademark of STSC, Inc. Lotus and dBASE are registered trademarks of Lotus Development Corporation and Ashton-Tate, respectively.

A PLUS★WARE™ PRODUCT

©1986 STSC, Inc.

COMPUTE WHILE YOU PRINT!

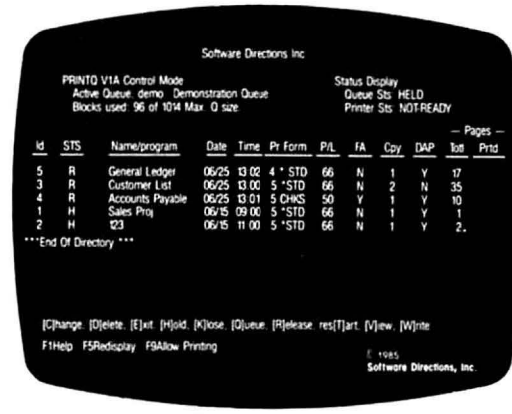
FINALLY, A REAL MAINFRAME PRINT SPOOLER FOR YOUR IBM PC OR COMPATIBLE

IF you spend part of your PC time running applications.
Part of it printing.
And a lot of time waiting . . .

Imagine a program that prints up to 10,000 pages while you run applications.

Print Q does that. Plus prints multiple copies. Re-starts on any page after form jams. And more. All while you keep on working.

It's the first really complete print spooling subsystem for your IBM PC. And your biggest time saver ever!



Convenient status display lets you monitor and control print commands at any time.

- **Print documents in order of priority regardless of order on disk.**
- **Print same form types together to minimize changes.**
- **Hold documents to be printed later.**

Forms jammed? Instead of starting from scratch, you can re-start at any page.

Printer down? Keep right on working. Print Q saves your documents and prints them later.

Print Q does all this and more without interfering with your applications.

HOW PRINT Q WORKS

Load Print Q once with your program disk and it remains resident, assuming complete independent control of your printer.

You run applications as usual, but instead of stopping after the print command, keep right on computing! Print Q intercepts the documents bound for the printer, spools them to disk, then prints them according to your commands. With Print Q you can:

- **Print up to 255 copies automatically.**
- **View documents without printing.**

USER-FRIENDLY AND GUARANTEED

Order now and you'll receive the 5¼" Print Q disk. Complete user-friendly documentation. A DP user's guide to enhancing Print Q capability. A service hotline number. *Plus our guarantee:*

If you're not convinced Print Q saves time, increases productivity and enhances printer function, return it for a full refund within 30 days.

Call toll-free or mail the coupon to order now.

1-800-346-7638
***In New Jersey call* 201-584-8466**

PrintQ™

For users of IBM, PC, AT, XT, PCjr and most IBM compatibles.

NOT COPY PROTECTED

PCW 7/86

Software Directions, Inc. 1572 Sussex Turnpike, Randolph, NJ 07869

YES. Rush me Print Q for just **$89**, which includes postage and handling. If I'm not convinced Print Q saves time, increases productivity and enhances printer function, I'll return it within 30 days for a full refund.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

☐ Check enclosed. ☐ Visa ☐ MasterCard ☐ Am.Ex.

Acct No. _____ Exp. date _____

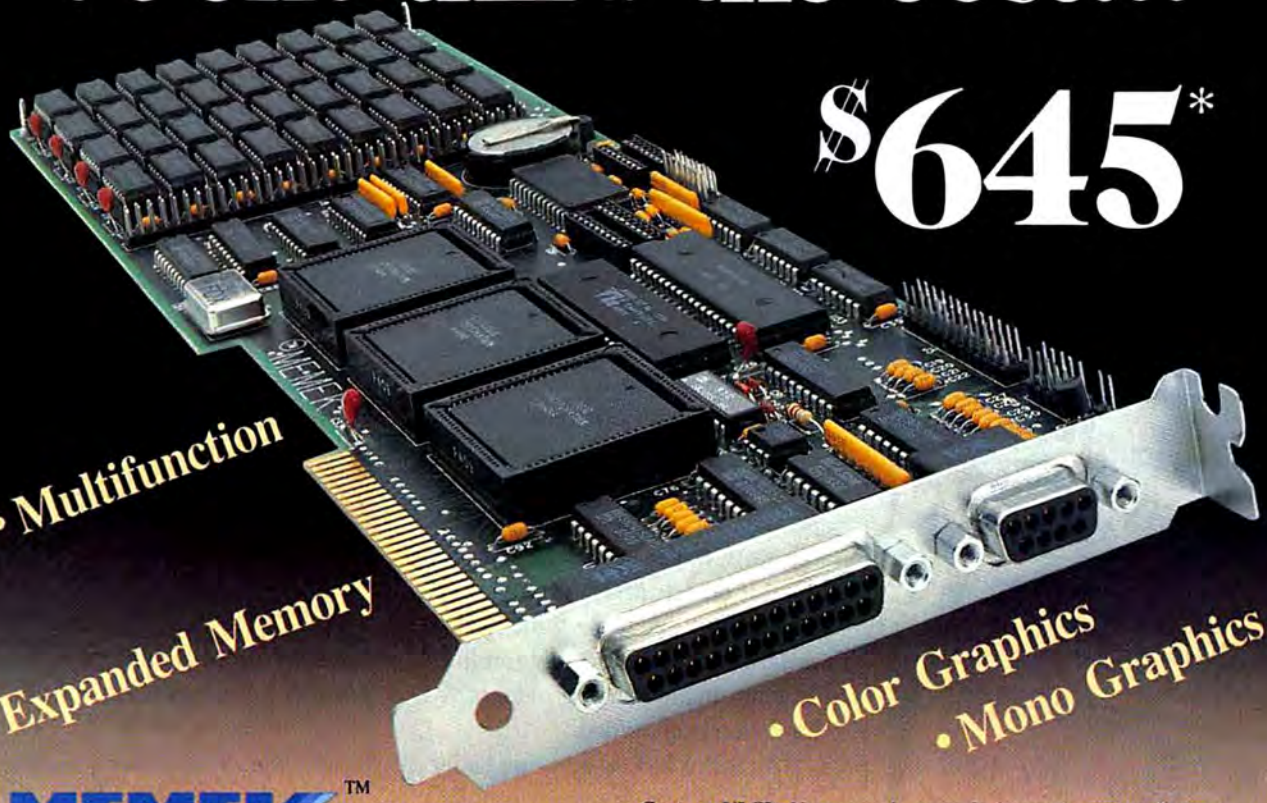
Signature _____

IBM is a registered trade mark of International Business Machines Corporation.

NJ resident add 6% sales tax.

6

Four boards in one at one-third the cost...



$645*

- Multifunction
- Expanded Memory
- Color Graphics
- Mono Graphics

MEMEK™ (say "mimic")

is the first multi-function, multi-display board for the IBM PC. It is so loaded with features that it can take the place of four state-of-the-art boards. Yet MEMEK costs one-third as much. At $645, it includes more features per dollar than any comparable product on the market. In addition, the technical support staff at Boca Research is committed to serving your needs by offering complete support and a full one-year warranty on all products.

Compatibility

MEMEK is a full length board which can be used in your IBM PC, XT, or compatible. All software which runs on the most popular monochrome and color graphics cards is compatible with MEMEK. This unique combination of memory, multi-function, and graphic capabilities all on one board, saves precious slot space for future expansion needs.

Easy set-up

Installation is a snap! There are no jumpers or switches to set. Included in the MEMEK package is a software program and easy-to-follow instructions to configure memory, display and I/O. The configuration you define is stored on the MEMEK board and is in place when the PC is powered on.

Custom VLSI: Uses very large scale integration technology to provide compatibility with IBM Monochrome and Color/Graphics display adapters, Hercules Graphics card, and Plantronics ColorPlus.

RAM: The base MEMEK board is equipped with either 256KB or 1 MEG of RAM. Optional expansion boards are available with 256KB or 1 MEG. At its maximum MEMEK can provide 2 Megabytes of parity checked user memory (socketed). MEMEK has been designed to comply wth the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) which is fast becoming the industry standard for large application programs.

Color Display Connector: Color graphics mode offers a variety of screens, from medium resolution with 4 colors to high resolution with 16 colors. Can interface to direct drive IRGB or composite monitor.

Monochrome Display Connector: Displays monochrome graphics to their fullest potential (720h by 348v). Utilizes IBM compatible text mode of 80 characters by 25 lines.

Serial Port: To connect printer, modem, graphic plotter, mouse, or other serial device.

Parallel Port: Interfaces with IBM and compatible parallel printers and plotters.

Clock/Calendar: Supplies correct date and time during power-up and file creation. Free replacement batteries supplied automatically for six years!

Optional Game Port: Permits interfacing of cursor control devices such as joysticks or paddles.

*** retail price includes 256K RAM, $795 retail for 1Meg RAM.**

Registered Trademarks: IBM, PC, XT, Monochrome and Color/Graphics adapters – International Business Machines Corporation. Hercules Graphics – Hercules Computer Technology. Plantronics, ColorPlus – Plantronics Inc. MEMEK – Boca Research, Inc. Lotus, Intel and Microsoft are registered trademarks.

BOCA RESEARCH, INC.
6401 Congress Ave.
Boca Raton, FL 33431
Phone 305/997-6227

Circle 423 on reader service card

release) or at the bottom of the appropriate page.

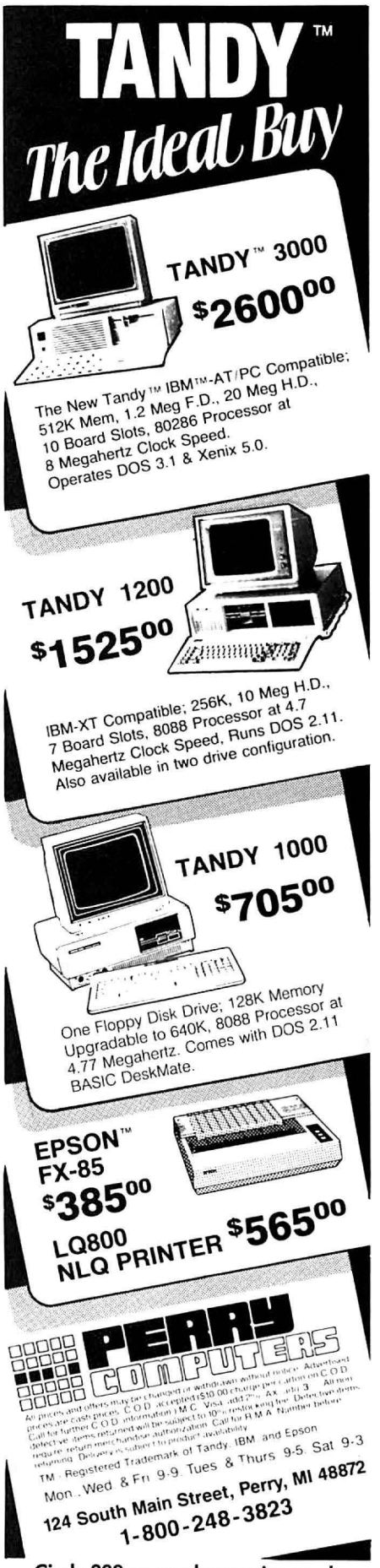
This born-again *WordStar 2000* is adept at printing two or three columns side by side, a feature prominent by its absence in the first release of the program. As with page offset, column separation is indicated in inches. You can easily switch from single-column format to two or three text columns and print the result justified. However, *WordStar 2000* still cannot show columns side by side on screen.

If you use *WordStar 2000* for creating tables, you'll especially appreciate the ability to set multiple tab stops to the nearest tenth of an inch. If the left margin changes, tabs are still set at the same relative distances. Automatic paragraph and automatic hanging indents have also been added.

MicroPro has made some badly needed changes in release 2, positioning the program better against *Word, WordPerfect,* and of course, the venerable *WordStar.* If you're using the first release of *WordStar 2000,* the upgrade is well worth the minor expense. *WordStar 2000* has earned a subdirectory on my hard disk. *–Janet Crider*

WordStar 2000 release 2
MicroPro Int'l Corp.
33 San Pablo Ave.
San Rafael, CA 94903
415/499-1200
List price: $495, WordStar 2000 Plus (includes TelMerge, StarIndex and MailList) $595; upgrade for those who bought the program prior to November 1, 1985, $60
Requirements: 256K (320K for some compatible machines and PCs using DOS 3.00 and 3.10); two disk drives (hard disk recommended); DOS 2.00 or later version
Not copy protected

Jason Durbin is editor of a corporate newspaper. Peter Feldmann is president of I.C. Consultants in Santa Barbara, California, and a consultant specializing in systems, programming, and technical writing. Ted Nace is a Contributing Editor for PC World *and the author of* LaserJet Unlimited *(Peachpit Press, Berkeley, 1986). Janet Crider is a word processing training consultant and the author of* Word-for-Word: A Comparative Guide to Word Processing Software *(Osborne/McGraw-Hill, Berkeley, 1985).*



Circle 238 on reader service card

Corporate Maneuver.

In the high-pressure corporate environment, every move counts. It's no wonder, then, that many corporate PC users are reaching for WordPerfect for powerful business word processing.

Reaching the top.

WordPerfect is now the best-selling word processor for the IBM PC, according to market research firm InfoCorp. And customers like Ford, Chrysler and TRW are leading the way.

Meeting user needs.

But WordPerfect's climb to the top was no overnight success story. For the past three years, user feedback has been applied to each new version of WordPerfect, pushing it closer and closer to perfection.

The result is WordPerfect 4.1, a word processor with unsurpassed business features for the IBM PC and compatibles. Features like an elegant thesaurus, a 115,000-word spelling dictionary, math capabilities, columns displayed side-by-side on screen, windows, line drawing, paragraph numbering, and extensive printer support.

Make your move.

There is a word processor that is as productive for executives as it is for secretaries. WordPerfect 4.1. It's the consummate corporate maneuver. For more information, call or write WordPerfect Corp., 288 West Center St., Orem, Utah 84057, (801) 227-4000.

WordPerfect
CORPORATION

Circle 165 on reader service card

INTRODUCING RAPIDWRITER. IT GOES BEYOND TEXT ENTRY SPEED LIMITS

RAPIDWRITER GIVES NEW MEANING TO THE WORDS "FAST TRACK"

Test results have shown RapidWriter dramatically increases word processing input speed from 25-100%—even faster in some cases.

RapidWriter is the first truly new text entry solution for IBM PCs. It combines software and a keyboard to allow you to enter frequently used words, complex phrases and standard paragraphs with a single keystroke.

RAPIDWRITER TYPES THE SAME THING OVER AND OVER SO YOU DON'T HAVE TO

Create your own meaningful abbreviations or "chords" for your specific application. You can customize your text entry to the degree you need it—it's like having your own computer shorthand.

For instance, you might continually type the phrase, "Very truly yours,". With RapidWriter a "chord" such as TY can be assigned to replace the 17-keystroke phrase. Simply press the T and Y keys at the same time—an action we call "chording"—and the complete phrase is automatically typed out in just one keying motion. No additional special keys are needed to activate the chord.

IBM PC is a registered trademark of International Business Machines Corp.

RAPIDWRITER INCREASES PRODUCTIVITY AND QUICKLY ADAPTS TO YOUR NEEDS

RapidWriter explodes the limits of word processing productivity as you now know it by turning routine word processing chores into simple "chords". RapidWriter helps you avoid costly delays, work jams, overtime and temporary help.

You can start using RapidWriter from day one. No built-in commands to learn—no new keyboard to memorize. Just sit down and start typing. Familiarity with RapidWriter comes effortlessly.

RapidWriter is a no-risk proposition. We extend a full-satisfaction guarantee with the purchase of each RapidWriter. We're certain that once you start using RapidWriter in your business it will become an indispensable productivity tool.

If for any reason you're not happy with RapidWriter, return the keyboard and software to us within 30 days, and we will refund the $595.00 purchase price.

RapidWriter—from Quixote Corporation—bringing a breakthrough in word processing technology to business.

1-800-523-8356

to order or for further information
In Illinois 1-800-325-1850.

A DIVISION OF QUIXOTE CORPORATION
ONE EAST WACKER DRIVE
CHICAGO, IL 60601

DEALER INQUIRIES INVITED

Circle 564 on reader service card

Announcing

Publish!

The Magazine of Desktop and Personal Computer Publishing

Interleaf Workstation

The In-House Edge

Smart Companies Slash Costs With Interleaf

Update on Pagemaker, Macpublisher, and Ready Set Go

How to Choose Your Macintosh Publishing Tool

Now! Page Makeup On Your PC

Over 30 New Products to Start You Off

Make A Fortu

The issue of Fortune magazine on the left side of this ad was painstakingly created by a large staff of editors and proofreaders and art directors and typesetters and camera operators and keyliners.

The Fortune on the right side of this ad was painlessly recreated by one person using PageMaker® software.

Because PageMaker gives anyone the ability to publish just about anything.

PAGEMAKER TURNS YOUR MACINTOSH INTO A PUBLISHING HOUSE.

With PageMaker you can set your own type, juggle pictures, control line spacing, enlarge or shrink graphics, create line rules, crop photos and move all the elements of a page around until you get them exactly where you want them.

Then you can print the whole thing out on a laser printer with 300 dot resolution. That means it will look so good no one will believe you did it yourself.

And you don't need to be a design genius to make PageMaker work. Because what you see on the screen is what you'll get on the page.

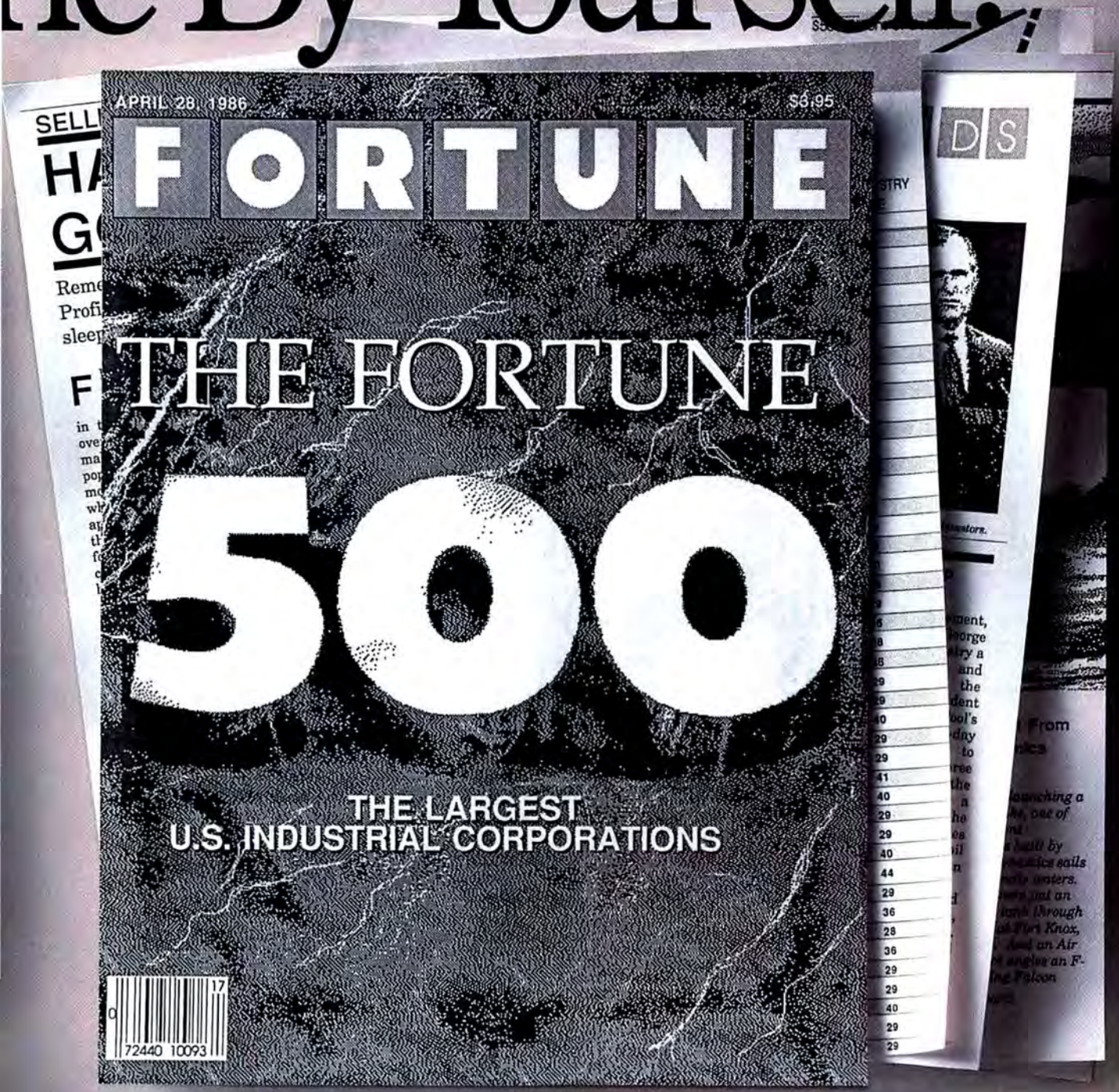
IT CAN MAKE EVERYTHING FROM MAGAZINES TO ROUTING SLIPS.

It doesn't take a great deal of imagination to see that if PageMaker is capable of producing something like Fortune, it will also be able to do some pretty spectacular things with your newsletters.

Or your financial statements. Or your price lists. Or your new business proposals. Or any

©1986 Aldus Corporation. PageMaker is a registered trademark of Aldus Corporation. Apple is a trademark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is used with its express permission. Cover created with PageMaker and other support hardware/software.

ne By Yourself.



thing else you can think of.

PAGEMAKER CAN SAVE A FORTUNE AS EASILY AS IT CAN MAKE ONE.

In addition to giving you control over the creative aspects of publishing, PageMaker can also help you with the financial details.

Because it will save money in typesetting and production on every piece you produce.

PageMaker runs on both Apple 512K Macintosh™ and Macintosh Plus computers and costs less than $500.

So call or send for our free brochure or see a demonstration of PageMaker at your local Aldus dealer today.

You'll discover how easy it is to make any good idea look like a million bucks.

ALDUS
PageMaker

FORTUNE © 1986 Time Inc. used with permission.

411 First Avenue South, Suite 200, Department B, Seattle, WA 98104 (206) 622-5500

Circle P8 on reader service card

For a sample of what a POSTSCRIPT®-equipped desktop publishing system can do, see the next 46 pages.

ADOBE SYSTEMS INCORPORATED

This entire issue of "Publish", including this ad, was set in the **Trump**® typeface, the newest addition to the Adobe Type Library. Available in the fall through your Apple® LaserWriter® dealer.

POSTSCRIPT is a registered trademark of Adobe Systems Incorporated. Trump is a registered trademark of Allied Corporation. Apple and LaserWriter are registered trademarks of Apple Computer, Inc.

Circle P7 on reader service card

Publish!

The Magazine of Desktop and Personal Computer Publishing

Features

Dedication Pays Off 20
by Jeff Walden
Companies cut costs by bringing publishing in-house on Interleaf's dedicated workstation.

Eye-Catching Pages 34
by Marjorie Spiegelman
To prepare great-looking layouts, start with the basics.

A Menu for All Seasons 36
by Sharon Efroymson
A premier Manhattan restaurant does its own menu printing and production.

Tooling Up 38
by James Felici
At Publish! *we stretched and shaped desktop technology to meet our needs—so can you.*

Reviews

Slow Down the Presses 26
by Jim Heid
Page makeup debuts on the IBM PC.

Revised Editions 28
by Diane Burns and S.Venit
Updated versions of three important page composition programs for the Macintosh.

Departments

9 **David Bunnell's Front Page**
Welcome to The World of Publish!

14 **Keeping Tabs**
by Susan Gubernat
Making an Impression

18 **Contributors' Notes**

19 **News Beat**

Tips!
25 *Extend the Life of a Toner Cartridge*
41 *Convert Wordstar to Word*

42 **Buying Information**

43 **Product Watch**

46 **Publish! Puzzlers**
by John A. Barry
Word Challenge

"Freedom of the press belongs to those who own one."
—A. J. Liebling

Cover photo by David Powers

Coming in the Premier Issue of Publish!

Look for the following topics to be covered in the September/October issue:

- ❑ **Which laser printer is right for you?** *Publish!* takes a close-up look at laser printers from Hewlett-Packard and Apple.
- ❑ **Imported images.** Low-cost scanners let you bring photos and line drawings into your computer, but when is a scanner a good investment?
- ❑ **Customer support.** Does your relationship with a product's manufacturer begin or end when you make a purchase? Here's what to consider before you buy.
- ❑ **Ten surefire ways** to produce pages without making time-consuming errors.
- ❑ **The great paper chase.** Your laser printer isn't limited to basic white paper. By varying your paper stock, you can create unusual, exciting pages—here's how.
- ❑ **The new copy centers.** In addition to photocopying and offset printing, today's copy centers offer a broad selection of page composition tools.
- ❑ **Plus:** Hardware and software reviews...tips from readers... page make-overs...answers to your technical questions... and new product listings.

Publish!

David Bunnell
Publisher and Editor in Chief

J. Kelley Younger
Executive Editor

Susan Gubernat
Editor

Jacqueline Poitier
Associate Publisher,
Art and Design

Editorial
Managing Editor Bruce Raskin
Associate Editor J. E. Arcellana
Technical Editor James Felici
Senior Copy Editor Bonnie Monte
Editorial Assistant May Sui
Assistant to the Executive Editor Gina Vanluc
Contributing Editors Tony Bove, Jim Heid, Ted Nace, Cheryl Rhodes

Art and Design
Art Director Bruce Charonnat
Design Consultant Spiegelman Design Associates, Inc.

Production
Director Herbert Linden
Senior Production Managers Frances Mann, Lee R. Trevino
Editorial Production Manager Ellyn L. Hament
Ad Traffic Jayne Boyer
Telecommunicators Mark L. Duran, Susan Ford, Virginia Weir
Display Advertising Supervisor Georgia George
Assistant Otto Waldorf

Research
Associate Publisher/Director Cheryl Woodard
Manager Gary L. Rocchio
Research Analyst Ralph Ames
Assistant Steven York

Corporate Development
Manager Karen Wickre
Special Projects Jeffrey S. Glines
Administrative Assistant Gloria C. Sundin

Circulation
Director Penny Ertelt
Single-Copy Sales Manager George Clark
Subscription Manager Gail Egbert
Single-Copy Sales Bill Cox
Fulfillment Coordinator Doug Norde

Marketing and Advertising Sales
Associate Publisher/Director James E. Martin
National Advertising Manager Larry Hilderbrand (415) 861-3861
National Sales Manager Penny Rigby (415) 861-3861
National Account Manager Alisson Walsh (415) 861-3861
Advertising Services Manager Ray Petsche
Assistant to the Director Loretta Giglione

Administration
Director Janet McGinnis
Accounting Pat Murphy
Facilities Joseph Wollenweber
Personnel Shelly Ginenthal
Technical Nancy Canning
Assistant to the President Christina W. Spence

Corporate
PC World Communications, Inc.
David Bunnell Chairman
Bartlett R. Rhoades President & CEO
Herbert Linden Vice President
James E. Martin Vice President
Jacqueline Poitier Vice President
Cheryl Woodard Vice President
Andrew Fluegelman 1943-1985 Founding Editor

Publish! ™ will be published bimonthly beginning in September 1986 by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107. Subscription rates are $29.90 for 6 issues, $52.90 for 12 issues, and $78.90 for 18 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $6 per year from Canada and Mexico; add $12 per year for surface mail or $80 per year for airmail from all other countries.

Editorial and business offices: 555 De Haro St., San Francisco, CA 94107 (415) 861-3861

Publish! is a publication of PC World Communications, Inc.

Printed in the United States of America.
Copyright© 1986 PC World Communications, Inc.
All rights reserved.

Submissions for Tips! should be sent to Tips!, *Publish!*, 555 De Haro St., San Francisco, CA 94107. Contributors will receive $25 for each idea selected for publication.

Office Publishing with IPRINT

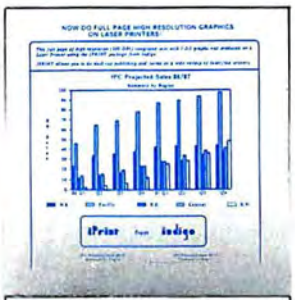
Saves Time
Saves Money
Quality Results

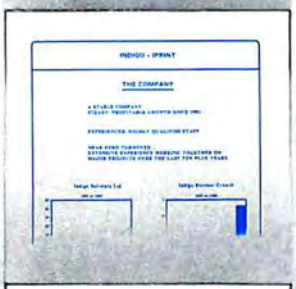
Office publishing capabilities at affordable prices . . . fully utilize the power and flexibility of your laser printer.

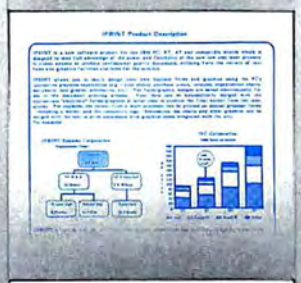
Use your PC to interactively design forms, organization charts, blocks diagrams, business graphics, presentation slides, etc. You can even integrate Lotus 1-2-3 graphics into your documents.

What appears on the screen is what comes out of the printer.

All this in one easy to use software package IPRINT.



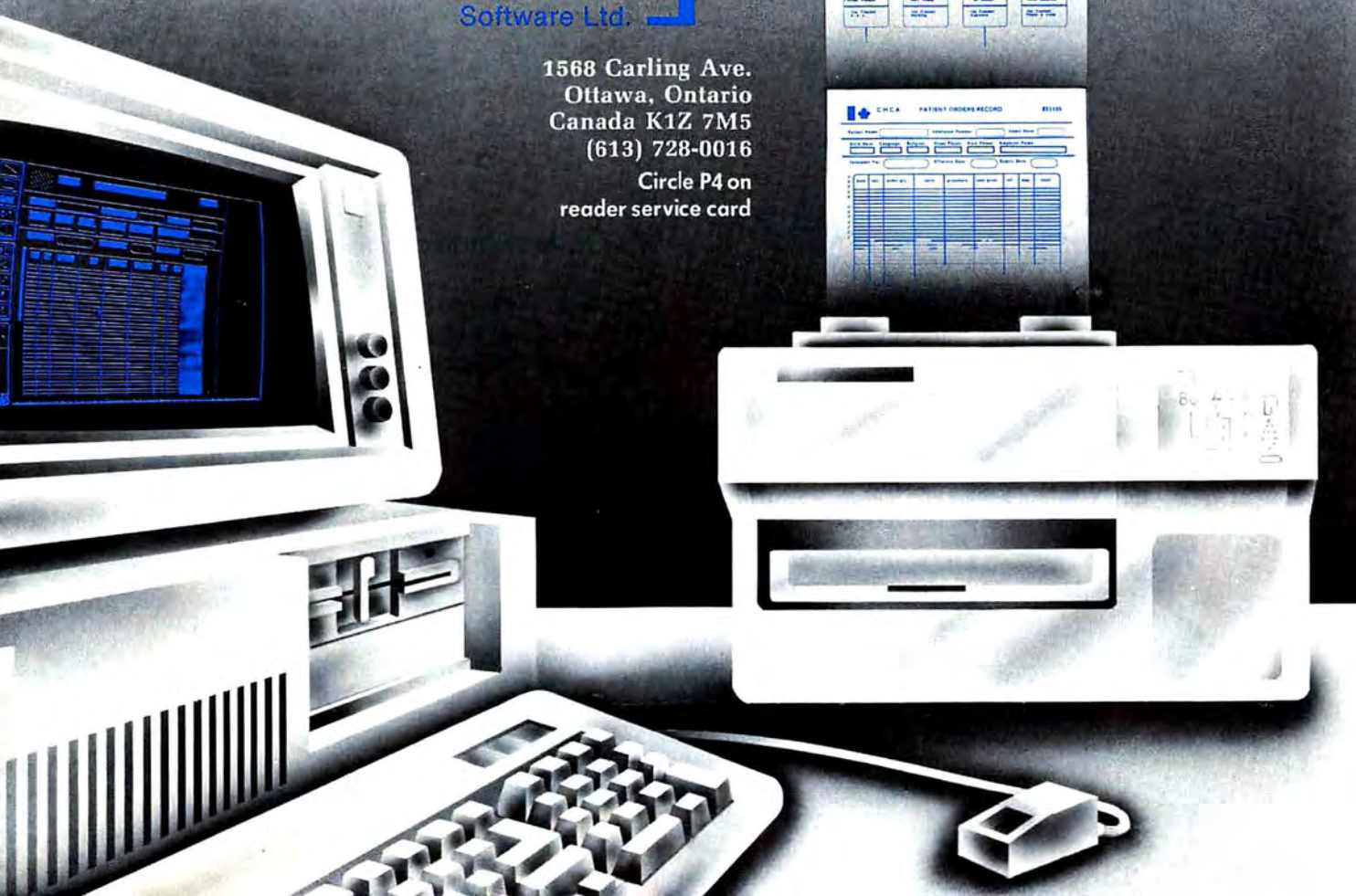




indigo
Software Ltd.

1568 Carling Ave.
Ottawa, Ontario
Canada K1Z 7M5
(613) 728-0016

Circle P4 on
reader service card



Announcing

Publish!

The Magazine of Desktop and Personal Computer Publishing

Now, an exciting new magazine from the publishers of PC World and Macworld—at Charter Subscription savings!

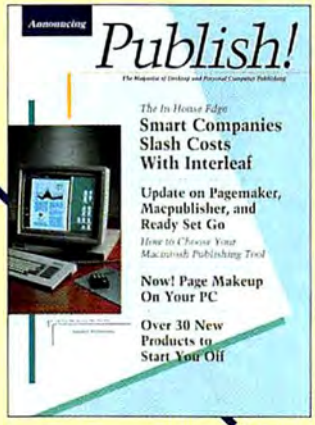
If you use a Macintosh or PC system to publish reports, newsletters, books, brochures, ads, or any other printed material, then you need *Publish!, the Magazine of Desktop and Personal Computer Publishing.*

Publish! is a new magazine that is entirely written, edited, and produced on personal computer–based systems. Because *Publish!* is on the cutting edge of this exciting new technology, you can depend on us for the expert information you need to set up and manage your own personal computer publishing operation.

Each colorful, feature-filled issue is easy to read and understand, yet comprehensive and authoritative. *Publish!* will answer all your questions about using personal computers with laser printers and page makeup software—and will even tell you how to drive commercial typesetters with a personal computer. What's more, *Publish!* covers both stand-alone systems and networks.

Learn how in every issue of Publish!

Publish! shows you the shortcuts and tricks of the trade that can help you get the most from the hardware and software available. You'll learn the



fundamentals of graphic design and other publishing basics, and you'll save time and money, too.

In coming issues of Publish!, you'll read:

- ❑ Reviews of laser printers...
- ❑ The latest word on typefaces available for personal computer publishing...
- ❑ A report on scanners for graphic reproduction...
- ❑ A checklist of legal issues that confront desktop publishers...
- ❑ Advice on how to avoid expensive catastrophes...

All this and more comes to you in *Publish!*, six times a year—and at a low Charter Subscriber price, if you act now.

Fast action saves you money!

For a limited time, Charter Subscriptions are available for only $19.95 for a full year (six bimonthly issues). You save 33% off the basic subscription price that others will pay when the Charter offer closes.

Take advantage of this limited-time Charter Subscriber offer now, and get the full benefit of *Publish!*'s expertise as soon as possible. Mail the attached postpaid card or the coupon below. For faster service, call toll free (800) 222-2990.

Act now, and start getting the information you need. But hurry—this Charter Subscriber offer is strictly time-limited!

Act Now for Charter Subscriber Savings—33% Off!

Publish! *Subscription Department*
P.O. Box 55400, Boulder, CO 80322-5400

YES, enter my Charter Subscription to Publish! *for one year—six bimonthly issues—at only $19.95. I save 33% off the basic subscription price!*

[ ] Payment enclosed [ ] Bill me later

[ ] Charge my [ ] Visa [ ] MasterCard

*Card no.*_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|

*Expiration date*_____ /_____

*Signature*_____

*Name*_____

*Street*_____ *Apt.*_____

*City*_____

*State*_____ *Zip*_____

Guarantee: If ever you're not satisfied with Publish!, *let us know and we'll promptly refund the price of every issue remaining on your subscription. No questions, no problems. We guarantee it.*

Offer valid in U.S. only. Premier issue will be mailed in August 1986.

4CYS8

Dot matrix printer

Laser printer

Linotronic® imagesetter

Now, Microsoft Word users can improve their characters.

Now Word can give you the world's highest-quality typeset output.

Microsoft® Word makes it very easy to put words on paper.

Now Linotype can make them jump off the page.

Turn keystrokes into masterstrokes.

Whether you're using an IBM PC or compatible, or an Apple Macintosh computer, you have the beginnings of a professional typesetting system.

Just connect your computer to a Linotronic laser imagesetter and you'll be able to create professional quality typeset documents that really stand out. (This ad was written using Word, and output on a Linotronic imagesetter.)

The result is printed communications that are more effective and more economical, too. Because typesetting dramatically reduces the costs of printing and postage. (The tight letterfit of typeset characters can reduce the bulk of many documents by as much as 50%.)

Combine Word and pictures.

As good as Word is, sometimes pictures tell the story better.

That's why you're also taking advantage of programs like Chart, MacPaint and MacDraw. And preparing visuals that you electronically cut and paste into your memos, reports and presentations. Most typesetters can't reproduce these pictures. They give you only the words, and you have to prepare the graphics some other way, adding time and money to the job. Only Linotronic imagesetters take exactly what you have on-screen and give it to you on paper. Or film. Positive. Or negative.

One thing Apple and IBM agree on.

Apple's LaserWriter™ printer uses typefaces licensed from Linotype's Mergenthaler™ library. And IBM chose Mergenthaler type for their mainframe printer.

Most of the typefaces that have become industry standards were developed by Linotype. (Helvetica® and Times®, for example.) And they're available only from Linotype.

We'll put Word into action.

Give us the chance to show you how to get more out of Word than you thought possible.

Linotype 1886 1986

Call (516) 434-2016. Or write Linotype Company, 425 Oser Avenue, Hauppauge, NY 11788.

ALLIED

Linotype Company

Circle P6 on reader service card

© Allied Corporation 1986.

Welcome to the World of Publish!

Every good magazine is born of a vision. *Publish!* represents a vision of a magazine about a new technology—a technology used to produce the magazine itself. Our medium really is our message.

The vision of using personal computer publishing to put out a magazine about personal computer publishing began in the minds of Tony Bove and Cheryl Rhodes. As pioneer reporters on this exciting new medium, they created *Desktop Publishing*, a magazine completely written, edited, and produced on a personal computer.

We shared their vision. In fact, we bought their magazine and expanded on it. The result is this trailblazing new publication—*Publish!, the Magazine of Desktop and Personal Computer Publishing.*

Tony and Cheryl are very much a part of our team as contributing editors and keepers of the flame. They will also continue to produce *Desktop Publishing* for us in its new form as a developers' newsletter and guide to new technology.

The beautifully designed magazine that you're now reading speaks volumes about where we're heading with *Publish!*. Tony and Cheryl may have planted the original seeds, but the magazine's vitality springs from the collective vision of a group of outstanding editors, writers, artists, and designers who have poured their ingenuity, talent, and creativity into it.

I hope you feel life stirring in these pages. And I hope you are as stirred by it as we are.

To make *Publish!* happen, we had to be convinced that it was a good business proposition. But we're not bringing out *Publish!* just for business reasons. That's not our nature.

We're doing it because we really care about publishing, especially personal computer publishing and corporate publishing. We value the process of communicating well. We also care about freedom of speech and people's ability to publish whatever it is they want to express.

"Freedom of the press belongs to those who own one," said writer A. J. Liebling. Obviously, if publishing technology becomes more accessible to a broader group of people, they can disseminate their ideas more widely.

My own personal vision of *Publish!* goes back to my high school days, when my father was the managing editor of the *Alliance Times Herald*, a daily newspaper in Nebraska. I worked for him, and at the young age of 16, I became the sports editor. I went to the office every morning and put out the wire copy. I wrote headlines and covered the basketball and football games.

While I was working there, I had the strange notion that someday one person, using a huge computer screen, wire copy, and photographs coming down the lines, could completely run a small-town newspaper: put in the stories, write articles about the council meetings, sell the ads, and put it all together.

That day is here. The significant economies that can be realized, the accessibility, the control, the ability to do your own publication from scratch—all of these are possible today with desktop and personal computer publishing.

And you don't have to be a small-town newspaper to benefit from this publishing revolution. You can be a corporate colossus, a midsize mogul, or even a small business, and still come out ahead with this powerful new technology.

Publish! is your link to the state-of-the-art future. Whatever your publishing level, *Publish!* will provide the answers.

"If you want to be a leader, find a parade and march in front of it." That's another saying I fondly subscribe to. We see personal computer publishing as a giant parade, and we intend to lead it by pushing the technology to the ultimate.

Publish! will help you build personal computer-based systems to publish everything from memos to encyclopedias. Businesses already publishing massive amounts of data (trillions of pages are put out by corporations every year) will be able to produce documents faster, better, and cheaper.

Thus, publishers, corporate employers, and those who run small businesses can all participate in the grand spectacle of our *Publish!* parade.

Equally important is that this is a magazine for people who are being drawn into the publishing arena for the first time.

We expect to see a boom of new publishing companies in addition to a wealth of new publishing opportunities. And I really believe that this technology will lead to a revitalization of the small-town newspaper business.

It will also spark the creation of a multitude of specialized magazines and publications not yet feasible because of prohibitive costs.

Although our vision of *Publish!* embraces the IBM PC and the Macintosh, it's much more than that.

We're also concerned with the growing use of workstations like the Sun Micro, the Apollo, and the IBM RT PC. We see this trend developing from two directions.

One is at the grass-roots level, where desktop publishers, who use largely Macintosh-based systems, will be producing more of their own newsletters, reports, and in some cases, newspapers and even magazines.

At the same time, we see minicomputer-based software and computer-aided publishing systems migrating down toward the personal computer area.

Publish! will cover the range, keeping tabs on both sides of the personal computer publishing phenomenon. We'll assist the individual publisher who has one personal computer and a laser printer; and we'll also show how to build networks and larger systems, what the best hardware choices are, how to integrate software into those systems, what the best software is, and how to obtain the optimum results.

As writers and editors gain new power and control over their output, it's important to note that the basic rules of design and aesthetics have not changed. What makes a page look great has already been established. We're seeing the results of documents being produced without considering the rules of style: a lot of ugly stuff is coming along with the good stuff.

Publish! will cover the elements of good design—how to pick typefaces, how to size columns and headlines, how to make pages look right. We will also help writers and editors develop expertise in page makeup and layout.

We see *Publish!* as a real testing ground for personal computer publishing technology. We promise to push the technology to the absolute limit as part of our challenge to be on the leading edge of the revolution. We will test and report on software systems the moment they hit the market and in many cases, even earlier.

We will also point out questionable products and pitfalls to avoid. And we are committed to steering you toward the truly fine products. We want you to enjoy the positive experience of personal computer publishing.

This magazine will be a kind of industry watchdog, keeping track of all the latest developments. We will run down the rumors and report the inside story to you before anyone else does.

We will present profiles of people who use this technology, and display some of the best examples of their work.

By reading *Publish!* you will be informed, you will save money, and you may even find that the magazine itself will inspire you to attempt greater things in your own work.

Although we have an exciting vision of what *Publish!* is about and what the technology entails, we also know from our experience in the fast-moving computer industry that things change very fast and are quite unpredictable.

So we also promise that *Publish!* will follow the turns, provide solutions, and decipher whatever it is that might be perplexing or unpredictable.

That's what makes personal publishing such an adventure. And *Publish!* is the grandest adventure of all because it's the true realization of the medium as the message. For us, it's an unparalleled opportunity to bring together the two worlds we care about most—personal computers and publishing. ❑

How to build a design studio, a type house and a print shop on 3.1 square feet of desk.

Introducing Desktop Publishing Plus.

You can hook up to 31 Macintosh Plus computers up to one LaserWriter Plus over the AppleTalk network.

If you're in charge of producing your company's newsletters, flyers, forms and manuals, we'd like to give you something:

Our sympathy.

Because we understand the pressure of getting a newsletter out while it's still news. The frustration of having a manual with more type bills than pages. The panic of revising a presentation ten minutes before you present.

Sympathy, of course, won't solve your problems. But we have something that will. Our Desktop Publishing Plus™ system.

The whole idea of Desktop Publishing Plus is based on the concept of desktop publishing, a category we virtually invented.

That concept being, when you need typesetting and production work done, you don't need to run to outside vendors anymore. You can just run to your desk.

Which will save you time because you can create, revise and, in many cases, produce mechanicals without going back and forth to type shops all day.

And you'll save money, because of all the monstrous type bills you won't be paying.

Desktop Publishing Plus actually consists of two pluses.

Our Macintosh™ Plus computer and our LaserWriter™ Plus printer.

The Macintosh Plus is the most powerful personal computer

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz ITC Avant Garde Gothic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz ITC Bookman

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz Helvetica Narrow

Here are some of the new faces you'll be seeing around the office. And you'll be seeing them in sizes from 4-point to 720-point.

© 1986 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Desktop Publishing Plus, LaserWriter, MacDraw, MacPaint, MacWrite and AppleTalk are trademarks of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is being used with its express permission. POSTSCRIPT is a trademark of Adobe Systems, Inc. Helvetica, Times, Palatino, Linotype and Linotronic are registered trademarks of Allied Corporation. ITC Avant Garde Gothic, ITC Bookman, ITC Zapf Chancery and ITC Zapf Dingbats are registered trademarks of International Typeface Corporation. Microsoft is a registered trademark of Microsoft Corporation. PageMaker is a trademark of Aldus Corporation. Easy3D is a registered trademark of Enabling Technologies, Inc. Letraset is a trademark of Letraset USA, Inc. For an authorized Apple dealer near you, call **(800) 446-3000 ext 50.** In Canada, call **(800) 268-7796** or **(800) 268-7637.**

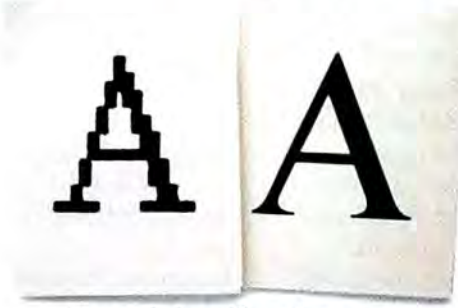
we've ever built. Its Motorola 68000 microprocessor and full megabyte of memory allow you to run powerful graphic and page design software programs. As well as powerful word processing, spreadsheet, database, and other business programs.

And its point-and-click mouse technology makes it easier to use than Letraset. So you can spend more time doing work instead of learning how to get the computer to work.

The LaserWriter Plus printer has the same 68000 microprocessor that's in the Macintosh Plus. Not to mention a hefty 1.5 megabyte of memory and a megabyte of ROM.

And inside its ROM is PostScript,® the page description language that is quickly becoming the industry standard.

Translated, this means the LaserWriter Plus can cover an entire page with virtually any combination of near typeset quality text and high resolution graphics.



The crisp looking "A" was done on a LaserWriter Plus. The fuzzy one was done on a standard dot matrix printer.

PostScript also allows the LaserWriter Plus to generate dozens of different type styles and hundreds of sizes from its 11 built-in typeface families. These families being Helvetica,® Helvetica Narrow, Times,® Palatino,® ITC Avant Garde Gothic,® ITC Bookman,® New Century Schoolbook, ITC Zapf Chancery,® ITC Zapf Dingbats,® Courier and Symbol. And more families are becoming available all the time.

MacDraw from Apple

Easy3D from Enabling Technologies

PageMaker from Aldus

Word from Microsoft

All of which means, you can now generate professional quality manuals, reports, presentations and overheads faster than you can say "you can now generate professional quality manuals, reports, presentations and overheads."

And if you decide you need commercial typeset quality printing, the Macintosh Plus can easily hook up to larger PostScript compatible typesetting machines like a Linotype Linotronic 100 or 300.

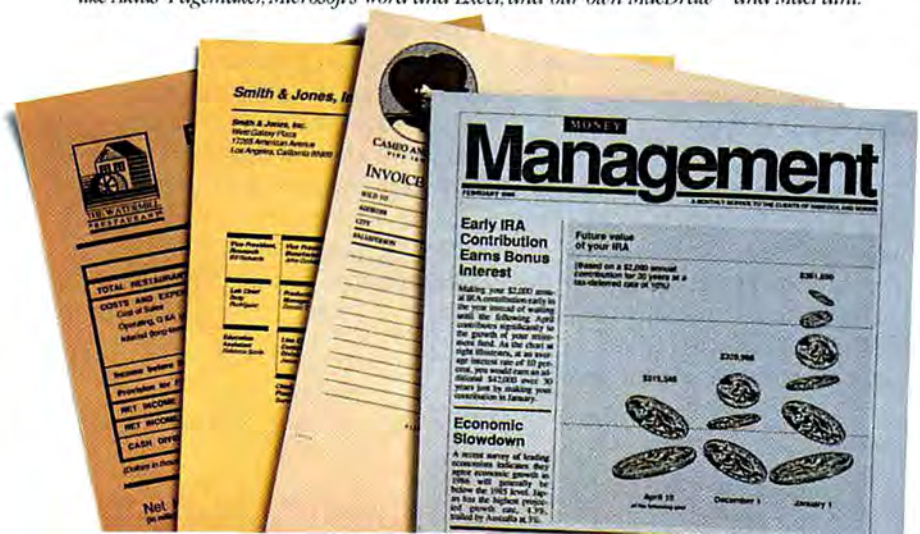
So visit your authorized Apple dealer.

And start making plans to build a design studio, a type house and a print shop on your desk.

But don't expect to have a ground-breaking ceremony in your office.

Just expect to break some new ground in it.

These were produced with nothing more than a Macintosh Plus, a LaserWriter Plus, and software like Aldus' Pagemaker, Microsoft's Word and Excel, and our own MacDraw™ and MacPaint.™



Making An Impression

The trouble with dubbing something a revolution before the fact is that you're bound to make some people defensive.

And understandably so. A successful revolution produces permanent, fundamental changes in roles, responsibilities, identities, and, ultimately, a redistribution of resources, a radical shift in power.

I've heard rash predictions from manufacturers and fellow journalists alike that the combination of laser printer, personal computer, and page composition software—the package we've come to identify as the basis of desktop publishing—will destroy the "publishing elite's" stranglehold on the communications industry; subvert censorship behind the iron curtain; and conquer illiteracy in the Third World.

The more mundane promises of increasing productivity in the office and eliminating typesetting and pasteup costs pale beside such hyperbole.

Let's be reasonable and admit that new technology alone won't foster change that can be defined as revolutionary.

Instead, I want to mollify some legitimate concerns I've heard expressed about its impact. Are the careers of trained graphic designers now threatened? Will professionals be replaced by do-it-yourselfers? And if so, will mediocrity in design, as well as in editing and in writing, proliferate?

When these questions arise, I find myself thinking about a graphic artist I know in rural New England. Beth Krommes is a wood engraver and papermaker. A few years ago she knew little about computers and wanted to keep it that way.

After taking a position as a magazine designer, Beth found less time for her own work. Then she latched onto the opportunity to learn automated page makeup on a new system her company had installed. The retraining let her devote half of her time to freelance work.

Once the least likely proponent of computerized methods, Beth now says she'd never revert to mechanical pasteup. Traditional skills and modern technology coexist gracefully in Beth's life because she faced the tools with the question, How can I make them work for me?

Too often we're easily cowed by the supposed power of tools. But we, ourselves, endow them with power whenever we assume that technology could replace human creativity.

Some of Beth's framed engravings hang on my walls. Her magazine designs have a more ephemeral existence. Both serve their purposes.

Like Beth, other designers will find ways to incorporate the new technology into their work. This won't happen, though, if we keep up the pretense that, with the right tools, *anyone* can be a designer. That's as foolish a claim as those made for word processing. The word processor hasn't made the real work of writing any easier; yet writers appreciate the new tools, however skeptical they may have been at first.

The other concern—the anticipation that we'll see a rash of badly designed publications—hardly gives me pause. I know we will but I'm sure that the mere existence of amateur writing or unprofessional design has never, however distracting, suppressed good work.

And finally, I'll gladly put up with the thousands of ugly newsletters, silly memos, and bad novels, knowing that the availability of the new tools, in the hands of someone like Beth, promote creativity.

We inaugurate *Publish!* as a laboratory staffed by editors, writers, and graphic designers for whom the efficacy of these new tools is a daily concern, one we share with you, our readers. Address your letters to us in care of Letters, *Publish!*, 555 De Haro Street, San Francisco, California 94107. ❑

When There's No One Sitting Beside You To Help, Who Can You Turn To?

Prentice-Hall's PERSONAL COMPUTER BOOK CLUB!

Whether you're a novice or experienced PC user —there's always so much more to learn. New software . . . new computer enhancements and capabilities . . . new techniques to streamline your work.

Unfortunately, user manuals don't provide all the answers. You have to rely on other sources.

Where can you find these sources of information —without wasting a lot of time, effort and money?

Join Prentice-Hall's PERSONAL COMPUTER BOOK CLUB!

Approximately every four weeks you'll receive news of new books on business software, hardware, and creative new computer applications. Each title is carefully selected by the PCBC staff to meet your most demanding needs and each is offered to you at a special member's only discount

—up to 30% and occasionally more!

Join now and receive a copy of SUPERMAC: MAKE YOUR MACINTOSH FASTER AND MORE POWERFUL . . . a $16.95 value . . . for only $1.69 (plus postage, handling and applicable tax).

Plus as a special bonus, we'll send you WEBSTER'S NEW WORLD DICTIONARY OF COMPUTER TERMS . . . FREE!

Yours For $1.69!

You have 15 days to decide if you want to keep SUPERMAC. If you aren't fully satisifed, simply send it back and your membership will be cancelled, no questions asked.

In any case, WEBSTER'S NEW WORLD DICTIONARY OF COMPUTER TERMS is yours to keep . . . FREE! And if you do decide that PCBC membership is right for you, our only requirement is that you agree to purchase three more books within the year.

WEBSTER'S NEW WORLD DICTIONARY OF COMPUTER TERMS Compiled by Laura Darcy & Louise Boston
This handy compact aid contains 2,600 basic terms, from abend to videotex, in nontechnical language—with cross-referencing. YOURS FREE!

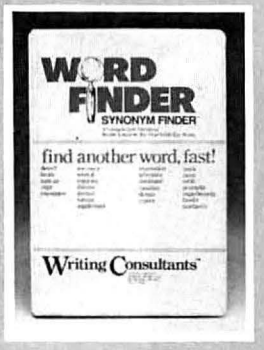
SUPERMAC by Danny Goodman
Shows you how to speed in and out of FatBits . . . insert MacWrite rulers without pulling down a menu . . . transfer files between the Mac and other personal computers . . . make a transition from a CP/M or MS-DOS computer to the Mac . . . use a second disk drive for optimum speed . . . and more! ONLY $1.69!

MAIL THE ATTACHED POSTPAID CARD TODAY

If card is missing, mail to: *P-H PERSONAL COMPUTER BOOK CLUB*
Membership Enrollment Center
P.O. Box 442
West Nyack, New York 10995

Circle P3 on reader service card

DON'T BE AT A LOSS FOR WORDS



When you're searching for the right word, you don't want to come up short! Word Finder offers 220,000 synonyms, four times the vocabulary of our competition, including Random House (used in Reference Set and Lightning). In just seconds, Word Finder performs the whole cycle of look-up and replacement automatically, so you enhance your writing without moving your eyes from the screen or your fingers from the keyboard. Just place your cursor on a word you want an alternate for, and pop up a window of synonyms—all words picked for their up-to-date, contemporary meaning for writers and business professionals. When you choose a new word, the window disappears, and your new word replaces the old word in the document, automatically!

Word Finder works with popular word processors and utilities like WordStar, Sidekick, etc.

"Its performance was astounding. Of all the thesaurus programs currently available, Word Finder is the best of the bunch."
Hillel Segal, The Denver Post

Retail $79.95, and not copy protected.

WORD FINDER™
SYNONYM FINDER™

Rush me **Word Finder** for $79.95. (Add $2.50 shipping; NY residents add sales tax) ☐ Visa ☐ MasterCard ☐ Check ☐ COD

Card Number _____ Exp. Date_____ /_____

Name _____ Phone _____

Company_____

Address _____

City_____ State _____ Zip _____

Word Processor _____ Computer/Op System _____

Writing Consultants™
A Division of Microlytics, Inc.™

Call 1-800-828-6293 in NY 716-377-0130
Techniplex Center, Suite 522, East Rochester, NY 14445

30 DAY MONEY-BACK GUARANTEE

Circle P5 on reader service card

Contributors' Notes

John Barry, coauthor of *Desktop Publishing* (Dow Jones-Irwin), is a writer and editor in Redwood City, California.

Diane Burns and S.Venit, graphic designers in San Francisco, write frequently about personal computers.

Sharon Efroymson is an instructor at the Productivity Center, a New York-based microcomputer training and consulting firm.

Jim Heid is a freelance writer and coauthor of *The Complete Guide to the Tandy 1000* (Ashton-Tate).

Marjorie Spiegelman, designer of *Publish!*, *PC World*, and *Macworld*, has taught graphic design at the University of California, Berkeley.

Jeff Walden is a freelance writer based in Sunnyvale, California.

Publish! is produced on Macintosh Plus computers using the following software: the Trump Mediaeval family of Adobe Postscript fonts, Fontastic, Fontographer, Macdraw, Macpaint, Microsoft Word, and Pagemaker. Page proofs are created on Apple Laserwriter Plus printers, and camera-ready copy is typeset on a Linotronic 300.

News Beat

Great Expectations For PC Page Makeup

There are some sure signs that desktop publishing for the IBM PC and compatibles is being taken seriously for use in business, as well as in graphic design.

Much-awaited desktop programs for the PC are slated to be available by the end of this year. Among them, Ventura Publisher from Ventura Software and a yet unnamed program from Bestinfo Inc. will be marketed not by their developers but by large corporations who want a share of the desktop market.

Xerox Corporation recently obtained worldwide rights to market Ventura Publisher; Software Publishing (publisher of the popular Pfs series of business productivity software) has signed a letter of intent to acquire marketing rights to Bestinfo's desktop product, which is based on Superpage, Bestinfo's professional pagination system for the PC.

A third desktop product for the PC, being developed by Skisoft, reportedly has caught the attention of Ashton-Tate, publisher of Dbase.

Along with Aldus Corporation's PC AT version of Pagemaker (also slated for release before year's end), these and other page makeup programs will be contending for the attention of corporate buyers, many of whom are inexperienced at page composition.

However, developers of many programs plan to address the novice as well as the seasoned graphic designer by combining a stylesheet approach with interactive screen displays of page layouts.

President of Skisoft, Ken Skier, even describes his product in language familiar to the corporate world: he refers to his page processing program as "a spreadsheet for words."

While no final retail prices have been announced for any of these programs, they're likely to fall within the $500–$700 range.

Under $5,000 And Original

"We're introducing a new measurement: *originals* per minute," says director of marketing at AST Research, Chuck Cortright, referring to his company's new laser printer. To be priced under $5,000, the Turbolaser, which AST expects to release in the summer, can print an eight-page publication in one minute.

Most laser printers under $10,000 can print only eight *copies* of a single page per minute.

The Turbolaser is powered by the Ricoh printing engine and comes with three built-in fonts: Courier, Letter Gothic, and Times Roman. AST has also licensed Bitstream's bitmapped and outlined fonts, which can be loaded into the printer's memory.

Machines That Bind

Now two new products from Velobind, Inc. (Sunnyvale, California), enable you to do your own binding. The Personal Velobinder ($60) fastens up to 25 sheets into a softcover binder. The Model One Eleven strip binding system (about $600) can handle books up to one inch in thickness, as well as most reports and technical documents.

They Said It Couldn't Be Done

The following magazines have more in common than meets the eye, at least initially: *Newservice* (Phoenix, Arizona), which reports on religion, health, drug abuse, and alcoholism; *Balloon Life* (Sacramento, California), a monthly for balloon enthusiasts; and the *American Revenuer* (Rockford, Iowa), a monthly journal of an organization of tax stamp collectors.

The publishers of all three use the Apple Macintosh and Laserwriter with Aldus's Pagemaker program to prepare camera-ready pages. ❑

Dedication

Hamish Norton, corporate finance associate at Lazard Freres, an investment banking firm in Manhattan, and secretary Janet Burgan incorporate late-breaking stock market information into presentations prepared on an Interleaf system.

Pays Off

Today's Interleaf workstation sets goals for your evolving desktop system

By Jeff Walden

It takes money to save money. The investment in an in-house publishing system, a major corporate expense, can pay for itself even in the short term. The Interleaf electronic publishing system—publishing software running on a dedicated workstation—costs at least $29,900, yet Interleaf owners report that their equipment payback periods run between six months and three years. Lazard Freres, a New York investment firm, estimates that its system paid for itself in one afternoon.

Less dramatic but no less persuasive returns are reported by other companies as well: Xanthus Corporation, a technical documentation firm in Austin, Texas; Loral Instrumentation, a manufacturer of electronic testing equipment in San Diego; and Bank of the West in San Francisco. Interleaf applications seem ordinary enough—technical documentation, brochures, presentations, and forms—but they yield extraordinary rates of return.

Interleaf combines machines and software to computerize the design and layout process, from unformatted text and graphics to camera-ready copy. At each step, what you see on screen resembles what is finally printed on paper. With text, tables, graphics, and art from several sources all handled on screen at the same time, Interleaf leaves the IBM PC, its work-alikes, and the Macintosh and Laserwriter combo in toner dust. The 19-inch screen of the Sun, DEC, and Apollo workstations that Interleaf runs on is about four times the area of a Macintosh screen and gives you a new perspective on the term *micro*computer.

Interleaf anticipates the capabilities of word processing and page-layout software that will someday be running on personal computers, when those machines become more powerful and less expensive. A $1,995 version of Interleaf software is already available for a rather modestly labeled "personal" computer—the IBM RT PC.

An Interleaf system handles six types of data: text, tables, graphics based on information from a spreadsheet or data base, scanned art, files from CAD (computer-aided design) programs, and freehand drawings that are created at the workstation. Besides its large, high-resolution screen, an Interleaf workstation includes a keyboard, a three-button mouse—and no floppy disk drives. The central processing unit, hard disk(s), ports, and tape backup reside in a chassis that sits on the floor.

Some Interleaf systems also include a scanner, costing as much as $40,000, to bring in existing artwork and photos. A more common component, a laser printer, produces galley and page proofs before typesetting. In fact, many companies using Interleaf consider laser printing acceptable final output. "The average user would never know the difference," claims Xanthus president David Shepherd. "Anyone who says otherwise must be in the typesetting business."

Interleaf runs under several operating systems: UNIX, Apollo Aegis and IBM's AIX (both UNIX work-alikes), and DEC VMS. Loral Instrumentation selected Interleaf in part because it could be connected via Ethernet to the company's three UNIX-based systems. Nonetheless, most Interleaf systems stand alone or

are connected directly to a single personal computer, so a vote for Interleaf is not necessarily a vote for UNIX.

Xanthus writes and publishes technical documentation for clients such as Texas Instruments and AT&T. The company's 30 writers prepare text on personal computers. The text is then passed by disk to a Compaq connected to the Interleaf system. Shepherd has kept careful records of Interleaf costs at Xanthus. "At most companies," he explains, "a documentation group is considered a cost center, but we have to be a profit-making group."

Xanthus's Interleaf system—two workstations, storage, and a laser printer—cost $82,000. Straight-line, five-year depreciation results in a per-month charge of $1,367 for both workstations. Monthly maintenance runs 1 percent of the total purchase price, or $820. The salaries of two operators at $28,000 each per year total $4,667 per month. Thus the total monthly operating expense is $6,854.

Shepherd estimates that his workers regularly process 100 pages per day. Based on 21 working days in a month, the Interleaf system creates 2,100 complete pages per month. Fully laid-out pages—including tables, charts, and some freehand graphics—thus cost $3.26 per page. Shepherd compares that to typesetting costs alone, which he estimates at $10 per page, or $21,000 per month, excluding type correction and pasteup. Based on these figures, the Interleaf system saves Xanthus $14,146 per month. The company recoups the system's purchase price every six months.

In "softer" numbers, Shepherd claims that Interleaf has chopped 3 weeks off the 13-week schedule of a typical project. "With the same number of writers," he says, "we can increase our billings 30 percent."

Hamish Norton, an associate in the corporate finance department of Lazard Freres, explains, "With us, it wasn't a matter of doing something cheaper—it was a matter of doing something we couldn't have done at all before."

Lazard Freres underwrites securities, negotiates mergers and acquisitions, and gives financial advice to corporations and governments. The highly focused task to which Norton sets the Interleaf system is preparing presentations for clients and potential clients. Those presentations must incorporate the latest market information; ideally, they should include data that is almost literally up-to-the-minute.

For Norton, a presentation with late-breaking information and Interleaf's typeset quality makes the best possible impression on clients. "I don't think, for the most part, that we're putting together presentations any faster using the Interleaf system—but what we were producing before looked like junk. Now it looks professional. It would have been impossible to get the same quality in the same amount of time."

How does Norton justify the expense of the corporate finance department's Interleaf workstation? "If we get one deal that we would not have gotten without this machine, it pays for itself several times over," he says. The system has already enabled the group to completely recompose a client's proposed *Wall Street Journal* ad an hour before deadline—thus saving an estimated $70,000 for running a blank page. More often, Norton says, the firm's asset management group uses the system for work it had been sending out for typesetting. "They're saving about $1,500 a month on work that takes them 10 minutes a week to do on Interleaf."

Loral Instrumentation manufactures microprocessor-based electronic test equipment for aerospace and defense companies. Its products can have any combination of 35 printed circuit board options installed. Each option requires its own voluminous documentation. Loral's three Interleaf workstations allow the company to ship documentation that's customized for each product.

"Because we put systems together," says Kelly Anderson, manager of technical publications at Loral, "we create unique manuals to serve customer needs. But the look must be consistent across all the manuals."

When Anderson came to Loral, it had no art department. Draftspeople from the circuit board design department were sometimes asked to ink organization charts and create presentations. Anderson hired her first artist to create a graphics library for use in the manuals. But revisions to the art kept hindering progress.

"It took an artist 10 hours to make one change on a drawing that had taken her 10 hours to create in the first place. I knew the value of having word processing on line," she says. "Why couldn't we have our art on line as well?"

Word processing at Loral was already on a computer—a VAX 750 running UNIX. Anderson could trade files between Interleaf and the VAX after connecting them via Ethernet. Interleaf integrates text from writers with the artwork that graphic artists draw in the Interleaf system. Any revisions to art are also made on the system. Anderson says that by the third project on the system, "We were doubling and tripling our productivity."

If an army travels on its stomach, a modern financial institution travels on its forms. The Bank of the West has billion-dollar assets and an administrative services department that's been using an Interleaf system for almost two years. According to Susan Mesches, vice president of administrative services, designing forms represents about 75 percent of the work done on the bank's single workstation. "The bank has 650 inventoried forms," explains Mesches, "and those are only the forms used by more than one department."

Before the bank started using Interleaf, the six writers in administrative services would first sketch each form on graph paper and then send it out for typesetting. Mesches estimates that a form took as long as a full day to create. Typesetting required several more days, and then corrections had to be made. Mesches says that with the Interleaf system, the same job takes between 20 and 30 minutes from start to finish.

Besides the forms, administrative services writes and produces almost a dozen manuals for the bank on operations, loan policies, automatic teller machines, and other systems the bank has installed. Mesches estimates that the system saves as much as $9,400 in typesetting charges on a single manual. She originally planned for the system to pay for itself in five years. At the current rate of savings, she says, the system can pay for itself in less than three.

Ed Kashi

Kelly Anderson (facing camera), manager of technical publications at Loral Instrumentation, oversees the work of graphic artists, who apply their drawing, design, and pasteup skills to page composition on screen.

Leafing Through the System

Interleaf is commonly compared to the Macintosh. Both systems use windows, icons, bit-mapped graphics, a mouse, and a Motorola 68000 series microprocessor. There the resemblance ends.

Screen size on Interleaf workstations is between 17 and 19 inches. The system needs the screen real estate: it displays an oversized 8½-by-11-inch page that accommodates bleed effects and registration marks placed outside the printing area while taking up only 60 percent of the Interleaf screen.

The three-button mouse is the key to interacting with the system. The Interleaf design suggests that you type text but lay out pages by pointing and clicking. One mouse button activates pop-up menus, which appear wherever the cursor happens to be. During an hour-long demonstration, the keyboard was used only to log on to the system and to show how existing text is reformatted as new text is typed.

Interleaf documents can be printed out on most phototypesetters that have image-processing capabilities, including the Compugraphic 8600G, the Autologic APS-Micro 5G, and the Linotronic 300. More typesetting options will be available with the release of a Postscript driver. (At press time, Interleaf expected to have the driver available in the summer.)

Interleaf markets three laser printers, each with a resolution of 300 dots per inch: an 8-page-per-minute unit built by Imagen ($11,500), a 26-page-per-minute unit from Dataproducts ($27,500), and a Canon printer equipped with Interlace's raster image processor ($8,000). The system also drives a laser printer from Data Recording Systems with a resolution of 800 dots per inch.

The Interleaf system software is available in two forms. Technical Publishing Software (TPS) is a fully integrated graphics and text system; the Workstation Publishing Software (WPS) version, designed as additional software for already installed engineering workstations, offers some similar capabilities.

Additional Interleaf workstations with 86 megabytes of storage (expandable to 190 megabytes) cost $15,000. They are directly connected to the central processor with cables, or networked through Ethernet at $750 per node. Storage sizes under the UNIX operating system can be deceptive to people used to personal computers. According to Interleaf, a system with 86 megabytes of storage actually has about 35 megabytes of storage left for data. Although text takes up relatively little storage space, graphics take up a lot more. A scanned photo, for example, can occupy 2 megabytes.

With 400,000 lines of code, the Interleaf program is complex and powerful. Yet three specific operations are beyond its talents (and will remain so in the forthcoming version 3.0).

First, Interleaf mixes text and graphics easily on the same page, but it can't handle runaround: the same column cannot hold both text and graphics on the same horizontal line. The closest Interleaf can come to runaround is redefining a section of text as two columns and placing the graphic in one of the columns. This kind of fix defeats the purpose of a dedicated system. It works, but it isn't elegant.

The second problem is the lack of a true style sheet, that is, a set of named paragraph and line definitions. You reformat a document by changing style sheets, as you can using Microsoft Word on an IBM PC. Interleaf lets you name paragraph styles and define an individual set of properties for each name but forces you to save the definitions either in the document itself or in an empty text document, rather than as an actual style sheet. Such de facto style sheets are reasonably easy to use but are cumbersome, considering the sophistication of the rest of the system.

Interleaf also cannot create a layout style sheet or template that would define the graphics and text areas on a page, the location of rules and graphics elements, and the position of running heads and other recurring text.

Although it's a microprocessor-based publishing system, Interleaf is not a personal computer, and companies don't use it like one. The Interleaf system is best run by a specially trained operator because it's costly, and—despite its ease of use and text-processing features—it's dedicated to page makeup and document design.

The graphics skills of the people who use the Interleaf system vary from company to company. At Loral and Xanthus, Interleaf operators are trained graphic artists who've transferred their skills from drafting board to computer screen. Writers use the system at Bank of the West, and secretaries use it at Lazard Freres.

Anderson says that the Interleaf system at Loral "directly duplicates" how documents were designed at the company before it installed the system, "although now we can bypass several steps. For example, the graphic artist had to get together with the word processor to figure out how big a hole to leave for a drawing. Because of the system's flexibility, that doesn't happen anymore."

The Interleaf system gives graphic artists a new tool, rather than shifting layout responsibility onto the writer. As lower-cost systems put Interleaf-style capabilities on everyone's personal computer, however, employers may place a premium on people who can use computers and have both writing and layout expertise.

"We would love to have our writers use Interleaf workstations as word processors," says Xanthus's Shepherd. "If the price comes down to $12,000 or $15,000, we'd look very seriously at throwing 20 PCs out the door and equipping our writers with Interleaf."

When will Interleaf reach your desktop? In five years, perhaps sooner. A personal computer system would need, in effect, the same hardware that Interleaf runs on now: 32-bit processors, 200 megabytes of storage, a 19-inch bit-mapped screen—but with a $5,000 price tag.

Better ways are being developed to configure existing hardware. For example, a "slave" processor to handle graphics routines takes a huge load off the main microprocessor, resulting in a faster personal computer that doesn't need the next generation of microprocessors.

Storage technology is also improving. The biggest boon may come from optical disks, which can hold data in the gigabytes (billions of bytes). Optical disks are already used for digitized pictures. DEC has developed an Interactive Video Information System that integrates a video disk with its computers. The system isn't designed for publishing, but the screen display integrates words and pictures. Improvements don't have to be as radical as optical disks. Better recording-head technology, less expensive and more efficient magnetic media, and data-encoding chips may combine to produce 200 megabytes of storage in the personal computer price range.

The last hurdle: how to obtain a large, inexpensive screen display with high pixel density and good gray scale, or depth of color. The most difficult requirement to meet is *inexpensive*, since cathode ray tubes—the stuff of television sets—are costly. Liquid crystal displays or some other technology might help overcome the cost factor.

Don't underrate the need for such a screen. "If graphic artists are going to use a system," warns Anderson, "you'd better buy a system that brings them as close as possible to actually using their hands on the layout. They will not accept a screen smaller than the size of an actual page. Maybe an engineer can. Maybe a secretary can. My graphic artists won't." ❑

Tips! ➲ Extend the Life of a Toner Cartridge

Don't assume you have to change your EP (electrophotographic) cartridge just because the indicator on the laser printer has turned red. The indicator automatically turns red after about 3,000 pages, based on the number of turns of the drum. The estimated life of 3,000 pages assumes 4 percent print coverage, or 50 characters per line and 40 lines per page. If you print graphics, you may get fewer than 3,000 pages from a cartridge, but most people should get much more than that. Passing the 3,000-page mark does not harm the printer.

A new cartridge contains about 160 grams of toner. To keep track of the amount of toner in a cartridge, weigh an empty one, then weigh a new one when you buy it. Weigh the cartridge from time to time so you can tell when it's close to running out of toner.—*Michael Gardner (Orinda, California)* ❑

Slow Down the Presses

Page layout on the IBM PC—will it work for you?

By Jim Heid

Running page composition programs, especially those that represent your actual layout on the screen, is hard work for any personal computer. Calculating character widths, determining line breaks, drawing fonts and images, and shuffling text in memory are all demanding tasks that push the limits of the IBM PC.

T/Maker Graphics' Clickart Personal Publisher is the first offering for people who use the PC and need a page makeup program with pull-down menus, scroll bars, and a tool palette. Personal Publisher looks and works like a Macintosh program, yet in doing so, shines a harsh spotlight directly on the PC's shortcomings in desktop publishing: a relatively slow microprocessor, no built-in typographic facilities, and poor screen resolution.

Initially, Clickart Publisher presents a blank screen and a blinking cursor. You can type text directly into the program, or you can write the text in a word processor, save it in ASCII (text only) form, and bring it in through the Edit menu's Get Text command. For publications with a great deal of text, you'll probably opt for the latter approach because of Clickart Publisher's tendency to lag behind your typing.

The product has four disks: a program disk for PCs with Color/Graphics Adapters, one for PCs with Hercules high-resolution adapters, a fonts disk, and a disk of "clip art" illustrations. Many of the program's dozen type styles are based on Macintosh fonts. To make T/Maker's several volumes of Clickart illustrations and fonts accessible to buyers of Clickart Publisher, the program can use Mac fonts and Macpaint images. You can transfer illustrations or fonts via a modem, a direct cable connection, or a network. You add or remove fonts using the font-moving utility that is included.

Because the Macintosh's pixel ratio differs from that of the PC, text and graphics imported from the Mac appear elongated when you use IBM's Color/Graphics Adapter, and only one-fourth of a page is visible at once. (T/Maker is developing a Clickart Publisher version that's compatible with IBM's Enhanced Graphics Adapter.) With the Hercules card, however, a half page is visible, and its contents don't look squeezed. A Show Page command displays an entire page reduced to fit, but you can't change the layout in this mode.

Clickart Publisher elegantly handles the tough job of electronic page makeup with just the keyboard available, though of course it works better with a mouse. Function key icons appear next to the menus, and most commands have Alt-key equivalents, such as Alt-S for "Save." The F9 key steps through the palette's tools, and F10 simulates a mouse button.

Producing a publication involves typing or importing text, creating columns, specifying margins and justification, and then adding graphic elements such as rules or pictures. You can

perform these tasks in a different order—creating columns first, for example—but Clickart Publisher's sluggishness becomes more apparent because the program has to readjust line breaks, margins, and columns with each text alteration.

The key to defining a publication's look and refining its layout is the Baselines menu. You set up columns through the Layout command and fine-tune text positioning though several Adjust commands, which draw a *baseline* under each line. Click on a baseline, and three *handles* appear. Dragging the left handle adjusts the left margin. The middle one moves lines up or down, and the right one controls the right margin. Unfortunately, you can't see the text as you move it; all you see are its baselines.

When you've filled a page with text from an ASCII file, you can store leftover text in Clickart Publisher's Clipboard and then paste it into a subsequent page. The program, however, does not automatically link text from a file that is sectioned across several pages. Each page has an overflow buffer that stores any text pushed off the page by editing changes, and you have to adjust the pages manually to make sure that the text flows correctly.

To place images on a layout, you use the Art menu's Get Art command. Clickart Publisher can't read files created by programs like Microsoft Chart or Lotus's 1-2-3, though an included background utility lets you capture any screen image. After you load the utility, you press Shift-PrtSc to capture a screen. You then run another program that lets you crop, enlarge, or reduce the image, and then save it as a Clickart Publisher "art" file.

A Picturewrap command automatically fits text around images, but only in a rectangular shape. You can, however, wrap text around an irregularly shaped graphic by making the baselines near an image shorter or longer.

The Print command commits your work to paper. With dot matrix printers, Clickart Publisher offers draft and high-quality printouts. You run a separate program to tell Clickart Publisher which printer you're using. Owners of Hewlett-Packard Laserjets and Apple Laserwriters must purchase a separate option to exploit their

On a PC with a Color/Graphics Adapter, you see only one-fourth of a Clickart Publisher page, and Macintosh fonts and graphics seem squeezed. You see twice as much of the page with a Hercules graphics board.

printer's capabilities. Laserjet owners can select a dot matrix emulation mode, but using a Laserjet this way is like using a Cuisinart to mix instant potatoes. (At press time, Clickart Publisher's laser printer option was not ready, although T/Maker expects to have it available in the summer.)

Clickart Publisher is an easy-to-use, well-designed program, whose pace—even on a PC AT—is like a snail's compared to similar Mac programs. Like a Ferrari in a traffic jam, it's capable but held back by its surroundings. Also, its compatibility with Macintosh fonts and Macpaint images is of marginal value. Clickart Publisher is billed as a publishing program for the PC owner who doesn't want to buy a Mac. Such a person isn't likely to have a large library of Macintosh images and fonts. And without a Hercules card, T/Maker's screen display of Mac fonts and graphics looks like their reflection in an amusement park mirror.

But in fairness, Clickart Personal Publisher succeeds in bringing publishing to the IBM PC, which was never designed to handle graphics or fonts. And speed is relative. Waiting a minute while a page is reformatted still beats waiting a day or two for corrections to come back from the typesetter. If envy of the Mac and Pagemaker have made you as green as a monochrome screen display, Clickart Publisher deserves your careful, though patient, attention. ❑

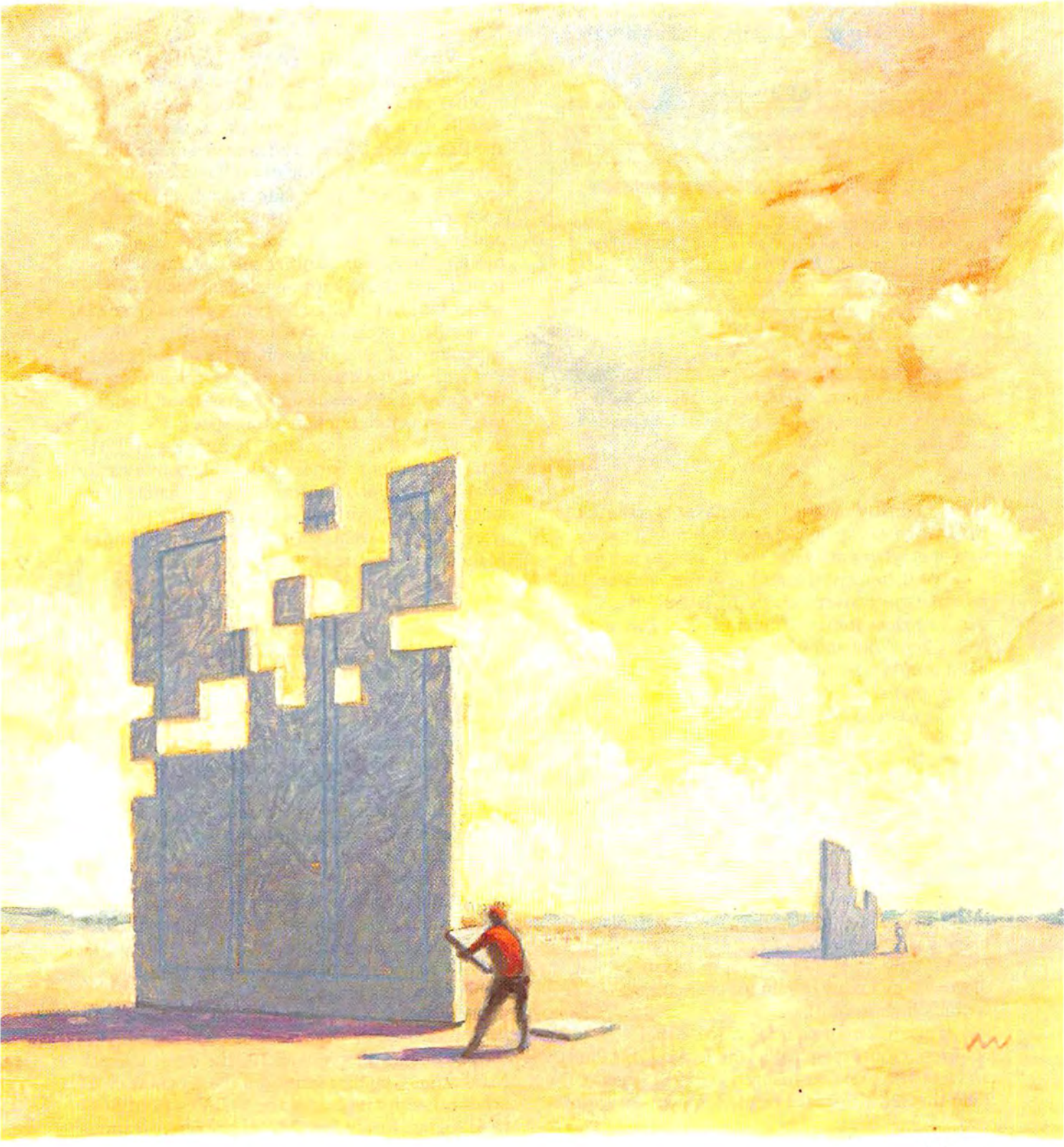
Revised Editions

Which of these will help you meet your deadlines?

By Diane Burns and S.Venit

As personal computers become faster and more powerful, and page makeup programs approach the capabilities of systems with six-digit price tags, telling the type from the hype becomes increasingly difficult. But for now the best bets are Pagemaker, Ready Set Go, and Macpublisher. Here are the pluses and minuses of the latest versions of these three Macintosh programs.

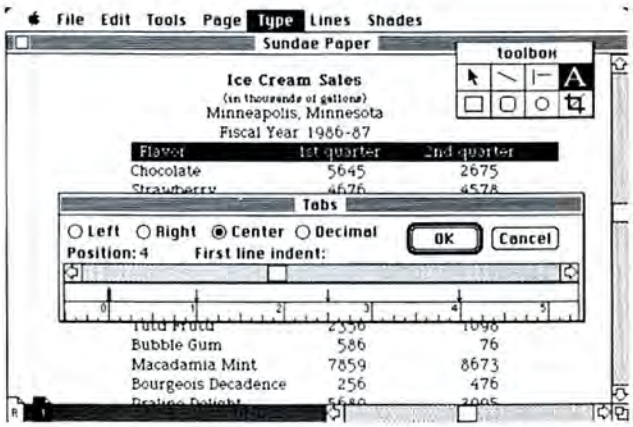
Pagemaker, from Aldus, has changed the least since its initial release, but that's because it started further ahead on the road to the dedicated workstation. Run by people who are familiar with the computer-integrated publishing systems used by major magazines and newspapers, Aldus approaches desktop publishing from the high end, adapting the features of dedicated workstations to the limitations of personal computer technology. With an intuitive, interactive screen display and powerful



Mick Wiggins

text and graphics handling, Pagemaker set the standard for page makeup programs on the Macintosh almost as soon as it was released.

At $495, Pagemaker started out at the high end in price as well. Even with Macpublisher and Ready Set Go now priced higher than when they



Responding to suggestions from Pagemaker users, Aldus included tab settings in version 1.2. You set tab stops on a ruler, as in Microsoft Word.

were originally released, Pagemaker is still more than twice as expensive. So if commonsense design is what you want, you'll have to pay for it.

Well conceived from the outset, version 1.0 incorporates features sought by layout artists. You can place formatted text from Macwrite and Microsoft Word and full-page graphics from Macpaint and Macdraw directly on your page layout. Pagemaker simplifies the process further with a handy "pasteboard" feature, which lets you view text and graphics before you position them, and several interactive displays that show on screen the layouts that you'll see on paper. All the layout tools work at all display sizes.

Aside from having corrected minor bugs, version 1.1 can lay out an 11-inch by 17-inch page (for large-format publications) and print a 300 percent enlargement of an 8½-inch by 11-inch page (for materials intended for wall display). It also allows you to print Macpaint documents "smoothed," which improves curves and diagonals by taking advantage of the Laserwriter's high resolution.

Pagemaker version 1.2 can use the additional fonts installed in the Laserwriter Plus and lets you place bit-mapped graphics larger than the 32K Clipboard limit. Another feature, sorely lacking from earlier releases, is the ability to set tabs in text. A dialog box lets you set left, right, centered, or decimal tabs along a ruler. Unfortunately, you can't see the effects of your tab settings on the screen until you close the box.

Version 2.0, which Aldus plans to release later this year, is reported to provide Postscript "wells" into which you can drop a short routine, usually for a special graphics effect, as part of the Pagemaker layout. The new version is also expected to offer kerning (the adjustment of spaces between letters), automatic hyphenation, a 999-page limit per file (as disk space allows), and spot color (elements such as a box or a headline printed in another color). Aldus will include a separate kerning table for each Laserwriter font from Adobe Systems, since kerning is an aesthetic decision based in large part on the appearance of pairs of letters in a particular font. But you will have to wait until manufacturers of color output devices install Postscript in their machines before implementing spot color.

With all its advantages, Pagemaker still has some limitations. For example, you cannot easily select the text of an entire article to change point size or leading. Another drawback is the program's price. Pagemaker represents the ceiling of Macintosh software in any major category.

Ready Set Go, from Manhattan Graphics, has changed radically since its initial release, which suffered when compared to Pagemaker and Macpublisher. Version 2.0, however, was a major improvement—enough of an improvement for Manhattan Graphics to claim the largest installed base among Macintosh page makeup programs (neither competitor has made a counterclaim). As a commercial printer, Manhattan Graphics seems to have approached Macintosh page makeup from the point of view of customers involved in low-volume publishing. Ready Set Go emphasizes free-form layout and is less than graceful when handling columnar text in high volume.

Designed to handle single-page layouts rather than long documents, Ready Set Go's initial version allowed only 1 page per file. That limit increased to 32 pages in version 2.0 and then to 40 pages in version 2.1, the latest release. Manhattan Graphics improved the program in other ways and increased the list price from $149 to $195, but Ready Set Go still has fewer features than Pagemaker or Macpublisher II. It seems to

Buyer's Checklist

Here's what you should look for in a page makeup program:

WYSIWYG Pronounced "wizzy-wig," for what-you-see-is-what-you-get—from screen display to printed page. The display should enable you to move and edit text and to place, size, and crop graphics—and see the results. The program should have options for precisely controlled placement of elements, such as snap-to guides, interactive zoom views, or dialog boxes.

H & J Hyphenation and justification. Discretionary (or manual) hyphenation involves typing a "soft" hyphen that appears when a word is broken at the end of a line; automatic hyphenation is based on an on-line dictionary or an algorithm in the program. Justification is the process of filling lines with as much type as will fit.

Leading A measure of line spacing, leading should be adjustable in points and on any line of text.

Kerning Adjusting the space between specific letter pairs to create more even letter spacing.

Text processing You should be able, while in a page makeup program, to open word processing documents with formatting intact. How does the program accommodate changes in multipage text? How can you wrap text around a graphic element?

Graphics handling While in the layout program, you should be able to open graphics created in Macpaint, Macdraw, and Macdraft. How do you crop and resize graphics? What tools are available for creating rules, boxes, screens, and so on?

Page processing A program should let you create templates. Can you insert, delete, and swap pages within a document?

Performance Includes printing time, speed, and how well your work style meshes with the program.

Support What are the warranty terms? How much time and support (from dealer or manufacturer) are available as you learn the program?

be the product of "Lite beer" software design: only the minimum capabilities you might need in a page makeup program, and less. Layout measurements, for example, can be expressed only in inches—not in centimeters or, what would be more useful, picas and points. Although Ready Set Go may produce layouts substantially similar to those produced in the other programs, it requires more time and effort.

For example, your hand grows weary using the mouse because you need to draw rectangles, representing blocks, to hold the text and graphics on your layout. Text continued from another page, from another column on the same page, or from text interrupted by a graphic element has to be in its own block. Page design can thus be a boxy, rather clumsy proposition. Manhattan Graphics seems to have realized the problem. Earlier this year the company announced the release of Ready Set Go templates called Desk Design.

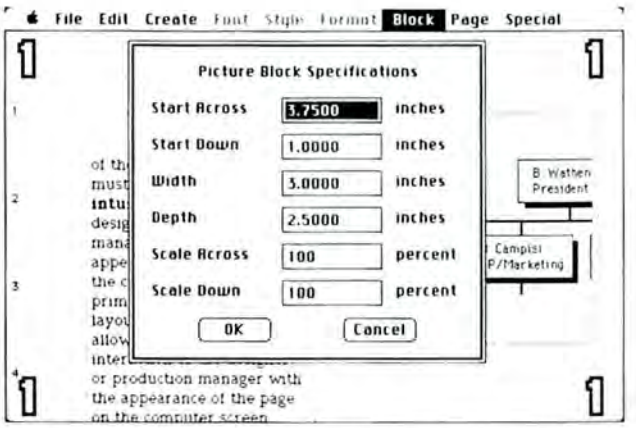
Ready Set Go blocks are Macintosh windows; they are sized and positioned like windows, although they lack the title bar and the sizing box that you click and drag to reposition and resize a window. Instead, you must position the pointer on the block's top line or lower right corner—an exacting task that you must do routinely.

The program's minimalist approach pays off somewhat in the single screen display, where you do all your work: text editing, graphics resizing, and positioning of elements in the layout. You won't become confused about what you can or cannot do in one display option or another because there are no others. You can't zoom in for an enlarged view of the page to fine-tune the position of a graphic element or to work with text in small point sizes. Positioning elements on the display is also made difficult by the lack of a "snap-to" command, which automatically aligns an element with the nearest grid lines. For precise placement (to .0001 inch) of a block and to set other attributes, you need to open the block specification dialog box.

Ready Set Go now has a scrolling feature that eases moving around on the page. In the past the program used a "show page" feature in which you moved an outlined rectangle to change the full-size display. Unfortunately, Ready Set Go does not use the Mac's familiar scroll bars; rather, you click a sector of the

screen while holding down the ⌘ key and the display moves in that direction. It's difficult to control scrolling distance using this technique.

Ready Set Go's strength, relative to the competition, is its text editing capability, a result of the fact that its initial release could not accept text imported from word processing programs. The current version can, but imported text loses its formatting—font sizes and styles, tab settings, and so on. Conveniently, Ready Set Go lets you set commonly used font sizes with a pull-down menu rather than in a dialog box as Macpublisher and Pagemaker do, although you need to open a dialog box for less popular sizes.



Instead of snap-to guides or zoom displays, Ready Set Go has you fine-tune the position of a text or graphic element in the block specification dialog box.

Ready Set Go still cannot directly open graphics from another program. Instead, you bring them in via the Clipboard (limited to 32K, well within the average Macpaint document but below the probable disk space requirements of scanned graphics) using a desk accessory like Artgrabber Plus, which lets you copy full-page Macpaint graphics. The accessory makes up for Ready Set Go's limitations so well that Manhattan Graphics now packages it with the program.

Macpublisher, by Boston Software, is the most improved of the three programs. In fact, the new version is called Macpublisher II to emphasize that, according to Boston Software, the program is rewritten from the ground up. Macpublisher II tries to set new standards in features, although its screen display is still cluttered. The clutter results from an almost tedious literalness (the cursor turns into scissors when you clip an article onto the layout, and loose clippings pile up next to the mockup). Still, Boston Software should be credited with boldly expanding the program to fit the technology. First among these programs, Macpublisher II allows you to perform kerning.

If Ready Set Go is minimalist, Macpublisher is baroque. It offers capabilities you never thought you'd need in a page makeup program, and most of them are on screen and in the way. So many features have been worked into Macpublisher II, in fact, that its shipping date was postponed several months. At press time, the Macpublisher II version described here was expected for immediate release.

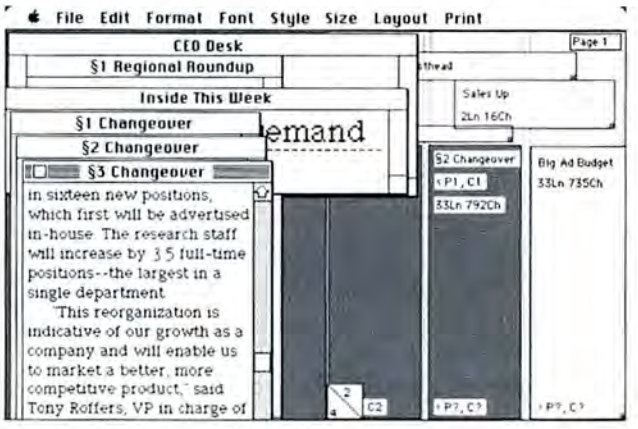
Unique among Macintosh page makeup software, Macpublisher was designed for the 128K Mac and the Imagewriter printer, and at $99 it appealed to the for-the-rest-of-us attitude of early Mac buyers. At $195 Macpublisher II continues to represent the low end of the price spectrum, runs (painfully) on the 128K Mac, yet is chock-full of features.

Its basic operation is unchanged from the original Macpublisher: you work in windows. One window shows the entire page layout as a dummy with rectangles indicating the position of text and graphic elements. The Minipage display option reduces the entire page to fit on screen; Maxipage shows the layout at actual size. Either display is not as useful as it should be because you cannot resize graphics or edit text; interaction is limited to repositioning elements.

Other windows—where you edit text and crop graphics—contain elements that you "clip" onto the layout. As you lay out an article, the text file is displayed in as many windows as it has sections in the layout, with each window linked to its section by an automatically generated section number. After laying out only one or two articles and a picture, Macpublisher's working area already seems like a hopelessly disorganized drafting table. A Windows menu that lets you choose which on-screen window to make active would alleviate the messy situation. (A desk accessory appropriately called Windows installs such a menu and is available in the public domain.) Still, you need to keep the text windows open to reset tabs, perform kerning, or make other changes, and then wait for the display to be updated to see what you've done. As a result, your work lurches along even as you produce page layouts.

This incomplete interaction between you and Macpublisher's screen also detracts from an otherwise valuable kerning capability. The program offers automatic kerning, based on a table of 26 pairs of letters, as well as manual kerning. Unfortunately, you can't see the results of manual kerning in the text window while you work—you must wait for the Maxipage view to be redrawn.

Discretionary hyphenation, another highly touted feature, would be less valuable if Macpublisher II could open Microsoft Word files with formatting intact, including Word's discretionary, or "soft," hyphens. (Macpublisher II keeps the



Cluttered clippings in Macpublisher II: if these windows were in a building, the heating bills would be horrendous.

formatting of Macwrite files but opens Word documents as text only.) As in Word, soft hyphens are entered in Macpublisher's text window by pressing ⌘-hyphen. Soft hyphens remain invisible unless a word falls on a line break. Automatic hyphenation is possible if you run Macpublisher files through Machyphen, another Boston Software program scheduled for release this summer. The program also works with Pagemaker and Microsoft Word documents.

Macpublisher II offers an embarrassment of riches in the graphics department. You can import full-page graphics directly from Macpaint or Macdraw (in PICT format) and resize them proportionately on the dummy. For rules, rectangles, or ovals, the program has a graphics palette that includes 99 patterns for lines and areas. But most remarkable are the features that reaffirm Boston Software's commitment to the low end, even unto output. Using Macpublisher II you can drop gray screens over text and indicate spot color for printing on the Imagewriter II, but not on the Laserwriter. The program also has an oversized printing option, intended for Imagewriter users who reduce the printout photostatically.

Macpublisher II has a handful of little gems in the tradition of its transparent ruler. Its "page jump" feature automatically sets continuation lines when an article breaks at the end of a page or column. You write the wording of the "continued on..." line in a dialog box, and the program fills in the appropriate page number. You need to add the "continued from..." line at the beginning of the subsequent section. You can swap pages within an issue, a handy feature that will undoubtedly be copied by the competition.

Macpublisher's 96-page maximum can theoretically accommodate magazine layouts. But in practical terms 96 pages of text and graphics won't fit on two 800K disks, so a hard disk would be required—as it would in any high-volume desktop publishing system. More bothersome is Macpublisher's filing system on the Macintosh desktop. It creates a separate file for each text or graphic element, as well as a file for the page layout itself. Even with the hierarchical filing system used by the latest Macintosh Finder, keeping track of all those files would be a major challenge to any publisher, desktop or not.

Other considerations remain, printing performance foremost among them. Pagemaker hits the streets way ahead of the other two in this regard, mainly because it addresses Postscript-driven printers or typesetters directly. By comparison, most Mac programs address Quickdraw, the Mac's internal imaging utility. This Quickdraw output is in turn translated into Postscript. Because the Quickdraw routines were intended primarily to draw the Mac's screen, Quickdraw is less efficient when it must take advantage of the higher resolution available in the Laserwriter or a Linotronic.

While these programs continue to evolve, you can reduce their price and performance differences to a single question: which program will meet your deadlines? Between Ready Set Go and Macpublisher II, you'll have to decide which features you really need and which program seems less cumbersome to use. Between Pagemaker and its lower-priced competitors, the difference is not in the features list but in how you interact with the program. As your deadlines approach, you realize that you spend either money on one or time on the others. ❑

Eye-Catching Pages

Beyond white space: mastering the basics of design

By Marjorie Spiegelman

If you've never so much as drawn a square box, you may feel hopelessly overwhelmed by the task of designing a page on a computer. It's so easy to get carried away by the choices of typefaces, type sizes, graphics, formatting. And too much of a good thing means confusion for you and for your readers.

Avoid the pitfalls by using some simple design rules. Far from limiting you, a design system liberates you from endless decision making and error correcting. The examples described here can be adapted to almost any printed material. The accompanying newsletter page illustrates the terms used.

Analyze the content. This involves more than merely reading the story—it means looking at it critically to decide which of its elements are more important than others. After you've determined your priorities, assign type sizes and styles to convey to the readers the levels of importance.

In most newsletter articles, the most important element is the headline, which distills the article's message into a few words. The headline should be the first and largest element. Next in importance is the subtitle, which supplements the headline; it's smaller and is the second element on the page. Subheads (short headlines that break up columns of text and signal a change in topic) are often the same type size as the text itself, with emphasis provided by boldface type.

Warning: Keep it simple. For example, if subheads are all different sizes, the reader won't know where to start.

Develop a grid, that is, a standard page structure. It helps you organize text and art on all your pages with consistency.

In page composition programs the basic grid is often referred to as the master page. It's made up of top, bottom, and side margins; columns; and the spaces between columns. Once you've established a master page format, you'll never have to "eyeball" elements on the screen (place them according to how they look rather than according to a measured format).

Perhaps the most important element in your grid or master page is *white space*, or empty space. White space creates a viewing ground for the information and adds visual interest. It also conveys information itself. If the amount or positioning of white space changes, readers expect a change in content.

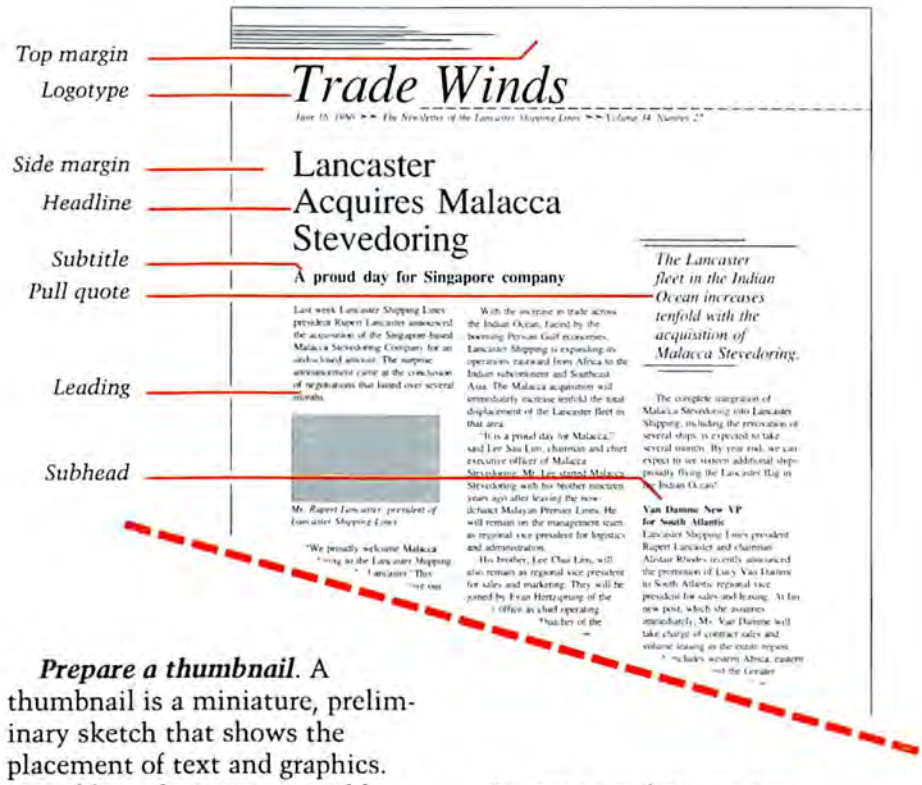
Start defining your grid by standardizing your margins. On a typical newsletter page measuring 8½ by 11 inches, the right and left margins should be equal—usually at least 3½ picas wide. (Six picas equal 1 inch; a pica is divided into 12 points.) Top and bottom margins shouldn't be equal—the top is usually smaller than the bottom—and they must be consistent from page to page. An example for newsletters is 4 to 5 picas for the top margin and 5 to 6 picas

for the bottom. Smaller margins make the page look crowded and uninviting.

Next, determine a column width. Generally, a newsletter page contains either two or three columns separated by 1 pica of white space. Use your column measure to size photographs, charts, and drawings. For example, in a three-column grid, graphics can be one, two, or three columns wide—not an arbitrary measure but one related directly to the grid.

Finally, decide on a type size for text. Generally, one of the most readable type sizes is 10 points, with 2 points of *leading* (white space between lines of type). In designers' and typesetters' language, this is called "10 on 12" and is often written "10/12." (The "12" comes from adding the 2 points of leading to the 10-point type measure. The total is called *line spacing*.)

Another advantage of 10/12 type is that because 12 points equal one pica, you can set up a system based on even multiples of picas. For example, the line spacing between text and subhead might be 24 points (2 picas) and the line spacing between the subhead and the text below it might be 12 points (1 pica). Paragraph indentations could all be 12 points, too. Simplifying the mathematical relationships reduces the number of design decisions you have to make, creates a stronger page, and leaves you free to experiment with graphics.



Prepare a thumbnail. A thumbnail is a miniature, preliminary sketch that shows the placement of text and graphics. It enables a designer to quickly determine how much room the text takes up and how much is left for graphics.

If you're eager for a finished product, you may be tempted to skip the thumbnail. Don't. Otherwise, you may find yourself on the last page of your newsletter with no text to put on the page. Before you do your thumbnail, format your text on screen at the proper type size, leading, and column width. If there is little copy, count the number of lines on screen; if your text runs for pages, count the lines on a printout.

Next, make your thumbnail sketch. Does the text fit into the space you've allotted? Is there enough room for charts, illustrations, photos? If you need more or less text, make the adjustments now.

You should also decide where illustrations will go. Try several thumbnails, putting the illustrations in different places. Remember that illustrations should be as close as possible to the text they depict.

Suppose you have a page with text but no graphics. How do you break up the monotonous columns of words? You might try a trick that adds visual variety and stimulates reader interest. A pull quote (also called a deck, readout, or teaser) is a provocative phrase or sentence pulled from the main text and reproduced in a larger type size. To set it off from the text, you might add plain or decorative lines or bars (also called rules) above, below, or next to the pull quote. One pull quote to a page is plenty.

These guidelines will help you create strong, simple, visually interesting pages that involve readers. They'll also streamline your production process so that you can spend more time on words and art.

Page Make-Over

Does your newsletter, memo, brochure, or report lack visual impact? We can help you do a complete page make-over. Send us a copy of the page or pages. We'll select examples and show you how to improve your design. Send samples to Page Make-Over, Publish!, *555 De Haro St., San Francisco, CA 94107.* ❑

A Menu for All Seasons

The Four Seasons publishes its bill of fare in-house

By Sharon Efroymson

Manhattan's famous Four Seasons restaurant takes pride in its superb menu. But the delicately prepared entrees—including such appetizing choices as breast of pigeon and curried mussels with mango—are only one source of satisfaction. The menu itself is a feast for the eyes, a work of art printed on parchment stock.

For the past 26 years, the menu's distinctive layout has figured importantly in the Four Seasons' image of quiet good taste. Now, thanks to today's personal computer technology, the restaurant can update the menu daily and print it in-house.

Daily menu production, management's wish for some time, didn't become a reality until the restaurant's advertising agency suggested using a personal computer—an IBM PC/XT—with a Hewlett-Packard Laserjet printer and a Canon NP-7050 two-color copier.

Besides increasing overall efficiency, the new system enables the Four Seasons to offer its guests better service. For one thing, the constantly changing special dishes are now incorporated into the menu. Manager Alex von Bidder explains, "Sherbets are made only when the fruit is perfectly ripe. You can't predict when that will be. Under the old system, the menu couldn't say whether the sherbet was plum or raspberry because outside printing needed a month's lead time."

Using the new system, the restaurant creates a laser-typeset master mechanical for each menu in minutes. Such efficiency is almost a necessity, since the Four Seasons generates lunch and dinner menus for six dining rooms, as well as the ever-changing wine list.

Although personal computer publishing promised efficiency, conversion to the process was not instantaneous. The system had to print the same menu, on comparable high-quality stock, with the same typography and design that the restaurant had always used.

Based on these considerations, the word processing program chosen was Microsoft Word, selected for its sophisticated formatting capabilities and its ability to take full advantage of the printing features offered by the Hewlett-Packard Laserjet. The Laserjet was purchased because it is quiet and uses numerous typefaces.

However, the Laserjet doesn't accommodate documents beyond legal size and doesn't print in color. To produce the oversize, two-color menu, each laser-printed page is enlarged

Bob Sacha

Four Seasons' manager Alex von Bidder (center) with executive chef Seppi Renggli and executive secretary Vicki Eckstein. In-house menu production improves service and efficiency.

LUNCHEON

COLD APPETIZERS

Seviche of SCALLOPS	10.00	Smoked Scottish SALMON	12.00
A Service of SHRIMP	13.00	Cherrystone CLAMS	9.50
RADICCHIO with Grana	11.00	LITTLE NECKS, A Platter	9.50
Service of Beluga CAVIAR	48.00	CRAB Lump Cocktail	15.00
Smoked STURGEON Mousse with Caviar	14.00	Blue Point OYSTERS	10.00
Curried MUSSELS with Mango	12.50	Spring Greens with RABBIT	12.50

HOT APPETIZERS

Grilled GRAAVLAX, Dill Sauce	17.50	SCALLOPS and FROGS' LEGS Ravioli	18.00
FETTUCCINE Primavera	16.50		

SOUPS AND BROTHS

DUCK Consommé	8.50	RED SNAPPER Chowder	9.00
Spring VEGETABLE Soup	8.00	Chilled CUCUMBER and WATERCRESS	8.50

TODAY WE ARE PREPARING... SPRING 1986 MONDAY APRIL 14th

APPETIZER
Braised Filet of RED SNAPPER 16.50
ENTREES
A Ragoût of SEA SCALLOPS with Tarragon 36.00
Broiled Fish: SWORD FISH 37.00
TODAY'S SHERBETS: Strawberry, Passion Fruit, and Lemon 6.50

EGGS AND SOUFFLES

OMELETTES Prepared Table Side	16.50	SPINACH Soufflé with Mushrooms	18.00
EGGS BENEDICT	18.50	Scrambled EGGS with Smoked Salmon	20.00

SEA AND FRESH WATER FISH

DOVER SOLE Meunière	38.00	A VARIETY OF SEASONALS	
Crisp SHRIMP with Mustard Fruits	32.00	Escalope of VEAL with Ginger	34.00
Blackened RED FISH with Refried Beans	35.00	Sautéed CALF'S LIVER with Braised Maui Onions	32.00
SHAD and ROE with Crisp Bacon	37.00	Filet of VEAL with Crabmeat and Artichokes	37.00
RED SHRIMP with Fennel	35.00	CARPACCIO 28.00 A CHEF'S SALAD	26.00
Rosemary Roasted TROUT	36.00	Cold Poached SALMON with Dilled Cucumbers	37.00
		Breast of PIGEON in Merlot	37.00

STEAKS, CHOPS AND BIRDS
BROILED OVER CHARCOAL

BEEF STEAK Paillard	31.00	Three French LAMB CHOPS	32.00
SIRLOIN STEAK or FILET MIGNON	32.00	SKILLET STEAK with Smothered Onions	34.00

SPA CUISINE ®

APPETIZERS		MAIN COURSE	
Spring FRUITS with a Kiwi Purée	14.00	Cold Filet of DOVER SOLE	38.00
Timbale of VEGETABLES, Peanut Sauce	14.00	A Skewer of SHRIMP and CHICKEN	35.00
Buckwheat NOODLES with Watercress and Crabmeat	15.00	Escalope of VEAL with Mustard Seeds	36.00

SPRING SALADS

AS A LUNCHEON ACCOMPANIMENT		VEGETABLES AND POTATOES			
Spring GREENS	8.00	Ginger Glazed CARROTS 7.00			
Bibb LETTUCE and WATERCRESS	8.00	STRING BEANS, Red Peppers 7.00			
Raw MUSHROOMS, Pepper Dressing	8.50	Sautéed CAULIFLOWER 7.50			
Wilted SPINACH and Bacon	8.00	Creamed SPINACH	7.00	POTATOES	
		ASPARAGUS, Any Style 12.50		Rosti	6.50
		SNOWPEA PODS	6.50	Baked in Jacket	5.50

DESSERTS

		BEVERAGES	
A Selection from the Dessert Wagon	7.50	Pot of Linden, English, or Jasmine TEA	3.00
The Four Seasons SHERBETS and ICE CREAMS	6.50	Pot of COFFEE 3.00 ESPRESSO	3.00
CAPPUCCINO Soufflé	8.50	CAFE Cognac Chantilly 8.50 Irish COFFEE	8.50
Soufflé for Two: MACADAMIA AND BOURBON	15.00	VIENNESE COFFEE, Whipped Cream	4.50

THE FOUR SEASONS

137 percent when it is reproduced on the custom menu stock. In addition, each menu passes through the Canon copier twice, once to print in black and once for brown. The restaurant's four-color logo is preprinted on the stock.

The Four Seasons' first efforts to set up the system met with frustratingly little success. The menus presented some unusual formatting challenges: the complex design used double and triple columns with a mixture of decimal, center, left, and right tab alignments. The text processor had to create a true typeset look, which required precise control over line spacing and type size as well as commercial-style typefaces.

James Nadler, a New York-based computer consultant was called in to teach the Four Seasons staff how to use Word. But it soon became evident that consulting was needed more than training.

Designed 26 years ago, the menu at New York's Four Seasons is now printed in-house using an IBM PC, Microsoft Word, an HP Laserjet, and a Canon copier.

For each menu, Nadler created a master file that he split into two files for printing, one for each color. He also developed elaborate style sheets. "Hewlett-Packard's and Microsoft's telephone hot-line support made this possible," he says.

Nadler trained Four Seasons executive secretary Vicki Eckstein to maintain the system. Eckstein was unfamiliar with even basic word processing. "I began learning the system a week before we started production," she recalls.

But now Eckstein is a pro. She even uses the system to create all her letters, memos, schedules, and logs for parties.

There's still room for improvement, says von Bidder. For example, since the copier can't handle the menu's regular paper stock, the computer-generated menus are one-third the weight of the originals, the Four Seasons' only major concession to adopting the new technology.

Although the restaurant is still perfecting the details, it is already realizing the benefits: the system has increased efficiency, cut costs, and enabled the Four Seasons to continue to offer its guests a beautifully printed menu, with even better service. ❑

Tooling Up

Bending the technology to the task

By James Felici

Personal computer publishing abounds with promises of new ways of working, promises of million-dollar technologies that run on personal computers, and promises of vastly improved productivity. Fulfilling those promises challenges all of us who use these still-evolving tools.

Choosing the right tools for a particular job demands hard decisions. Right now the chances of finding a system that exactly meets your needs are slim. The easiest road—tailoring publications to the capabilities of the tools—inevitably leads to limitation and compromise.

But at *Publish!* we decided to push the available tools as far as they would go, to produce a magazine that does not compromise on quality in text or graphics or on its ability to meet its deadlines. We've designated ourselves a laboratory to run personal publishing tools through one of the most strenuous tests for any publishing system—the production of a national magazine. This is like driving a family station wagon in a rugged Grand Prix—not a course recommended for everyone but a sure way to find out what the buggy will do. For us, writing about the tools and using them had to go hand in hand, even if the grasp occasionally led to white knuckles.

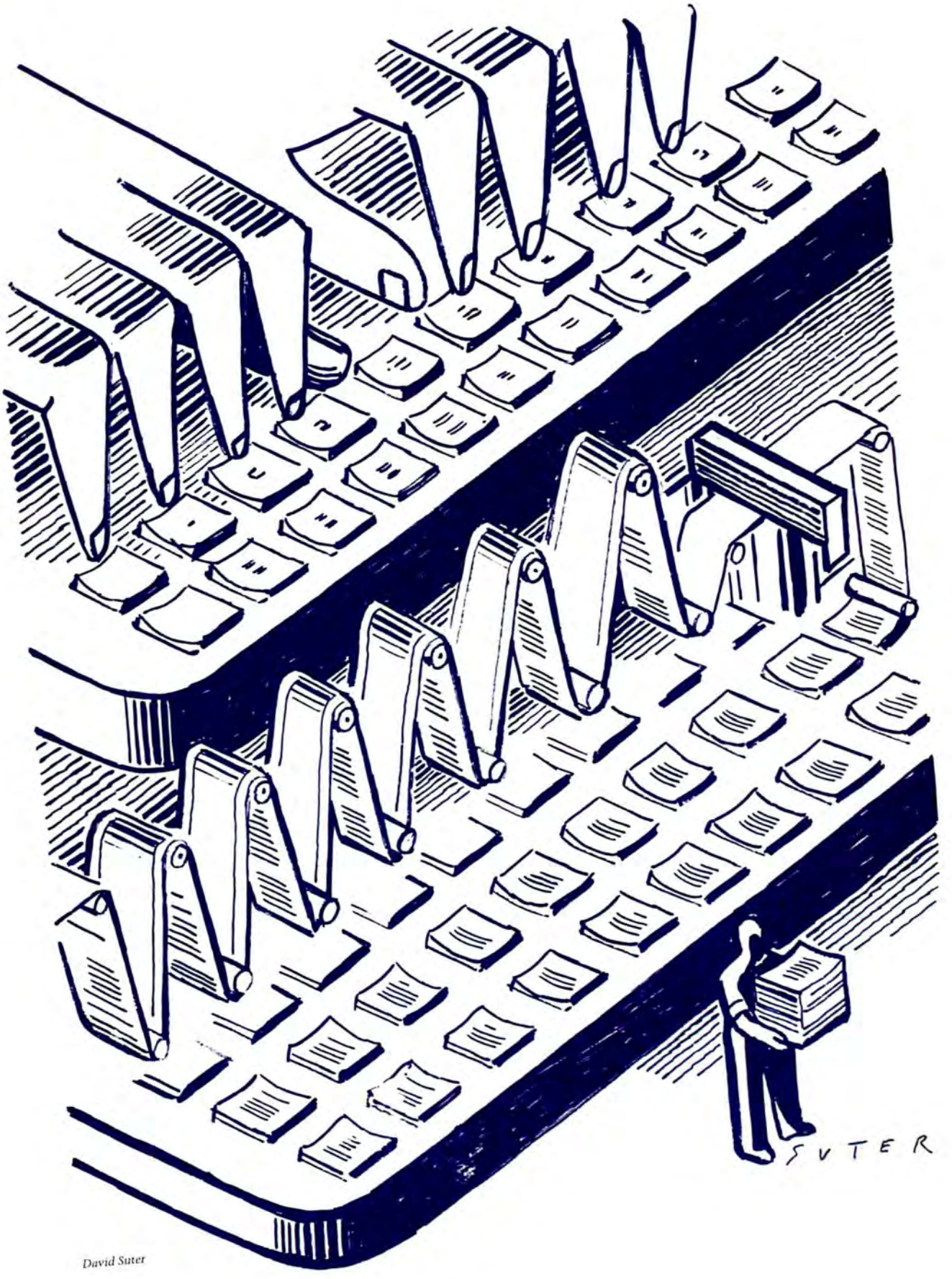
Making *Publish!* look the way we envisioned it entailed what one of our editors referred to as the "graceful kludge"—a practical, workable system pieced together from an assortment of machines, methods, and programs selected for their individual strengths. Like others who use desktop computers, we found that every available application had its strong point but that no one product could do everything we needed it to. So we assembled a battery of equipment much the way a carpenter outfits a toolbox: with a hefty assortment of specialty tools.

Our starting point was Apple's Macintosh Plus. The Mac's graphics interface requires that programs developed for the machine conform to its approach. This characteristic was essential in helping us build a cohesive publishing system. We decided against an IBM PC or compatible because the very factor that has led to those computers' popularity—their generic approach to computing—currently puts them at a disadvantage in integrated publishing applications.

Apple's Laserwriter printer, a machine we didn't want to be without, is driven by the Macintosh. Postscript, Adobe Systems' versatile page description language that integrates text and graphics, makes the Mac-Laserwriter connection possible. Postscript is a common tongue of computer graphics, used by computers and printers of all sorts.

Postscript also provided us with access to commercial phototypesetting by enabling us to drive the typesetter with the Macintosh. Commercial phototypesetting offers a higher resolution than anything a laser printer can produce, and it also makes available a larger number of high-quality traditional typefaces.

Typography must do more than simply put words on a page; it must look attractive. When a reader has a choice of what to buy and what to ignore, good-looking type can swing the decision. *Publish!*'s typeface is Trump Mediaeval. Of the limited number of Postscript text faces currently available, Trump has a lively quality that is well suited to our subject matter.



David Suter

Even though we chose to use commercial typesetting, we didn't abandon the laser printer. Far from it. Laser printers are wonderful typesetting tools. They allow you to proofread corrected text before you phototypeset it—much cheaper and faster than making corrections on final typeset pages. We value our printer for what it is: a low-resolution typesetter.

The typesetter's fonts must match those used by the computer that drives it. Adobe is creating an expanded library of fonts that work with Postscript. These fonts, based on designs licensed from commercial sources, will establish a common font base and give Postscript the potential to be a universal publishing language.

Unfortunately, the Adobe fonts we used lacked certain characters we needed, most notably the Macintosh's Command key symbol (⌘). We also needed fixed typographic spaces—such as em and en spaces—which are crucial to controlled positioning of type. We used Fontographer, a font editor, for these needs to create our own pi font (a font of utility characters).

No sooner had we met our commitment to provide excellent type than we crashed head-on into our first major production challenge: electronic page makeup—integrating text and graphics in the computer, rather than by hand. Electronic page makeup is a keystone of personal computer publishing; we could hardly meet our editorial mandate without using it to build our own pages.

Ideally, our text would have been fed through commercial typesetting software such as Magnatype, which runs on IBM PCs and compatibles and provides the aesthetic refinements that make for truly fine type—automatic hyphenation, precise control over letterspacing and word spacing, automatic document formatting, and sophisticated tabular capabilities. But Magnatype deals with words only. It can make up whole pages with all the text in place, but it can't integrate graphic elements. Therefore, we had to forgo what was otherwise the best possible typesetting program, because *Publish!* plans to use graphics abundantly. In these early days of personal computer publishing, one capability often seems to come at the expense of another.

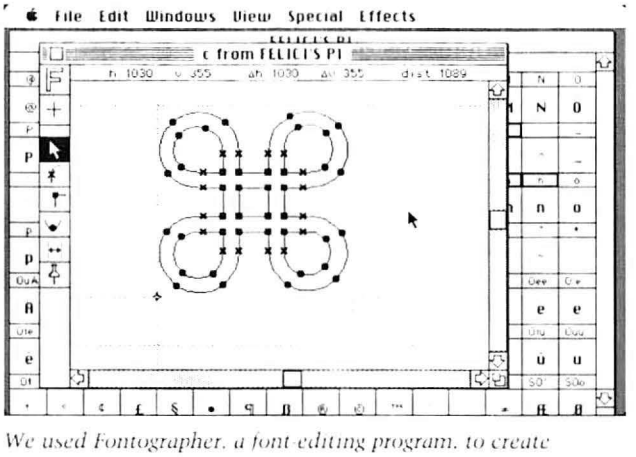
Our search for a workable page makeup program had to consider the needs of our art department; it had to give them maximum flexibility and freedom. The program that most closely simulates their traditional method of designing and pasting up layouts is Pagemaker. Pagemaker lets them place whole columns of text on the electronic page and then trim the text to fit. Other page makeup programs we investigated required us first to create a pretrimmed area and then to pour text into it. Pagemaker's approach is much more akin to the cut-and-paste methods most graphic artists are familiar with.

Fast, capable, and easy to use as Pagemaker is, it required a number of compromises. In its current form, Pagemaker is unable to automatically hyphenate text or adjust letterspacing, and it is not an efficient word processor. Eventually we solved each of these problems.

Publish!'s design calls for type that is uneven, or ragged, on the right margin rather than even, or justified. This design is advantageous when you're using a program such as Pagemaker, which doesn't hyphenate words automatically. The ragged-right design avoids the need for frequent end-of-line hyphenation.

With ragged type, any space left over after words are fit on a line is deposited at the end of the line, allowing word spaces and letterspaces to be of a consistent width. Even without hyphenation, unsightly deviations in the ragged margin can appear when a long word is forced down to the next line, leaving a very short line above it. When that happens, we hyphenate those long words manually. This is not an efficient way of typesetting, but we grin and bear it.

Another of Pagemaker's shortcomings is that it doesn't allow for changing the spaces between letters, a process called kerning. Kerning is necessary to compensate for the irregular spacing created by certain letter combinations. For in-



We used Fontographer, a font-editing program, to create custom characters. The Macintosh Command key symbol shown above consists of a series of curve, tangent, and corner points that create the character's outline.

stance, a visually disruptive gap exists between a capital *T* and just about any lowercase letter set next to it. Consistent letter spacing is essential for good-looking, readable type.

To get the spacing we want in our headlines, we set the letters one at a time on Pagemaker's pasteboard and drag them one by one into position. This is laborious, but worth the effort. Needless to say, our other type remains unkerned.

A third problem with Pagemaker is that it is not designed to be used as a word processor. So we had to find an additional program to handle all our text. We selected Microsoft Word because we liked its appropriation of certain typographic idioms. For instance, it can work in picas (one-sixth of an inch) and points (the 12 divisions of a pica), the standards of the graphic arts industry. Microsoft Word measures the spacing between lines in points, just as a typesetting system does.

Graphics proved to be the thorniest issue, primarily because it is a new field for all computer users, not just for personal computer users. Unlike typesetting, which has been computerized for decades, computer imaging is in its infancy. We finally realized that the marketplace wasn't yet adequately stocked with choices. Some of our art demands are met by "draw" and "paint" programs—mostly Macdraw and Macpaint—but we have yet to find a solution to the problems presented by photographic (halftone) art.

Photographs are first converted into electronic form by machines called scanners, or digitizers. Currently, the best photographic images that personal-computer-driven scanners can create are no better than those you see in the local newspaper. The quality of such images is about half as good as is required for magazine reproduction. Nowadays, for scanned images from a personal computer, "modest quality" is the name of the game. And color, for the near future at least, is out of the question.

So at that point we jumped off the computer bandwagon and into an old, comfortable buggy. The photos you see in this magazine were reproduced by traditional camera methods. Given the state of the art, we felt it was more economical and more aesthetically rewarding to reproduce photographs the old way.

This decision reminded us that all these new tools are a means to an end, not an end in themselves. How you plan to use your publication—who will read it, for what purpose, and how you want it to look—should determine what technologies you use. If what comes out of your printer will be your final product, ready for distribution, then electronic integration of text and graphics on the page is a must. But if you are going to reproduce those pages on any printing device, from a photocopier to an offset press, your final product may be better served by a combination of traditional processes and computer capabilities. Don't worry that traditional methods will be too expensive. A velox print—which is a photographic image rendered by camera processes into a dot pattern that a printing press can reproduce—costs less than $10, while the cost of a scanner is in the thousands of dollars.

The most important thing to keep in mind as you assemble a publishing system is exactly the kind of pages you want to produce. The complexity of your goals will dictate the tools and processes you need.

Just a few years ago, the cost of assembling an electronic publishing system was prohibitive. At that time, if you solicited advice on what system to buy, someone would certainly have said to wait another six months, because some really important new systems were just around the corner. Six months later, the advice would have been the same. Though personal-computer-based systems have brought costs way down, you're apt to hear the same advice still. What makes today's buying decisions easier is the faster return you can expect on your more modest investment.

The issue of systems capability, of course, is far more difficult to predict, given the rapidly evolving technology. The best any of us can do is to gamble on systems that promise avenues for growth, rather than obsolescence. It is surely worth the risk. ❑

Tips! ⇨ Convert Wordstar To Word

On the IBM PC, you can convert a Wordstar document into Microsoft Word format by using a utility supplied on the Word utilities disk. After making the conversion, you may find that Word style sheets do not format the document the way they should. To correct the problem, highlight the entire document by pressing Shift-F10. Then press Alt-Space. The style sheet will now have the intended effect.—*Kathleen M. Boone (New York, New York)* ❑

Buying Information

How to find products mentioned in this issue

Adobe Systems Typeface Collection
List price: family of four faces $185, family of two or three faces $145
Adobe Systems
1870 Embarcadero Rd.
Palo Alto, CA 94303
(415) 852-0271

Canon NP-7050
List price: $9,995
Canon, U.S.A.
1 Canon Plaza
Lake Success, NY 11042
(516) 488-6700

Clickart Personal Publisher
List price: $185; kits for HP Laserjet, Apple Laserwriter, or other Postscript printer $150 each
T/Maker Graphics
2115 Landings Dr.
Mountain View, CA 94043
(415) 962-0195

Fontastic
List price: $49.95
Altsys Corp.
P.O. Box 865410
Plano, TX 75086
(214) 596-4970

Fontographer
List price: $395
Altsys Corp.

Hercules Graphics Card
List price: $499
Hercules Computer Technology
2550 Ninth St. #210
Berkeley, CA 94710
(415) 540-6000

Hewlett-Packard Laserjet
List price: $2,995
The Hewlett-Packard Laserjet Peripherals Group
16399 West Bernardo Dr.
San Diego, CA 92127
(619) 592-8182

IBM PC/XT
List price: without hard disk drive, $2,145, with hard disk drive $2,895
IBM Direct
P.O. Box 1328
Boca Raton, FL 33432
(800) 426-2468

Interleaf Electronic Publishing System
List price: $29,900
Interleaf, Inc.
10 Canal Park
Cambridge, MA 02141
(617) 577-9800

Laserwriter
List price: $5,995
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010

Laserwriter Plus Kit
List price: $799
Apple Computer, Inc.

Linotronic 300
List price: $49,950
Linotype Co.
425 Oser Ave.
Hauppauge, NY 11788
(516) 434-2000

Macdraw
List price: $195
Apple Computer, Inc.

Macintosh Hard Disk 20
List price: $1,499
Apple Computer, Inc.

Macintosh Plus
List price: $2,599
Apple Computer, Inc.

Macpaint
List price: $125
Apple Computer, Inc.

Macpublisher II
List price: $195,
Machyphen $59.95,
Pages for Publisher templates $79.95 each
Boston Software
1260 Boylston St.
Boston, MA 02215
(617) 267-4747

Magnatype Laserwriter Package
List price: $5,250
Magna Computer Systems
14724 Ventura Blvd.
Sherman Oaks, CA 91403
(818) 986-9233

Microsoft Word
List price: DOS version $450, Macintosh version $195
Microsoft Corp.
16011 N.E. 36th Way
Box 97017
Redmond, WA 98073-9717
(206) 882-8080

Pagemaker
List price: $495
Aldus Corp.
411 First Ave. S. #200
Seattle, WA 98104
(206) 622-5500

Ready Set Go
List price: $195, **Desk Design** templates $69.95
Manhattan Graphics
163 Varick St.
New York, NY 10013
(212) 989-6442 ❑

Answers to Word Challenge

(See page 46 for Publish! *Puzzlers)*

1. Lead. A term imported from hot-metal typography, in which printers insert lead strips to add space between lines of type. The space between lines is called leading.

2. Proof. The copy of text used for examination and corrections.

3. Grid. A set of visual guidelines for positioning the elements of a layout.

4. Point. A typographic measurement: 72 points equal about 1 inch.

5. Pica. Another measurement: 1 pica equals 12 points, or about one-sixth of an inch.

6. Kern. To adjust the spacing between specific pairs of letters to improve their appearance.

7. Galley. A long sheet of typeset text not yet made up into pages.

8. Page layout. The placement of all the elements, including text and graphics, on a page.

9. Widow. The last line of a paragraph, appearing at the top of a page, separated from its related text.

10. Header. A line of text (such as a chapter or section title) at the top of every page of a document.

11. Boldface. Type that is thicker and weightier than the rest of the body type with which it appears.

12. Signature. A single sheet of paper with several pages printed on each side. The sheet is then folded into "booklets" from which books and magazines are assembled. One fold creates a four-page signature; two folds, an eight-pager. ❑

Product Watch

Software

Text Processing

Deskset, a typesetting system, performs data translation, kerning, tracking, disk conversion, and hyphenation and justification. The integrated system includes an IBM PC, composition software, eight fonts, and an Apple Laserwriter. List price: complete package $9,495, software plus Laserwriter driver $995, graphics input utility option $595. Copy protected. *G.O. Graphics, Inc., 18 Ray Ave., Burlington, MA 01803. (617) 229-8900.*

Machyphen and **Macindexer** help create text-intensive publications. Machyphen works with Macpublisher II, Pagemaker, and Microsoft Word. It uses a 30,000-word dictionary to invisibly flag hyphenation points. Requirements: 128K. List price: $89.95. Not copy protected.

Macindexer creates indexes automatically or manually using selected words in Macwrite or Microsoft Word documents. Requirements: 128K. List price: $79.95 copy protected, $109.90 not copy protected. *Boston Software Publishers, Inc., 1260 Boylston St., Boston, MA 02215. (617) 267-4747.*

Rimwriter IV works with all IBM PCs and compatibles and the HP Laserjet Plus. The program features precise letterspacing, 50 tabs, horizontal and vertical rules, boxes, halftone fills and patterns, and multiple columns. Requirements: 256K, 10-megabyte hard disk, DOS 2.0 or later version. List price: $2,000, additional fonts $150 each. Copy protected. *Genesys Systems, Inc., P.O. Box 277, Ellinwood, KS 67526. (316) 564-3636.*

Softtype, for all IBM PCs and compatibles, creates typeset output on the HP Laserjet and Laserjet Plus. Word processing programs supported include Multimate, Wordstar 2000, Displaywrite 3, Word Perfect, and Samna. Requirements: 512K. List price: $1,000. Copy protected. *Softest, Inc., 555 Goffle Rd., Ridgewood, NJ 07450. (800) 445-9292,(201) 447-3901.*

Graphics Processing

Cricket Graph generates charts and graphs that are stored in PICT files rather than in bit-mapped files and thus can surpass the Macintosh's screen resolution. Twelve chart and graph types are supplied, any ten of which can be overlaid and otherwise combined on a page. Requirements: 512K. List price: graphics program $195, film recorder and color printer version $495, demo $6.95. Not copy protected. *Cricket Software, 3500 Market St. #206, Philadelphia, PA 19104. (215) 387-7955.*

Drafix 1, a two-dimensional drafting package for all IBM PCs and compatibles, features "roll-down" menus for drawing, editing, and annotation functions. The program accepts input from a variety of mice and digitizers. Requirements: 512K; two disk drives; DOS 2.1 or later version; IBM CGA, IBM EGA, Hercules, Tecmar GM, Sigma 400, AT&T DEB, or Conographics graphics cards. List price: Drafix 1 $295, AutoCAD file exchange option $95. Not copy protected. *Foresight Resources Corp., 932 Massachusetts, Lawrence, KS 66044. (913) 841-1121.*

Easy3D creates three-dimensional shaded objects on the Macintosh. Features include geometric solids, tools for turning two-dimensional outlines into three-dimensional objects, adjustable lighting, and object merging. Requirements: 512K. List price: $99. Not copy protected. *Enabling Technologies, Inc., 600 S. Dearborn St. #1304, Chicago, IL 60605. (312) 427-0386.*

Graph-in-the-Box, a memory-resident program for all IBM PCs and compatibles, creates 11 types of charts and graphs from on-screen data. Requirements: 128K; IBM CGA, IBM EGA, or Hercules graphics card. List price: $97.60 copy protected, $157.60 not copy protected. *New England Software, Greenwich Office Park 3, Greenwich, CT 06830. (800) 633-2252.*

Picturebase archives, organizes, and retrieves electronic pictures. The program labels Macintosh clip art and Macpaint or Macdraw pictures with titles and explanatory notes, then files the pictures in the program's library at full or reduced size. Requirements: 512K. List price: $69.95. Not copy protected. *Symmetry Corp., 761 E. University Dr., Suite C, Mesa, AZ 85203. (800) 624-2485, (602) 844-2199.*

Page Makeup

Fontasy, for all IBM PCs and compatibles, mixes graphics and text on a single page in up to three columns. Requirements: 256K (512K recommended); IBM CGA, IBM EGA, or Hercules graphics card. List price: program disk with 28 fonts $69.95, additional fonts $24.95 per disk. Not copy protected. *Prosoft, 7249 Bellaire Ave., Box 560, North Hollywood, CA 91603. (818) 765-4444.*

Lasersoft/PC, version 1.0, for all IBM PCs and compatibles, designs forms, incorporates data, then prints the results on the HP Laserjet or the Xerox PC 4045 laser printer. Requirements: 128K, two disk drives, DOS 2.1 or later version. List price: $295. Not copy protected. *Business Systems International, 20942 Osborne St., Canoga Park, CA 91304. (818) 998-7227.*

Mecca III, a typesetting, composition, and computer graphics system for the IBM PC AT, features batch pagination, interactive page makeup, and CAD/CAM functions. Graphics elements can be moved, copied, scaled, rotated, and zoomed. A complete system includes an IBM PC, a Laserwriter, a color graphics display monitor, a graphics tablet, a 30-megabyte hard disk, and 2 megabytes of RAM. An AT upgrade kit includes the memory module, monitor, graphics tablet, graphics card, and software. Requirements: 2 megabytes. List price: complete system $22,000, upgrade kit $9,900. *Amgraf, Inc., 1501 Oak St., Kansas City, MO 64108-1424. (816) 474-4797.*

Spellbinder Desktop Publisher, for all IBM PCs and compatibles, is an upgraded version of the Spellbinder word processing program. It uses dot commands to format text and create pages. Requirements: 256K, two disk drives or a hard disk, DOS 2.0 or later version. List price: $650. Not copy protected. *Lexisoft, Inc., P.O. Box 1950, Davis, CA 95617. (916) 759-3630.*

Fonts/Font Editors

Fancyfont and **Fancyword**, for all IBM PCs and compatibles, provide fonts for typeset output on the HP Laserjet and, in sizes from 6 to 72 points, on Epson FX-80 printers. Requirements: 192K, DOS 2.0 or later version. List price: Fancyfont $180, Fancyword $140. Not copy protected. *SoftCraft, Inc., 222 State St., Madison, WI 53703. (800) 351-0500.*

Fontographer creates scalable, downloadable fonts for use with the Macintosh and Laserwriter and generates the corresponding screen representations. Requirements: 512K, two disk drives. List price: $395. Copy protected. *Altsys Corp., P.O. Box 865410, Plano, TX 75086. (214) 596-4970.*

System Tools

PC Em-U-Print and **Fontastic** are laser printer utilities for all IBM PCs and compatibles. Memory-resident PC Em-U-Print translates IBM graphics printer codes into codes for laser printers. Requirements: DOS 2.0 or later version. List price: $95. Not copy protected.

Fontastic provides English language menu selections for HP Laserjet and Laserjet Plus commands. List price: $89.95. Not copy protected. *Koch Software Industries, 11 W. College Dr., Bldg. G, Arlington Heights, IL 60004. (312) 398-5440.*

Printworks for Lasers, a memory-resident program for all IBM PCs and compatibles, offers typesetting functions and cut-and-paste graphics from within word processing and spreadsheet programs. Requirements: 256K, DOS 2.0 or later version (not DOS 3.0). List price: $125. Not copy protected. *Softstyle, Inc., Hawaii Kai Office Bldg. #205, 7192 Kalanianaole Hwy., Honolulu, HI 96825. (808) 396-6368.*

Hardware

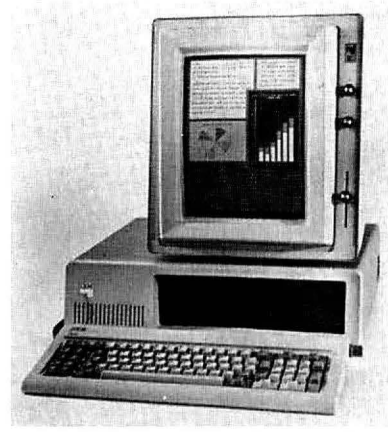
Input Devices

Microtek Scanner 300A is a 300-dots-per-inch page-feed scanner that produces Macintosh images at Laserwriter resolution. The included software positions and scales images, displays a full page, and generates pure Postscript code directly. Images can be used with the Justtext typesetting program, with Macpaint, and with Thunderscan documents. List price: $2,500. *Microtek Lab Inc., 16901 S. Western Ave., Gardena, CA 90247. (213) 321-2121.*

PC Scan is a paper-feed scanner that translates either typewriter or letter quality printed pages into digital data. It operates with all IBM PCs or compatibles. The software supports Wordstar, Wordstar 2000, Multimate, Universal, and Displaywrite 3 word processors. Requirements: RS-232 serial port. List price: $2,785. *Dest Corp., 1201 Cadillac Ct., Milpitas, CA 95035. (408) 946-7100.*

Scan 300, a paper-feed image scanner for the Macintosh and all IBM PCs and compatibles, creates 300-dpi digital images. The scanner has 64 selectable gray scales and 12 built-in halftone screens with various resolutions. Software for editing images in Macpaint and Pagemaker is supplied. The IBM version of the scanner includes an interface board. List price: $2,495. *Abaton Technology Corp., 1526 Cloverfield Blvd., Santa Monica, CA 90404. (818) 905-9399.*

Computer Add-Ons

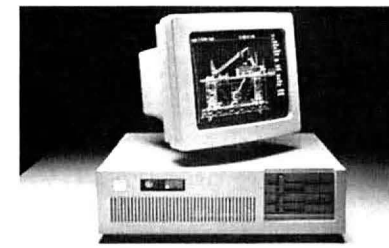


Genius is a 15-inch monitor that displays 66 lines of 80-column text—a full 8½-by-11 page—in 728-by-1,008 resolution. The portrait monitor displays graphics in black and white, and text in up to four shades of gray. The supplied interface card can emulate IBM PC monochrome and CGA graphics and text at the same time, displaying monochrome at the top of the screen and graphics at the bottom. Wordstar 2000, Wordperfect, PC-Write, Xywrite, Volkswriter, GEM, and Microsoft Windows all run on the monitor in full-page mode. List price: $1,795. *Microdisplay Systems, 1310 Vermillion St., Hastings, MN 55033. (800) 328-9524.*

Jlaserprinter, a board for all IBM PCs and compatibles, provides a high-speed interface to the HP Laserjet and other Canon engine laser printers. Jlaserprinter's extra memory allows it to print a full-page 300-dpi image that requires more memory than the Laserjet Plus has. Graphics software must be adapted to work with the board; however, the printer can be used in normal fashion by flipping a switch on the board. List price: $699, with 2 megabytes $1,029. *Tall Tree Systems, 1120 San Antonio Rd., Palo Alto, CA 94303. (415) 964-1980.*

Multisync, a "smart" color monitor, is compatible with the IBM PGA, EGA, and CGA. List price: $799. *NEC Home Electronics , Inc., Personal Computer Div., 1401 Estes Ave., Elk Grove Village, IL 60007. (800) 323-1728.*

Vega, a half-slot graphics card for all IBM PCs and compatibles, can emulate the IBM EGA and CGA and Hercules graphics cards. The Vega includes 256K of video RAM. Software enhancements allow programs such as 1-2-3 that write directly to display hardware to run on the board. Switches on the outside of the board control settings. List price: $599. *Video 7 Inc., 550 Sycamore Dr., Mipitas, CA 95035. (408) 943-0101.*



WY-700, for all IBM PCs and compatibles, is a 15-inch monitor capable of displaying black-and-white text and graphics in 1,280-by-800 resolution, and 50 lines of 160 characters. The monitor is bundled with a full-size, single-slot graphics card. List price: $1,595. *Wyse Technology, 3571 N. First St., San Jose, CA 95134. (408) 433-1000.*

Product Watch listings are based on information provided by the manufacturers; the descriptions are not product reviews or endorsements. Contact manufacturers for further information. Prices are as quoted at press time and are subject to change. ❑

Word Challenge

Test your knowledge of publishing terms

Publishing has its own specialized vocabulary, one that you may already be familiar with or will soon be learning.

Here are a dozen publishing terms, with clues—some obvious, some more obscure—provided in parentheses. Record your answers in the blanks.

One blank space in each answer is numbered. When you've completed the quiz, fill in the corresponding numbered spaces at the bottom of the page. If all your answers are correct, a "message" will be revealed in the spaces. Answers appear on page 42.

Questions

1. To add space between lines (British group Zeppelin). $\underline{}_{10}$ — — —

2. Page for checking (potency of potables). $\underline{}_{1}$ — — — —

3. The matrix on which pages are planned (football field, minus Fe). — $\underline{}_{9}$ — —

4. A typographic measurement (ballet position). — $\underline{}_{4}$ — — —

5. Another typographic measurement (Yankee pronunciation of a kind of tightwad). $\underline{}_{7}$ — — —

6. Putting the squeeze on a couple of characters ("coin" in Brooklyn). — — $\underline{}_{11}$ —

7. A long sheet of type (ship's kitchen). — — — — $\underline{}_{8}$ —

8. Planning the arrangement of a publication, by mechanical means or with software (congressional aide's floor plan). — — — — — — — — $\underline{}_{3}$ —

9. Dangling line of type (black arachnid). — $\underline{}_{12}$ — — —

10. Label at top of page (soccer move). $\underline{}_{6}$ — — — — —

11. Heavy type (brave visage). $\underline{}_{5}$ — — — — — — —

12. A sheet of paper folded to form pages in multiples of four (a John Hancock). $\underline{}_{2}$ — — — — — — — —

Rate your vocabulary

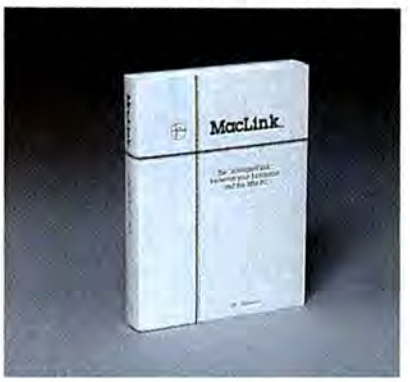
Correct	*Rating*
11-12	Master
9-10	Journeyman
7-8	Apprentice
Under 7	Tyro

Message

$\underline{7}$ $\underline{3}$ $\underline{5}$ $\underline{10}$ $\underline{12}$ $\underline{2}$ $\underline{6}$ $\underline{4}$ $\underline{11}$ $\underline{1}$ $\underline{8}$ $\underline{9}$ $\underline{12}$ $\underline{2}$ $\underline{6}$

Text to tabloid. Three easy steps.

Step 1: MacLink
PC data in, Mac data out.

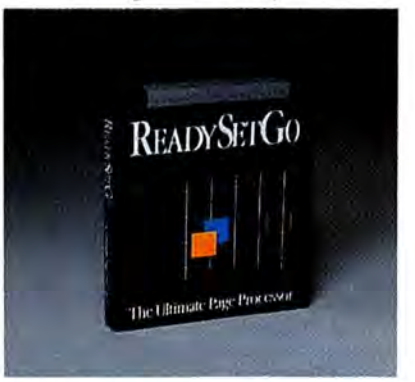


Still trying to shove those 5¼" PC diskettes into 3½" Mac slots? Well, before you hire someone to re-input all that data, take a look at MacLink. It converts and translates word processing, spreadsheet, and virtually every other type of file from the IBM-PC into files readable by equivalent Mac programs.

Your writers can send you their data via modem, or you can do the transfer yourself with the optional PC to Mac cable.

Datavis MacLink **$89**

Step 2: ReadySetGo
Design and conquer.



You call yourself a desktop publisher and you don't own a copy of ReadySetGo? Shame on you. It's virtually all you need to go it alone.

First, you can do a rough page design and start throwing in blocks of copy. See how they fit. See how they look. See how they run onto the next page. Make some changes. Try a different type face, or a different size, or some borders, or some different graphics. You'll see instantly if your new idea works or not.

And as soon as everything's the way you like it you can print out a master on a LaserWriter, ImageWriter, or PostScript printer. Vol. 1, No. 1. You're in business.

Manhattan Graphics
ReadySetGo **$105**

Step 3: PictureBase
Stay organized.

It's 10:00 PM deadline night. Do you know where your favorite monarch butterfly icon is? You would if you had PictureBase. It keeps your clip art and original graphics organized.

Just copy MacPaint visuals into the PictureBase library. Whenever you need one, call it up by name or description, cut it, paste it into your ReadySetGo layout. And you're off!

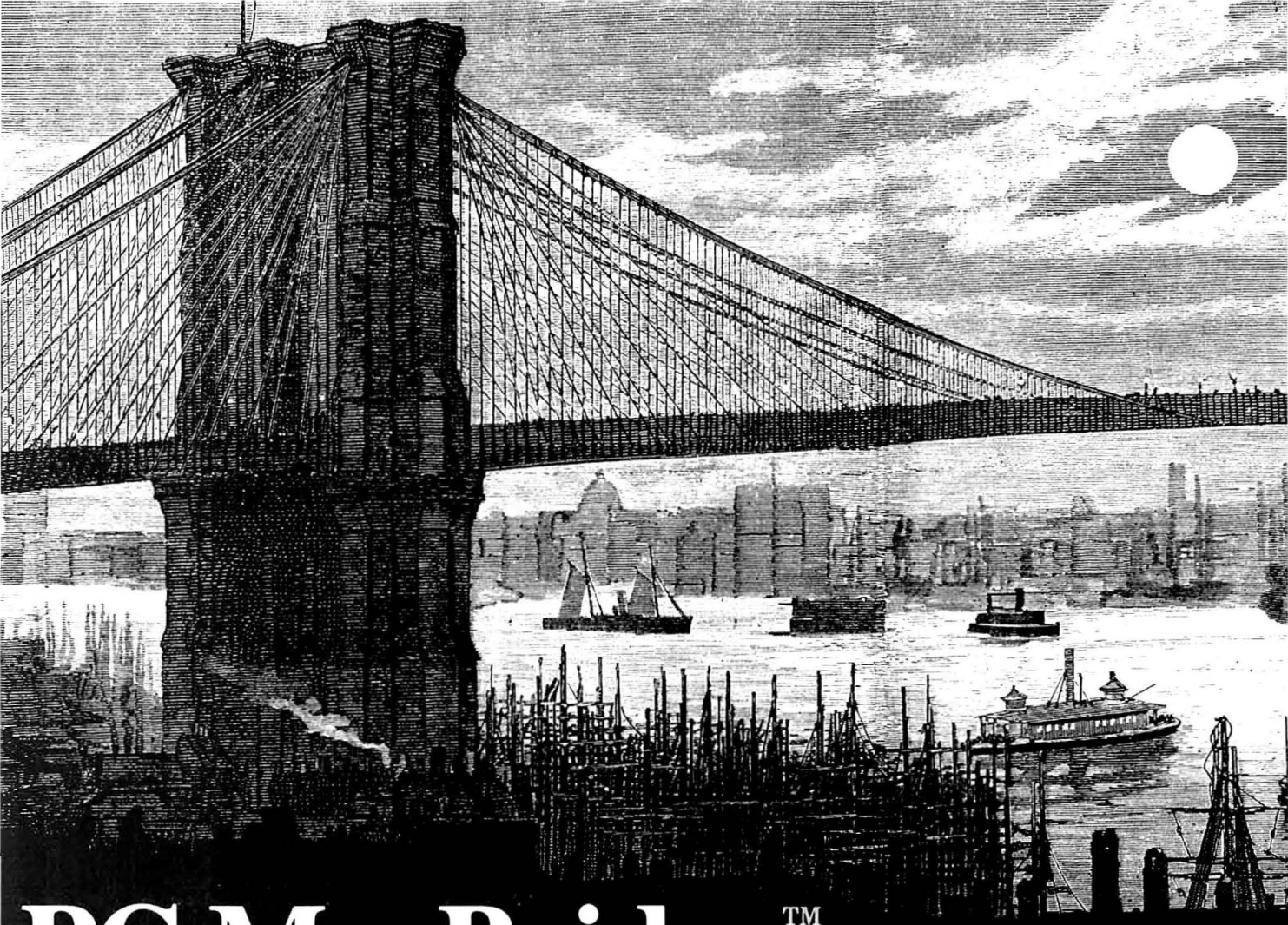
Symmetry PictureBase **$45**

MacConnection™

14 MILL STREET, MARLOW, NH 03456 1-800/Mac&Lisa or 603/446-7711

©Copyright 1986 Micro Connection, Inc. MacConnection is a division of Micro Connection, Inc. MacConnection and Micro Connection are trademarks of Micro Connection, Inc.

Circle P2 on reader service card



PC MacBridge™

Bridges your IBM® PC with the Apple® Macintosh™ Office Network™ and LaserWrite

Now you can bridge the IBM-Apple gap.

PC MacBridge from Tangent Technologies is a PC enhancement card that puts you on the AppleTalk Personal Network. The PC user can now tap the power of the Macintosh Office and the LaserWriter printer.

And with the LaserWriter, a whole new dimension in printing immediately opens up to you. Our LaserScript software turns PC word processors, like WordStar and MultiMate, into page processors. And the PostScript output gets you near-typeset quality printing on the LaserWriter.

For graphics, we give you LaserGraph. You get presentation quality graphics from Lotus 1-2-3. Where pie-charts lo like pies, not eggs. LaserGraph also lets you generate y own high-resolution business graphics.

Plus with our MailBox software, you get electronic ma and file transfer capabilities. You can send mail or trans your PC-generated Lotus 1-2-3 files to Mac-based Lotu Jazz or Microsoft Excel.

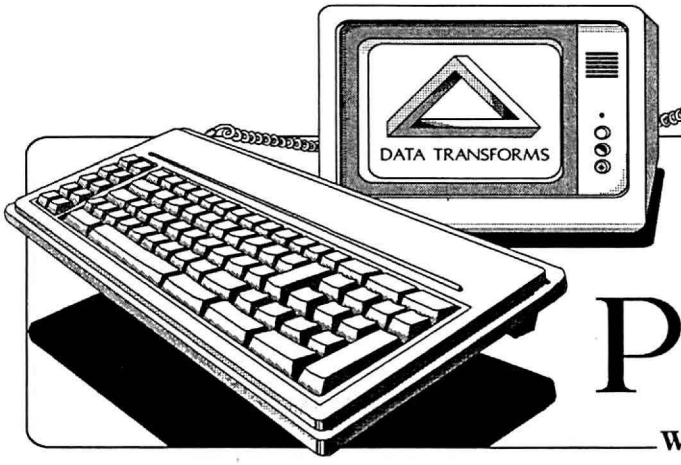
Bridge the Mac-to-PC gap with PC MacBridge.

For complete details, call your local dealer or call us direct. This is one bridge you'll want to cross as soon a you can.

TANGENT TECHNOLOGIES

5720 Peachtree Parkway • Suite 100 • Norcross, Georgia 30092 • (404) 662-0366 In Canada, call McKENZIE BROWN LTD (416) 593-

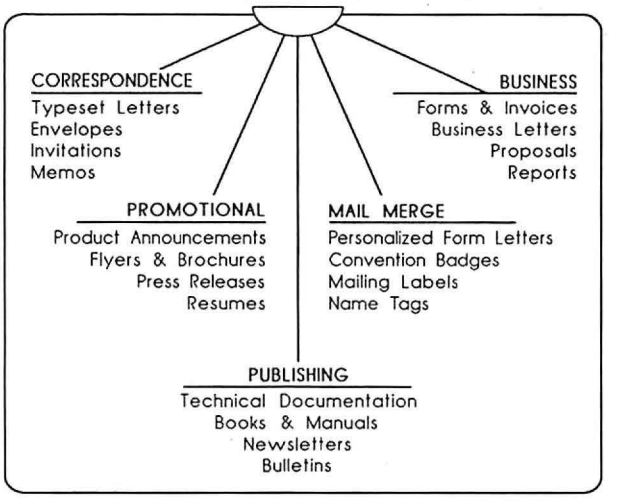
Circle P10 on reader service card



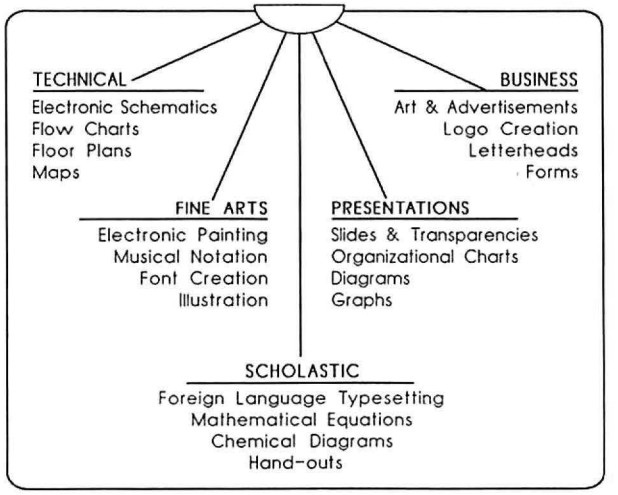
Desktop Publishing

With your IBM-PC, XT, AT or compatible

PRINTRIX



FONTRIX



Data Transforms' PRINTRIX™ and FONTRIX® combine typesetting *and* graphics for desktop publishing magic. Individually, each is a stand-alone program; PRINTRIX for typesetting, FONTRIX for graphics.

Used in combination, FONTRIX output may be re-routed through PRINTRIX to merge high resolution graphics with fully justified, multi-page typesetting. Listed at left are just a few of the myriad practical applications these versatile programs perform.

PRINTRIX is an automated batch processor of textfiles. As such, it accepts both standard ASCII and native textfiles from most major word processors, adding fonts, page formatting and graphic insertions to print camera-ready output on your printer. A great range of features, like proportionally spaced fonts, variable form size, *italics*, **boldface**... even automatic mail merge let PRINTRIX typeset everything from mailing labels to thousand-page documents.

FONTRIX is a screen based, visual editor of text and pictures. Its fonts and graphics are displayed on-screen exactly as they will appear in print. Perfectly suited for complex page layouts and technical drawings, FONTRIX gives you a high resolution "electronic page", a workspace up to 115 times the size of a single screen. The wealth of drawing and painting tools, enormous work area, electronic cut-and-paste, font editor, mouse interface and other fine features bring FONTRIX to the forefront of PC graphics technology.

Both programs support over 70 models of dot matrix, ink jet and laser printers. Suggested retail price: $120 for PRINTRIX; $155 for FONTRIX. For more information contact:

Data Transforms 616 Washington Street Denver, CO 80203 (303) 832-1501.

This entire advertisement was created with these two packages using an IBM-PC, a laser printer, and the Tall Tree Systems' JLaser card. *Printrix* performed the typesetting, composed the page layout and married text and graphics into a unified whole. *Fontrix* designed the fonts and drew the illustrations. (Note: the headlines, "Desktop Publishing", "Printrix" and "Fontrix" are not font-based, but were hand drawn using *Fontrix's* line and circle drawing tools and its electronic cut-and-paste.) *Printrix* and *Fontrix* are trademarks of Data Transforms Inc. *IBM-PC, XT, AT* are trademarks of International Business Machines Corp. *JLaser* is a trademark of Tall Tree Systems Inc.

Circle 592 on reader service card

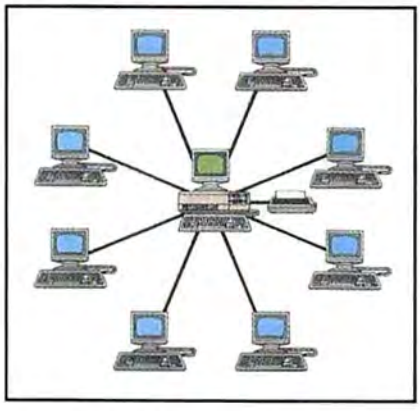
It seats 9 comfortably.

This is the new Sperry PC/IT.™

A Personal Computer system with such speed and power, you can easily share it with a colleague.

Or with most everybody in your department.

Or even with the entire company.



The miniature mainframe

The trend in PC applications today is toward allowing several people to use them concurrently.

Unlike most PCs.

The Sperry PC/IT, however, has the power to support up to nine users under Xenix.™ It's like having a mainframe, where users can share the most expensive resources—memory, disk and printers.

Not a bad arrangement for a department in which people are working side by side. Using the same kind of applications and the same kind of data.

What if you need a network?

If nine connections aren't enough, the Sperry PC/IT will gladly host its own local area network.

Up to 56 people, using any IBM-compatible PC and any MS™-DOS program concurrently, can be connected. And share an array of printers and disks, on as many as eight additional data/print server PCs.

Want to talk speed?

We asked Intel to provide us with the fastest version of the 80286 microchip available. The result is what our engineers call a "screamer": a machine as much as 15% faster than the IBM PC/AT™ Enhanced.

But there's more.

Up to 5MB of memory. 8 usable option card slots. An optional 60MB tape cartridge unit. Up to 80MB of hard-disk storage available today—expanding this summer to a maximum of 138MB.

A word about software

The Sperry PC/IT is fully industry compatible. In fact, both MS-DOS and Xenix are available.

So you can choose from the thousands of MS-DOS programs already in circulation, while still being prepared for the emerging Xenix boom.

The new Sperry PC/IT. It takes a back seat to no one.

For further information, call toll-free 1-800-547-8362, and ask for Information Kit #94.

Or write Sperry Corporation, Dept. 100, Box 500, Blue Bell, PA 19424-0024.

The power to get things done.

SPERRY

™Xenix is a trademark of Microsoft, Inc. PC/IT is a trademark of Sperry Corporation. Personal Computer AT and MS-DOS are trademarks of IBM. ©Sperry Corporation, 1986

From the Hardware Shelf

PC World offers first impressions of recent hardware releases

A remote controller whips a laser printer into shape, a portable shows its colors, a board bridges the IBM/Apple gap, a compatible gets it together, and a slot-waster lets you off the hook.

Edited by Eric Knorr

JLaser and JRAM-3

Tall Tree was selling the JRAM-2 2MB memory expansion board when most PC users thought expanded memory meant a cure for amnesia. When Intel, Lotus, and Microsoft hatched their own method of cracking the 640K barrier, Tall Tree was quick to incorporate the triumvirate's expanded memory specification (EMS) into JRAM-3, JRAM-2's successor. Now this scrappy, adaptable company has introduced JLaser, a piggyback board that uses JRAM-3's RAM for a new objective: expanding the memory of laser printers.

The memory limits of popular laser printers like Hewlett-Packard's LaserJet and Corona's LP-300 have stymied many users who expected better graphics and a wider selection of fonts from their machines. Even the LaserJet Plus's 512K of RAM is only enough for a full-page image resolution of 150 dots per inch (dpi) or a third of a page at 300 dpi. JLaser can access 1MB of JRAM-3's 2MB maximum, enabling you to produce a full page of 300-dpi bit-mapped graphics.

JLaser works with any laser printer that uses a Canon LBP-CX engine, including Apple's LaserWriter, Corona's LP-300, the Canon A1, the QMS KISS, and both LaserJet incarnations. Functioning as a remote printer controller, JLaser connects by cable to JPrinterswitch, a T-switch block that plugs directly into the Canon engine receptacle. Making the connection is straightforward on the LaserJet, although you may have to remove a back panel on some laser printers.

(continues)

Fred Simson

Now it costs even less to look good.

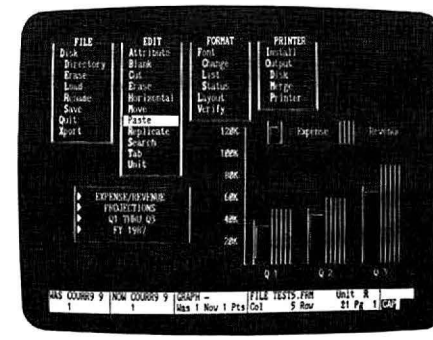
Wordstar 2000 is a trademark of MicroPro International Corp. Epson is a trademark of Epson America, Inc.

The Cordata Desktop Printshop™ has always been the best value in PC-compatible laser printers.

With speed and flexibility that the others can't match.

For example, we put 38 type fonts on diskette, not expensive cartridges. And let you mix up to 32 fonts in a single document. Automatically.

A high-speed graphics interface transfers data up to 30 times faster than Hewlett-Packard's LaserJet+, and because most Desktop Printshop features are implemented in software, they're easy to update.



And because Epson™ emulation is standard, the Desktop Printshop has a ready-to-run solution for many programs that other laser printers can't use.

But now the Desktop Printshop is an even better value.

Not to mention being easier.

A new forms design software program comes with the Desktop Printshop that lets you create documents quickly—and easily—using pull-down menus, not complicated commands.

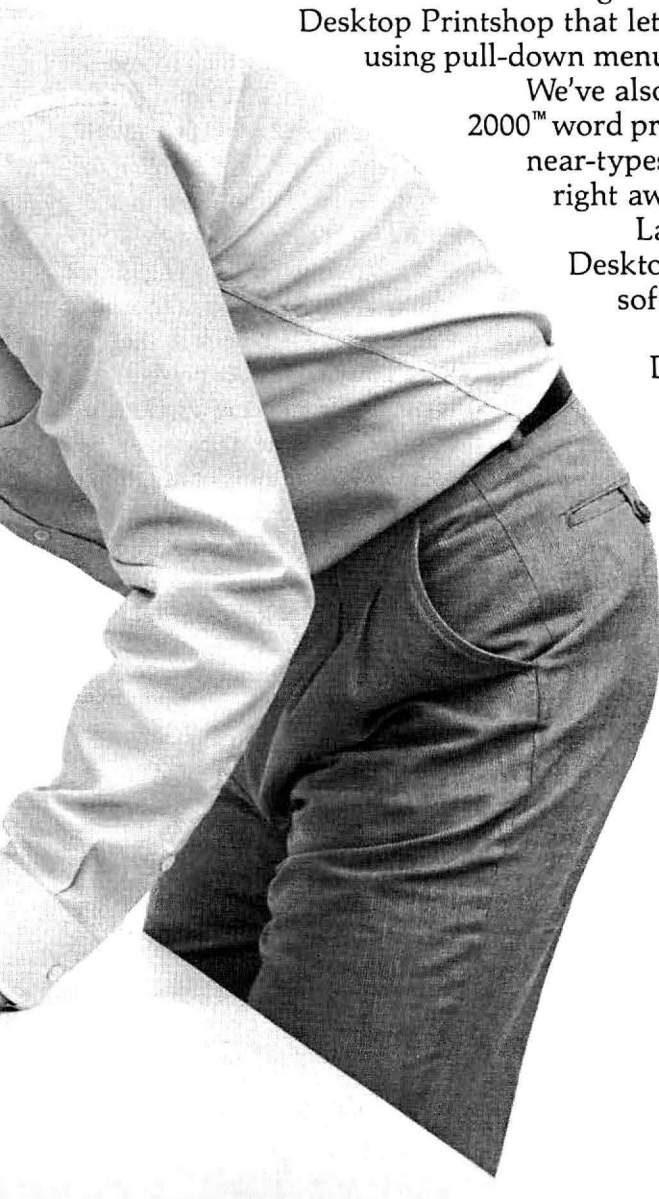
We've also included the industry-acclaimed Wordstar 2000™ word processing program. So you can start producing near-typeset quality memos, reports, and correspondence right away.

Last, but not least, we've lowered the price of the Desktop Printshop to $2995, including forms design software, Wordstar 2000 and 38 fonts on diskette.

So don't settle for just any laser printer. Demand the Desktop Printshop.

All it takes is a call to Cordata at: (800) 621-6746 (in CA: (805) 495-5800; in Canada: (604) 984-0641) for the name of your nearest Desktop Printshop dealer.

After all, how can you afford *not* to look your best?



The Desktop Printshop.™

CORDATA, 275 E. Hillcrest Drive, Thousand Oaks, CA 91360
TELEX 650-2696270; in Europe: Holland 032-18111

Circle 346 on reader service card

cordata
formerly corona data systems, inc.

GREAT SOFTWARE
AT MODEST PRICES

Some samples from our library of over 489 disks for the IBM PC:

Desk Organizer A great pop-up helper, phone dialer, note pad, calendar, and calculator.
☐ 405 Deskmate–More than a sidekick $6

Communications
☐ 310 Qmodem–fast with windows $6
☐ 212, 334 Set up a BBS system $12

Assembler with tutorial.
☐ 10 Chasm, the CHeap ASseMbler $6

Draw on your computer screen.
☐ 344, 345 PC Key Draw (graphics req.) $12

Spreadsheet
☐ 199 PC-Calc–simpler than Lotus & effective .. $6
☐ 214,215,267,268 Spreadsheet, database ... $24

Powerful database management programs
☐ 5 PC-File III–Labels, forms, letters, more ... $6
☐ 287, 288 File Express–reports generator $12

BASIC tutorial–A nice way to learn BASIC.
☐ 105 PC Professor $6

Word processing
☐ 294 Edit, small, full-featured $6
☐ 78 PC-Write, popular and powerful $6
☐ 388 100 form letters on disk $6
☐ 194 PC-Read, computes grade level of text ... $6
☐ 379 Wordstar utilities, color, ASCII converter .. $6
☐ 480 PC-Outline, create an outline $6

Artificial intelligence languages
☐ 417 Prolog $6
☐ 148 XLISP–experimental version of Lisp $6
☐ 398 ESIE, expert system generator $6

Japanese Art of Paperfolding
☐ 408 Origami–graphics required $6

Games–The most interesting games on, or off, Earth.
☐ 293 Arcade Games (color graphics req.) $6
☐ 390 Flight and others (graphics req.) $6
☐ 354 PC Jr. games $6
☐ 292 Spacewars, great on Hercules card $6
☐ 476 Patrick's Best games (mostly mono) $6

Recover lost files–File examine/repair utility (floppies only.)
☐ 133 Ultra Utilities, similar to Norton's $6

DOS Help and explanations for the new user.
☐ 254 PC DOS Help $6
☐ 403 Computer Tutor, learn PC-DOS $6

Housekeeping–Our favorite utilities.
☐ 273 Best Utilities $6
☐ 478 Hard disk utilities, WHEREIS and more ... $6

Unprotect popular software
☐ 414 Routines to disable copy protection $6

Financial
☐ 164 Cashtrac, checkbook, personal finances . $6

Typing tutor to train those digits to dance.
☐ 320 Touch Type $6

Something for programmers:
☐ 424 Pascal compiler written in Turbo Pascal .. $6
☐ 263,264 Laxon & Perry FORTH $12

Genealogy,–several to choose from:
☐ 90 Genealogy, keep track of family tree $6
☐ 240 FT-etc., family tree organizer $6

For more software than you ever thought possible.
☐ 350-page directory (disks 1-300) $8.95
☐ Supplement (disks 301-454) $3.95
☐ 400 Listing of latest disks–401-480+ $6

PC-SIG Membership–Includes directory, supplement, newsletters, and more.
☐ PC-SIG 1 yr. Membership ($35 foreign) $20
Choose one: ☐ Printed ☐ On disk directory

SPECIAL
Any 5 Disks *plus* Directory, Supplement and 1-Year Membership Only $39 (Reg $50)

Most programs have documentation on disk and request a donation from satisfied users. Please add $4 postage and handling per order ($10 foreign)–California residents add state sales tax.

Total Enclosed $_____ by ☐ Check ☐ VISA ☐ MC
Card No._____
Exp. date_____ Signature_____
Name_____
Address_____
City_____ State_____ Zip_____

PC-SIG
To order, call: **800-245-6717**
In CA: **800-222-2996**
For technical questions or local orders: **(408) 730-9291**
1030-D East Duane Avenue Sunnyvale, CA 94086
Dealer Inquiries Invited **#152**

Circle 293 on reader service card

If you want to return to your printer's built-in fonts and memory, JPrinterswitch allows you to toggle back to the printer's native controller. Because JLaser itself bypasses the printer's memory, controller, and external connectors, you can also use JPrinterswitch to toggle between a PC using JLaser and a PC hooked up to the printer's parallel or serial port.

JLaser is a new product, so as of yet there's no glut of software written for the board. However, several good typesetting and page formatting packages support JLaser, including SoftCraft's *Fancy Fonts,* Le Baugh's *Le Print,* IMSI's *Dr. Halo II,* and Data Transforms' *Printrix.* All these programs offer a wide variety of bit-mapped fonts and produce higher-quality output than ROM-based font cartridges. Soon *Framework* and *PC Paintbrush* will also support the board.

Installed in a Compaq Deskpro with an 8086 processor running at 7.14MHz, the JLaser version of *Fancy Font* printed a 2000-word document on a Canon A1 laser printer in 80 seconds–three times faster than the version written for the printer itself. Although it prints a page of bit-mapped graphics quickly, JLaser can't match the speed of the A1's own controller and ROM-based fonts. Using comparable ROM cartridges instead of downloaded soft fonts, I printed the same document in less than 15 seconds.

One bonus feature of JLaser is that you can still use JRAM-3's expanded memory for the many PC programs that support EMS. Unpopulated, JRAM-3 goes for $269, and you can fill the board with 64K-bit or 256K-bit chips in any configuration. If you opt for the full 2MB, the other half of JRAM-3 can even be used to accommodate software written specifically for the JRAM-3/JLaser combination. For example, the JLaser version of the *Dr. Halo II* paint program reserves 1MB of the JRAM-3 board for itself while simultaneously using the other megabyte for a full page of graphic output.

Priced at $1029, which includes the JRAM-3 with 2MB of memory, JLaser provides PC users with a relatively inexpensive entrée into bit-mapped laser graphics and a wealth of soft fonts. The slow speed inherent in bit mapping is certainly a consideration, although the ability to switch back to the printer's own controller prevents this languor from being a serious drawback. However, because JLaser lacks hard fonts or anything resembling a page description language, the board's ultimate utility will be determined by the software that supports it. *–Ross Smith*

JLaser
Tall Tree Systems
1120 San Antonio Rd.
Palo Alto, CA 94303
415/964-1980
List price: JLaser and JRAM-3 with 2MB RAM $1029

(continues)

modula-2PC™

The ultimate PC tool.

***Build your own* database application, screen display system, telecommunication package, memory management program, disk organizer, even an operating system, or *anything you can imagine*—easily, quickly and with accuracy!**

You can do things in *Modula-2PC* that you wouldn't even *attempt* in Pascal, C, or Prolog!

By its very nature, *Modula-2PC* permits you to have all the structure and separation of a superset version of Pascal, plus all the machine control abilities of C.

In the Modula-2 language, the compiler tells you instantly if there is some sort of inconsistency in your view of how to process your data. By forcing more checking of your statements and intended structure at compile time instead of run time, *Modula-2PC* provides error-free, cost-effective program development.

You'll especially appreciate *Modula-2PC* in group projects, where you can make each structure of data visible, or hidden within particular modules, preventing accidental alterations of any individual programmer's data.

And since *Modula-2PC* is the world's most advanced development tool for the IBM PC family of computers, it will help anyone who powers-on a PC to write even a five line program.

Modula-2PC combines ultra-fast compiling speed with a full set of library modules that you can use like macros to write programs—that can automatically check themselves while running.

So, don't touch that BASIC interpreter! Dump your C compiler and rid yourself of the hairpulling it causes. Stop complaining about Pascal's shortcomings.

Let *Modula-2PC* work for you!

Modula-2:
The language designed by the author of Pascal—*to replace Pascal.*

Modula-2PC:
The *most advanced* Modula-2 compiler.

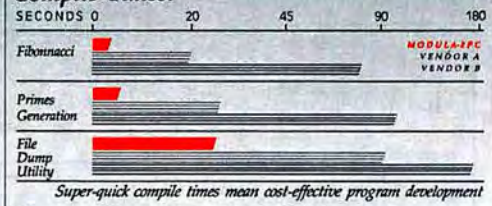
Modula-2PC provides:
- Native code support for PC/XT/AT/PC*jr.* and compatibles
- Full language support, including long integers
- One-Pass Compilation
- Niklaus Wirth's *3rd Edition* features
- *Two* to *four* times *faster* compilation
- *No* link step required
- *Comprehensive* User's Manual & Reference
- Direct, easy linkage to assembler programs
- Automatic generation of "EXE" files
- Program overlays
- Range/pointer checking

This original, innovative compiler system is the result of 2 years of design development and has been rigorously tested and debugged using state-of-the-art systems. It performed flawlessly on 50,000 lines of code in random samplings of production disks.

Our staff is expert in large-scale mainframes, operating systems design, telecommunications, and, of course, personal computers. If you have special needs for customized versions of the compiler, consultation, or seminars, write to: PCollier Systems, Inc., Suite 390; 7925-A North Oracle Rd.; Tucson, AZ 85704 or call: 1-800-522-2060 (1-800-654-7396 in Arizona)

© 1986 P. COLLIER SYSTEMS, INC. Modula-2PC is a Trademark of P. Collier Systems, Inc.
IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES CORP.

Compile Times:



Super-quick compile times mean cost-effective program development

System Programming Facilities:
- Access to I/O ports/interrupt vectors
- Absolute addresses for variables
- In-line instruction generation

Library Modules Included:
All standard I/O, conversion, and string modules, *plus* PC screen/keyboard control, DOS/BIOS interfaces, concurrent processes, advanced memory allocation, and more—

Requires:
IBM PC/XT/AT/PC*jr.* or compatible–512KB Memory–One disk drive

Introductory Price—only **$59.95** PLUS $4 SHIPPING & HANDLING

60 Day Money Back Guarantee
NOT COPY PROTECTED

VISA/MASTERCARD *Call Toll Free*
1-800-522-2060 (1-800-654-7396 in Arizona)
AZ residents add 5% sales tax
PHONE ORDERS SHIPPED NEXT DAY VIA UPS SURFACE
CALL FOR ADDITIONAL INFORMATION

PCollier SYSTEMS INC

Suite 390, 7925-A North Oracle Road
Tucson, Arizona 85704

☐ Amount enclosed $ _____
☐ CHECK ☐ M.O.
☐ Charge to my credit card
VISA# _____
M/C# _____
Expiration date _____

☐ *Send me more information about Modula-2PC.*
☐ *I'd like to try Modula-2PC on our next application.*
Send us ____ set(s) complete, including 2 Disks w/User's Manual & Reference at your introductory price of $59.95 plus $4 shipping and handling/set.

Name _____ *Phone* _____
Company/Institution _____
Address _____
City _____ *State* _____ *Zip* _____

PCW2-7/86

MAIL ORDERS—ALLOW 3 WEEKS FOR DELIVERY

Circle 515 on reader service card

Low Prices Are Only

Compare our prices, products and service

- **Business Accounts Program**
- **Second Day Air Shipping**
- **Toll Free Technical Suppor**

DATABASE SYSTEMS

ASHTON-TATE
$399. dBase III+
BORLAND
95. Reflex
MICRORIM
379. R:Base 5000
NANTUCKET
369. Clipper
PAPERBACK
65. VP Info

WORD PROCESSING

DAC
$ 39. Easy Word
LIVING VIDEOTEXT
59. Ready
109. Think Tank
MICROSOFT
245. Word
MICROPRO
79. Easy
179. WordStar 3.3
249. WordStar Professional
295. WordStar 2000+
MULTIMATE
69. Just Write
229. Multimate
245. Executive
289. Advantage
SSI (Satellite)
69. The Library
235. WordPerfect 4.1

SPREADSHEETS

LOTUS
$339. 1-2-3
MICROSOFT
124. Multiplan
PAPERBACK
65. VP Planner

INTEGRATED PACKAGES

ASHTON-TATE
$415. Framework II
LOTUS
459. Symphony
MICROSOFT
65. Windows
SOFTWARE PUBLISHING
75. Report
84. File, Write, Graph, Access or Plan
QUARTERDECK
65. Desqview

ACCOUNTING

BPI
$325. GL, AR, AP or Payroll
DAC
39. Easy Payroll
55. Easy Accounting
EVERGREEN
165. One-Write-Plus
REAL WORLD
339. GL, AR, AP, PR, Inv or Payroll

PERSONAL FINANCE

MECA
$ 85. Managing The Market
109. Managing Your Money
MONOGRAM
109. Dollars & Sense
SIMON & SCHUSTER
55. J. K. Lasser Money Manager
TIMEWORKS
75. Personal Financial Planner

CAD SYSTEMS

AMERICAN SMALL BUSINESS
$185. Pro Design I
FORESIGHT RESOURCES
239. Drafix I
GENERIC SOFTWARE
119. Generic CAD With Dot Plot

COMMUNICATIONS

HAYES
$ 99. Smartcom II
MICROSOFT
169. Access
MICROSTUF
105. Crosstalk
165. Transporter
VM
95. Relay
135. Relay Gold

UTILITIES

ALPHA SOFTWARE
$ 57. Keyworks
AMBER
40. Homebase
BORLAND
46. Superkeys
52. Sidekick (copiable)
CENTRAL POINT
23. Copy II PC
23. PC Tools
81. PC Option Board
FIFTH GENERATION
105. Fastback
FINOT GROUP
64. Keep Track
FUNK
39. Sideways
NORTON
59. Utilities
ROSESOFT
83. Prokey

PROGRAMMING LANGUAGES

BORLAND
$ 22. Turbo Tutor
32. Turbo Toolbox
35. Turbo Graphix Toolbox
40. Editor Toolbox
46. Word Wizard
46. Turbo Pascal
46. Traveling Sidekick
59. Turbo New Pack
63. Turbo Prolog
65. Turbo Lightning
79. Turbo Pascal w/8087 & BCD
79. Traveling Sidekick Combo
155. Jumbo Pack
MICROSOFT
99. Macro Assembler
199. Pascal Compiler
275. C Compiler
229. Fortran Compiler

GRAPHICS

DECISION RESOURCES
$155. Sign Master
209. Diagram Master
235. Chartmaster
245. Map Master
GRAPHICS COMMUNICATION
215. Freelance
329. Graphwriter Combo
MICROGRAFX
109. Draw
115. Windows Draw (Req. Windows)
229. PC Draw
275. In-A-Vision
MICROSOFT
199. Chart

ORDERING INFORMATION

- Most orders shipped second day air. Shipping Charges:
- US & Puerto Rico — 3% ($6 minimum)
- APO, FPO — US rate PLUS $5
- Canada — 12% ($15 minimum)
- Foreign — 18% ($25 minimum)
- Heavy items may require additional shipping charges.
- Prices reflect a 3% discount for Conroy-LaPointe Credit Card or cash. Add 3% for other credit card purchases.
- Customer Service: (503) 620-9877

PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE

SPERRY
PC/IT

IBM® PC/AT Compatible

$2599

- 512K RAM Expandable to 5 M
- 6, 7.16, & 8 MHz Processor
- 1 Parallel & 2 Serial Ports
- 8 Expansion Slots
- Clock/Calendar
- Hard Disk Systems Available

$2899 With Mono Card & Monit

LASER 128: Better than Apple® at half the price.

$499
With Monitor & Cable

- 128K RAM, 32K ROM
- 65C02 CPU
- 5¼" Floppy Drive, Internal
- 1 Expansion Slot, IIe
- 1 Parallel & 2 Serial Ports
- External Drive Port
- Numeric Keypad
- 4 Cursor & 10 Function Keys
- Supports Double Hi Res
- Mouse/Joystick Port

$949 With Monitor, Printer, 2nd Floppy Drive, Cables

MAGNUM™ MEMORY & MULTIFUNCTIO BOARDS

PC MASTERCARD

"0" KB $139
384KB $189
1.5 MB $339

- Expandable to 1.5 M
- Serial Port
- Parallel Port
- Clock/Calendar
- Game Port
- Utility Software
- 1 Year Limited Warra

ECONORAM™

384 KB $109: Short Card
1 Year Limited Warra

To Order:

1-800-547-1289

In Oregon: 1-800-451-5151
Hours: 6-6 Pacific
Mon-Fri, 8-4 Sat

Business Accounts Call: 1-800-4-CONROY

Part Of The Story . . .

with anyone's . . . mail order or retail.

- **Full Product Warranties**
- **Conroy-LaPointe Credit Card**
- **Products For Apple & Mac**

BUSINESS ACCOUNTS

Not just for business, but for schools, government agencies, and other institutions. In addition to our regular low prices, wide selection and professional service, we now accept purchase orders from organizations who qualify. To receive an application, just call 1-800-4-CONROY or 503-684-7261 in Oregon).

MAGNUM™

XT/MARK 2™

$1295

With Monitor & Video Card

MEMORY CHIPS & COPROCESSORS

RAM CHIPS

$ 13.	64K, 200 NS Kits
14.	64K, 150 NS Kits
39.	256K Kits
49.	128K Kits for AT

HAUPPAGE

119.	8087 Chip
175.	8087-2 Chip
229.	80287 Fast 5 for AT
349.	80287 Fast 8 for AT

EXPANSION BOARDS

AST

$275.	SixPak Plus, 384K
339.	Rampage for PC
399.	SixPak Premium
495.	Rampage for AT

INTEL

CALL	Above Board 64K For PC
CALL	Above Board 128K for AT

MAGNUM

99.	EconoRAM 384K
139.	PC MasterCard No RAM
189.	PC MasterCard 384K
325.	PC MasterCard 1.5 MB

ORCHID

279.	Conquest No RAM

TALLTREE

269.	JRAM 3, 256K EMS Board, PC
279.	JRAM AT3, No RAM for AT

VIDEO BOARDS

EVEREX

$265.	The Edge

HERCULES

159.	Color Graphics
309.	Graphics Card

ORCHID

CALL	Turbo EGA

QUADRAM

419.	Quad EGA+ Board

STB

379.	EGA Plus

VIDEO 7

185.	Mono Graphics Adapter
399.	VEGA Board

INPUT DEVICES & DIGITIZERS

KEYTRONICS

185.	KB 5151 Keyboard
319.	KB 5153 Keyboard

MICROSOFT

129.	Mouse
139.	Serial Mouse

MOUSE SYSTEMS

129.	Mouse With Software & PC Paint

DRIVES & TAPE BACKUPS

CDC Floppy Drives

$ 99.	Half Height 360K
119.	Full Height 360K

IRWIN

539.	10 MB Tape Backup Kit

MOUNTAIN

875.	20 meg DriveCard Hard Disk

SILICON VALLEY COMPUTER

599.	Goldcard 21 MB Hard Disk Card

SEAGATE Hard Drives

489.	20 MB for PC
649.	20 MB for AT
789.	30 MB for AT

SYSGEN

1085.	60 MB Internal Tape Backup
1150.	60 MB External Tape Backup
1225.	20 MB Hard Disk, 20 MB Tape (PC)
1999.	30 MB Hard Disk, 60 MB Tape (AT)

TEAC Floppy Drives

109.	55-BV Half Height 360K

TOSHIBA

115.	360K FLoppy Drive For AT
169.	1.2 MB Drive For AT

MODEMS

EVEREX

$159.	1200 Baud Internal

HAYES

419.	1200 External
379.	1200B Internal
629.	2400 External
579.	2400B Internal

CONROY-LAPOINTE

185.	1200B Internal w/Software
195.	1200 External w/Software
389.	2400B Internal w/Software

PRINTERS & PLOTTERS

CANON

2199.	Laser Printer A1-P

EPSON

389.	FX 85 160 cps, 32 NLQ
419.	HI 80 Plotter
589.	FX 286 200 cps, 40 NLQ
649.	LQ 800 180 cps, 60 LQ
795.	LQ 1000 180 cps, 60 LQ, 15"
995.	LQ 1500 200 cps, 67 LQ, 15"

OKIDATA

CALL	182 S or P, 192 S or P, 193, 292, 293

PANASONIC

275.	P1091 120 cps,
439.	P3151 Daisywheel

MONITORS

AMDEK

$125.	300G 12" Green Composite
135.	300A 12" Amber Composite
159.	310A 12" Amber TTL
409.	Color 600
549.	Color 722
609.	Color 725
795.	Color 730

NEC

599.	JC 1401P3A Multisynch

PRINCETON

179.	MAX 12 12" Amber TTL
459.	HX-12 12" Color RGB
559.	HX 12e RGB for IBM-EGA
599.	SR-12 Hi Res RGB

POWER & SURGE PROTECTION

CONROY-LAPOINTE

$ 93.	130 Watt Power Supply

CURTIS Surge Suppressors

30.	Diamond, 6 outlets
35.	Emerald, 6 outlets, 6' cord
47.	Sapphire, 3 outlets, RFI filter
55.	Ruby, 6 outlets, cord, RFI Filter

KENSINGTON

92.	Masterpiece
129.	Masterpiece Plus

DISKETTES & ACCESSORIES

CONROY-LAPOINTE DISKETTES

$ 16.	DS/DD 10
119.	DS/DD 100
29.	DS/HD 10 for AT
279.	DS/HD 100 for AT

FUJI

19.	DS/DD 10
39.	DS/HD 10 For AT

GENERIK DISKETTES

11.	DS/DD 10
89.	DS/DD 100
28.	DS/HD 10 for AT

DYSAN

29.	DS/DD 10

MAXELL

19.	DS/DD 10
34.	DS/HD 10 for AT

The complete IBM compatibile.

Mono Graphics Card And Monitor
640K RAM On Motherboard
Dual 360K Floppy Drives
Dual Speed 4.77 & 8 MHz Processor
135 Watt Power Supply
Selectric, PC/AT Style Keyboard
Parallel Printer Port
2 Serial Ports
5 Slots & Clock/Calendar
MS-DOS 2.11
Warranty: 1 Year Parts, 90 Days Labor

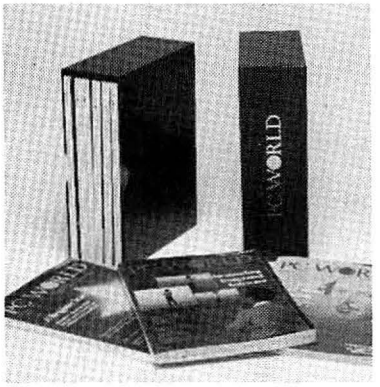
EGA System $1375 Special

- Magnum XT/Mark 2 With 640K & 2 Half Height Floppy Drives
- EGA Compatible Color Graphics Card
- 3% Off Any EGA Compatible Color Monitor We Carry

Conroy•LaPointe Inc.SM

Circle 554 on reader service card

Store & Retrieve



You can have immediate access to your PC World issues by storing them in our PC World file boxes. A perfect way to keep every issue of PC World in top condition and always at your fingertips. The cost is $6.95 for one file box; $13.90 for two file boxes; $20.00 for three file boxes.

Each file holds up to 6 issues and is bound in rich maroon leatherette and embossed in gold leaf lettering. They're rugged, compact, convenient — a perfect way to keep every PC World in top condition and always at your fingertips.

Unconditionally Guaranteed!

Mail to:
Jesse Jones Box Corporation
Dept. PC World
P.O. Box 5120
Philadelphia, PA 19141

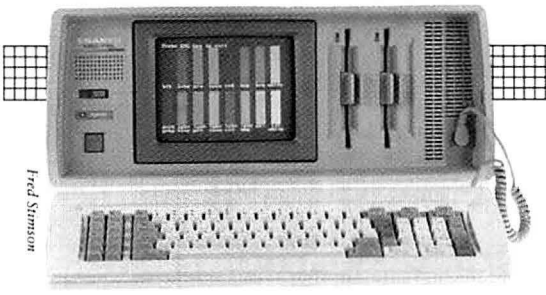
Please send me _____ file box(es).
My check for $_____ is enclosed.

Name

Address

City State Zip

Please make checks payable to Jesse Jones Box Corporation.
Allow 4 to 6 weeks for delivery.



Fred Stimson

Sanyo's 43-pound MBC-775e is the first "portable" PC compatible to offer color.

MBC-775e Portable Color Computer

I grew up with my eyes glued to a black-and-white TV, so when I bought my first color tube, I was amazed at how good even "The Price Is Right" looked. After spending the past few years of my adult life hunched over a portable computer, I expected a similar thrill when I turned on Sanyo's new MBC-775e Portable Color Computer, the first PC-compatible portable with a built-in color display.

It's tough to compare a screaming game-show contestant to a pie chart, but suffice it to say that the Portable Color Computer made an impression all its own. Because it measures only 9 inches diagonally, the machine's display looks high resolution, even though it's actually 320 by 200 lines. With 4 vivid colors in medium-resolution mode (16 in text mode), the Portable Color Computer clearly offers itinerant computer users a break from monochrome monotony.

Luxury, however, carries a price. Partly due to its color CRT, the Portable Color Computer weighs in as the Refrigerator Perry of portables at 43.1 pounds. In other words, although it's transportable when need be, this computer is basically deskbound. And with a yeti-size footprint of 20.5 by 16.25 inches, you'd better have a big desk.

The machine's $2499 asking price nets you more than a colorful personality. The motherboard comes with 256K RAM, an 8087 socket, and a built-in parallel port. Two half-height 360K floppy disk drives are standard. In addition to MS-DOS 2.11 and GW BASIC, Sanyo throws in four programs from Computer Associates: *EasyMailer, EasyWriter II, EasyFiler,* and *EasyPlanner.* Given the machine's size, however, its two free expansion slots and 80-watt power supply seem miserly. And if you want more memory than the motherboard's maximum 256K capacity, you'll have to use one of those precious slots for a memory expansion board.

One likable aspect of the Portable Color Computer is its switchable 8088-2 microprocessor. By pressing a tiny blue button next to the parallel port, you can toggle between the machine's standard 4.77MHz clock rate and 8MHz. The documentation doesn't say how to switch the clock, however, and I had to call Sanyo for help. Aside from this omission, the guide to operations seems reasonably thorough.

Sanyo may have done its best to hide the clock button, but for once the commonly misplaced power switch is where it should be. (Why, I've often mumbled as I groped behind a computer, is the switch always in back? I don't have to crawl

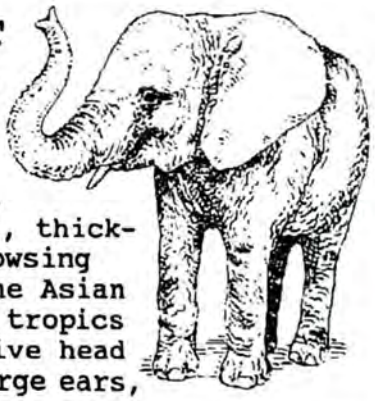
(continues)

ELEPHANT.

The world's largest and most powerful living land mammal. It is a tall, thick-skinned, browsing animal of the Asian and African tropics with a massive head and body, a long trunk, large fanlike ears, and ivory tusks. The elephant belongs to the order Proboscidea, a name which refers to its most characteristic feature, the trunk (a word derived from the French trompe, meaning trumpet or proboscis).

ELEPHANT

The world's largest and most powerful living land mammal. It is a tall, thick-skinned, browsing animal of the Asian and African tropics with a massive head and body, large ears,



Other OCR systems

The JetReader™

WHY GET JUST WORDS, WHEN YOU CAN GET THE WHOLE PICTURE.

Introducing Datacopy's JetReader™

Often business communications demand that documents be prepared combining both text and illustrations. Now with JetReader there is a high quality, low cost OCR system for your personal computer that lets you do this quickly and conveniently. The JetReader reads output from virtually any printer as well as graphic images and illustrations.

The chart shows the JetReader's capabilities. And it lets you compare its very affordable price of $2,950 to other OCR systems.

Datacopy's JetReader system comes complete with software for reading both text (OCR) and images (WIPS™). It also includes seven word processing formatters for converting the data scanned into a format compatible with the most popular word processing programs. If your favorite isn't included, our basic formatting programs will work for you.

We realize that you work with documents that are more than one page in length. Our scanner accepts up to ten pages, and then automatically reads each one, accurately creating a data file from the printed information.

	WP/ Compatible Formats	Multi-Page Autofeed	Learns New Typestyles	Word/Image Software	Price
Datacopy JetReader	7	✓	✓	✓	$2,950
Kurzweil	2	✓	✓		$36,500
Compuscan	2	✓			$5,695
Dest	5				$2,885

When you purchase the JetReader system with OCR Plus, you get the added capability of having an OCR system you can train to read the font, style, and language used in your business. That is, of course, if it's not already included in the long list of typestyles the system is factory-trained to read.

Call today to get the whole picture.
1-800-556-1234
(Inside CA please call 1-800-441-2345) and ask for extension 96.

DATACOPY

JetReader.™ When words aren't enough.

Datacopy Corporation, 1215 Terra Bella Ave., Mountain View, CA 94043 JetReader and WIPS (Word Image Processing System), are trademarks of Datacopy Corporation.

Circle 572 on reader service card

SOLID CITIZENS.

Presenting four upstanding Citizens who give faithful service above and beyond the call of duty. Citizen™ dot matrix printers, precision-engineered by the people who've become a wristhold word in fine, precision-engineered watches.

The Citizens are sleek, quiet, and reliable. They're extremely easy to use. And feature a unique push-feed paper system that makes paper loading a breeze. What's more, the Citizens are IBM®- and Epson®-compatible. Can print graphics. Can dash out output at 160 cps (40 cps correspondence-quality) or a blazing 200 cps (50 cps correspondence quality). And offer a comprehensive 18-month warranty on *all* parts and labor, including the print head.

The Citizen MSP-10/15 and MSP-20/25. Four solid reasons to stop by your dealer.

And watch what the Citizens can do for you.

For more information, call 1-800-556-1234, Ext. 34.
In California, 1-800-441-2345, Ext. 34.
Or write Citizen America Corporation,
2425 Colorado Avenue, Santa Monica, CA 90404.

CITIZEN™

© 1986 Citizen America Corporation. Citizen and the Citizen logo are trademarks of Citizen Watch Co, Ltd. IBM is a registered trademark of International Business Machines Corporation. Epson is a registered trademark of Epson Corporation.

Circle 999 on reader service card

SUPERCHARGE A PC INTO AN AT WITH MOUNTAIN'S $695 RACECARD.

Our new RaceCard™-286 can give your IBM® PC or XT™ the speed, power and performance of an IBM AT—with true reliability and at a fraction of the cost.

Simply plug RaceCard-286 into a short slot inside the PC and you're ready to run. There's no need for any kind of software modification. RaceCard-286 provides total compatibility with virtually all AT software, RAM and peripheral cards.

RACECARD IS FAST, FAST, FAST.

RaceCard-286 lets you run your software up to six times faster, using any standard PC/XT. That's because its CPU is up to 35% faster* than an AT's. An optional 80287 math co-processor is available to save time when using number-intensive software.

RaceCard-286 also comes ready to support the 3COM Ether Series, Novell, IBM's PC/LAN, NESTAR and other networks.

ONE YEAR WARRANTY.

RaceCard-286 is one reliable performer. But if service is required, it's backed by a 12-month limited warranty featuring "Ready Replacement" within the first six months.

A ROCK-SOLID REPUTATION.

Mountain's hard-earned reputation among business users over the last nine years for responsiveness, innovation and reliability means we'll be there when you need us.

TEST DRIVE ONE TODAY.

Don't be left behind in the PC performance race. With RaceCard-286 under the hood, your PC will drive faster and perform better. Call for more information and the name of your nearest Mountain dealer.

Mountain®

THE PEAK OF PERFORMANCE

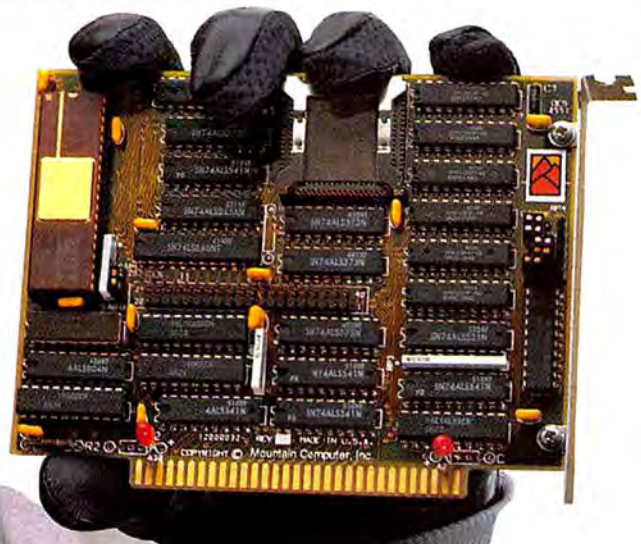
1-800-458-0300 (in Calif., 1-800-821-6066)

Circle 120 on reader service card

Mountain Computer, Inc., 360 El Pueblo Road, Scotts Valley, CA 95066, (408) 438-6650, TWX 910-598-4504, FAX 408-438-7623. Mountain products are distributed and sold worldwide. Call or write for the name of the dealer or distributor nearest you.

*Not including I/O. ®registered trademarks and ™trademarks of Mountain Computer, Inc. and International Business Machines Corp.

©1986 Mountain Computer, Inc.



KEY TRONIC...THE INDUSTRY STANDARD

ASK ANY OF OUR 200,000 CUSTOMERS WHY.

A model is available for AT&T* 6300 and 6300 PLUS systems.

Key Tronic developed the Professional Series KB 5151 Keyboard so that IBM* PC/XT* or AT* users can increase word processing speed and spreadsheet accuracy. *Today, it's the Industry Standard!*

The KB 5151 is designed to work with both the old and new models of the IBM* PC/XT* and AT*.

There are a lot of reasons why the Key Tronic KB 5151 is so popular. ***For productivity,*** the keyboard features separate numeric pad and cursor keys, as well as the top row function keys and familiar typewriter layout.

"We input a lot of numbers and the Key Tronic KB 5151 keyboard saves keystrokes and time. I keep the Num# Lock down all the time . . . the numeric pad is like a calculator — it's that much faster."

—Lael Summer
Sr. Exp. Analyst, Guardian Life Insurance Co.
New York, NY

"The KB 5151 saves a ton of time. I wouldn't have a PC without one. We have two and expect to get others."

—John Shurtleff
Controller, Reinders Brothers Inc.
Elm Grove, WI

For service, worldwide Key Tronic customer support is available *when* you need it.

"I received very prompt response from the Key Tronic service department. My problem with the 5151 keyboard was taken care of very quickly with a seven day turnaround, and I couldn't be happier."

—Diane Ward, Secretary
M-A-Com
Burlington, MA

And for quality, you can depend on Key Tronic. The KB 5151 is designed to last up to five times longer than most other keyboards.

"I haven't had any problems with it, certainly. This is a good, solid keyboard. I plan to convert my clients to use this keyboard."

—E. F. Hafemeister, Owner
MTS Consulting
Park Ridge, NJ

Buying a KB 5151 is the best way to upgrade your system to the *"Industry Standard."* See your local dealer today, or call **1-800-262-6006** for more information. (7a.m.-3p.m. Pacific Time). In Washington State call (509) 927-5515.

See us at PC Expo
July 9-11, 1986
New York City
Booth #2718

"Feel the Key Tronic Touch" ™

key tronic®

The Responsive Input Company ™

P.O. Box 14687 • Spokane, WA 99214 • USA
(509) 927-5515 TWX 510 773-1885

$25 Rebate Offer!

You can trade-in your used IBM* PC/XT* or AT* Keyboard. Buy a Key Tronic KB 5151 and receive $25. Offer expires July 31, 1986. See your local dealer or call 1-800-262-6006 for details.

*IBM, XT, and AT are registered trademarks of IBM Corporation.
*AT&T is a registered trademark of AT&T Corporation.

Circle 577 on reader service card

behind my stereo to turn it on.) Sanyo bucks tradition by putting the big, square power button right on the front panel.

The Portable Color Computer's keyboard has a responsive touch, and several important keys, including <Enter>, <Shift>, and <Ctrl>, have been enlarged. Moreover, Sanyo has moved <GrayPlus> northward, supplanting it with a second <Enter> key—an arrangement some spreadsheet users may find agreeable.

The Portable Color Computer ran *WordStar, dBASE III, Flight Simulator,* and *1-2-3* releases 1A and 2.0 without difficulty. In addition, Sanyo claims to have successfully tested *Symphony, Framework, Microsoft Word,* and a dozen other major PC packages. The company also makes a blanket claim of compatibility with programs supporting the IBM Color/Graphics Adapter.

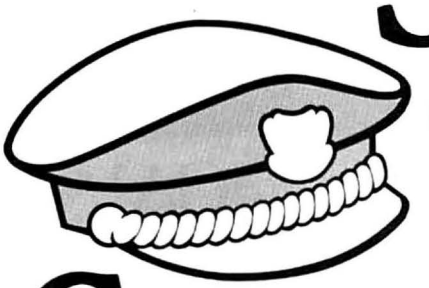
Sanyo's 28-pound MBC-675 portable, which offers monochrome graphics on a 7-inch screen (and a standard 4.77MHz clock rate), retails for $900 less than the Portable Color Computer. If color graphics are integral to your work—as an indispensable preview for presentations, for example—shelling out the extra cash may be worth your while. But for users with small budgets who are forced to choose between color and convenient mass storage, buying a portable with a

(continues)

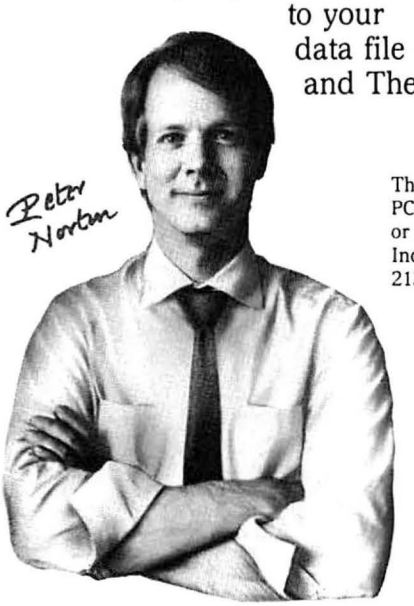
New from Peter Norton.

THE *QUICK* AND *EASY* HARD DISK MANAGER.
LETS YOU *TAKE CHARGE* OF YOUR COMPUTER.

Point. Shoot. Take Command.



Rip full throttle through your data with this time-saving control program from Peter Norton. The Norton Commander™ software gives you a fast, powerful *point and shoot* method to perform your computer operations. Point to a directory and The Commander jumps to it. Point to your data file and The Commander runs your data with its matching program. Speed through listings, update files like lightning. Delete. Copy. Built-in sweep functions manage your disk. Add your own user menus for one-key operation. *And it doesn't eat up your screen while it's doing it.* Easy to use with keyboard or mouse. The Norton Commander. The quickest way to enhance your PC, and *take command.*



The Norton Commander. Designed for the IBM® PC, PC-AT, and DOS compatibles. At your software dealer or order direct for $75 from Peter Norton Computing, Inc., 2210 Wilshire Boulevard, Santa Monica, CA 90403. 213-453-2361. Visa and Mastercard welcome.

THE NORTON COMMANDER™

The Norton Commander™ is a trademark of Peter Norton Computing, Inc. © 1986 Peter Norton Computing. IBM® is a registered trademark of International Business Machines Corporation.

EGA? QUADRAM, OF COURSE.

Move ahead with the Quadram EGA Solution. Together, our new enhanced monitor and video board deliver the extended color selection and crisp resolution that makes all your work look better. And when your work looks better, you look better too.

QuadChrome Enhanced Display

Begin your move with our new EGA monitor, for brilliant graphics in enhanced mode and bright, colorful displays in standard mode. A big 13" screen, built-in green/amber switch for extra sharp text, and a tilt/swivel base combine to bring you comfortable, easy-on-the-eyes viewing.

QuadEGA+ Graphics Adapter

Next, our full-performance EGA board, 100% compatible with the four PC display standards: Enhanced graphics. Standard color graphics. Hercules monochrome graphics. And monochrome text. Across the board compatibility like this means you can use all your current software and still be prepared for the future. Plus, with both our EGA board and monitor, you get an extended two year warranty for the ultimate in reliable performance.

Where do you go for EGA performance like this? Your authorized Quadram dealer, of course. Don't wait. Move ahead now. For more information, contact us at One Quad Way, Norcross GA 30093; (404) 564-5566.

IBM is a trademark of International Business Machines, Inc. Hercules is a trademark of Hercules Graphics Products. QuadEGA+ and QuadChrome Enhanced Display are trademarks of Quadram Corp. Quadram and the Quadram logo are registered trademarks of Quadram Corp.

The Quadram EGA Solution
BOARD $595 MONITOR $795

QUADRAM®
An Intelligent Systems Company

Circle 217 on reader service card

hard disk would be a far better choice. Your programs may not look as pretty, but they'll perform beautifully. *–Jason Durbin*

MBC-775e Portable Color Computer
Sanyo Business Systems Corp.
51 Joseph St.
Moonachie, NJ 07074
201/440-9300
List price: $2499, Model 775 (no switchable clock) $2299

PC MacBridge

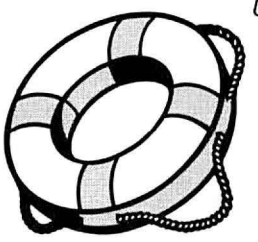
Tantalizing... but out of reach. That's how millions of PC users view Apple's LaserWriter, with its high speed, powerful PostScript page description language, and full-page, high-resolution graphics. To satisfy this mass yearning, Tangent Technologies has created PC MacBridge, an add-on board that enables you to send output from a variety of PC programs to the LaserWriter via the AppleTalk local area network.

Of course, there are other ways to link a PC to a LaserWriter, the most common of which is to connect the two via your PC's serial port and use *Microsoft Word*'s PostScript output. In the real world, however, most LaserWriters are already hooked up to one or more Macintoshes, making the PC MacBridge and AppleTalk connection one of the most practical ways for a PC to access high-quality LaserWriter output–and chat amiably with Macs along the way.

(continues)

You know I can rescue your data.

It's no secret. Thousands of business and home users have used my Norton Utilities™ software to restore precious data erased or deleted by accident. Mr. Kriley of Los Angeles lost his thesis and found it using my *UnErase*™ feature. He writes: "I owe my degree to Peter Norton." Computer pundit Jim Seymour says "Norton has saved my posterior with *UnErase* so many times—it's wonderful, Peter!"



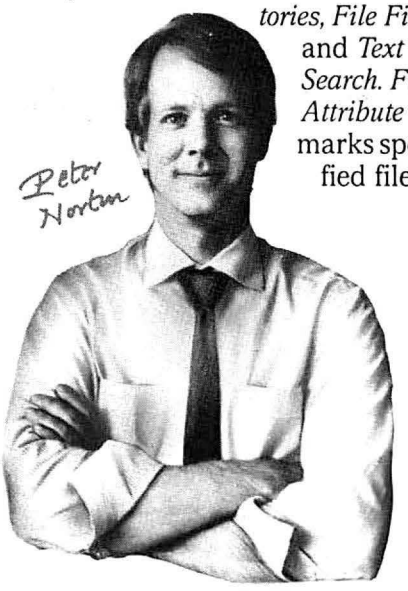
A life saver for your data.

UnErase is a powerful utility that lets you systematically search for lost data and retrieve it with a few simple commands. It makes The Norton Utilities the highly acclaimed industry standard for data recovery.

Now what can I do for you *every day?*

You don't lose data every day. That's why there's more to the package than just the *UnErase* program. My other utilities perform a wide variety of organizational and maintenance tasks that keep your PC organized and your data secure. They have names like *List Directories, File Find* and *Text Search. File Attribute* marks specified files so they cannot be altered or erased. *Wipe File* deletes data by file. *Wipe Disk* clears your entire disk.

Other utilities measure available file space, test your disk for damage, and measure your computer's performance. *PC Magazine* calls The Utilities "Indispensable." *The New York Times* says "Don't compute without it." Peter McWilliams (*The Personal Computer Book*) says "You'll bless this disk." Dozens of features keep your data in line. Every day.



The Norton Utilities. Designed for the IBM® PC, PC-AT, and DOS compatibles. Available at Computerland and most software dealers. Order direct for $99.95 from Peter Norton Computing, Inc., 2210 Wilshire Boulevard, Santa Monica, CA 90403. 213-453-2361. Visa and Mastercard welcome.

THE NORTON UTILITIES™
DATA RECOVERY
DISK MANAGEMENT

A life saver for your data.

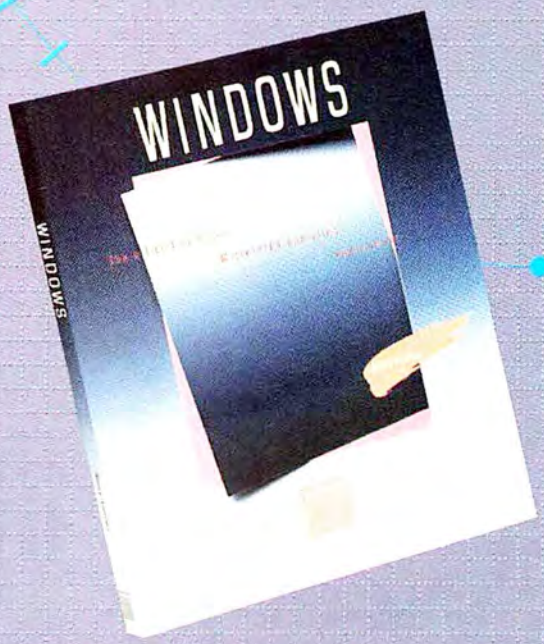
The Norton Utilities™ and *UnErase*™ are trademarks of Peter Norton Computing, Inc. © 1986 Peter Norton Computing. IBM® is a registered trademark of International Business Machines Corporation.

The book that opens

WINDOWS

The Official Guide to Microsoft's Operating Environment

If you're a serious computer user, you don't want to miss out on the bright new era of exciting, efficient, and powerful computer use that Microsoft® Windows heralds. Start using this graphics-based, low-cost MS-DOS® operating environment with a copy of the Microsoft Press title WINDOWS at your side. Discover how you can integrate the applications of your choice: word processor, spreadsheet, database, or any other MS-DOS® software. Learn to use them in unison — run them together, switch among them effortlessly, and transfer information — as you juggle assignments during your working day. WINDOWS will also introduce you to the handy built-in desktop accessories (Notepad, Clock, Calendar) and Windows' competent applications (Write and Paint). WINDOWS . . . from Microsoft Press . . . the logical complement to your new operating environment. By Nancy Andrews.



$17.95 Available wherever books and software are sold.

Microsoft Press
16011 NE 36th Way
Redmond, WA 98073-9717

MICROSOFT PRESS

PC MacBridge comes with three programs, including LaserGraph, which lets you create bar, pie, and line charts on the LaserWriter, and MailBox, which supports file transfer via the AppleTalk network. *LaserScript* is the heart of PC MacBridge, however, because it enables you to use the LaserWriter for printing *WordStar, MultiMate, 1-2-3,* or ASCII text files.

LaserScript provides commands that take advantage of some of PostScript's most attractive features. For example, the *WordStar*-to-PostScript converter enables you to select typefaces, change font sizes, and print members of the extended character set by using *WordStar*-like commands or by embedding PostScript commands within a document. Other commands let you select page dimensions, set tabs for proportional fonts, and insert graphs into text documents.

Using PostScript commands, pasting graphics into text documents is easy. For instance, if you want to use a horizontal bar in key spots throughout a document, you create a small file containing the appropriate commands. Then, whenever you need the bar, you embed a command within the document calling on that file.

Unfortunately, the PC-PostScript connection isn't flawless. When you convert *WordStar* files to PostScript, for example, *LaserScript* won't change the location of line breaks if lines have been lengthened or shortened by proportionally spaced fonts. If you opt for right-justification, the software simply adds space between words in the short lines, an expedient that often produces excessively "airy" text.

PC MacBridge offers extra options for spreadsheet and business graphics users. For instance, the conversion program for *1-2-3* enables you to print extra-wide spreadsheets using a small font and landscape (sideways) printing. And for *1-2-3* graphs, you can exploit LaserWriter's wide variety of fonts to create more attractive labels.

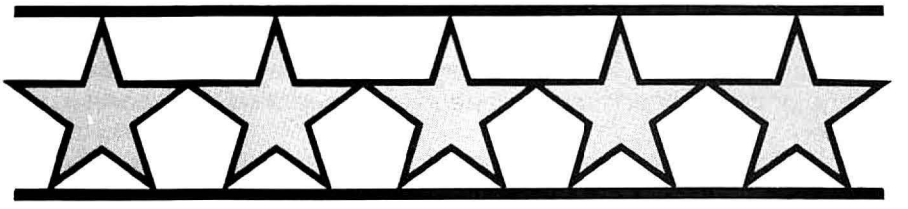
The nascent personal computer publisher can also use PC MacBridge's Mail Center to access the page makeup and graphics power of the Macintosh. Over the AppleTalk network, you could send PC text files to a Mac, do the layout with Aldus's *PageMaker,* and send the polished product to a LaserWriter on the same network.

If you want to save an expansion slot, you can buy *LaserScript/S,* a version of *LaserScript* that performs the same output conversions but relies on a direct RS-232C link to the LaserWriter. However, a software-based, one-to-one connection between a PC and a LaserWriter is not only slower than the PC MacBridge solution, it's also a bit selfish. If you want to use a high-class machine like the LaserWriter, you've got to be prepared to share it with a Mac. *—Ted Nace*

PC MacBridge
Tangent Technologies
5720 Peachtree Pkwy. #100
Norcross, GA 30092
404/662-0366
List price: $650, LaserScript/S $250

(continues)

THE NORTON COMMANDER™



New from Peter Norton.

THE *QUICK* AND *EASY* HARD DISK MANAGER.
LETS YOU *TAKE CHARGE* OF YOUR COMPUTER.

Call or write for free brochure. Program available direct for $75 from Peter Norton Computing, Inc., 2210 Wilshire Boulevard, Santa Monica, CA 90403. 213-453-2361.

The Norton Commander™ is a trademark of Peter Norton Computing, Inc. © 1986 Peter Norton Computing

How Does One Air Express Office Send Another Air Express Office a List of What's Coming?

Next time you have a lengthy message to send cross country, load it into your computer instead of a plane. It's a lot faster.

Our Crosstalk software and a modem can make it possible for your PC to communicate almost instantly with almost any other computer in the world, over ordinary phone lines.

In minutes, you could send or receive a 10-page report, an inventory list, or anything else you'd like to have in someone else's hands right now. You can speed the way you do business, no matter where you do business.

Crosstalk facilitates communication among different computer brands, operating systems, and modems. It even makes it possible for your PC to become a smart remote terminal to almost any dial-up computer — your company mainframe, for example, or an information utility such as CompuServe.

CROSSTALK XVI

Because Crosstalk is so easy for beginners to use and so versatile for experts, it's become the most popular microcomputer communications program available. Ask your dealer, or send for our brochure.

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 3007

CROSSTALK is a registered trademark of Microstuf, Inc.
CompuServe is a Servicemark of H&R Block

Circle 275 on reader service card

C&C Computers and Communications

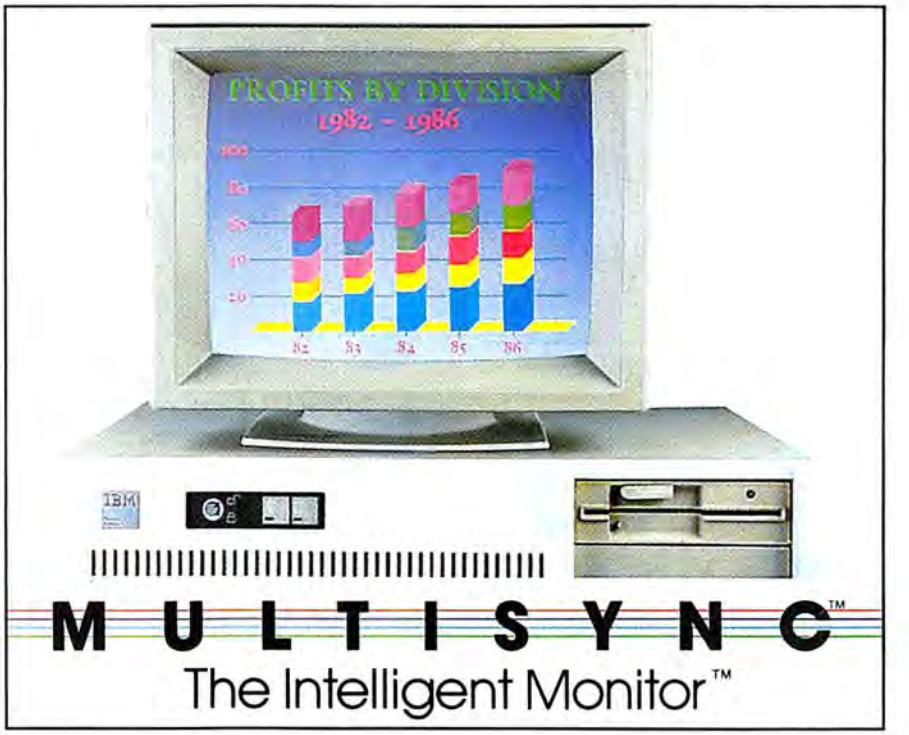
Your first color monitor should be good enough to be your last.

NEC introduces the only color monitor you need. Superb resolution plus MultiSync for across-the-board compatibility with all three PC graphics boards made by IBM,® for business graphics, CAD/CAM, computer art, and text.

Now there's one high resolution color monitor that does things your way. The MultiSync™ monitor from NEC.

It gives you the best color resolution available at the price.

- Compatibility with the IBM Professional Graphics Adapter, the IBM Enhanced Graphics Adapter, and the IBM Color Graphics Adapter.



Compatibility with the IBM® Enhanced Graphics Adapter Board

- MultiSync, the NEC feature that automatically adjusts to color adapter board scanning frequencies from 15.75 KHz to 35 KHz—suggesting the possibility that the MultiSync monitor might be compatible with *all* color graphics boards that are fully compatible with the IBM PC, PC/XT, and PC/AT, now and in the future.
- Full implementation of high resolution graphics software for business and other applications, now and in the future.
- And color capability limited only by the board being used.

See Things Our Way

Until now, you had to choose different color monitors for compatibility with all three PC color graphics boards made by IBM. With so many board and monitor configurations, folks didn't know which way to look.

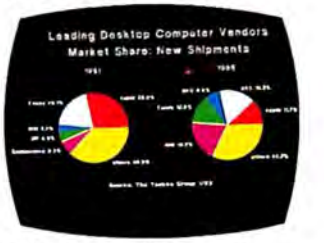
The new MultiSync color monitor gives you unique compatibility. As well as TTL and analog color. With 7 switchable text colors. And resolution up to maximum 800 horizontal dots and maximum 560 vertical lines, on a large, 13″ diagonal viewing area.

All that, priced at just $799. All from NEC, a name respected around the world for advanced, reliable products backed by nationwide service.

Compatibility with the IBM® Professional Graphics Adapter Board

It's the one color monitor that does everything your way.

Compatibility with the IBM® Color Graphics Adapter Board



But why talk more about it? Visit your nearest dealer and see a graphic demonstration of the new NEC MultiSync monitor's capabilities. Then draw your own conclusions.

For information dial

1-800-447-4700

NEC HOME ELECTRONICS (U.S.A.) Inc.
Personal Computer Division
1401 Estes Avenue
Elk Grove Village, IL 60007

NEC

Circle 194 on reader service card

MONEY

MANAGE IT WITH hBUDGET™

hBUDGET is a CADILLAC of personal and small business accounting software. Easy to use, extensive capabilities. Now prints checks in any format! Compatible with newest portable PC's!

For IBM PC and compatibles
ASK US FOR MORE INFORMATION

$ 19 demo package-FULL FUNCTION, limited data storage sufficient for approx. 2 months use (5 program disks, "print your own" manual on disk). Credit toward purchase of:
$ 89 program package (5 program disks, "print your own" manual on disk)
$ 155 full package (5 program disks, elegant IBM style manual with slip case, phone support, free upgrades

Phone orders, M.CARD/VISA, checks, add $3 shipping and handling, Wisconsin residents add 5% sales tax

OAK PARK SOFTWARE Inc.
PO Box 710 Milwaukee WI 53201-0710
(414) 797-7911

Circle 391 on reader service card

RS-232C SWITCHBOX

BOOSBOX

- 1 port to 5 devices
- serial interface
- gold-plated contacts
- ceramic wafer switch, silver contacts
- free user-designed switchplates
- custom cables available
- inexpensive
- reliable $99.50

Write for brochure

BOOSBOOS CORP.
PO Box 432, Broad Street
Three Bridges, NJ 08887
201-782-3853

Circle 571 on reader service card

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)
QUANTITY ONE PRICES SHOWN

OUTSIDE OKLAHOMA: NO SALES TAX

640 Kbyte MOTHERBOARD KITS: Zenith 150: $78.10 IBM PC/XT, Compaq Portable & Plus; hp Vectra

DYNAMIC RAM

256K	64Kx4	150 ns	$4.37
256K	256Kx1	100 ns	4.87
256K	256Kx1	120 ns	3.35
256K	256Kx1	150 ns	2.95
128K	128Kx1	150 ns	4.55
64K	64Kx1	150 ns	1.40

8 Mhz $ 17.50
8 Mhz $365.00

EPROM

27512	64Kx8	250 ns	$28.00
27C256	32Kx8	250 ns	7.85
27256	32Kx8	250 ns	5.45
27128	16Kx8	250 ns	3.90
27C64	8Kx8	200 ns	5.10
2764	8Kx8	250 ns	3.45

V20/V30 $175.00
80287-8 $125.00

STATIC RAM

43256L-12	32Kx8	120 ns	$50.00
6264LP-15	8Kx8	150 ns	3.10
6116LP-3	2Kx8	150 ns	2.10

8087-2
8087-3

OPEN 6½ DAYS: WE CAN SHIP VIA FED-EX ON SAT.

NO EXTRA COST FOR FED-EX SAT DELIVERY ON ORDERS RECEIVED BY Th 9st Air $8/4 lbs Fr P One $13/2 lbs

MasterCard VISA or UPS CASH COD
Factory New, Prime Parts
MICROPROCESSOR UNLIMITED, INC.
24,000 S. Peoria Ave.
BEGGS, OK 74421 (918) 267-4961
Prices shown above are for May 19, 1986

Please call for current prices. Prices subject to change. Please expect higher or lower prices on some parts due to supply & demand and our changing costs. Shipping & insurance extra. Cash discount prices shown. Orders received by 6 PM CST can usually be delivered to you by the next morning, via Federal Express Standard Air = $6.00, or Priority One = $13.00*

Circle 103 on reader service card

A mere $1350 nets you the FD-1000 from PC Designs, an XT-compatible kit that comes with a monochrome monitor and 1MB of RAM.

FD-1000 Personal Computer

Down, down, down tumble hardware prices, as Korea, Japan, Hong Kong, and Taiwan ply their PC wares through America's mail-order houses. These days you can get a generic PC for a song, and if you want to save your vocal cords, you can go an even less expensive route and order your computer as a kit.

PC Designs is one of those mail-order houses with ubiquitous ads offering cut-rate clones under plain brown wrappers. The company's FD-1000 PC XT compatible includes a Princeton MAX-12E amber monitor, two half-height Mitsubishi 360K floppy drives, 1MB of RAM on the motherboard, and an 8088-2 CPU that you can toggle between 4.77MHz and 8MHz. The price tag for this fully packed box is a mere $1350, the only catch being that the machine comes in pieces.

To test the FD-1000's ease of assembly (and, incidentally, the intelligence of a real estate investor), I decided to give my computer-neophyte husband a crack at putting the machine together. "But I barely know the difference between RAM and a disk drive," John complained. "How can I put a computer kit together?"

"If you get into real trouble, I'll help you," I promised. Within hours of opening the packing case, John was in a panic. "Where's the motherboard?" he wailed. "And what's the difference between a hard disk controller and a video adapter?"

Well, perhaps the test was a bit unfair, but it illustrates two important points. First, assembling a PC kit requires familiarity with basic components (i.e., you can't bolt down a power supply unless you know what one looks like). Furthermore, you need accurate, detailed instructions to get the job done. One of John's problems was an out-of-date manual that hadn't been upgraded as fast as the FD-1000; being a novice, he couldn't sort the relevant instructions from the obsolete ones. PC Designs assured us that the manual is being updated.

In the meantime, my expertise had to suffice, and a closer look at the FD-1000 revealed an even richer set of features than I'd first

(continues)

For $2495, what you see is what you get.

MANUFACTURER'S BASE MODEL	SUGGESTED RETAIL PRICE*	PROCESSOR SPEED	EXPANSION SLOTS	MONEY-BACK GUARANTEE
VICTOR V286	$2495	6 to 8Mhz	8	YES
IBM PC/AT	$4360	6Mhz	6	NO
COMPAQ DESKPRO 286	$3995	6 to 8Mhz	6	NO

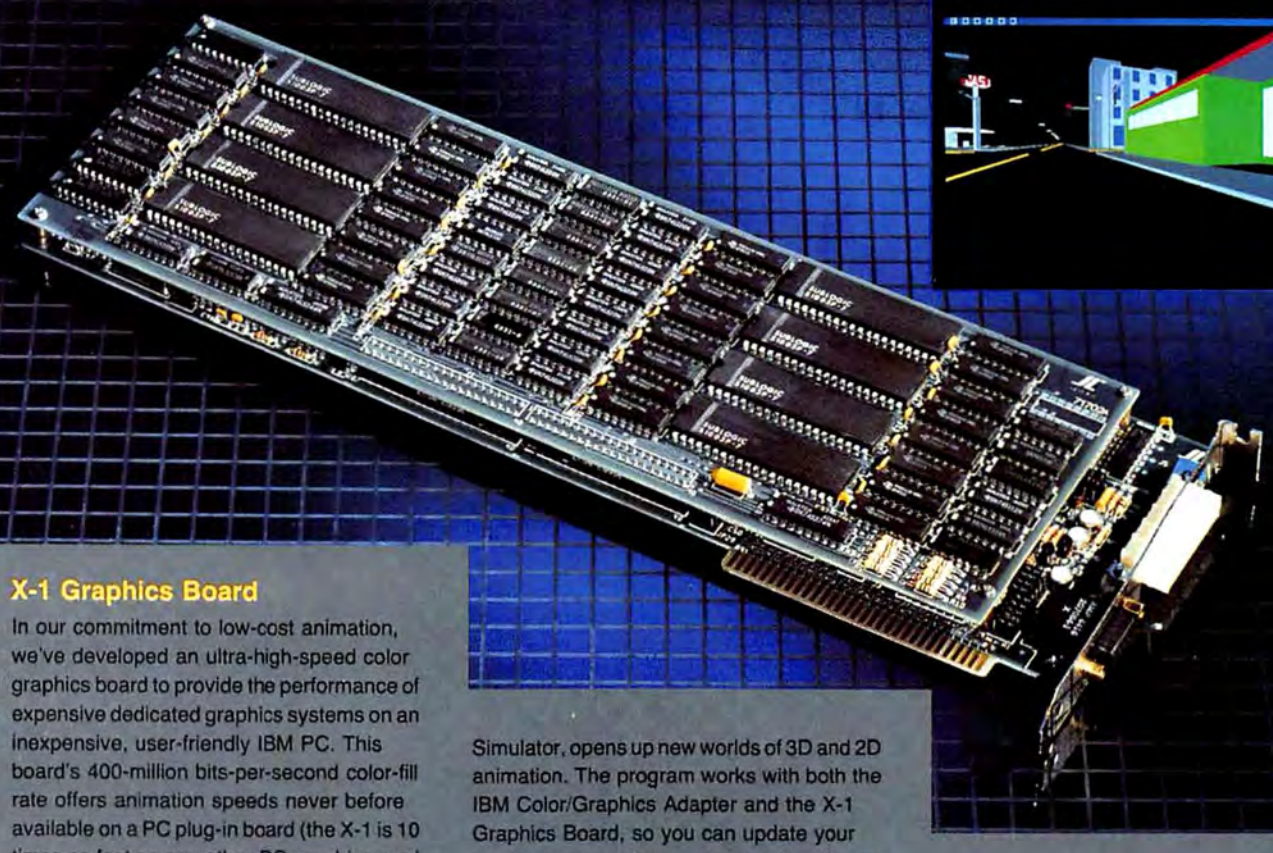
The simple fact is, you get more with the Victor V286.™More speed. More features. More for your money. You also get more peace of mind. Because the Victor V286 comes complete with nationwide servicing through Xerox.®And a 30-day **Money-Back Guarantee,** an offer you won't see from anyone else. You won't see any software compatibility problems either. The V286 runs most every program faster than the IBM, but a flip of a switch will slow it down to mirror the AT and let you run the most finicky programs flawlessly. We've also equipped the V286 with features IBM considers options. Features you'll consider necessities. You can even expand the memory to 1 MB without using option boards. Those are just a few of the reasons the Victor V286 should be your next computer. For a more complete picture, and your nearest Victor dealer, call Cindy at 1-800-248-5252.

*Does not include monitor or video board.
Totals for comparably equipped models as of 5/14/86. IBM and IBM Personal Computer AT are trademarks of International Business Machines Corporation. COMPAQ and COMPAQ DESKPRO are trademarks of COMPAQ Computer Corporation.
†Available from participating dealers.

VICTOR®
Scotts Valley, CA (408) 438-6680

Circle 521 on reader service card

High-Speed Animation on Your IBM PC!



X-1 Graphics Board

In our commitment to low-cost animation, we've developed an ultra-high-speed color graphics board to provide the performance of expensive dedicated graphics systems on an inexpensive, user-friendly IBM PC. This board's 400-million bits-per-second color-fill rate offers animation speeds never before available on a PC plug-in board (the X-1 is 10 times as fast as any other PC graphics card we've seen). The low-cost, high-performance X-1 Graphics Board opens up entirely new applications for microcomputer-based graphics.

3D Graphics Software for use with the Standard IBM Color/ Graphics Adapter or X-1 Graphics Board

Our 3D Graphics software, the graphic drivers behind Jet and Microsoft Flight Simulator, opens up new worlds of 3D and 2D animation. The program works with both the IBM Color/Graphics Adapter and the X-1 Graphics Board, so you can update your hardware at any time and maintain software compatibility.

Specs: The X-1 Graphics Board is available for $2990, and requires an IBM PC or PC-compatible computer with minimum 128K RAM, PC-DOS or MS-DOS Version 2.0 or newer, and an X-1 compatible RGB display monitor.

The 3D Graphics software is available for $995, and requires an IBM PC or PC-compatible computer with minimum 256K RAM, PC-DOS or MS-DOS Version 2.0 or newer, and either an IBM Color/Graphics Adapter or the X-1 Graphics Board.

See your dealer for details and a special hardware/ software demonstration, or call SubLOGIC directly for more information.

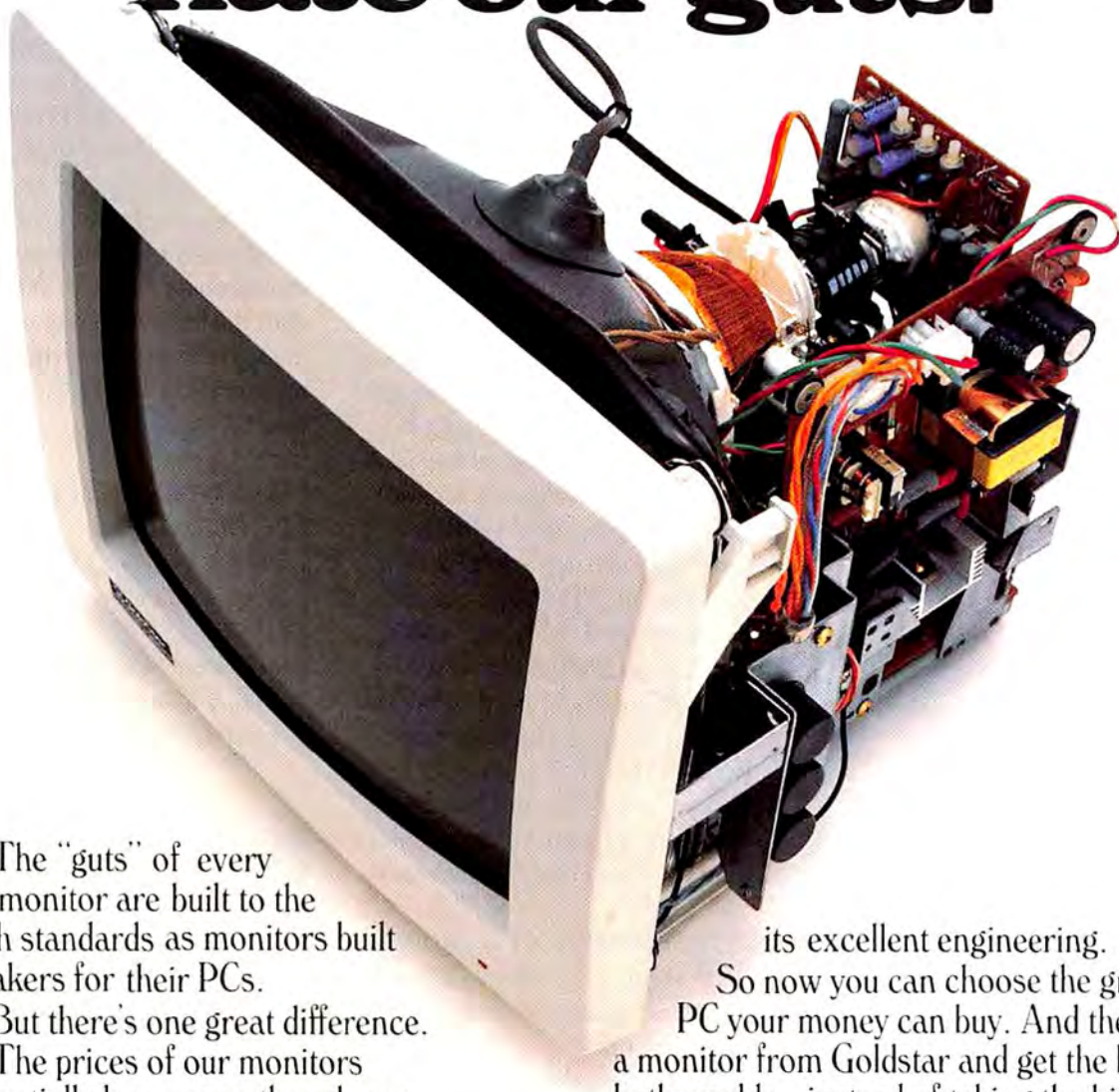
IBM is a registered trademark of International Business Machines Corp.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

Circle 467 on reader service card

Why our competitors hate our guts.



The "guts" of every Goldstar monitor are built to the same high standards as monitors built by PC makers for their PCs.

But there's one great difference.

The prices of our monitors are substantially less—even though our monitors are designed for IBM PCs and compatibles.

We offer a complete line of color and monochrome monitors with specs that are equal to or better than the leading competition.

For example, our MCH-4015 13" RGB color monitor has a chemically-etched non-glare screen, .31mm dot pitch, 790 maximum lines and 25 MHz bandwidth for superb resolution and performance.

Every Goldstar monitor is backed by 250 service centers all over the U.S., and by a company with sales of $8.7 billion worldwide that is internationally known for its excellent engineering.

So now you can choose the greatest PC your money can buy. And then pick a monitor from Goldstar and get the best of both worlds—instead of taking the high-priced monitor the PC maker supplies.

The more our competitors dislike us, the more you'll love us.

MBM-2015 12" Monochrome Monitor and MCH-4015 13" Color Monitor

GoldStar®

Expensive electronics. Without the expense.

©1985 Goldstar Electronics, Int'l. Inc. Lyndhurst, N.J. 07071

Circle 392 on reader service card

TRY BEFORE YOU BUY
SOFTWARE $6 EA.
(User Supported) Programs

PC-WRITE (easy to learn word processor)
FILE EXPESS (NEW! database manager 192K)
FILE EXPRESS #2 (complete user manual & utilities on disk)
PC-DBMS (relational database-req. manager 192K)
QMODEM (new-fast-versatile-modem comm. 192K)
GL & AR (general ledger with accounts receivable)
PC-DESK (calculator-files-notepad-clock-labels-more)
PC-DESKMATES (9 pop-up window desk aids & utilities)
GEN. LEDGER (double entry bookkeeping)
COLOR GAMES (frog, packman, kong, space war, pyramid)
MONO GAMES (castle, star ships, bugs, golf, pitfall)
GAMES DISK (flight, startrek, spacevad, slots & more)
ULTRA UTILITIES (recover lost files, examine sectors)
WORDFLEX (easy to use word processor)
TIME & MONEY (home finance mgr. & computation aids)

The above programs were written for IBM-PC, XT and PC-jr
Will run on most true compatables. SPECIFY if for the PC-jr

6 FOR 29.95 OR 10 FOR 44.95
YOUR CHOICE
SOFT/PLUS RESEARCH
P.O. BOX 590
13080 Hwy. 253
BOONVILLE, CA 95415

INFORMATION (707) 895-2210 [all orders please include $3 shipping & handling] [credit card orders $10 min. please] ORDERS (800) 852-5888
8:30 a.m.-4:30 p.m. west coast time Monday thru Friday

Circle 850 on reader service card

DYNAMIC RAMS

41256	100ns	$5.85
41256	120ns	$3.35
✓41256	150ns	$2.75
4164	120ns	$1.40
✓4164	150ns	$1.30
4464	150ns	$5.50

■ PROCESSORS

8087-2	8mHz	$160.00
8087-3	5mHz	$115.00
80287-3	6mHz	$179.00
80287-8	8mHz	$ CALL
V-20	8mHz	$ CALL
V-30	8mHz	$ 20.00

■ STATIC RAMS

6264LP-15	150ns	$2.95

■ E. PROMS

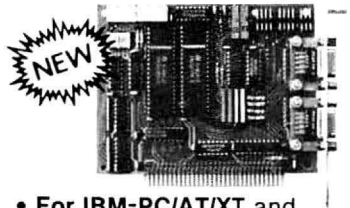
27C256	250ns	$8.50
27256	250ns	$7.50
27128	250ns	$3.95
27C64	200ns	$5.25
2764	250ns	$3.50
2732A	250ns	$4.25

■ 8000's (Parts in stock)

I.C.EXPRESS
15358 Valley Blvd., City of Industry, CA 91746
Phone: 818-369-2688 (Mon-Fri • 8-5)
ORDER TOLL FREE
(800) 892-8889 • (800) 882-8181
Outside California Inside California
CALL FOR CURRENT PRICES & VOLUME DISCOUNTS.
Price Shown for Cash • MasterCard/VISA add 3% more
Prices are subject to change. Minimum order $10.00
California residents must add 6.5% sales tax
Shipping & Handling: UPS Ground $5.00, UPS Air $7.00 (under 1 lb.)
ALL MERCHANDISE IS 100% GUARANTEED.

Circle 684 on reader service card

RS-422
Communications Board



- For IBM-PC/AT/XT and compatibles
- Dual RS-422 serial interface
- Programmable to 56k baud
- Differential drivers to 4000 ft.

$345.00
QUA TECH, INC.
478 E. Exchange St. Akron OH 44304
(216) 434-3154 TLX: 5101012726

Circle 570 on reader service card

surmised. In addition to the monitor, memory, and floppy drives, you get a 140-watt power supply, five free full-size expansion slots, and a choice of XT or AT keyboard styles. Built into the motherboard are two serial ports, two parallel ports, and a battery-driven clock/calendar.

The unit is already wired to handle up to four floppy drives and can accept a 20MB hard disk (a Seagate 20MB drive is available from PC Designs for an additional $495). A bevy of other low-priced accessories can be purchased from the company, such as an 8087-2 math coprocessor ($185), Key Tronic's 5151 keyboard ($75), and BSR's Astec 300/1200-bps internal modem ($179). If you need color, you have a choice of The Edge from Everex ($125) or a Hercules Color Card ($75), and you can couple either board with a Princeton Graphics HX-12 RGB Monitor ($325).

The FD-1000's XT-compatible BIOS seems to accommodate most popular PC software without difficulty. In both 4.77MHz and 8MHz modes, the machine ran DOS 3.10, *dBASE II* and *III*, *SuperCalc*, *WordStar*, *DisplayWrite 3*, *PC-Talk*, *ProKey*, and a number of public domain utilities. When I tried swapping peripherals with an IBM Portable PC, the FD-1000 displayed equally impressive hardware compatibility.

With some coaching, John ultimately succeeded—his machine passed the smoke test the first time he turned it on. If you're used to opening up your PC, you should be able to assemble the FD-1000 with a screwdriver and a pair of pliers in less than 2 hours. In addition, PC Designs offers a toll-free service line and backs up the machine with a 30-day money-back guarantee and a one-year warranty on parts. The stability of mail-order firms is often a wild card, but the prolific array of name-brand options—plus the abundant built-in features—should make the FD-1000 a favorite with the bargain hunter who likes to say, with a manic grin, "I built my computer from a kit!" —*Linda Gail Christie*

FD-1000 Personal Computer
PC Designs, Inc.
5837 S. Garnett
Tulsa, OK 74146
918/252-5550
List price: 1MB RAM and two floppy disk drives $1350, 20MB hard disk $495

SideDialer

There are power users . . . and benighted users. If you have an empty slot that's likely to stay that way, and if your job entails endless hours on the phone (salespeople take note), SideDialer from Quadtel may save your fingers from fatal fatigue. A hardware/software package for $55, SideDialer is the auto-dial solution for those who need a modem like Kareem Abdul-Jabbar needs elevator shoes.

The SideDialer package bundles a RAM-resident utility on disk with a pint-size board that sports

(continues)

We have a complete line of the finest software available for only

$29.95 each

INTRODUCTORY OFFER
(or order any three packages and pay only $75.00)

Look at all of the features which our packages include!

You will discover that software doesn't have to be expensive to fill all of your needs. Our software runs on the IBM PC, XT, AT, PC Jr. and true compatibles. The accounting packages and WindowMaster require two floppy disk drives or a floppy disk and a hard disk drive.

THE General Ledger:

- Verifies all data input
- Totals entries to check balances
- Supports multiple departments or profit centers
- Proofs input data onto paper for auditing
- Lets you specify recurring journal entries
- On-line inquiry for account status
- Reports include: Income Statement, Balance Sheet, Chart of Accounts, General Ledger Report, Accounts Distribution Report, Trial Balance
- Prints Financial Statement in flexible, user-defined format

THE Accounts Payable:

- 5 transaction types: Release, Hold, Void, Prepaid and Credit Memos
- Access invoices for payment or inquiry
- Priority status or projected payment date available for each voucher
- Maintains numeric control over checks
- Complete payment information on voucher stub checks
- Computes discounts
- Writes automatic payables schedule
- Automatic vouchers for recurring items
- Allows partial payments
- Reports include: Aged Trial Balance, Two Pre-check Reports, Aged Cash Requirements, Vendor History Report, Check Register, Checks, Summary of Accounts Distribution Vendor List, Account List

THE Accounts Receivable:

- Balance forward or open item billing
- Automatic computation of late charges or interest rates
- Handle cash, C.O.D. or credit customers
- Specify any 3 invoice aging periods
- Print statements at any interval
- THE A/R posts cash receipts or invoices to customer accounts, types customer statements and reminder notices, and organizes and prints management information reports
- Automatically records recurring charges
- Reports Include: Aged Trial Balance, On-Line Enquiry, Batch Proof, Accounts Distribution Report, Customer Statements, Customer Lists, Invoice & Cash Batch Proof, General Ledger Update
- Optional dunning letters

THE Order Entry:

- Processes invoices singly or in batches
- Up to 99 lines items per order
- Held (unshipped) items are marked on the Order Report
- THE O/E system automatically shows customer credit rating
- Each invoice depletes THE Inventory automatically
- Sends accounting transactions to THE Accounts Receivable
- Assign separate line item amounts to independent sales and receivables accounts
- Checks stock quantities in THE Inventory and notifies you when back orders are required
- Stock depletions will be automatically reported in THE Inventory
- Detailed invoice information
- The Order Report provides urgent information on every order

THE Inventory:

- Perfectly suited to retail environment
- Simple transactions for: addition, deletion, alteration and examination
- Complete current statistics on each inventory item
- Activity statistics for current or to-date period
- Instant on-line inquiries
- Optional hard copy record of all inventory transactions for auditing
- 13 digit, user-definable alphanumeric part number
- 30 character description field
- Reports include: Activity Report, Valuation Report, Auditability Proof, Reorder Report, Item List, and Item File Print

THE Payroll:

- Handles any combination of weekly, biweekly, semimonthly & monthly pay schedules
- Define up to 20 earning or deduction categories for all employees
- Assign any 8 categories for each employee
- Accountants can perform after-the-fact payroll processing
- Prints information for government reports
- Salary expenses can be distributed to different departments, branches or profit centers
- System includes safeguards and verification procedures
- Reports Include: Company History, Pay Transaction Proof, Calculations Proof, Employee History, Employee Master List, Check Register, Payroll Journal, Vacation report, 940 & 941 Reports, W2 Forms, & Prints Checks
- Of course, THE Payroll calculates payroll including Federal & State taxes, prints checks, allows hand written checks, lets user maintain tax tables and keeps an extensive employee payroll history

THE Name & Address System:

- Create name & address files
- Print mailing labels
- Sort files by up to 4 items
- Search or sort by match or range
- Print a report of a NAD file
- Merge files
- 88 character open reference field
- Sort by any character in reference field
- 10 number zip code

THE Spreadsheet:

- On-line tutorial
- Cut & paste multiple spreadsheets
- Format: Global, Column, Row, Entry
- Arrays: Copy, Replicate, Move, Insert, Delete, Blank
- Labels: centered, right or left justified
- Variable cell width
- 2 Windows to view separate areas of worksheet
- 20 special math functions
- Manual or automatic recalculation
- Complete glossary of spreadsheet terms
- Maximum spreadsheet size: 255 Rows x 64 Columns
- Variable print formatting options
- Simple editing functions
- Status on contents of any cell
- Set hold on any row or column to prevent srolling
- On-line help

THE Wordprocessor:

- On-line help
- Powerful editing: Erase, Copy or Cut & Paste characters, words, sentences, lines, paragraphs, pages, or user-defined blocks of text
- Automatic word wrap-around (may be turned off)
- User-defined page breaks, soft hyphen, tab, indent and margin settings
- Proportional & justified printing
- Global Search & Replace, Automatic & Examine
- Optional command character viewing
- Superscript and subscript
- Phrase files for boilerplate
- Print bold, centered, underline
- Edit ASCII files
- Right or left justification
- Hyphenation

THE Mailmerge:

- Integrates THE Wordprocessor & THE Name & Address System
- Mass mailings
- Specialized mailings to select groups in your Name & Address System.
- Can read A/R customer file, A/P vendor file and payroll employee file so you may send customized Wordprocessor letters

WindowMaster:

Our windowing system lets you integrate your application programs. You can run up to 7 applications simultaneously. Run THE Payroll and print checks while you are using THE Wordprocessor. Or enter orders with THE Order Entry while THE Spreadsheet performs a lengthy calculation and THE Mailmerge prints letters for a mass mailing. The simple interwindow transfer feature allows you to pass data from one application to another. The powerful keyboard enhancer lets you program keys on your keyboard to perform special functions which would otherwise require many keystrokes. You can also redefine keys. WindowMaster integrates your IRE applications and enhances your computer.

CALL TODAY TOLL FREE:

1-800-227-2400

Ask For Extension 937

In California:

1-800-772-2666, Ext. 937

(Lines Open 24 Hours, 7 Days a Week)
FOR MORE INFORMATION CALL:
(415) 268-1435

ACCOUNTING PACKAGES: FULLY INTEGRATED OR STAND-ALONE WITH COMPLETE AUDIT TRAILS

Indian Ridge Enterprises, Incorporated

508 Second St., Oakland, CA 94607 Dept. PC

$29.95 each or $75.00 for any 3 packages. Please Include Shipping & Handling charges listed below. Credit Card Orders by Phone OR Send Check OR Money Order with Coupon. Sorry, No COD's or Purchase Orders.

☐ THE General Ledger ☐ THE Order Entry ☐ THE NAD System ☐ THE Mailmerge
☐ THE Accounts Payable ☐ THE Inventory ☐ THE Spreadsheet ☐ WindowMaster
☐ THE Accounts Receivable ☐ THE Payroll ☐ THE Wordprocessor

☐ Check ☐ Money Order ☐ VISA ☐ MasterCard

Account No. _____ Expiration Date _____

Name _____

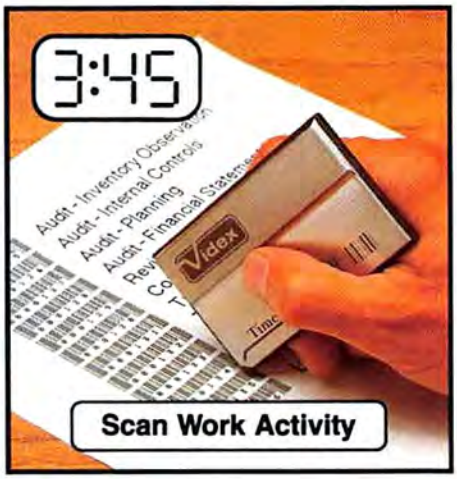
Address _____

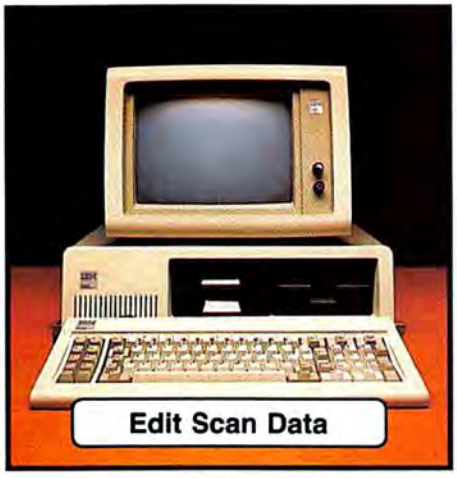
City _____ State _____ Zip _____

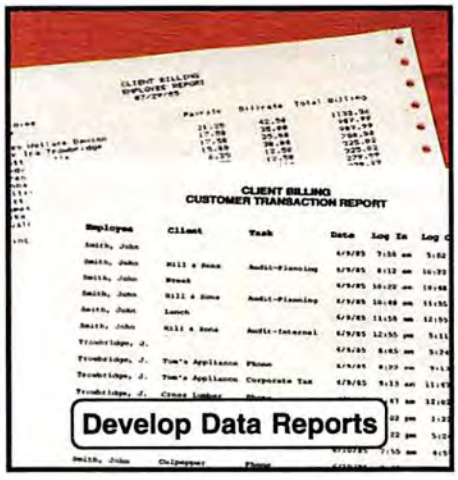
Phone _____ Signature _____

1 or 2 Packages — Add $7.50 Shipping & Handling
3 to 5 Packages — Add $10.00 Shipping & Handling
5 to 10 Packages — Add $15.00 Shipping & Handling
California Residents add 6½% Sales Tax. Outside US add $15.00 and payment must be made by bank draft payable in US by US Dollars.

TimeWand™ - Keeping track of time...







Six easy steps to time management!

The Videx TimeWand™ is an intelligent yet inexpensive bar code system for your business needs. Small enough to fit easily into a shirt pocket and weighing in at less than two ounces, TimeWand gives a new dimension to the concept of fully portable bar code readers.

Versatility is the hallmark of the TimeWand system. With its built-in microprocessor, TimeWand puts the power of a computer into the palm of your hand. Power that lets you actually change how TimeWand works. Whether you want to read different types of bar codes or program the wand to read bar codes in a certain order, TimeWand can accommodate your needs.

Available in three different memory configurations, TimeWand can store from 2,000 to 16,000 characters in its internal memory. This means you can hold from a few hundred to a few thousand bar codes in the TimeWand before transferring the information to a host computer system.

TimeWand time-stamps *each* bar code as it's read. This lets you know not only what the bar code says, but *when* the code was read.

The TimeWand's recharging/download station uses a standard RS232C serial connector that allows you to communicate with the wand through a variety of host computer systems. Since the communication is keyless, the scan information is sent quickly and error free. Currently, software packages are available for the IBM PC (and compatibles), Apple //, and Apple Macintosh personal computers.

Put the power of TimeWand in your own hands... and let it work for you.

TimeWand (2K version) - **$198**
Recharger - $149
TimeWand Manager Software (Macintosh) - **$499**
TimeWand Communications Software (IBM) - **$299**

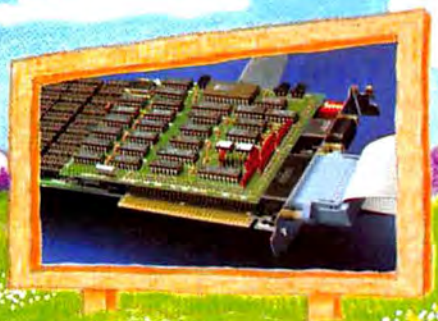
Videx

1105 N.E. Circle Blvd., Corvallis, OR 97330
503-758-0521
Demonstrated at NCC '86 Booth #C3447

Videx is a registered trademark and TimeWand is a trademark of Videx, Inc.

Circle 581 on reader service card

Once upon a time



Tall Tree Systems introduced a 2MB memory board called JRAM-2. It broke the 640K and offered I/O modules, a warm re- data saver, and high speed switching at an incredibly low $, and it worked like . Then one day a software company and a hardware company discovered the and issued an edict for a NEW EMS. In no time at all **Tall Tree Systems** introduced JRAM-3 which used the NEW EMS. It still has the , the warm re- , the switching and the low $, but now it can multi-user and multi-tasking programs. Best of all it has a new called JLASER. It lets your HP Laserjet™ or other laser printer based on the Canon™ do full page graphics and custom typesetting just like .

	JRAM-3	Rampage™	AboveBoard™
JLASER	✓		
re-	✓		
	✓	✓	
	✓	✓	
$	269	495	395

HP LaserJet, Rampage, and AboveBoard are trademarks of Hewlett-Packard, Canon, AST Research Inc., and Intel Corp., respectively.

The End

Tall Tree Systems
1120 San Antonio Road • Palo Alto, CA 94303 • (415) 964-1980

The text and icons on this page were created on a Composition Technology International PageScan System using a Tall Tree JRAM-3 board and was output on a Corona Laser Printer.

Circle 51 on reader service card

TimePro
TIME & COST
Track - Bill - Evaluate
Systems for:
Attorneys
Consultants
CPAs
Departments
Job/Costs
Architects
Engineers
$89.95
+ $7.50 USA ship & handling
IBM & Compat.
To Order Call:
1-800-628-2828 ext. 538
For Information Call:
303-320-0952
Low Cost Solutions, Inc.
Circle 484 on reader service card

Get the whole story on graphics terminal emulation.

To find out more about software that lets your PC emulate TEKTRONIX™ 4105/6/7/9 and DEC VT100™ terminals, call or write:
GRAFPOINT
4340 Stevens Creeks Blvd., Suite 280, San Jose, CA 95129 (408) 249-7951
Circle 563 on reader service card

Get a PC of the Action with a PC WORLD Action Ad!
Toll Free:
800-435-7766
(CA: 800-435-7760)

two phone jacks—one for your phone and one (you guessed it) for the wall jack. As the name suggests, SideDialer's compatibility with *SideKick* is a major selling point. You simply pop up *SideKick*'s phone directory, select a number, and the little board does the rest.

Actually, SideDialer's compatibility extends well beyond *SideKick* to include not only other desktop management software but virtually any application. Once you load the software, you can call up SideDialer from within a program by pressing <Ctrl>-<Shift>, which maneuver opens a window containing a menu of dialing options.

Among the available features are single-keystroke auto-redial, the ability to dial any phone number you highlight on screen, and SideDialer's own quick-dial directory, which enables you to assign commonly called names and numbers to your PC's function keys. You can also set the auto-dial to pause briefly or wait for you to press a key before continuing to dial a number containing an access code.

During testing, SideDialer ran smoothly with *SideKick*, *1-2-3*, *WordStar*, *dBASE III*, Bellsoft's *Pop-Up DeskSet Plus*, Lotus's *Spotlight*, and Polytron's *PolyWindows Desk*. When you load the SideDialer utility, however, you must make sure it's resident before *SideKick* or any applications program.

Since SideDialer supports both touch-tone and pulse dialing, you can also use it with rotary phones or nondigital PBX systems. Perhaps the product's greatest benefit is its ability to dial numbers already entered into an existing data base. If you need auto-dialing but not a modem, or you now share a modem with other PCs and rampant telecommunicators, SideDialer offers a relatively low-cost alternative—as long as you don't mind giving up a slot. —*Richard Jantz*

SideDialer
Quadtel Corp.
2030 E. 4th St. #234
Santa Ana, CA 92705
714/543-7755
List price: $54.95

Ross Smith is a freelance writer and co-owner of Computersmith, a Santa Rosa, California, typesetting firm. Jason Durbin is a freelance writer and editor living in Berkeley, California. Ted Nace is a Contributing Editor for PC World. *Linda Gail Christie is a columnist for* Pico *and the author of several books on PC applications. Richard Jantz is a freelance writer and the author of* Creating the Best Impression: All About Business Graphics Software *(Hayden Book Co., Hasbrouk Heights, NJ, 1986).*

Introducing

INFOGATE

The Corporate Solution For Integrating PC Software and Mainframe Information

. . . available now

Cullinet's INFOGATE is the first personal computer product to allow a wide range of different microcomputer spreadsheets, databases, word processors, and graphic software to talk to the mainframe and to each other. INFOGATE provides users of 1-2-3™, Symphony,™ dBASE®, Multimate™, and other software with direct access to the corporate data needed for their PC applications. For users of multiple PC products, INFOGATE also makes it possible to easily exchange data between products. INFOGATE—stand-alone or with Cullinet's Information Center Management System—it only costs $300. Call Cullinet's toll-free number 1-800-551-4555 today!

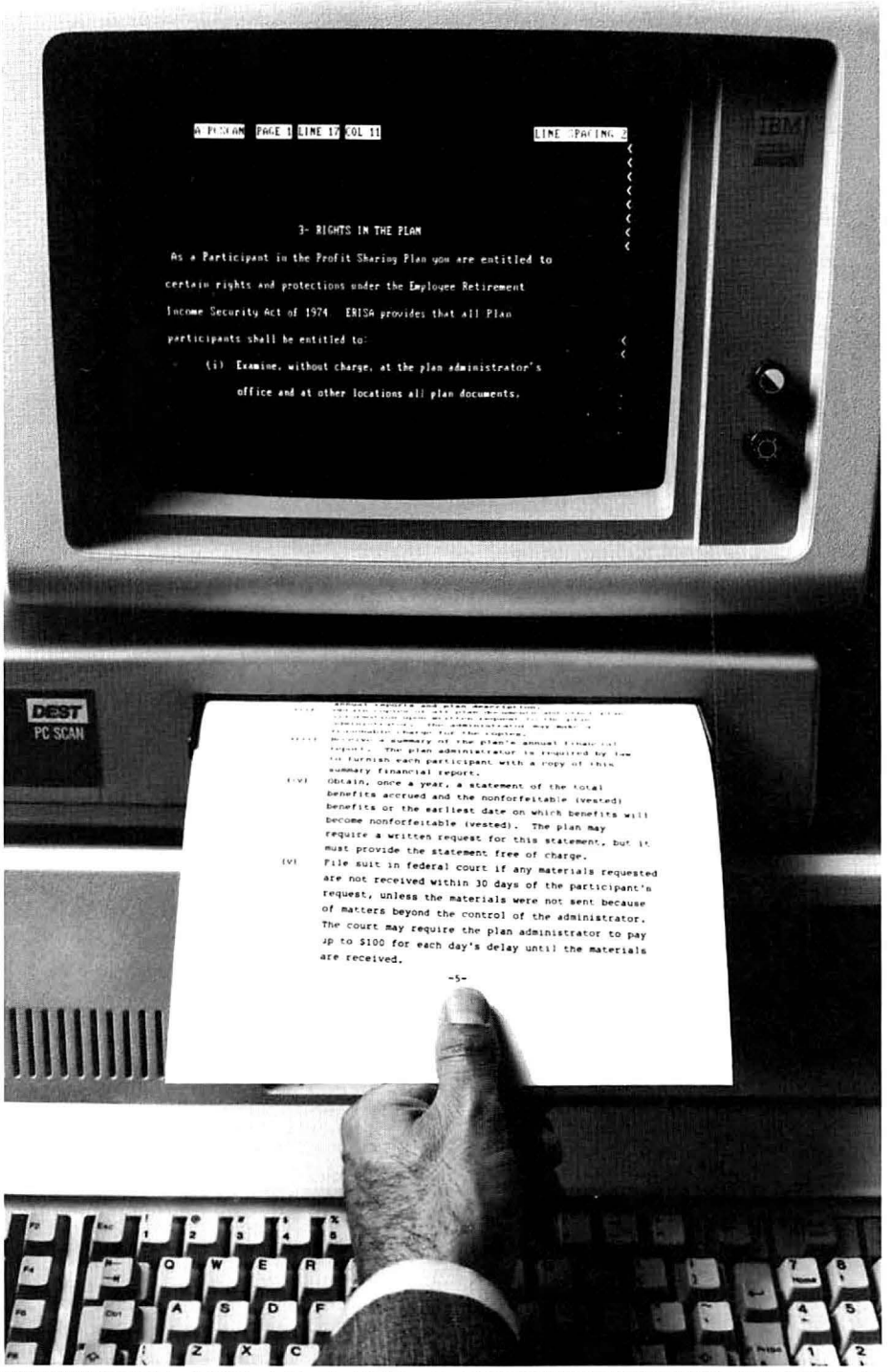
Cullinet

© 1986 Cullinet Software, Inc., Westwood, MA 02090-2198

dBase is a registered trademark of Ashton-Tate, Multimate is a trademark of Multimate International Corporation, Symphony and 1-2-3 are trademarks of Lotus Development Corporation.

Circle 439 on reader service card

TEACH YOUR PC TO READ.



Why? Because if your PC could read, you wouldn't have to spend so much time typing data into it.

Introducing PC Scan™ from DEST.

It can read a typewritten page into your IBM® PC, XT, AT or compatible in just 25 seconds. At the touch of a key. So you can spend more time doing more productive things.

Like acting on information, instead of simply entering it.

Now nearly everything you do with your PC can be done faster. Word processing. Electronic mail. Even electronic filing.

Best of all, it costs a great deal less than you might think to make you a great deal more productive with PC Scan.

For a free brochure and the name of a dealer near you, call the toll-free number below.

And we'll have your PC reading in no time.

DEST

800-538-7582

In California, 408-946-7100.

© 1986 DEST Corp. PC Scan is a trademark of DEST Corp. (not to be confused with PC Scanner, a product of Caere Corp.) IBM is a registered trademark of International Business Machines Corp.

Circle 602 on reader service card

With all these SoftLogic Solutions, you could run out of problems.

Now there's a whole family of low-cost, easy to use Softlogic software for the IBM PC, XT, AT, and compatibles. They'll save you time, aggravation, and lots of money. Got a problem? Check out these Softlogic Solutions.

Software Carousel™—The easy way to move from one program to another.

What a hassle. Saving, exiting, loading, retrieving—just to move from one application to another. With Software Carousel, you can keep up to ten programs loaded and ready to run. Best of all, you can use all your memory in each and every one. Supports AboveBoard™ and RAMpage,™ too.

Disk Optimizer™—Speeds up your disk by cleaning up your files.

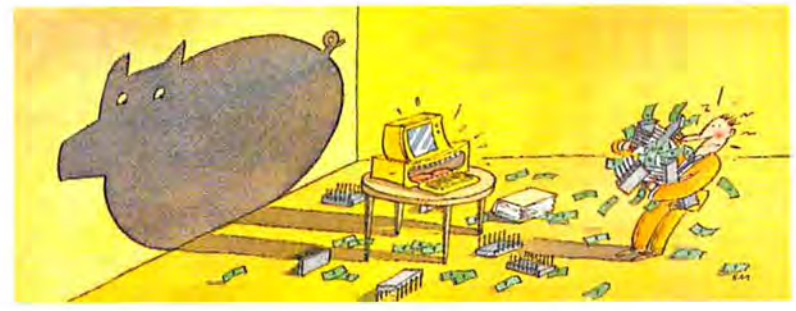
You may not notice, but your hard drive is getting slower. Because your files keep getting fragmented and scattered on your disk. Reading, writing, everything takes longer, because your disk is working harder. Disk Optimizer puts back the speed by putting your files back in one piece—where they belong.

Cubit™—Packs more of your data onto less disk space.

Filling up your hard disk again? Don't run out and get a bigger drive. Get Cubit, and get up to twice the storage capacity from the drive you already have. Cubit compresses and decompresses word processor, spreadsheet, database, all kinds of files—quickly, safely, invisibly.

DoubleDOS™—The multitasking software that takes less of everything.

You can spend more money, load more memory, and read more manuals with systems like TopView™ or Windows.™ Or you can get DoubleDOS, the amazingly simple concurrent software environment that lets you and your computer each work on different tasks at once. Nothing could be easier. And nothing costs you less.



Put your problems behind you. Order these SoftLogic Solutions today.

$49.95* Each

*Plus $5.00 shipping & handling.

So why put up with problems? Especially when you can get dependable SoftLogic Solutions for just $49.95* each. Ask for SoftLogic products at your computer dealer. Or order directly from SoftLogic Solutions by calling 800-272-9900 (603-627-9900 in New Hampshire).

Order today: 800-272-9900

SoftLogic Solutions, Inc.
530 Chestnut Street
Manchester, NH 03101
800-272-9900 (603-627-9900 in NH)

SOFTLOGIC SOLUTIONS

Circle 744 on reader service card

Only OfficeWriter™ makes document transfer this simple.

Now OfficeWriter—with OfficeLink™—lets your IBM PC share documents with all **Wang** and **IBM DCA** compatible word processing systems.

For example, with OfficeLink you can transfer documents between your IBM PCs and your Wang PCs. This software-only solution is as simple as changing a diskette. Create your document anywhere there's an IBM PC. Then carry the diskette to your Wang PC. OfficeLink makes it *that* simple.

OfficeLink is an amazingly powerful way to expand your word processing capabilities. Even more amazing is the cost. OfficeLink is inexpensive because it's a *software-based* solution.

OfficeWriter is also available with other document transfer options for IBM DCA and Wang bisynchronous communications.

IBM is a registered trademark of International Business Machines Corporation. Wang is a registered trademark of Wang Laboratories Inc.

OfficeLink: Only Office Solutions, Inc. has it.

Ask your local dealer for OfficeWriter or call toll-free 1 800 228-0747.

What could be simpler?

Office Solutions

2802 Coho St.
Madison, WI 53713

Circle 533 on reader service card

EVERYTHING SYMPHONY WAS SUPPOSED TO BE.

AVAILABLE NOW ONLY $84.95 WITH A 60-DAY MONEY BACK GUARANTEE

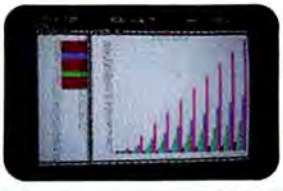
In One Totally Integrated Package:

- Word Processing With Spell Checker
- Communications
- Spreadsheet
- Database
- Graphs

- Extremely easy to learn and use
- Data is interchangeable with all modules and other products
- Windows allow quick movement between tasks
- Four background, one foreground mode. Can print on two printers or plotters and two communication devices (modem and main-frame direct connection) all at the same time.
- Artificial Intelligence features reduce the number of keystrokes required to perform tasks
- Upgradable software and data to UNIX and XENIX

- **Package contains:** one plastic box, one illustrated reference manual, one program disk, one sample diskette, keycaps and user support plan
- **System Requirements:** IBM PC or compatibles, 512K, two 360K diskette drives, color or mono display
- Twenty-four hour Hotline Support (optional)

Multiple windows allow quick movement between tasks.



Colorful graphic representations

What the experts say:

"I can safely say that I have yet to come across a package which demonstrates such functionality combined with such an innovative approach to the man-machine interface. ABLE are to be congratulated on producing a product which achieves a very high standard of excellence."
—Michael D. Bowe, DATA GENERAL

"The best multi-purpose product I have evaluated. Multi-tasking works great, able to print, make an on-line connection and edit a document at the same time."
—Robert Lawrence, ITT INFORMATION SYSTEMS

ABLE Int'l

ABLE Int'l is a longtime, innovative supplier of software for micro and minicomputers.

301 North Main Street
Pueblo, Colorado 81003 USA
Telephone 303-544-9600. Telex 650-2154286

ABLE One

To order, call **1-800-826-1907.**
In Colorado call **1-800-826-4784.**
Order 24 hrs. a day

60-Day Money Back Guarantee*

These prices include shipping to all U.S. cities. All foreign orders add $10 per product ordered.

Not copy-protected $84.95
(CO res. add $5.52 tax per copy
Quantity: _____ at $84.95
Amount: CO res. 6½% tax _____
Payment: VISA MC BankDraft
Check AmEx Diner's
Credit Card Exp. Date: __/__
Card #: _____

Name: _____
Shipping address: _____
City: _____
State: _____
Zip: _____
Telephone: _____

COD's and Purchase Orders WILL NOT be accepted by ABLE. Colorado residents add 6½% sales tax. Outside USA: add $10 and make payment by bank draft, payable in US dollars drawn on a US Bank.

*If you find that this product does not perform in accordance with our claims and representations, within 60 days of purchase, call our Customer Service Dept. and we will gladly arrange for a refund.

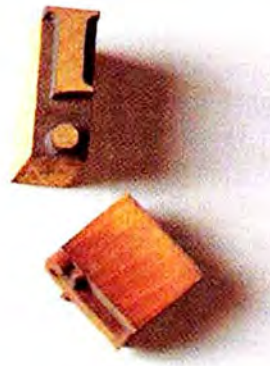
Circle 583 on reader service card

Typesetting Point by Point

The typographer's language is peppered with terms dating back to Gutenberg's time. While word processing has acquainted you with the basic vocabulary, you'll need to be fluent to make the jump to personal computer publishing.

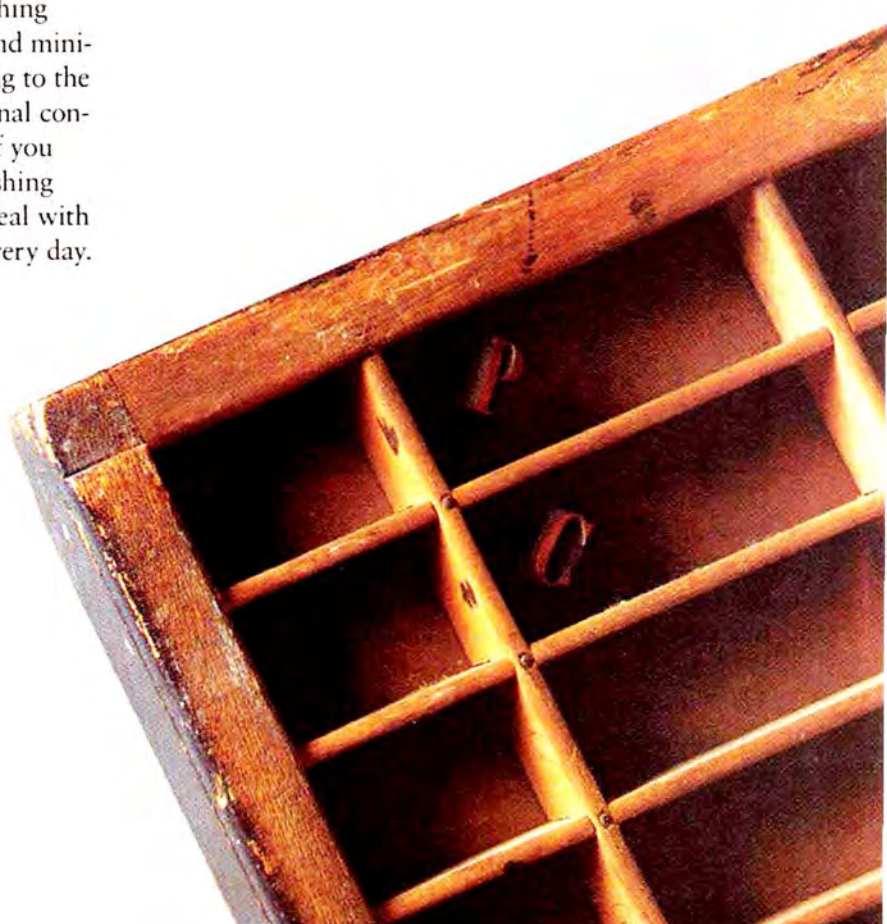
James Felici and Ted Nace

David Hockney



At the heart of the personal computer publishing movement is a set of skills virtually unknown to anyone outside the typesetting trades. An entire lexicon unique to the field of typography describes the methods used to arrange letters on a page in a way that is pleasing to the eye. By their nature, these elements are unobtrusive—aesthetically laid-out type doesn't call attention to itself. But there's a lot going on behind the scenes.

The PC publishing phenomenon is a result of the economies of mass production; the publishing technology once vested solely in mainframe and minicomputer typesetting systems is now migrating to the PC. Economies of scale compromise the original concept of typeset quality output. Nonetheless, if you take the plunge into personal computer publishing with a PC and a laser printer, you'll have to deal with many of the issues that a typographer faces every day.



Sources of Typographic Quality

Even a quick comparison of laser printer and commercial typesetter output reveals that quality typography requires more than just the right typeface (see Figure 1). A laser printer's 300 dot-per-inch resolution cannot match the sharp 1000 or greater dpi images that high-resolution phototypesetters print on photographic paper.

Another subtle source of typographic quality is the spacing and placement of text elements on the page. Most impact printers are limited to *fixed escapement*, meaning that the print head moves the same horizontal distance across the page after each letter is struck, an effect also known as *monospacing*.

If all characters were the same width, fixed escapement would present no problem. But character widths vary; monospaced type is hard to read because letters are too far apart for the words to be easily identified. Because the eye is so sensitive to the spacing of letters, an important element of quality type is the ability to vary letter and word spacing.

The importance of precise control over placement extends to text blocks as well. Thus, another significant element in the typographic quality equation is the ability to arrange text on a page in precise and intricate ways—a feature far beyond the capabilities of everyday word processors.

Taking the Measure

Typesetting jargon harks back to the days when type was set by hand, but the vocabulary is by no means obsolete. Two particularly important terms, *pica* and *point*, are the fundamental units of typographic measurement. A pica equals .166040, or about one-sixth, inch. The pica is in turn divided into 12 points. Don't labor converting points and picas to inches or centimeters. Although many a personal computer publishing program measures type in those more familiar units, they are far too large to be useful for most type, and using the typesetting terms will ease your communication with the professional graphic arts industry.

Crispness & *Clarity*

The appearance of typeset output is a function of *image resolution, point size,* and *typeface.*

Crispness & *Clarity*

The appearance of typeset output is a function of *image resolution, point size,* and *typeface.*

Figure 1: These samples from the Times Roman typeface family have been set from four separate fonts: roman, italic, bold, and bold italic. The left sample was set on plain paper on a laser printer at 300-dpi resolution. The right sample was printed on photographic paper on a commercial typesetter at 1200 dpi.

Picas and points are fixed measurements, but typography also relies on a variety of flexible spaces whose dimensions vary with the type size.

A standard measure of open space is the *em*, named for the width of the *M*, which is usually the widest letter in a typeface's character set (see Figure 2). Fortunately, the size of an em is easy to remember: It is always equal to the current point size. When you're setting a line in 12-point type, an em is 12 points wide.

Because the eye is so sensitive to the spacing of letters, an important element of quality type is the ability to vary letter and word spacing.

Related to the em is the *en*, which is equal to half the width of an em or the width of the letter *N*, and the *thin space*, a user-definable unit that is usually half an en.

The em, the en, and the thin space establish a measuring scheme that is proportional to the type around them. Thus a paragraph indent of one em has a predictable visual relationship to the text, whether that text is set in 8-point or 36-point type.

The finest unit of typographic measurement, usually called a *typesetter unit*, is the minimum amount of escapement possible on an output device, be it a laser printer or a phototypesetter. The typesetter unit is also expressed in terms of an em. Two popular schemes for measuring font character widths call for 54 typesetter units per em and 100 per em.

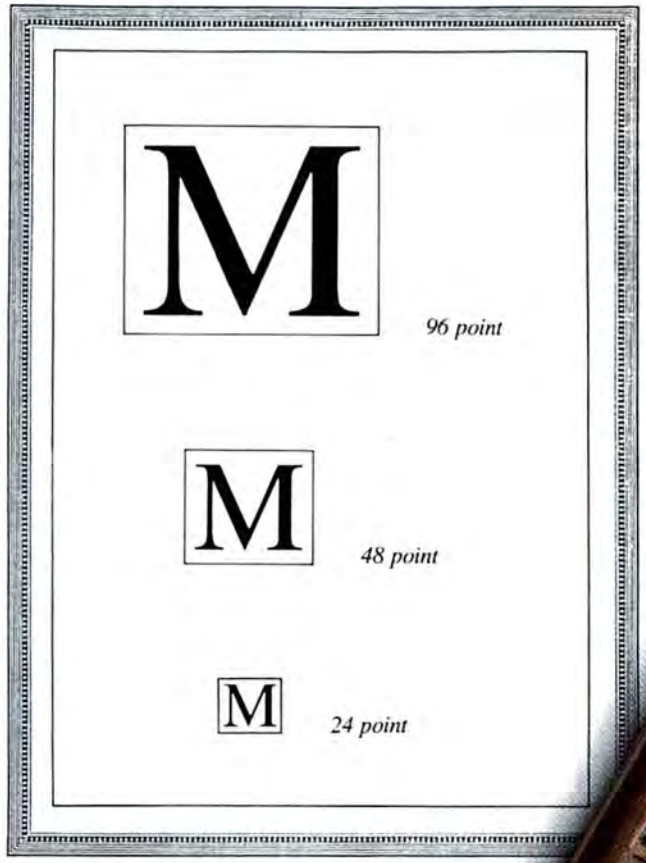


Figure 2: The em space is a standard typographical measurement of horizontal space. It is equal to the point size of whatever typeface you are using.

Sizing Up Type

Gutenberg's revolutionary idea was to put each character on an individual metal block (hence the moniker "movable type"). The raised image of the letter was inked and pressed to the paper, forming the printed image. The lead blocks were placed in rows to form lines of words, and rows were stacked to assemble pages. Braces held the body of type in place during the printing process.

Solid leading (9/9)

I am type! I bring into the light of day the precious stores of knowledge and wisdom long hidden in the grave of ignorance. I coin for you the enchanting tale, the philosopher's moralizing, and the poet's phantasies; I enable you to exchange the irksome hours that come, at times, to everyone, for sweet and happy hours with books–golden urns filled with all manna of the past.
–Frederic Goudy

+1 point leading (9/10)

I am type! I bring into the light of day the precious stores of knowledge and wisdom long hidden in the grave of ignorance. I coin for you the enchanting tale, the philosopher's moralizing, and the poet's phantasies; I enable you to exchange the irksome hours that come, at times, to everyone, for sweet and happy hours with books–golden urns filled with all manna of the past.
–Frederic Goudy

+2 points leading (9/11)

I am type! I bring into the light of day the precious stores of knowledge and wisdom long hidden in the grave of ignorance. I coin for you the enchanting tale, the philosopher's moralizing, and the poet's phantasies; I enable you to exchange the irksome hours that come, at times, to everyone, for sweet and happy hours with books–golden urns filled with all manna of the past.
–Frederic Goudy

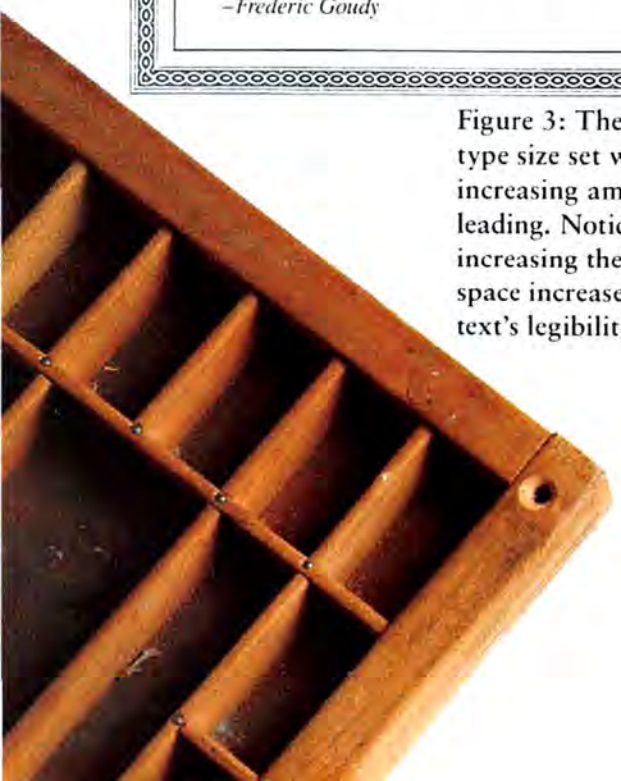


Figure 3: The same type size set with increasing amounts of leading. Notice how increasing the white space increases the text's legibility.

Each character's width was equal to the horizontal space its letter block filled, a distance now referred to as that character's *required escapement*. The point size of the type derived from its vertical component, measured in points from the top of the tallest character (like an *A* or *l*) to the bottom of the lowest hanging letter (a *g* or *y*). If the measurement equals 12 points, then the character set is said to be 12-point type.

Because the letter blocks were originally made out of lead alloy, the vertical space between lines of type on a page is called *leading*. The minimum leading of the type was equal to its point size. In Gutenberg's day, the blocks that composed a line of type were set flush against the lines above and below, or *solid*, a term still used today. (When blocks of, say, 14-point type are set solid, they are said to be set on 14 points of lead, expressed as 14/14.) If more space between lines was desired, the typographer could add lead in the form of thin metal strips packed between the lines of type (see Figure 3).

Although computers have gotten the lead out of typography, the terminology remains. Since typographers no longer manipulate individual blocks of lead, leading is measured from the bottom, or *baseline*, of one typeset line to the baseline of the line above it. Leading increments vary from system to system, but half-point increments are typical; some systems also work in quarters or tenths of points.

About Face on Fonts

Because the process of using computer-generated type is far removed from that of hand-set type, many concepts and terms based on the older technology are confusing. This is especially true with the terms *typeface* and *font*, which are now often used interchangeably.

Before photographic processes emerged, metal type characters were cast from master forms that were carved individually for each type size. Type designers routinely made design alterations in different sizes of one typeface to maintain a consistent aesthetic effect over a range of sizes. The stroke of an *l*, for instance, might look balanced and in proportion to other letters at 10 point, but when enlarged proportionally to 72-point size, it might appear too thick and clumsy. Although type design has firm mathematical underpinnings, the eye is the ultimate arbiter of design.

For this reason, each typeface size had its own *font master* with slightly different design qualities. In old print shops, each typeface had a separate cabinet, and each size was allotted a font drawer. When a printer asked for a font, he was calling for a typeface and a type size. A particular job might require 10-, 14-, and 20-point Bodoni Bold—one typeface, three fonts.

The terminology began to change with the advent of the phototypesetting machine, which set type using a light source and focusing lens, glass or film negatives of fonts, and photographic paper. The light source exposed the negative on the paper, which was then developed much like a photograph to produce the black image of the letter on the paper's white background. By manipulating the lens, many type sizes could be generated from one negative. Because there is a limit to the amount that lenses can enlarge and shrink an image and still maintain sufficient sharpness, the printer needed different font masters for different size ranges. Still, the age-old distinction between font and face was becoming blurred.

When digital type arrived on the scene and characters were generated electronically with no tangible font master, the terms face *and* font *became interchangeable.*

When digital type arrived on the scene and characters were generated electronically with no tangible font master, the terms *face* and *font* became virtually interchangeable. Although digital fonts still often have different master designs for different size ranges (systems that store typefaces as bit maps have separate designs for every point size), these unique masters are invisible to the typesetter; they are automatically engaged when the appropriate type size is invoked.

In short, consider a font a matrix from which a typeface is generated. Thus, when inspecting type with Edwin Newman or William Safire, the proper phraseology is, "From what font is that set?" or "What face is that?," but never, "What font is that?" (see Figure 1).

Kerning

Typographers adjust the space between letters to improve readability. The process, called *kerning*, is determined by the shapes of adjacent letters. The sides that letters present may be flat (M, n, E), round (e, O, c), or angular (w, V, A), and they may have a lot of white space along their flanks (T, L). A major typographic challenge is artfully fitting these shapes against one another so that distracting gaps are minimized.

A typesetting computer performs kerning by referring to a table of specific letter combinations and the appropriate spacing adjustments for each. The computer uses the kerning table when setting each character—an enormous and potentially time-consuming computing task. For this reason, automatic kerning has historically been omitted from PC-based text processing programs, even full-blown typesetting and page composition programs. This practice is beginning to change, however, and high-end publishing packages are now distinguished by their ability to kern automatically.

Hyphenation and Justification

In electronic publishing, typographic attributes are imposed by embedding codes within unformatted text. A *hyphenation and justification* (h&j) program then interprets the codes and makes the line-ending decisions that shape the formatted text block, usually into a column such as this.

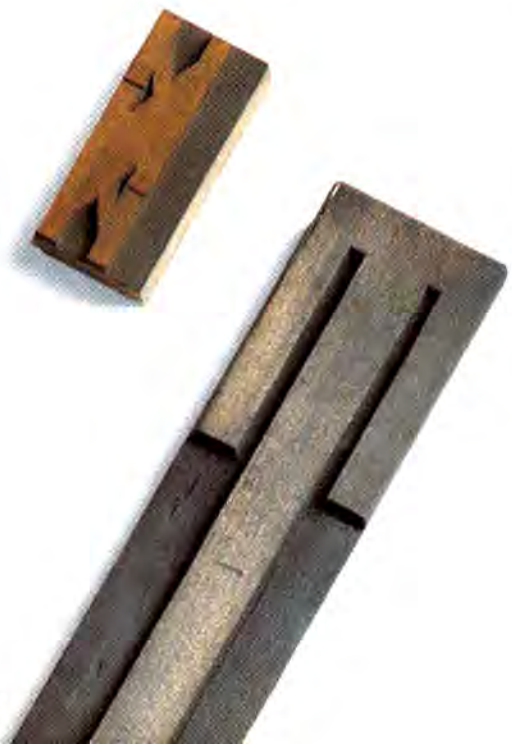
Justification is the process of fitting lines of type within a specified line length; hyphenation is a tool to achieve this end. The h&j process is a stren-

uous computing task; the lines must be justified according to line length, typeface, type size, kerning, the degree to which word and letter spaces can be compressed or expanded, and grammatical hyphenation rules.

An h&j program breaks lines at spaces between words whenever possible. When a word is too long to leave intact on a line, however, the program will split the word according to a hyphenation dictionary or a set of rules. In general, dictionary-based hyphenation is superior to a logic-based system. The difference can be illustrated with a word like *pressed*, which most logic-based programs will either hyphenate as *pre-ssed*, viewing pre- as a prefix, or *press-ed*, because consecutive identical consonants are usually legitimate syllable breaks.

Justification is the process of fitting lines of type within a specified line length; hyphenation is a tool to achieve this end.

Why hyphenate at all? The ability to hyphenate allows the computer to lay down type without greatly increasing and varying spaces between words and characters. Hyphenation preserves the program's ability to space text closely, thus enhancing readability.



Formatting the Type

Although dozens of elements determine the look of text, only four are absolutely necessary: typeface, point size, leading, and line length (or measure).

Beyond these, the most fundamental concern is margin treatment. You can vary a margin four ways (see Figure 4).

Justified text fills the line completely, except perhaps the short last line of a paragraph (known as a widow). Justified margins are vertically straight.

Flush left text is often described as *flush left, ragged right*. Such text abuts the left margin but does not necessarily extend to the right margin. This ragged right format is a natural compromise for word processing programs that cannot hyphenate. Justification without hyphenation grossly distorts word spaces.

Flush right is the opposite of flush left and is not recommended for setting large bodies of text, because the eye tends to get lost moving from the right margin back to the left when starting to read a new line. Flush right is typically used only in headlines and advertisements.

Centered (or *ragged center*) is a marriage of both flush left and flush right styles. Text is centered on a vertical axis running down the middle of the column; leftover space is allocated evenly to both ends of the line.

Line-Ending Commands

A typesetting program can usually set an individual line flush left, flush right, centered, or indented regardless of the position of the surrounding text. Most word processors—and PC programs that claim typesetting talents—translate <Enter> into a command for breaking lines. Most typesetting systems, however, rely instead on specific paragraph-ending commands and a family of line-ending commands called *quads*.

Bodoni developed lofty ideals and visualized anew the intrinsic beauty of typography. He introduced a distinct and beautiful style into his types that was the forerunner of all modern faces.

Flush left (rag right)

One of the changes which Bodoni introduced into the forms of his roman letters was in the serifs. Those of the capitals he reduced to single sharp lines of about the same weight as the thin strokes of the letters.

Centered (rag center)

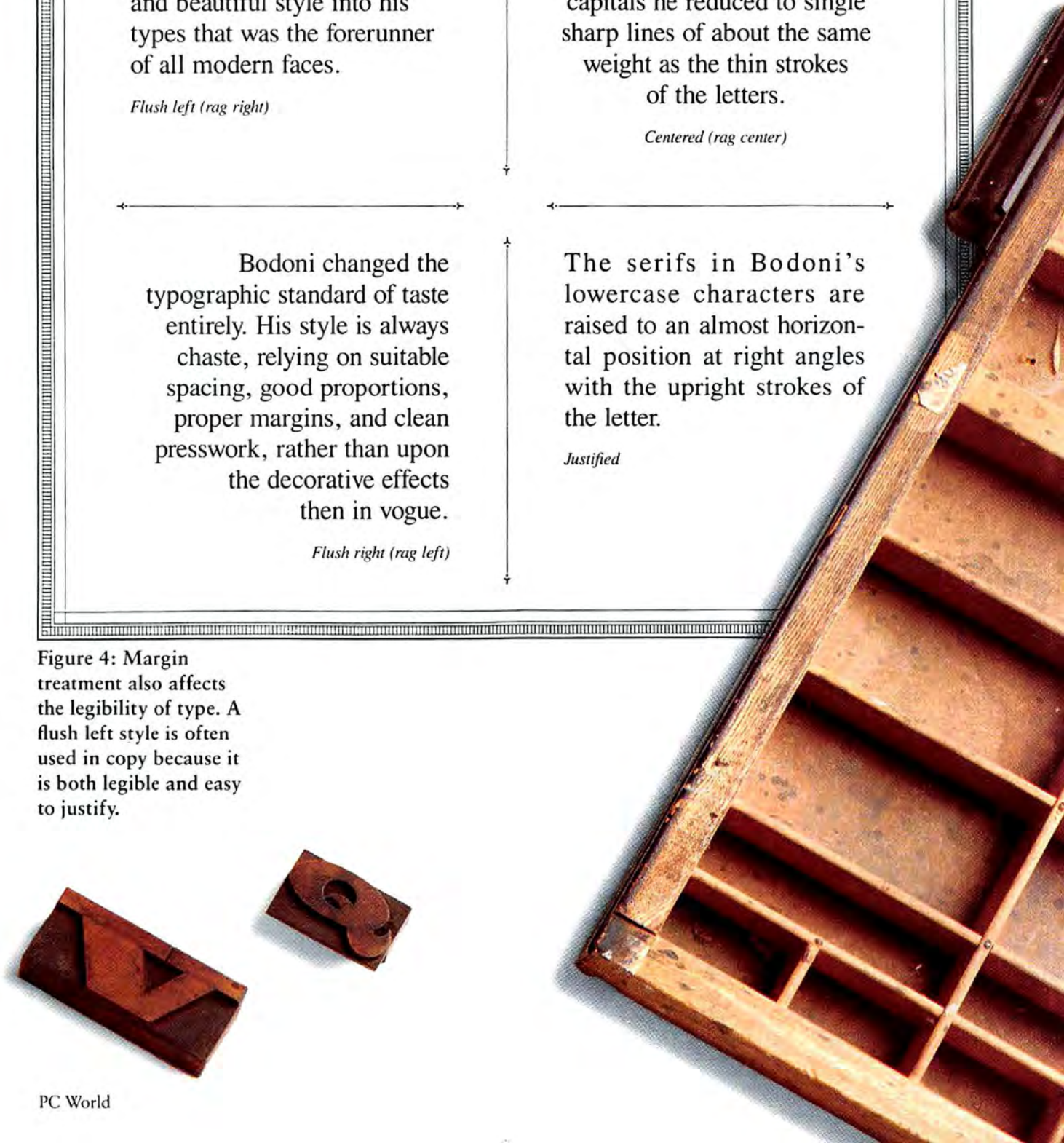
Bodoni changed the typographic standard of taste entirely. His style is always chaste, relying on suitable spacing, good proportions, proper margins, and clean presswork, rather than upon the decorative effects then in vogue.

Flush right (rag left)

The serifs in Bodoni's lowercase characters are raised to an almost horizontal position at right angles with the upright strokes of the letter.

Justified

Figure 4: Margin treatment also affects the legibility of type. A flush left style is often used in copy because it is both legible and easy to justify.



In the days of hand-set type, quads were blank blocks that sat below the inked plane of the letter blocks, filling out lines of type when the actual text fell short of the full measure, as in Figure 5. Quads were also used to center lines of type or align them flush right or left, and so the terms remain—quad left, quad right, and quad center.

In computerized typesetting, left, right, and center quad commands are used as line-ending commands to override the prevailing margin treatment. In other words, you can direct the system to set text flush left, but when it encounters a quad right command, it will end the current line, set it flush right, and then revert to setting text flush left.

The end paragraph command is similar to the quad commands—it quads the line to the appropriate margin (to the left in flush left copy, to the right in flush right copy). The end paragraph command also enacts paragraph formatting functions, such as an indent on the first line of the next paragraph.

A Formatting Tool Kit

Commercial typesetting systems come with an impressive array of formatting commands that precisely control the look of a page. While the personal computer publisher won't need all the powers of a dedicated (and prohibitively expensive) typesetting system, most of the following functions should be available in any PC publishing system.

Figure 5: The term "quad" originated in the days of hand-set type, when typesetters used small blocks of lead called quads to hold short lines of type in place.

A variety of *indention* schemes is desirable (see Figure 6). These schemes can be combined to automate indention and create free-form layouts and outline formats. Most typesetting indents are conditional, toggling off under certain circumstances, such as the occurrence of an end-paragraph command, but any personal publishing system should have a *standing indent* that remains in effect until it is explicitly canceled. A standing indent will indent every line of text, no matter how many lines are set, how many paragraphs come and go, or how many other indents are created and canceled.

Also important is a *paragraph indent* function that moves the left or right margin toward the center of the typeset column, much like a standing indent. The key difference is that this indent is canceled by an end paragraph command–a handy feature for forgetful PC publishers.

A publishing system should also have a command that indents the first line of every paragraph by a specified amount. Called *first line indent* or *indent first*, the command can be inserted at the beginning of a lengthy passage of running text, and as long as each paragraph is tagged with an end paragraph command, the first line of every paragraph will automatically be indented.

The functional opposite is the *hanging indent*, which is likewise activated by an end paragraph command. It directs the system to leave the first line of type flush to the left margin but to indent all the other lines in the paragraph.

An *indent on text* function lets you create an indent based on the length of a specific string of text–a word or phrase. The indent on text feature is commonly used in outlines and order forms.

Extra lead and *reverse lead* commands modify the leading scheme in effect, immediately altering the position of the baseline. Lines beyond these commands are set relative to the new baseline.

One common application for the extra lead command is providing additional space between paragraphs. If you're setting 14-point type and you specify an extra 7 points of lead at the beginning of a paragraph, the first line of that paragraph is set on 21

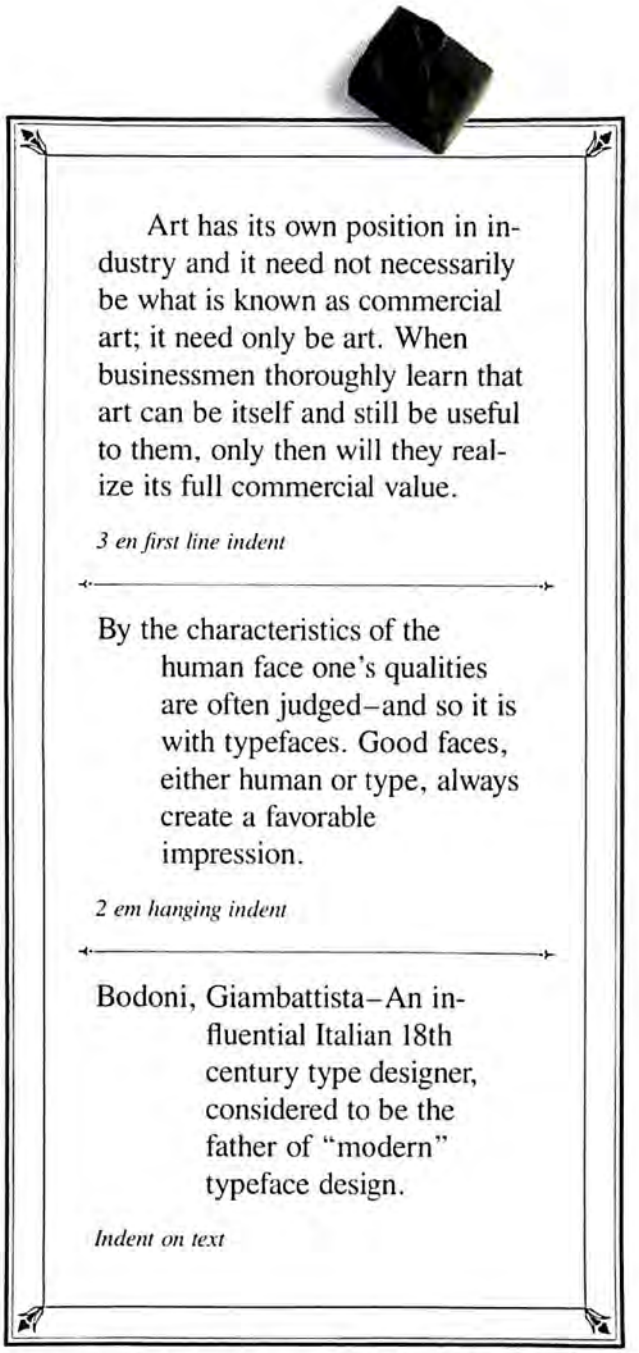
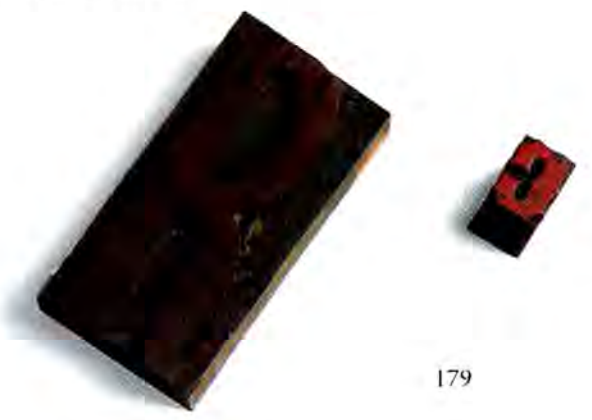


Figure 6: An indention sampler. Both the first-line and hanging indents can be invoked automatically. The indent on text allows you to create an indent based on the width of typeset matter, in this case the name Bodoni.



points of lead. At the end of that typeset line, the system will return to 14-point leading. If a line includes scientific or mathematical symbols, you can also insert or remove lead anywhere in the line to accommodate subscripts and superscripts.

Expanding and compressing spaces between words and between letters is fundamental to professional-looking documents. You should be able to control spacing for an entire document and within a single line. This flexibility allows you to *letterspace*, or custom fit, a line to the margin—a very popular design technique these days. It also comes in handy when an h&j program cannot do its job within the format limitations you've established.

Because a trick of the eye causes white space between letters to look disproportionately wider in larger type sizes, larger type appears to be loosely set. *Tracking*, which measures and controls the overall tightness of letterspacing, can be adjusted in the typesetting process (just as the spacing between letter pairs can be adjusted by kerning) to counteract the optical illusion of loose type (see Figure 7). Most typesetting systems offer several degrees of tracking; the appropriate degree may be triggered automatically when type size crosses a designated limit.

Fundamental Questions

Personal computer publishing products range from slightly modified word processors to professional quality commercial typesetting programs. You should answer several basic questions before investing time and money in one of these products.

Perhaps the most fundamental issue is whether a laser printer, such as the HP LaserJet or the Apple LaserWriter, will be your sole source of output, or whether you will send files to a commercial typesetter. In the latter case, your PC publishing program should possess sophisticated typographic capabilities, such as kerning and tracking, that govern white space. The program must also support the same fonts the typesetter uses. Otherwise, you'll be setting typo-

Figure 7: The upper sample is unrefined text: No adjustment has been made to the overall letterspacing—tracking—and the text has not been kerned. The lower sample has been kerned and had its tracking tightened.

graphically inferior type on a commercial typesetter, which is akin to giving an old car a new paint job without hammering out the dents. Unfortunately, very few publishing packages for the PC offer commercial typesetting capabilities.

Do you expect the entire typesetting process to be automatic? Some moderately expensive typesetting programs will automatically kern an entire file on the fly, but others may require manual kerning.

Keep in mind that available PC publishing systems offer different grades of utility. To rate the practicality of a program, make an effort to discover what it takes to use it—and if the effort is worth the output. But don't shy away from a sophisticated program just because it seems a little too complicated. Your needs and your skills may grow more quickly than you think.

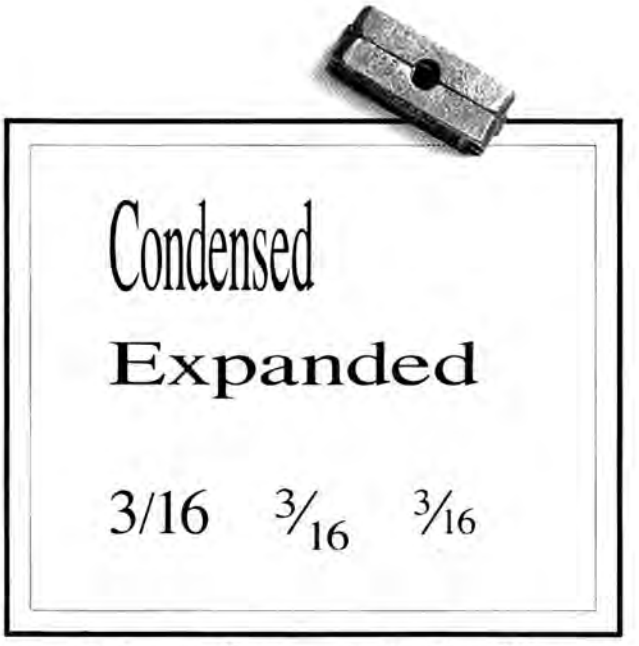


Figure 8: Special effects. The samples at the top were created by altering character width. The rightmost fraction was set by an automatic fraction-building utility, which creates far better results than integer fraction building (left) and the superscript/subscript approach (center). The rules that surround the figure were built individually, using vertical and horizontal rule set commands.

Typographically Forewarned

When laser printer manufacturers first claimed their machines could produce commercial quality type, typographers rightly belittled the assertion, noting that laser output was at best a rough approximation of professional-level type. The criticism is still well founded. When shopping for a PC publishing system, look beyond the hype. *Kerning* is currently the favored buzzword among vendors, but few packages offer true kerning ability. What is often touted as kerning is actually a tracking utility.

Also make sure that hyphenation is automatic. Some PC-based hyphenation programs force you to intervene when difficult hyphenation decisions arise. Manually inserting a break point is usually a simple task, but it hardly makes for efficient production. While speed may not be important to you, accuracy should be. Test the program with some sample text laced with a good selection of hard-to-hyphenate words. Include long words to see if the program hyphenates them in the middle or simply clips off the first or last syllable. Set up narrow column widths to maximize hyphenation opportunities and see how well the program performs.

Finally, look for extra features that you may not need now but might eventually use. As with any productivity software, you need room to grow. When you become proficient as a page designer, you may want features like automatic fraction building, horizontal and vertical rules, expanded typefaces, and discretionary hyphenation (see Figure 8). While none of these special effects is crucial, each can lend your documents a crisper, more finished look. Words will be arranged in a pleasing way; the page will invite the reader to read on. And that, after all, is what the craft of typography is all about.

Although a capable PC publishing system and a working knowledge of typographical concepts will get you started, you must also have an eye for detail and the patience to sweat the small stuff. In the world of typography, it's all small stuff, measured in fractions of inches.

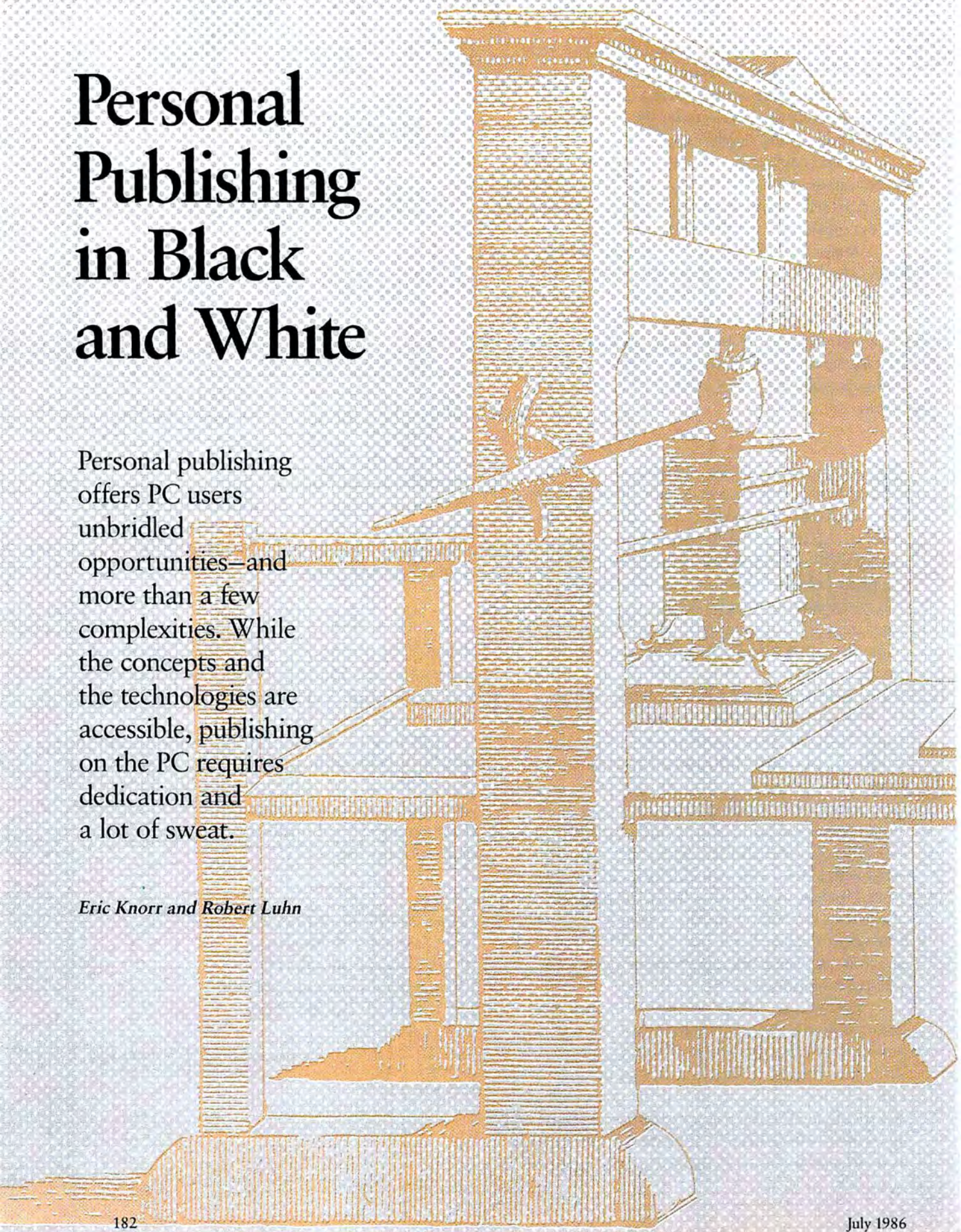
James Felici is the Technical Editor of Publish!. *Ted Nace is a Contributing Editor for* PC World *and the coauthor of* LaserJet Unlimited *(Peachpit Press, 1986, Berkeley).*

This article is based on the forthcoming book New Skills for Laser Publishing, *by James Felici and Ted Nace, to be published by Addison-Wesley, Boston, Massachusetts.*

Personal Publishing in Black and White

Personal publishing offers PC users unbridled opportunities—and more than a few complexities. While the concepts and the technologies are accessible, publishing on the PC requires dedication and a lot of sweat.

Eric Knorr and Robert Luhn



Fred Simpson

In the early 1980s, a PC with a word processing program and a dot matrix printer with graphics capability represented the sum total of personal computer publishing systems. Company executives, pleased with the productivity gained with PCs but raised on the authoritative, crisp output of the IBM Selectric, thundered, "Make it look typed!" Letter quality printers soon satisfied this demand, but when it came to impressing clients and beating out competitors, greater polish was required. Thus, most companies turned to graphics, layout, and typesetting professionals for the necessary presentation pizzazz.

Today, personal computer publishing is coming into its own, spurred by advances (and drastic cost reductions) in laser printers, word processing packages, and page composition programs. For the first time, businesses lacking the deep pockets of a Fortune 500 company can blend text and

graphics to create winning reports, customer and company newsletters, manuals, brochures, fliers, price lists, and more without farming the work out to typesetting firms and graphics houses. While the quality of the resulting laser-typeset text and graphics won't threaten magazine and book publishers, the output is suitable for many business situations. Better still, a PC-based publishing system lets you control the entire process and make last-minute changes without bankrupting your company.

Publish and Perspire

The current clutch of laser printers and page layout software can't fully mirror the powers of a mini- or mainframe-based typesetting system. But with these tools, you can justify text, control spacing between letters and words, pour text into columns, paste up digitized images and graphics generated by paint programs, and access enough typefaces to keep budding personal publishers happy. In short, you have the power to size and combine all the important elements on a page to create an aesthetically pleasing, harmonious whole.

But be forewarned—publishing on the desk top is no simple endeavor. If you thought mastering your first word processor was tough, you'll appreciate its relative simplicity once you tackle the ins and outs of a page composition program. Not only will you have to get up to speed on such time-honored techniques as kerning, justification, leading, and indention (see "Typesetting Point by Point" in this issue), you'll need to learn a handful of unfamiliar programs to produce that ultimate company newsletter. The specifics will vary, but you may have to switch to a newer word processor such as *Microsoft Word* that offers comprehensive page formatting and is designed to use laser printer fonts. To conjure up charts and supporting graphics, you will have to grapple with painting and drawing programs like *PC Paintbrush* and *Graphix Partner*.

The accomplished PC publisher in effect must wear several hats at once: designer, layout artist, and typographer. But expediency and reality may compel companies with voluminous and more complex output to create a full-time publishing manager position. Filling that slot means dedicating the necessary budget to hire a professional with publishing and/or design experience. Given the complexities of PC publishing, the money would be well spent.

The accomplished PC publisher in effect must wear several hats at once: designer, layout artist, and typesetter.

Publishing à la PC

Publishing and design professionals may initially balk at the idea of using a PC for personal computer publishing. The machine of choice has so far been the Apple Macintosh—and for good reason. The Mac environment imposes a set of strict rules that programs must follow. Data formats must be compatible; thus, integrating text from a word processor with graphics from a paint program is a relatively uncomplicated process. The Mac's consistent graphics-oriented user interface, which relies on icons and pull-down menus, makes learning a variety of programs a far simpler task. Add a mouse for dragging text and graphics around, and you have a system that's tailor-made for laying out a page.

Consider, too, that the Macintosh is linked to the Mercedes-Benz of laser printers, the Apple LaserWriter. The printer features a hefty 1.5MB of memory, a Motorola 68000 microprocessor, and ROM chips holding PostScript, Adobe Systems' powerful page description language (see "PostScript: Master of the Raster," *PCW*, August 1985). The LaserWriter's capacious memory is the key to its high-resolution output and to easier page makeup; an entire page at 300- by 300-dpi (dots per inch) resolution can be manipulated at once. (The Hewlett-Packard LaserJet, by comparison, is limited to a 75- by 75-dpi graphics page.) In addition, Mac programs that incorporate PostScript drivers, such as *PageMaker* and *Microsoft Word*, can scale fonts, stretch and rotate images in almost any conceivable manner, and take advantage of other LaserWriter talents.

But in the business world, the Mac is an adjunct to office computing; the PC, its programs, and

its peripherals reign supreme. On a cost/performance basis, the scales usually tip in favor of the PC family. Processing is faster, and memory and hard disk storage are sometimes half the price of comparable Macintosh hardware. The array of software for the PC dwarfs what is available for the Mac. In the laser printer world, the Hewlett-Packard LaserJet (by dint of its association with the PC) outsells the LaserWriter six to one. With a comparatively modest $2995 price tag ($3000 less than the LaserWriter), the LaserJet's popularity with PC users is no surprise. This trend may change as more and more PC users yearn for the graphics capabilities of PostScript.

Naturally, the LaserJet can't match all the talents of the LaserWriter. Though both printers are based on the Canon LBP-CX laser printer engine and use the 68000 microprocessor, the LaserJet is shy on memory and unable to comprehend PostScript commands. As a result, the LaserJet produces minuscule 300-dpi graphics and cannot scale fonts. However, an extra $1000 buys you a LaserJet Plus, and things begin to look considerably better. Memory jumps to 512K, enabling the printer to store as many as 16 disk-based fonts and spit out 300-dpi images covering a third of a page.

Third-party vendors are also helping the LaserJet catch up. Inexpensive font generation programs such as *Fancy Word* expand the LaserJet's character set, while multimegabyte memory boards such as the JLaser from Tall Tree Systems enable the LaserJet to handle full-page 300-dpi graphics easily (see "From the Hardware Shelf" in this issue).

Still, the extra memory won't lend your documents the éclat of the LaserWriter and PostScript (see Figure 1). But the LaserWriter can connect to the PC's serial port, and new publishing programs for the PC such as *MagnaType, ScenicWriter, Do-It,* and the

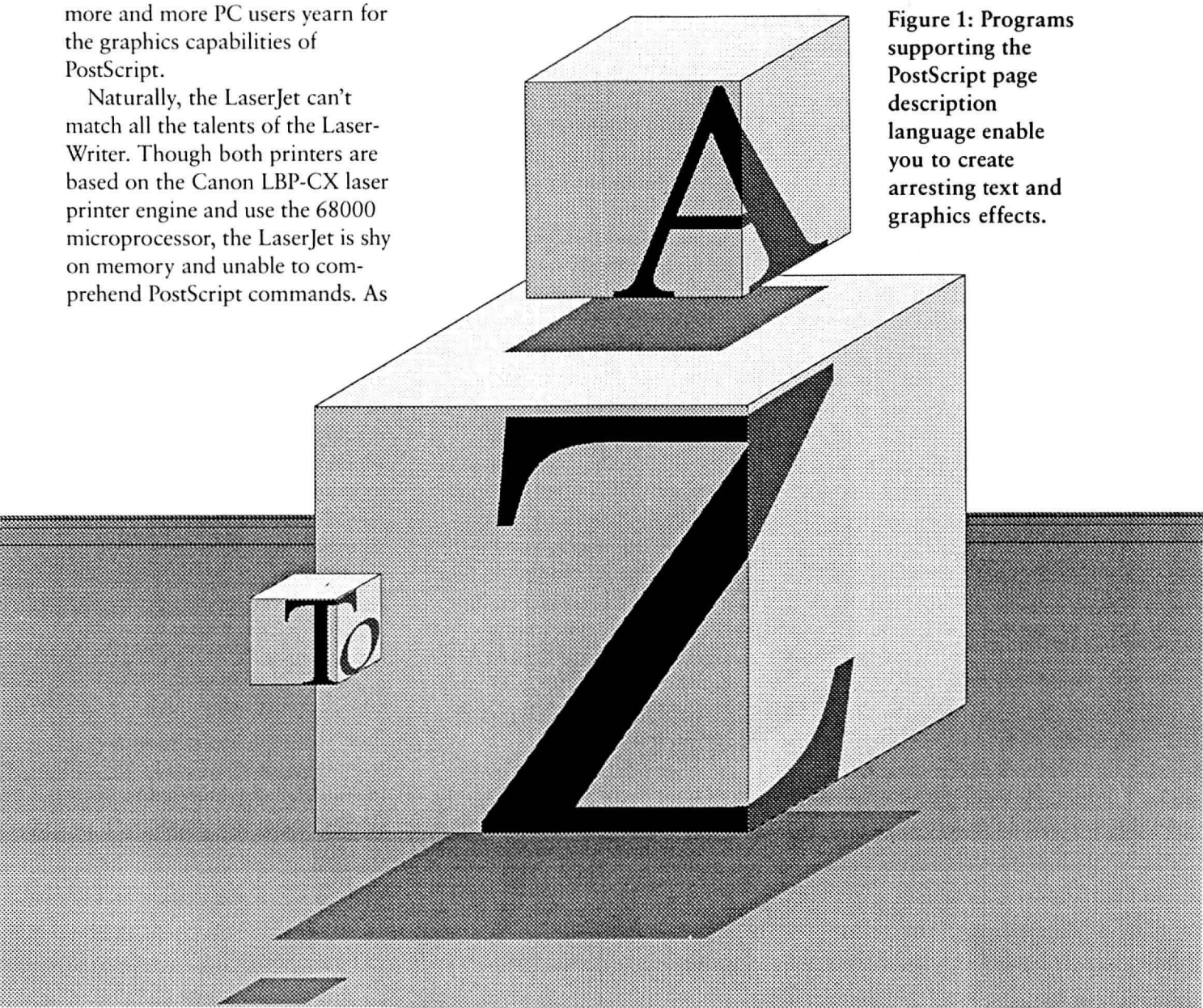


Figure 1: Programs supporting the PostScript page description language enable you to create arresting text and graphics effects.

recently converted *PageMaker* all generate PostScript files—as can *Microsoft Word, XyWrite III,* and *Microsoft Chart.* Converters such as Tangent Technologies' PC MacBridge board also let popular programs from *WordStar* to *1-2-3* tap the LaserWriter's powers.

The PC's user interface is also moving toward Mac-like standardization. *Microsoft Windows,* an extension of DOS that imposes many of the same rules on applications that the Mac does, can easily integrate text and graphics from *Windows*-compatible programs (see Screen 1). Mac analogues such as *Windows Write, Windows Paint,* and *Windows Draw* and converted Mac programs such as *ClickArt* and *PageMaker* will likely be available by press time. *Windows* will, of course, sport a PostScript driver for LaserWriter output.

What You See and What You Don't

Depending on the personal publishing program you use, you may or may not see on screen what eventually rolls out of your laser printer. Some programs rely on coding, in much the way early word processing programs handled printing enhancements. As with traditional typesetting programs, there's little attempt to show on screen what the document will look like when printed. *WordStar* is a good example of the coding approach. To print a block of text in boldface, you insert control characters at the beginning of the block and turn them off at the end. Embedded codes also control italics, subscripts, and similar functions.

Other publishing programs take the what-you-see-is-what-you-get (sometimes referred to as WYSIWYG) tack—screen display closely emulates a document's ultimate appearance. If you want to set text in italics, for example, you don't have to wait until print time to see your handiwork. Moreover, rather than requiring embedded codes, many such programs let you pick fonts and functions from menus.

Code-oriented publishing programs are generally more flexible and powerful than their display-oriented counterparts. One particularly pertinent example is *MagnaType* from Magna Computer Systems, which provides a full complement of typesetting features, from kerning and tracking (functions that control spacing between characters and words) to automatic hyphenation and justification. Although it supports PostScript and the LaserWriter, *MagnaType* is a true typesetting program, capable of driving a commercial typesetter (see "MagnaType: The Personal Typographer" in this issue).

Typographers may not prefer display-oriented programs, but design professionals and those making their first forays into the field will find them much easier to learn and use. A leading example of such software is Aldus's *PageMaker,* currently the most popular page composition program for the Macintosh and perhaps soon for the PC. The program can display an entire page, zoom a section, automatically reformat for new column margins or inserts, and scale images to fit (see Figure 2).

> PageMaker *can display an entire page, zoom a section, automatically reformat for new column margins or inserts, and scale images to fit.*

Instead of coding a hole in a document for a picture that will be pasted in later by hand, all elements of the document are assembled on one electronic drafting table. (See "Taking a Page From the Pros" in this issue.)

Graphic Impressions

There's more to PC publishing than setting text in a professional-looking typeface. You can enhance a document by creating graphic elements like boxes, horizontal bars, and vertical rules—functions supported by most PC publishing programs. But if you've seen effective presentation graphics, you know how charts and illustrations can amplify a message. If extra visual punch is what you need, consider page layout programs, such as *PageMaker* and Ventura Software's *Ventura Publisher,* that can import graphics from other business programs and include freewheeling output from draw or paint programs.

A typical page makeup session to produce a newsletter in the *Microsoft Windows* environment might work as follows. Before importing text formatted by *Word* into *Windows Write*, you would convert the document from style sheet formatting to direct formatting, because *Write* discards style sheets. Once text is suitably polished, you would open the *Write* document file from *PageMaker* and pour the text into previously defined columns. You could construct a masthead and headlines using *Windows Draw*'s fonts and create a freehand graphic with *Windows Paint* illustrating a news item. *PageMaker* would then import the two files. Using *PageMaker*'s toolbox, you could crop, shrink, or expand the images and insert borders for emphasis. The page would then be sent to the laser printer.

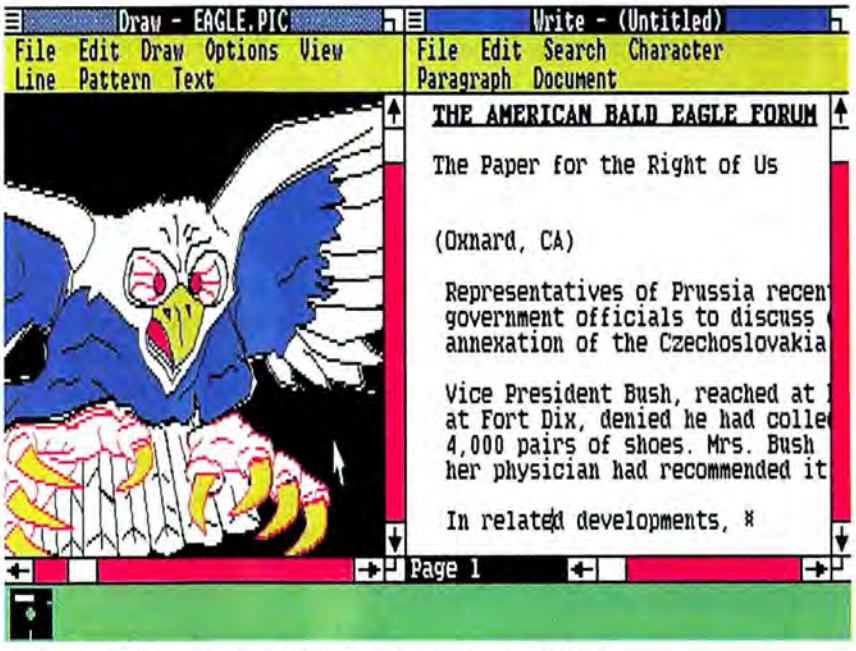
To further complicate matters, if you want to incorporate photos into a document without physically pasting them in, you'll have to turn to expensive and not-so-friendly digitizers like the Datacopy Model 700 Word Image Processing System (WIPS). Resembling a desk-top photocopier, the Datacopy turns whatever is placed on its scanning plate into a digitized bit map. To include a scanned image in a document, you must transfer the bit-mapped image file by means of the scanner's software to *PageMaker*.

If this sounds convoluted, it is. Integrating all the elements discussed here would mean learning no less than seven separate programs. In addition, some steps in the process—such as final layout, scanning, and printing out graphics—are intricate and time-consuming. It's clear that PC publishing is no casual affair.

System Suggestions

Naturally, the quality and complexity of the output you require will determine the cost and capabilities of your personal computer publishing system. If you generate only letters, memos, and departmental reports, running *MagnaType* on an AT is overkill indeed. A word processor and a dot matrix printer with a sharp near letter quality mode would probably suffice. Bona fide personal computer publishing becomes imperative when you must incorporate graphics and when clients, top management, or the public will see your documents.

Wherever you are in the PC publishing continuum, be aware that do-it-yourself publishing is expensive. A system including a PC, the requisite software, and a laser printer can easily top $20,000. As you move toward the high end (above $40,000), some contend that you might as well purchase a terminal and a small dedicated typesetter for about $50,000. A dedicated system offers far more fonts than a laser printer but can't use any other software. For many, a PC-based system will likely be the best choice.



Screen 1: If you've used the Macintosh, you'll find the Windows environment familiar. In the early part of the page makeup process, you create graphics with Windows Draw and enter text in Windows Write. Depending on your whim, the image on the left could be reduced, cut, and pasted into the Write document; the entire Write file would then be imported by PageMaker. PageMaker could also capture and size the text and graphics files separately.

What systems dot the personal computer publishing landscape? Based on cost and functionality, there are some notable points along the way.

The low end. A commonsense personal publishing system for the low end would probably include a hard-disk-equipped PC XT featuring monochrome graphics capability. For output, either the QMS KISS or the LaserJet Plus, because both are supported by a wide range of software. The KISS is about $1500 cheaper than the LaserJet Plus and is compatible with programs that have drivers for Epson, Diablo, and Qume printers (see "KISSes $2000" in this issue). However, the KISS's graphics potential is sorely limited by 128K of memory and relatively crude 150-dpi output. The LaserJet Plus produces sharp characters and one-third-page 300-dpi graphics.

If you choose *Microsoft Word* or *XyWrite III* as your word processor and pseudo page makeup program, you have access to the LaserJet's collection of cartridge and disk-based fonts. But text and graphics integration is problematic, since mammoth amounts of memory and disk storage are required and images are difficult to size and fit on a page.

The midrange. One rung up, you might hang on to *Word* or *XyWrite III* for word crunching and add *Windows, Windows Write, Windows Paint, Windows Draw,* and *PageMaker.* For color display and swift processing (respectively desired and required with *Windows*), you would swap the XT for an AT equipped with a hard disk, an Enhanced Graphics Adapter, and an Enhanced Color Display. A LaserWriter would accommodate PostScript files generated by *PageMaker.* Text would be sharper still, with full-page images of 300 dpi and unlimited graphics manipulation. For the truly professional look, PostScript files could be sent to a Linotronic 300 typesetter for 1270-dpi output. This capable personal publishing system could easily cost $15,000. If digitized images were a must, you'd need to add $3000 or more for a scanner.

The high end. In this rarefied realm, the distinctions between desktop and professional typesetting begin to blur. An 8MHz AT or 10MHz compatible and a monochrome monitor would run *MagnaType.* The LaserWriter would produce preview galleys, and type would be set on a commercial typesetter driven by *MagnaType.* The resolution of the output would depend on the typesetter used. Hold on to your wallet: Behind door number three lies a bill starting at $14,000—not counting the typesetter and the professionals needed to run the system.

Caveats for Custom Publishing

There's always another "revolution" coming round the bend. Laser and other photoelectric printers will no doubt continue to boost resolution while whittling price tags. Software developers, goaded by the success of upstart *PageMaker* and the entry of traditional systems like *MagnaType,* will bring greater functionality to their PC publishing products—and, one hopes, simplify the process. Word processing developers, for better or worse, will continue to take document formatting seriously and ponder the possibilities of laser printing. Programs such as *Word,* with its comprehensive style sheets, laser font use, and PostScript output, point the way toward a possible path—one that few professional word processing programs will be able to ignore. And the example of the Macintosh, as illustrated by *Microsoft Windows,* may make the cherished buzzword *integration* a reality.

In the meantime, keep in mind that personal computer publishing isn't for everyone. For some, sticking with a tried-and-true type and design house is just the ticket; for others, doing the coding in-house, having a type shop run off galleys, and pasting up the result on boards may be a perfectly cost-efficient solution. PC publishing means time, often unrewarded effort, and a willingness to be patient with hardware, software, and your own limitations. There are many programs to learn and disciplines to understand. Future publishing programs may help you make better design decisions, but until then, be prepared to climb a steep learning curve.

Eric Knorr and Robert Luhn are Associate Editors for PC World.

There's nothing standard about this corporate standard.

The standard is MultiMate Advantage.™

The word processing software program found on the "approved" list of most major companies.

Corporate standard aside, MultiMate Advantage also lives up to people standards.

Because it lets you customize to fit your needs.

For example, with the new columnar feature, creating up to eight columns on the screen is no longer wishful thinking.

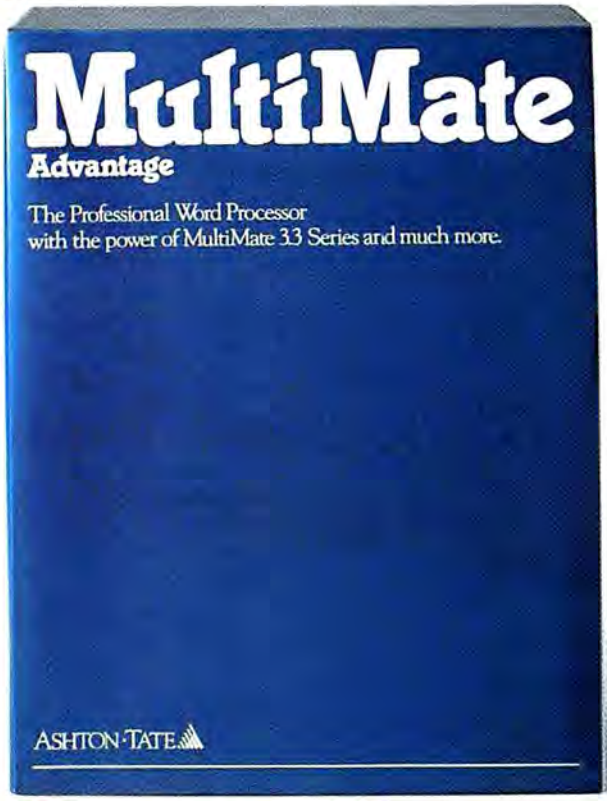
Neither is printing those columns on a single page. In fact, MultiMate Advantage supports over 350 different printers.

It also supports a new 40,000-word thesaurus. As well as a 110,000-word dictionary (complete with medical and legal jargon), which you can easily customize to include your own frequently used words.

And if you still need more reasons why this corporate standard isn't standard, look no further than MultiMate Advantage's keyboard. It's been specially designed just for word processing.

For the name of your nearest authorized Ashton-Tate dealer, call (800) 437-4329, Extension 235. And get your hands on MultiMate Advantage.

It's the first word processing program good enough to live up to everyone's standards.



Requires IBM* PC or 100% compatible. Trademarks/owner: MultiMate/Multimate International, an Ashton-Tate company; Ashton-Tate/Ashton-Tate; IBM/International Business Machines Corp. © 1986 Ashton-Tate. All rights reserved.

Circle 501 on reader service card

Corporate Publishing Takes Off

Pioneering companies large and small are reaping enormous savings and dramatically improving the quality of their public image by assigning a new function to their PCs—publishing.

Barbara Robertson

Around the Boeing Corporation legend has it that the documentation for a 747 weighs more than the plane itself. That mass of paper, however, is just a small portion of the aerospace giant's total publishing effort, which amounts to 2 billion pages a year. So it is not surprising that one division at Boeing is using more than 200 Macintosh computers to halve production costs for some of its reports and proposals. After all, Apple has heavily promoted the machine's ability to handle personal computer publishing.

What comes as a surprise is that the bulk of Boeing's campaign to improve the quality and reduce

David Bishop

the costs of its publishing centers not on the Mac but on the PC.

When typesetting specialist Chad Canty was hired by Boeing's Software Education Product Group to improve the department's documentation, he first considered using Macintoshes. But Canty was not pleased with either word processing program available on Apple's flagship product–*MacWrite* was not sophisticated enough, he says, and *Microsoft Word* was too slow. His ultimate decision to go with PCs was helped by the fact that the software group already possessed them.

Enormous publishing costs are not unique to Boeing. According to InterConsult of Cambridge, Massachusetts, publishing ranks second only to personnel as most companies' biggest expense, typically consuming 6 to 10 percent of gross revenues. Nor is Boeing alone in its effort to reduce those costs through an existing investment in PCs.

At Sperry Corporation, a Blue Bell, Pennsylvania, computer manufacturer, Tony Menichelli, manager of composition and layout services, faced a task similar to Canty's. While evaluating a switch from manual pasteup of type produced by a local typesetter to a mainframe typesetting and page layout system, Menichelli found a third alternative–a local area network of Sperry PC ITs and the PC-based *Superpage* pagination system, an interactive page layout program.

Publishing ranks second only to personnel as most companies' biggest expense, typically consuming 6 to 10 percent of gross revenues.

At SBT, a Sausalito, California, software company that offers *dBASE II*-based accounting programs, a PC pagination system combined with a laser printer reduces the costs of documentation and provides a competitive edge. "We can quickly add features or change our discount policy to meet a changing market and get new, high-quality printed material to our dealers in 48 hours," says Robert H. Davies, SBT's president.

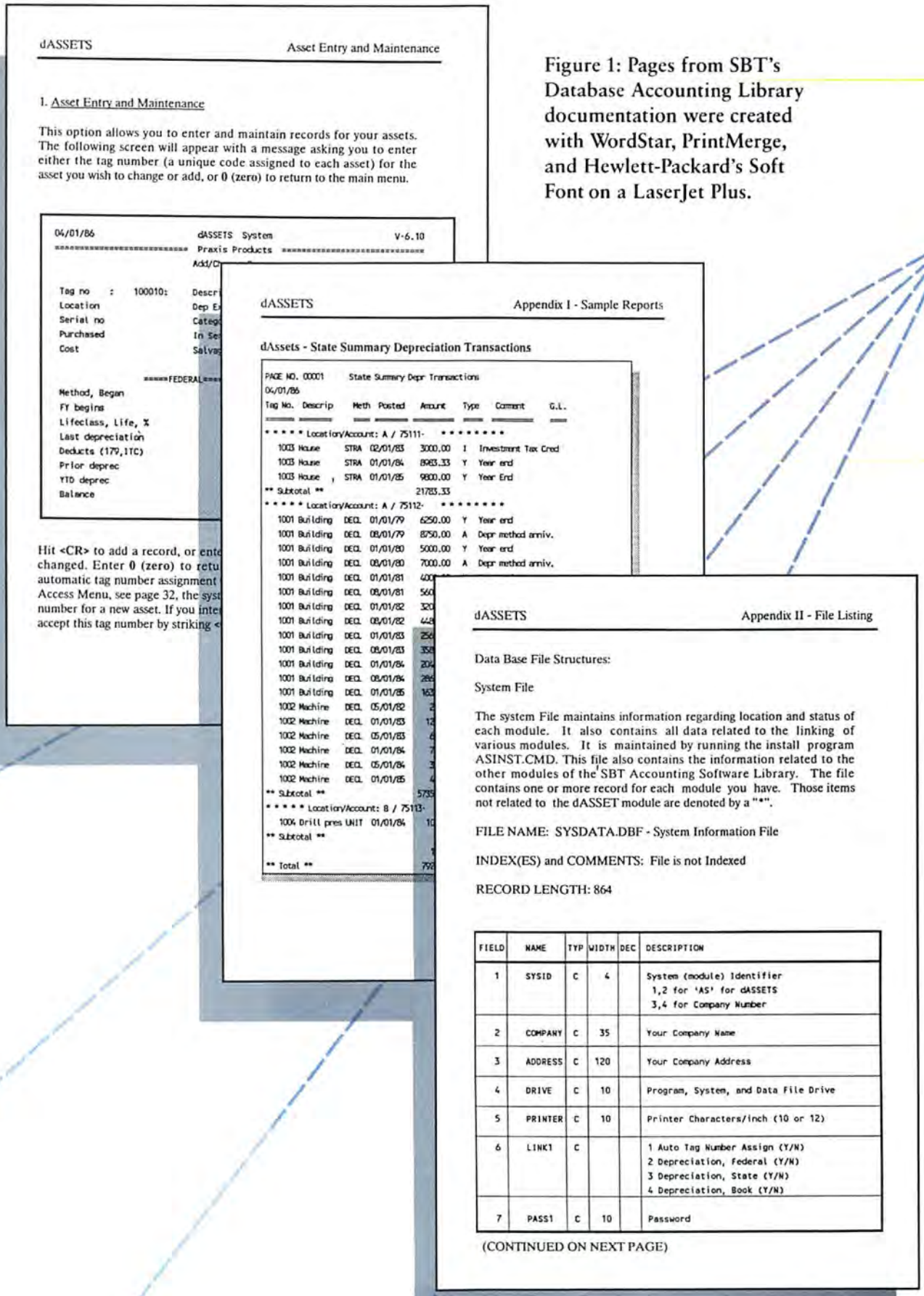
How is all this possible on PCs? After all, the personal publishing tools that have made such a splash on the Mac–the inexpensive, do-everything programs that integrate graphics and type into camera-ready pages–are just now being introduced on the PC. But there are ways to enhance the publishing process without the sophisticated page layout capabilities of a program like Aldus's *PageMaker* for the Macintosh. Indeed, such programs may not be appropriate for every publishing application.

The Cost of Tradition

One reason the cost of publishing is so high (InterConsult estimates that U.S. firms spent $200 billion to produce 2.5 trillion pages in 1984) is that most firms still assemble business documents by the traditional, labor-intensive manual method. The written portion of a document goes from a word processor to a typesetter, and not always directly–sometimes it is manually rekeyed. The rosin-coated paper used by phototypesetters is expensive–about 50 cents a sheet–but its cost is relatively insignificant compared to that of the manual cut-and-paste process whereby type is combined with headlines, charts, diagrams, and other graphic elements.

The inevitable last-minute changes that occur in the assembly process are even more laborious: It has been estimated that a 10 percent revision can account for 70 percent of a document's production time, boosting the cost of technical documentation to as much as $400 per page over the course of several revisions.

For some applications, the expense and turnaround time of this traditional process are completely unacceptable. SBT originally used daisy wheel printers to produce camera-ready copy, which was then photographically reduced from 8½ by 11 inches to fit a smaller, bookshelf-size three-ring binder. Later, in an effort to make the documentation look more professional, SBT went to an outside production facility. "We got an estimate for $8000," Davies says. "But it ended up costing $30,000; took four months for the production alone; and since the outside company didn't understand the program, the resulting quality was not what we'd hoped for."



dASSETS Asset Entry and Maintenance

1. Asset Entry and Maintenance

This option allows you to enter and maintain records for your assets. The following screen will appear with a message asking you to enter either the tag number (a unique code assigned to each asset) for the asset you wish to change or add, or 0 (zero) to return to the main menu.

04/01/86 dASSETS System V-6.10
Praxis Products

Tag no : 100010:
Location
Serial no
Purchased
Cost
=====FEDERAL=====
Method, Began
FY begins
Lifeclass, Life, %
Last depreciation
Deducts (179,ITC)
Prior deprec
YTD deprec
Balance

Hit <CR> to add a record, or ente
changed. Enter 0 (zero) to retu
automatic tag number assignment
Access Menu, see page 32, the syst
number for a new asset. If you inte
accept this tag number by striking <

dASSETS Appendix I - Sample Reports

dAssets - State Summary Depreciation Transactions

PAGE NO. 00001 State Summary Depr Transactions
04/01/86

Tag No.	Descrip	Meth	Posted	Amount	Type	Comment	G.L.
***** Location/Account: A / 75111- ********							
1003	House	STRA	02/01/83	3000.00	I	Investment Tax Cred	
1003	House	STRA	01/01/84	8983.33	Y	Year end	
1003	House	STRA	01/01/85	9800.00	Y	Year End	
** Subtotal **				21783.33			
***** Location/Account: A / 75112- ********							
1001	Building	DEQ	01/01/79	6250.00	Y	Year end	
1001	Building	DEQ	08/01/79	8750.00	A	Depr method anniv.	
1001	Building	DEQ	01/01/80	5000.00	Y	Year end	
1001	Building	DEQ	08/01/80	7000.00	A	Depr method anniv.	
1001	Building	DEQ	01/01/81	400			
1001	Building	DEQ	08/01/81	560			
1001	Building	DEQ	01/01/82	320			
1001	Building	DEQ	08/01/82	448			
1001	Building	DEQ	01/01/83	256			
1001	Building	DEQ	08/01/83	358			
1001	Building	DEQ	01/01/84	204			
1001	Building	DEQ	08/01/84	286			
1001	Building	DEQ	01/01/85	163			
1002	Machine	DEQ	05/01/82	2			
1002	Machine	DEQ	01/01/83	12			
1002	Machine	DEQ	05/01/83	6			
1002	Machine	DEQ	01/01/84	7			
1002	Machine	DEQ	05/01/84	3			
1002	Machine	DEQ	01/01/85	4			
** Subtotal **				5735			
***** Location/Account: B / 75113-							
1004	Drill pres UNIT		01/01/84	10			
** Subtotal **							
** Total **				79			

dASSETS Appendix II - File Listing

Data Base File Structures:

System File

The system File maintains information regarding location and status of each module. It also contains all data related to the linking of various modules. It is maintained by running the install program ASINST.CMD. This file also contains the information related to the other modules of the SBT Accounting Software Library. The file contains one or more record for each module you have. Those items not related to the dASSET module are denoted by a "*".

FILE NAME: SYSDATA.DBF - System Information File

INDEX(ES) and COMMENTS: File is not Indexed

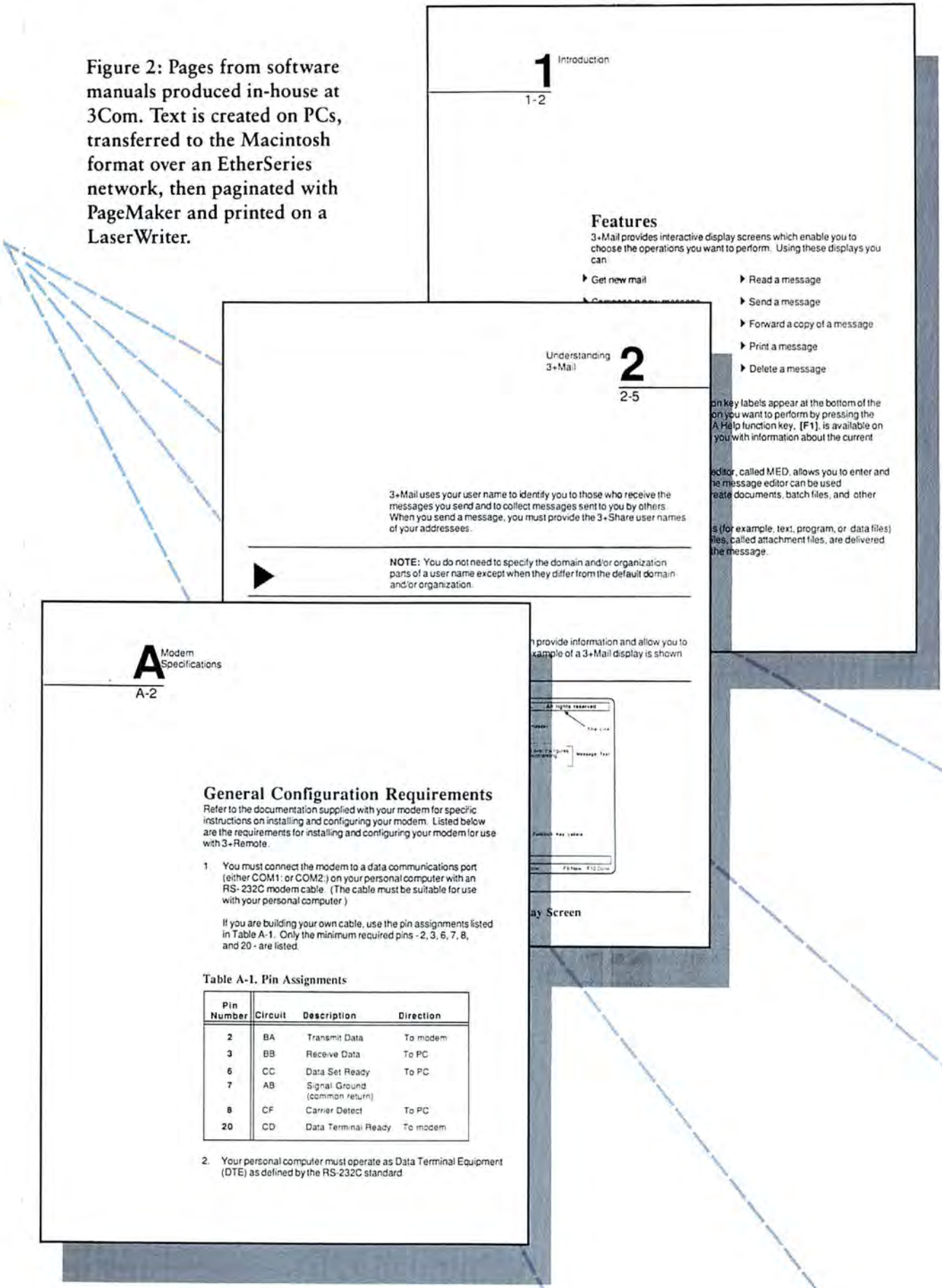
RECORD LENGTH: 864

FIELD	NAME	TYP	WIDTH	DEC	DESCRIPTION
1	SYSID	C	4		System (module) Identifier 1,2 for 'AS' for dASSETS 3,4 for Company Number
2	COMPANY	C	35		Your Company Name
3	ADDRESS	C	120		Your Company Address
4	DRIVE	C	10		Program, System, and Data File Drive
5	PRINTER	C	10		Printer Characters/inch (10 or 12)
6	LINK1	C			1 Auto Tag Number Assign (Y/N) 2 Depreciation, Federal (Y/N) 3 Depreciation, State (Y/N) 4 Depreciation, Book (Y/N)
7	PASS1	C	10		Password

(CONTINUED ON NEXT PAGE)

Figure 1: Pages from SBT's Database Accounting Library documentation were created with WordStar, PrintMerge, and Hewlett-Packard's Soft Font on a LaserJet Plus.

Figure 2: Pages from software manuals produced in-house at 3Com. Text is created on PCs, transferred to the Macintosh format over an EtherSeries network, then paginated with PageMaker and printed on a LaserWriter.



1 Introduction
1-2

Features
3+Mail provides interactive display screens which enable you to choose the operations you want to perform. Using these displays you can:

- Get new mail
- Read a message
- Send a message
- Forward a copy of a message
- Print a message
- Delete a message

on key labels appear at the bottom of the
on you want to perform by pressing the
A Help function key, [F1], is available on
you with information about the current

editor, called MED, allows you to enter and
e message editor can be used
eate documents, batch files, and other

s (for example, text, program, or data files)
iles, called attachment files, are delivered
the message.

Understanding 3+Mail 2
2-5

3+Mail uses your user name to identify you to those who receive the messages you send and to collect messages sent to you by others. When you send a message, you must provide the 3+Share user names of your addressees.

NOTE: You do not need to specify the domain and/or organization parts of a user name except when they differ from the default domain and/or organization.

provide information and allow you to
xample of a 3+Mail display is shown

ay Screen

A Modem Specifications
A-2

General Configuration Requirements

Refer to the documentation supplied with your modem for specific instructions on installing and configuring your modem. Listed below are the requirements for installing and configuring your modem for use with 3+Remote.

1. You must connect the modem to a data communications port (either COM1: or COM2:) on your personal computer with an RS-232C modem cable. (The cable must be suitable for use with your personal computer.)

   If you are building your own cable, use the pin assignments listed in Table A-1. Only the minimum required pins - 2, 3, 6, 7, 8, and 20 - are listed.

Table A-1. Pin Assignments

Pin Number	Circuit	Description	Direction
2	BA	Transmit Data	To modem
3	BB	Receive Data	To PC
6	CC	Data Set Ready	To PC
7	AB	Signal Ground (common return)	
8	CF	Carrier Detect	To PC
20	CD	Data Terminal Ready	To modem

2. Your personal computer must operate as Data Terminal Equipment (DTE) as defined by the RS-232C standard.

Now, using *WordStar* for text entry and a combination print driver and page formatter called *PrintMerge* from Polaris Software, SBT produces high-quality, camera-ready copy in-house, sending it out only for reproduction of multiple copies (see Figure 1). In addition, the company uses this system for preliminary documentation and addenda, which, because of laser printing, look as polished as the final versions. "We can make a change in the program and ship it with changed documentation the same day. It's unbelievable," says Davies.

The *PrintMerge* program lets *WordStar* users select LaserJet type fonts and sizes, specify page formats, and add graphics by entering commands from within *WordStar* documents. For example, to draw a box, you enter the dot command .BX followed by numeric codes that designate line width and upper-left and lower-right coordinates. Type spacing, size, and style are selected with *WordStar* control-code sequences.

Other users of *PrintMerge* tend to be much like the production staff at SBT: *WordStar* users who want better quality than they can get from a daisy wheel printer and *WordStar*'s limited formatting capabilities. Pacific Information Corporation, for example, produces specialty books with *PrintMerge* and an HP LaserJet. "I do a lot of the layout and page formatting myself," says Kenneth Plate, president of the company, who also writes and edits most of Pacific Information's books. "Since I'm involved with the intellectual content of the books, it's easier, saves us time, and makes a better product."

The Electronic Art Department

Tony Menichelli's graphics needs at Sperry Corporation are more complex. The company's annual output of 40,000 pages of mainframe software and hardware manuals requires that more than 120,000 pages be typeset and laid out in the course of the several revisions that lead to final, camera-ready copy. Menichelli chose *Superpage*, a pagination program from Bestinfo, that is much more expensive than *PrintMerge*.

Based on the various letter widths in a chosen proportional type font, *Superpage* calculates how many characters are needed to complete a column line. To fill the space evenly *Superpage* hyphenates words at the ends of lines, then presents the text file on screen in preview mode.

"Once *Superpage* has hyphenated and justified the text, it flows that text onto your predefined page forms," says Menichelli. "If you agree with where the program cuts the copy, you accept it; otherwise, you establish a new bottom margin and then continue flowing text onto the next page."

Before *Superpage*, Sperry used a fairly traditional publishing process. Working on dedicated word processing terminals, writers entered their text and coded it for typesetting. The output from the typesetter was a column of text known as a galley. The art staff spent most of its time cutting the galleys into page-length chunks, with running headers and footers pasted in manually. "Our artists were doing pasteup instead of graphics, and consequently the books' graphics suffered. We've been trying to put more graphics in for the past five years," says Tony Menichelli, "but schedules never seemed to allow it."

Menichelli says the electronic cut-and-paste process has given his artists more time to work creatively with authors, think about graphic concepts, and do mock-ups on their drawing boards. "But then they'll show people their concept for the illustration—and you can't really show it until it's nearly done—and someone will decide that it's wrong, and they've got to change it." Such changes, he says, are much easier if the graphic is created electronically. Menichelli hopes to have such a capability on hand soon. With computer-created graphics, he notes, "you can erase sections, move type, and change the lines of charts and boxes around." Making changes on electronic graphics saves time, he says, "the same way word processing does when it saves you from retyping pages because of a few changes."

Menichelli currently has *Superpage* leave an appropriate amount of space on the page for graphics to be pasted in later. He plans to look into a recent enhancement of *Superpage* that uses a scanner to "read" and digitize images. "You can use a Datacopy scanner to scan an image into a file; then at pasteup stage, you can call it into the page being printed." The Datacopy software has a sizing ability so you can reduce or enlarge the graphic to fit the layout.

Because the PC-based system is just part of Sperry's publishing operation, switching to another

system would be difficult, Menichelli says. A mainframe pagination system was brought on line prior to the development of the PC-based system to solve the same problem—the cost and delays resulting from manual pasteup. A gateway between the mainframe and the local area network on which the PC-based system resides allows work to be transferred between the two systems when either one is overscheduled. The system can also vary the quality of output, depending on the job at hand.

"If it's something for which we can accept no compromises, we print it on our Autologic APS-5 typesetter," Menichelli explains. But when slightly lower quality output will suffice, his division produces the work much less expensively on a laser printer driven by *Superpage,* without having to change formatting codes. For drafts, *Superpage*'s text editor, a modified version of *XyWrite II,* has a compressed mode that allows text to be edited and printed on a dot matrix printer without interference from typesetting codes.

Boeing Takes Off With XyWrite

At Boeing, Chad Canty has taken a completely original approach to what at first seemed a simple problem. Many of the software systems designed to solve internal engineering or management problems were good enough to become commercial products. Boeing's RIM data base, developed for NASA to keep track of the many unique heat-shield tiles on the space shuttle, is just one example. Canty's Software Education Products Group was given the charter to sell such software and services to the outside world. But the letter quality print of the in-house documentation was not suitable for products intended for public consumption. When Canty was asked to add proportional spacing to the division's word processing capabilities, he initially thought that meant finding a word processor that would work with any laser printer.

By the time he was finished, Canty had given an inexpensive, off-the-shelf word processing program, *XyWrite II +*, the ability to do typesetting, graphics, and page formatting.

Canty chose *XyWrite* because the program had many of the options he wanted, such as widow and orphan control and multicolumn formatting with word wrap inside columns. *XyWrite* does not display a bit-mapped page on screen with type in a font and size corresponding to what will be printed. However, *XyWrite* does display line breaks based on the specified type style and point size, even for proportionally spaced text. Equally important, the program allows users to insert PostScript printing commands, which handle the gamut of typesetting codes, anywhere within a file.

PostScript is a page description language that can tell a laser printer, such as the Apple LaserWriter, to create virtually any kind of graphic element. For example, a PostScript command could instruct the printer to "measure the length of the text in a line and build a box to fit around it," says Canty.

Canty believes that people underestimate the difficulty of moving from word processing to near typography. "There's a lot more to be conscious of," he says. "It's like going from driving a bus to flying a Lear jet." In order to simplify the task for his department's 24 employees, Canty developed a number of correctly formatted boilerplate texts. The writers no longer worry about the front matter of manuals. The formatting instructions that set type for the necessary ownership and licensing notices, title pages, and tables of contents, as well as other standard elements, are all inserted automatically. Yet Canty still expects several staff members to handle the fine points of typography and design.

As a result of Canty's efforts, Boeing is publishing professional quality manuals for little more than

the cost of the relatively amateurish books that preceded them. While it is difficult to quantify what this means to Boeing either in production dollars saved or in increased sales, the improvement in quality is so dramatic, it earned Canty a special award from Boeing's Computer Services Division.

How difficult is it to write PostScript code? "Not hard for someone who has worked with a high-level language before," says Canty. Although it might require working in unfamiliar units of measurement, such as picas and points, "the typographic aspects fall out by themselves," he says.

The Future Is Now

Although sophisticated publishing is possible with PCs, not everyone is eager to buy a $7000 package like *Superpage* or even a $2495 program like *Do-It* from Studio Software. Nor does constructing a homegrown solution like Canty's appeal to many. Instead, most companies have been awaiting the arrival of relatively inexpensive programs like *PageMaker* for the PC.

Some companies, however, can't wait for the future; they have to publish now with the available tools. In Mountain View, California, 3Com's Application Systems Division documentation and product services department was locked into the PC world, says Liz Kroha, department manager, but simply couldn't wait for the forthcoming PC publishing programs. The company contracts with outside writers for much of its copy, and they all work on PCs. Thus, text comes in on 5¼-inch, PC-DOS-formatted floppy disks.

Using five Macintoshes and two PCs hooked up to an EtherSeries network with a 3Server file server as a gateway between the IBM and Apple machines, the production team gets the best of both worlds. After a utility strips out the formatting characters from the various kinds of word processing files—*WordPerfect, XyWrite,* and *WordStar*—those files are transferred over the network from DOS formats to 3½-inch Mac-formatted disks. *MacDraw* images are combined with type that has been formatted and justified by *MacWrite* (see Figure 2). The department has used the system to turn out 16 books—2500 pages of camera-ready art—in three months time.

Clearly, progressive companies that already are comfortable with PCs are finding that they can dramatically reduce their publishing costs and improve their image through PC-based publishing systems. Though the software is still short of perfection, it won't be long before *PageMaker* and other advanced electronic publishing programs begin to make an impact among a much broader second wave of companies. They will discover in the PC an inexpensive, high-quality alternative to the costly, laborious process that has ruled the publishing world for generations.

Barbara Robertson is a Mill Valley, California, freelance writer and editor.

PrintMerge
Polaris Software
310 Via Vera Cruz #305
San Marcos, CA 92069
800/388-5943, 800/231-3531
California
List price: $124
Requirements: 196K, two disk drives, DOS 2.00 or later version

Superpage
Bestinfo
33 Chester Pike
Ridley Park, PA 19078
215-328-2900
List price: $7000
Requirements: 512K, hard disk, Hercules Graphics Card with 64K, parallel port

XyWrite II +
XyQuest Inc.
P.O. Box 372
Bedford, MA 01730
617/275-4439
List price: $295
Requirements: 192K, one disk drive, DOS 1.10 or later version

Look! Light

✓ **denotes IBM-AT compatibility.**
✻ **denotes IBM-PCjr compatibility.**
(call for specific requirements)

SOFTWARE

We only carry the latest versions of products. Version numbers in our ads are current at press time.

Alpha Software
✻✓Keyworks 2.0 ... $49.
✻jr Electric Desk ... 69.
Ashton-Tate
✓dBase II 2.43 ... call
✓dBase III Plus 1.0 ... call
✓Framework II 1.0 ... call
Best Programs
PC Connection 15-day money back guarantee on these Best Programs.
✓PC/Tax Cut *(1986 version for 1985 taxes)* 119.
✓Professional Finance Program 4.0 ... 149.
✓PC/Fixed Asset System 3.1 ... 299.
Bible Research
✻✓THE WORD 3.1 *(KJV Bible)* ... 159.
✻✓THE WORD 3.1 *(NIV Bible)* ... 159.
Borland International
✻✓Turbo Tutor 1.0 ... 19.
✻✓Turbo Database Toolbox 1.2 ... 33.
✻✓Turbo Graphix Toolbox 1.0 ... 33.
✻✓Turbo Editor Toolbox 1.0 ... 41.
✻✓Turbo Gameworks 1.0 ... 37.
✻✓Turbo Newpak *(Gameworks and Editor)* 52.
✓Turbo Lightning 1.0 ... 57.
✻✓Sidekick 1.5 *(non-protected)* ... 51.
✻✓Traveling Sidekick 1.0 *(req. Sidekick)* ... 45.
✻✓Traveling Sidekick 1.0 w/Sidekick ... 73.
✻✓Reflex 1.1 ... 59.
✻✓Superkey 1.1 ... 41.
✻✓Superkey/Sidekick Package ... 67.
✻✓Turbo Pascal 3.0 ... 41.
✻✓Turbo Prolog 1.0 ... 65.
✻✓Turbo Holiday Pack *(Pascal 3.0, Tutor, and Database Toolbox)* ... 67.
✻✓Turbo Family Jumbo Pack *(Pascal 3.0, Database, Editor & Graphix Toolboxes, Tutor and Gameworks)* ... 135.
BPI Accounting Software
✓General Ledger C.13 ... 299.
✓Accounts Payable C.13 ... 299.
✓Accounts Receivable C.13 ... 299.
✓Business Builder ... 399.
Breakthrough
✓Timeline 2.0 ... 239.
Broderbund
✻✓Print Shop ... 35.
✻✓Graphics Library #1 ... 22.
Computer Associates
✓SuperCalc 3 Release 2.1 ... special
Dac Software
✻✓Dac Easy Accounting ... 45.
✓Dac Easy Word ... 32.
✓Dac Easy Payroll ... 32.
Decision Resources
✻✓Sign-Master 5.1 ... 157.
✓Diagram-Master 5.0 ... 207.

PC Connection Software Special
through July 31, 1986

COMPUTER ASSOCIATES
✓SuperCalc 3 Release 2.1

Spreadsheet, information manager and presentation graphics with all the power and flexibility of 1-2-3 for less than half the price.

- Spreadsheet—9999 cols. x 127 rows. Incredibly fast calculation, sparse matrix technology, math chip support, over 50 financial and mathematical functions
- Information Management—up to 9998 records, 127 fields per record. Can sort numerically or alphabetically in dictionary (not ASCII) order
- Presentation Graphics—8 different chart types, supports color graphics, Hercules Monochrome Graphics, and the EGA
- Comes with Sideways 3.11

For the IBM-PC, XT and AT **Call for special price**

✻✓Chart-Master 6.1 ... $237.
✻✓Map-Master 1.0 ... 245.
Evergreen
✓One Write Plus 1.01 ... 159.
Executive Systems
✓XTREE 2.0 *(file & directory manager)* ... 37.
5th Generation
✓Fastback 5.03 ... 97.
Funk Software
✻✓Sideways 3.11 ... 39.
Graphic Communications
✓Freelance ... 199.
Harvard Associates
✻✓PC LOGO 2.0 ... 89.
Infocom
✓Cornerstone 5.1 ... 65.
Lifetree
✻✓Volkswriter 3 ... 147.
Living Videotext
✓ThinkTank 2.1 ... 105.
✓Ready! 1.0 ... 49.
Micro Education (MECA)
✻✓Managing Your Money 2.0 ... 99.
✓Managing the Market ... 79.
Micropro
✻✓WordStar 3.31 ... 179.
✓WordStar Propak 3.31 ... 259.
✓WordStar 2000 Plus Release 2 ... 285.
Microrim
✓Extended Report Writer 1.2 ... 85.
✓Clout 2.0 ... 135.
✓R:base 5000 1.01 ... 359.
Special! Get one R:base 5000 free from Microrim for every one you buy through June 30.

Microsoft
✓Multiplan 2.0 ... $119.
✓Microsoft Word 3.0 ... call
✻✓Microsoft Project 2.0 ... 239.
✻✓Microsoft Chart 2.0 ... 197.
✓Windows 1.0 ... 65.

The following Microsoft mice now come with PC Paintbrush 3.0 software:
✓Microsoft Bus Mouse with software 5.0 135.
✓Microsoft Serial Mouse with software 5.0 135.

LANGUAGES
✓Quick Basic 1.02 ... 69.
✻✓Macro Assembler 4.0 ... 105.
✓Pascal Compiler 3.31 ... 175.
✓Fortran Compiler 3.31 ... 205.
✓Basic Compiler 5.36 ... 235.
✻✓C Compiler 3.0 ... 235.
✓Cobol Compiler 2.1 ... 449.
Microstuf
✻✓Crosstalk XVI 3.6 ... 95.
✓Remote 1.3 ... 95.
Migent Software
✓Ability 1.0A ... 65.
MultiMate International
✻✓MultiMate 3.31 ... call
✓Multimate Advantage 3.6 ... call
Nantucket Software
✓Clipper ... 349.
Paperback Software
✻✓VP-Planner ... 57.
Peter Norton
✻✓Norton Utilities 3.1 ... 59.
Powerbase
✓Powerbase 2.2 ... 189.
Quarterdeck
✓DESQView 1.2 ... 65.
Satellite Software
✻✓WordPerfect 4.1 ... 239.
Simon & Schuster
✻✓Webster's New World Speller 1.2 ... 39.
Softstyle
✻✓Printworks 1.05 ... 39.
✻✓Printworks Laser 2.0 ... 69.
Software Group
✓Enable 1.1 ... call
Software Publishing
✻✓PFS:Report B:01 ... 77.
✻✓PFS:File B:01 ... 84.
✻✓PFS:Graph B:01 ... 84.
✻✓PFS:Write C:01 *(with PFS:Proof)* ... 84.
✓Harvard Presentation Graphics ... 245.
✓Harvard Total Project Manager 1.1 ... 285.
Sorcim/IUS
✓SuperCalc 3 2.1 *(with Sideways)* ... call
Spectrum Holobyte
✻✓Art Studio ... 32.
Springboard
✻✓Newsroom ... 35.
✻✓Clip Art Volume 1 *(for Newsroom)* ... 19.
✻✓Clip Art Volume 2 *(for Newsroom)* ... 25.
Unison
✻Art Gallery 1 ... 22.
✻Printmaster 1.1 ... 37.

For the IBM-PC (XT & AT) exclusively. **Circle 136 on reader service card**

PC CONNECTION®

* DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION. SOME ITEMS HAVE MANUFACTURERS WARRANTIES UP TO FIVE YEA

PC Precision.

The Big Bleep.
Some people still think mail order is a slapdash operation where quantity is king and quality the banished prince. Obviously they've never seen our product interrogation room (a.k.a. tech department) here in Marlow, NH (pop. 552). Every day, programs and peripherals swagger in, acting like they're the greatest thing since bottled water. After hours of grueling experiments, many emerge victorious. The rest stagger out humiliated, defeated, begging us not to reveal their tragic flaws.

The Long Good Buy.
These days any company can get an 800 number, set up a warehouse, fill it with boxes and labels, park a tractor trailer at one end, and call itself a mail order house. But it takes a mad lust for truth to really *serve* micro users. Who knows what evil lurks in the hearts of circuit boards and software? We do.

We give all our products the third degree, so we can give all our customers the straight scoop. Like whether that word processor will support your printer. Or if those two memory-resident programs can peacefully co-exist. Or if that graphics card can keep up with your new monitor.

It's a jungle out there, folks. But we've gathered the evidence and the verdicts are in.

Choose your weapon.
A customer from California writes: "Your technical support is great! But how do I open my computer?" With the PC Connection 8-piece Tool Kit, of course. The solution to any installation intrigue. A $29.95 value—we'll send one free to everyone who places a $750 order between now and Sept. 30.

Just call 1-800/243-8088 or 1-603/446-3383, M-F 9:00 to 9:00; Saturday to 5:30. If you're planning to visit, call ahead to make sure what you want is in stock.

Master your micro with a free PC Connection Tool Kit. Screwdrivers, nutdrivers, chip puller, inserter, and more. Offer not available to commercial accounts. Limit one per customer.

For the IBM-PC (XT & AT) exclusively.

PC CONNECTION®

©COPYRIGHT MICRO CONNECTION, INC., 1986. MICRO CONNECTION AND THE RACCOON CHARACTER(S) ARE TRADEMARKS OF MICRO CONNECTION, INC. PC CONNECTION IS A REGISTERED TRADEMARK OF MICRO CONNECTION, INC., MARLOW, NH.

ning, languages, &

TRAINING

ATI
SKILL BUILDER PROGRAMS
ntro and How To Use:
PC-DOS MS-DOS
Compaq Typing Tutor
BM-PC BASIC ..... *each* $33.
TRAINING POWER PROGRAMS
How to Use:
dBase III Lotus 1-2-3 Wordperfect
Wordstar Displaywrite 3
Symphony ..... *each* 43.

NDIVIDUAL SOFTWARE
The Instructor II ..... 35.
Professor DOS ..... 47.
Tutorial Set *(both items above)* ..... 75.
Typing Instructor ..... 39.
Training for Lotus 1-2-3 ..... 49.
Training for dBase III ..... 49.
Training for Project Management ..... 49.

Scarborough Systems
MasterType ..... 26.

Simon & Schuster
Typing Tutor III ..... 33.

EDUCATIONAL

Barron's
Computer SAT ..... 35.

Designware *(requires graphics board)*
Spellicopter *(ages 6 to adult)* ..... 22.
Grammar Examiner *(ages 9 to adult)* ... 25.

Eduware *(requires graphics board)*
Algebra 1, 2, 3, or 4 ..... 22.

Harcourt Brace Jovanovich
Computer SAT ..... 49.
Computer GRE ..... 55.

Stone *(requires graphics board)*
My Letters,Numbers,Words *(ages 1 to 5)* 29.
Kids Stuff *(ages 3 to 8)* ..... 29.
Algebra+ *(grades 7-12)* ..... 32.

The Learning Company
(requires graphics board)
Reader Rabbit *(ages 5 to 7)* ..... 26.
Rocky's Boots *(ages 9 and up)* ..... 32.

RECREATIONAL

Blue Chip
High finance simulations.
Baron ..... 32.
Millionaire ..... 32.

Electronic Arts *(requires graphics board)*
Pinball Construction Set ..... 24.
Music Construction Set ..... 26.
Dr. J/Larry Bird One-on-One ..... 28.

Friendlysoft
PC Arcade ..... 35.

Hayden Software *(requires graphics board)*
Sargon III *(highest rated Chess program)* 32.

Infocom *Difficulty levels shown in italics*
JUNIOR
Seastalker ..... 25.
STANDARD
Enchanter *the Witness *Planetfall
Cutthroat *Wishbringer *Zork I
Ballyhoo *Fooblitzky
Hitchhiker's Guide ..... *each* 24.
ADVANCED
*Zork II *Zork III *Sorcerer
*A Mind Forever Voyaging ..... *each* 27.
EXPERT
*Spellbreaker *Suspended ... *each* 29.
Invisiclues (hint booklets) are available for most Infocom games. Specify game ... 6.

Microleague Sports
(requires graphics board)
*Microleague Baseball ..... 25.

Microprose *(requires graphics board)*
*F-15 Strike Eagle ..... 22.

Microsoft *(requires graphics board)*
*Flight Simulator 2.12 ..... 32.

1Step Software *(requires graphics board)*
*Golf's Best *(Pinehurst)* ..... 32.
*Golf's Best *(St. Andrew's)* ..... 32.

Parlor Software
*Bridge Parlor *(best Bridge simulation)* ... 49.

PCSoftware
*Championship Blackjack ..... 25.

Sierra On-Line *(requires graphics board)*
*King's Quest II ..... 33.

Simon & Schuster
(requires graphics board)
Star Trek/Kobayashi ..... 27.

Spectrum Holobyte
(requires graphics board)
*GATO ..... 27.
*Tellstar *(w/Halley's Comet)* ..... 32.

Sublogic *(requires graphics board)*
*Night Mission Pinball ..... $29.
*Jet ..... 33.
*Scenery *(airport)* disks for Jet ..... *each* 15.
*Package of all 6 Western Airports ..... 69.

XOR
NFL Challenge *(be the coach)* ..... 79.

PC Connection Hardware Special
through July 31, 1986

NEC Multisync Monitor and QUADRAM EGA+

If you can't decide between the high resolution monochrome and the excitement of color graphics, take both with our hardware special this month.

Quadram EGA+
- Runs all four video standards: monochrome text, Hercules compatible monochrome graphics, color graphics, and enhanced graphics
- Short version for half-slots
- Two-year warranty

NEC Multisync JP1401P3A
- Displays all four video standards
- Also compatible with IBM Professional Graphics Adaptor
- *PC Magazine (3/24)* called it "a superb performer"

Both for ..... **$899.**

HARDWARE

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

AST Research *(1 to 2 years)*
SixPakPlus 64k *includes Sidekick version 1.5 non-copy protected, & DESQView* ..... 169.
SixPakPlus 384k *(fully populated)* ..... 219.
Parallel, game, or second serial port for AST boards *(specify board)* ..... 35.
AST-5251-11 ..... 579.
Reach Modem *half card 300/1200 baud internal modem includes Crosstalk XVI* 349.
Advantage 128k *upgradeable to 1.5 Meg includes Sidekick version 1.5 non-copy protected* ..... 369.
RAMpage! *upgradeable to 2Mb, fully supports* LOTUS/INTEL *expanded memory specification (EMS)* ..... call
AT RAMpage! *upgradeable to 2Mb* ..... call

Amdek *(2 years)*
Video 310A mono monitor *(amber)* ..... 159.
*Color 722 - RGB monitor *(EGA compat.)* 519.

Compucable *(lifetime)*
Plastic Keyboard & Drive Cover Set ..... 15.
IBM Mono Screen Enhancement ..... 17.

Cuesta *(1 year)*
Uninterruptable power backup units
Datasaver 400 WATT ..... call

Curtis *(lifetime)*
ACCESSORIES
PC Pedestal *(for IBM Mono or Color)* ... 27.
Portable Pedestal ..... 36.
Printer Stand ..... 18.
System Stand ..... 19.
*Universal System Stand ..... 25.
*Low Profile Tilt and Swivel Pedestal ..... 25.
Crystal 300-watt *(line conditioner)* ..... 159.
CABLES
*Smartmodem to IBM Cable ..... 17.
Keyboard Extension Cable *(3 to 9 feet)* 27.
Extension Cables for IBM Mono Display 33.
Color and Monochrome Extension cables 39.
*Printer-to-IBM cable ..... 17.
SURGE SUPPRESSORS
*Safestrip ..... 21.
*Diamond *(6 outlets)* ..... 29.
*Emerald *(6 outlets; 6 ft cord)* ..... 36.
*Sapphire *(3 outlets; EMI/RFI filtered)* .... 47.
*Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 55.
*Command Center ..... 99.

DCA *(1 year)*
Irma ..... 769.

Epson *(1 year)*
*FX-85 printer *(80 column)* ..... call

1-800/243-8088

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

260W

For the IBM-PC (XT & AT) *Exclusively.*

PC CONNECTION®

lots more!

*✓FX-286 printer *(136 column)* ..... call
*✓LX-80 printer *(80 column)* ..... call
*✓LQ-1000 printer *(136 column)* ..... call
*✓Printer-to-IBM cable ..... 15.
We are an authorized Epson service center. Ask about the extended service plan.

Hayes *(2 years)*
*✓Smartmodem 300 ..... 139.
*✓Smartmodem 1200 ..... 389.
✓Smartmodem 1200B *(w/Smartcom II)* .. 349.
✓Smartmodem 1200B *(no software)* ..... 309.
*✓Smartmodem 2400 ..... 579.
✓Smartmodem 2400B *(w/Smartcom II)* .. 539.
✓Smartcom II 2.1 *(software)* ..... 75.

Hercules *(2 years)*
✓Hercules Color Card *(parallel port)* .... 159.
✓Hercules Graphics Card *(parallel port)* 299.
$50 end user rebate direct from Hercules until August 31.

Intel *(chips: 1 year; boards: 5 years)*
Above Board PC ..... call
✓Above Board AT ..... call
Above Board PS *(multifunction board)* .. call
8087 *(for IBM-PC & XT)* ..... 129.
8087-2 *(works on 8 Mhz computers)* ... 177.
✓80287 *(for IBM-PC AT)* ..... 225.

Kensington Microware *(1 year)*
*✓Masterpiece ..... 94.
*✓Masterpiece Plus ..... 129.
*✓Printer/portable computer stand ..... 17.

key tronic *(90 days)*
5150 keyboard ..... 115.
5151 keyboard *(deluxe)* ..... 169.
*jr5151 keyboard *(deluxe)* ..... 169.
✓5153 keyboard *(with touch pad)* ..... 279.

Kraft *(1 year)*
✓Joystick ..... 29.
✓*New!* 3 Button Joystick ..... 35.
✓Executive Cursor Control *(w/Joystick)* ... 47.

Mouse Systems *(3 years)*
*✓PC Mouse with PC Paint+ ..... 139.
✓PC Mouse with Ready ..... 139.
✓PC Mouse with Dr. Halo II ..... 139.
✓PC Mouse with Ready and PC Paint+ 149.

NEC *(90 days)*
✓Multisync monitor *(EGA compatible)* ... 549.

Orchid Technologies *(1 to 2 years)*
Conquest Multifunction Board Øk *fully supports* LOTUS/INTEL *expanded memory specification (EMS)* ..... 264.
✓PC Net Board ..... 319.
✓Eccell Multifunction Board for the AT ... 399.
PC Turbo 286e w/1 Meg ..... 749.
Tiny Turbo 286 ..... 459.

Paradise Systems *(1 year)*
✓Color/Mono Card ..... 149.
✓Modular Graphics Card ..... 275.
Five Pack w/384k ..... 159.

Princeton Graphics *(1 year)*
*✓HX-12 RGB monitor *(690 x 240)* ..... 449.
✓MAX-12E Amber monochrome monitor 179.

Quadram *(1 year)*
Expanded Quadboard *with clock calendar, parallel, serial & game port, and Quadmaster software.*
Øk *(upgradeable to 384k)* ..... 169.
384k *(fully populated)* ..... 219.
Gold Quadboard Øk ..... $387.
Silver Quadboard Øk ..... 249.
*✓Microfazer Printer Buffer *(parallel) w/copy MP 64 (64k) upgradeable to 512k* ..... 159.
✓QuadEGA+ ..... 369.

SMA *(20-day money-back guarantee)*
PC-Documate Keyboard Templates *available for:*

DOS/Basic 2.0-2.1	✓dBase III
✓DOS/Basic 3.0-3.1	Wordstar
✓Lotus 1-2-3	✓Wordstar 2000
✓Symphony	Turbo Pascal
Framework	✓WordPerfect

✓Multimate ..... *each* 12.

Toshiba *(90 days)*
All Toshiba printers listed are 24 pin dot matrix.
*✓P321 parallel printer *(80 column)* ..... 519.
*✓P341 parallel printer *(136 column)* ..... 849.
*✓P351 parallel printer *(136 column)* .... 1089.

OUR POLICY

- We accept VISA and MASTERCARD. (VISA and MASTERCARD only accepted on U.S. & Canadian orders.)
- No surcharge added for charge cards.
- 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 shipments insured; no additional charge.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- 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, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Note: Accounts on net terms pay actual shipping. **Continental US:** For monitors, printers, and drives, add 2% for UPS ground shipping. Call for UPS Blue or UPS Next-Day-Air. For all other items, add $2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. **Hawaii:** For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add $2 per order. **Alaska and Outside Continental US:** Call 603/446-3383 for information.

Circle 136 on reader service card

1-800/243-8088

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

260W

For the IBM-PC (XT&AT) exclusively.

Video 7 *(2 years)*
✓VEGA Card ..... $369.

DRIVES

All drives are shipped with complete installation instructions.

IOMEGA *(90 days)*
✓Bernoulli Box 20 Meg w/PC2 card .... 1999.
✓10 Meg cartridge ..... 51.
✓Bernoulli Box 40 Meg w/PC2 card .... 2499.
✓PC2B (Bootable) Card ..... 219.
✓20 Meg cartridge ..... 69.
✓Bernoulli Box Care Kit ..... 79.
We are an authorized IOMEGA service center.

Mountain Computer *(1 year)*
Drive Card 20 Meg ..... call

PC Connection *(1 year)*
Hard Drive Card 20 Meg ..... 489.

Seagate *(1 year)*
20 Meg Internal Hard Drive *(w/controller and cables)* ..... 459.
✓20 Meg Internal Hard Drive for the AT . 569.

TEAC *(1 year)*
FD-55BV Drive *(5¼" half-height, DS, DD)* 109.

Toshiba *(90 days)*
PC, XT 360k Drive *(5¼" half-height)* ... 109.
✓AT 360k Drive *(5¼" half-height)* ..... 117.

MEMORY

*64k Memory Upgrade Set for IBM-PC or XT system board or any memory board
150 nanosecond *(set of 9)* ..... 15.
200 nanosecond *(set of 9)* ..... 12.
Install memory upgrades & run diagnostics *at time of board purchase only* ..... 10.
✓256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* ..... 39.

DISKS

All disks have a lifetime warranty.

DS/DD Disks for the PC & XT (40 TPI). *10 disks per box.*
*✓Maxell MD-2 ..... 19.
*✓Verbatim Datalife ..... 17.

DS/High Density Disks for the AT (96 TPI). *10 disks per box.*
✓Fuji ..... 27.
✓Maxell ..... 34.
✓Verbatim ..... 34.

*✓**Flip Sort** *(holds 75 disks)* ..... 15.
*✓Floppiclene Head Cleaner *(5¼")* ..... 18.
*✓**Innovative Concepts** Flip n' File 50 ..... 16.
*✓**Innovative Concepts** Flip n' File 50 w/lock 21.

INFORMATION SERVICES

Compuserve
*✓Compuserve Information Service *(includes subscription, manual, 5 hours of connect time, monthly publications)* ..... 24.

Dow Jones
*✓Membership Kit ..... 19.

PC CONNECTION®

©COPYRIGHT MICRO CONNECTION, INC. 1986. ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MagnaType: The Personal Typographer

More than a personal publishing program, MagnaType is a powerful front-end typographic program that can control a phototypesetter as easily as it drives a laser printer—without the cost of a minicomputer.

James Felici and Walter Omstead

Pardon the prejudices of professional typographers, but the personal computer publishing revolution did not start with laser printers and page makeup software for personal computers. Those were mere Boston Tea Parties and Stamp Act rebellions compared with the shot heard round the world from *MagnaType*, an advanced typesetting program for PCs. Magna Computer Systems' debut program does not provide "near typeset quality" output, but the real thing—bona fide commercial typesetting from a PC. Unlike personal publishing packages, *MagnaType* doesn't emulate professional typesetting, it *is* professional typesetting.

Until the introduction of *MagnaType*, commercial-quality typesetting systems typically required a minicomputer and one or more terminals, in addition to a film processor and a phototypesetting machine—hardware so expensive that it is impractical for all but high-volume type producers. In fact, commercial type shops usually run two shifts to make ends meet.

Magna Computer Systems, however, has brought the power of the minicomputer to the XT or AT with no sacrifice in functionality. For commercial-quality type you still need a phototypesetting machine, but the cost of the front-end computer and software to drive it has dropped from $40,000 to less than $15,000. (For an introduction to typesetting systems, see "Typesetting Point by Point" in this issue.)

Magna Force

MagnaType is the brainchild of Fred Rose and Burt Wigdor, who were also the heart of the team that developed one of the most popular and successful commercial typographic systems, marketed by Computer Composition International (CCI). The CCI system utilizes a network of "dumb" terminals connected to a Data General minicomputer.

With the rise in the popularity and power of the PC, Rose and Wigdor realized that for most commercial typesetting operations the minicomputer

DESKTOP
PUBLISHING
COMPUTER
THE PC INK
Type

system could be replaced by PCs. Rose and Wigdor tried to convince their company to develop a PC version of its system, but CCI was not interested. So in 1984 the two entrepreneurs set out on their own to found Magna.

MagnaType is structured as a shell over DOS, providing a work-alike version of the CCI typesetting system. The program runs well on a hard-disk-equipped PC, an XT, or a compatible. On the faster AT it actually outpaces its minicomputer-based predecessor.

The program's economic and logistical advantages are clear. First, it runs on off-the-shelf hardware: No specialized equipment or expensive service contracts are required, plus you have the freedom to shop for hardware bargains. Second, *MagnaType* sets up each PC as an independent workstation running its own software. Data can be shared via a local area network, and the absence of a shared CPU avoids the slowdowns and crashes that can occur with a minicomputer-based system.

Using MagnaType *exclusively with desktop laser printers is high-tech overkill.*

Functional advantages aside, perhaps the real beauty of *MagnaType* lies in the savings it makes possible. At $8500 for the version that controls a typesetting machine, or $5250 for the version that drives only a laser printer, the program may seem costly, especially when you consider that each terminal needs its own copy. But add the software's price to that of a PC, and you have a typesetting front end that costs a fraction of the $100,000 you might spend on a minicomputer front end. And because the unit price of *MagnaType* declines with multiple purchases, the more workstations you add, the more you save.

Additional Magna software can increase savings and improve efficiency. *MagnaWord*, a $2500 subset of *MagnaType*, does everything but drive the typesetter. You could install *MagnaWord* on some workstations and transfer files to a *MagnaType*-equipped computer for output to a typesetting machine or laser printer. Another program, *MagnaLink*, establishes a multiuser system with an AT or compatible as the file server and XTs or compatibles as the workstations.

In-House Typesetting

Despite the savings compared to the cost of a traditional system, a complete in-house *MagnaType* setup still requires a sizable investment. Aside from software and computers, you need a commercial-quality typesetter, a variety of type fonts, a film processor to develop the silver-based photographic paper used by the typesetter, and possibly a laser printer for proofing. A system with two workstations is likely to range in price from $40,000 to $100,000, depending on the sophistication of the hardware, primarily the typesetter itself. However, a minicomputer-based system might cost between $100,000 and $200,000. For businesses that spend tens of thousands of dollars a year on typesetting, an investment in *MagnaType* could pay for itself quickly.

Among the businesses that could profit from a complete in-house system are magazine and book publishers, advertising agencies, and large companies with centralized publication departments.

An alternative in-house system might forgo the typesetting machinery and use a laser printer to create proofs that show how the typeset copy will look. All proofreading, corrections, and design modifications could be accomplished with *MagnaType* and the laser printer; then the final, corrected files would be transmitted to an outside type vendor that also used *MagnaType*. If you plan to use such a system, verify that your *MagnaType* system's parameters exactly match those of your type vendor. A typesetting vendor without *MagnaType* might be able to accept your coded files but would first have to write a custom programming interface specifically for *MagnaType*.

The laser printer you use in-house must be driven by PostScript, the page description language created by Adobe Systems of Palo Alto, California. At

present, the Apple LaserWriter and high-end models from DataProducts, NBI, and QMS all employ this language.

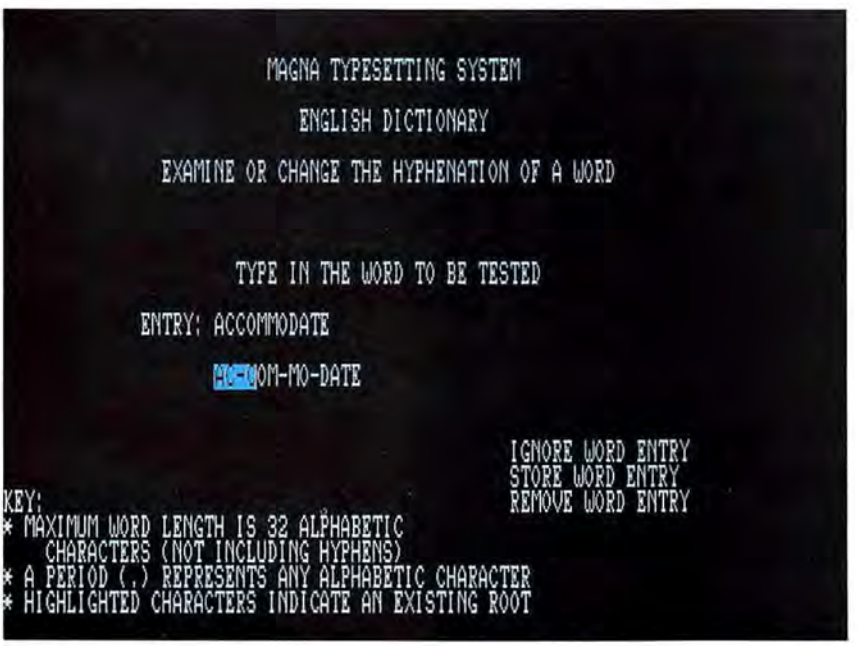
MagnaType is best suited for production of commercial-quality type (which utilizes silver-based photographic paper) rather than for laser printer personal publishing. The extremely fine grains of photosensitive compounds are the key to the excellent resolution produced with such paper. The laser printer can, of course, be used to create final copy for many applications, but much of the program's power is wasted on the coarse 300-dots-per-inch (dpi) resolution of printers such as the LaserWriter. Using *MagnaType* exclusively with desktop laser printers is high-tech overkill.

Easy Does It

Software for typesetting systems is not known for its user-friendliness, but *MagnaType* has taken a step in the right direction with its menu-based structure, which clarifies the organizing principles of the program. For example, one primary menu selection gives you access to the program's management operations, such as font-width tables, hyphenation dictionaries, and kerning tables and values, which determine spacing between some letters (see Screen 1). Other menus permit you to move around the system; view file directories; and create, select, and transfer files.

The program also maintains a continuous internal log of all actions performed on the system—who did what when. This is an essential function in a typical typesetting environment, where several people may work on the same job. *MagnaType* also includes a number of housekeeping utilities for deleting redundant files, clearing out completed jobs, and creating and organizing work areas.

The simplicity of using the program, however, belies the complexity of the craft of typesetting. Like most professional typesetting programs, *MagnaType*'s text processing is based on a mnemonic coding scheme. The operator, or keyboarder, formats documents by embedding codes in the text string, and these codes are translated into instructions for the typesetting machine. The codes are composed of an alphabetic identifier followed by a numeric quantifier,



Screen 1: MagnaType's English hyphenation dictionary. The program gives you access to any of 99 hyphenation dictionaries. During hyphenation you have the option of redefining word breaks or adding a word not already in the dictionary.

enclosed in angle brackets. For example, in *MagnaType*'s coding <cc20> means "change the column measure to 20 picas wide." The complexity of typesetting can be glimpsed by viewing all the codes needed to create the paragraph you're now reading (see Screen 2).

Most of these codes only need to be stated once—they remain in effect until altered or toggled off—but all the parameters must be defined. The *MagnaType* system uses 110 such commands, which in the correct combinations can create almost any typographic effect under the sun.

You can make many of the more complex or redundant coding functions invisible, automatic, or easily invoked by mnemonic macros. In addition, a number of the typographic parameters and refinements can be preset as background functions or defaults that the keyboarder never has to enter. These parameters include how fractions are built, what letter combinations are kerned and by how much, and when hyphenation is allowed.

Fancy Formats

Typesetting formats are powerful macros made up of coding sequences, text, or both. The headings in this article, for example, were created by using a short format. When the keyboarder inserted the mnemonic code <uf6>—"use format 6"—the code string invoked ended the preceding paragraph, added lead to create the space above the heading, produced the solid box next to the heading, indented the text for one line to avoid crashing into the box, and changed the heading typeface to bold.

MagnaType's file structure and use of formats enable you to create a custom coding scheme. You assign a file label to a family of jobs; when beginning a new job, you add a hyphen and a job number to the family name. Each job can also have a descriptive name for easy identification, and you can create a file of up to 500 numbered formats for a family of jobs.

This formatting capability is fairly typical of typesetting systems, but Magna has surpassed many others by allowing you to assign your own mnemonic labels to the numbered formats. These labels can even transcend job families. Say your company regularly creates annual reports, quarterly reports, an in-house newsletter, a client newsletter, and an employee hand-

Screen 2: The top line of the text area shows the elaborate coding string needed to format a typical PC World paragraph using MagnaType. In practice, most of these codes are introduced in the form of a user format—akin to a familiar macro statement—and need to be stated only once in a document. Most typesetting commands stay in effect until altered or toggled off.

book. Each of these publications has its own headline, text, subhead, and running head styles. Magna's format-labeling scheme allows you to use the same logical label for a running head, regardless of the publication.

Importing Files

Although not a practical substitute for a good word processing system, *MagnaType* can handle text prepared with a word processor. The program has a menu for importing ASCII files, which most word processing programs can produce. Files imported this way, however, are stripped of their original formatting and control characters.

Still, you can insert a lot of coding with a word processsor before transferring files to the typesetting software. Certain essential indicators, such as the one for all "hard" carriage returns, must be translated into typographic code before export to the Magna system, or they will disappear during file transfer.

H&J: Give Me a Break

After a file has been coded, a one-key *MagnaType* command begins *hyphenation and justification (h&j)*. The monitor shows the actual line breaks that will appear in the typeset copy (though the text does not actually appear justified on screen because of the monospace display). In a mode called *measured h&j*, each line is accompanied by measurements that indicate line lengths in picas and points, as well as the distance of each line from the beginning of the file (see Screen 3). These are excellent copy-fitting aids, allowing you to fit copy to a given measure and to determine the length of an article or chapter without seeing proofs.

The h&j routine also flags unresolvable coding errors, such as a column measure too wide for the typesetter or a nonexistent format number. The program won't catch all coding errors, only those that demand the impossible.

Screen messages indicate such errors, and you can use the program's search-and-replace utility to locate and replace incorrect codes. Unlike typesetting systems that stop the h&j process every time such an error is encountered, *MagnaType*'s h&j component simply flags the errors and continues justifying. No matter how many coding errors a file contains, you can correct them in one operation rather than having to stop and restart the h&j process.

```
     JOB          NAME          ENTRY    LAST REVISION   CHARS  PICAS
MAGREVU - 001-07   MAGNATYPE IMCAP  25MAR86 25MAR86 19:01 JF    784   21.08

(AG)(XB)(RR)(AH)(CS5,5,5)(T1)(CP10.5)(CL13)(CC12.9)(CFSA)(IF0.11)0
The simplicity of using the pro-◀0.11/11.1x1.1▶
gram, however, belies the complexity ◀12.2x2.2▶
of the craft of typesetting. Like most ◀11.8x3.3▶
professional typesetting programs, ◀11.8x4.4▶
(CFSAI)
MagnaType'(CFSA)s text processing is based ◀12.4x5.5▶
on a mnemonic coding scheme. The ◀11.8x6.6▶
operator, or keyboarder, formats docu-◀12.7x7.7▶
ments by embedding codes in the text ◀12.2x8.8▶
string, and these codes are translated ◀11.11x9.9▶
into instructions for the typesetting ◀11.6x10.10▶
machine. The codes are composed of ◀12x11.11▶
an alphabetic identifier followed by a ◀12.1x13▶
numeric quantifier, enclosed in angle ◀12.3x14.1▶
brackets. For example, in (CFSAI)MagnaType'◀12.6x15.2▶
(CFSA)
s coding $IUoc20$IV means "change the ◀11.8x16.3▶
column measure to 20 picas wide." The ◀12.7x17.4▶
complexity of typesetting can be glim-◀12.7x18.5▶
```

Screen 3: The screen display after the hyphenation and justification of the text shown in Screen 2. The numbers to the right of each line show, in picas and points (1) indents, if any; (2) line length; and (3) distance of the line's baseline from the top of the file. The figure at the upper right of the screen, above the status line, shows the total length of the file in characters and picas.

A Sampler of MagnaType Features

Copy protection. The disks are not copy protected, but the program will not run without a hardware lock that attaches to a serial port on the computer. Each copy of the program has a unique lock assigned to it. The lock has a pass-through connection that allows the port to communicate with another device, such as a printer or typesetting machine, if the lock verifies that the correct copy of the program is in use.

Screen display. Display is monospaced in either color or monochrome. Colors are not user-definable.

Clipboard. Blocks defined during editing can be saved in a holding area called the clipboard. You can define and save four of these blocks indefinitely and partially view them in an on-screen window.

Programmable keys. The function keys invoke h&j, block moves, search and replace, word/line deletions, automatic case change, cursor jump by paragraph, and several screen suppression options. The numeral keys are programmable, and the key assignments can be viewed in a window.

Global formats. In addition to user formats that are linked to specific families of jobs, you can define global formats that apply to all jobs on the system.

Networking. PCs running *MagnaType* can be linked with off-the-shelf network hardware and software,

Ecumenical Output

The final operation before typesetting is *composition*, during which the program translates all the embedded codes and information assembled during h&j into instructions that drive the typesetter. Because every typesetting machine has its own language, *MagnaType* is equipped with drivers for a variety of machines, including the Apple LaserWriter.

During the h&j and composition phases, *MagnaType*'s multitasking capabilities really shine. The program performs h&j from the beginning to the end of a file, a process that takes 30 seconds or more for a 40K file. But *MagnaType* displays the first part of the file on screen while it's processing the latter portion, so you can begin checking and editing right away. Similarly, while the program is composing files, you can be working on another file.

MagnaType allows for easy queuing of jobs for composition and output. From the main file directory, you select whatever jobs you want to compose, and the program will prepare them for typesetting while you do other work on the system. As they are finished, *MagnaType* lists the composed jobs in a separate directory. To send them to the typesetter, you go to that directory and select the jobs you want typeset. You can also prioritize a job, which automatically places it ahead of all others in the typesetting queue.

Training, Support, and the Great Beyond

Because commercial typography is so complex, *MagnaType* is elaborate for a PC program. However, Magna does not let users sail on the typographic seas without orientation and a fairly good set of charts. All purchasers are entitled to three full days of instruction from a Magna representative. The first two days focus on handling the software itself, and the

but it is probably better to use *MagnaLink*, even though it is not a true network. Rather, it is a file-sharing system that saves all jobs on the system twice—once at the workstation where they were created and once in a central workstation that is designated as a file server. This creates a central depository for all files, with automatic backup at the remote stations.

Device drivers. *MagnaType* has drivers for Allied-Linotype's series 100, 202, and 300; Autologic's APS-5 and μ-5; Compugraphic's 8400 and 8600; Apple's LaserWriter; and PostScript laser printers from Data-Products, NBI, and QMS.

third day is a typopgraphic workshop on practicing coding and system management. After the initial training, *MagnaType* owners can subscribe to a telephone support service. In addition, subscribers receive *Magnazine*, a user-group publication containing tips and shortcuts, information on system subtleties, detailed articles on system functions, and news of product updates.

MagnaType's documentation is typical of commercial typesetting software manuals: It supplies what you need to know but never as much as you want to know. The documentation shows how to typeset with *MagnaType* but not necessarily *how* to typeset. For this reason, the phone support service is an important resource, especially for typesetting neophytes.

Like other typesetting system vendors, Magna will continue to produce corollary programs and utilities in addition to regularly upgrading the program. Planned enhancements include book pagination and highly automated tabular capabilities.

For thousands of businesses, schools, and government agencies, typesetting is a fact of life; quality publications depend on it. The cost of a system and the complications of typesetting have largely outweighed the production and economic advantages an in-house system can provide. *MagnaType* is changing all that, and as personal-computer-based typesetting systems plummet in price and grow in accessibility, the reverberations from Magna's shot heard round the world will be felt in the related field of high-resolution, commercial typesetting.

James Felici is Production Editor of Macworld *and Technical Editor of* Publish!. *Walter Omstead is a San Francisco-based author and consultant.*

MagnaType, MagnaWord, MagnaLink
Magna Computer Systems
14724 Ventura Blvd.
Sherman Oaks, CA 91403
818/986-9233
List price: MagnaType with driver for typesetter: first copy $8500, second copy $5000, third to fifth copies $4500, sixth copy and up $4000; MagnaType with driver for laser printer only: first copy $5250, second copy and up $3500; MagnaWord: first and second copies $2500, third to fifth copies $2250, sixth and up $2000; MagnaLink $3500
Requirements: 512K, hard disk, DOS 2.00 or later version

The Scenic Route

With a multitude of commands and an arcane operating system, ScenicWriter isn't everyone's personal publishing system. Its power rivals that of sophisticated typesetting systems, however, making it the program of choice for demanding publishing projects.

Jim Heid

ScenicSoft's personal computer publishing software, *ScenicWriter,* brings to mind the old TV commercial that ended with, "It isn't for everyone. But then, it doesn't try to be." *ScenicWriter* is a complex product that requires a big investment in hardware and learning time. The program swims against the rising tide of mouse-based, what-you-see-is-what-you-get products. With *ScenicWriter,* what you see are cryptic commands like *.SetItemP 2q .5l 2l 1l.*

What you get, however, are capabilities that most personal publishing products can only dream of: publications of virtually any length, with tables of contents and indexes that are created automatically. *ScenicWriter* can also produce complex tables, automatically update cross-references (as in "see Figure XYZ on page 150"), and print text in any number of columns. And *ScenicWriter* can control today's top laser printers and phototypesetters as few programs can.

Sound like a typesetting system? It is. When it was created in 1981, *ScenicWriter* cost $5000 and was the centerpiece of turnkey publishing systems in which $25,000 laser printers produced proofs and final copy was generated on $50,000 phototypesetters. In those days, *ScenicWriter* ran under SofTech Microsystem's p-System operating system on multiuser, 68000-based microcomputers. When desktop publishing became *the* hot growth area in microcomputing, the portability of the p-System enabled ScenicSoft to release a PC version without rewriting the program.

The advantage of this family resemblance is that PC users can enjoy the same publishing power as supermicro, minicomputer, and mainframe users; the PC version of *ScenicWriter* has all the typographic talents of its predecessors. The disadvantage is that *ScenicWriter* still runs under the p-System, a complex operating system whose tutorial takes up the first third of *ScenicWriter*'s 300-page manual. For PC-DOS users, the p-System is an alien world where drive A: becomes #4:, the E key displays a directory, and file names can have more dots than a Dalmatian.

The p-System causes headaches for any PC user, but it's downright hostile toward Tandy 1000 owners, freezing the keyboard and forcing them to restart the computer if they type too quickly. A

forthcoming version of *ScenicWriter* promises to cast off its p-System ball and chain, but for now, the product's learning curve resembles Mount Everest.

Climbing Mount Scenic

ScenicWriter demands much, not only in patience but in disk space. You'll need roughly 1.5MB of free hard disk space to hold the p-System and *ScenicWriter*'s various programs and data files. *ScenicWriter* is not copy protected, and installing it isn't traumatic if you follow the manual's directions to the letter. After copying the *ScenicWriter* disks to your hard disk, you'll be tempted to plow into the program and begin creating design masterpieces. Try it, and the foreign ground of the p-System combined with *ScenicWriter*'s complexity will stop you like a brick wall.

ScenicWriter's excellent manual wisely suggests that after you install the program, you practice editing an example file to master the p-System editor—an awkward program that's hardly better than a pen and eraser for text editing.

With the editor, word wrap is optional, paragraph reforming is manual, and separate modes for inserting, deleting, and replacing text make you concentrate more on the commands than on the text. The editor was designed for programmers, offering automatic indentation, nested editing of multiple files, and other features that simplify working with lines of code. It's more of a grown-up EDLIN than a word processor.

Fortunately, you don't have to use it—a *ScenicWriter* utility lets you convert *WordStar* and plain ASCII files into p-System files, which are required by the *ScenicWriter* typesetting program. You'll probably use your favorite word processor to write text and insert formatting commands, then import the files into *ScenicWriter*. Still, this leaves much to be desired. When revisions are required, you have to either return to your word processor, make the changes, and then convert the revised files, or face the p-System editor.

A forthcoming version of ScenicWriter *promises to cast off its p-System ball and chain, but for now, the product's learning curve resembles Mount Everest.*

ScenicWriter *controls the LaserWriter series like no Macintosh program can. I've never seen a LaserWriter Plus work so hard.*

The good news is that a new *ScenicWriter* release, which should be available when you read this, will include a modified typesetting program that will be able to read MS-DOS-format ASCII files directly. This will allow you to edit and maintain text files using the word processor of your choice.

Of Menus and Macros

ScenicWriter comprises several programs, all tied together by a main menu. In addition to the editor, p-System filer, and the DOS filer, there are file conversion utilities, a spelling checker, and two printing programs. One option prints files without formatting, useful for checking formatting commands and proofreading; the other, called LaserText, processes the commands and translates them into camera-ready copy.

ScenicWriter's formatting commands fall into two categories: macro and backslash. Some macro commands control a publication's overall appearance, including margin width and the position of headers, footers, and folios (page numbers). Others select fonts or summon special text formats such as bulleted or numbered paragraphs or tables. Still others let you number a publication's chapters and sections—a key step in creating a table of contents.

Each macro command comprises any number of low-level *ScenicWriter* commands (see Figure 1). For example, the macro command *.Ix 'biscuits'* might appear in the text of a cookbook,

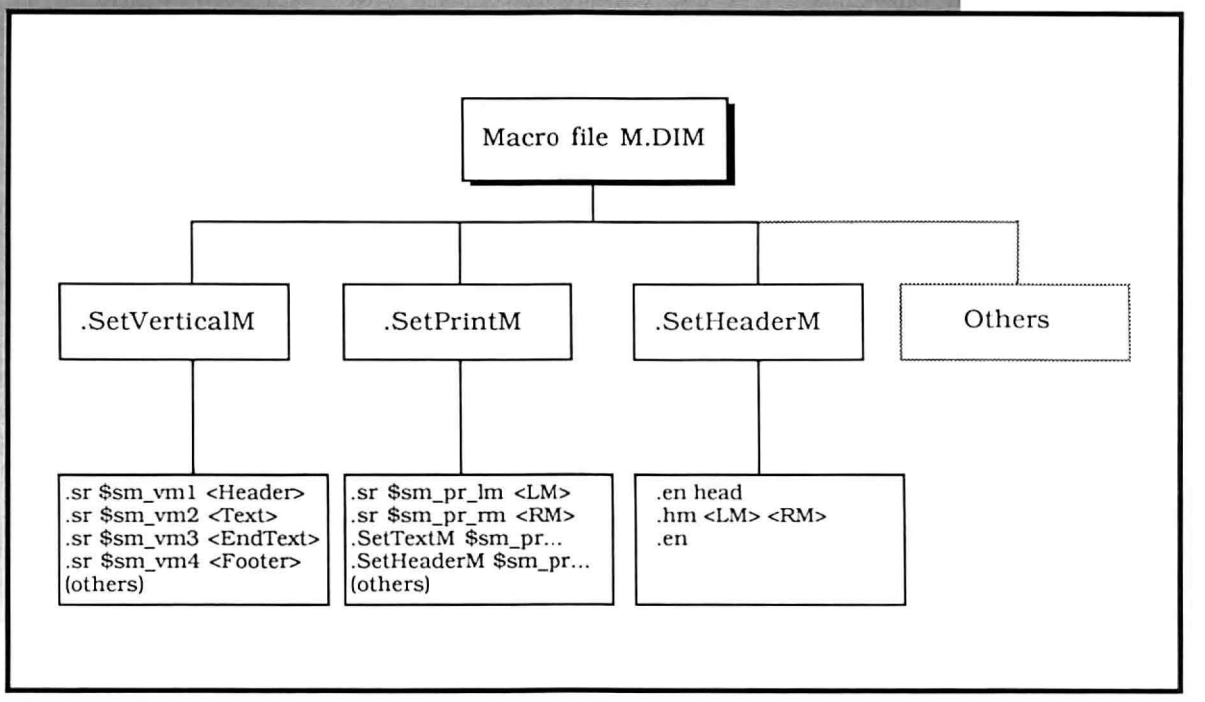


Figure 1: An organizational chart for the macro file M.DIM, whose macros control text margins. Every ScenicWriter macro comprises a number of low-level commands and does the work of many typesetting codes.

representing an index entry for the word *biscuits*. When the LaserText typesetting program encounters the macro, *ScenicWriter* executes several low-level commands that save the macro's parameter (in this case, *biscuits*) in a data file along with the page number where the reference occurs. The data file is later processed and printed by other macros to form the cookbook's index.

Because few publications require every macro, *ScenicWriter*'s macros are organized into files—M.DIM.TEXT contains macros that control dimensions and the number of columns on a page, whereas macros in M.RULES-.TEXT are for drawing lines. You specify these macro files using yet another macro. The command *.Use M.RULES*, for example, tells *ScenicWriter* to process all the macros for creating line drawings.

Macros give *ScenicWriter* power and flexibility. You can stay within the confines of existing macros and not concern yourself with their underlying technicalities, modify them for a specific publication's design, or define new macros that handle formats not built into *ScenicWriter*.

The only problem with the *ScenicWriter* macro facility is that you must type macros in a mix of uppercase and lowercase characters, such as BoldCenter or SetColumns. If you fail to observe the case conventions, you'll be rewarded with an error message at printing time.

Details, Details

If macro commands form a publication's foundation, backslash commands control the details (see Figure 2). The most-often-used backslash commands change typestyles (*\it* for italics, *\bf* for boldface, *\fontHelvetica* for Helvetica type) or print accented characters or symbols not on the PC's keyboard (*\bullet* for •, *\emdash* for —, *\degree* for °). Others change the type size (*\size24p* for 24-point type) or add extra line spacing before a line (*\extrapre6p*). Some commands can be combined (*\bf24p* for bold 24-point type).

A few backslash commands work together with macros. One example is the automatic cross-referencing feature. To tell *ScenicWriter* to maintain a cross-reference for an occurrence of *biscuit*, you place the macro *.RefPoint 'biscuit'* near the point where *biscuit* appears. Then, you use the backslash command *\$xr_biscuit* elsewhere in the publication, as in, "See page *\$xr_biscuit* for more biscuit recipes."

ScenicWriter provides nine measurement systems for such elements as type size and margins: centimeters, inches, Didot points (one equals .3759 millimeters), picas, points, units (1/300 inch for most laser printers), quads (type width), line spacing, or type height. The latter three are relative measurements whose actual values depend on the size of the current typeface.

Preparing for Printing

For small publishing jobs, you can place commands that specify typefaces and dimensions at the beginning of the text file itself. For large jobs involving many text files, however, that isn't a good approach, since changing the publication's specifications would mean revising every text file.

ScenicWriter provides a logical system for structuring large jobs that makes wholesale formatting changes a matter of editing one or two lines. Instead of pecking the formatting macros into every file, you store all formatting information in a print file, which also holds a macro that calls an include file and the data file (see Figure 3). The include file lists the publication's text files in their printing order. When a publication contains a *ScenicWriter*-generated table of contents and index or automatic cross-references, a separate data file holds information such as the page numbers where chapters begin, cross-references occur, or index entries appear.

To print the entire publication, you need specify only the print file. If a design change requires reformatting, you simply edit the appropriate lines in the print file and reprint.

ScenicWriter comes with four formatted print files that you can modify. Two files create simple, one-column pages for one-sided or two-sided printing, respectively. A third produces the layout used in *ScenicWriter*'s attractive manual, while the fourth produces a book layout according to Prentice-Hall specifications.

Your reward for climbing ScenicWriter's *learning curve comes when hard copy appears. The program's typesetting heritage lets it give today's top laser printers a complete workout.*

Power to the Printer

Your reward for climbing *ScenicWriter*'s learning curve comes when hard copy appears. The program's typesetting heritage lets it give today's top laser printers a complete workout. Versions of *ScenicWriter* are available for Hewlett-Packard's LaserJet and LaserJet Plus, Apple's LaserWriter and LaserWriter Plus, other laser printers, including several QMS models, and even phototypesetters.

The program gives LaserJet Plus owners full access to the printer's gray scales and patterns, and elegantly supports LaserJet Plus SoftFonts—disk-based fonts that are loaded into the printer's memory before use. After a one-time installation process that involves

```
.. Backslash commands example file
.Use M.DIM
.Use M.ORG
.. Next two lines call key symbol macros; M.SCREEN draws boxes
.Use M.IBM_KEYS
.Use M.SCREEN
.. Set margins
.SetPrintM 1i 4.75i
.fi 1
.SetJust 0
..
\it ScenicWriter'\ro s backslash commands are used to access \it italic, \bf
boldface, \ro and \bi bold italic \ro type. They also summon characters not on
the PC's keyboard\emdash like the em dash. You must remember to type a space
after a backslash command, since that's how \it ScenicWriter\ro  knows where the
command ends.

\extrapre.5l \fontPalatino-BoldItalic \size14p They also control fonts and
sizes.

\extrapre.5l \rol0p Backslash commands also let you add extra space before and
after lines. And they're the key to printing key symbols, as in: Press \kRt  to
move the cursor right, or \kLt  to move it left.
..
.pi
```

ScenicWriter's backslash commands are used to access *italic*, **boldface**, and ***bold italic*** type. They also summon characters not on the PC's keyboard—like the em dash. You must remember to type a space after a backslash command, since that's how *ScenicWriter* knows where the command ends.

They also control fonts and sizes.

Backslash commands also let you add extra space before and after lines. And they're the key to printing key symbols, as in: Press [→] to move the cursor right, or [←] to move it left.

Figure 2: On the top is text formatted with backslash commands, on the bottom, the printed output.

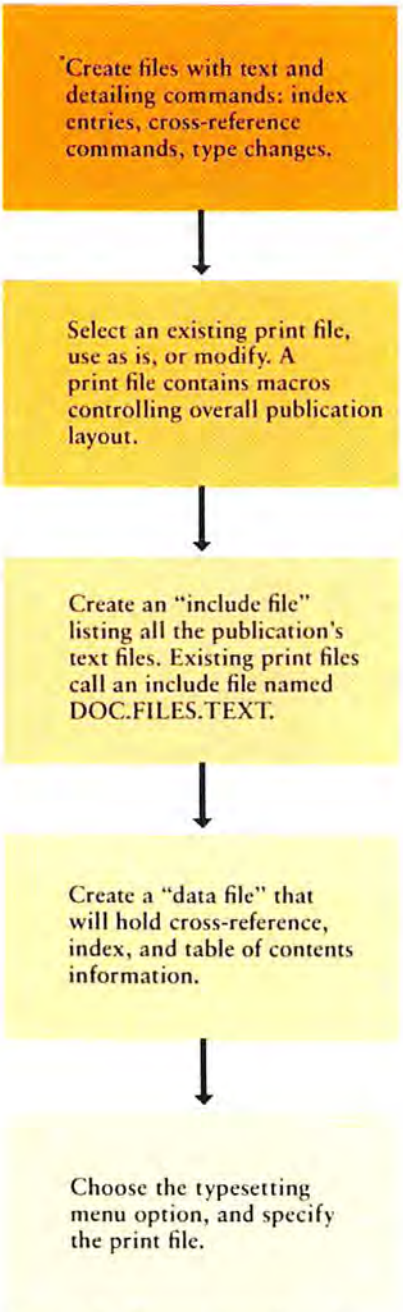


Figure 3: A conceptual outline of the publication process. The program takes a batch-oriented approach to large publishing jobs.

using the DOS filer to transfer the font files into the p-System, you can access any downloadable font by name; before downloading a font, *ScenicWriter* checks to make sure it isn't already in the printer's memory.

Combined with a LaserJet or LaserJet Plus, *ScenicWriter* turns out first-rate copy, but it pales compared to what the program can produce with Apple's LaserWriter series and other printers equipped with Adobe Systems' PostScript page description language. *ScenicWriter* controls the LaserWriter series like no Macintosh program can. I've never seen a LaserWriter Plus work so hard. Through macros and backslash commands, *ScenicWriter* can slant, expand, and contract fonts and produce text in sizes from 1 point to 6 inches, in increments of 1/300 inch—a total of 1800 different type sizes. You can print outlined text as well as text shaded in any of 99 gradations of gray.

ScenicWriter also exploits PostScript's ability to define new fonts made up of modified existing fonts. A typical application of this capability is slanting the roman version of a font to create a pseudo-italic, or oblique, font (see Figure 4). But in keeping with *ScenicWriter*'s "make PostScript sweat" philosophy, you aren't limited to typical applications. If you want to compress and slant a font beyond recognition, you can.

ScenicWriter's LaserText program not only opens the doors to font finagling, it handles traditional typographic chores as a dedicated typesetting system would. For example, most word processors justify type (align its left and right margins) by varying the spaces between words. *ScenicWriter*, in contrast, alters the spaces between letters (micro-justification), thus eliminating wide gaps between words and giving justified text a professional look.

What It Can't Do—Yet

Despite *ScenicWriter*'s many gifts, some tasks exceed the abilities of the version reviewed. The most significant limitation concerns graphics—although you can manually create charts and diagrams within the program using block characters, you cannot import graphics or digitized images into a publication. Another shortcoming is the lack of an automatic hyphenation feature, which is especially helpful when creating publications with justified margins. Finally, *ScenicWriter* cannot automatically kern—enhance the appearance of certain letter combinations by placing the letters closer together. However, you can manually kern text using *ScenicWriter* commands. Since you would normally need to kern only with large text such as headlines, *ScenicWriter*'s inability to kern automatically isn't a major flaw.

ScenicSoft programmers are working on new versions that will be released throughout this year. By the time you read this, ScenicSoft should have released a version that adds an automatic hyphenation feature, a revised LaserText program that can read DOS files directly, and the ability to incorporate *1-2-3*, *PC Paintbrush*, and *AutoCAD* graphics into a publication. Finally, a version that bids

farewell to the p-System and runs under MS-DOS is scheduled for release later this year. If you need *ScenicWriter* now, however, don't wait: ScenicSoft's track record for upgrades is commendable, with minor upgrades provided free and major revisions costing $50 to $75.

Is It Your Type?

Whether you should take the scenic route to publishing depends on your work. Because the program offers no interactive design features, such as the ability to move or reformat text and immediately see the results on screen, *ScenicWriter* isn't suited for those who would rather rough out a design visually than type formatting codes. Similarly, if all you produce are small publications such as brochures, newsletters, or short reports, *ScenicWriter* is probably more program than you need.

With its ability to cross-reference text and generate tables of contents and indexes, *ScenicWriter* shines for book and documentation publishing. It's also finding a niche in what ScenicSoft calls data base publishing, in which files of client or inventory information are transferred directly from a data base manager into *ScenicWriter*, allowing directory and catalog production with no additional typesetting costs. *ScenicWriter*'s batch approach to printing makes major graphic revisions a snap, even in massive documents, and its printer and typesetter support is outstanding. You can't master *ScenicWriter* overnight, but you aren't likely to outgrow it, either. To borrow from another commercial (and with apologies to the Peace Corps), it's the toughest program you'll ever love.

Jim Heid, based in Peterborough, New Hampshire, is a freelance writer, personal publishing consultant, and a former typesetter for a commercial typographer. He is also the coauthor of The Complete Guide to the Tandy 1000 *(Ashton-Tate, Torrance, California, 1986).*

ScenicWriter
ScenicSoft, Inc.
12314 Scenic Dr.
Edmonds, WA 98020
206/742-6677
List price: $695
Requirements: 256K, hard disk, laser printer or phototypesetter

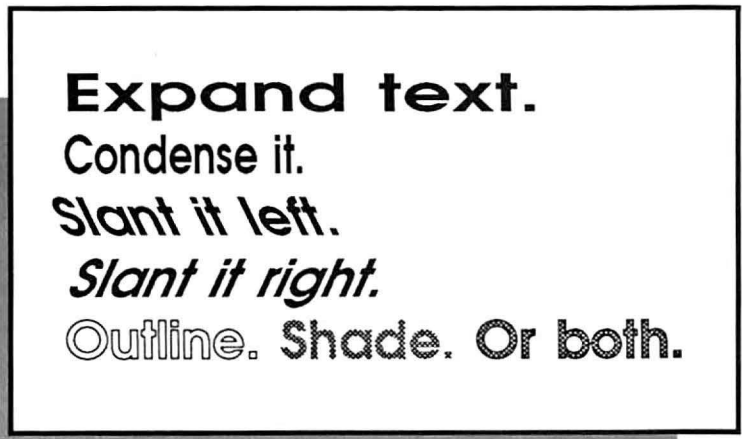


Figure 4: ScenicWriter gives printers equipped with Adobe Systems' PostScript a complete workout, letting you create new fonts from altered versions of existing ones. ScenicWriter also supports Adobe's downloadable fonts, offering owners of Apple LaserWriters and other PostScript-equipped devices access to today's most popular typefaces.

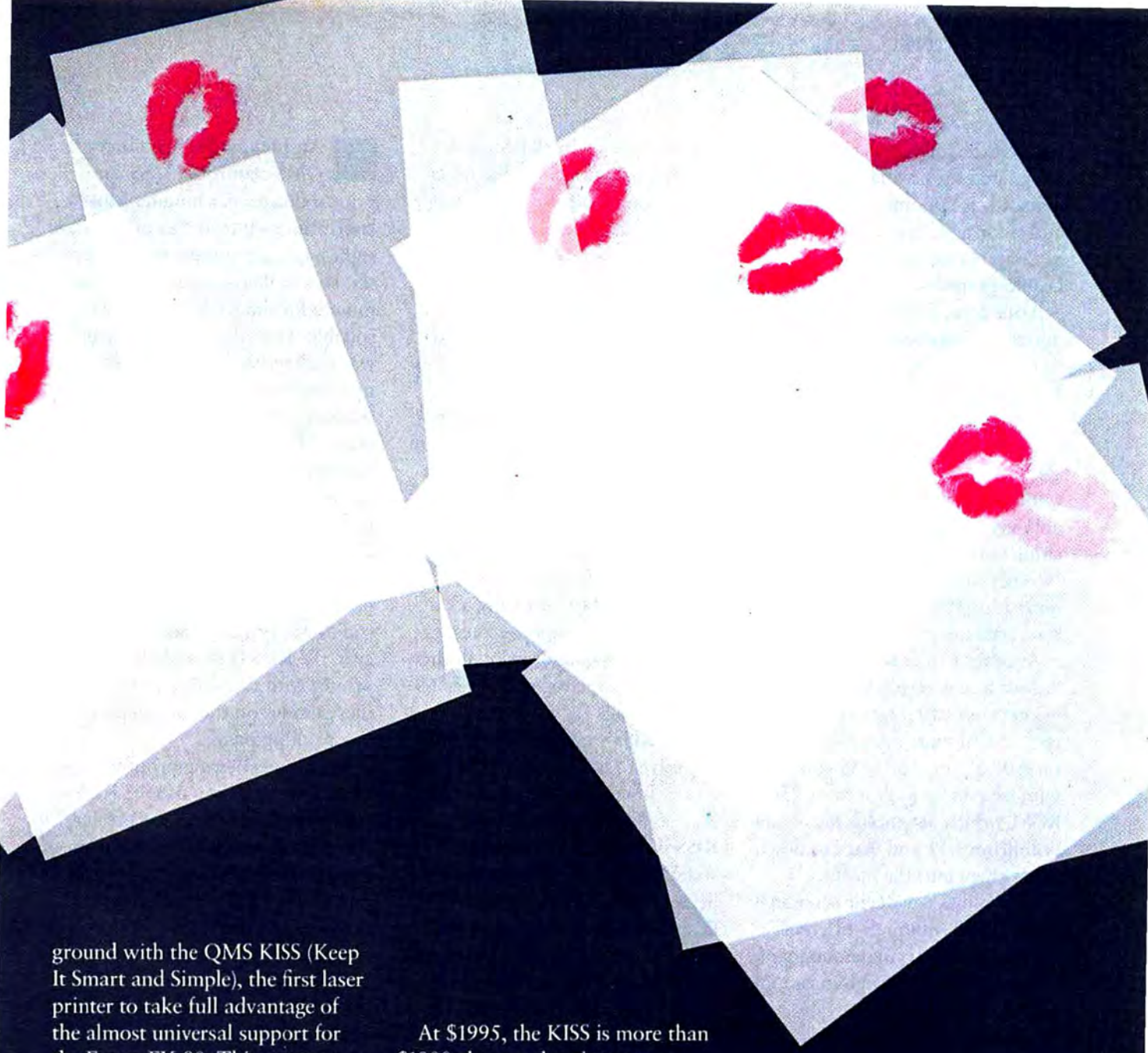
KISSes $2000

The QMS KISS's low price is making headlines, but the real story behind this laser printer is that it works like the printers you already know.

Bill Crider

File formats, protocols, communications, expanded memory specifications, graphics interfaces . . . each has its own requirements for software compatibility, and the cacophony of competing standards is deafening. Laser printers have recently added to the babel, with nearly every different laser device demanding its own driver. Although it's entertaining to imagine a get-tough organization (something like ANSI with muscle) making order out of this chaos, the reality is that standards are made in the marketplace, and the de facto standard for dot matrix printers clearly belongs to Epson.

Quality Micro Systems (QMS) has capitalized on this common



ground with the QMS KISS (Keep It Smart and Simple), the first laser printer to take full advantage of the almost universal support for the Epson FX-80. This common-sense approach makes the KISS instantly compatible with nearly every piece of software written for the IBM PC. To round out its repertoire, the printer also supports programs written for the most popular daisy wheel printers, the Diablo 630 and the Qume Sprint series.

At $1995, the KISS is more than $1000 cheaper than its nearest competitors, the Hewlett-Packard LaserJet and the Corona LP-300. While few FX-80 owners will make the leap to even a low-cost laser printer, you can bet the KISS is turning the heads of daisy wheel printer owners. Compared to daisy wheels with "fast" speeds of 40 or 50 characters per second (cps), the KISS represents an inexpensive step up to 400-cps printing, plus Epson-compatible graphics and a variety of fonts.

Capitalizing on the Competition

Central to the KISS is the same Canon printing engine found in Hewlett-Packard, Canon, Corona, and Apple laser printers. The control panel also resembles the panels of those printers, and the KISS uses identical toner cartridges. The KISS comes with 128K of RAM—64K more than the LaserJet and 384K less the LaserJet

Plus. Of the total RAM, 80K is designated for downloadable fonts, 8K is appointed as a print buffer for text, and all 128K can be commandeered for Epson or Diablo graphics.

Aside from low cost, the biggest difference between the KISS and its competition is the interface. Most laser printers use serial interfaces, which you set up by means of DOS MODE commands and special cables. The KISS has a Centronics parallel interface, enabling you to hook up the machine with standard printer cable. No special configuration is required. (QMS also sells a 19,200-bps serial interface for $250.)

Another KISS earmark is the lack of font cartridges. Most laser printers use cartridges, which contain several fonts apiece—at $200 to $500 a pop. The KISS comes with nine fonts built into its 256K ROM (which also holds the emulation firmware), and you can download others into the machine's RAM on disks available separately from QMS. Although different fonts take up varying amounts of memory, 80K is enough for about four downloaded fonts. Fonts can be set in up to 32 point—compared to the LaserJet's 14.4-point limit and the Corona LP-300's 24 points.

Emulating Everyone

Some laser printers, such as Corona's Desktop Printshop, are partially Epson compatible. Without relying on added software, the KISS comes much closer. The only major difference between KISS commands and those used by the Epson FX-80 is the KISS's lack of a wide print mode. All the other Epson commands found in most software packages perform without surprises—including *1-2-3*'s single, double, triple, and quad densities.

During testing the KISS fared well, running dozens of programs compatible with Epson, Diablo, and Qume printers without any major snafus. The biggest problem was the slight skewing of the aspect ratio (the ratio of length to height) in some graphics output, due to the machine's imperfect emulation of Epson dots. Also, some files had to have only 63 lines per page, simply because laser printers cannot print all the way to both the top and the bottom of a page.

The KISS's command sets are exclusive to its current emulation mode. In other words, you can't issue a Diablo command when the KISS is doing an Epson impersonation, which is the machine's default mode. To switch to the Diablo or Qume mode, you enter a command on the KISS's control panel or send the appropriate escape code from a DOS batch file or from within an application. When emulating Diablo 600 and Qume Sprint text output, the KISS executes tricky maneuvers with alacrity, including shadow printing, proportional spacing, and printing the extended character set.

If you need graphics, however, note that the KISS's Epson compatibility has its price. Although the machine can print 300 by 300 dots per inch (dpi), it's using all those dots to emulate either Epson or Diablo output. In the Epson FX-80 single-density mode, for example, the KISS's resolution is only 60 by 72 dpi.

Auspicious Performance

QMS claims the KISS can print six pages per minute. Most laser printers purport to print eight pages per minute but deliver six, so a ballpark guess of four per minute for the KISS seemed reasonable. Happily, this pessimism was undeserved. In fact, when printing from DOS, the KISS consistently cranked out *eight* pages every 59 seconds. Of course, printing speed ultimately depends on the software being used, which is probably the rationale behind QMS's conservative estimate.

All laser printers support both portrait (normal) and landscape (sideways) printing modes. However, the KISS is the only laser printer with the ability to mix these modes on the same page in one printing pass.

Instead of entering program commands, you can use the KISS's control panel to select the printer you want to emulate and the printing parameters within each emulation mode. However, altering the machine's settings with the control panel keypad is often unnecessarily complicated. To change typefaces, you may have to issue a sequence of 20 or more keypad entries. Using an escape sequence, the same operation would take 5 keystrokes on your computer's keyboard.

The KISS offers extensive built-in diagnostics, including printer status sheets and printouts of font sets and test patterns. The two-character LED display on the control panel shows 15 status messages. Some are obvious (PJ for paper jam, PO for paper out), while others are less so (PU for power-up self-test sequence, DL

Epson, Diablo, and Qume compatibility make the QMS KISS simple to use, but the graphics are limited.

for download idle). At the end of the power-up sequence, the machine automatically prints a status sheet showing the current margins, paper size, emulation mode, page orientation, and default fonts. It also tells you how many pages have been printed by the print engine—a nice feature if you want to track printer and toner cartridge usage.

The Low-Cost Laser Appraised

I love this printer, but I hate its documentation. QMS went to great lengths to produce a simple, easy-to-use product and then bundled it with some of the most obscure technofog in print. The manual is organized in the worst possible way, presenting an explanation of the control panel commands first. After you've spent hours on this exercise in futility, you're belatedly taught the far simpler method of using escape codes to control the machine.

Especially frustrating is that the documentation glosses over the most engaging attribute of the machine—ease of use. Setting up the KISS is as easy as plugging it in and telling your application that it's using an Epson printer (switching emulation modes is a separate process). While the manual is useful as a technical reference, its ponderous explanations are certainly not vital to setting up and using the machine.

Far more useful is the $69 utility sold as an extra by QMS. The utility is RAM resident, enabling you to pull down menus from within almost any application to change modes or fonts. This is an unusually effective approach to printer control, although I think the disk should be bundled with the machine. A brief start-up manual and a quick-reference guide to the various configuration groups, options, and toggles would also help KISS users immensely. In the meantime, I've learned to get by with a series of batch files in DOS and a printed list of often-used commands.

The KISS doesn't do everything a laser printer is capable of, especially when it comes to graphics. Software that can exploit the machine's 300-dpi graphics potential is sorely needed. The addition of LaserJet emulation would be one way to get the most out of the KISS until third-party software devlopers start supporting the machine.

On the other hand, adding more capabilities would also increase the complexity and the price. Instead, the machine provides a relatively simple set of capabilities for two-thirds the cost of most other laser printers. This positioning makes the KISS extremely attractive for daisy wheel users who've been waiting for a laser printer that's both cheap and easy to use. Someday, a standard will emerge that will set the pace for all laser printers. Until then, QMS has broken new ground by applying today's standards. Buying a KISS means you'll have to sacrifice high-resolution graphics capability, but you'll also own a laser printer with the broadest software compatibility available.

Bill Crider is president of the Tucson Computer Society and a Contributing Editor for PC World.

QMS KISS
Quality Micro Systems
P.O. Box 81250
Mobile, AL 36689
205/633-4300
List price: $1995, with serial interface $2245, optional utility disk $69

Plotting the Big Picture

A low-cost expert forecasting system for the layperson, Macro-Track may not look pretty, but its predictions about the economy can be surprisingly accurate.

John B. Gordon

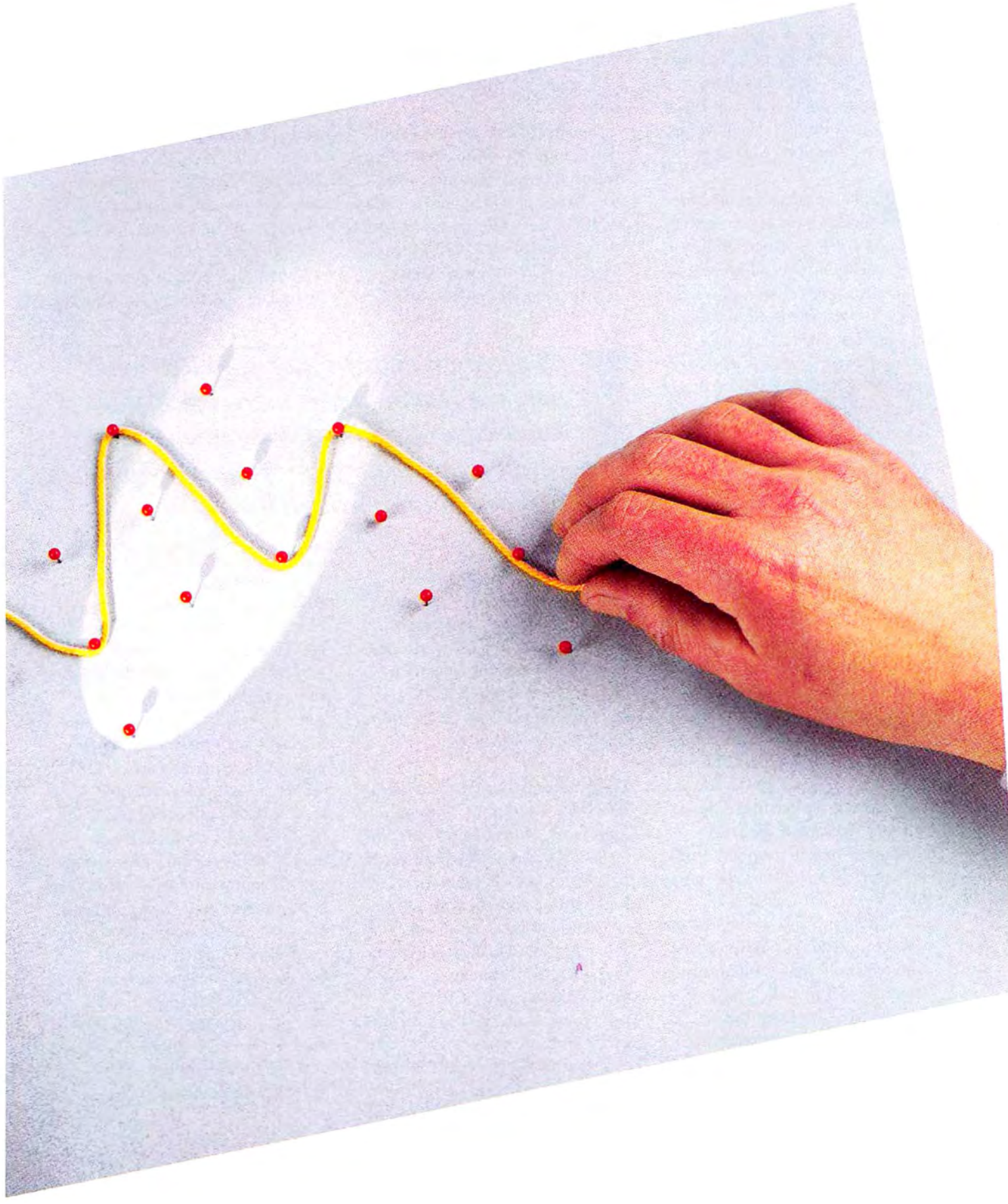
You don't have to be a VP of Exxon to watch the economy closely and reckon its effect on your business. Taking into account expert forecasts for inflation, interest rates, and consumer sentiment can give any business strategy a sharper competitive edge. But when you're hashing out a business plan, finding the information you want in publications like *Barron's*, *Business Week*, or the *Wall Street Journal* can be an interminable task.

Macro-Track from Black River Software provides a centralized source of information about the overall economy. An expert forecasting program aimed at private investors, small business managers, and marketing and financial analysts, *Macro-Track* offers a historical data base of over 53 economic indicators and predicts three months to three years in the future for each.

Bucking the traditional regression modeling approach to economic forecasting—a method that weaves a complex web of cause-and-effect relationships based on conventional assumptions about the economy—*Macro-Track* makes its projections using standard statistical analyses. While the program's methodology is largely textbook stuff, employing statistical decision rules in an expert system is an innovative approach to economic forecasting.

Macro-Track's $224.95 price tag may make it tough for some to take the program seriously. Its closest competitors, offered by leading econometrics firms, are in the $2000 to $3000 range. In addition, *Macro-Track* is painfully slow, and the character graphics

Fred Stimson



on screen and on paper are uninspiring, to put it kindly. But make no mistake—this is a serious forecasting program, and its projections stack up quite well against those proffered by the big guys.

The Soothsayer On Line

Unlike most expert systems, *Macro-Track* does not require expert users. No special knowledge of statistics or economics is necessary; in fact, the program's design is best described as a black box. *Macro-Track*'s specific method of analyzing historical data is proprietary, and there's no way to change the statistical rules that govern its operation. You can add your own data to the program's data base, but *Macro-Track*'s predictions appear to be most accurate when confined to the program's own relatively small data base.

Macro-Track comes on a single non-copy-protected disk, and the installation is easy. The historical data base comes on a separate disk, which Black River updates by mail monthly (three months of updates are included with the price of the software). To add this new data to the existing data base, you type *update* at the DOS prompt; a special program on the new disk then transfers the update files.

On a floppy disk system the update requires about five minutes. The reason it takes so long—aside from the fact that the program is written in compiled BASIC—is that *Macro-Track* revises its forecasting models as it updates, so you don't have to wait for it to recalculate each time you select an option.

The historical data base comprises monthly or quarterly figures for each of its economic indicators, some of which go back as far as 1960. Referred to as *time series*, these records are stored in chronological order and provide the source material for *Macro-Track*'s projections. Unlike the government's raw economic statistics, which are often revised after they're issued, Black River's data is clean and current when it arrives in your mailbox. Some analysts may buy *Macro-Track* for its quality data base alone.

Unlike most expert systems, Macro-Track *does not require expert users. No special knowledge of statistics or economics is necessary; in fact, the program's design is best described as a black box.*

Forecasting Future History

For a program with high ambitions, *Macro-Track*'s user interface is pretty pedestrian. At the program's homely main menu, highlighting an item with the cursor keys and pressing <Enter> is the only way to make a selection. Pressing <Esc> backs you out of most options, and <Ctrl>-P prints out an on-screen report or listing in its entirety.

Selecting the Directory option from the main menu opens a window containing a complete list of *Macro-Track*'s time series, which you can flip through using the <PgUp>, <PgDn>, <Home>, and <End> keys. In printout form, the list includes the beginning and ending dates of each time series, but the screen display shows only the series' name (see Screen 1). Why the program uses pint-size windows that cut off valuable information is one of *Macro-Track*'s many mysteries.

When they receive their monthly update, most users will skip the Directory and go directly to *Macro-Track*'s Bulletin, a magazine-style synopsis of economic conditions similar to *Business Week*'s "Business Outlook" section. The Bulletin compares *Macro-Track*'s GNP and inflation forecasts with those of other experts—Chase Econometrics, DRI, Wharton Associates, Merrill Lynch, the Conference Board, and the President's Council of Economic Advisors. This information enables you to average forecasts and assemble your own prognosis on where the economy is going.

After perusing the Bulletin, you'll probably delve into one of three summary reports that give overviews of *Macro-Track*'s forecasts. Designed to highlight series with a high probability of change, the Short-Term Alert, One-Year

Outlook, and Turning Points summaries provide a starting place for further exploration.

The Short-Term Alert shown in Figure 1 projects the amount of change in all 53 time series for the fourth quarter of 1985. The series are classified into three groups according to the probability that the projected direction of change will actually occur—*Macro-Track*'s "confidence rating" for its own forecasts. On screen, this report displays only those columns that show the series' names, probability, and direction of change. This truncation means you must print out the report to see the level and percentage of projected change, plus the level, scale, and date of the latest time series update.

Seven series in Figure 1 have an 80 to 100 percent chance of matching the projected direction of change, which *Macro-Track* terms a 'significant' probability. Eighteen series have a 60 to 80 percent chance, or a 'moderate' probability, and the remaining half of the data base falls into the 'indeterminate' group, with a less than 60 percent probability of matching *Macro-Track*'s predictions. If you wish, you can alter the default percentage ranges that define these groups.

The number of indeterminate series in Figure 1 may seem unreasonable, yet the major econometric services and the business press were all equally uncertain about most of the same series. 1985 was a tough year for forecasters. For example, although strong economic growth usually coincides with a bull market, most of 1985 saw sluggish growth despite a strong stock market. Forecasting uncertainties were compounded by the large federal budget deficit and a tax reform plan looming on the horizon.

Screen 1: Macro-Track uses small windows to display reports; reports appear in their entirety only on printouts.

The format of *Macro-Track*'s One-Year Outlook summary report is identical to that of the Short-Term Alert, the only difference being the length of the projection. The Turning Points summary predicts the date when each series will change direction. Like the other summaries, the Turning Points report shows the level and percentage of change as well as current level, scale, and date information.

A Second-Rate Broker

The last summary option on the main menu is the Investment Guide, which recommends the markets you should invest in, based on forecast yields. You can simulate the returns over time from either these *Macro-Track* suggestions or your own strategy. The program also compares the simulated returns with the least-risk strategy (treasury bills), while another function simulates the returns from perfect advance knowledge of the markets.

The Investment Guide is the least useful of *Macro-Track*'s features. Although Black River has recently added data for specific securities, most of the time series for stocks are price indexes. In other

```
                              M A C R O * T R A C K

Ver:2, SN:718                                                  Tue 24 Sep 1985

                                SHORT-TERM ALERT
                                ----------------
                  Probability of moving Up or Down Next Period

                                 Next Period Direction                Currently
                                 ---------------------------          ---------------------
Series                           Prob.  Dir'n   Level Change          Level Scale  Date
-------------------------------  -----  ------  ---------------------  ---------------------
SIGNIFICANT PROBABILITIES:

 Trade:US Net Exports            98.6%  DOWN to -109.6 -   9.6%      -100.0 bils  Q3 1985
 Price:New Homes                 96.5   UP to    104.5 +   1.5        103.0 thou  Q3 1985
 Money Supply:M2 1972$           92.9   UP to    976.6 +   0.4        973.0 bils Aug 1985
 GNP:Constant $                  92.3   UP to   1691.3 +   0.7       1680.0 bils  Q3 1985
 Capital Expenditures            90.3   UP to    400.9 +   2.1        392.6 bils  Q3 1985
 Price:Growth Mutual Fund        81.4   UP to    261.6 +   2.6        259.0 %    Aug 1985
 Exchange Rate:$/Lb.             80.6   DOWN to    1.38 -   1.5          1.40     Aug 1985

MODERATE PROBABILITIES:

 Stock Price:Wilshire 5000       79.3   UP to     2005 +  20.0       1985 %     Aug 1985
 Price:Sotheby Art Index         76.8   UP to    337.5 +   0.4        336.0      Aug 1985
 Inventory-Sales Ratio           76.0   DOWN to    1.52 -   0.5          1.53     Aug 1985
 Stock Price:Dow Jones 30        75.9   UP to   1356.6 +   0.9       1345.0      Aug 1985
 Price:PPI Energy                72.4   UP to    653.4 +   0.8        648.3      May 1985
 Exchange Rate:DM/$              71.4   DOWN to    2.88 -   0.7          2.90     Aug 1985
 Exchange Rate:Yen/$             69.8   DOWN to   236.8 -   0.7        238.5      Aug 1985
 Stock Price:S&P 500             67.0   UP to    194.8 +   0.9        193.0      Aug 1985
 Int Rate:AAA Corporate          63.4   DOWN to   10.86 -   0.1         10.93 %   Aug 1985
 Int Rate:LT T-Bonds             65.1   DOWN to   10.33 -   0.1         10.40 %   Aug 1985
 Help Wanted Ads                 62.8   UP to    142.7 +   0.5        142.0      Aug 1985
 Int Rate:Municipal Bonds        62.1   DOWN to    8.65 -   0.1          8.70 %   Aug 1985
 Indicator:Leading               62.0   UP to    170.0 +   0.1        169.8      Aug 1985
 Saving Rate                     61.9   DOWN to    5.0 -   0.1          5.1 %    Q3 1985
 Indicator:Coin/Lag Ratio        61.4   UP to    128.8 +   0.2        128.5      Aug 1985
 Ind.Production:NonDurable       61.3   UP to    126.6 +   0.2        126.3      Aug 1985
 Productivity:Output/Hour        61.2   UP to     98.3 +   0.3         98.0      Q3 1985
 Price:Copper                    60.9   DOWN to   0.69 -   1.4          0.70     Aug 1985

DIRECTIONS ARE INDETERMINATE:

 Int Rate:3 Mo T-Bills           59.7   DOWN to   6.91 -   0.1          7.01 %   Aug 1985
 Int Rate:Home Mortgage          59.3   DOWN to  11.60 -   0.1         11.65 %   Aug 1985
 Profit Margin:Mfg.              58.9   DOWN to    4.0 -   0.1          4.0 %    Q3 1985
 Consumer Credit Ratio           58.9   UP to     16.3 +   0.2         16.1 %    Aug 1985
 Int Rate:Prime                  58.6   DOWN to   9.31 -   0.1          9.40 %   Aug 1985
 Exchange Rate:US$               58.4   UP to    141.5 +   0.4        141.0      Aug 1985
 Price:Wheat                     58.2   DOWN to   2.99 -   2.0          3.05     Aug 1985
 Retail Sales:Constant $         57.8   UP to    53.82 +   0.2         53.70 bils Aug 1985
 Price:Beef Steers               56.9   DOWN to   52.0 -   1.0         52.5      Aug 1985
 Income:Hourly Earnings          56.5   UP to    166.5 +   0.3        166.0      Aug 1985
 Price:Silver                    55.9   UP to     6.38 +   2.9          6.20     Aug 1985
 Price:Gold                      54.5   UP to    327.3 +   0.7        325.0      Aug 1985
 Stock Volume:NYSE               54.3   UP to     2521 +   0.8         2500 mils Aug 1985
 Price Change:GNP                54.2   UP to      3.1 +   0.1          3.0 %    Q3 1985
 Price Change:PPI                52.9   UP to      1.6 +   1.1          0.5 %    Aug 1985
 Consumer Sentiment              52.6   DOWN to   92.6 -   0.4         93.0      Q3 1985
 Federal Govt:Surplus            52.8   DOWN to -160.5 -   0.5       -160.0 bils  Q3 1985
 Capacity Utilization            52.2   DOWN to   80.2 -   0.3         80.5 %    Q3 1985
 Housing Starts                  51.2   DOWN to   1696 -   0.2         1700 thou Aug 1985
 Ind.Production:Durables         51.0   UP to    129.0 +   0.2        128.8      Aug 1985
 Price Change:CPI                50.8   DOWN to    3.4 -   0.1          3.5 %    Aug 1985
 Income:Real Per Capita          50.4   DOWN to   4975 -   0.0         4975       Q3 1985
 Profits:Corporate Aftax         50.0   UP to     134.0     0.0        134.0 bils  Q3 1985
 Autos:Domestic Sales            50.0   UP to      7.7      0.0          7.7 mils Aug 1985
 Unemployment Rate               50.0   UP to      7.4      0.0          7.4 %    Aug 1985
```

Figure 1: The Short-Term Alert, one of four report options that summarize Macro-Track's projections

words, unless you want to invest in one of the few Fortune 500 companies listed, the program will recommend that you buy stocks in a given market, but it won't tell you which ones. Entering your own specific stock price information into the data base is one option, except that *Macro-Track* is not really designed to handle all the extenuating circumstances that affect the stock market. *Macro-Track*'s strength lies in its macroeconomic forecasts, and it can falter badly with microeconomic projections.

In-Depth Analysis

The summary reports offer a way to browse through *Macro-Track*'s projections and find those of personal interest. For example, if you're a retailer, you'll find predictions for retail sales, consumer confidence, consumer credit, and personal income particularly intriguing. If a summary forecasts a major change in one of these series, you'll want to know when and how big the fluctuation is likely to be.

Suppose your primary concern is the outlook for interest rates on home mortgages. When you're in the Directory or a summary report, moving the cursor to the time series called Int Rate: Home Mortgage and pressing <Enter> superimposes a larger window on the first. At the top of the window

is a status line showing the default analysis option, Forecast 70% Range.

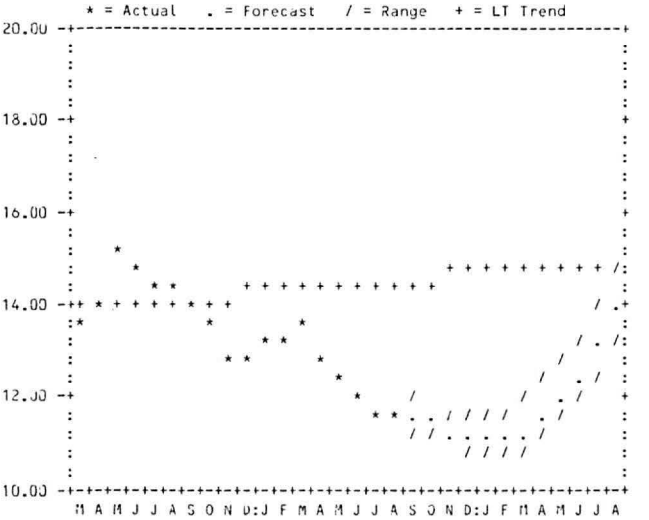
Pressing <Enter> at this point generates an on-screen graph that plots the most recent 18 quarters of actual home mortgage interest rates as well as a forecast for the next 12 quarters. The Forecast 70% Range option also displays any recent recessionary periods plus the projected long-term trend, which is based on the entire history of home mortgage interest rates held in the data base.

To view the base figures for the data points, you can select the Display Plot Values option, which stacks these numbers on the graph itself. If you generate a Forecast Analysis printout, however, an orderly, chronological listing of the applicable time series data appears (see Figure 2). You can also print a table of all data for a time series or a graph of a complete time series history plus a three-year projection.

In the Forecast Analysis report, the 70% Range column figures (represented by slashes on the graph) indicate the confidence limits surrounding the forecasts. In other words, there's a 70 percent chance that the projected interest rates will fall between the low and high end of the range. Pressing the percent key after selecting the Forecast 70% Range option lets you change the probability range to whatever you like.

In addition to the basic Forecast 70% Range analysis, *Macro-Track* offers several conditional options.

```
                          M A C R O * T R A C K

Ver:2, SN:718                                                  Tue 24 Sep 1985

                 FORECAST ANALYSIS - Int Rate:Home Mortgage

                    SCALE: Percent      UNITS: -n/a-

                 59.3% chance of DECREASE next period.

                                          Change
                                 Change   from     70% Range
                   Most         Annual   Last    ------------
          Date     Likely        Rate    Year     Low   High
        --------  ----------------------------  ------------
        Sep 1985   11.60    -0.6    -2.4    11.36  11.83
        Oct 1985   11.51    -1.1    -1.9    11.23  11.79
        Nov 1985   11.40    -1.4    -1.5    11.07  11.72
        Dec 1985   11.27    -1.5    -1.7    10.91  11.64
        Jan 1986   11.13    -1.7    -1.9    10.72  11.54
        Feb 1986   11.21     1.0    -2.1    10.76  11.67
        Mar 1986   11.40     2.2    -2.0    10.90  11.89
        Apr 1986   11.68     3.4    -1.3    11.14  12.22
        May 1986   12.06     4.6    -0.2    11.48  12.64
        Jun 1986   12.55     5.8     0.7    11.92  13.17
        Jul 1986   13.13     7.0     1.4    12.46  13.80
        Aug 1986   13.94     9.7     2.3    13.23  14.65
        Nov 1986   14.49     2.3     3.1    13.65  15.34
        Feb 1987   15.11     2.5     3.9    14.14  16.08
        May 1987   15.72     2.4     3.7    14.62  16.83
        Aug 1987   16.27     2.1     2.3    15.04  17.51
        Nov 1987   16.71     1.6     2.2    15.35  18.07
        Feb 1988   16.99     0.9     1.9    15.50  18.49
        May 1988   17.10     0.2     1.4    15.47  18.72
        Aug 1988   17.02    -0.5     0.7    15.27  18.78

          * = Actual   . = Forecast   / = Range   + = LT Trend
```




```
                 Most likely LOW Jan 1986 at 11.13 %

                 70% Chance: as Early as Aug 1985
                             as Late as  Dec 1986
```

Figure 2: Macro-Track's Forecast Analysis report details past and future activity for a given time series.

The most interesting of these, Analyze My Forecast, allows you to evaluate your own assumptions about future economic conditions.

For example, suppose you plan to buy a new home in the winter of 1986 but you can't afford the mortgage payments unless interest rates are less than 9 percent. If you enter your wishful 9 percent projection, *Macro-Track* will calculate the probability that your desire will actually come to pass. The Analyze My Forecast option is one of *Macro-Track*'s most valuable features. If you make an assumption about future economic conditions in a business plan, having a quick way to assess the accuracy of that assumption can be invaluable.

Two other conditional options allow you to change the time frame on which *Macro-Track* bases its projections. Three more conditional options plot percentage changes from period to period. One shows the percentage change from quarter to quarter, another plots the annual rate of change (annualized at a compound rate), and the third calculates the percentage change between any period last year and the same period this year.

This flexibility makes it possible to cull the data you want for a variety of applications. You can even create a .PRN file with *Macro-Track* and import it into *1-2-3* for further manipulation, but you can only include base data in the .PRN file, not forecasts.

Macro-Track Versus the Competition

For those skeptical of *Macro-Track*'s abilities, the program features an intriguing simulation option that enables you to measure its past forecasts against the economy's actual performance. *Macro-Track* needs the first few years of

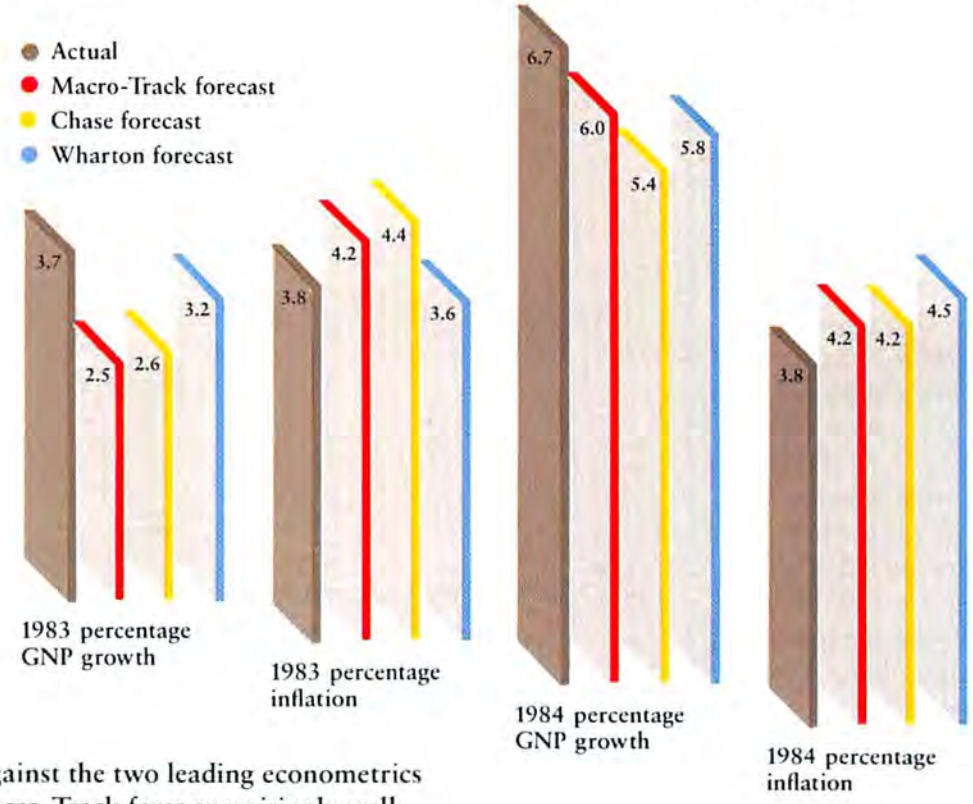


Figure 3: Against the two leading econometrics services, Macro-Track fares surprisingly well. Bucking the traditional regression modeling approach to economic forecasting, Macro-Track makes its projections using standard statistical analyses.

data in a time series on which to base its projections, of course, but beyond that it will plot every subsequent quarter up to its three-year limit. For a single time series, running a simulation takes several minutes, during which time the screen stays blank.

Executing a simulation for interest rates on three-month treasury bills from January 1983 to June 1985 produced notable results. Because their fluctuations often lead to changes in other interest rates, treasury bills are probably the most-watched indicators, and they're notoriously hard to forecast.

Although the forecast showed some large errors around the turning points in July 1983 and December 1984, *Macro-Track* was correct about 90 percent of the time in predicting whether interest rates would go up or down—an impressive performance, considering that all forecasts were simulated three months in advance. Simulated forecasts for several other interest rates yielded similarly accurate results.

Finally, the crucial challenge—measuring *Macro-Track*'s forecasts of real GNP growth and inflation for 1983 and 1984 against forecasts produced by the two leading econometrics firms, Chase Econometrics and Wharton Associates. As you can see in Figure 3, which includes the actual performance of the economy, the three forecasters show little variance.

While *Macro-Track* is undoubtedly a value for the price, its rough edges are often distracting. The documentation is maddeningly brief and lacks any screen shots or report illustrations. The demo disk—actually a tutorial—is somewhat more successful, although it too falls short of comprehensively explaining the data *Macro-Track* provides. On-line help, activated by pressing the question mark key, brings up a small window at the bottom of the screen that simply lists basic cursor key and menu selection functions. Fortunately, the program is simple to operate, so you'll probably learn your way around with only a minimal trial-and-error period.

Better graphics, faster operation, and more complete documentation of *Macro-Track*'s report options would greatly enhance the program's appeal. Regardless of proprietary taboos, a layperson's guide discussing how the program arrives at its projections is also much needed, especially for people who plan to risk money on the forecasts. But the real bottom line for a program like this is the accuracy of its forecasts, which compare well with projections from more conventional sources. For anyone concerned with the peaks and valleys of the economy, *Macro-Track* provides a low-cost sketch of future terrain.

For those who are skeptical of Macro-Track*'s abilities, the program features an intriguing simulation option that enables you to measure its past forecasts against the economy's actual performance.*

John B. Gordon is a professor of business administration and an associate editor of a forecasting journal.

Macro-Track
Black River Software
118 N. Marshall #150
Winston-Salem, NC 27101
800/841-5398
List price: $224.95 including three months of data base updates; additional updates: one year $95, two years $175, three years $250
Requirements: 48K, two disk drives
Not copy protected

For Services Rendered

For professionals who charge by the hour, Timelog, TBR, and The Client Management System can keep track of where the time goes, turn time sheets into invoices, and make sure that an hour spent is $125 earned.

Clifford Clouse and David Sandhaus

Attorneys, CPAs, and consultants—and any professional whose primary commodity is time—end each day with a vague memory of hours bent over books and talking to clients, and, if they're diligent, a slip of paper detailing how those hours were spent. A month later the slips of paper, intermingled with receipts and bills, have multiplied to stacks. With each passing day, the prospect of compiling those scrawls into an orderly account

becomes more daunting, and in the madhouse of day-to-day duties, the task is often shunted aside.

Time-billing software can tame the business end of your profession. Such programs track dollars and hours spent on each client, then generate client bills, record payments, and track and age accounts receivable. Most keep data bases of a firm's personnel and activities and generate management reports that summarize time and money spent on each client, project, and activity. When you're ready to send out bills, the software serves them up, logs them, and then awaits payments. When payments arrive, the program hospitably accepts your entries. And because tasks become manageable, they're more likely to get done.

Time-billing software can tame the business end of your profession. Such programs track dollars and hours spent on each client, then generate client bills.

Most time-billing packages are designed for any professional who charges by the hour—lawyer, engineer, consultant, architect, accountant—but some are created to meet the needs of specific professions. Three standouts (two generic and one job-specific) are considered here. *Timelog* is a general-purpose time-billing package from Gavel Computing Systems that provides basic functions at a bargain price. *Time, Billing, and Client Receivables (TBR)* from Computer Associates (formerly Sorcim/IUS) is a more comprehensive general package for a heftier sum. *The Client Management System* from CompuLaw is designed to solve the specific billing problems of small to medium-size law firms (see Table 1).

Timelog

Someone who pales at the sight of a computer monitor can install *Timelog* and be entering client files in a couple of hours. Installation is a breeze. *Timelog*'s documentation doesn't match the program's precision, but entry screens and menus are so clear that you can almost throw the book away.

Timelog purports to offer basic time-billing functions for any profession, and its simplicity and $295 price tag bring it within reach of almost any office. The simplicity notwithstanding, *Timelog* offers a number of praiseworthy features.

A time-billing package must make entering client data easy; the idea is to prevent the month-end pileup of time sheets. To make keeping up uncomplicated, *Timelog* relies on just one simple form for entering both fees and payments (see Screen 1). You can enter charges as hourly fees (calculated for increments as small as 1/100 of an hour) or flat fees.

Ever in pursuit of efficiency, most time-billing programs use codes to describe transactions. *Timelog* eschews that practice, instead offering up to two lines for a plain English description of each entry. As a shortcut, however, the program lets you define the function keys at the beginning of each entry session. With the proper forethought you can thus insert most transaction descriptions—*consultation fee* or *payment for professional services*, for instance—with the press of a key. A new release of the program will reportedly allow you to use <Alt>, <Ctrl>, and <Shift> combinations to program 40 function key definitions instead of the current 10.

Timelog also minimizes typing with a ditto feature, which repeats the last entry typed for an item. If you're entering several transactions for Melvin Magpie, for instance, you need only type the name on the first form. After that, pressing <Enter> at the Name line automatically enters *Melvin Magpie*. After you've entered one transaction for a client, the program automatically attaches the proper address and the name of the professional handling the case to additional transactions for that

Table 1: Time-billing features

Timelog	TBR	CMS	Features
1000	Unltd.	2500	Number of clients
Unltd.	Unltd.	40	Number of professionals
			Accounting
■	■	■	Hourly rates
■	■	■	Fractions of hours
■	■	■	Flat fees
■	■	■	Disbursements
		■	Retainers
		■	Trust accounts
	■	■	Automatic aging of past-due accounts
			Invoice accounting
	■	■	Automatic interest charges
			Bills
■	■	■	Prebill reports
■	■	■	Itemized bills
	■		Customizable bill formats
■	■	■	Adjustable amounts
■	■	■	Selectable bill printing
	■	■	Reminder statements
			Time keeping
	■	■	Nonbillable-time tracking
■	■	■	Overridable default rates for each professional
			Miscellaneous
		■	Screen printing
		■	Password security
	■	■	Projects grouped by matter/type
■	■	■	Records purged at end of billing period
■	■	■	Hard audit trail available
■	■	■	User-defined cross-references
■	■	■	User-defined codes for labeling transactions
			Reports
■	■	■	Client list
	■	■	Project list
			Accounts receivable
■	■	■	For firm
■			Per activity
■		■	Per professional
	■	■	Per client
	■	■	Per project
			Aged receivables
■	■	■	For firm
			Per activity
■	■	■	Per professional
■	■	■	Per client
	■		Per project
			Costs advanced
■	■		For firm
■			Per activity
■	■		Per professional
■	■	■	Per client
	■	■	Per project
			Unbilled hours
	■	■	For firm
			Per activity
			Per professional
			Per client
			Per project
	■	■	General ledger
	■		Closed files
		■	Retainer account activity
		■	Trust account activity

client. And if you begin to enter your client's name but can't remember how to spell it, you can call up a *Timelog* window that will oblige with a client list.

Words Are Key

Timelog identifies charges and payments via a short lexicon of predefined keywords and phrases (for example, *credit*, *payment*, *fee*), which you indicate on the description line. Entering any of these keywords puts a transaction into one of three categories–expense payments, fee payments, or professional fees–for billing purposes. An additional keyword, *settlement*, applies only to legal practices. You can also define two keywords for hourly fees and eight for payments.

The keyword lexicon works in this way: Because *payment* is a predefined keyword, typing *payment for consultation on 11/24* tells *Timelog* to credit the amount and insert the transaction under Payments on the client's bill. Thus, keywords help keep classifications straight but do not limit your ability to describe your dealings with clients. Once you've defined your keywords, however, they cannot be changed. Any description not using a keyword is itemized under Other Fees on client bills.

Like all the programs evaluated here, *Timelog* uses a balance forward method of recording payments–that is, it unquestioningly credits payments received to a balance owed on an account. If a client owes you $450 for consultations and $75 for payments you made for your client to a third party, a $75 reimbursement would be shown simply as a $75 credit against the outstanding balance of $525. The payment would not be credited toward any specific item, making it hard to square contested amounts or identify specific write-offs.

The Creditor Cometh

Although *Timelog*'s bill-generation facility is not sophisticated, it is adequate. Invoices are separated into three categories: hourly fees, other fees, and payments. You can itemize and date fees or print totals only. Gavel reports, however, that its update will offer 15 to 20 standard bill formats and free customized bill formats during the first year of release. Like the other programs evaluated here, *Timelog* lets you print prebill reports, which create a facsimile of the bill without changing a client's record. You can survey the prebill report and decide on write-offs or adjustments before creating the bill itself.

For such a modest program, *Timelog* shows surprising strength at report generation. The program's Totals menu offers account summaries by client, transaction description, professional, or any combination of the three. Accounts receivable can be summarized by client, by professional, and for the entire firm. You can call up a list of past-due accounts, aged 30, 60, and 90 days past the last billing or last payment. Most totals–but strangely, not all–can be sent to a printer; all totals can be displayed on the screen.

Unaccounted For

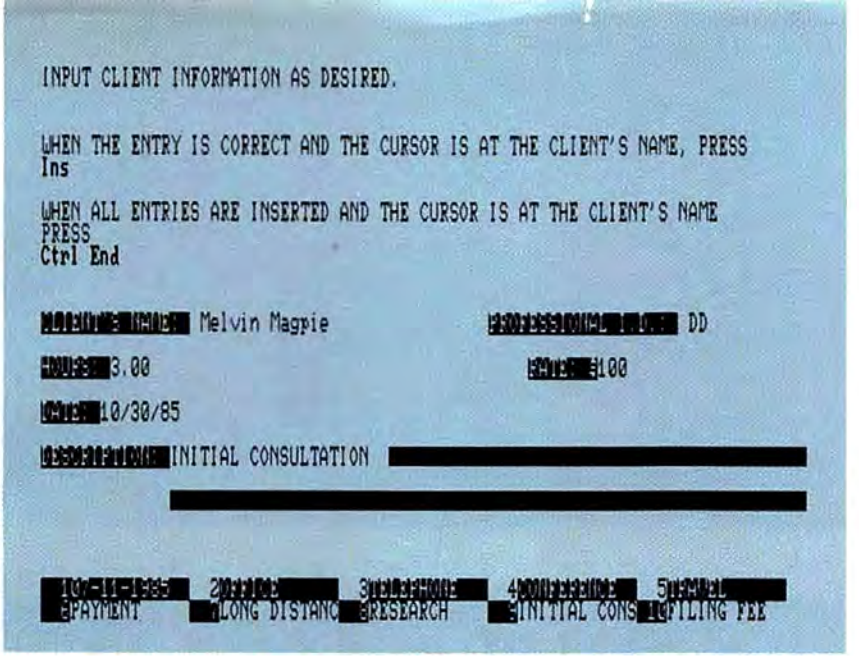
Timelog's reporting falls short in one important respect: It cannot record and summarize unbillable time. Such accounting is not necessary for strict billing purposes, but it gives managers information about their firm's productivity.

Professions that require such a feature or that need specialized billing procedures could find *Timelog* deficient. Law firms in particular might miss retainer and trust accounting. Retainer accounting, which subtracts expenses from prepaid sums, is slated for the program's new release, but Gavel has announced no plans to include the trust fund accounting required by most law practices. If your firm can do without these added embellishments, *Timelog* is a bargain.

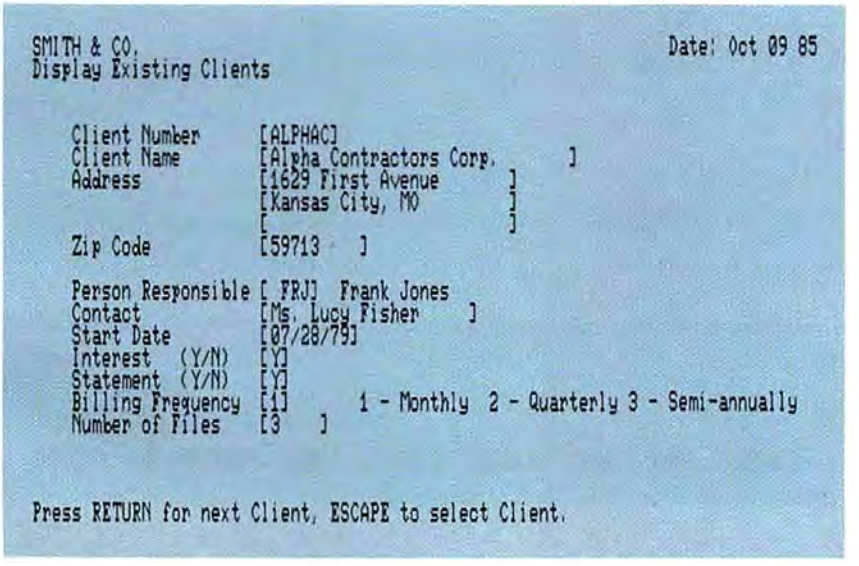
TBR: Major League

With its four system disks, 39 reports, and $1500 price tag, *TBR* is in an entirely different league from *Timelog*. Had Bob Cratchit used this package, Tiny Tim might have spent Christmas in Saint-Tropez. *TBR* is designed to take care of time accounting for small to medium-size professional firms; Computer Associates claims that the program handles an unlimited number of clients and professionals.

TBR is indisputably intended for the firm that expects to plow considerable effort and money into a time-billing system. The program depends on user-defined codes to categorize transactions and clients. This requirement makes *TBR* a challenge to set up, but the program can be closely



Screen 1: Timelog's data entry screen is sparse but surprisingly flexible. Keywords entered on the description line tell the program how to sort the entry. The function key definitions at the bottom of the screen are created by the user to enter keywords or other often-used terms.



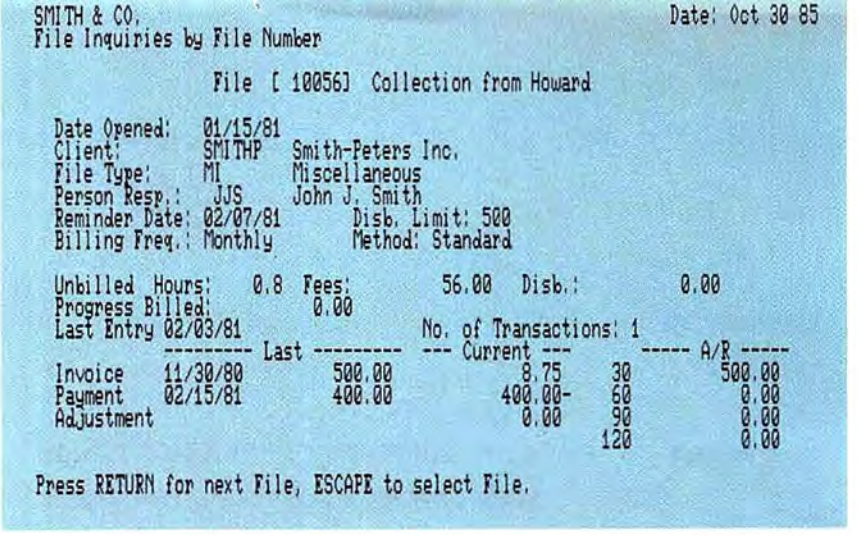
Screen 2: The client data screen in TBR's Client Profiles module creates data base entries from which the other modules draw. Information about projects and the firm's professionals are entered into similar video forms.

customized for your office. Once you've got it running, it supplies complete and efficient accounting. Although harder to use than *Timelog*, *TBR* pays off with elaborate and targeted responses to your needs.

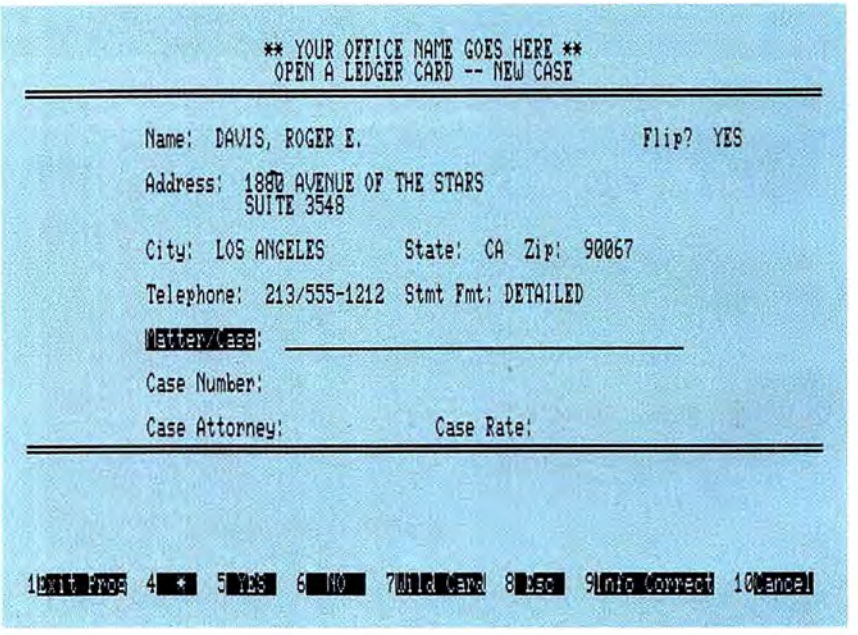
A Modular Troika

TBR is organized into three integrated modules: Client Profiles, Client Time and Billing, and Client Receivables. The modules provide simple on-screen forms with which you enter, alter, and view file information (see Screen 2). Each module also includes summaries of pertinent billing statistics and a lineup of key status reports—39 preset reports in all.

The Client Profiles module maintains information on staff members, clients, projects (called files in *TBR* lingo), and bank accounts. It includes separate entry forms for data about each element. The module lets you define file types, into which you can



Screen 3: TBR serves up on-screen summaries of accounts by client, file, file type, or professional. A client summary is shown here.



Screen 4: This CMS entry form creates a new "ledger card" for a case.

group projects. An accounting firm, for instance, could group files into corporate and tax categories and call up statistics grouped by type. Each professional in the firm receives identifying initials and a billing rate classification. (You can define up to nine billing rates.) When deleting a file from Client Profiles, you have the option of saving summary information on that file in a closed file report.

Account Activity

You enter time and disbursement records into the Client Time and Billing module. You can define up to 999 *dictionary codes* with which to label transactions and the same number of *disbursement codes* to label costs advanced to a client's account. The codes are automatically translated into their English counterparts on reports and bills.

You can set aside up to 10 dictionary codes to identify nonbillable time. Unbilled hours don't appear on a client's account but are tracked for management records. They can be used to tally each

professional's productivity and the profitability of each project category, thus detailing the firm's strengths and weaknesses. On-screen reports in this module summarize billed and unbilled hours and payments to date by client, file, file type, and professional (see Screen 3).

TBR's refined formatting procedures let you custom-design bill formats, including two-part bills for separate client and office records. You can also import custom bill formats created with Computer Associates' *EasyWriter II* word processor. Up to five bill formats can be stored and then retrieved with a single keystroke.

Once the invoices are posted and sent, the Client Receivables module, *TBR*'s third, takes over. Here you record payments, identify and charge interest to accounts that are 60, 90, and 120 days past due, and produce reminder notices of aged balances. For a client with multiple cases, you can easily distribute payments among them, in any combination you choose. On-screen reports show current and previous balances for each file. Transaction records can be printed to Computer Associates' *EasyBusiness General Ledger* or to an ASCII file for transfer to another package.

Strict Efficiency

TBR uses an orderly accountant's approach to time billing. Its strictness is exemplified by two features in particular. Throughout, *TBR* forces a hard audit trail. After each batch of transactions is posted, you cannot enter more information until you've printed a transaction report—a feature you grow to appreciate, though it can be frustrating. Another control feature is the program's time sheet check, which totals time submitted for each professional during a specified period and prints a report of those who have not accounted for all eligible hours.

Although thoughtfully documented and logically organized, *TBR* is not for the faint of heart—it makes few concessions to user-friendliness. Plan to devote a considerable amount of time to learning *TBR*'s ins and outs; program installation and customization require especially serious concentration. The manual does include a good tutorial, however, and once mastered, *TBR* is fast, efficient, and complete—and flexible enough to accommodate almost any profession.

Features Gone AWOL

Like *Timelog*, *TBR* lacks provision for retainer and trust funds and uses simple balance-forward accounting. These omissions are excusable in a $295 package, but not in a program that sets you back $1495.

A part of Computer Associates' *Plus System*, *TBR* is integrated with the company's accounting and financial reporting programs as well as with *EasyWriter II*. Other available enhancements include *EasyPlus 1.1*, which uses windows for limited multitasking with popular applications like *1-2-3* and *WordStar*, and the *EasyPlus Network Manager*, which enables the program to be used on 3Com's EtherSeries local area network.

The Client Management System

Lawyers have perhaps the most complex billing requirements of all professionals. In addition to the hourly fees and advanced costs covered by most time-billing packages, attorneys often charge a fixed fee or a contingency fee with costs advanced, or draw against a retainer. An individual attorney may charge different rates for different types of cases, or even change rates within the same case: for example, if a case goes to the trial phase, the attorney typically charges a new, higher rate. Trust fund accounting must be managed separately. CompuLaw's *Client Management System (CMS)*, a time-and-billing package designed specifically for law firms, handles all these vagaries.

CMS falls between *Timelog* and *TBR* in both complexity and price. Its easy-to-read manual provides a step-by-step tutorial for new users, and the program is generally competent and friendly. CompuLaw will provide on-site training for a fee, but you can become proficient with the software on your own in about a week's time.

Keeping Time

CMS handles up to 40 *timekeepers*. In theory, this means the program is suitable for firms with up to 40 attorneys, but since many law firms also charge for secretaries, law clerks, paralegals, word processors, and even photocopy machines, the practical limit on attorneys may be much smaller. The program can store 220 clients per 1MB of hard disk space and a

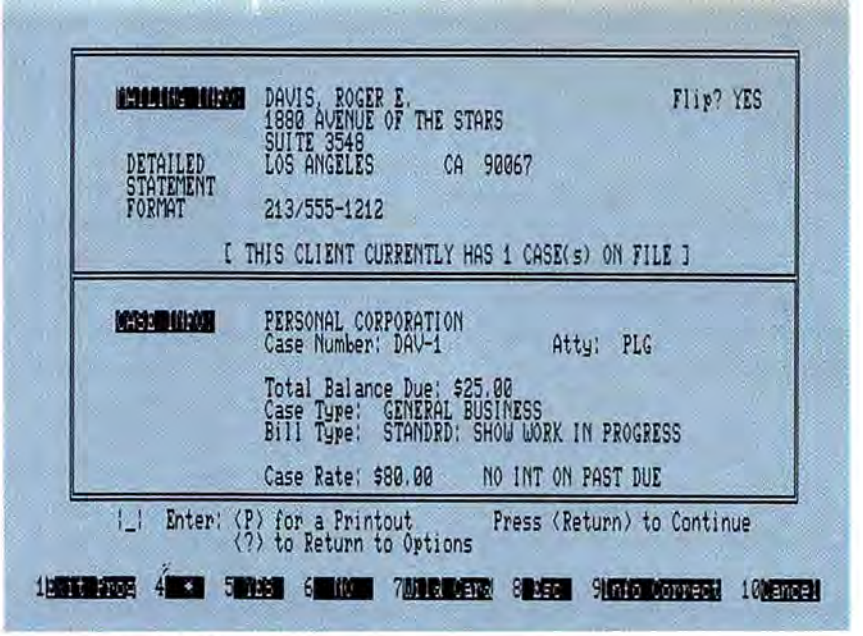
maximum of 2500 cases. The program works on floppy disk systems as well, but is excruciatingly slow and can store little client data.

To set up the program, you define up to 40 case types (akin to *TBR*'s 10 file types) and 63 service codes to label transactions. Predefined service codes monitor transfers to and from trust accounts and retainers, and track these for reports. You're also free to assign a default hourly rate for each attorney.

If you need to label more than 63 types of transactions, you can designate one service code as OTH, for other charges. And you can enter as lengthy an explanation as needed to document a transaction or activity on a client bill. Adding a pound sign (#) to any transaction code identifies it as nonbillable.

The core of the program is the ledger card that you create for each case (see Screen 4). The program updates the ledger card with each new transaction, bill, and payment. You can call up a ledger card by client name or case number at any time to see a summary of a client's account or to enter a new transaction (see Screen 5). Using the <Tab>, <Shift>, and <Ins> keys, you can perform basic text editing.

Like *Timelog* and *TBR*, *CMS* draws the appropriate address, attorney, and other information from a client's file for each new transaction for that client; it also keeps track of the attorney responsible for each case. These elements are automatically applied to each file but can easily be overridden.



Screen 5: The ledger card summarizing an account can be called up by case number or client name.

Flexibility to Spare

CMS's 22 management reports are comprehensive and comprehensible. An abbreviated general ledger (GL) management report provides accounting information such as monthly, quarterly, and yearly accounts receivable, fee write-ups and write-downs, costs billed, discounts allowed, and monthly trust accounting information. The general ledger also offers an accounts receivable aging report that shows which clients have not paid their bills in 30, 60, 90, or 120 days. CompuLaw offers a full-featured general ledger package and calendar modules, along with a program that allows *CMS* entries to be entered at remote computers and posted in batches to the main program. The remote entry module also includes ten extra management reports. The GL and calendar programs can be fully integrated into *CMS*.

The program provides eight preset billing formats, running the gamut from a simple summary statement of amount due to detailed bills that provide line descriptions of all work done for a client. You can print bills and reports to your screen or to the printer by attorney, alphabetical range, case type, or bill type. You can also send single statements or prebills, in ASCII format, to any word processor. One slick little feature enables you to enter clients by last name but receive a report listing first names first.

Calling Collect

Overall, *CMS* is characterized by an abundance of features and ample flexibility. It handles unpaid accounts impressively, automatically aging accounts and calculating late payment charges according to a user-defined interest rate. Actions taken to collect past-due accounts, such as letters or calls to the client, are also recorded.

The program's main limitation is its lack of provision for handling general office overhead. *CMS* handles costs advanced and allows account adjustments but does not allow a firm to track individual expenses. Such costs as travel and

heating offices on weekends are increasingly pertinent to client billing systems; in a competitive market attorneys bill clients for such expenses instead of raising hourly rates. Chalking up those expenses to costs advanced skews the ledger, and merely adjusting an account balance or charging flat fees denies the firm a method of tracking the effect of such expenses over time. In order to better track expenses, we found it necessary to designate one timekeeper as EXP (for expenses), which had unfortunate ramifications in the program's general ledger and timekeeper productivity reports. On the other hand, the program enables you to compute and bill interest separately.

The program's only other flaws are minor. *CMS* uses some odd and inconsistent commands. Instead of using <Esc> (a common toggle), you usually press ?–a confusing and awkward command–to exit a menu, and occasionally X or <F10>. The program also accesses the disk quite often, delaying the screen refresh several seconds.

Still, *CMS*'s many strengths outweigh its weaknesses. It's easy to install, learn, and use, free of fatal bugs, and flexible enough to adapt to most small and medium-size law firms. And at $995, it's affordable.

Top Billing

Each of the three packages evaluated here takes a distinctive route to essentially the same destination. Choosing among them, however, is easy: They're all good programs, but if you can use one, you probably can't use the others.

For $295, *Timelog* is a surprisingly complete time-billing system. Its numerous management reports and ease of data entry match those of systems costing three times as much, and the new release should add flavor to its vanilla invoices. It can't track retainers, trust accounts, or unbillable time, however–shortcomings that may disqualify it for many firms.

TBR is a complete, businesslike package. With its generous complement of transaction codes and user-defined file groupings, you can customize it for any size business, and buried within its menus are features to take care of just about any task. Its integration with Computer Associates' various business packages strengthens its appeal, as does its local area network support. *TBR*'s price and lack of trust and retainer accounting, however, may make it unsuitable for some practices.

CMS offers heavyweight time and billing features for law firms, addressing their complex and specialized accounting needs. It doesn't handle expense accounting as well as it could, but it tracks almost every other transaction in neat, easy-to-understand fashion.

If you're not sending out bills regularly or you're unclear about how your firm is spending its time, a time-billing package could soon become one of the most valuable pieces of software in your library. It won't watch the clock for you, but it can organize your accounting and smooth the consolidation of time, costs, and accounts receivable. It could pay for itself with the collection of just one unpaid bill–and it may very well leave you with more time to devote to billable pursuits.

Clifford Clouse is an accountant and controller of 4-5-6 World, a distributor of 1-2-3 *templates. David Sandhaus is an attorney in San Jose, California, and president of Legal Automation, a consulting firm.*

Timelog
Gavel Computing Systems Inc.
Rt. 2, Box 466
Alachua, FL 32615
904/462-4564
List price: $295
Requirements: 256K, two disk drives (hard disk recommended), DOS 2.00 or later version

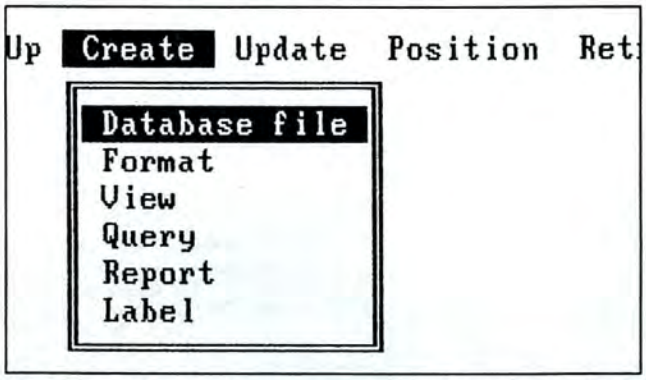
Time, Billing, and Client Receivables (TBR)
Computer Assoc.
2195 Fortune Dr.
San Jose, CA 95131
408/942-1727
List price: $1495
Requirements: 128K, two disk drives (hard disk recommended), DOS 2.00 or later version

The Client Management System
CompuLaw Inc.
3520 Wesley St.
P.O. Box 472
Culver City, CA 90230
213/558-3360
List price: $995, Legal Ledger $595, Docket Calendar/Critical Dates $495, Remote Entry/More Reports $495
Requirements: 256K, two disk drives (hard disk recommended), DOS 2.00 or later version; 320K for DOS 3.00 or later version

The database used now be used

Introducing dBASE III PLUS.™

The PLUS stands for all the improvements we've made to the world's number one selling database management software.



The Assistant helps beginning users accomplish day-to-day data management tasks without programming.

Mind you, dBASE III PLUS still has the powerful dBASE programming language, dot prompt, and all the features that have made dBASE III the standard of the industry.

We've simply raised the standard.

And just as dBASE III introduced more power to the people, our new dBASE III PLUS introduces more people to the power.

People who aren't all that crazy about programming, for example.

The Assistant feature in dBASE III PLUS now provides them with new easy-to-use pull-down menus for creating, using and modifying multiple databases.

So now anyone who can manage a simple cursor can manage day-to-day data management tasks. Without programming.

And by using our new Screen Painter, anyone can create custom screens. Without programming.

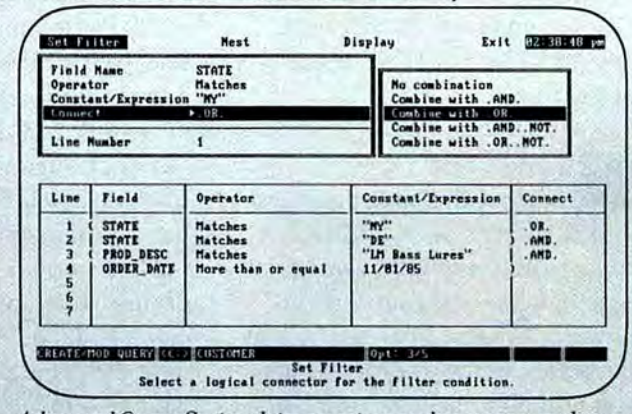
Or using View, access related information in several databases at one time. Without programming.

With Advanced Query System, another new non-programming feature, any user can build complex queries just by selecting from the dBASE III PLUS pull-down menus.

For rapidly creating entire programs, there's even a new Applications Generator.

And for all those who wish to learn to program, the Assistant can be of further assistance. By teaching you programming commands as you go along. Without disrupting your work flow.

These are only a few of the dBASE III PLUS features that can help new users quickly get up to speed. And experienced users quickly increase their speed. (Sorting, for example, is up to two times faster and indexing up to ten times faster than dBASE III.)



Advanced Query System lets you set up and answer complex queries without programming.

Circle 867 on reader service card

by more people can by more people.

And it's the fastest way to network those users, too. Because now, true multi-user capabilities for local area networking are built right in.

dBASE III PLUS can also help put developers in the fast lane. With a new Data Catalog and more than 50 new commands and functions. Plus code encryption and linking, improved debugging aids, assembly language calls and much more.

For the name of the Ashton-Tate® dealer nearest you,* call 800-437-4329, Extension 0285.**

And get your hands on dBASE III PLUS.

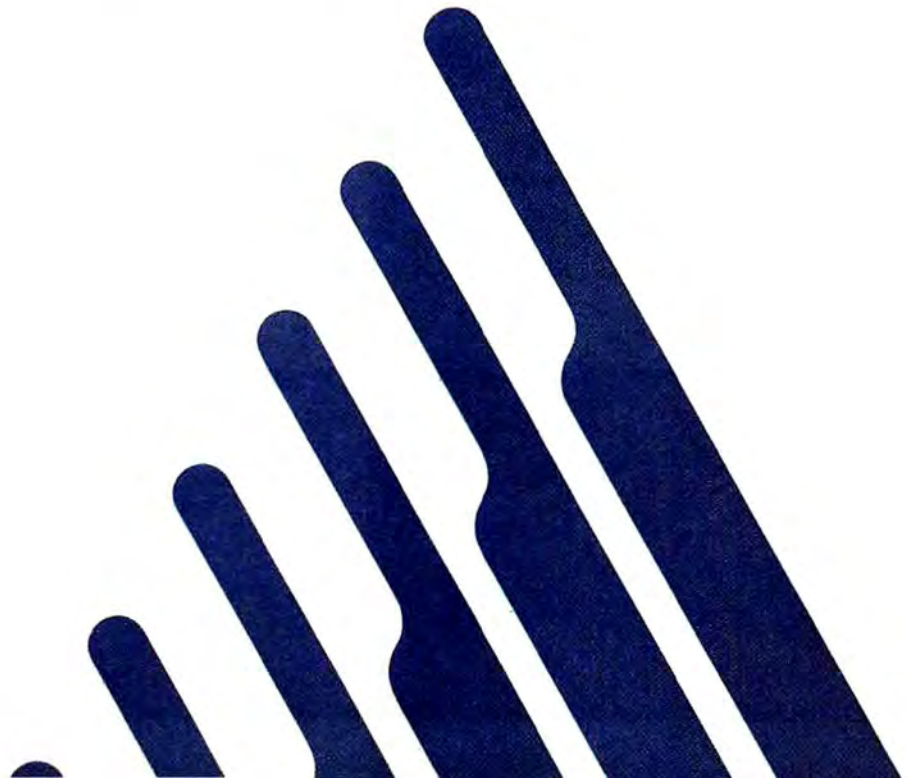
It's the software more people can look forward to using.

*Upgrades are available to all dBASE III owners. **In Colorado call (303) 799-4900, Extension 0285. Requires IBM® PC or 100% compatible. Trademarks/owners: Ashton-Tate, dBASE III PLUS/Ashton-Tate; IBM/International Business Machines Corp.
© Ashton-Tate. All rights reserved. 1986.

ASHTON·TATE

dBASE III PLUS

The data management standard.



Bulldog's Grand Slam Specials

- AST 6-Pack w/384 ..... $209
- HERCULES Compatible Monocard 99
- EPSON LQ 800 469

IBM

PC SYSTEMS

256 K, 2 Drives $1350
256 K, 2 Drives Monochrome Monitor and Card 1589
256 K, 2 Drives Color Monitor & Card 1789

XT SYSTEMS

256 K, 1 Drive, 10 mb Hard Disk $2050
256 K, 1 Drive, 20 mb Hard Disk 2150
256 K, 1 Drive, 10 mb Hard Disk Monochrome Monitor & Card 2289
256 K, 1 Drive, 20 mb Hard Disk Color Monitor & Card 2575

AT SYSTEMS

AT BASIC 256 K, 1.2 mb Floppy $3050
512 K, 20 mb Hard Disk 1.2 Floppy 3395
512 K, 20 mb Hard Disk 1.2 Floppy Monochrome Monitor & Card 3825
512 K, 30 mb Seagate Hard Disk 1.2 Floppy 3750

Take hold of your future with AT&T 6300 PC. Now you can get all the features and speed you need at the right price. All AT&T Systems include Keyboard, Bit Image Graphics, Green Monitor, 256K DOS, and On-Board Clock Calendar.

2 Drive System $1795
10 mb System 2095
20 mb System 2170
Upgrade to 640K 75
AT&T Color Monitor add 475

MONITORS

QUADRAM QUADCHROME II $329
NEC MULTISYNC 559

PRINCETON		TAXAN		AMDEK	
MAX 12	159	121 G or A	139	300G	129
HX 12	459	620	395	300A	139
HX 12E	515	630	450	310A	159
SR 12	585	640	495	600	410
				722	500

SOFTWARE

IBM DISPLAY WRITE III $369
WORDSTAR 2000 249
WORDSTAR 2000+ 279
WORD PERFECT 4.1 209
MICROSOFT WORD 239
VOLKSWRITER III 159
FREELANCE 219
CROSSTALK 109
WORD FINDER 65
SUPER CALC 189
LOTUS 1 2 3 329
SYMPHONY 429
D BASE II 259
D BASE III+ 369
FRAMEWORK 369
FANCY FONTS 135
REVELATION 575
MULTIMATE 239
CLIPPER 349
R BASE 5000 369
ENABLE 349
MICROSOFT WINDOWS 79
EASY 89
FAST BACK 99
CHARTMASTER 239

BORLAND — BORLAND — BORLAND

TURBO PASCAL $43
TURBO LIGHTNING 69
REFLEX 1 1 69
TRAVELING SIDEKICK 59
GAMEWORKS 43
TURBO TOOL BOX 33

HARD DRIVES

SEAGATE 10 mb w/controller $395
SEAGATE 20 mb w/controller 475
SEAGATE 30 mb for AT ST4038 635
SEAGATE 40 mb for AT ST4051 725
TULIN 30 mb for AT 595
CORE INTERNATIONAL 20. 30. 40. 56. 72. mb ..... CALL
IOMEGA BERNOULLI
10 mb 1795
20 mb 2279
40 mb 2999
MOUNTAIN 20 mb drive card 849
WESTERN DIGITAL 10 mb Hard Card 559
WESTERN DIGITAL HARD CARD 20 mb 625
PRIAM 60 mb AT 1195
PRIAM 43 mb AT 949

For Orders Call: 1-800-438-6039
In Georgia Call: 1-404-860-7364

Bulldog Computer Products

Incorporated in Georgia

Circle 865 on reader service card

Bulldog Takes The Heat Off High Prices !

GRAPHICS CARDS

GENOA EGA	$349
GENOA SPECTRUM	259
QUADRAM EGA	379
STB CHAUFFUER	249
STB EGA PLUS	349
SIGMA COLOR 400	449
SIGMA EGA	379
HERCULES GRAPHICS	289
PERSYST BOB BOARD	349

MULTI FUNCTION BOARDS

AST 6 PACK w/384K	$209
RAMPAGE FOR AT w/512K	445
INTEL ABOVE BOARD for PC w/256K Expandable to 2 mb	375
INTEL ABOVE BOARD for AT w/512K Expandable to 2 mb	575
ADVANTAGE w/128K	349
IRMA BOARD	769
J RAM III by Tall Tree for PC w/o K	210
J RAM III by Tall Tree for AT w/o K	249
J LASER	350
ORCHID CONQUEST	279
AST 5251-11 PLUS	615
MAYNARD ACCENT w/o K	199
QUADBOARD w/o K	179

EVEREX SPECIALS

GRAPHICS EDGE	$239
THE EDGE	219
MAGIC CARD II w/384K	179
MINI MAGIC w/o K	69
300/1200 INTERNAL MODEM	165
60 m.b. TAPE BACKUP for AT Internal	799
External	849
RAM 3000 w/oK	175

Chips Chips Chips Chips Chips Chips Chips Chips Chips Chips Chips

64K - $1.25 128K - $4.75 256K - $3.25 8087 - $149 80287 - $199

PRINTERS

EPSON

LX 80	$219
LX 90	239
FX 85	369
FX 286	515
LQ 800	469
LQ 1000	629
RX 100	299
DX 10 Daisywheel	209
DX 20 Daisywheel	289
DX 35 Daisywheel	589

OKIDATA

182	229
83 A	529
192 P	349
84 P	649
193	499
2410	1729

TOSHIBA

321	459
351	1025
341	789

CITIZEN

MSP 10	255
MSP 15	385
MSP 20	339
MSP 25	495
PREMIER 35	415

DRIVES & TAPES

360 KB Floppy for AT	$105
1.6 mb Floppy for AT	145
IRWIN 10 mb Tape for PC	
Internal	495
External	595
SYSGEN QUICK FILE 60	
Internal	1025
External	1075

MODEMS

HAYES 300	$159
HAYES 1200	369
HAYES 1200 B	339
comes w/Smart Com	
HAYES 2400 External	575
HAYES 2400 Internal	525
US ROBOTIC COURIER 2400 or MICROLINK 2400	439
VENTEL HALF CARD	349
VENTEL 1200 PLUS	339

Sales Hot Line

1-800-438-6039

3241-E Washington Road • Martinez, Georgia 30907

Our Prices Are Taking A Dive !

Bulldog Computer Products

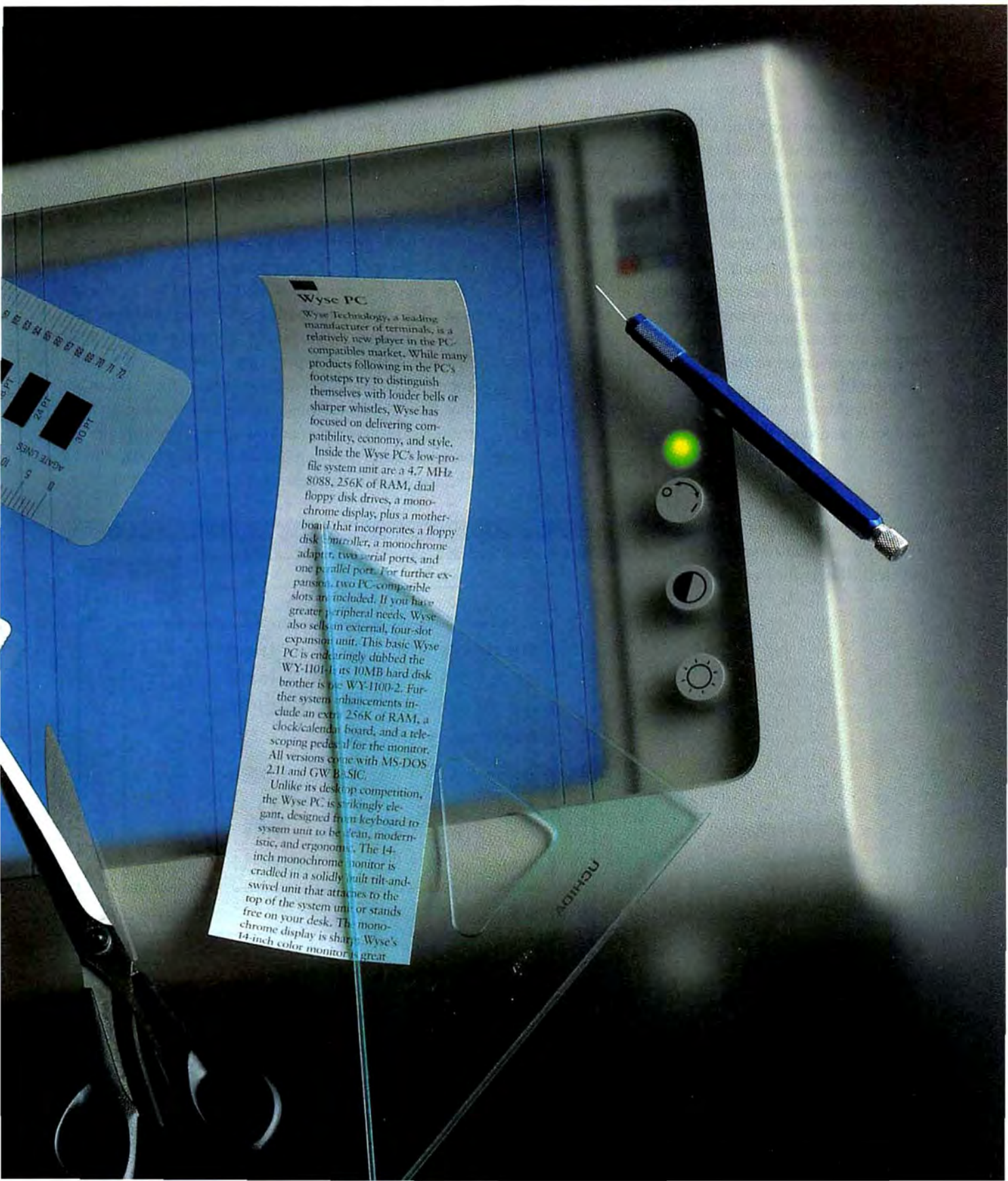
Taking a Page From the Pros

PageMaker and Ventura Publisher will soon bring sophisticated page makeup power to the PC environment. Both programs work hard at taming PC hardware for this highly graphic application, but while they look very similar, each is suited to a different style of document.

Danny Goodman

The many newsletters, manuals, and magazines that spill from the LaserWriter's output tray demonstrate that the great promise of personal computer publishing is being realized on Apple's Macintosh. Existing page makeup software products such as *PageMaker*, *MacPublisher*, and *ReadySetGo* allow virtually anyone to piece together handbills, advertisements, newsletters, even pages of magazines and books, with the mechanical skill of an experienced layout artist (albeit without the professional's crucial

Fred Simson



Wyse PC

Wyse Technology, a leading manufacturer of terminals, is a relatively new player in the PC-compatibles market. While many products following in the PC's footsteps try to distinguish themselves with louder bells or sharper whistles, Wyse has focused on delivering compatibility, economy, and style.

Inside the Wyse PC's low-profile system unit are a 4.7 MHz 8088, 256K of RAM, dual floppy disk drives, a monochrome display, plus a motherboard that incorporates a floppy disk controller, a monochrome adapter, two serial ports, and one parallel port. For further expansion, two PC-compatible slots are included. If you have greater peripheral needs, Wyse also sells an external, four-slot expansion unit. This basic Wyse PC is endearingly dubbed the WY-1101-1; its 10MB hard disk brother is the WY-1100-2. Further system enhancements include an extra 256K of RAM, a clock/calendar board, and a telescoping pedestal for the monitor. All versions come with MS-DOS 2.11 and GW BASIC.

Unlike its desktop competition, the Wyse PC is strikingly elegant, designed from keyboard to system unit to be clean, modernistic, and ergonomic. The 14-inch monochrome monitor is cradled in a solidly built tilt-and-swivel unit that attaches to the top of the system unit or stands free on your desk. The monochrome display is sharp; Wyse's 14-inch color monitor is great

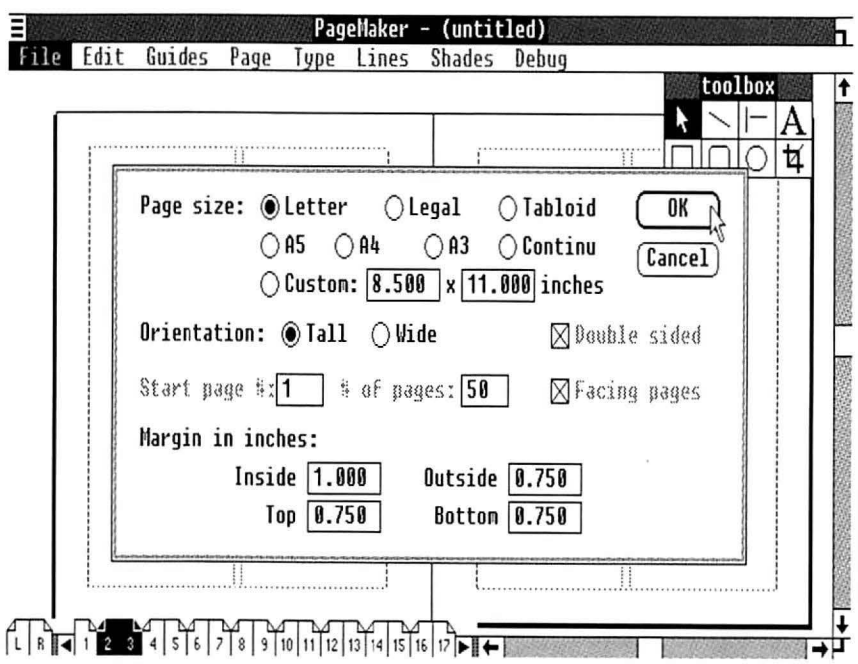
sense of elegant and effective design). On a high-resolution laser printer, these programs can produce text that comes remarkably close to typeset quality and line-art illustrations that look painstakingly handcrafted. You can prepare creditable camera-ready art in a matter of minutes, without leaving the office or hiring expensive outside services.

Cut From the Same Cloth

The Macintosh will yield its sole grip on the personal computer publishing market this summer as software developers such as Aldus Corporation and Ventura Software bring Mac-like publishing programs to the IBM PC environment. Due to the multiplicity of PC video displays and popular laser printers, the task of making a what-you-see-is-what-you-get page makeup program work on the PC has kept many a programmer up past bedtime. These two programs are but the first to successfully address these problems.

PageMaker from Aldus runs under *Microsoft Windows* and reveals its roots by closely paralleling the appearance, command structure, and functions of its Macintosh counterpart. Positioned head-to-head against *PageMaker* is the GEM-based *Ventura Publisher,* developed by Ventura Software and marketed exclusively by the Xerox Corporation. At press time, both mouse-controlled products were still in development and thus not available for review, but as this product preview indicates, their differences are as striking as their similarities.

PageMaker and *Ventura Publisher* look much alike on screen. Obvious similarities include pull-down menus, on-screen fonts closely resembling the characters that will be printed, and display of bit-mapped graphics imported from other graphics programs. Both programs can display two-page spreads on a single screen, although small type must sometimes be *Greeked* (represented by jumbled or dummy text). The programs' basic page-layout concepts are also quite alike. For example, in both you first specify the page's physical dimensions, column widths, and column spacing (Screen 1 shows how *PageMaker* handles these specifications). Then, by choosing an item from a pull-down menu, you open previously prepared word processing documents or graphics image files for placement beginning at a particular spot on a



Screen 1: PageMaker's setting sheet enables you to specify the physical dimensions of a page.

page. Regardless of the margins in the original document, the programs fill in the text between the column guides established according to that page's specifications.

High Road, Low Road

Beneath the superficial likenesses of these two programs lurk substantial differences in conceptual design and approach. *PageMaker*, adhering to the design of its original Macintosh version, is much truer to the on-screen metaphor of the layout artist's work environment. The PC version will incorporate the improvements and added features of *PageMaker 2.0* for the Macintosh, including automatic hyphenation and kerning (see "Typesetting Point by Point" in this issue). Just as the layout artist applies text typescript and graphics photostats to pasteup boards, with *PageMaker* you can work with text and graphics on a simulated pasteup board (see Screen 2.) A scrap area on either side of the active page lets you temporarily store pictures and text blocks while you work with other elements.

A layout artist will also appreciate *PageMaker*'s prowess in electronically cutting and pasting galleys (strips of typeset text)—a method far superior to the manual one. *PageMaker* treats a word processed document like one continuous galley ready to "flow" into columns of any width. To begin "pasting up" a document, you move the cursor to an appropriate starting place. Snap-to guides assure that the left margin of the text about to be placed on the page will be exactly flush with the left edge of the previously set column. A click of the mouse button fills the column with text; a plus sign at the bottom of the column indicates that more text is waiting to be filled into other columns. With the pointer, you "pick up" the remaining text and place it wherever you want to, be it in the next column or several pages deeper into the document. If you later decide to add a figure or change the location of the starting point in the column, *PageMaker* will readjust the text of that article throughout the document to fit the new layout. A *PageMaker* document is limited to a maximum of 999 pages.

Just as the layout artist applies text typescript and graphics photostats to pasteup boards, with PageMaker *you can work with text and graphics on a simulated pasteup board.*

Ventura Publisher conceals the pasteup-board metaphor, instead supplying a slightly more automated environment for flowing text into a page makeup document. For instance, when you place the beginning of a word processed document on a page, the program automatically flows the entire document across as many pages as the article requires. Thus, the length (in pages) of a *Ventura Publisher* document changes dynamically to accommodate the textual material; the program creates up to 100 pages in a PC equipped with 640K. Pasting up a second article in the same document, however, requires more manual manipulation than laying out a single article. You proceed page by page, placing the boundaries for each article, selecting the text file from the menu, and watching the next section of text flow into the container. *Ventura Publisher* then remembers the container and the text connections you establish so that it can automatically reformat text after inserts or deletions.

Ventura Publisher incorporates graphics more adroitly than its Aldus counterpart (see Screen 3). When you draw an area to contain an imported

graphics image, *Ventura Publisher* automatically reformats the text around the graphic block. In *PageMaker*, you must first pull up the text in a column (like pulling up a window shade), change the column guide, and then drag the bottom of the column back down so that the program can reflow text into the narrower column.

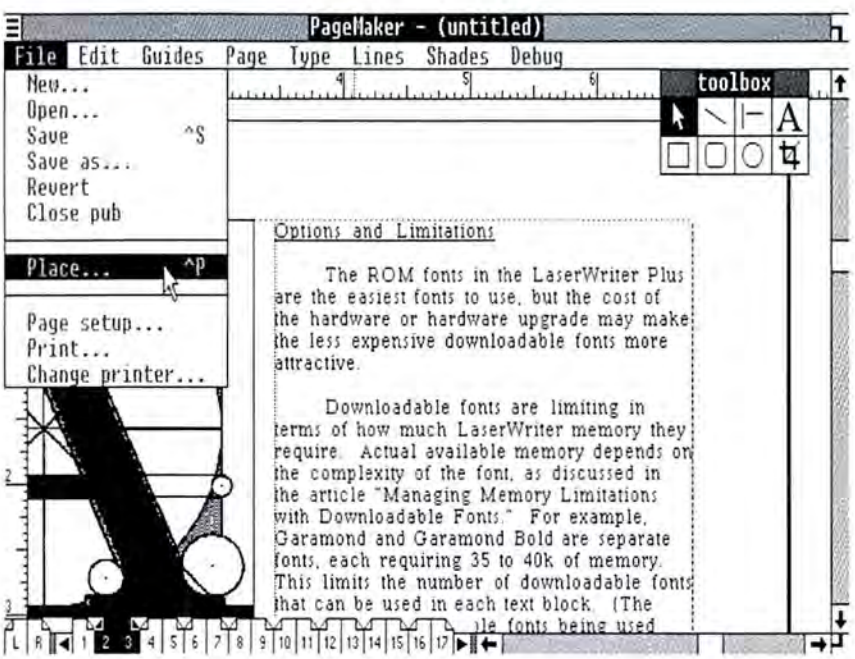
As you might expect, *PageMaker* easily imports graphics created with *Windows Paint* or Micrografx's *Draw; Ventura Publisher* incorporates graphics from *GEM Paint, Draw, Graph,* or *WordChart. Ventura Publisher* works with text in ASCII, *WordStar, MultiMate,* or *Microsoft Word* format; at press time *PageMaker* accepted only *Microsoft Word, Windows Write,* and ASCII documents, but Aldus stated its intention to support the most popular word processing programs with the initial release of *PageMaker.*

File Styles

The two programs differ significantly in their methods of storing documents on disk. *PageMaker* assembles files of text and graphics information that will eventually be sent to the printer (high-resolution graphics images from optical scanners remain in a separate, linked file). Thus, *PageMaker* documents are often larger than the original word processing files, but not large enough to be unwieldy on a hard disk. A typical text-only page occupies roughly 5 to 10K of disk space (depending on the content of the page).

Editorial changes made within *PageMaker* are stored only in the *PageMaker* document; the original document is left untouched. *Ventura Publisher,* on the other hand, creates files that hold only page-formatting information and "pointers" to the text and graphics files created with other programs. The text and graphics files are thus dynamically linked to the *Ventura Publisher* document—if you edit a text document while in *Ventura Publisher,* the change is saved in the original file. The relative merits of either method are debatable.

The ability to send files to remote typesetters is related to file composition. Sending *Ventura Publisher* page layouts to a typesetting service (presumably one with PostScript-equipped phototypesetters—see "Personal Publishing in Black and White" in this issue) is riskier because you must make sure that all component files are telecommunicated or delivered on disk. *PageMaker*'s one-file-per-document system reduces the likelihood of confusion. Consider your requirements for data integrity and convenience before choosing either program.



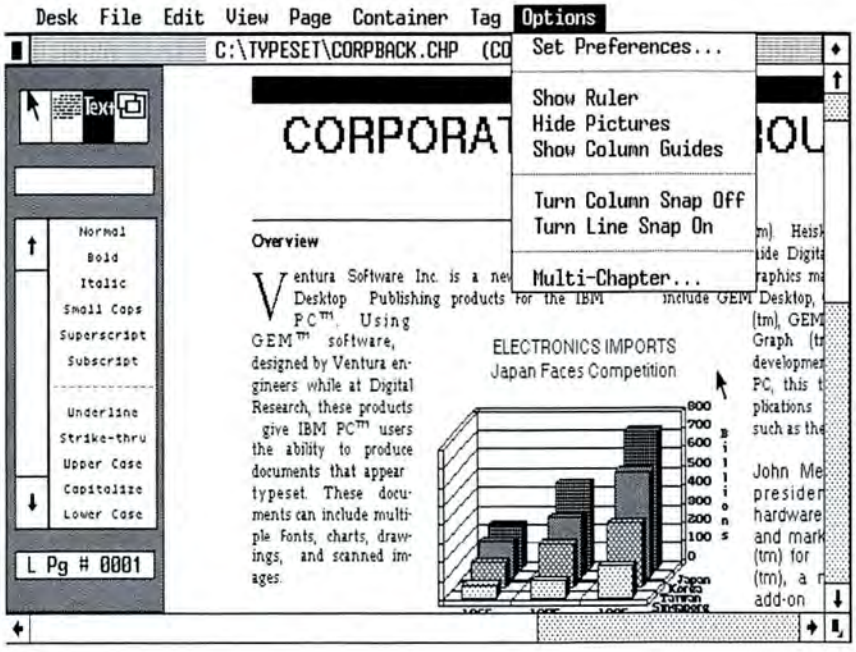
Screen 2: PageMaker uses the pasteup-board metaphor to facilitate page design and layout.

Style Sheets and Other Differences

Ventura Publisher features a built-in style sheet capability, which simplifies the formatting of various textual elements—subheadings, chapter titles, article titles, bulleted copy, and so on. For example, once you establish style specifications for an instruction manual, you simply assign a subhead style element to each subhead on screen. Later, if you decide that subheads should be 14-point text instead of 16-point, you change the subhead font specification on the style sheet. Immediately, all subheads throughout the document change to the new size. Aldus plans to offer "templates"—its version of style sheets—in a future release of *PageMaker.*

Despite their similarities, *PageMaker* and *Ventura Publisher* seem suited for entirely different document environments. By virtue of its pasteup-board metaphor, *PageMaker* provides excellent control over multiple elements within tricky layouts—newsletters, sales brochures, annual reports, and documents whose text spans several successive pages. By contrast, *Ventura Publisher*'s speedy reformatting and extensive support for table of contents creation, index

The Mac's hardware and operating system software seem to have anticipated the requirements of personal computer publishing.



Screen 3: Ventura Publisher reformats text around a graphics block.

generation, and section numbering make it well suited for long, single-article documents such as technical manuals and book chapters. *Ventura Publisher*'s style sheets and automatic flowing of text also ensure consistency throughout lengthy documents.

Over the Hardware Hurdles

Although personal computer publishing is not a trivial programming feat on any system, several critical technical issues make designing such software for the Macintosh relatively easy. The Mac's hardware and operating system software seem to have anticipated the requirements of personal computer publishing. For instance, the Mac screen displays text in a vertical resolution of 72 dots per inch (dpi). Consequently, text and leading (spacing between lines) display accurately according to standard typesetting point size (1 point equals 1/72 of an inch). On the Mac screen, therefore, a 12-point font is displayed within a vertical range of 12 picture elements (pixels) on the screen. As long as the specified font size is an integer (such as 12, 13, 14), the Macintosh accurately depicts leading and the vertical height of characters. At any other video resolution, character heights might require scaling to fit to the nearest pixel. But because the Mac is a one-monitor computer, a programmer doesn't have to split hairs to accommodate monitors with different resolutions.

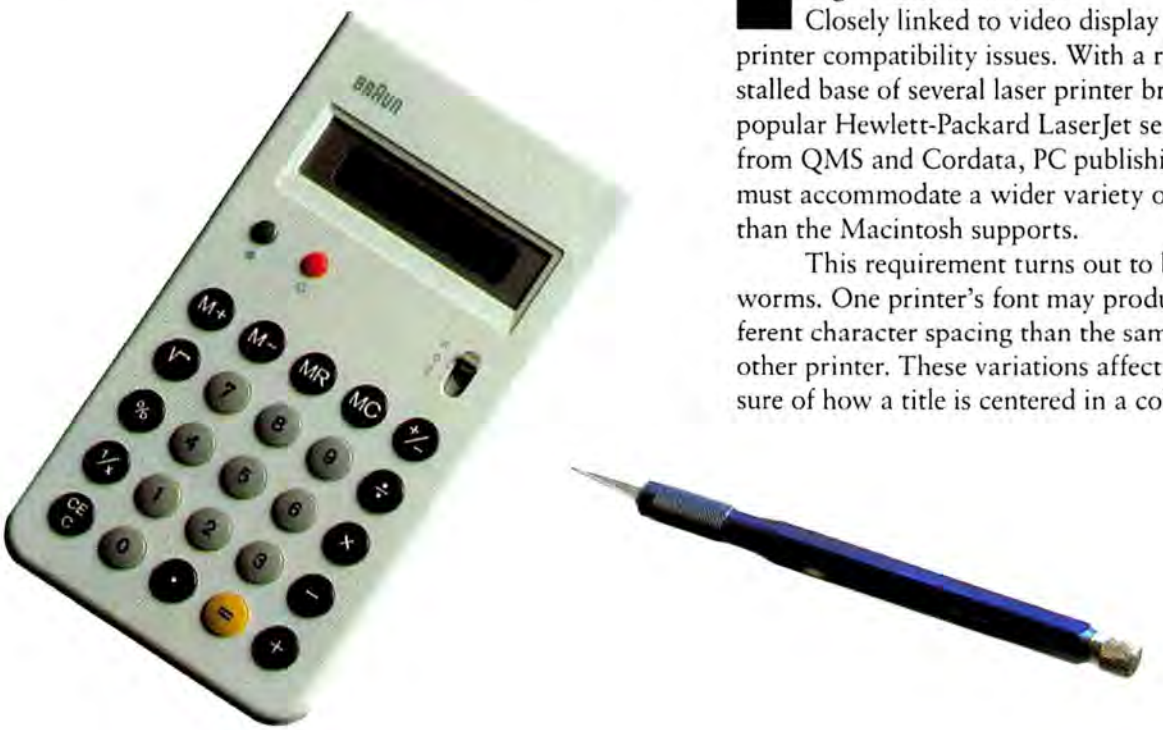
The situation is quite different on the IBM side of the personal computer publishing fence, however. Potential problems abound for the programmer who strives to make the program work with a variety of video display devices and printers. In many ways, page makeup software is asking this hardware to perform a task for which it wasn't originally designed.

Traditional measures of video resolution prove inadequate when the software design goal is the most accurate possible on-screen representation of printed output. Various display adapters and monitors produce different numbers of pixels per inch. Therefore, PC publishing program designers prefer to think in terms of the actual number of dots per vertical inch that a particular display device offers. At the low end of the IBM bit-mapped display scale is the IBM Color Display, which paints approximately 28 dpi vertically. The IBM Enhanced Color Display, driven by the Enhanced Graphics Adapter (EGA), measures 52 dpi, while the EGA-driven IBM Monochrome Display comes in at a respectable 64 dpi. Surprisingly, the combination of the Hercules Graphics Card and the IBM Monochrome Display offers 72 dpi. The Hercules aspect ratio (horizontal-to-vertical relationship) of 1.5 to 1, however, makes images look a bit wider than the 1.1 to 1 or 1.2 to 1 ratios of some display adapters.

Page Printer Problems

Closely linked to video display concerns are printer compatibility issues. With a relatively large installed base of several laser printer brands, such as the popular Hewlett-Packard LaserJet series and printers from QMS and Cordata, PC publishing designers must accommodate a wider variety of output devices than the Macintosh supports.

This requirement turns out to be a can of worms. One printer's font may produce slightly different character spacing than the same font on another printer. These variations affect the precise measure of how a title is centered in a column or how a



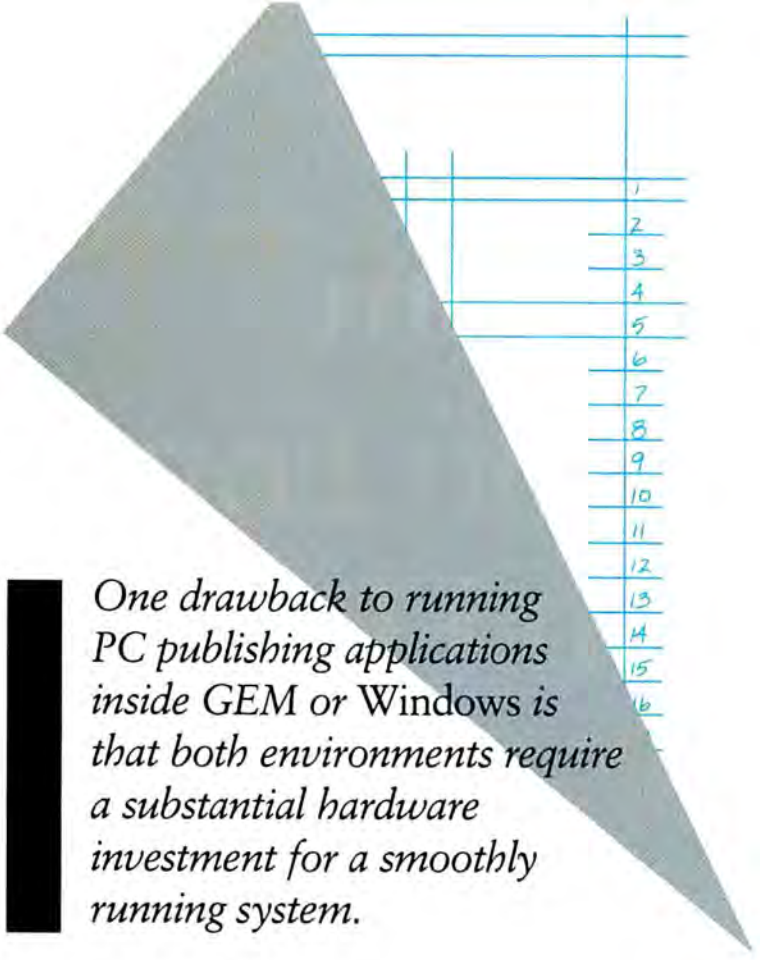
line fills out to the desired margins. For the page makeup software to accurately display on screen what the printer will produce, the program must customize the on-screen page layout for a particular printer's font characteristics. In other words, for the most accurate screen representation of printed output, screen fonts must be designed, or "tuned," for the specific printer in use. If they aren't, you might end up with a printed page that differs markedly from its on-screen draft.

Environmental Impact

Programming environments such as GEM and *Windows* handle many printer and display device parameters automatically. If you specify a 16-point font in a GEM application, for example, GEM scales down the next larger tuned size (18 point) to display a 16-point character height as accurately as possible. But *Windows* balks when you specify an odd multiple of a tuned font on file. Instead, it displays loosely spaced text in the next smaller tuned font on file. The page makeup program must then calculate the proper intercharacter and interword spacing of a true font in the size you wish to print.

One drawback to running PC publishing applications inside GEM or *Windows* is that both environments require a substantial hardware investment for a smoothly running system. Operation on any 8088-based PC means sluggish performance—acceptable speed demands an 80286-based computer. And due to the size of the environments themselves, a minimum of 512K is recommended. Furthermore, to even approach an accurate display of printed documents, a Hercules or an EGA graphics board is recommended. (*Ventura Publisher* will run on an IBM Color/Graphics Adapter or the equivalent, but it is not recommended.) The environments also require a hard disk for efficient operation. Finally, be prepared to add a mouse to your PC publishing workstation. Laying out text blocks, graphics blocks, and design elements on a page is a visually oriented operation; the mouse speeds and simplifies adjustments.

Fortunately, pioneering program developers Aldus Corporation and Ventura Software have met the technical challenges discussed here. The PC's open architecture promises to inspire a wider range of high-resolution monitors and page printers—in short, a robust environment for personal computer publishing. *PageMaker* and *Ventura Publisher* have proven the PC's publishing's viability; end users' imaginations will surely prove its usefulness and find ways to expand its applications. ●



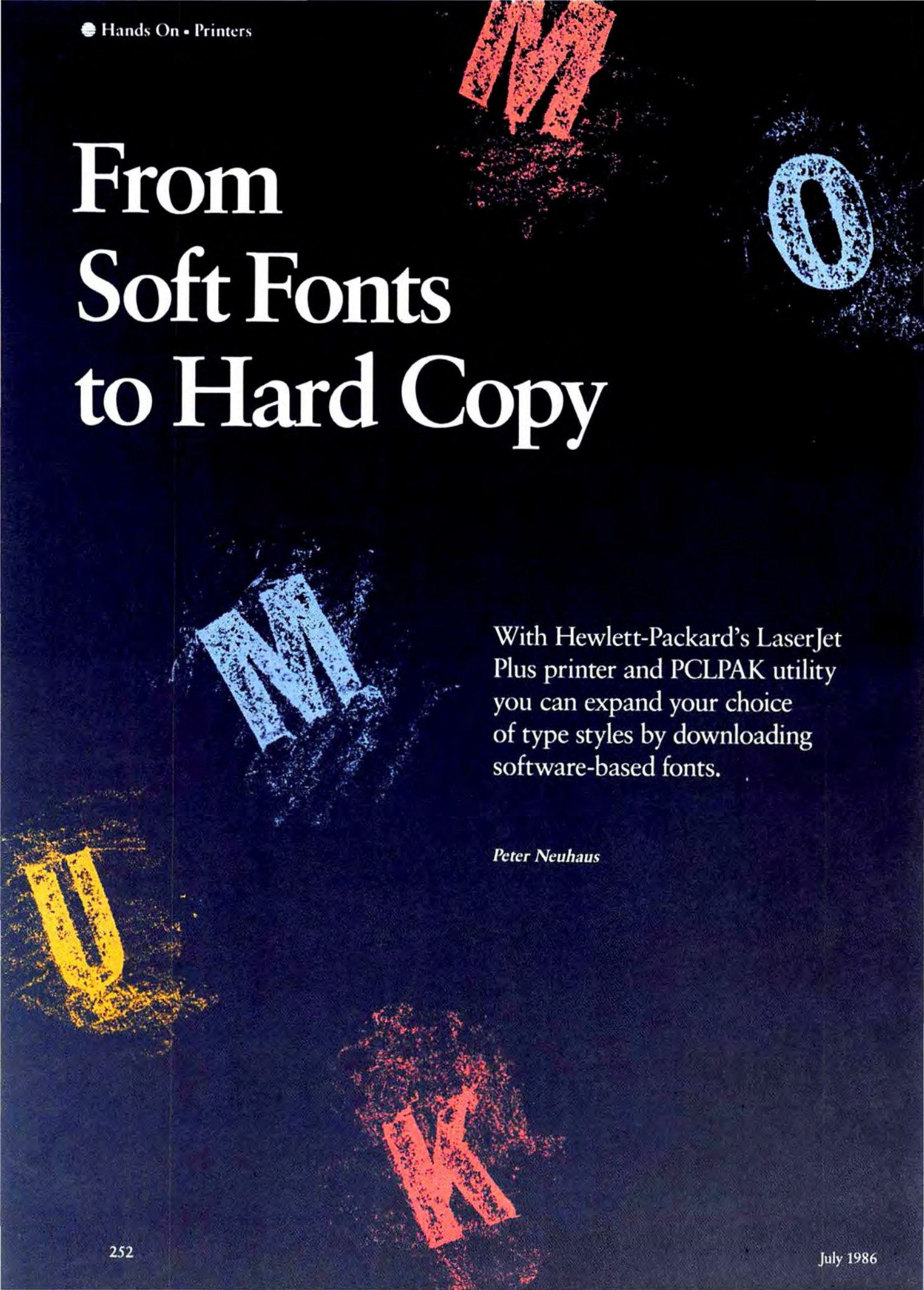
One drawback to running PC publishing applications inside GEM or Windows *is that both environments require a substantial hardware investment for a smoothly running system.*

Danny Goodman is a Contributing Editor for PC World *and* Macworld.

PageMaker
Aldus Corp.
411 First Ave. S #200
Seattle, WA 98104
206/622-5500

Ventura Publisher
Ventura Software, Inc.
675 Jarvis Dr., Ste. C
Morgan Hill, CA 95037
408/779-5000

From Soft Fonts to Hard Copy



With Hewlett-Packard's LaserJet Plus printer and PCLPAK utility you can expand your choice of type styles by downloading software-based fonts.

Peter Neuhaus

When Hewlett-Packard introduced the LaserJet printer, the field of publishing expanded to include average PC users. These users quickly absorbed the new technology, identified its limitations, and demanded even greater capabilities.

In particular, they noted the inability to set many different fonts on a page and complained about the scarcity and limited flexibility of font styles. HP's newest laser printer, the LaserJet Plus, has emancipated itself from many of its predecessor's restrictions (see "Son of LaserJet," *PCW*, February 1986). The Plus's ability to print disk-based fonts that are downloaded from a PC—also called soft fonts—goes a long way toward making the LaserJet Plus a viable personal computer publishing machine.

This article supplies step-by-step instructions on using PCLPAK, a utility included with HP's *LaserJet Plus Printer Soft Font*, to create an environment in which these fonts can be accessed by a word processor, specifically *Microsoft Word*. It is assumed that your LaserJet Plus is already properly configured and operational and that you are familiar with its basic operation.

The Fonts of Life

Before the LaserJet Plus can print characters on paper, it must have dot-by-dot descriptions of those characters, which are collected in files called fonts. Such fonts take three forms: internal fonts, permanently stored in the LaserJet's ROM; optional plug-in ROM font cartridges; and soft fonts downloaded from the PC, which reside temporarily in the printer's internal RAM.

Each type of font has advantages and disadvantages. Internal fonts don't occupy any of the LaserJet's internal RAM and are easy to use—just establish

Donna Sharee

Table 1: Each font possesses a variety of characteristics, the most dramatic being its height, or point size.

Characteristic	Definition	Example
Orientation	How the character is placed relative to the page	Portrait, landscape
Symbol set	The type of characters in the font	ASCII, Roman 8
Spacing type	The method of spacing between characters	Fixed, proportional
Pitch	The number of characters per horizontal inch	10, 12
Height	The general size of the character given in points (72nds of an inch)	12 point
Style	A modification of the normal font	Upright, italic
Stroke weight	The density of the characters	Light, medium, bold
Typeface	The name, sometimes copyrighted, describing the overall appearance of the font	Courier, Helvetica, Times Roman

communications with the PC and you're ready to start printing. The price of this simplicity is that you are limited to two basic typefaces, both of which are upright, medium weight with fixed spacing: Courier 10 pitch, 12 point (portrait and landscape) and Line Printer 16.66 pitch, 8.5 point. The term *portrait* refers to pages printed in a normal orientation; *landscape* denotes pages printed sideways.

To expand the range of choices, HP offers additional fonts in the form of plug-in cartridges, each containing variations on one or two typefaces. You can choose from 20 cartridges, but a single cartridge costs $225 to $400, a sizable investment if you want a full library of fonts. Furthermore, because you cannot change cartridges without turning the printer off, you are restricted to a limited number of fonts within a single document.

The third source of fonts, soft fonts, appeared on the scene with the release of the LaserJet Plus. The printer's ability to store multiple fonts eliminated one of the most severe restrictions imposed by the original LaserJet. Soft fonts are also a bargain—$250 buys two major typefaces (Helvetica and Times Roman) in 9 fonts each. If you count the landscape variations, you get a total of 36 fonts. The same fonts in cartridge form cost more than $1000. Unlike cartridge fonts, which are limited to a point size of 14.4, soft fonts can also produce 18- and 24-point characters. Furthermore, HP guarantees its cartridges for only 500 insertions each, whereas disk-based fonts are practically immortal. Soft fonts are not without their drawbacks, however; loading them into the printer's internal memory takes time, and they consume printer memory space that could otherwise be used for text, graphics, or forms overlays.

The Great Escape

On the original LaserJet, accessing a particular font was a roundabout process. The user specified some or all of the attributes shown in Table 1, and the printer selected from the current internal and cartridge fonts the font that most closely matched those attributes. The attributes were specified by a string of characters that began with the Escape character (ASCII 27). For example, to choose a single font you would have had to send the following cumbersome escape sequences to the printer: ESC&l1O ESC(8U ESC(s0p16.66h8.5v0s0b0T.

This indirect method of specifying a font resulted from the HP standard known as Printer Control Language, or PCL. Besides the clumsiness of the required escape sequences, their length sometimes exceeded the limitations of popular word processors, which were used to embed them in text files.

With the LaserJet Plus, HP has provided a much simpler method for selecting fonts. Now, each downloaded or cartridge font can be assigned a font

ID number that can later be referenced by a much simpler escape sequence. For example, to select the font previously assigned font ID number 123, you would send the sequence ESC(123X to the printer. If your word processor has a printer driver that supports downloaded fonts, you might be able to simply choose the font attributes from a menu or give a two-keystroke macro command.

PCLPAK Preliminaries

To take advantage of the power of soft fonts, you must first transfer them from disk to the LaserJet's internal RAM. To eliminate the need for users to write their own downloading programs, HP includes its PCLPAK utility with the soft fonts. This menu-driven program accepts page layout and font specifications from the user and converts them to the correct commands. You can send these commands directly to the LaserJet Plus or to a disk file that can be copied to the printer later.

In this example, you will use PCLPAK to create a disk file containing the font descriptions necessary to print out the final copy in Figure 1. After the files are downloaded to the LaserJet Plus, you will be able to access them with a word processing program, in this case *Microsoft Word*. Figure 2 shows a conceptual diagram of the process.

Before you begin, make sure you have purchased the right symbol set–either ASCII, which provides standard characters and numerals, or the larger Roman 8, which contains foreign character and math symbols. Some word processors like *Microsoft Word* support only the ASCII symbol set.

The user guide that comes with PCLPAK contains detailed installation instructions. Essentially, you copy the program files and the soft fonts you want to use into a hard disk directory called

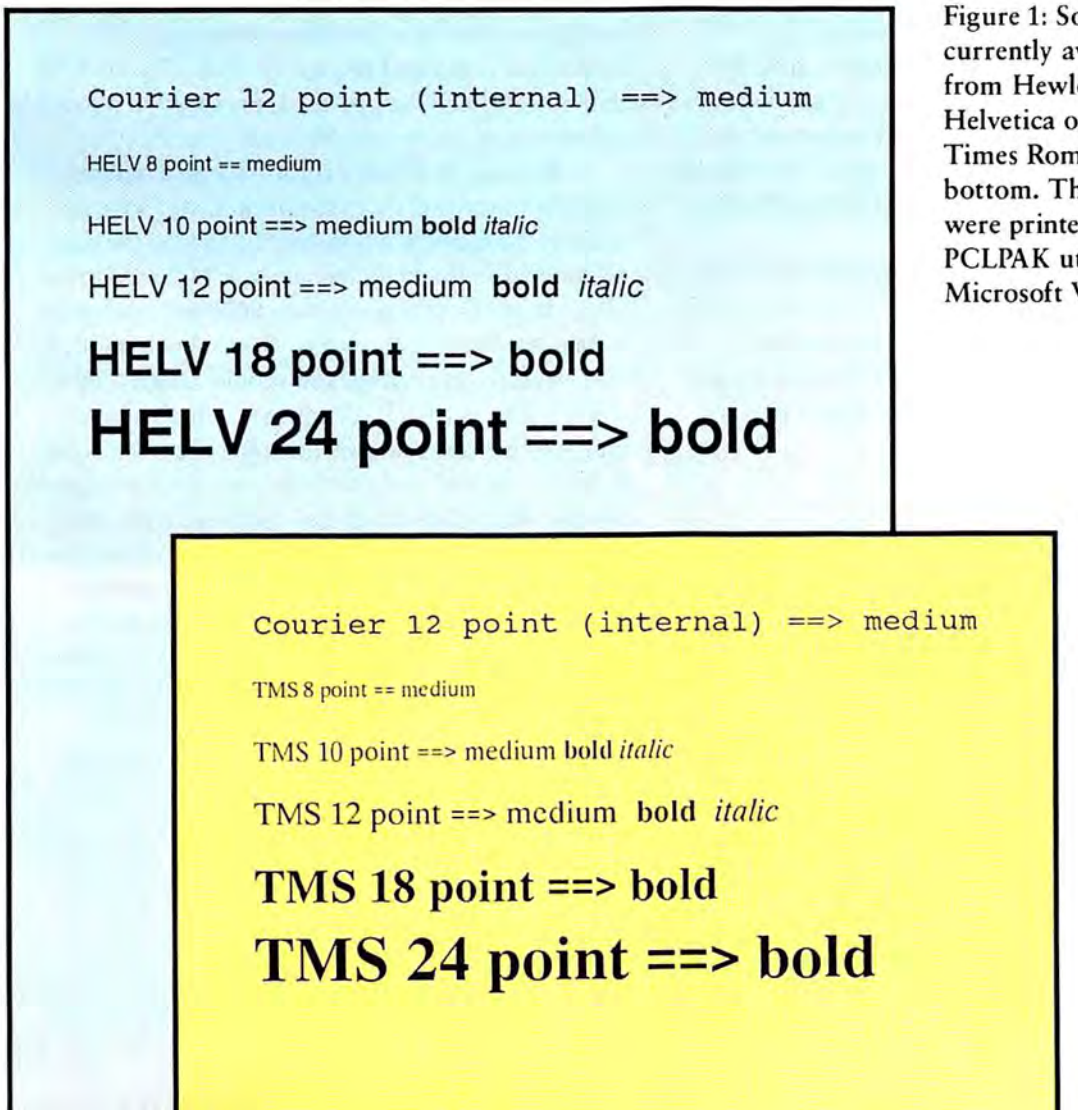


Figure 1: Soft fonts currently available from Hewlett-Packard: Helvetica on top, Times Roman on the bottom. These documents were printed using the PCLPAK utility with Microsoft Word.

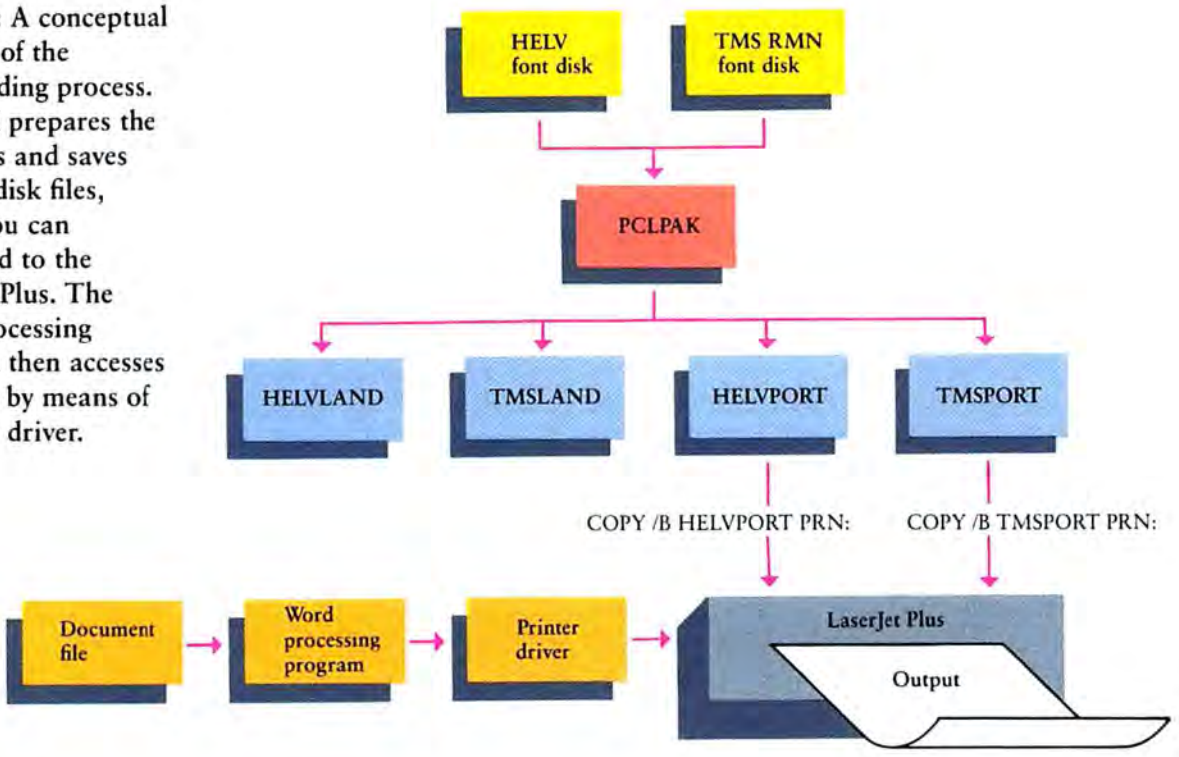


Figure 2: A conceptual diagram of the downloading process. PCLPAK prepares the soft fonts and saves them in disk files, which you can download to the LaserJet Plus. The word processing program then accesses the fonts by means of a printer driver.

\PCLFILES. If you have a floppy system, place PCLPAK in drive A: and the soft fonts in drive B:. Before proceeding with PCLPAK, it is a good idea to print a directory listing of all the file names on the font file disks. You can use this listing to check the accuracy of the file names that you will enter into the PCLPAK menus.

To load the program and call the Printer Selection menu, type **PCLPAK**. After you choose the LaserJet Plus, the main menu appears. The order of the remaining steps is critical. If you make a mistake, exit PCLPAK and start over—there is no way to remove commands from the output file.

Assigning Fonts

Currently two soft fonts are available from HP: a Helvetica-like font named HELV and a Times Roman-like font named TMS RMN (see Figure 1). We'll use both fonts. The next step is to create a file named HELVPORT, which will contain the soft fonts for the HELV font set in portrait mode. This file is fairly large—around 150K—so you'll be able to store only two such files on a floppy disk.

You can also send the fonts directly to the printer, but if the printing process takes more than one session or you want to reuse a particular font set, saving the fonts in a file makes more sense. You can even add a command to your AUTOEXEC.BAT file that automatically copies the fonts saved in a font file to the printer every time you start your PC.

Because PCLPAK expects that you will download the fonts directly to the printer, you have to redirect the fonts to a disk file. To change the destination from the main menu, enter **M** (for Manage Files), **D** (for Destination), then **HELVPORT**, and press **< Enter >**. Pressing **Q** returns you to the main menu.

Before continuing, you should assign a number to each font in the HELV font set. Since there are nine files for portrait fonts, number them 1 through 9. Notice that all portrait fonts have the file name extension .SFP, while landscape fonts use .SFL. Although assigning font IDs is optional, it allows easier access to the fonts from some word processors.

To assign the font IDs, press **F** to go to the Fonts menu and **D** to move to the Download menu. To give the first font an ID, press **I**, then **1**, and then **< Enter >**. Now press **F** (for Filename) followed by the name of the first font file name, in this case **HV08R#US.SFP**. Press <**Enter**> and then **G** (for Go) to send the font to the disk file.

You can find the font names on the Font File Sheet that comes with the soft fonts or in the file directory listing that you printed previously. If you made a mistake while entering a font ID or file name, you can correct it before issuing the Go command. Just use the I and F commands again. Once you select Go, the font becomes part of the output file and cannot be removed.

Repeat the sequence of assigning a font ID number, followed by the corresponding font file name, and issue the Go command for the rest of the font files. The first six files to be stored in HELVPORT are shown in Screen 1. The three not shown are HV12I#US.SFP, HV18B#US.SFP, and HV24B#US.SFP.

As you download each font file, it is added to the list displayed under the Current Font Status heading. You may notice in Screen 1 that PCLPAK has tagged the first font Primary, the second as Secondary, and the remainder Not Selected. For this application, these labels have no bearing—all the fonts chosen, even those marked Not Selected, will be available for printing. You may also notice that under Current Settings, the fonts are listed as Permanent. This status protects them from being removed if you reset the LaserJet Plus with either an escape sequence or a front panel control.

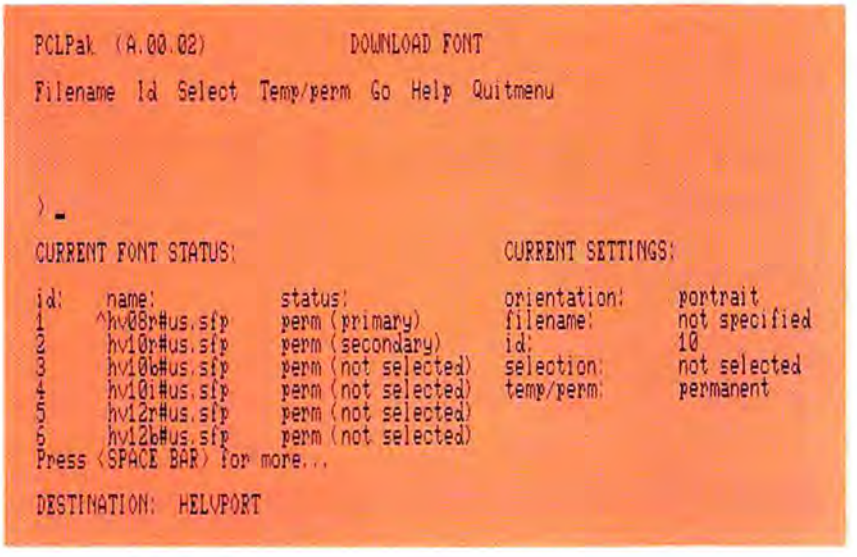
Although the LaserJet Plus has approximately 390K of user memory available, it is easy to waste this space with unused fonts. Therefore, if you won't need certain fonts, simply omit them from the procedure. Don't renumber the fonts; use the font IDs that you originally assigned. This method avoids overlaying a downloaded font with a different font that uses the same ID number, and makes font management and font references within your documents less confusing. When you're done selecting fonts, press **Q** three times and then **Y** to exit PCLPAK.

Downloading the Fonts

You are now ready to transfer the soft fonts to the LaserJet Plus in preparation for printing them with a word processor. From the DOS prompt in the \PCLFILES subdirectory, type **COPY /B HELVPORT PRN:** and press **< Enter >**. The /B option specifies a binary copy, which ignores any special characters within the file that might terminate the transfer. While the transfer is taking place, the Ready light on the printer will flash.

If you also want to use the TMS RMN font set, repeat the PCLPAK procedure just described, but assign the destination to a new file called TMSPORT. This time use font IDs 10 through 18 for the TMS RMN font files. Finally, copy TMSPORT to the printer using the same COPY /B command from the DOS prompt.

For every portrait font file there is a landscape font file on the supplied disk. If you want to use landscape mode, perhaps to print a spreadsheet or a wide transparency, create two files called HELVLAND and TMSLAND following the procedure described earlier. A couple of steps are different: You need to reassign the destination to HELVLAND for the Helvetica



Screen 1: PCLPAK's Download Font menu. To specify a font for downloading, you assign it an ID number, type in the file name, and select Go to send it either to the printer or to a disk file. Assigning font IDs is important if you have a word processor that requires you to insert the escape codes in the text.

files and TMSLAND for the Times Roman files, and instruct PCLPAK to set the fonts for landscape mode. To do the latter, press **P** to go to the Pagelayout menu, **O** to move to the Orientation menu, and **LLQQ** to select Landscape and return to the main menu. The rest of the process is the same as that used to create the HELVPORT file, except you replace the file name extensions .SFP with .SFL. Use font IDs 19 through 27 for the HELV landscape fonts, and 28 through 36 for the TMS RMN fonts.

The new files can be downloaded to the printer using the COPY /B command mentioned earlier. Note, however, that although the printer can store both the portrait and landscape fonts for either HELV or TMS RMN, the remaining user memory may not be sufficient to print a large document. Also, you can use only 16 fonts per page—fewer if you select the larger fonts, which take up more memory. Therefore, load only the specific font and orientation needed for a single application.

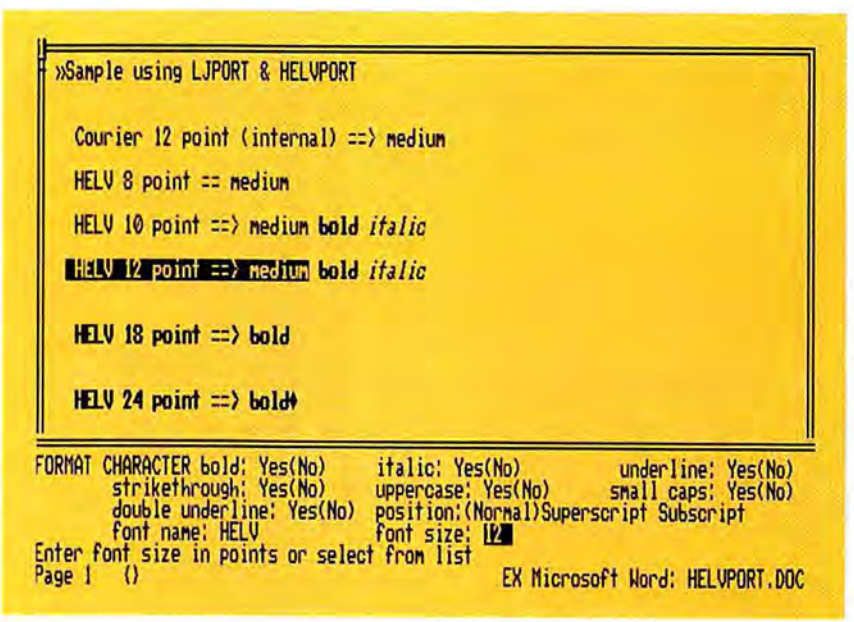
The Word Processor Connection

At press time only eight word processing programs provided printer drivers that specifically support soft fonts for the LaserJet Plus (see Table 2). You may be able to use downloaded fonts with other word processors, but with varying degrees of success. If you want to use another word processor, contact the vendor to find out how the program accesses soft fonts, and if possible, get someone to demonstrate how the fonts work.

Each word processor handles font selection escape sequences differently. Some, like Quicksoft's *PC-Write*, allow you to key them directly into the text by holding down the <Alt> key and typing 027 on the numeric keypad (to send the escape character) followed by the remaining characters that call a particular font. *PC-Write* and some other word processors can also be configured to insert the correct codes each time a given key or formatting code is selected. With a program that requires you to enter the escape sequence directly into the text, you would type <Alt>-<Ins>-<CursorDown>-<Home>(18X into the document to select the font assigned ID 18. To return to an internal font, such as Courier, you must send one of the lengthy escape sequences that uniquely identifies the desired font. Chapter 5 of the LaserJet Plus's *Operator's Reference Manual* lists these sequences.

Word processors such as *Microsoft Word* completely isolate the user from escape sequences. Fonts are simply selected or changed in a submenu of the Format Character menu, which lists the fonts associated with the active printer driver.

Currently, *Word* supplies two drivers for accessing HP's soft fonts. The first driver, HPDWNSFP-.PRD, is for both HELV and TMS RMN font sets in portrait orientation. The other, HPDWNSFL.PRD, is designed for printing the same fonts in landscape for-



Screen 2: Microsoft Word's Format Character menu. Word allows you to choose soft fonts from menus rather than having to insert escape codes in the text.

Table 2: Word processors with drivers that specifically support Hewlett-Packard soft fonts

Program Name	Version	Manufacturer
Microsoft Word	2.1	Microsoft Corporation
WordPerfect	4.1	Satellite Software International
WordStar 2000	2.0	MicroPro International
Proofwriter	2.28	Image Processing Systems
Palantir Word Processing	2.0	Palantir Software
Volkswriter 3	1.0	Lifetree Software
Spellbinder Scientific	6.0	Lexisoft Incorporated
Spellbinder Desktop Publisher	6.1	Lexisoft Incorporated

mat. Both drivers also allow access to the internal Courier fonts.

You specify one of these drivers when you install *Word* using the SETUP program. Thereafter, when you issue the Print Options command in *Word*, this driver appears in the list of available drivers. Since you can use only one driver at a time, you cannot mix landscape and portrait pages or soft and cartridge fonts within a document.

To begin formatting text in a particular font, first highlight the text. Press **< Esc >** to summon *Word*'s main menu, and then press **FC** to go to the Format Character menu (see Screen 2). Tab to the font name field, and press the **< CursorLeft >** key to display a list of fonts available with the active driver. Select the correct font with the cursor keys and press **< Enter >** ; then tab to the font size field and press the **< CursorLeft >** key to display a list of point sizes. Use the cursor keys to choose the correct size, and press **< Enter >** . Bold and italic versions of these fonts can be selected from this menu, or, while in text mode, via the <Alt>-B and <Alt>-I commands.

An alternate method for accessing the soft fonts in *Word* is to assign them as style sheet attributes in *Word*'s Glossary. The Glossary's menus are the same as the Format menus; the only difference is that you don't have to highlight the text or return to the menus each time you change a font format. All you do is type in the style attributes once; you subsequently access them by entering a short keystroke command in the text. With either method, you print the document as you would any other–except you'll see your LaserJet Plus produce as it never has before (see Figure 1).

Future Fonts

It's clear that cartridge fonts are on the way out and that disk-based fonts will soon be the method of choice for laser printer typography. Hewlett-Packard may offer supplementary fonts by the time you read this, and third-party vendors are already competing in the soft font arena, so you can expect to see lower prices and a wider range of fonts and type styles.

Soft fonts provide a flexible means of unleashing the power of your laser printer. Yet their very flexibility requires an organized approach to font management and use. By following a few simple procedures, you can add a whole new range of fonts to your printer's repertoire. ●

Peter Neuhaus is a freelance writer specializing in electronic publishing and the application of computers to graphics design.

LaserJet Plus Printer Soft Font
Hewlett-Packard
P.O. Box 3640
Sunnyvale, CA 94088
800/538-8787, 408/738-4133
List price: $250 (for Helvetica and Times Roman fonts shown in Figure 1 and PCLPAK downloading utility)
Requirements: 256K, two disk drives, DOS 2.00 or later version, LaserJet Plus printer

Painless Extraction

Is your company's mainframe computer a distant citadel, open only to the potentates of DP? If so, take heart. With Infogate and 1-2-3, you can have mainframe data your way without resorting to safecrackers.

Wayne Rash

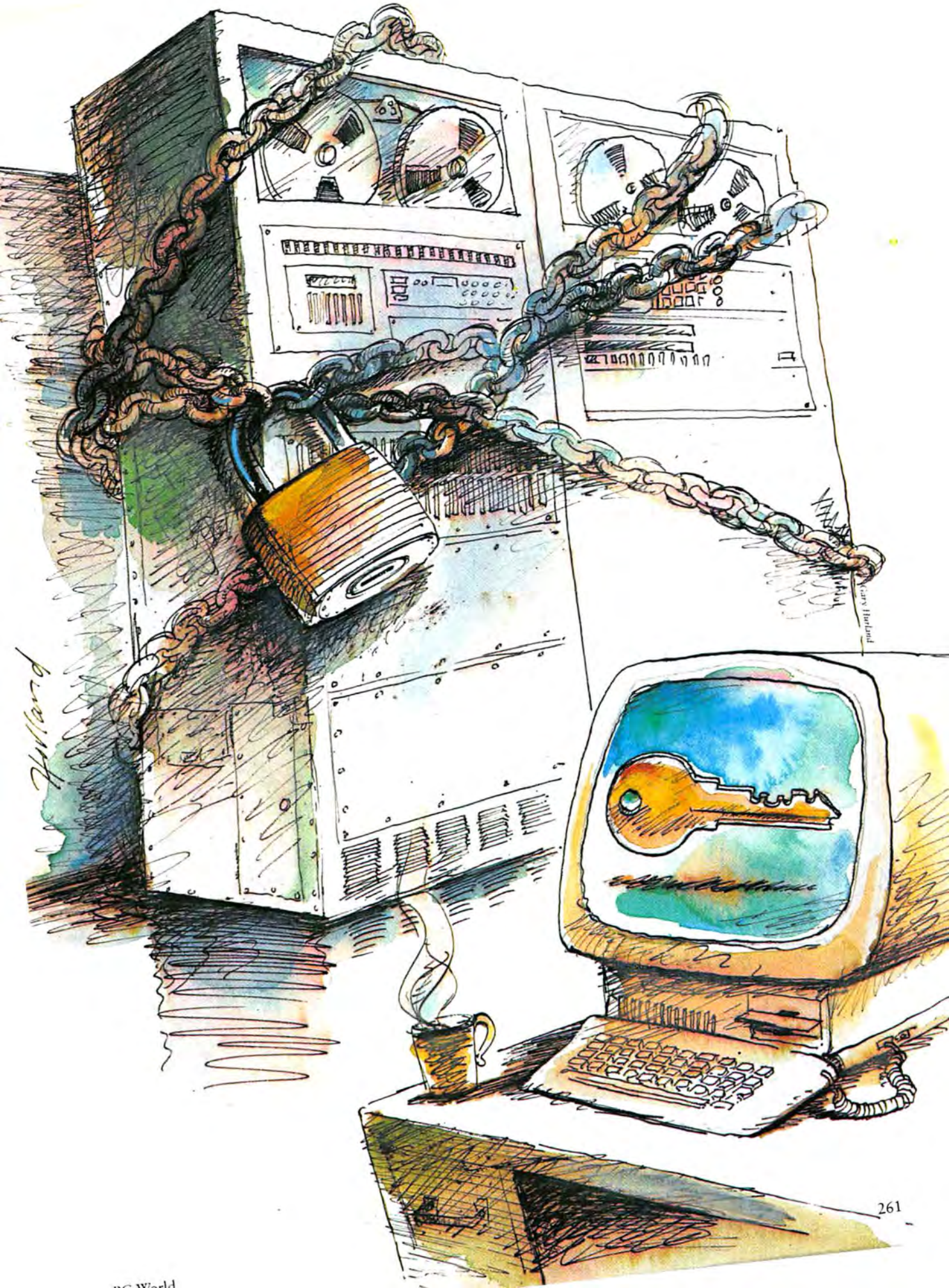
Ever since personal computers snuck onto corporate desk tops, business users have dreamed of tapping into their company's mainframe computer data. Such dreams weren't realized until relatively recently, partly because data processing (DP) managers who controlled mainframe resources resisted, and partly because mainframe software companies made no provisions for PC users. But the walls separating the mainframe and the PC are crumbling. Software and hardware vendors on either side are improving the micro-to-mainframe connection. Users at Fortune 500 companies, hospitals, and universities—and anyone else with a yen for mainframe data—can grab a piece of the action. Not surprisingly, DP departments are taking PCs a bit more seriously.

One PC program leading the charge is *Infogate* from Cullinet Software, a major provider of data management software for IBM mainframes and compatible systems. No expensive mainframe software companion to *Infogate* is necessary, and better still, a PC needn't be wired directly to the mainframe—though communications via 3270 emulator boards like the IRMA Fastlink are supported. As this article demonstrates, all you need is a modem, *Infogate,* and an amenable mainframe data base at the other end.

But *Infogate* is more than a fancy terminal emulator. With this jack of all systems, not only can you access mainframe data like a dedicated terminal user, you can capture (download) it, transfer it to *1-2-3* or another PC program for a rubdown, then return (upload) the altered data to the mainframe, all under the aegis of Cullinet's sophisticated file transfer protocol. *Infogate* communicates with nearly any computer and data manager, but when it finds Cullinet's IDMS/ICMS data management system at the other end of the line, it treats the mainframe like an extra PC disk drive.

Environmental Protection

Of course, mainframe data cannot be funneled directly into a *1-2-3* worksheet. *Infogate* acts as an intermediary, extracting mainframe data, translating it from native 8-bit EBCDIC into the equivalent 7-bit ASCII code, polishing it in the program's spreadsheetlike module, and finally passing it on to a PC application. Riding herd over the process is



easier than with most PC-to-mainframe arrangements because applications such as *1-2-3*, *dBASE*, and *Symphony* can be treated like *Infogate* program modules. In effect, *Infogate* works like an ersatz *Microsoft Windows*, simultaneously integrating mainframe and PC applications and thus easing the passage of data between the two.

Setting up and running an *Infogate*-to-mainframe session is not terribly taxing. *Infogate*'s *SuperKey*-like Teach function can record and play back all the cursor movements, program commands, and miscellaneous keystroke sequences that call various procedures. *Infogate*'s ability to control and automate a PC-to-mainframe session is considerable.

Whether you'll be allowed to tap this power depends largely on your company's policies. Many DP managers will rightly object to freewheeling PC users altering a central (and expensive) mainframe data base. At best, modified files will be transferred to a protected area in mainframe storage, where they will be examined, validated, and eventually stirred back into the mainframe data. Accordingly, this application focuses on forging and automating the PC-to-mainframe link with *Infogate*, bringing data to the PC and eventually to that ubiquitous data manipulator, *1-2-3*.

Tools of the Trade

Central to *Infogate*'s operation are program modules called Tools. The Information Manager, one of the most important Tools, gives the user entrée to Teach along with a number of DOS-like commands that delete and copy files, create subdirectories, open files, and run programs on both PCs and mainframes. The Profile Tool configures *Infogate* for your

```
Connection Name SYS24PC     IDB Connection Yes     Connection Type Hayes
Description
    TTY Connect to IDB with Hayes Smartmodem (Receive Timeout=600)

Autolog Procedure
    c:\logon

Port                  Com1              Break Length          35
Duplex                Half              Data Bits             7
Baud Rate             1200              Parity                Ignore
Receive Timeout       600               Stop Bits             1
Send Timeout          10                XON/XOFF              No
Emulation             TTY

Phone Number          1-111-555-1234
Dial                  Tone              Wait for Dial Tone    2
Touch Tone Timing     70                Wait for Carrier      30
Pause Time for Comma  2                 Recognize Carrier     6
Speaker Status        On Until Carrier  Carrier Loss to Hang Up 7

                                                  ready

To return to command menu, press <F9>
```

Screen 1: Getting to know you. Like a PC-Talk setting sheet, an Infogate connect definition file holds the communications parameters that make PC to mainframe chitchat possible.

system, Emulator handles communications, Translator converts data into mainframe or PC format, and Mail stores incoming files.

While extracting even a handful of mainframe data is no trivial task, applying the necessary Tools (and automating their execution) is well within the grasp of most PC users. If you use DOS subdirectories, are acquainted with communications software, and occasionally access commercial online services such as Dialog or Dow Jones, many of *Infogate*'s procedures will be familiar.

Often, using a PC and a mainframe together is faster and more convenient than using either alone. Consider the following situation: A corporation stores employee salary data on its mainframe. The manager of Department 200 wants to gather information on staff members hired before January 1, 1985, pour it into a *1-2-3* template, calculate bonuses against a budget, and insert the information back into the mainframe data base for the company's payroll department.

Without direct access to mainframe data, someone would have to print out the data, enter it into a *1-2-3* worksheet and manipulate it, print it out once more, and type it into the mainframe from a dedicated terminal. However, "what if" questions are often difficult to pose to a mainframe program—and mainframe equivalents of *1-2-3* are not inexpensive. Depending on the amount of data being processed, *1-2-3*, *Infogate*, and a mainframe working in tandem can do the job in a fraction of the time.

Screen 2: A typical mainframe logon sequence. At each step in the process, Infogate must wait for the mainframe prompt to appear before sending a request.

Logging On

Infogate can't reach out and touch someone without a Connect Definition file, which is not unlike a *PC-Talk* setting sheet or a *Crosstalk* configuration file (see Screen 1). However, there are a few differences. The Autologon Procedure statement specifies that in this case, the logon commands are found in the \logon subdirectory. The communications parameters that follow will seem familiar, though some settings—such as time-out and break-length—will require a call to the DP department.

To actually make the link that lets you access those tantalizing gigabytes of mainframe data, *Infogate* must log on to the system and plot its course through the mainframe's file structure. Again, your company's DP department will have to provide system and user specifics (acceptable transmission speeds, user account number, and so on) and offer advice on maneuvering through the data base.

You can automate the entire logon process by recording it the first time around with Teach. At start-up, you would select Teach from the Information Manager screen and name the logon sequence. Teach transcribes the action at the keyboard and stores it as a text file with the .!_H extension. Unfortunately, Teach can't record the mainframe's prompt—in this case, (/\)—or take time delays into account. As a result, you must record when and where the mainframe prompt appears in the sequence and note any time lags. Once you have recorded and stored the logon procedure, you would open the file with a word processor and insert the mainframe prompts. Indicate set time

delays with *wait* plus a value in seconds (such as *wait(,3)*), and delays that depend on the appearance of the mainframe prompt with *wait("?(/\)")*.

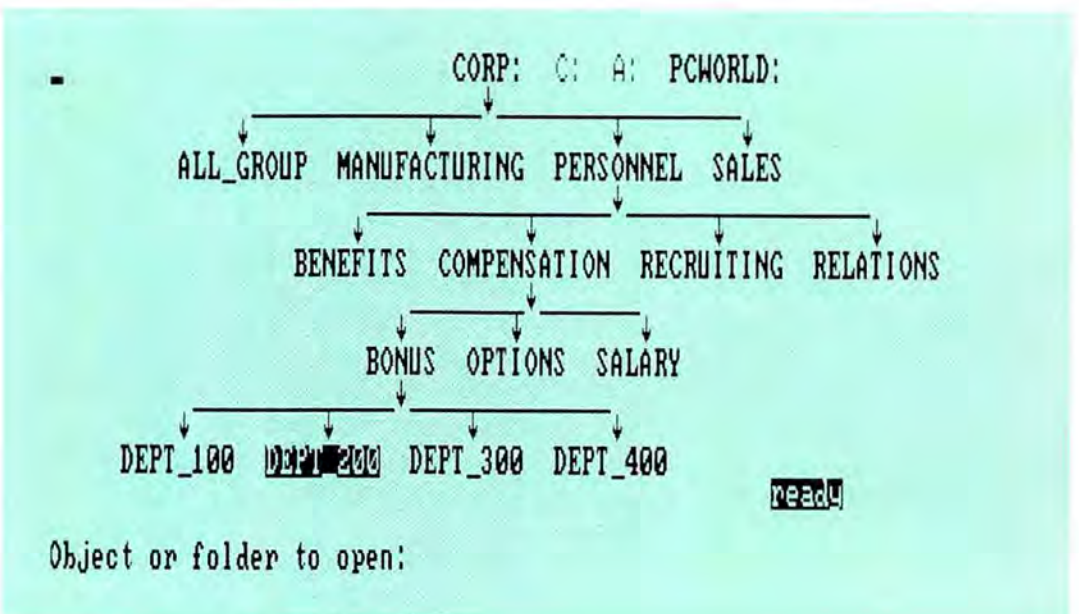
Screen 2 shows a typical logon sequence recorded by Teach with mainframe prompts and wait statements inserted with *WordStar*. Typing *input* tells the Emulator that the following entries should be transmitted to the mainframe. In this particular case, *Infogate* must wait 3 seconds before sending *I*, the command to run the IDMS/ICMS data management program. You hold *Infogate* with <Ctrl>-<Home> for 3 seconds, type **I**, and wait for the (/\) prompt. Throughout the logon process, you would type in a message or command, wait for the prompt to reappear, then type in the next entry. In sequence, you sign on to the mainframe (s pcw infogate), gain entrance by supplying the user name (pcw) and the password (infogate), and finally unlock the door to the assigned data base by typing in the magic phrase (asf2dci) and confirming the choice with **< Enter >**. To actually maneuver around the data base, you would exit the Emulator and press **< F9 >** to run the Information Manager.

Seek and Ye Shall Find

Before you can extract data, you naturally need to know its location. The path to enlightenment—and your data—starts in the DP department. With such guidance, chances are you won't get lost in a forest of subdirectories or accidently copy a mainframe file that dwarfs the storage capacity of your PC.

Thankfully, *Infogate*'s Information Manager simplifies the process of finding a file by graphically depicting directory relationships, much in the manner of *Xtree* and similar DOS shell programs (see Screen 3). You can slide down a directory path with the cursor keys, ferret out subsidiary directories, and elicit directory listings noting a file's name, size, type (IDB or DOS), and time and date of creation.

In this example, you moved from CORP: in the root directory, through the Personnel and Compensation subdirectories, to the BONUS subdirectory. A file directory listing (see Screen 4) shows that BONUS contains the sought-after file, DEPT_200. (You could



Screen 3: Navigating around a mainframe's directory is a matter of following the map laid out by Infogate's Information Manager.

also arrive at this point by supplying *Infogate* with the path statement
CORP:/PERSONNEL/
COMPENSATION/BONUS/.)
The salary data can now be captured and spirited away to the PC.

From Mainframe to PC

Keep in mind that you can't view the mainframe data until you download it to *Infogate*. You can't scroll through a relational mainframe data base file like a *1-2-3* worksheet, marking and cutting out desired blocks of data. Instead, you must coax the data out with conditional statements. Thus it's imperative that you have an idea of how the mainframe data is structured. Once again, avail yourself of the DP department's wisdom in this area.

Now that you know the path to the DEPT_200 file, exit the Information Manager and load the Translator Tool. The Translator displays a spreadsheetlike interface but is primarily a holding area for incoming mainframe data—you can't insert numbers or labels. (Both are supplied by the downloaded data.) Choose Open, type the path
CORP:/PERSONNEL/COMPENSATION /BONUS/.)
and answer **yes** to the mainframe's query. In my example, employees who started work before January 1, 1985, are eligible for bonuses. You would choose Select from the

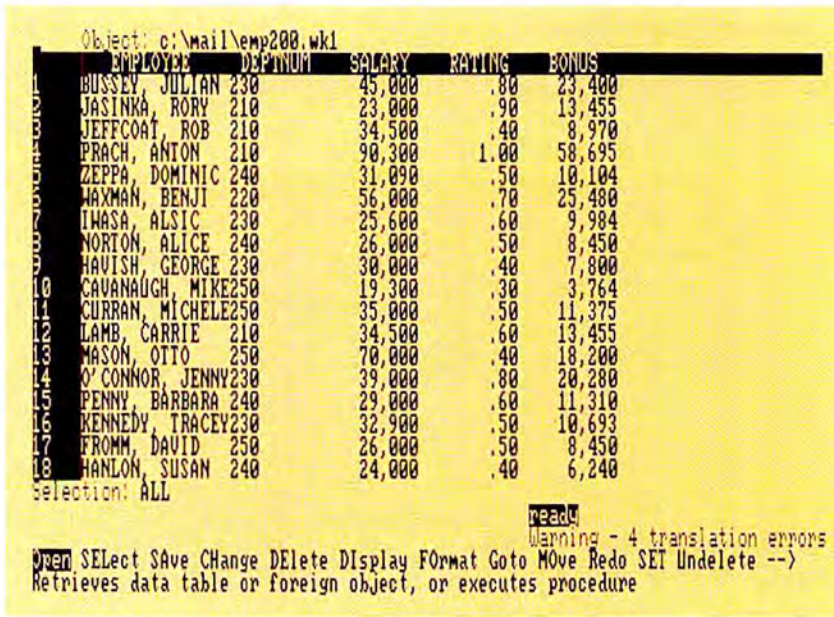
Screen 4: A quick directory listing reveals that the DEPT_200 file is held in the BONUS subdirectory.

```
Contents of -- CORP:\PERSONNEL\COMPENSATION\BONUS
5 Entries                                                          length
   BONUS                          data-table    2-07-86   10:30am      NA
      Data table of employee salaries and FY '86 bonuses
   DEPT_100                       folder        2-04-86    4:37pm
   DEPT_200                       folder        2-04-86    4:37pm
   DEPT_300                       folder        2-04-86    4:38pm
   DEPT_400                       folder        2-04-86    4:38pm

                                                ready

Object or folder to open:
```

Translator menu and type **select hire < "85/01/01"**, press **< Enter >**, and answer **yes** to the mainframe prompt. This directs the mainframe data management system to gather the pertinent data. To trigger the downloading process and the actual translation of data into a DOS-readable format, select Save from the Translator menu and specify a PC drive and path. Downloading is not particularly speedy; at 1200 bps our sample of 100 records took 20 minutes to make the journey.

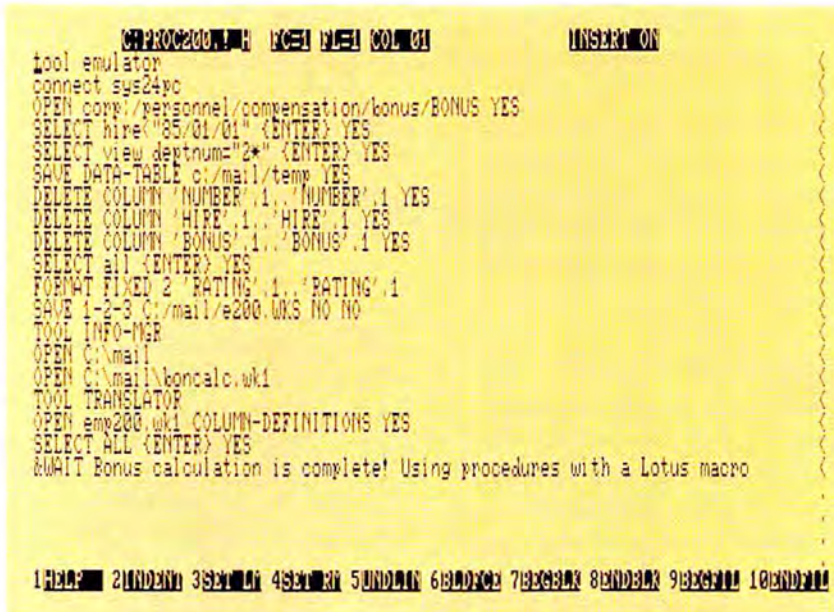
From PC to 1-2-3

Once *Infogate*'s sluggish downloading process grinds to a halt, the data is ready for sculpting. Using the Translator's Delete function, you can remove superfluous columns and rows by name (delete column 'number') or flick the cursor around in *1-2-3* fashion and shave off the dross. But the Translator is more than a data Skilsaw. With the Format command, numeric data can be recast in a flash. For example, values in the Rating column (see Screen 5) arrived in single digit form (1 for future star, .3 for corporate benchwarmer). Selecting Format and entering **fixed 2 'rating'** converts the data into two decimal places as shown. You could use the same procedure to translate whole dollar amounts into currency format.



Retrieves data table or foreign object, or executes procedure

Screen 5: Captured mainframe data is deposited in Infogate's spreadsheetlike holding area before moving on to a PC application. Here, columns and rows can be deleted, decimal places added, and data translated into a program-specific format.



Screen 6: Infogate's Teach function can record the keystrokes for finding, selecting, transferring, formatting, and passing data to 1-2-3 and play them back, effectively automating the PC-to-mainframe session.

With the data finally in presentable shape, select Save and enter **1-2-3 C:/MAIL/E200.WKS**. *Infogate* automatically creates a worksheet named E200.WKS, shoehorns the data in, and places the file in the MAIL subdirectory. To calculate employee bonuses, *1-2-3* must step to the fore. You could leave *Infogate* at this point and run *1-2-3*, but as we shall see, remaining in the *Infogate* environment has its advantages.

Exit the Translator, return to the Information Manager, log on to the MAIL subdirectory, and load BONCALC.WK1 (see Listing 1). Because *1-2-3* was installed as an *Infogate* Tool, it loads automatically whenever *Infogate* tries to open a worksheet. The \0 macro in BONCALC.WK1 loads E200-.WKS and asks you to enter the budget. From here, you can specify different assumptions for different salary ranges. For example, if you firmly believe that the rich should get richer, employees making over $70,000 might get a 50 percent bonus, while those making between $50,000 and $69,999, a mere 35 percent. Once you supply this information, the macro calculates all the bonuses and notes if you are over or under budget. Once you are happy with the result, the \d macro extracts the bonus values and drops them into a newly created worksheet, EMP200.WK1. Its job done, *1-2-3* returns control to *Infogate*. (Screen 6 shows a Teach recording of the session, from selecting the data to download to macro execution.)

```
\0        /fccee200.wks~
          {branch \b}

\b        {goto}b2~~{?}~
          {down}{?}~
          {down}{?}~
          {goto}f3~~{?}~
          {calc}
          {menubranch \c}


\c        Continue              Stop
          Enter next range      Extract and save data
          {branch \b}           {branch \d}

\d        {goto}A7~~
          /fxvemp200.wk1~
          {right}{right}{right}{right}
          {branch \e}


\e        {down}{IF @cellpointer("contents")}{branch \e}
          {branch \f}

\f        {up}~r~               /qy
\0        /fccee200.wks~
          {branch \b}

\b        {goto}b2~~{?}~
          {down}{?}~
          {down}{?}~
          {goto}f3~~{?}~
          {calc}
          {menubranch \c}


\c        Continue              Stop
          Enter next range      Extract and save data
          {branch \b}           {branch \d}

\d        {goto}A7~~
          /fxvemp200.wk1~
          {right}{right}{right}{right}
          {branch \e}


\e        {down}{IF @cellpointer("contents")}{branch \e}
          {branch \f}

\f        {up}~r~
          /qy
```

Listing 1: The bonus calculation macro, BONCALC

Teach Your Program Well

Since *Infogate* is still connected to the mainframe, you don't have to log on to shoot the bonus data back to the mainframe. You merely load the Information Manager, select the Copy command, and type

C:E200.WKS CORP:/PERSONNEL/COMPENSATION/BONUS/.)

In reality, you wouldn't directly update Dept_200 but would send the data to a separate holding file.

If nothing else, *Infogate* makes mainframe-to-PC data transfers palatable and practical. While you will have to shepherd a session through the first time, *Infogate*'s Teach function can handle the job solo after that. Once you've gotten the hang of *Infogate*, you'll never again meekly accept monthly printouts from the DP department—and you won't have to.

Wayne Rash is a freelance writer, a senior analyst with the American Management Systems of Arlington, Virginia, and a microcomputer and office automation consultant to the federal government.

Infogate
Cullinet Software, Inc.
400 Blue Hill Dr.
Westwood, MA 02090-2198
617/329-7700
List price: $300
Requirements: 384K, two disk drives, DOS 2.00 or later version, serial port and modem or 3270 emulation board, hard disk and color monitor recommended
Copy protected

CALL TOLL FREE 1-800-382-2242

NORTHEASTERN Software

7 Trap Falls Rd. Shelton, Connecticut 06484 (See Below)

WE WILL BEAT

- Tap our unmatched selection and inventory of software/hardware for the IBM PC and Commodore Amiga (as well as the Mac and Apple).
- School and corporate purchase orders are welcomed. CALL 1-800-874-1108.
- Special/rush orders. If something you need is not listed, hard to find, or needed in a hurry, CALL 1-800-874-1108.
- Order Status. CALL (203) 375-3860.
- Ask for System Sales when ordering a complete system.
- FREQUENT PURCHASER PROGRAM. Any repeat customer will automatically receive $1 off any order he or she places with us. Please mention to your operator that you are a repeat customer. We value your continuing business. Send in $1,000 worth of invoices (representing previous purchases) and you will receive a coupon worth 1% off any future purchase. With $5,000 worth of invoices, receive a coupon worth 5% off any future purchase.
- No additional charges for credit card orders.
- Convenient hours. 7 days/week: 9AM–11 PM EST.
- FREE AIR EXPRESS SHIPPING. Purchase $150 or more of software and for no additional charge we will ship your products by air courier. Mention this to your operator as you place your order.
- FURTHER DISCOUNTS BY MAIL. Circle the items in our ad you want, send the aid in with the coupon below and receive $ .50 off each item! Cut out a competitor's ad with a lower price and we will give you $1 off his price (subject to the conditions below).

Send coupon and list of items desired to:
DISCOUNT BY MAIL DEPARTMENT
Northeastern Software, 88 Ryders Lane, Stratford, CT 06497

To be eligible for the $1.00 per item discount you must:
1. Fill out all items. 2. Send in our ad with the items you desire circled.

Name_____

Address_____
(Include Company Name)

City_____ State_____ Zip_____

Phone No. at above address_____

Check form of payment
Visa MasterCard C.O.D. Personal Check
Certified Check Money Order

Card No._____ Exp. Date_____

Computer Model _____

Personal and company checks allow 3 weeks to clear. For faster delivery, send cashier's check, certified check, or money order. Shipping—Software ($3.00 minimum). Shipping—Hardware (please call 203-375-3860). COD—Add an addition $2.00. Alaska, Hawaii, Canada, PO, APO, and FPO $5.00 minumum. Foreign orders—$15.00 minimum and 15% of all orders over $100. Mastercard and Visa (please include card no. and expiration date). Connecticut residents add 7.5% sales tax. Prices subject to change without notice. All returns must have a return authorization number. Call 203-375-3860 to obtain one before returning goods for replacement. Defective merchandise replaced with same item only. We do not guarantee compatibility. All sales are final. "Comparable advertised price" does not include typographical errors on the part of other vendors or prices that do not reflect higher shipping costs, credit card charges, or membership fees. The $1 off offer only applies to items where Northeastern's price is not already the lowest. Final judgment remains with the manager on duty.

SPECIALS

ARCHIVE
60MB Cart Backup (Internal) 695.00
60MB Cart Backup (External) 750.00
AST Six Pack Plus 384K W/Sidekick 235.00
Centerpoint Copy II PC 17.50
IBM PC/XT/AT (All Configurations) .... CALL
NEC Multisync 520.00

ACCESSORIES

CURTIS
PC Pedestal II 29.00
Flip N File 50 ..... 11.00
KENSINGTON
Universal Printer Stand 15.00
KEYTRONICS
KB-5150 ..... 113.00
KB-5151 PC JR. 164.00
KB-5151 Deluxe Keyboard 164.00
KB-5153 Keyboard W/Touch Tabl .. 279.00
PERFECT DATA
Head Cleaning Kit 8.00

BLANK MEDIA

BASF DS/DD 11.50
Elephant DS/DD 13.00
Fuji DS/HD 27.00
Maxell DS/DD 16.00
Maxell DS/QD (For AT) 27.00
Verbatim DS/DD 16.75
Verbatim DS/HD 40.00
Sony DS/DD 13.00
Sony DS/QD 40.00

SURGE PROTECTORS

CURTIS
Diamond Surge Suppressor 24.00
Ruby Surge Suppressor 43.00
Emerald Surge Suppressor 30.00
Sapphire Surge Suppressor 43.00
DATASHIELD
PC-200 Power Backup 225.00
XT-300 Power Backup 335.00
AT-500 Power Backup 515.00
AT-800 Power Backup 595.00
KENSINGTON
Masterpiece 83.00
Masterpiece Plus 111.00
STEDIWATT
4 Outlets 35.00
6 Outlets 40.00
8 Outlets 45.00

PRINTERS

BROTHER
HR 15 XL 328.00
HR 15 Tractor 95.00
HR 25 ..... 455.00
HR 25/35 Tractor 114.00
HR 35 ..... 660.00
Twinwriter 5 ..... 835.00
CITIZENS
MSP-15 (160 CPS) 360.00
MSP-20 (200 CPS) 330.00
MSP-25 (200 CPS) 500.00
PREMIERE 35
DIABLO
Advantages D-25 ..... 595.00
DYNAX/FORTIS
D4-45 Dual Head Printer 835.00
DX-15 ..... 375.00
EPSON
All Epson Printers ..... CALL
IBM
Quietwriter II ..... CALL
IBM Proprinter ..... CALL
JUKI
6100 (15 CPS) 332.00
6200 (30 CPS) 505.00
6300 (40 CPS) 645.00
MANNESMAN TALLY
MT-85 ..... CALL
NEC
Spinwriter Elf 350 ..... 370.00
Spinwriter 2030 or 2050 (20 CP) . 610.00
Spinwriter 3530 or 3550 (35 CP) . 955.00
Spinwriter 8850 (55 CPS) 1265.00
2000/3500/8800 Tractor 190.00
P5 Pinwriter (Parallel) 920.00
OKIDATA
All Okidata's ..... CALL

PANASONIC
KXP-1091 ..... 235.00
KXP-3151 ..... 370.00
QUME
Spring 11/40 40 CPS LQ ..... CALL
SILVER REED
EXP 400P 185.00
EXP 500P 235.00
EXP 550P 360.00
EXP 800P 655.00
STAR MICRONICS
SG-10 (120 CPS) 213.00
SG-15 (120 CPS) 369.00
SD-10 (160 CPS) 329.00
SD-15 (160 CPS) 439.00
SR-10 (200 CPS) 479.00
SR-15 (200 CPS) 579.00
TOSHIBA
1340 PAR. or SER. 385.00
321 PAR 515.00
341 PAR Only 745.00
351 PAR Only 1015.00

MODEMS

ANCHOR AUTOMATION
Signalman Express 1200 ..... 225.00
Signalman Lightning 2400 ..... 340.00
Volksmodem 1200 ..... 166.00
AST
AST Reach Internal 1200 ..... 310.00
HAYES
Chronograph 165.00
Smartcom II 84.00
Smartmodem 300 (External) 127.00
Smartmodem 1200 (External) 350.00
Smartmodem 1200B (Internal) 310.00
Smartmodem 1200B (Internal W/Software) 329.00
Smartmodem 2400 (External) 560.00
Smartmodem 2400B W/Software 530.00
Hayes Transet 1000 ..... 260.00
NOVATION
Smartcat Plus 1200 Standalone 305.00
2400 Standalone Modem W/Software 527.00
2400 Standalone Modem 465.00
Half-Card 2400 W/Software 465.00
Half-Card 2400 Hardware Only 417.00
PROMETHEUS
Promodem 1200 ..... 265.00
Promodem 1200B Hardware Only .. 180.00
Promodem 1200B W/Software 205.00
US ROBOTICS
Password 1200 Baud 197.00
Courier 2400 Baud 385.00
VENTEL
2400 Half-Card W/Crosstalk XVI ... 445.00
1200 Plus External 300/1200 ..... 305.00
PC Modem 1200 W/Crosstalk XVI .. 305.00
PC Modem 1/2 Card W/XTalk 335.00
200M TELEPHONICS
PC 1200 W/Software 249.00
PC 1200 Hardware Only 222.00

DRIVES

ARCHIVE
60MB Cartridge Backup (Internal) .. 795.00
60MB Cartridge Backup (External) . 995.00
CORE INTERNATIONAL
20MB AT Plus 1250.00
30MB AT Plus 1550.00
60MB Cartridge Backup (Internal) . 1450.00
EVEREX
20MB Cassette Backup 575.00
20MB Cassette Backup 625.00
60MB Cartridge Backup (Internal) . 835.00
60MB Cartridge Backup (External) . 975.00
100MB Cartridge Backup (External) . 995.00
IOMEGA
Bernoulli Box 10MB W/CNTRL ... 1735.00
Bernoulli Box 10MB Plus W/CNTR 1850.00
Bernoulli Box 2-10MB W/CNTRL .. 2305.00
Bernoulli Box 2-10MB Plus W/CN .. 2435.00
Bernoulli Box 2-20MB W/CNTRL .. 3140.00
IRWIN MAGNETICS
20MB Cartridge Backup (Internal) .. 595.00
20MB Cartridge Backup (External) . 805.00
MAXTOR
140MB Hard Drive for AT (Internal) 3400.00
MOUNTAIN COMPUTER
10MB Drivecard or Zang ..... CALL
PRIAM
60MB for XT (Internal) 1450.00
60MB for AT (Internal) 1350.00
RACORE
Drive Two for PC JR. 355.00
Expansion Board for PC JR. W/1 ... 145.00
SEAGATE
30MB Full Height for AT INT 695.00
40MB Full Height for AT EXT 795.00
MPI
360KB Full Height 90.00
TALLGRASS
60MB Cartridge Backup (Ext) 1335.00
Interface Card for TG 20/21/22 ... 132.00
THESIS
Fast File (SMB RAM Disk) 1895.00
WANGTEK
60MB Cartridge Backup (Internal) .. 875.00

BACK-UP / COPY SOFTWARE

CENTRAL POINT
Copy II PC 17.50
Copy II PC Option Board 71.50
MERIDIAN
Carbon Copy (2 Req.) 128.00
QUAID
Copywrite 37.00
FIFTH GENERATION SOFTWARE
Fastback 90.00
TRANSEC
Transec Module A, B and C 30.00

CHIPS

INTEL
Intel 8087-3 Math Co-Processor ... 106.00
Intel 8087-2 Math Co-Processor ... 147.00
Intel 80287 Math Co-Processor ... 175.00
MAJOR BRAND CHIPS
Set of 64k 150ns 9.50
Set of 256k 150ns 23.50

DESKTOP / UTILITY SOFTWARE

ALPHA
Electric Desk PC 175.00
Keyworks 46.00
BOURBAKI
1 DIR 45.50
BORLAND
Sidekick 27.50
Sidekick Non-Protected 42.50
Superkey 34.00
Traveling Sidekick 39.50
CENTRAL POINT
PC Tools 17.50
DIGITAL RESEARCH
GEM Collection 106.00
GEM Graph 132.00
GEM Draw 132.00
GEM Wordchart 105.00
GEM Desktop 26.50
GEM Draw W/Desktop 137.00
ELECTRONIC ARTS
Get Organized! 63.00
EXECUTIVE SYSTEMS
X Tree 27.00
GOLDEN BOW
V Feature Deluxe ..... CALL
MICROSOFT
Windows 56.75
PETER NORTON
Norton Utilities 3.1 ..... 47.00
QUARTERDECK SOFTWARE
DESQVIEW 60.00
ROSE SOFT
Pro Key 68.00
SOFT LOGIC
Disk Optimizer ..... CALL
STARBRIDGE TECHNOLOGY
Starbridge DOS 28.00
WARNER
Desk Organizer 55.50

ACCOUNTING PACKAGES

BPI
Business Builder 395.00
General Acc./AR/AP or Payroll 278.00
Job Costing 375.00
Inventory Control 375.00
CHANG LABS
Rags to Riches Series 59.00
EVERGREEN SOFTWARE
One-Write Plus 139.50
ACCOUNTING PROGRAMS EACH
GREAT PLAINS
Business Programs 450.00
OPEN SYSTEMS
Accounting Software ..... CALL
RESOURCE MGT. I
PEACHTREE
Back to Basics 182.00
Peachtree GL/AP/AR 235.00
SIERRA ON LINE
Homeword 47.00
Homeword Speller 37.00
SORCIM
Easy Plus System 77.00
AR/AP/GL 281.00
STATE OF THE ART
AR/AP/GL/INV 319.00
UNITED SOFTWARE
In House Accountant 100.00

DATABASE SOFTWARE

ALPHA SOFTWARE
Database Manager II 150.50
ASHTON TATE
D Base II 263.00
D Base III Plus 365.00
BORLAND
Reflex 50.00
FOX & GELLER
Quick Code III 137.00
Quick Index III (Protected) 72.00
Quick Report III 137.00
D Graph III 137.00
Dutil III Plus 74.00
INFOCOM
Cornerstone ..... CALL
INNOVATIVE SOFTWARE
Smart Software System 395.00
Smart Spelling Checker 78.00
MICRO DATA BASE SYSTEMS
Knowledgeman II/2 ..... 245.00
Knowledgeman Upgrade Kit 142.00
MICRORIM
Clout 2.0 ..... 116.00
Extended Report Writer 74.00
RBase 5000 ..... 318.00
NANTUCKET
Clipper 334.00
POWERBASE SYSTEMS
Powerbase 165.00
SOFTWARE PUBLISHING
PFS: File 75.00
PFS: Report 66.00
STONEWARE
Advanced DB Master 265.00
TIMEWORKS
Data Base Manager II 76.50

GRAPHICS PACKAGES

APPLIED SOFTWARE TECHNOLOGY
Versaform XL 49.50
BPS
Business Graphs 212.00
Overhead Express 99.50
BRIGHTBILL ROBERTS
Graphics Partner 49.50
BRODERBUND
Print Shop 35.00
Graphics Library I 24.00
CONNECTICUT SOFTWARE
Printer Boss 79.00
Sideline 35.00
DATA TRANSFORMS
Fontrix 75.00
Fontpacks 1-11 ..... 13.00
DECISION RESOURCES
Chartmaster 195.00
Diagrammaster 185.00
Signmaster 130.00
MAP MASTER
DIGITAL RESEARCH
DR Draw 155.00
DR Graph 155.00
DR Logo 80.00
ENERTRONICS
Energraphics 155.00
Energraphics W/Plotter Option 200.00
Enercharts 155.00
GCI
Graphwriter Combo Pack 281.50
Free Lance 187.00
MICROGRAPHX
PC Draw 197.50

Circle 381 on reader service card

Connecticut Orders Call (203) 929-8522 IN CANADA 1-800-843-0074

ASTERN

ANY COMPARABLE ADVERTISED PRICE BY $1

ICROSOFT
art ... 165.00
SOFTWARE
ecutive Picture Show ... 135.00
FTCRAFT
ncy Fonts ... 135.00
FTSTYLE
ntworks ... 33.50
ntworks Laser ... 64.00
FX ... 39.00
FTWARE PUBLISHING
S: Graph ... 74.50
ECTRUM HOLOBYTE
Studio ... 25.00
RINGBOARD
wsroom ... 32.00
Art Vol 1 ... 16.00
Art Vol 2 ... 21.00
MAKER
ckart Publisher ... 105.00
er Option ... 85.00
ISON WORLD INC.
nt Master ... 31.00
Gallery I ... 20.00

GRAPHICS TABLETS AND MICE

SI
Halo II ... 80.00
Paintbrush Plus ... 37.00
gitech Mouse W/DR Halo II ... 104.00
Mouse W/DR Halo II ... 117.00
ALA
cutive Presentation Kit ... 84.00
eed Key Controller Card ... 30.00
eed Key Tablet W/Software ... 112.00
ola Pad ... 85.00
CROSOFT
use (Bus) ... 106.00
use (Serial) ... 119.00
USE SYSTEMS
Paint ... 64.00
Mouse W/Point + ... 115.00
Mouse W/Ready ... 107.00
Mouse W/Ready + Point + ... 132.00
YES, CH
ch II Joystick ... 24.50
ch III Joystick ... 31.00
me Port Card for IBM ... 32.50
AFT
o Button Joystick ... 16.00
ee Button Joystick ... 32.00
ic Cursor Con W/Joystick ... 45.00
SI
use Sys. Mouse W/Dr. Halo II ... 105.00
i Mouse W/Dr. Halo II ... 104.00
SI Mouse W/Dr. Halo ... 105.00

HOME FINANCE PACKAGES

TTERIES INCLUDED
ctronic Checkbook ... 38.00
S
ckpak II ... 45.00
NTINENTAL SOFTWARE
me Accountant Plus ... 75.50
Advantage 85 ... 34.00
W JONES
rket Analyzer ... 195.00
rket Manager ... 137.00
ies & Prospect Organizer ... 218.00
readsheet Link ... 137.00
WARDSOFT
Preparer ... 175.00
al Estate Analyzer III ... 208.00
ECA
naging Your Money ... 94.00
naging The Market ... 77.00
ONOGRAM
llars & Sense W/Forecast ... 93.00
ARBOROUGH
r Worth ... 57.00
MON AND SCHUSTER
Lassers Money Manager ... 53.00
Lassers Tax Program ... 43.00
MEWORKS
via Porters Fin Planner ... 83.00
RNING POINT
me is Money ... 66.00

INTEGRATED SOFTWARE

HTON TATE
mework II ... 360.00
TIME FRAME
Frame Lock ... 22.00
LOTUS DEVELOPMENT
123 ... 299.00
REPORTWRITER 123
Symphony ... 410.00
SOFTWARE GROUP
Enable ... 330.00
SOFTWARE PRODUCTS
Open Access ... 372.00
SOFTWARE PUBLISHING
PFS: First Success ... 185.00
XANARO
Ability ... 255.00

PROGRAMMING LANGUAGES

ADDISON WESLEY
True Basic ... 82.50
BORLAND
Turbo Pascal W/8087 ... 55.00
Turbo Pascal W/BCD ... 55.00
Turbo Pascal W/8087, BCD ... 62.50
Turbo Pascal ... 35.00
Turbo Lightning ... 50.00
Turbo Gameworks ... 33.00
Turbo Graphics Toolbox ... 28.00
Turbo Database Toolbox ... 28.00
Turbo Editor Toolbox ... 33.00
Turbo Tutor ... 17.50
Turbo New Pack ... 48.00
Turbo Prolog ... 61.00
Turbo Jumbo Pack ... 135.00
DIGITAL RESEARCH
CPM/86 ... 33.00
HARVARD ASSOCIATES
PC Logo 2.0 ... 87.00
LIFEBOAT
Lattice C Compiler ... 235.00
Run C Interpreter ... 77.00
C Food Smorgasboard ... 77.00
Panel ... 145.00
Lattice Windows ... 145.00
Multi Halo Lattice ... 123.00
MICROSOFT
Quick Basic Compiler ... 58.00
Basic Compiler ... 225.00
Basic Interpreter ... 195.00
Business Basic Compiler ... 249.50
C Compiler ... 223.00
Cobol Compiler ... 395.00
Fortran Compiler ... 198.00
Macro Assembler ... 85.00
Pascal Compiler ... 173.00
SUMMIT SOFTWARE
Better Basic ... 118.00
Btrieve Interface or Math Mod ... 63.00
Run Time ... 150.00

PROJECT MANAGEMENT SOFTWARE

BREAKTHROUGH SOFTWARE
Timeline ... 205.00
HARVARD SOFTWARE
Total Project Manager ... 255.00
LIVING VIDEOTEXT
Ready ... 48.00
Thinktank 2.0 ... 91.00
MICROSOFT
Project ... 227.00
SORCIM
Superproject Plus ... 182.00

SPREADSHEET SOFTWARE

CONSUMER SOFTWARE
Spreadsheet Auditor ... 75.00
FUNK SOFTWARE
Sideways ... 33.00
GNP DEVELOPMENT
CPA+ ... 325.00
MACRO+ ... 24.00
Password+ ... 23.00
Recalc+ ... 47.00
MICROSOFT
Multiplan ... 111.00
PAPERBACK SOFTWARE
VP Planner ... 54.00
PALADIN
Flash Calc ... 53.00
SOFTWARE PUBLISHING
PFS: Plan ... 74.50
SORCIM
Supercalc III ... 185.00
TIMEWORKS
Swift Calc W/Sideways ... 95.00

WORD PROCESSING SOFTWARE

BRODERBUND SOFTWARE
Bank Street Writer ... 45.00
HAYDEN
The Writer ... 25.00
LEADING EDGE
Nutshell or Word Processor ... 48.00
Word Processor W/Mail Merge & Spell ... 100.00
LIFETREE SOFTWARE
Color Magic ... 20.00
Volkswriter Deluxe III ... 140.00
Volkswriter Scientific ... 0.00
MICROPRO
Easy ... 91.00
Wordstar ... 161.00
Wordstar 2000 ... 233.00
Wordstar 2000+277.50
Wordstar Professional+233.50
MICROSOFT
Word ... 227.00
MULTIMATE INTERNATIONAL
On File ... 85.00
Just Write ... 51.00
Multimate ... 200.00
Multimate Advantage ... 243.00
Multimate Executive ... 277.00
SAMNA
Word III ... 250.00
SATELLITE SOFTWARE
Word Perfect ... 196.50
SIMON AND SCHUSTER
Websters Spelling Checker ... 33.00
SOFTWARE PUBLISHING
PFS: Proof ... 51.00
PFS: Write ... 74.00
SORCIM
Easywriter II ... 186.00
WRITING CONSULTANT
Word Finder ... CALL

EDUCATIONAL SOFTWARE

ATI
Skill Builder Programs ... 24.00
Training Power Programs ... 43.00
BARRONS
Computer SAT ... 50.00
BIBLE RESEARCH
The Word 1.0 (KJV or NIV) ... 145.00
CBS SOFTWARE
Goren's Bridge ... 39.00
Mastering the SAT ... 50.00
CDEX
All Programs ... 37.00
DLM
Alien Addition or Minus Mission ... 17.00
Bobbies Greatest Word Chase ... 15.00
Demolition Division ... 17.00
Meteor Multiplication ... 17.00
Spelling Whiz or Verb Viper ... 17.00
DAVIDSON AND ASSOCIATES
Math Blaster ... 24.00
Speed Reader II ... 35.00
Spell It or Word Attack ... 24.00
DESIGNWARE
Body Transparent or Grammar Examiner ... 23.00
European Nations and Locations ... 23.00
Math Maze or Spellagraph ... 20.00
DIGITAL RESEARCH
DR. Logo ... 80.00
EDUWARE
Algebra I, II or III ... 20.00
HARCOURT BRACE JOVANOVICH
Computer SAT ... 45.00
HUMAN EDGE
Mind Prober ... 24.00
INDIVIDUAL SOFTWARE
Professor DOS or Professor Pixel ... 32.00
The Instructor II ... 26.00
Tutorial Set ... 52.00
Typing Instructor ... 26.00
LEARNING COMPANY
Magic Spells or Word Spinner ... 22.00
Number Stumper or Reader Rabbit ... 22.00
MECA
Basic Building Blocks ... 26.00
Jim Fixx ... 41.00
SCARBOROUGH
Build a Book About You ... 14.00
Mastertype ... 22.00
SCHOLASTIC
Agent USA or Turtle Tracks ... 21.00
SIMON AND SCHUSTER
Typing Tutor III ... 27.00
SPINNAKER
Alphabet Zoo ... 14.00
Kindercomp or Face Maker ... 12.00
Delta Drawing or in Search of ... 21.00
Amazon or Dragon World ... 23.00
Kidwriter or Story Machine ... 17.00
Snooper Troops 1 or 2 ... 19.00
Trains ... 17.00
SPRINGBOARD
Music Maestro or Piece of Cake ... 19.00
Easy as ABC ... 21.00

GAMES

BLUECHIP
Baron or Millionaire ... 28.00
Squire or Tycoon ... 28.00
BRODERBUND
Ancient Art of War ... 25.00
Lode Runner ... 19.50
Print Shop ... 34.00
Graphics Library I ... 20.00
CBS Software
Felony or Murder by the Dozen ... 13.00
DATASOFT
Bruce Lee ... 21.00
Electronic Arts
Music Construction Set ... 26.00
One on One ... 26.00
Pinball Construction Set ... 21.00
HAYDEN
Holy Grail ... 27.50
Sargon III ... 27.50
INFOCOM
Suspended ... 26.00
Deadline or Starcross ... 27.00
Spellbreaker ... 27.00
Witness or Planetfall ... 22.00
Enchanter or Wishbringer ... 22.00
Cutthroats or Seastalker ... 22.00
Enchanter, Wishbringer or Witness ... 22.00
Hitchhiker's Guide ... 22.00
Sorcerer or Infidel ... 25.00
A Mind Forever Voyaging ... 25.00
Suspect ... 25.00
Zork I ... 22.00
Zork II or III ... 25.00
MICRO LEAGUE SPORTS
Micro League Baseball ... 22.50
General Managers Disk ... 22.50
Micro League 1985 Team Disk ... 11.50
MICROPROSE
F-15 Strike Eagle or Solo Flight ... 19.50
Hellcat Ace or Spitfire Ace ... 19.50
Silent Service ... 19.50
MICROSOFT
Flight Simulator (New Version) ... 28.00
Flight Sim Scenery Disks ... 13.00
MINDSCAPE
Rambo or Rocter ... 27.00
Stephen Kings The Mist ... 25.00
James Bond A View to a Kill ... 25.00
ODESTA
Backgammon ... 29.00
Chess 7.0 ... 39.00
ORIGIN SYSTEMS
Ultima III ... 35.00
PC SOFTWARE
Armchair Quarterback ... 21.00
Championship Blackjack ... 21.00
SCARBOROUGH
Boston Computer Diet ... 52.00
Songwriter ... 26.50
SEGA
Super Zaxxon ... 20.00
Tapper or Spy Hunter ... 25.00
SIERRA-ON-LINE
King's Quest I or II ... 27.00
SIMON AND SCHUSTER
N.Y. Times Crosswords ... 11.50
Star Trek ... 24.00
SIR-TECH
Wizardry I ... 34.00
SPECTRUM HOLOBYTE
Gato ... 20.00
STRATEGIC SIMULATIONS
Battle for Normandy ... 22.50
Tigers in the Snow ... 22.50
SUBLOGIC
Night Mission Pinball ... 24.00
Jet ... 30.00

MULTIFUNCTION BOARDS

AST
Six Pack Plus 64K W/Sidekick ... 215.00
Six Pack Plus 384K W/Sidekick ... 235.00
AST-Advantage Board 128K ... 369.00
AST-Advantage Pack OK ... 108.00
AST-I/O Plus II ... 117.00
EVEREX
Mini Magic 0-640K 1/2 Card ... 68.00
INTEL
Above Board ... CALL
Orchid Technologies
Conquest Multifunction W/OK ... 252.00
Eccell Multifunction at W/OK ... 383.00
PARADISE SYSTEMS
5-Pack Multifunction Card W/OK ... 93.00
PERSYST
Short Slot Memory Board W/384K ... 185.00
Mega Memory Board W/OK ... 229.00
PC/Monochrome Board ... 143.00
PC/Color Graphics Board ... 143.00
808 Board ... 315.00
Mono Combo Board ... 285.00
QUADRAM
Expanded Quadboard W/OK ... 175.00
Expanded Quadboard W/384K ... 215.00
Silver Quadboard W/OK ... 193.00
Gold Quadboard W/OK ... 345.00
Quadmeg-AT W/128K ... 292.00
Quadport-AT Starter Kit ... 97.00
Liberty AT W/64K ... 255.00
STB
Grande Byte-AT W/128K ... 187.00
Quarter Byte W/256K ... 150.00
Big Byte Memory Board W/64K ... 114.00
Rio Plus II W/64K ... 167.00
Super Rio II W/64K ... 249.00
TECMAR
Captain Multifunction W/64K ... 167.00
Maestro Multifunction W/OK ... 310.00
Wave 64K ... 170.00
SIGMA DESIGNS
Maximizer W/OK ... 145.00
Sigma Expansion Chasis (9 Slot) ... 595.00

NETWORK CARDS

ORCHID
PCNET Blossom 64K ... 520.00
PCNET Starter Kit (2 Card) ... 725.00

ACCELERATOR BOARDS

ORCHID
PC Turbo-186 W/DB 256K ... 369.00
PC Turbo-186 W/8087 DB/256K ... 775.00
TITAN
Accelerator PC W/128K ... 460.00
MCT
Speed Demon PC ... 368.00
QUADRAM
Quadsprint ... 409.00

COMMUNICATION BOARDS

AST RESEARCH
AST-5251/11 ... 575.00
AST-5251/12 ... 475.00
DCA
Irma Board ... 785.00
Irmaline Remote ... 850.00
QUADRAM
Quadlink ... 309.00
TECMAR
Lcb Master W/Options ... 675.00

VIDEO CONTROLLER CARDS

AST RESEARCH
AST-Preview ... 235.00
EVEREX
The Edge ... 263.00
Graphics Edge Display Card ... 267.00
HERCULES
Color Graphics Card ... 147.00
Monochrome Graphics Card ... 283.00
PARADISE SYSTEMS
Modular Graphics Card ... 230.00
Color Card ... 95.00
Monochrome Card ... 105.00
Multi Display Card ... 168.00
Module A ... 62.00
Module C ... 179.00
Clock W/64K Ram Module B ... 120.00
PERSYST
Mini Monochrome Board ... 116.00
BOB BOARD
Short Port Color Graphics Card ... 123.00
QUADRAM
EGA+ ... 360.00
QUADRAM
Quadcolor I ... 175.00
Quadvue Monochrome Card ... 223.00
SIGMA
Color 400 Card ... 412.00
STB
The Chauffeur ... 233.00
Ega Plus ... 290.00
Mono Plus With Parallel Port ... 137.00
Graphics Plus II ... 207.00
TECMAR
Graphics Master ... 427.00
VIDEO 7
Monochrome Graphics Adaptor ... 123.00
Monochrome Graphics Adaptor+ ... 160.00
Vega Board ... CALL

MONITORS

AMDEK
Video 310A Amber ... 140.00
Color 300 Composite ... 203.00
Color 600 HI-RES RGB ... 375.00
Color 710 Ultra HI-RES RGB ... 425.00
Color 722 RGB Enhanced Graphic ... 470.00
Tilt & Swivel ... 19.00
NEC
Multisync ... 520.00
PRINCETON
HX-9 HI-RES RGB Color ... 384.00
HX-12 HI-RES RGB Color ... 409.00
HX-12E HI-RES RGB Color ... 475.00
MAX-12E HI-RES Amber ... 147.00
SR-12 Super HI-RES Color ... 539.00
TAXAN
630 RGB Color 640 X 400 RES ... 429.00
640 RGB Color 720 X 400 RES ... 479.00

COMMUNICATIONS SOFTWARE

COMPUSERVE
Compuserve Starter Kit ... 19.50
DELTA TECHNOLOGIES
Direct Access ... 33.50
HAYES
PLEASE ... 107.00
KENSINGTON
Easyline Mail Manager ... 90.00
MICROSOFT
Access ... 155.00
MICROSTUF
Crosstalk or Remote ... 92.00
Transporter ... 137.00
SOFTWARE PUBLISHING
PFS: Access ... 74.00
UNITED SOFTWARE
ASCII Express ... 107.00
VM
Relay Gold ... 133.00

MAKE YOUR IBM PC FASTER THAN AN AT.

IN JUST 5 MINUTES!

$595

DON'T TAKE OUR WORD FOR IT. USE IT FOR 60 DAYS. IF YOU ARE NOT TOTALLY SATISFIED RETURN IT FOR A FULL REFUND.

It sounds great; the idea of a speedup board that you can just plug right in as easily as putting bread in a toaster. How wonderful to be able to convert a PC or XT to a $4000 AT without the expense. But even when you get ready to spend $595.00 you want to be sure your choice is the very best.

Here at PCSG we sell our IBM PC disk access speedup software by the thousands. But software doesn't do anything about speeding up the microprocessor (or CPU) speed. As you know the microprocessor is the brain of the computer that controls all the operations like screen updates and calculations like a spreadsheet makes.

Faster and smarter than an AT – PCSG guarantees it.

We wanted to offer a speedup card that would be the compliment to our disk speedup software, (incidentally included at no extra charge.) We wanted it to be literally the most advanced, fastest, most feature rich board available today. We could only be satisfied with a board that was the finest example of the engineering art.

There is no question we have met our every objective by developing and manufacturing the *BREAKTHRU 286* card. This is the best designed and most functional speed up card available today. We guarantee it.

HERE IS WHAT MAKES IT SO SPECIAL.

First, it installs so easily. It is a half slot card, only five inches in length. You don't even have to give up a full slot. What's more, unlike competing products it works in the Compaq and most clones. The instructions are so simple we considered showing a picture of a child putting it in. Easy diagrams show how you just place the card in an open slot, remove the original processor and connect a single cable. There is no software required. From that moment you are running faster than an AT.

Second, it is advanced. The *BREAKTHRU 286* replaces the CPU of the PC or XT with an 80286 microprocessor that is faster than the one found in the AT. A 16K cache memory provides zero-wait-access to the most recently used code and data. In benchmark tests the card accelerated software programs—both custom and off-the-shelf anywhere from 200% to as much as 700%. Wow!

Third, you have full compatibility. All existing system RAM, hardware, and peripheral cards can be used without software modification. It operates with LAN and mainframe communication products and conforms to the Lotus/Intel/Microsoft Expanded Memory Specification (EMS). Software compatibility is virtually universal.

Fourth, it is the best there is. There are several other boards on the market. Some are priced about the same as the *BREAKTHRU 286* and some are cheaper. We at PCSG have compared them all, but there simply was no comparison. What we discovered is that many cards being sold offer only a marginal speed up in spite of their claims. We found some to be merely versions of the obsolete 8088 or 8086, and others to be just poorly engineered. The 8MHz *BREAKTHRU 286* is unequivocally the best executed and most completely reliable speedup board manufactured today.

PCSG has since early 1983 dominated the lap portable market with ROM software such a Lucid spreadsheet and Write ROM that reviewers rated as excellent. We were proud to successfully enter the IBM PC market last year with disk access speedup software. Now we are so pleased with the *BREAKTHRU* speedup card. We use them on our own PC's to make them faster than AT's. We are really excited about this product.

PCSG makes the unabashed statement that the *BREAKTHRU 286* card represents more advanced technology than boards by Orchid, Quadram, Victor, Mountain, P.C. Technologies, Phoenix . . . we could go on.

But an ad can't let you experience it for yourself. That's why we sell the *BREAKTHRU 286* on a 60 day trial. If you aren't completely satisfied return it within 60 days for a full refund. It is priced at $595. Call today with your MasterCard, Visa, American Express or COD instructions and we will ship your card the very next day.

PERSONAL COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. #207 • Dallas, Texas 75229

214-351-0564

MasterCard VISA

Circle 604 on reader service card

Password: Communicate

Information and insights on the PC communications marketplace

This month: Will CD ROMs threaten the on-line industry? Can NAPLPS survive without Viewtron? Can GEnie compete in the on-line consumer market? Will your next job interview be with an AT?

Edited by Eric Brown

On Line

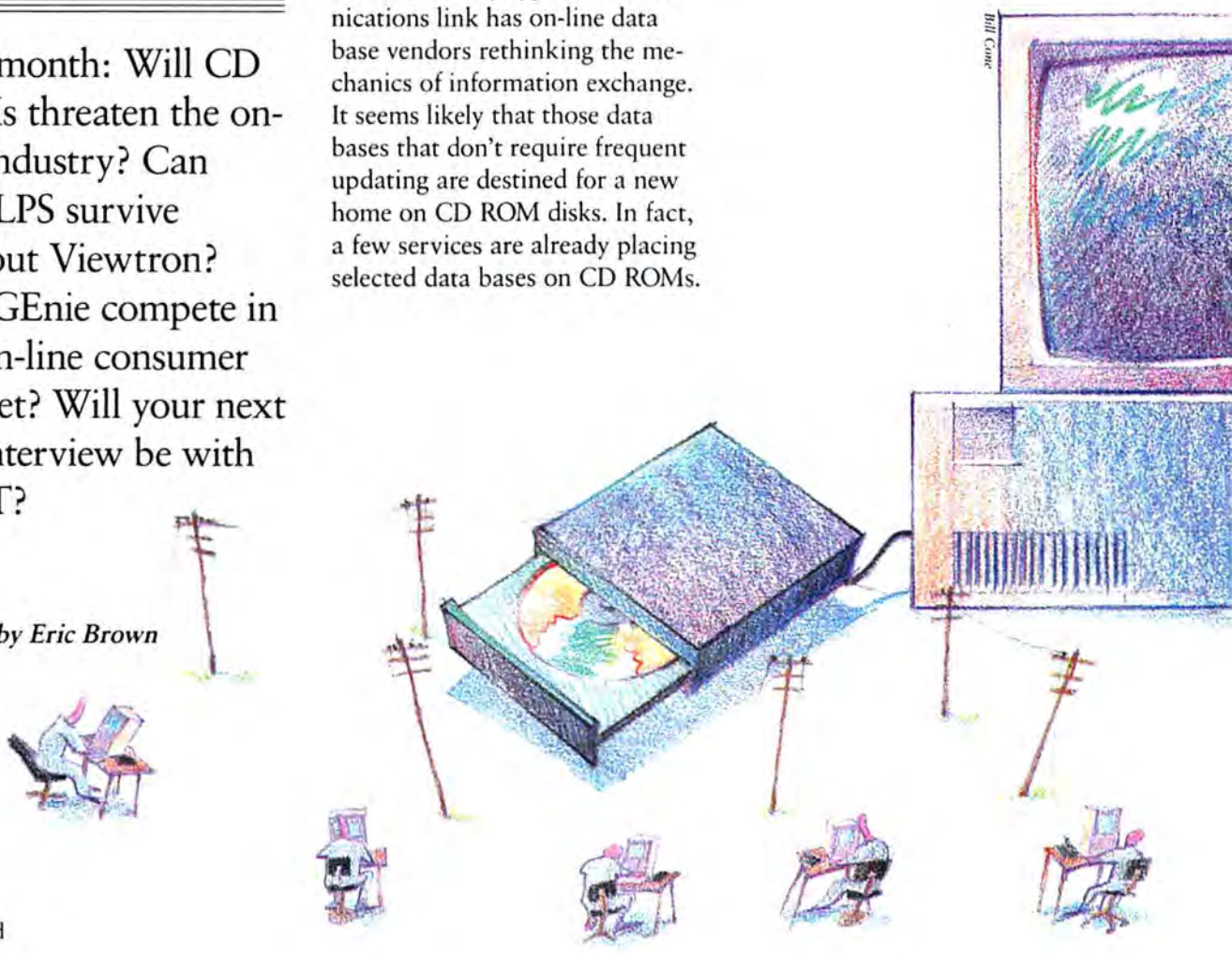
On-Line Vendors Eye CD ROM

As radio stations, record stores, and stereo shops around the country extol the pristine audio reproduction of compact disks (CDs), the personal computer industry ponders the virtues of CD's computing cousin, CD ROM. Like their audio counterparts, CD ROM disks and players use lasers to read and store digitized information, but instead of playing music, they store and retrieve a massive amount of text and data—550MB (150,000 pages) of text. The fact that this much information is now accessible through a PC without any type of communications link has on-line data base vendors rethinking the mechanics of information exchange. It seems likely that those data bases that don't require frequent updating are destined for a new home on CD ROM disks. In fact, a few services are already placing selected data bases on CD ROMs.

Most electronic information vendors see compact disks as complementary rather than adversarial. "CD ROM enhances on-line information," says Rick Meyer, product manager at Dialog Information Service. "It's a natural extension of existing on-line services." Jane Brown, director of business development at BRS Information Technology, agrees that incorporating "on disk" with "on line" makes good sense. "CD ROM is another medium of electronic information storage," she says, "and we're in the electronic information business."

Despite these confident pronouncements, on-line data base vendors are somewhat uncertain, playing in a new ball game whose

(continues)



TEST OF STRENGTH:

PC/FOCUS gives Micro Managers the muscle for future growth and expansion.

Frankly, there are many capable DBMS's available in today's PC marketplace.

But only PC/FOCUS has the extra capabilities you need to support your growth and expansion. Decision support capabilities like business graphics, statistical analysis and spreadsheet. Application portability to VAX/VMS, WANG/VS, AT&T UNIX and IBM mainframe environments. Even built-in micro-to-mainframe links for data transfer!

So when you select your PC DBMS, make sure it's the one that "rings the bell." PC/FOCUS.

For details, call the IBI office nearest you or write to Donald Wszolek, Information Builders, Inc., 1250 Broadway, New York NY 10001.

PC/FOCUS

Information Builders, Inc.

World Headquarters: New York City, U.S.A., (212) 736-4433
Toronto, Canada: (416) 364-2760 • London, England: 903-6111

One language. One solution.

dBase III is a trademark of Ashton-Tate.
AT&T UNIX is a trademark of AT&T Corp.
WANG/VS is a trademark of Wang Laboratories, Inc.
VAX/VMS is a trademark of Digital Equipment Corp.
IBM is a trademark of International Business Machines Corp.

Circle 499 on reader service card

Market Analyzer PLUS™ corners the bull and sends the bear running for the woods.

The leading technical analysis software, the Market Analyzer™, has just been surpassed. The Market Analyzer PLUS is now here to make you a success in any market.

Charting

Double your vision and quadruple your insight—view two charts at once, or four different charts of four different stocks on a single screen. Plot a point and figure of on-balance volume or draw a triple exponential smoothing. Define your own formulas, create your own market index, and watch your portfolio take shape under the rigors of your analysis.

Technical Screening

Take stock of your ten best and worst performers: and if your investment advisors aren't performing, the Market Analyzer PLUS will tell you that, too. Rank and filter your rank and file to see which are in the strongest technical trend and which are going for the greatest profit.

Automated Run

When you're on the run the Market Analyzer PLUS will run without you. Go out on the town while the Market Analyzer PLUS goes to town on your portfolio. Return to find your portfolios and histories updated with current quotes from Dow Jones News/Retrieval®. You'll have printouts of your favorite charts and reports with the same or different analysis on each stock. . . . So you can stay on top of your investments even when you're investing in your favorite restaurant.

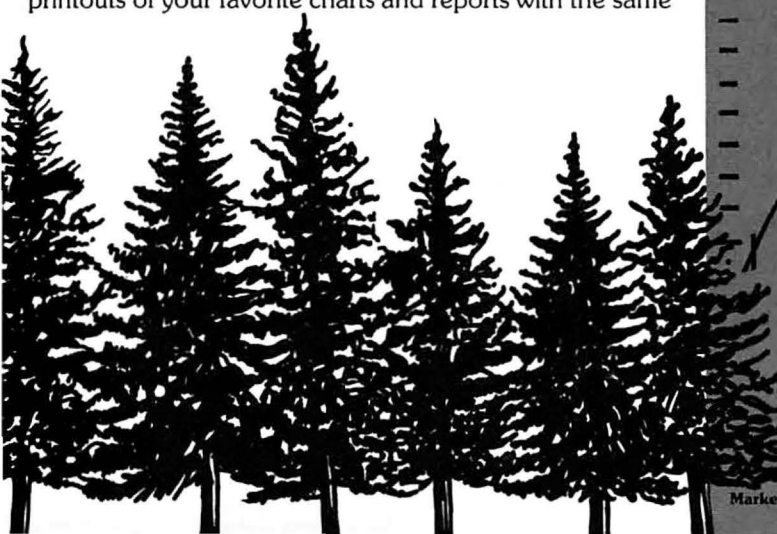
To complete this total investment package, the Market Analyzer PLUS provides:

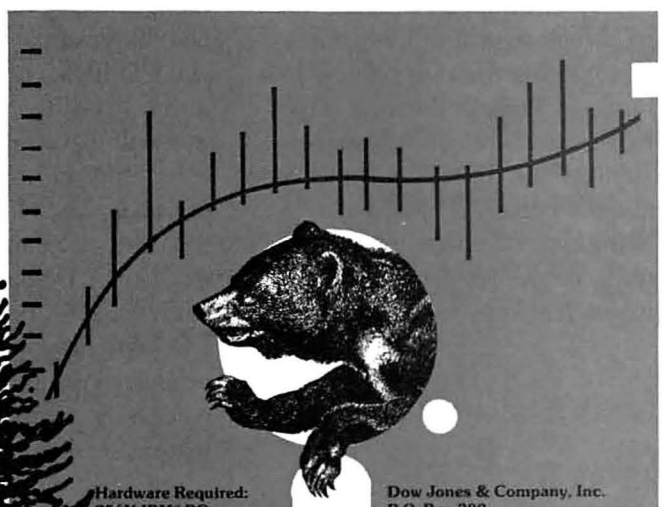
- Portfolio Management
- Spreadsheet Interface
- Dow Jones News/Retrieval Subscription
- Customer Service Hotline
- And as many ways to find bulls in your portfolio as there are bears in the woods

For a demonstration disk ($7.50) or literature call
1-800-345-8500 Ext. 121

To order the Market Analyzer PLUS call
1-800-257-5114
(609-452-1511 in New Jersey, Canada and Alaska)

DowJones™
Software





Hardware Required:
256K IBM® PC,
PC/XT™, AT™
or AT&T PC 6300
IBM Color Graphics card

Dow Jones & Company, Inc.
P.O. Box 300
Princeton, NJ 08543-0300

Circle 3 on reader service card

Market Analyzer PLUS by Dow Jones & Company, Inc. and RTR Software, Inc.
© 1986 Dow Jones & Company, Inc. All Rights Reserved.

rules have yet to be formulated. It clearly isn't business as usual. On-line companies have traditionally sold passwords to individual users or organizations. Their product is the amount of time used on the system to access a data base. CD ROM promises to make that same information as accessible as a collection of encyclopedias, with no central data base, no communications link or log-on procedure, and no running meter.

Because CD ROM products will sit on a desk top either in the office or at home, data base vendors must repackage their on-line data in a more personal format. "People live with on-line products," says Brown, "but CD ROM products will have to be something they can't live without. [CD ROM] requires an entirely different marketing perspective."

Dialog's Meyer agrees, "We have experience with on-line products, but CD ROM presents many unresolved issues." Among the major concerns that companies have yet to address are product pricing, industry standards, what information to transfer to disk, and update policies (whether to send replacement disks or have users update their data bases via modem). Perhaps the most important issue is determining specific applications. The debate rages on about whether CD ROM is a home entertainment or business technology. "People who consider themselves knowledgeable in the industry haven't given these issues hard thought," says Brown. "We've never handled a product like this."

One major concern that may be deterring information providers from creating CD ROM products is the lack of industry standards. Meyer says, "It will certainly foster the market when CD ROM search software and information products can run on any drive."

Few publishers will commit to CD ROM without an installed base of hardware, and users won't purchase hardware without applications. To resolve this impasse, the High Sierra Group, an ad hoc committee composed of companies with interests in CD ROM, such as Reference Technology, Digital Equipment, Microsoft, Hitachi, Philips, and 3M, are meeting to develop a de facto file format standard. The file format governs the way information is organized on a CD ROM disk, ensuring that data bases published on CD ROM can be read and accessed by any CD ROM player.

Clouding the issue is the joint announcement made by Sony and Philips International (the original developers of compact audio disks and CD ROM) of a compact-disk-interactive (CD-I) specification that will make possible interactive entertainment or educational products. The High Sierra Group has postponed any announcement of CD ROM standards pending its study of CD-I. Brown believes CD-I will have little impact on products currently under consideration by most electronic information vendors. "CD-I," she says, "will probably be most prominent in educational products."

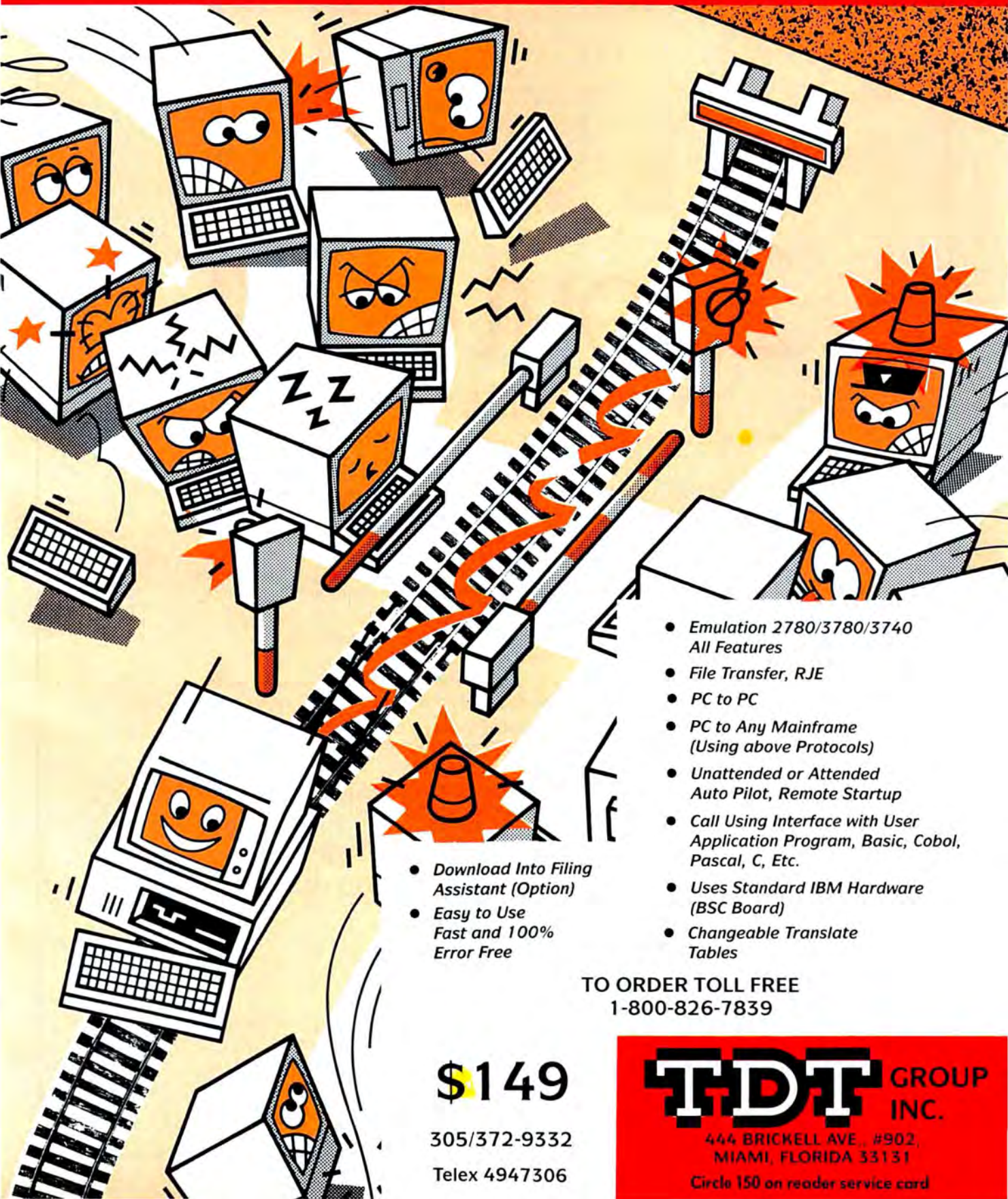
Despite the predicament currently stalling the industry, CD ROM products, many still in the testing stage, are beginning to appear. Dun's Marketing Services will make Dun & Bradstreet's Million Dollar Directory available on CD ROM. The directory contains information on the top 160,000 companies in the United States, including area of business, leading executives, sales volume, and affiliated companies.

Richard Schwarz, senior vice president of Dun's Marketing Services, says the company is testing a CD ROM product but admits that the market remains unidentified. "We still need to find out how we are going to use this product," he says, "and consequently how to price it."

David Roux of Datext believes the CD ROM race belongs to the swift. His company has brought to market a CD ROM product aimed at executives and managers in Fortune 1000 companies. The Datext Corporate Database provides financial data on 10,500 companies culled from data bases like Disclosure, Business Research, and Predicasts, all available through on-line sources. "We saw attractive information in electronic form that we felt people would find easier to use in CD ROM format," Roux says. "Being the first company with a product for the business market has given us a definite edge."

(continues)

PC 3780
FILE TRANSFERS STAY ON THE TRACK



- *Emulation 2780/3780/3740 All Features*
- *File Transfer, RJE*
- *PC to PC*
- *PC to Any Mainframe (Using above Protocols)*
- *Unattended or Attended Auto Pilot, Remote Startup*
- *Call Using Interface with User Application Program, Basic, Cobol, Pascal, C, Etc.*
- *Uses Standard IBM Hardware (BSC Board)*
- *Changeable Translate Tables*

- *Download Into Filing Assistant (Option)*
- *Easy to Use Fast and 100% Error Free*

TO ORDER TOLL FREE
1-800-826-7839

$149

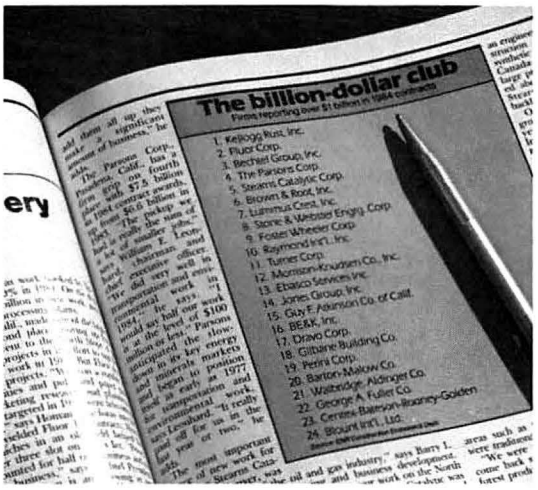
305/372-9332

Telex 4947306

TDT GROUP INC.

444 BRICKELL AVE., #902,
MIAMI, FLORIDA 33131

Circle 150 on reader service card



23 out of 24.

The Billion Dollar Club. An elite group that handles the biggest projects in the world.

Last year, according to *Engineering News-Record,* only 24 companies made it.

23 of them use Primavera Project Planner.

Primavera is the one project management software product that consistently delivers more of what top project managers demand:

The *capability* to handle projects with up to 10,000 activities. Coupled with the *flexibility* provided by features like 20 activity codes per project, choice of I-J or precedence formats, interactive and batch modes for data entry, resource leveling, even on-screen bar charts and histograms.

Not to mention our extensive reporting functions that help you create exception reports, summary reports or selective focus reports at any level of detail.

And we keep improving. In fact, in the past two years, Primavera has added more than 100 user requested enhancements to our software.

Take a good look for yourself. Send for our $35 demo, put us to your toughest tests and see why we call Primavera the hardest working project management software going.

We're helping 23 top companies manage their projects more effectively. Isn't it time we did the same for you?

Project management software that works as hard as you do.

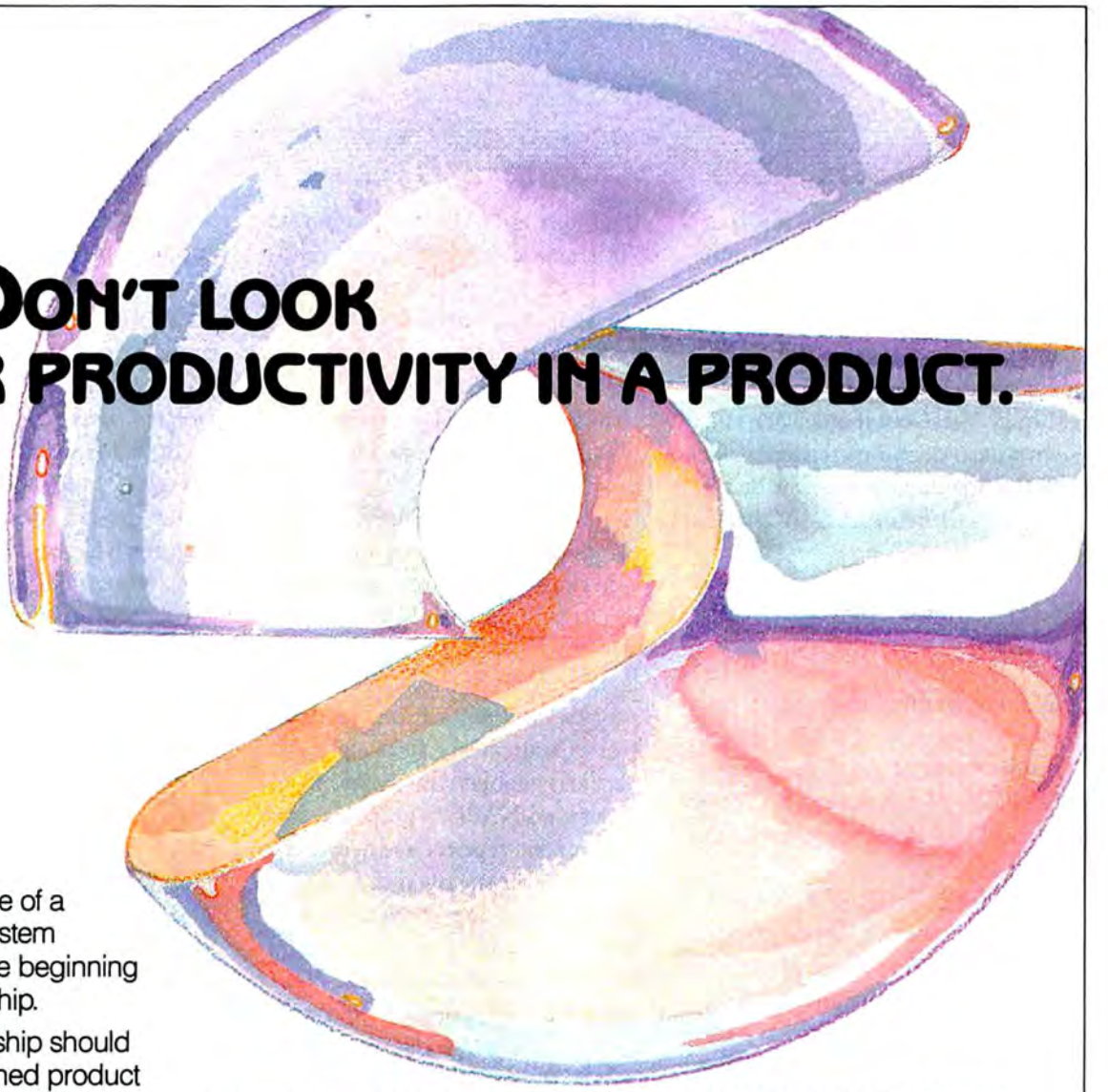
PRIMAVERA SYSTEMS, INC.

Suite 925 • Two Bala Plaza • Bala Cynwyd, PA 19004 • (215) 667-8600 • Telex: 910 997 0484

Primavera project management software:
Primavera Project Planner • Finest Hour (hourly scheduling, multiple calendars)
Primavision (optional plotter graphics) • Available for MS-DOS and VAX environments.

Source: ENR Construction Economics Dept., *Engineering News-Record.* Issue Date: April 18, 1985.

Circle 148 on reader service card



DON'T LOOK FOR PRODUCTIVITY IN A PRODUCT.

The purchase of a data base system should be the beginning of a relationship.

That relationship should include planned product upgrades, experienced technical support, vertical application templates, informational seminars, training programs, user groups, newsletters, special marketing programs...and much, much more.

Demand a Relationship

At Software Solutions, the relationship begins as soon as you contact us. We'll help you find answers to your questions about DataEase™—or about any information management issue.

The product evaluator at Manufacturer's Hanover Trust summed up the experience of tens of thousands of users by calling DataEase "the most impressive productivity tool I have seen."

When you talk to us, ask for our sample diskette. See for yourself why *Data Based Advisor* points to DataEase as "the easiest to understand and use full-featured data base program," calling it "a program which could easily set the industry standard."

Discover us. Find out how important the company behind the product can be.

PWRLD7/86

Send information and a free DATAEASE sample diskette for my PC (check one):
☐ IBM ☐ WANG ☐ DEC ☐ TI

Include materials relating to:
☐ Corporate Client ☐ Retailer
☐ MIS/DP/IC Professional ☐ VAD
☐ Other _____

Name: _____

Title: _____ Phone: _____

Company: _____

Street: _____

City: _____ State: _____ Zip: _____

Mail to:
Software Solutions, Inc.
12 Cambridge Drive
Trumbull, CT 06611

Telex: 703972
800-243-5123

Software Solutions. Get into a relationship that works for you.

Canada
Computerlinks, Toronto, Ontario; (416) 231-1270

United Kingdom
Sapphire Systems, Essex; 01-554-0582

West Germany, Austria
M&T Software Verlag, Munich, 089-4613-0

Scandinavia
West Soft A/S, Alesund, Norway; (47) 71-46166

Switzerland, France
Softsource, S.A. 1209 Geneve, Switzerland; 985152&985-153

Ironically, the on-line information industry, which is itself quite young, is now threatened with at least partial obsolescence unless it acts quickly and takes control of the new CD ROM business. Although these companies are faced with hard decisions regarding CD ROM, the compact disk is definitely in their futures. *–Wes Nihei*

Here Comes NAPLPS –Viewtron or Not

Despite the dissolution of its greatest proponent, a standard for the transmission of graphics called NAPLPS (North American Presentation Level Protocol Syntax) refuses to die.

After Knight-Ridder Newspapers' recent attempt to go nationwide with its mixed NAPLPS-ASCII on-line consumer service, Viewtron, the 3-year-old videotex service went out of business. During its brief stint in the national spotlight, Viewtron offered a choice between going on line with standard ASCII-based software or downloading color graphics frames of data using NAPLPS decoder software (see "Here Comes Viewtron–NAPLPS or Not," *Password Communicate, PCW,* March 1986).

Notwithstanding a boost in subscribers from 3000 to 20,000 during the last six months, Knight-Ridder president James K. Batten announced Viewtron's shutdown on March 21. Pointing the finger at NAPLPS, Batten said, "It is now clear that videotex is not likely to be a threat to either newspaper advertising or readership in the foreseeable future."

With Viewtron's passing, one would expect the long-standing dream of a nation tuned into graphics videotex to be extinguished. Yet even as Viewtron disappears from the on-line scene, other powerful players seem willing to pick up with NAPLPS where Knight-Ridder left off. The latest version of *Professional Connection* communications software from CompuServe Information Services enables subscribers to download NAPLPS graphics, such as financial reports and weather charts, from specified data bases. For example, any stock chart on the system can be viewed as a NAPLPS line chart. "NAPLPS drivers are included on the *Professional Connection* disk," says Sandy Trevor, executive vice president at CompuServe, "but anybody with a NAPLPS decoder and a graphics system can view these charts."

Users can also interact with the service in the traditional (and much faster) ASCII text mode. According to Trevor, however, the simplicity of CompuServe's graphics overcomes NAPLPS's biggest drawback–slow transmission speed. "NAPLPS is slow at transmitting pictures and logos," says Trevor, "but it's much faster with lines, curves, and polygons"–the business graphics found on CompuServe. Trevor points out that using a 2400-bps modem will further reduce delays.

CompuServe will continue to support the transmission of graphics using the less sophisticated RLE (Run Length Encoded) monochrome raster protocol. An RLE decoder is included in *Professional Connnection* and can also be downloaded from CompuServe's IBM PC special interest group. So far, the major application for RLE has been the transmission of weather maps. According to Trevor, airline pilots often download the maps using Tandy Model 100 laptops while in flight. Weather maps can also be accessed with the NAPLPS decoder.

But CompuServe isn't the only service experimenting with NAPLPS. NAPLPS services are still holding their own in Canada, and several specialty services in the United States continue to serve up their on-line information in NAPLPS form. For example, Videolog Communications' Videolog service, which specializes in the electronics industry, uses NAPLPS graphics to store and transmit circuit diagrams and other electronic schematics.

Perhaps the most significant support for NAPLPS comes from Trintex, the videotex partnership of IBM, CBS, and Sears Roebuck. Earlier this year Trintex announced it would adopt NAPLPS for its service but declined to give a launch date.

The choice of NAPLPS for this IBM-dominated venture has sparked speculation that Big Blue

(continues)

Does your laser printer have enough power to produce a stunning document?

Only SoftCraft offers you: 1. Font variety, 2. Formatting power, 3. The ability to create custom characters and symbols.

Armed with Fancy Word, Fancy Font or Laser Fonts your laser printer becomes a high-quality alternative to expensive, time consuming typesetting services. SoftCraft products maximize your laser printer's potential by easily turning your newsletters, presentation materials, documents and invitations into works of art.

In fact, this ad copy was printed using Laser Fonts on an HP LaserJet printer!

1. Font Variety

SoftCraft's complete library contains hundreds of fonts in various styles and sizes from 4 to 72 points. Each product comes with fonts in sizes from 8 to 24 points, including Roman, **Sans Serif**, *Italic*, **Bold**, *Script*, Old English and more.

2. Formatting Power

In addition to all of the conventional formatting commands, *Fancy Font* includes commands that deal with variable-width (proportional) fonts and different height fonts. This is especially useful in setting tables, math formulas and perfectly justified text.

Fancy Word and *Laser Fonts* support all of Microsoft Word's formatting features; no other codes or commands are required.

3. Create Custom Symbols and New Fonts

An included font editing program (optional with Fancy Word) allows you to modify any character and create new characters and logos, up to one inch by one inch. You can also create new fonts, scaled to size, from our database of character outlines.

Choose the Product That's Right For You

Fancy Font: A powerful text formatting and printing program that works with any word processor to provide a wide range of font styles and sizes. You embed simple commands in your document to control Fancy Font's extensive formatting capabilities.

Fancy Word: For Microsoft Word users. You use Microsoft Word like you always have, including the paragraph and character format commands, but you now print all the special characters, styles and sizes.

Laser Fonts: Downloads a large variety of fonts, up to 30 points in size, into laser printers at a significantly reduced price over HP. Laser Fonts automatically configures Microsoft Word to fully take advantage of the downloaded fonts and can be used with any other word processor that can access soft fonts. Laser Fonts can also be used with Fancy Font or Fancy Word to dramatically speed printing on laser printers.

SoftCraft software runs on PCDOS and MSDOS computers with HP, Canon, NCR, Tall Tree and compatible laser printers (Laser Fonts requires a printer with download capability). Fancy Font and Fancy Word are also available for dot matrix printers.

Call TOLL FREE **(800) 351-0500**

Please send me information on the following SoftCraft products:

- ☐ Laser Fonts
- ☐ Fancy Word
- ☐ Fancy Font

NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

PRINTER MAKE _____

MAIL TO:
SoftCraft, Inc., 222 State St., Madison, WI 53703

SoftCraft, Inc.
222 State Street, Madison, WI 53703 (608) 257-3300

Fancy Font is a registered trademark of SoftCraft, Inc. Fancy Word and Laser Fonts are trademarks of SoftCraft, Inc. Microsoft is a registered trademark of Microsoft Corp.

Circle 648 on reader service card

has finally hit upon a strategy for disposing of its warehouses full of unsold PCjrs. The PCjr, discontinued over a year ago, can still be bought for as little as $550, and a PCjr version of IBM's *PC Videotex* NAPLPS decoder software is still available. With a color monitor, the NAPLPS-equipped Jr would make a respectable, low-cost videotex terminal.

Until the problems of low speed and limited graphics resolution are solved, most on-line vendors will probably follow CompuServe's lead in providing NAPLPS as an option rather than a requirement. Even if some NAPLPS services flounder, more graphics videotex services will undoubtedly follow. The El Dorado of graphics communications and the hope that it will eventually lure advertising into the on-line world are just too tantalizing to resist.

GEnie: Out of the Bottle

GEnie (General Electric Network for Information Exchange), the new on-line service from General Electric Information Services Company (GEISCO), is a technically solid, well-designed consumer service that emphasizes communications. You'll find no searchable data bases or ticker tape services on GEnie, but you will be able to send and receive electronic mail, join special interest bulletin boards (called roundtables), and engage in real-time computer conferencing. These services are standard fare on other on-line networks, but GEnie's are a little better than most, and the user manual is one of the best around.

Low cost is the big story behind GEnie. At $5 an hour for non-prime-time access plus a sign-up fee of only $18 (compared to as much as $50 for the competition), the service may force other vendors to reconsider their pricing.

Although GEnie is new, with a low activity level and only a fraction of its competitors' services, it is well worth checking out. Most of the roundtables deal with technical topics such as the IBM PC, the Amiga, Tandy computers, and PC data base software. Many roundtables contain libraries of public domain and freeware programs. You can use the XMODEM error-checking protocol to upload and download programs. For several months this spring, GEnie stopped charging users for time spent uploading material into the roundtable libraries, an experiment that GEISCO's management is considering making permanent.

The most popular roundtable is Scorpia's Game Roundtable, where people can engage in fantasy role-playing games. Scorpia, well known in the computer gaming world for her articles and reviews, ran a special interest group for several years on CompuServe. Her gaming group is one of the best roundtables on any system, offering more fantasy games than the present GEnie population can support.

Beyond roundtables, the list of services is short but growing. GEnie offers several excellent on-line games, many designed by Bob Maples, a top computer game designer. Also provided is the ISIS (Internationally Syndicated Information Services) electronic news wire, which carries synopses of stories from leading industry newsletters. GEnie publishes an on-line magazine called *Computing Today*, which carries news of the microcomputer industry and reviews of new products.

In the electronic-yard-sale section, members can sell or trade items. However, GEnie lacks large-scale electronic shopping, on-line travel reservations, and many other interactive services available from the competition.

When you enter command mode, GEnie's solid design becomes apparent. Here you can avoid the menus and move directly from one service to another by typing *M* followed by the proper page number. Add a comma, and you can specify a selection from the menu of the page you are going to. For example, if you want to read your mail, type *M200,2*. The next screen you see will be your first incoming message. GEnie also uses plain English commands to access many services—another way to check your

(continues)

Get the Picture with COLORPHOTOBASE

PHOTOBASE™

PHOTOBASE is a software package that works with data base management systems such as: dbase II*, R:Base 4000* and the IBM Filing Assistant*.

PC-EYE™

PC-EYE is a high speed, high resolution video digitizer board that lets you capture anything you can see.

Now you can open up a whole new dimension in data base applications by merging real-life color pictures with popular data base management systems. Pictures of people, products, diagrams, maps, company logos — whatever you want to photograph — can be integrated with your data base. Consider these typical applications:

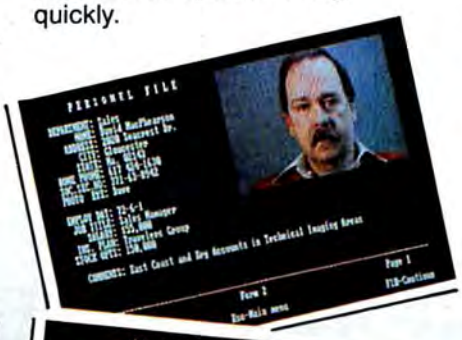
Security — verify those employees who have authorized clearance to limited access areas. A data base containing employee pictures and personnel records can be searched and displayed for visual verification.

Real Estate — add pictures of houses to on-line real estate listings for faster property identification and improved sales presentations.

Electronic Cataloging — pictures of products can be combined with a data base system containing product specifications, pricing, availability and much more.

Medical Files — Existing data base systems containing patient histories can incorporate pictures of x-rays, cell slides and external body disorders. The ability to visually inspect previous medical problems of patients can greatly enhance the speed and accuracy of future diagnosis.

Customers, distributors and sales personnel can quickly search data and view the resulting product/ picture information on one screen. Files can be updated easily, quickly.



It's Easy

With a simple keystroke, pop-out of your data base system and into the PHOTOBASE menu. Capture images of text, photos, artwork and 3-dimensional objects with an ordinary video camera and our high resolution PC-EYE™ video digitizer. Pop back into your data base system and add the picture name to your data base like you would any other piece of information. The full functionality of the data base system is preserved, but the resulting display is text and picture information on one screen.

Pictures are displayed in the upper right quadrant of the screen or at a full screen resolution of 320 x 200 with 256 optimized colors. Screen display can alternate with text, images, or both simultaneously viewed.

Call or write and we will send you information on PHOTOBASE, PC-EYE, compatible cameras and other imaging equipment in the Chorus Family of products.

(603) 424-2900 or 1-800-OCHORUS.

TM PHOTOBASE and PC-EYE are trademarks of CHORUS Data Systems.
*dBase II is a trademark of Ashton-Tate; R-Base 4000 is a trademark of Microrim, Inc.; IBM Filing Assistant is a trademark of International Business Machines Corporation.

CHORUS

CHORUS Data Systems, Inc., 6 Continental Blvd., P.O. Box 370, Merrimack, New Hampshire 03054

Circle 935 on reader service card

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-30 DAY SOFTWARE RENTALS†...

Every few months, *The NETWORK* saves its members more than $24,000,000 and processes over 100,000 orders.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns *including some of the most important names in the computer industry:*

AT&T	*General Motors*
Barclays Bank	*Gillette*
Bell & Howell	*Hewlett Packard*
Citibank	*Hughes Aircraft*
Columbia University	*IBM*
Data General	*ITT*
Exxon	*Kodak*
Farm Bureau Insurance	*United Nations*
Frontier Airlines	*University of Illinois*
General Mills	*Yale University*
General Electric	*Veteran's Administration*

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and value-wise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE 1-800-621-S-A-V-E

(Orders—Membership and Advice!)
In Illinois call (312) 280-0002
Your Membership Validation Number W276

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS.
Our knowledgeable sales consultants are on duty Mon.-Fri. 8:00 AM to 7:00 PM, Sat. 9:00 AM to 5:00 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio Street
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!
Customer Service and Order Status (312) 280-1567
8:30 AM to 4:30 PM, Mon.-Fri. CST

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and send my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT," a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

276 ☐

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✓) all boxes that apply.

Basic Membership with 14 Day Rentals

- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l. per year—with 14 day rentals
- ☐ Games Software Rental Library for $10 add'l. per year

Special V.I.P. Membership* with 30 Day Rentals

- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l. per year—with 30 day rentals

*VIP members receive advance notice on limited quantity merchandise specials

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Exp. Date ____ (mo) ____ (year)

☐ Check or money order enclosed for $____

Name ____

Address ____ Apt. No. ____

City ____ State ____ Zip ____

Telephone ( ) ____

Please provide the following information to insure compatibility with your system (check all boxes that apply):

☐ IBM-AT ☐ APPLE *IIe* ☐ APPLE *IIc* ☐ APPLE *II+*
☐ IBM PC ☐ MACINTOSH ☐ LISA ☐ APPLE III

☐ **Other:** ____

Signature ____
(Signature required to validate membership)

Copyright © 1985, PC NETWORK INC

Listed below are just a few of the over 30,000 products available at our EVERYDAY LOW PRICES!

GAMES & EDUCATIONAL SOFTWARE

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Bluechip *Millionaire, Oil Baron or Tycoon*	$19.75*
Broderbund *Ancient Art of War*	22.75*
Broderbund *Lode Runner*	17.25*
CBS *Goren-Bridge Made Easy*	40.00*
CBS *Mastering the SAT*	50.00*
CDEX *Training for Word Star*	37.25*
Comprehensive *Intro to Personal Computing*	26.50*
Davidson *Math Blaster, Word Attack!*	21.50*
Hayden *Sargon III*	29.75*
Individual *Professor DOS*	29.75*
Individual *The Instructor*	24.50*
▶ **Infocom** *Zork I or Witness*	19.75*
▶ **Infocom** *Deadline or Suspended*	24.00*
Microsoft *Flight Simulator*	$27.00*
Mousa Systems *PC Paint-Turn your PC into a Color Macintosh!*	59.95*
Scarborough *MasterType*	19.75*
Sierra On-Line *King's Quest II*	24.75*
Spectrum Holobyte *GATO*	18.00*
▶ **Spinnaker** *Alphabet Zoo, Kinder Comp, Story Machine, Face Maker, Hey Diddle Diddle, Rhymes & Riddles*	15.25*
▶ **Spinnaker** *Delta Drawing*	20.75*
▶ **Spinnaker** *Most Amazing Thing*	20.77*
Sublogic *Night Mission Pinball*	19.25*
Sublogic *Jet*	27.50*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

ATI *How to Use Microsoft Word*	31.25*
ATI *How to Use Lotus 1-2-3*	37.25*
▶ **Ashton-Tate** *DBase III+*	345.00*
▶ **Ashton-Tate** *Framework II*	365.00*
Borland *SideKick (Protected)*	24.50*
Borland *Turbo Pascal*	39.00*
Borland *Turbo Pascal 8087*	34.00*
Borland *SuperKey*	51.00*
Breakthrough Software *Time Line 2.0*	203.00*
Central Point *Copy II PC*	18.25*
Conceptual Instruments *Desk Organizer*	47.00*
Digital Research *DR Logo*	75.00*
Digital Research *Gem Desktop*	25.00*
Digital Research *Gem Draw*	117.00*
Enertronics *Energraphics*	143.00*
Funk Software *Sideways*	32.00*
Harvard *Harvard Project Manager*	175.00*
Harvard *Harvard Total Project Manager*	225.00*
Hayes *Smartcom II—New VT 100 Emulator*	68.00*
Human Edge *The Management Edge*	24.00*
▶ **Human Edge** *The Sales Edge*	24.00*
Human Edge *Mind Prober*	24.00*
Infocom *Cornerstone*	65.00*
Lifetree *Volkswriter III*	126.50*
Lotus *Lotus 1-2-3*	262.00*
MicroPro *Wordstar 2000*	$209.00*
MicroRim *R Base 5000*	285.00*
Microsoft *C Compiler*	205.00*
▶ **Microsoft** *Word—Latest Version 2.0*	197.50*
Microsoft *Multiplan*	101.00*
Monogram *Dollars & Sense*	85.00*
Mosaic *The Twin*	75.00*
▶ **Multimate** *Multimate (Latest Version)*	180.00*
Multimate *Multimate Advantage*	270.00*
NuBS *Knowledgeman/2*	229.00*
▶ **Meca** *Managing Your Money*	84.00*
Open Systems *A/R INV G/L A/P JobCost*	ea.275.00*
Power Base *Power Base*	155.00*
Real World *G/L A/P A/R P/R or OE/INV*	ea.350.00*
Rosesoft *ProKey Version 4*	65.00*
Ryan McFarland *RM COBOL (Dev. System)*	520.00*
Samna *Samna + Word Processor*	340.00*
Satellite Software *Word Perfect*	180.00*
Softcraft *Fancy Fonts*	125.00*
Softstyle *SET-FX*	35.00*
Software Group *Enable*	293.00*
Software Publishing *PFS: File, Write, Graph*	68.00*
Software Publishing *PFS: Report*	59.50*
Sorcim *Supercalc III*	169.00*
Xanaro *Ability*	247.50*

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh Base System*	CALL	
Apple *Apple IIc*	CALL	
Apple *Apple IIe*	CALL	
AT&T *6300 PC CPU2 128K/2 Floppy/1 Serial/1 Parallel*	$1,575.00*	*(34.02)*
Columbia *Desktop Systems*	CALL	
COMPAQ *Hard Disk20MB Portable/1 Floppy w/256K*	1,999.00*	*(43.18)*
COMPAQ *DeskPro Hard Disk 10MB w/256K 1 Floppy*	1,940.00*	*(41.90)*
▶ **IBM** *PC Base System 2 DS DD-FDC w/256K*	1,159.00*	*(25.03)*
▶ **IBM** *PC Professional 20MB Hard Disk*	1,499.00*	*(32.38)*
IBM *PC/AT All Configs*	CALL	
IBM *PC/AT Base Unit 1.2MB Floppy w/256K*	2,875.00*	*(60.37)*
Texas Instruments *Professional*	CALL	

DISK DRIVES & CONTROLLERS

IOmega *Bernoulli Box/Dual MB Drives*	$2,100.00*	*(45.30)*
▶ **PC Network** *10Mb Internal 1/2 Height Autoboot Drive by Seagate or Shugart*	340.00*	*(7.40)*
▶ **THE "20MB** *20MB Internal 1/2 Height Drives by Seagate or Microscience*	395.00*	*(9.07)*
PC Network *10MB Tape Backup Same Unit used in Compaq's DeskPro*	340.00*	*(9.48)*
PC Network *20MB Tape Backup Half Height w/controller*	495.00*	*(10.69)*
▶ **PC Network** *Half Height 5¼ DD-DD drive*	89.00*	*(2.36)*
▶ **Tandon** *TM 100-2 Full Height DS/DD Drive*	120.00*	*(1.73)*
Tallgrass *25MB External Hard Disk*	2,250.00*	*(48.60)*

MEMORY CHIPS

All chips guaranteed for life

▶ **64K Memory Upgrade Kits** *(8 chips)*	$9.00*	*(1.00)*
▶ **64K Dynamic Ram Chips** *(Each)*	1.00*	*(1.00)*
▶ **256K Dynamic Ram Chips** *(Each)*	2.90*	*(1.00)*
▶ **128K AT Mother Board Chips** *(Each)*	5.50*	*(1.00)*

MODEMS

▶ **Hayes** *Smartmodem 2400*	$525.00*	*(5.00)*
Hayes *Smartmodem 1200B with new Smartcom II VT 100 Emulator*	305.00*	*(2.50)*
Hayes *Smartmodem 1200B Alone*	265.00*	*(2.50)*
Hayes *Smartmodem 1200*	340.00*	*(5.00)*
Prometheus *Promodem 1200*	247.00*	*(6.00)*
U.S. Robotics *Courier 2400BPS Modem*	345.00*	*(5.00)*

ALL THE "MODEMS ARE 100% HAYES COMPATIBLE

THE "1200 C...n External	129.00*	*(5.00)*
THE "1200 Com Internal	119.00*	*(5.00)*
THE "2400 Com External	277.00*	*(5.00)*

MONITORS

Amdek *Video 310A Amber TTL Monitor*	$130.00*	*(3.00)*
Amdek *Color 500 High Res RGB Monitor*	365.00*	*(7.88)*
Amdek *Color 722 NEW! Enhanced*	440.00*	*(9.29)*
Magnavox *Amber IBM Type TTL Monitor*	79.00*	*(5.00)*
NEC *JC-1401 Multisync RGB Color Monitor*	525.00*	*(11.34)*
Princeton *HX-12 RGB Monitor*	387.50*	*(8.37)*
Princeton *HX-12E RGA or EGA Monitor*	445.00*	*(9.83)*
Princeton *MAX-12E Supports Either Mono or RGB Cards*	132.00*	*(5.00)*
Princeton *SR-12 Ultra High Res RGB*	CALL	
Quadram *Quadchrome II NEW! 640x200 RGB w/14"Screen Black Phosphor Mask IBM Case*	289.00*	*(6.24)*
Taxan *630 High Res RGB Monitor*	383.00*	*(8.27)*
Taxan *640 Highest Res (720x400) Currently Available—Works with Persyst BOB Card*	439.00*	*(8.27)*
Zenith *ZVM-1230A Green High Res Non Glare*	81.00*	*(2.50)*

MULTIFUNCTION CARDS

Apparat *AT Ram Expansion card*	$139.00*	*(2.50)*
▶ **AST** *SixPakPlus with 64K*	140.00*	*(2.50)*
AST *10 Plus II "*	120.00*	*(2.50)*
▶ **AST** *Advantage for AT*	325.00*	*(2.50)*
▶ **THE "** *512K Memory Board w/OK*	65.00*	*(2.50)*
▶ **THE "Multi 384** *A functional clone of the AST's "SixPakPlus." Includes up to 384MB of expansion memory, 1 serial, 1 parallel, 1 game port, a clock/calendar and 3 software standard*	72.00*	*(1.70)*
▶ **THE "Multi I/O** *I/O Plus Clone Sw/Par/Game/Clock Standard*	60.00*	*(2.50)*
Quadram *Improved Quadboard w/OK*	170.00*	*(2.50)*
Tecmar *Captain Multifunction Card O/K*	109.00*	*(2.50)*

PRINTERS

Citizen *MSP-10 NEW! 160CPS/80COL/Fric + Trac*	$225.00*	*(4.86)*
Citizen *MSP-15 NEW! 160CPS/132COL/Fric + Trac*	315.00*	*(6.80)*
Citizen *MSP-25 NEW! 200CPS/132COL/Fric + Trac*	435.00*	*(9.40)*
Citizen *Premiere 35 NEW! 35CPS Daisywheel/132COL/Fric + Trac*	360.00*	*(7.78)*
Epson *LX-80 100CPS 80COL LQ Model*	199.00*	*(4.30)*
Epson *FX-85*	299.00*	*(6.46)*
▶ **Epson** *+ K 286 NEW! 200CPS 40CPS NLQ*	459.00*	*(9.91)*
▶ **Epson** *LQ-1000 NEW! 180CPS 60CPS NLQ*	CALL	
NEC *2050 20CPS Letter Quality Printer*	570.00*	*(11.88)*
NEC *3530 33CPS LQ Printer*	690.00*	*(14.90)*
NEC *3550 33CPS Letter Quality Printer*	690.00*	*(14.90)*
NEC *8850 55CPS Printer*	920.00*	*(19.87)*
▶ **Okidata** *ML 182 NEW! 120CPS LQ Model Fric/IBM Graphics and more*	188.00*	*(4.06)*
▶ **Okidata** *ML 192 NEW! 160CPS LQ Sleek Design/Fric/IBM Graphics*	299.00*	*(6.45)*
▶ **Okidata** *ML 193 NEW! 160CPS LQ Sleek Design/Fric/IBM Graphics*	425.00*	*(9.18)*
Qume *Sprint 11/40 40CPS Letter Quality*	1,155.00*	*(24.00)*
Qume *IBM Cable and Interface (required)*	72.00*	*(1.00)*
Texas Instruments *855 DP,LQ w/tractor*	550.00*	*(11.88)*
Toshiba *NEW! P341 210CPS/132COL*	699.00*	*(15.01)*
Toshiba *NEW! P351 288CPS/132COL*	926.00*	*(20.00)*

VIDEO CARDS

Hercules *Color Card w/Parallel Port*	$142.00*	*(2.50)*
Hercules *Monochrome Graphics Cards*	263.00*	*(2.50)*
Paradise *New Modular Graphics Card*	219.00*	*(2.50)*
THE "Plus *EGA Clone*	269.00*	*(2.50)*
▶ **THE "Plus Mono** *includes Mono Card, Light Pen, 100% Hercules Compatible!*	79.00*	*(2.50)*
▶ **THE "** *Clone Card*	60.00*	*(2.50)*
Persyst *BOB Card Ultra High Res Color Card with Mono Quality Text in Color*	299.00*	*(2.50)*
STB *The Chauffer Color & Mono Card Runs Color Software in Monochrome with No Special Drivers!*	239.00*	*(2.50)*

ACCESSORIES AND SUPPLIES

▶ **Brand Name DS/DD Diskettes** *Guaranteed for Life! Not Generic*	$8.95*	*(1.00)*
▶ **DS/DD Bulk Pack Special** *Packaged in 5¼ with sleeves and labels. Guaranteed for Life!*	ea. .59*	
▶ **PC Network** *Replacement 130 Watt IBM PC Power Supply—Gives you PC (Old or New) the same capacity as an XT. Good for add in tape drives (without need for a piggyback unit) and large capacity disk drives!*	79.00*	*(2.75)*
SMA *PCDocumate Keyboard Templates for Lotus/DBase/Multimate and others*	ea. 9.99*	*(1.00)*
Sony *DS/DD Diskettes*	15.95*	*(1.00)*
Sony *AT High Density Diskettes*	39.95*	*(1.00)*
WP Printer Paper *2600 Sheets Microfine Perfs (invisible when torn)*	17.00*	*(10.00)*

***PC NETWORK Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Minimum shipping $2.50 per order. International orders call for shipping & handling charges. Money Orders, personal and company checks please allow 10 working days to clear. All prices subject to change.

†RENT BEFORE YOU BUY — Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 14 (Regular) or 30 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—JUST 20% OF THE MEMBER WHOLESALE PRICE. **We feature over 1,000 available titles in IBM/Apple/MAC and CP/M Formats.** Prices subject to change without notice.

COMPLETE SYSTEMS
(Optional local warranty service available in most major metro areas)

IBM PC BASE SYSTEM

IBM PC w/256K
Floppy Drive Controller
2 Double Sided Double Density Disk Drives
Mix and Match with your Favorite Monitor and Printer!

$1,159.00*

CUSTOM CONFIGURATIONS WELCOME

IBM PC HARD DISK SYSTEM

IBM PC w/256K
Floppy Drive Controller
1 Double Sided Double Density Disk Drive
Half Height Hard Disk

w/20MB
$1,499.00*

CALL FOR LATEST IBM ANNOUNCEMENTS

PORTABLE HARD DISK SYSTEM

256K/1 Floppy/Hard Disk

COMPAQ™

$1,999.00* w/20MB

call for 10MB

DESKPRO SYSTEM

256K CPU/1 Floppy/Hard Disk

$1,940.00* w/10MB

$2,025.00* w/20MB

Wholesale Prices Change Rapidly...if you ever see a lower price advertised anywhere please call! You will find the Network's Price will always be the best!

64K IBM PC MEMORY EXPANSION KITS

Quantity Discounts Available.
Guaranteed for Life!

Set of 9 Chips **$9.00***

DISKETTES

Guaranteed for Life!

Brand name diskettes available in boxes of 10 or in bulk packs of 50

5¼ DS/DD
Bx. 10 **$8.95***
Bx. 50 ea. **.59***

5¼ SS/DD
Bx. 10 **$7.95***
Bx. 50 ea. **.47***

1/2 HEIGHT DS/DD DISK DRIVES

The Network buys direct and makes fantastic deals with manufacturers like Tandon/CDC/Shugart/Qume/TEAC/Hi-Tech and others to bring you fantastic prices on Name Brand drives for your PC/AT/XT/or Compatible

$85.00*

Quantity Discounts Available

INTERNAL PC HARD DISK

Low Power/Automatic Boot. Works on standard PCs and Compatibles. Includes drive/controller/cables/mounting hardware and instructions.

10MB **$340.00***

20MB **$395.00***

Quantity Discounts Available

Lotus™ **$262.00***

WordPerfect **$180.00***

MultiMate™

NEW from the Network

*Members pay 8% above this wholesale price plus shipping.

CALL TOLL FREE **1-800-621-S-A-V-E** (orders and memberships)

In Illinois call **(312) 280-0002** Validation code: W276

Customer Service and Order Status (312) 280-1567

TM & R - Registered trademarks of IBM/COMPAQ/APPLE/AST · Research/LOTUS/MultiMate Int /IOMEGA

PC NETWORK

. . . WITH THESE 15 UNIQUE BENEFITS

1 COST + 8% PRICING — The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 600 PAGE WHOLESALE CATALOG — Members receive our 600 page wholesale catalog containing over 30,000 hardware and software products for the *IBM PC, APPLE* and over 50 other popular computer systems. **THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY. NOW UPDATED QUARTERLY!**

3 IN-STOCK INSURED FAST HOME DELIVERY — The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. **EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.**

4 10 DAY RETURN POLICY — **If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.**

5 MEMBERSHIP SATISFACTION GUARANTEE — If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS — The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED — WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

7 FREE TECHNICAL SUPPORT — The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT — FREE!**

†**8 OPTIONAL BUSINESS RENTAL LIBRARY** — All members can join our BUSINESS RENTAL LIBRARY ***featuring over 1000 available titles*** for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNT PRICE FOR A 14 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 30 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†**9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY** — The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS — THE PRINTOUT — Issued Quarterly at no charge to Network members only! The Printout contains all the New Product listings and price changes you need to keep your Catalog up to date. Also, we buy excess dealer inventories, and store bankruptcy closeouts, which we turn around and make available to our members at fantastic savings via *THE PRINTOUT*.

11 DISCOUNT BOOK LIBRARY — Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS — Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM — Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left)*. The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS — For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 *ONLINE*™ BULLETIN BOARD — Download "Freeware" from the nation's largest single concentration of Public Domain software available! Get tied into the nation's largest technical information network! Place orders, get tech support or contact customer service from the Network's *OnLine*, "not just a bulletin board but a complete customer information network.

Simply put: THE™ highest quality and best value in computer products anywhere.

THE™ commitment to our customers is compatibility, quality, value, service and support

THE™ backs every product with a

45 DAY MONEY BACK GUARANTEE

and a

FULL 1 YEAR PARTS AND LABOR WARRANTY

THE™ MULTI 384

This multi-function card features 0-384K memory, a serial port for communication, a parallel printer port, a clock/calendar with battery backup, and a software bonus which includes RAMdisk and other utilities. Retail $155.00

$72.00* Special Wholesale Price

THE™ COLOR CARD

100% compatible with the IBM™ colorcard with display modes of 80x25 alphanumeric and 320x200 graphic. Retail Price $105.00

Special Wholesale Price **$60.00***

THE™ 576K MEMORY +

Supports 0-576K of available memory and is compatible with all IBM™ PC's. Retail Price $66.00

Special Wholesale Price **$37.00***

THE™ PRINTERFACE

Supports all text and graphics features and is fully compatible with third party software. Retail Price $29.00

Special Wholesale Price **$18.50***

THE™ MODEMS

100% Hayes compatible

THE™ 1200 COM EXTERNAL

This self-testing 1200 BPS modem comes with auto answer, auto dial, auto redial and a built-in speaker. Retail Price $275.00

Special Wholesale Price **$129.00***

THE™ 1200 COM INTERNAL

Features auto answer, dial and redial, with a built-in speaker, RS 232-C serial port and PC Talk III. Retail Price $255.00*

Special Wholesale Price **$119.00***

THE™ 2400 COM EXTERNAL

Eight times the speed of a 300 BPS unit makes this 2400 Baud modem truly affordable, and we've made it truly compatible. With auto answer, auto dial, auto redial, and a built-in speaker with volume control. Retail Price $519.00

Special Wholesale Price **$277.00***

THE™ H720 MONO

This monochrome graphics card with printer port features 100% IBM™ and Hercules™ compatibility, at a fraction of their prices. Retail Price $155.00

$73.00* Special Wholesale Price

THE™ 20MB HARD DISK

Featuring a half height IBM™ PC compatible internal 20MB disk drive, controller card, connecting cables and installation manual. Retail Price $675.00

Special Wholesale Price **$395.00***

THE™ MULTI I/O

Feature for feature, **THE**™ matches the AST™ I/O + and comes up a winner, with serial/parallel and game ports standard, (a second serial port optional), a clock/calendar, RAMdisk and print spooler. Retail Price $110.00

$60.00* Special Wholesale Price

THE™ 2MB RAM

This Intel™ spec board will give you up t 2MB's of expanded memory. Enough to run memory intensive software such as Framework, Symphony and Microsoft™ Windows. w/OK. Retail Price $225.00

Special Wholesale Price **$129.00***

THE™ EGA PLUS

With 256K and parallel port is ideal for high resolution graphics display of Microsoft Windows,™ AutoCAD,™ and other graphic software. IBM™ EGA compatible. Retail Price $485.00

Special Wholesale Price **$240.00***

*All Items Subject to Availability – Prices Subject to Change
TM – Registered Trademarks of IBM/Ast Research/ Microsoft/Hercules/Hayes

Thompson, Harriman and Edwards Compute

THE™

Thompson, Harriman and Edwards Computer Products Company Ltd.

THE™ PC + COMPUTER

THE™ PC + is compatible with all business, professional and personal software written for the IBM™ PC. It will also enhance your productivity with its ability to switch to an 8 megahertz clock rate, enabling you to run your software twice as fast as the IBM™ PC. **THE™ PC +** also comes standard with an "AT" style keyboard, correcting the inefficiencies found by IBM™ on their regular PC keyboard. 640K standard on the mother board will allow you to run memory intensive programs such as Lotus 1-2-3, DBase III and Framework without adding extra memory cards. Plenty of power, with a 135 Watt source and lots of room for expansion with 8 card slots is also standard. Base unit includes: 640K RAM, Computer with One 360K 5¼" Floppy Drive, Dual Turbo Clock Speed, 8 Expansion Slots, 135 Watt Power Supply, "AT" Style Keyboard, Full 1 Year Warranty and 45 Day Money Back Guarantee!

Retail Price $829.00

Special Wholesale Price

$469.00*

(Monitor Not Included)

THE MOST INCREDIBLE LIMITED TIME OFFER IN COMPUTER HISTORY, FROM THE™ and PC NETWORK...

THE™ PC+

640K RAM, IBM™ PC compatible, 360K 5.25" Disk Drive, Turbo Speed, "AT" Style Keyboard

All **THE** products in this special sale are offered thru

PC Network

*All prices in this ad are wholesale—PC Network Members pay wholesale + 8% and shipping.

CALL TOLL FREE W286

(800) 621-SAVE

In Illinois (312) 280-0002

Special Wholesale Price

$469.00*

Products Company Ltd.

Dealer Inquiries Call **THE™** at (312) 642-9626
319 West Ontario Street, Chicago, Illinois 60610

Circle 460 on reader service card

mail is to type *read* at any system prompt.

GEnie's roundtable command mode is particularly powerful. It allows you, for instance, to read all the new items nonstop. At the end of each topic a prompt asks if you want to reply, continue with the next category, or quit. At any prompt in the roundtable you can select a specific category and topic to either read or reply to; read specific messages identified by number, author's name, or date; or search for messages containing a specific character string.

The real-time conferencing system also has a well-designed command set that includes options for talking privately with someone during a conference, communicating in code, and squelching comments from particular attendees.

GEISCO has built a solid foundation upon which GEnie can grow, and it appears to be doing so by leaps and bounds. One of the giants in corporate communications, GEISCO is a worldwide packet-switching network offering a range of applied teleprocessing services, some of which could be ported to GEnie. GEISCO has the market clout to attract leading third-party electronic service providers to GEnie and give its fledgling service the technical and financial resources to survive in the highly competitive on-line environment. The question is whether GEISCO will really commit itself to GEnie or simply regard it as an experiment. So far, GEISCO seems prepared for the long haul as it "hothouses" its new baby into the dangerous jungle of the on-line marketplace.

–G. Berton Latamore

GEnie
General Electric Information Services Co.
401 N. Washington St.
Rockville, MD 20850
800/638-9636 ext. 21
Cost: sign-up $18; access charges non-prime-time 300 or 1200 bps $5/hour, 2400 bps $15/hour; prime-time 300 or 1200 bps $35/hour, 2400 bps $45/hour; no monthly fee

Trends

Interrogation by AT

The next time you apply for a job, you may find yourself being interviewed over the telephone by a PC AT. More than 200 companies already screen potential employees using a computerized interview system developed late last year by Telecomputer Interviewing Services (TIS) of San Francisco.

The company claims that applicants will be more honest in responding to computerized interviews than they would talking to a human. "Research indicates that people provide more sensitive information about themselves to a computer than to a stranger," states Robert Clouse, vice president of research and development at TIS and a polygraph (lie detector) expert. The company has conducted more than 10,000 computer interviews so far.

Client companies are given an access code, a password, and a toll-free TIS telephone number. A personnel official uses a touch-tone phone to call TIS, then logs on and hands the phone to the interviewee. The job applicant answers 150 questions in 20 minutes by pushing one of three buttons on the phone.

Telecomputer's system is built around two IBM PC AT computers and custom software developed by the company's programmers. One AT answers incoming calls, verifies customer access codes, scores the interviews, and directs the second AT, which conducts the interview using a digitized speech board.

A preemployment interview costs $15 to $28, depending on the client's annual volume of business. Clients that conduct more than 5000 interviews a year can save about 25 percent by buying a Portable Interview Processing Unit, which includes an AT with custom software and a digitized speech board.

Clouse says many employers use the tests to probe into alcohol and

(continues)

Can cut disk access time in half

Makes Your IBM PC LIGHTNING™ Fast!

$89.95 unprotected

$49.95, copy protected version with some limitations

Loads with the DOS — always ready as a background program (like Sidekick) to accelerate disk access. You do nothing — everything is automatic.

You are going to be so amazed when you start to work with ***LIGHTNING***™ installed. Most programs that frequently access the disk (hard disk or floppy) are made instantly faster — up to 2 to 4 times faster.

It is so easy to install and you never have to do anything again; it does it all for you — like lightning.

Disk instensive programs (like databases) can run 2 to 4 times faster.

LIGHTNING™ comes to you on a diskette. You simply load it onto your DOS diskette if you are using floppies, or if you have a hard disk, into the DOS area. Simple A-B-C instructions let you get it started the first time in five minutes. Then it is always ready, working automatically in the background any time you boot up. (The copy protected version is a "key diskette" and doesn't boot with the DOS.)

What's it like to use it? If you have ever worked with or seen a RAM Disk you know what a difference speed can make when working with any program that frequently accesses the disk. Well, ***LIGHTNING***™ enables those programs to approach the same rapid speed as a RAM Disk, but it does it without the disadvantages. With a RAM Disk there is a constant danger that you can lose your precious data if you forget to copy it back to the disk drive. With ***LIGHTNING***™ you just use your programs normally. You don't have to remember anything.

LIGHTNING™ has a fun feature that shows you just how fast you're operating. Any time you want, with a couple of keystrokes you can see a screen that keeps a record of how many times you've accessed the disk, and how much time ***LIGHTNING***™ has saved you. It's fun to check it out, and it's always astounding. Speed-up varies, depending on your application, frequency of disk access, and amount of RAM you can allocate. For example, best results occur with indexed databases.

When you work with a database program or most word processors, or any time you need to frequently load files into RAM or save them back, you are accessing your disk. It is such a pleasure to cut those times often in half and up to one-fourth.

Spreadsheets can speed up their loading and saving. Recalculation speed is not affected.

Another plus — ***LIGHTNING***™ fully exploits Above Board™ memory for PC's with that addition.

PCSG since early 1983 has dominated the lap portable market with ROM software such as Lucid spreadsheet and Write ROM that reviewers rated as excellent. We are proud to enter the IBM PC market with ***LIGHTNING***™. It's a great product that we not only enjoy offering, but enjoy using on our own PC's. It will support IBM PC, XT, and AT.

If you have an IBM PC or clone and don't have *LIGHTNING*™, we simply have done a poor job explaining it to you.

This is an exciting program. A typical comment from ***LIGHTNING***™ users is "I don't know how I ever did without it."

PCSG provides hotline support for the IBM PC.

(214) 351-0564

PERSONAL COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd., #206, Dallas, TX 75229

MC, Visa, American Express, Check, or C.O.D.

© PCSG

LIGHTNING™ PCSG 1985
Sidekick™ Borland Int.
Above Board™ Intel Corp.

Circle 236 on reader service card

NEW!

SafeSkin™
KEYBOARD PROTECTOR
Remains in place during keyboard use. Prevents damage from liquid spills, dust, ashes, etc. Fits like a second skin, excellent feel. Available for: IBM-PC, AT, Apple (all), Compaq, Model 100, NEC 8201, C64, Zenith 150, DEC, Kaypro, KB5151, AT&T 6300, WYSE 50 and many others, Send $29.95, check, M.O., Visa & MC include exp. date. Specify computer type. Dealer inquiries invited. Free brochure avail.
Merritt Computer Products, Inc.
2925 LBJ Fwy. #180 / Dallas, Texas 75234
(214) 339-0753
Circle 639 on reader service card

maxell.
5¼" SS/DD $.64
OTHER BRANDS AS LOW AS $.54
BULK DISKETTES-QUANTITIES OF 500 with TYVEK SLEEVES
RIBBONS (All Brands)
EPSON MX 70/80 $4.20
Prices based on quantities of 48
C.O.D. C.O.D.
800-222-0490
201-462-7628 In N.J.
MEGAsoft P.O. Box 710, Freehold, NJ 07728

Flow Charting II™
FAST. SIMPLE. SPECIFIC.
Now build, update and print process flow and organizational charts easily, confidently.
- Readjust chart immediately after addition or deletion
- Travel quickly across a 120 or 200-column screen
- Move a single character or half a chart - instantly.

Present the true, current picture. Use Flow Charting II on your IBM®-PC compatible system. General Motors, Bechtel, Touche Ross, Fairchild and 500 other major US corporations use it.
1-800/672-3470, ext. 897 Calif.
1-800/538-8157 ext. 897 National
408/629-5044 International
PATTON & PATTON
340 Lassenpark Circle
San Jose, CA 95136
IBM is a registered trademark of International Business Machine Corp.
Circle 388 on reader service card

drug use, something most job applicants will not admit in face-to-face interviews. To keep interviewees off-balance, the TIS system gives them only 3 seconds to respond to each question.

To check for accuracy, the computer asks similar questions at different points during the interview. For instance, it might ask if the applicant has used illegal drugs in the past year and later inquire if he or she has smoked marijuana in the past month.

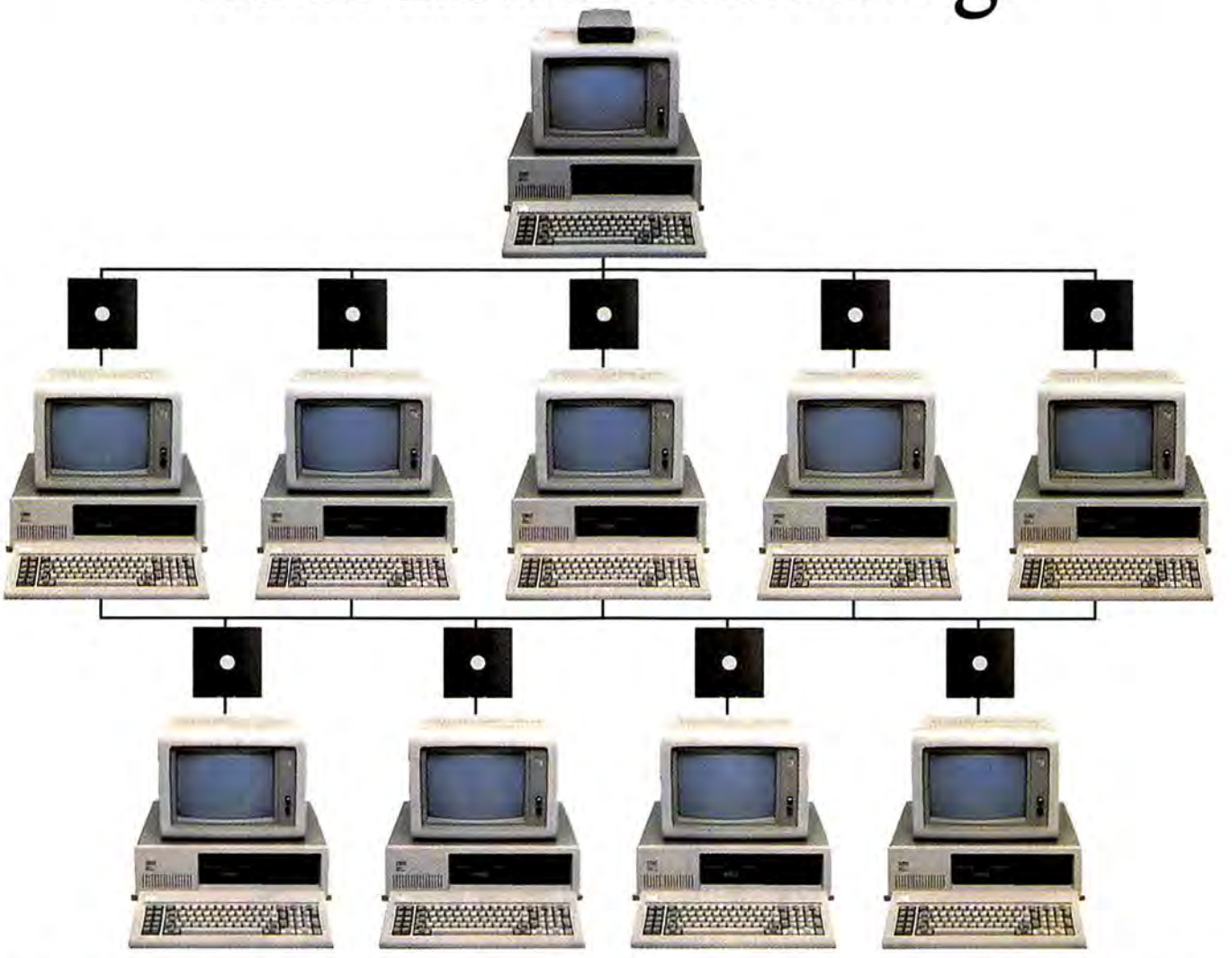
Two minutes after the interview, the employer can call TIS for the results. In a digitized voice, the AT will rate the applicant in productivity, attendance, honesty, and social behavior. TIS also gives an accuracy rating, based on the consistency of the applicant's answers. The computer can even inform employers if an applicant made a significant admission during the interview, such as the theft of more than $100 in the past year.

Although at least one union has already raised questions about the TIS interview's invasion of privacy, Clouse insists the test is not designed solely for the benefit of employers. "Our real goal is to inject some objectivity into the personal interview," says Clouse. He points out that no question used in the interviews is illegal. (After conducting legal research in all 50 states, TIS changed about 70 percent of the interview questions in a prototype interview.)

TIS only provides scores and does not approve or disapprove of job applicants. The company also insists its computer interview should serve as an adjunct to rather than a replacement for human personnel interviews. But while interviewing by touch-tone phone may not be as Draconian as some measures intended to catch drug abusers, the practice nevertheless turns at least part of a job interview into a menacing interrogation rather than a friendly chat. *–John Eckhouse*

Wes Nihei is the Editorial Assistant for PC World. *G. Berton Latamore is a writer based in South Burlington, Vermont, and the editor of* VideoPrint, *a videotex industry newsletter. John Eckhouse is a business correspondent for the* San Francisco Chronicle.

If you can't put a Hayes modem on every PC in your IBM network, here's the next best thing.



© 1986 Hayes Microcomputer Products, Inc.

*Manufacturer's estimated retail price.

It's new communications software from Hayes called Smartcom II® for the PC Network.

It lets you share modems. So even PC s without their own modems can communicate outside the network.

Before now, if you needed to communicate outside the network, you had to physically go to wherever the modem was. That, in turn, meant bumping the operator off his modem-equipped PC, so that you could handle your communications.

Hayes Smartcom II for the PC Network puts an end to all the delay and inconvenience. Now, when a PC needs the modem, the user is automatically connected from his own desk. So communications capabilities are immediately available to everyone on your network, whether their PC has a modem or not.

You only buy one software package per modem. The workstation part of the software can then be duplicated for each PC on the network, at no extra cost. It's better than having a site license!

Each PC can have its own password, define its own log-on procedures, set its own macros, and use all the other outstanding operating features of our standard Smartcom II while connecting with any of the shared modems on the network.

You get all this for only $599*! And it's backed by Hayes, the PC communications leader.

So if you currently utilize, or are contemplating adding, IBM PC networks, you should also add Smartcom II for the PC Network. For efficient communications. Without delay.

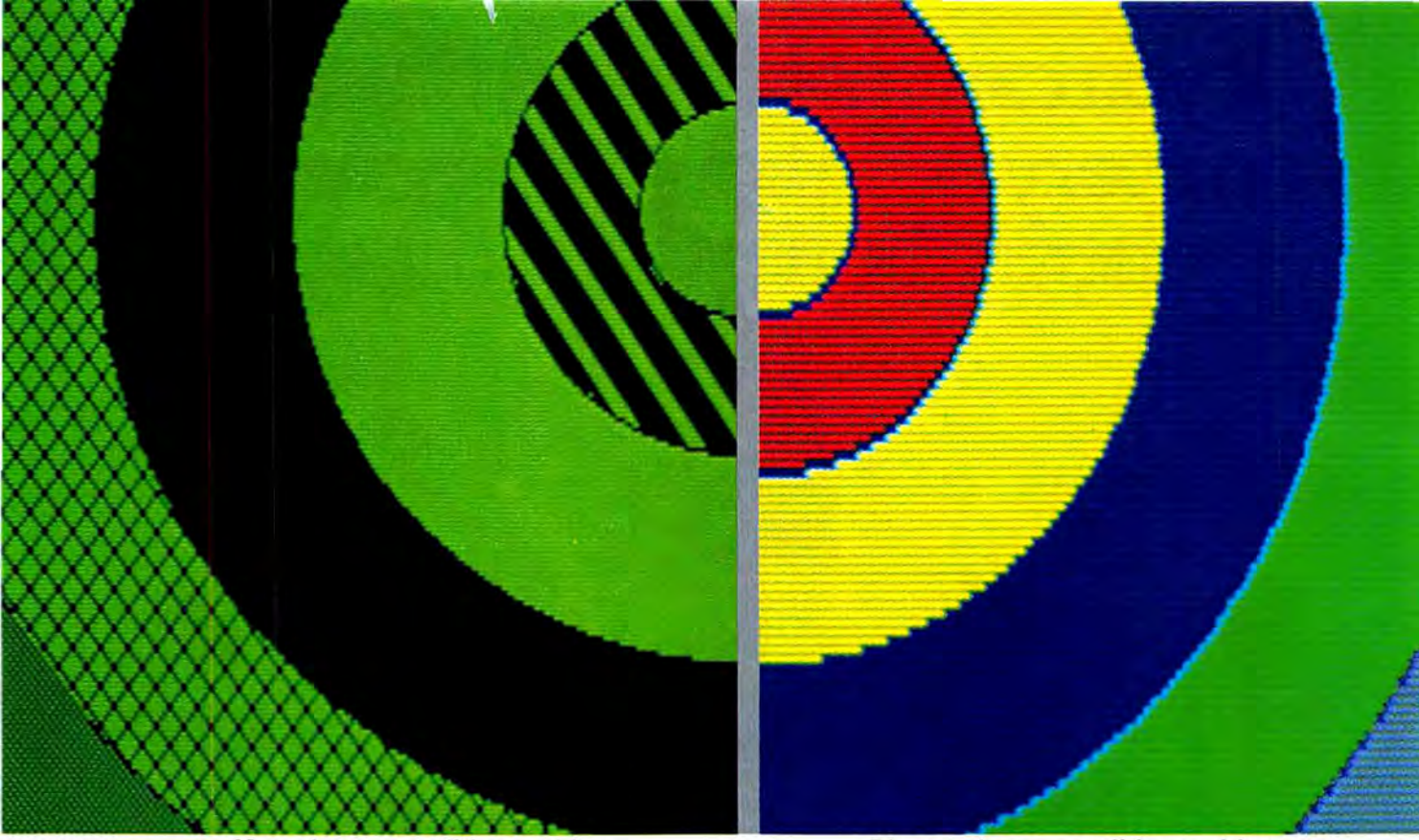
See your authorized Hayes dealer for details. Or contact Hayes at 404/441-1617.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, Georgia 30348.

Hayes®

Say yes to the future

Circle 815 on reader service card



Hercules compatible graphics:
720x348.

Plantronics compatible graphics:
640x200x4 colors.

Introducing The Paradise Hi-Res Graphics Card.™ Two Upgrades For The Price Of One.

Now you can have much higher resolution than your current video card gives you. Without buying new software. Or an expensive monitor.

All you need is the new Paradise Hi-Res Graphics Card.

It gives you the highest resolution possible on a standard monitor. With monochrome displays, you get Hercules compatible 720x348 graphics. With RGB and composite displays, you get Plantronics compatible graphics: 16 colors in 320x200, and 4 colors in 640x200. That's two upgrades for the price of one.

And no matter which monitor you choose, the Paradise Hi-Res Graphics Card gives you full compatibility with standard video modes.

Better yet, you can use your existing software to its best advantage. Because Hercules and Plantronics graphics are widely supported by packages like Lotus 1-2-3, Symphony, Framework, and lots more.

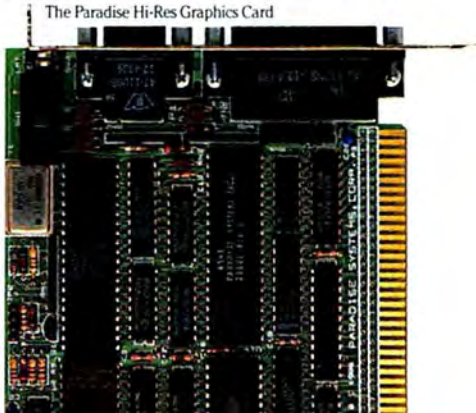
And Paradise gives you all this, plus a parallel port. On one short card.

If you'd like to know more, we'll send you full information. Including a free Hi-Res software compatibility guide. Just call (800) 527-7977, Ext. 342, toll-free. From California, (800) 822-2020, Ext. 342. Or check it out at the best PC dealers.

PARADISE

SYSTEMS, INC

The Paradise Hi-Res Graphics Card



Trademarks: Paradise, Hi-Res Graphics Card-Paradise Systems Inc.; Lotus 1-2-3, Symphony-Lotus Development Corporation; Symphony, Framework-Ashton-Tate, Inc. Registered trademark: IBM-International Business Machines Corp.

The Help Screen

PC World offers answers and advice at every level

This month: Using 1-2-3 release 1 or 1A to convert numeric scores to letter grades; light pen drivers; programs for the Apple LaserWriter and the Hewlett-Packard LaserJet; an undernourished menu system; and setting the PC on its side

Karl Koessel

Grading Without Upgrading 1-2-3

Several readers have written in response to the solution published in April's *Help Screen* for converting a numeric grade in a *1-2-3* worksheet cell into a letter grade. (The screen referred to made a delayed appearance in May's column.) Those readers offered macro techniques that, while admittedly a bit time-consuming and not automatic (as a cell formula is), did not require release 2. The macro shown in Screen 1 is an enhanced blend of the algorithms offered by Darlene Drysdale of San Antonio, Texas, and Larry O. Miller of Camarillo, California.

To create the macro, load *1-2-3*, go to cell J1, and enter the macro's description. Copy the lines shown in the cell range K1..K20, starting at cell K1. (Remember, you must type an apostrophe before entering macro lines that begin with a slash. To save time, use /Copy Range to duplicate the first /XI@Vlookup line and then edit the duplicates.)

In the column immediately to the left of the macro, enter the labels '**A**, **Loop**, **Next**, and **End** in the appropriate rows. Then go to the cell containing /A, the name of the macro. Select */Range Name Labels Right*, press **< CursorDown >** until you've highlighted the four labels (from /A to End), and press **< Enter >**.

The next step is to create the three-column grade table. The first column, the table's index, contains the minimum grade point required to receive the letter grade in the third column. The second column lists the values to be returned by the @Vlookup function. Go to cell G3 and enter the label **Grade table**. Then use */Worksheet Column Set* to reset the width of columns G, H, and I. Press **< CursorDown >** and enter the grades F through A + + into column I as shown in Screen 2. In the cell to the left of the F, select */Data Fill* and type **< Backspace >. < PgDn > < Enter > 0 < Enter > 1 < Enter > 13 < Enter >**. Move the cell pointer one column to the left and enter the numbers shown in column G. Next, place the cell pointer on 0 at the top of column G, select */Range Name Create*, and type **Grade table < Enter > < Backspace > . < End > < CursorRight > < End > < CursorDown > < Enter >**. Save the work done so far.

(This example uses standard percentage grading. Because the macro employs the vertical lookup command @Vlookup to search the grade table, you can easily modify it to accommodate other grading systems. For example, assume 255 points is a perfect score, or an A + +; 210 is the minimum number of points for an A +; 195 for an A; and so on. Simply replace the minimum values for percentage grading with the minimum accumulated points required for each letter grade, and the modified macro is ready.)

To use the macro, create a list of student names and grade points like those shown in Screen 2, place the cell pointer on the first cell of the grade point column, and press **< Alt > -A**. The first two lines of the macro create, delete, and recreate the range named Grade point. The process ensures that this range name is assigned to the cell that the pointer is currently highlighting—even if that name has previously been assigned to another range. The next line

(continues)

We have 1000's of Software and hardware items in stock. Shipments on almost all items within 24 hours!

WAREHOUSE DATA PRODUCTS

Call for programs not listed

Technical & Other Info. (602) 246-2222

TOLL-FREE ORDER LINE 1-800-421-3135

FREE! UP TO $100 SOFTWARE FREE!
With every purchase over $100.00 you can select one of the following MS/DOS diskettes at no charge.

1. Blueberry I - 54 basic utility programs includes printer select, graphic generation, etc. **Retail value $10.**
2. Blueberry II - includes a banner generator, a label maker and a checker game (requires graphics card). **Retail value $10.**
3. Print Select program - Assembly language program to select different type fonts, etc., or make your printer function as a correctable typewriter - perfect for envelopes, notes, etc. Adaptation modules for popular printers included and capability to adapt any printer. **Retail value $40.**
4. Deposit Program Compiled DBase to list and total cash, check, bank card for bank deposit and keeps history - Developed for our corporate use - Super Program! (source code available). **Retail value $40.**

Select an additional diskette for every additional purchase of $150 or purchase over $500 and receive all four at no charge.

——DATA BASE MANAGERS——

Clipper	$334
Clout 2	119
Condor III	310
Fox and Geller Quickcode	138
Fox and Geller Quickreport	138
Knowledgeman II	299
K Paint	60
K Graph	135
K Text	105
K Report	135
Nutshell	Call
PFS: File	78
RBase 5000	319
Think Tank	92
Tim IV	139

——WORD-PROCESSING——

Easy (Micro Pro)	88
Leading Edge w/Merge/Spell	75
Microsoft Word 3.0	Call
Multimate 3.31	Call
Multimate Advantage	Call
Oasis Word Plus	85
Peachtext 5000	145
PFS: Write	78
Random House Spell Checker	36
Samna III 3.0	265
Volkswriter 3	Call
Word Perfect 4.1	199
Wordstar	162
Wordstar Propac	233
Wordstar 2000	233
Wordstar 2000+	278

——SPREADSHEETS——

Microsoft Multiplan	109
PFS: Plan	78
Supercalc III 2.1	Call
VP Planner	49

——ACCOUNTING——

BPI Accounts Payable	299
BPI Account Receivable	299
BPI General Accounting	299
BPI Payroll	299
Cyma	Call
Dollars and Sense	95
Tobias Managing Your Money	94

TCS. Big Four equivalent of Peachtree Series 4 - Specially augmented and customized for your IBM PC Terminal and Printer - GL, AR, PA, AP, CP/M-80, CP/M-86 for PC XT, DOS 1.1, 2.0.
Each Module $65 For All Four $249

——INTEGRATED——

Enable	Call
Smart Software	Call

——TRANSFER PROGRAMS——

Crosstalk XVI	$89
Hayes Smartcom II	88
Microsoft Access	149
Move-It	79
Remote	89

——GRAPHICS——

Chartmaster	205
Dr. Halo II	99
Energraphics w/o Plotter	160
Energraphics w/Plotter	205
Fancy Font	129
Fontrix	99
Freelance	197
Graphwriter/Combo	294
Microsoft Flight Simulator	30
Printshop	33
PFS Graph	78
Signmaster	134

INCREDIBLE VALUE!

Nationally advertised boards for IBM PC and most compatibles at giveaway prices.
1 year warranty

Keyboards (similar to 5151)	$89
Monochrome Board w/Printer Port	$79
Graphic Board with parallel port (similar to Hercules Graphics)	$95
Expansion Board 0 to 576K	$42
Multifunction Board w/game port (similar to AST Six Pack)	$99
Four Drive Floppy Controller	$45
Color Card without printer port	$79
Color Card with printer port	$89

MULTITECH Turbo IBM Compatible Computer 256K, dual drives, 8MHZ, Ports-parallel,-serial-clock, 5151 type keyboard, graphics board (similar to Hercules), mono monitor, DOS 6 month national (TRW) warranty $995

——LANGUAGES——

Lattice C Compiler 3.0	Call
Run C Professional	169
Microsoft C Compiler	222
Microsoft Fortran	196
Microsoft Macro Assembler	84
Microsoft Pascal Compiler	169
Microsoft Quick Basic	55
Multi Halo	140

——UTILITIES——

Copy II PC	19
Copy II PC Board	79
Copywright	45
Desqview	59
Fastback	89
Microsoft Windows	56
Norton Utilities 3.1	49
PC Tools	19
Prokey 4.0	72
Superkey	39

——PROJECT MANAGEMENT——

Microsoft Project	222
Super Project Plus	Call

HARDWARE

——HARD DRIVES——

Bernoulli 20 MB ½ ht	2269
Lead Edge hi speed 30 MB AT	465
Seagate 20 MB Internal w/Controller	439

——MODEMS——

Hayes 1200	Call
Hayes 1200B w/Software	Call
Hayes 2400	599

HARDWARE

U.S. Robotics Courier 2400	Call
U.S. Robotics Password 1200	Call

——RAM——

64K 150NS Chips (Japan-Set of 9)	$11.50
256K Ram Chips (Set of 9)	32

——BOARDS——

AST Advantage	359
AST Sixpack (384K)	Call
Hercules Color Card	145
Hercules Graphics Card	299
J RAM III (Tall Tree)	Call
J RAM III AT (Tall Tree)	Call
J Lazer (Tall Tree)	Call
Paradise Five Pak	99
Paradise Modular Graphics Card	249
Quadram Board with Par/Ser and Game Port	199
Quadcolor I	185
Sigma Maximizer Multifunction	149
STB Chauffeur Board	249
STB EGA Plus	320
STB Mono Board	155
AB Parallel Print Switch w/cables	75
Mini Micro Parallel Print Buffer	69
IBM 120 Watt Power Supply	83

——COMPUTERS——

Corona PC ..... Call

Sperry PC Mono 256K Dual Drive Serial Port, Clock, MS/DOS 2.11 ..... Call

ITT Computers PC Compatible 256K Dual Drive, Mono, MS/DOS ..... Call

ITT XP 80286 IBM/PC Compatible, 512K, 10 MB Winchester, 3 times faster than an XT. 30% faster than an AT ..... Call

Sharp Portable ..... Call

——PRINTERS——

CITIZEN

MSP-10	255
MSP-15	355
MSP-20	329
Citizen 120D	169
Premiere 35 Daisywheel	415

EPSON - Call on all models

JUKI

Juki 6100	349
Juki 6300	685

NEC

8850	1098
P5 Parallel	995
P5 XL	1149
Elf 360	398

OKIDATA - Call on all models

PANASONIC

1091	235
1092	299
1592	435
KXP3151	410

STAR MICRONICS - Call for prices

TOSHIBA

P351	975
P341	799

——MONITORS——

AMDEK	Call for price
NEC Multi Sync	544
Taxan 121 Green	Call
Taxan 122 Amber	Call
Princeton Max 12	159

TERMS: Add 3% for C.O.D. orders. Shipping on most software is $5.00. AZ orders +6½% sales tax. Personal check - allow fourteen (14) days to clear. Prices are subject to change. We accept purchase orders from authorized companies. All returns are subject to a restock fee. We do not guarantee compatibility.

No Charge for MasterCard or Visa

MasterCard VISA

TOLL-FREE ORDER LINE 1-800-421-3135

WAREHOUSE DATA PRODUCTS

2701 West Glendale Ave. • Phoenix, AZ 85051

Hours 7 A.M. to 5:30 P.M. M.S.T. - Mon. thru Fri.
Saturday 10:00 A.M. to 3:00 P.M.

Circle 220 on reader service card

THE ART OF STRIPPING...

Picture a complete system. One that provides a simple, reliable way to distribute and retrieve information. The centerpiece of this system is the Cauzin Softstrip™ reader. A state-of-the-art scanning device that's rapidly changing the shape of computer software.

You probably have seen Softstrip data strips containing software listings and data that have been published by such leading periodicals as Data Based Advisor, Mac User, // Computing, MACazine, Bar Code News, and Nibble mac. But the system doesn't stop there. Using the Softstrip technology, you can make paper work smarter for almost any application which uses computers.

INDEXES

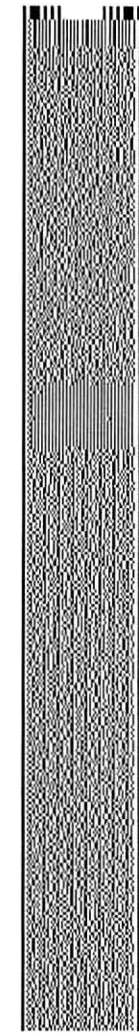
Using computers to access reference data is becoming critical. To make it easy for subscribers to put Table of Contents data "on line," in their own PC's, Pergamon Press and Bar Code News have already started printing their indices within their publications in strips. Imagine, scanning data into your computer right from the pages of the journals you receive.

COMPATIBILITY BETWEEN COMPUTERS

Anything you can put on a magnetic disk, you can print on a data strip. So, one strip can be read by all computers. There's no need to worry about incompatible media sizes or densities. You can even use strips to transfer text or binary files between incompatible computers. For instance, Apple or Mac to a PC. Or the other way.

DATA BASE UPDATES

Whether it's chemical abstracts, price listings, catalogs, telephone data, or financial reports, regular updates for major files are a natural for Softstrip data strips. In fact, data strips can provide the means to effectively and inexpensively get important data out.



This data strip contains the program and instructions on moving Apple or Mac files to a PC.

TECH SPECS

The Reader is lightweight and portable. It comes complete with all the software and cables you should need to connect it to your PC; Apple II series; or Macintosh computer. It has its own power supply and connects to standard RS232 ports (or to the Apple //e cassette port).

ALL YOU NEED TO START MAKING YOUR OWN DATA STRIPS...
besides your computer, a Softstrip reader, and STRIPPER™ (the "make-it-yourself Softstrip data strip program"):

FOR IBM PC or any 100% COMPATIBLE OWNERS
Epson RX or FX printer
Printer interface card

FOR MACINTOSH OWNERS
Apple Imagewriter I or II

FOR APPLE II OWNERS
Epson RX or FX printer, or,
Apple Imagewriter I or II, and,
Super Serial™ card (built into Apple //c), or,
Grappler™ graphics card, or,
Dumpling™ graphics card.

ACT NOW!

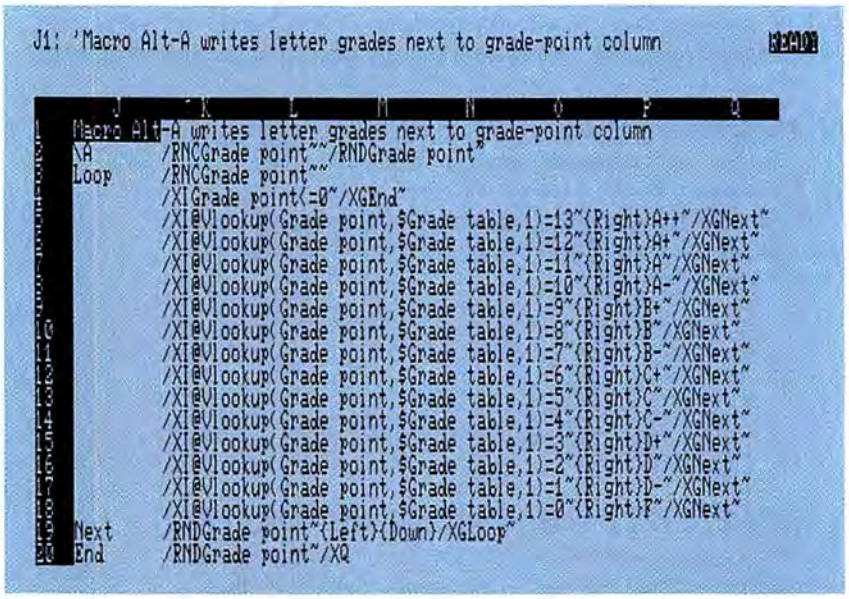
Buy everything you need to read strips for only $199.95 and you can get software to print your own strips for just $19.95. Call to order or for the Dealer nearest you... 1-800-533-7323

CAUZIN SYSTEMS, INC.
835 SOUTH MAIN STREET
WATERBURY, CT 06706
203-573-0150

CAUZIN

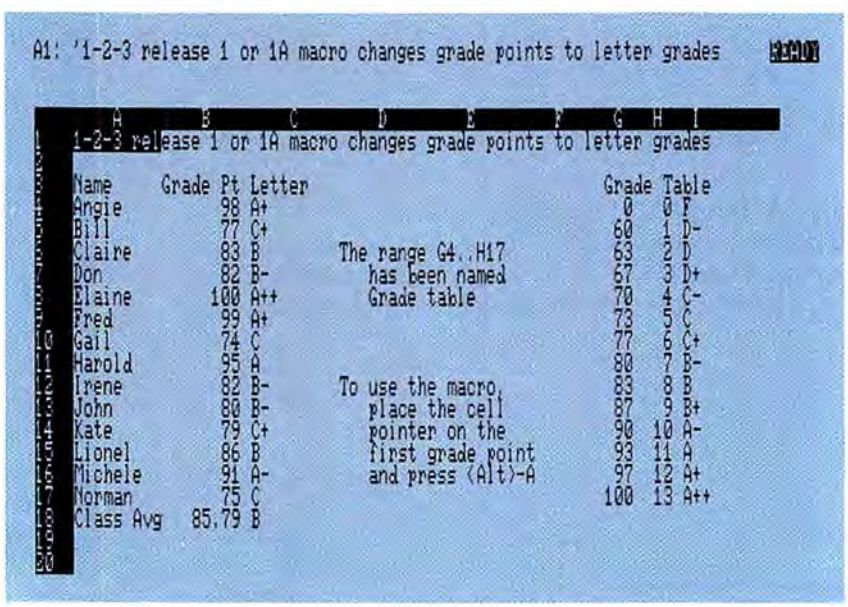
Creators of the Softstrip™ Technology

Circle 154 on reader service card



```
J1: 'Macro Alt-A writes letter grades next to grade-point column        READY

     J      K      L      M      N      O      P      Q
1   Macro Alt-A writes letter grades next to grade-point column
2   \A      /RNCGrade point~~/RNDGrade point~
3   Loop    /RNCGrade point~~
4           /XIGrade point<=0~/XGEnd~
5           /XI@Vlookup(Grade point,$Grade table,1)=13~{Right}A++~/XGNext~
6           /XI@Vlookup(Grade point,$Grade table,1)=12~{Right}A+~/XGNext~
7           /XI@Vlookup(Grade point,$Grade table,1)=11~{Right}A~/XGNext~
8           /XI@Vlookup(Grade point,$Grade table,1)=10~{Right}A-~/XGNext~
9           /XI@Vlookup(Grade point,$Grade table,1)=9~{Right}B+~/XGNext~
10          /XI@Vlookup(Grade point,$Grade table,1)=8~{Right}B~/XGNext~
11          /XI@Vlookup(Grade point,$Grade table,1)=7~{Right}B-~/XGNext~
12          /XI@Vlookup(Grade point,$Grade table,1)=6~{Right}C+~/XGNext~
13          /XI@Vlookup(Grade point,$Grade table,1)=5~{Right}C~/XGNext~
14          /XI@Vlookup(Grade point,$Grade table,1)=4~{Right}C-~/XGNext~
15          /XI@Vlookup(Grade point,$Grade table,1)=3~{Right}D+~/XGNext~
16          /XI@Vlookup(Grade point,$Grade table,1)=2~{Right}D~/XGNext~
17          /XI@Vlookup(Grade point,$Grade table,1)=1~{Right}D-~/XGNext~
18          /XI@Vlookup(Grade point,$Grade table,1)=0~{Right}F~/XGNext~
19  Next    /RNDGrade point~{Left}{Down}/XGLoop~
20  End     /RNDGrade point~/XQ
```

Screen 1: This 1-2-3 release 1/1A macro computes letter grades from numeric grade points.



```
A1: '1-2-3 release 1 or 1A macro changes grade points to letter grades    READY

     A      B      C      D      E      F      G   H   I
1   1-2-3 release 1 or 1A macro changes grade points to letter grades
2
3   Name     Grade Pt Letter                                Grade Table
4   Angie          98 A+                                      0   0 F
5   Bill           77 C+                                     60   1 D-
6   Claire         83 B        The range G4..H17             63   2 D
7   Don            82 B-          has been named             67   3 D+
8   Elaine        100 A++         Grade table                70   4 C-
9   Fred           99 A+                                     73   5 C
10  Gail           74 C                                      77   6 C+
11  Harold         95 A                                      80   7 B-
12  Irene          82 B-       To use the macro,             83   8 B
13  John           80 B-          place the cell             87   9 B+
14  Kate           79 C+          pointer on the             90  10 A-
15  Lionel         86 B           first grade point          93  11 A
16  Michele        91 A-          and press <Alt>-A          97  12 A+
17  Norman         75 C                                     100  13 A++
18  Class Avg   85.79 B
19
20
```

Screen 2: The macro in Screen 1 is easily modified for other grading systems. Just place the minimum point value for each letter grade in the first column of the grade table.

checks to see if the value in the range Grade point is less than or equal to 0. If it is (as when a cell is empty), the macro branches to End, the last macro line, which deletes the range name Grade point and returns the worksheet to the ready mode. If the value in the cell is greater than 0, the next line of the macro executes.

That line uses the @Vlookup function to extract a value from the grade table and then compares that value to 13. If the returned value is not 13, the macro branches to the next line. For example, if a grade is 88, the @ function returns a 9. Because 9 does not equal 13, processing is passed to each subsequent /XI command until @Vlookup(Grade point,$<UN>Grade table,1) = 9 is encountered. Once the proper match is found, the remainder of the line executes, and the cell pointer moves right to the Letter column of the worksheet and posts the letter grade (in this case, B+). The /XGNext command at the end of the line appropriately branches the process to Next, the last line of the macro. That line deletes the current range name, Grade point; moves the cell pointer left to the list of grade points and down to the next cell; and instructs macro execution to continue at the line labeled Loop, where the cycle begins again.

Light Pen Emulates Mouse

In reference to "Light Pen, Heavy Problem" (*The Help Screen, PCW,* March 1986), Craig M. Rawlings informs us that his company has

(continues)

SQUEEZE 10 TIMES AS MANY SPREADSHEETS ON A DISK. $79.95.

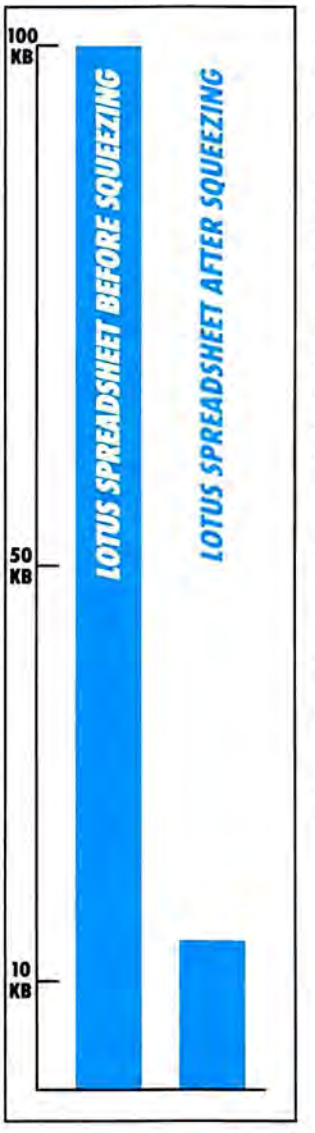
Spreadsheets are wonderful tools, but they have three major drawbacks: they take up a lot of disk space, they take a lot of time to load and to save, and they're expensive to send electronically.

Introducing SQZ!™ from Turner Hall Publishing, the spreadsheet compaction utility that reduces the amount of disk space needed for Lotus 1-2-3® and Symphony™ spreadsheets by 80%-95%. And cuts retrieve/save time. More than 50% for floppy users.

WORKS WITH ALL RELEASES OF 1-2-3 AND SYMPHONY.

SQZ! takes up less than 30K of RAM and runs co-resident in memory with DOS and the Lotus program. It works easily with popular memory-resident programs like Note-It™ and Sidekick.™ In RAM, the spreadsheets remain the original size. Spreadsheets are automatically squeezed and unsqueezed during normal file saving and retrieving without loss of content.

SQZ! features a communications option that reformats spreadsheets so they can be sent over electronic mail services that normally only accept text files. And since the files are sent in compressed form, you can save 80%-90% in transmission time on your phone bill. And a password feature lets you encrypt files to protect them from unauthorized use.



SQZ! is simple to use. It's not copy-protected so hard disk users can install it easily. The user interface mimics Lotus.' You can even customize the defaults.

SQZ! runs on the IBM® PC, XT,™ AT,™ and 100% compatibles with any release of 1-2-3 or Symphony. It's compatible with EMS memory expansion boards. Every package comes with a complete User's Manual, the program diskette, a Help Hotline number, and a 30-day money-back guarantee.

We also publish Note-It, the 1-2-3 documentation utility. Which, we're proud to say, was named 1985 runner-up Product of the Year by Infoworld.

Remember, when you're up to your ears in data, there's only one thing you can do. SQZ!

SQZ!

THE DATA SQUEEZER FOR LOTUS.

HOW TO ORDER.

Order SQZ! by phone. We accept MasterCard or Visa. Or fill out the coupon at the right and send it to us with a check or money order. Include $2 shipping ($12 outside USA). CA residents add $5.60 sales tax. SQZ! comes with a 30-day, money-back guarantee.

Turner Hall Publishing
10201 Torre Ave., Cupertino, CA 95014

1-800-556-1234 x527.

(In CA 800-441-2345 x527.)

SQZ! is also available at better dealers.

Please send me _____ copies of SQZ! at $79.95, plus $2.00 for shipping ($12 outside USA). CA residents add $5.60 sales tax. ☐ I enclose _____. Please charge my ☐ MasterCard or ☐ Visa.

Card # _____ Exp. Date _____

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone ( ) _____

PCWD/070186

SQZ! and Note-It are trademarks of Turner Hall Publishing. Lotus and 1-2-3 are registered trademarks, and Symphony is a trademark of Lotus Development Corp. Sidekick is a trademark of Borland International. IBM is a registered trademark of, and IBM XT and IBM AT are trademarks of International Business Machines Corp. Program copyright Synex Systems Corp.

light pen drivers for *1-2-3, Symphony,* and *GEM Draw,* as well as for *WordStar, AutoCAD,* and *Windows.* Warp Speed Computer Products also markets a single-pixel-resolution light pen adapter, a video adapter that provides single-pixel-resolution light pen support, and *Penmouse,* a mouse-to-light-pen converter that will adapt most mouse software (programs with standard bus or serial mouse drivers, such as *PC Paint, PC Paintbrush,* and *Dr. Halo*) for light pen control. For more information, write to Warp Speed Computer Products at 5555 S. Inglewood Blvd., Los Angeles, CA 90230, or call 800/874-4315 (800/826-1563 in California).

Learning to Love the LaserJet

Q. *I have access to a Hewlett-Packard LaserJet at my office, where it does its job quietly and more or less quickly. However, I want to learn more about the machine, available software, and compatible hardware. Are there any sources of information on software and hardware, and are there any relevant techniques for integrating text and graphics?*

Tami Woods
Los Angeles, California

A. *LaserJet Printer Family Software and Hardware Solutions* from Hewlett-Packard (1986, part number 5954-7298) is a comprehensive directory of software and hardware for the LaserJet. For in-depth product information and tips for marrying text and graphics, get ahold of *LaserJet Unlimited* by Ted Nace and Michael Gardner. The book is available from Peachpit Press, 2110 Marin Ave., Berkeley, CA 94707, or it can be ordered by phone (415/524-0184). Information is also just a *PC World* away. Check out "Dress Up Your Documents" (September 1985), *From the Software Shelf* (November 1985), and "Lotus by Laser" (February 1986).

PC Programs for Apple's LaserWriter

Q. *My firm recently purchased an Apple LaserWriter, which we use with our PC and* Microsoft Word. *The results are fantastic, and we would like to expand our use of the LaserWriter into other applications such as graphics, spreadsheets, and data management. Can you identify other PC programs that support the LaserWriter?*

Thomas M. Miner
El Toro, California

A. *MagnaType* and *ScenicWriter* make extensive use of the LaserWriter's talents (see "MagnaType: The Personal Typographer" and "The Scenic Route" in this issue for reviews of those products). Another package to watch for is Aldus Corporation's popular Macintosh program, *PageMaker,* scheduled to appear soon on the PC under the aegis of *Microsoft Windows.*

Keep in mind that any PC program making use of the LaserWriter must support PostScript, the page description language built into the printer. *Word* has a PostScript driver and thus can take advantage of the LaserWriter's scalable fonts, extended character sets, and more. One solution for the lack of a driver in programs such as *1-2-3, WordStar,* and *MultiMate* is *LaserScript/S,* a PC-to-PostScript converter from Tangent Technologies (see *From the Hardware Shelf* in this issue). For a list of PC applications supporting PostScript, send a request to Adobe Systems, the developer of the language, at 1870 Embarcadero Rd. #100, Palo Alto, CA 94303, or call 415/852-0271.

Menu System Recipe's Missing Ingredient

Q. *I feel like the bride whose mother-in-law gave her the groom's favorite cake recipe but, with a wry smile, omitted one key ingredient. Following the instructions in "Serving Up DOS"* [PCW, *February 1986], I prepared a front-end menu that works like a charm—except for one small problem.*

The last two lines of 1.BAT, 2.BAT, and so on are supposed to return control to the main menu batch file after exiting the particular application that each calls. When exiting two of my applications, Crosstalk *and* Reflex, *the menu system works perfectly. But exiting* Microsoft Word *or* Dollars and Sense *halts the menu system; I am returned to DOS in the respective program's subdirectory.*

(continues)

"Okay, we know who's getting ten megabytes and who's getting twenty. Who gets tape?"

We've got it all. FileCard™ is the easy, plug-in path to 10MB of hard disk storage. Get 20MB with our WD20i internal hard drive or PortaFile,™ with its carrying handle. And the WD60Ti gives you add-in tape backup storage.

WESTERN DIGITAL
ENHANCED PERIPHERALS

Western Digital Corporation, Enhanced Peripherals Division
2445 McCabe Way, Irvine, CA 92714.
For the dealer nearest you call 1-800-847-6181.

FileCard and PortaFile are trademarks of Western Digital Corporation.

Circle 383 on reader service card

Why does the menu system work with two of my applications but fail with two others? What is the missing ingredient that will get my menu system to serve up both Word *and* Dollars and Sense *and then return to the main menu after exiting those programs?*

Henry P. Starr
Woodland Hills, California

A. Most programs are well behaved. Certain types, however, make the menu system in "Serving Up DOS" fail. Some cause COMMAND.COM to lose track of the batch files that called them. Others are loaded by other batch files, but because COMMAND.COM can keep track of only one batch file, when the first batch file calls the second, COMMAND.COM forgets the first. These problems can be remedied by inserting **COMMAND /C** on the same batch file line before the command that calls the application. For example, change the batch file line that calls *Dollars and Sense* to read 'COMMAND /C DS'.

Sideways System Saves Space

Q. *On my desk I have an IBM PC, keyboard, monitor, and external hard disk drive–a convenient but unsightly arrangement. My office doesn't have room for PC furniture, such as a desk that would house the system unit and external hard disk drive below the desk top and out of sight. However, Curtis Manufacturing offers a stand that mounts the PC's system unit on its side. With the stand I could keep the system unit vertically on the floor under my desk, but I am concerned that this could cause the PC to overheat.*

I assume that the PC was made to sit horizontally and that its internal layout and air intake vents were designed to produce an airflow pattern that provides adequate ventilation. If I turn the PC on its side, what ill effects, if any, will result from the altered airflow pattern? For example, when the PC is horizontal, the expansion boards are vertical and do not obstruct the rising heat that they and the motherboard generate. But when the PC is on its side, the horizontal expansion boards might impede the outflow of hot air. Could reduced cooling cause internal electronic components to fail prematurely? Also, does sideways operation affect a floppy disk drive?

John N. Ridgely
Rockville, Maryland

A. Keeping the PC on its side will not cause it to overheat, nor will it tax the life or performance of a floppy disk drive. Natural convection, the flow of air caused by rising heat, plays a minor role in cooling the PC. The airflow pattern is maintained by the location of the PC's air vents and exhaust fan, so it doesn't matter whether the PC is horizontal or on its side. And floppy disk drives are designed to operate horizontally, vertically, diagonally, or upside down.

There are, however, ergonomic considerations in placing the system unit on the floor. The unit should be kept close enough so that inserting and removing disks is not cumbersome or inconvenient. The monitor should be high enough to encourage good posture. You may need extension cables (also available from Curtis) for the keyboard and the monitor. Remember, damaged equipment can be easily fixed or replaced–a damaged spine can't.

System Stands and Curtis Cables
Curtis Manufacturing Co., Inc.
305 Union St.
Peterborough, NH 03458
603/924-7803
List price: SS-1 System Stand for IBM PC and XT (high-impact plastic) $24.95; SS-2 System Stand for AT and Compaq Deskpro 286 (metal) $24.95; SS-3 System Stand (adjustable from 4 to 7½ inches, high-impact plastic) $24.95; EC-1 Extension Cables (shielded 3-foot IBM Monochrome Monitor power and signal extension cables) $49.95; EC-2 Extension Cable (coiled keyboard extension cable that stretches to 9 feet) $39.95

Do you have any questions concerning the IBM PC or compatibles? Send them to The Help Screen, PC World, *555 De Haro St., San Francisco, CA 94107, or electronically to MCI Mail PC-WORLD, CompuServe 74055,412, or The Source STE908.*

Computer Mail Order Shopping Guide

A convenient shopping guide provided as a service to our PC World readers

COMPUTER PRODUCTS

Compuclassics

SOFTWARE

DATA BASE MANAGEMENT

ASHTON TATE
dBase III Plus 389.00

BORLAND INTERNATIONAL
Reflex 62.00

FOX & GELLER
QuickCode III 145.00
QuickReport 145.00
dGraph III 145.00

LEADING EDGE
Nutshell 79.00

M.D.B.S.
Knowledge Man (Version 2) 299.00

MICRORIM
RBase 5000 359.00
Extended Report Writer 89.00

MICROSTUF
Infoscope 125.00

NANTUCKET
Clipper (dBase III Compiler) 359.00

SOFTWARE TOOLS
Viewgen (dBase III Screen Generator) 49.95

WORD PROCESSORS

LEADING EDGE
with Merge & Spell 140.00

LIFETREE
Volkswriter 3 159.00

MICROPRO
Wordstar 179.00
Wordstar Propak 249.00
Wordstar 2000 245.00
Wordstar 2000 Plus 295.00

MICROSOFT
Word 259.00

MULTIMATE
Advantage 265.00
Executive 205.00
Just Write 65.00
Multimate 205.00

SAMNA
Samna Word III 269.00
Samna + 369.00

SATELLITE SOFTWARE
Word Perfect 4.1 219.00

INTEGRATED SOFTWARE

ALPHA SOFTWARE
Electric Desk 189.00

ASHTON TATE
Framework II 389.00

LOTUS
Symphony 449.00

SOFTWARE GROUP
Enable 339.00

SOFTWARE PUBLISHING
PFS Family
Write 80.00
File 80.00
Graph 80.00
Access 80.00
Plan 80.00
Report 69.00

GRAPHICS

DECISION RESOURCES
Chartmaster 230.00
Diagram Master 209.00
Signmaster 175.00

DIGITAL RESEARCH
Gem Draw 159.00

GRAPHIC COMMUNICATIONS
Graphwriter Combo 319.00
Freelance 239.00

MICROGRAFX
In-A-Vision 259.00
PC Draw 249.00

MICROSOFT
Chart 209.00

MOUSE SYSTEMS
PC Mouse + Paintbrush 119.00

PROJECT MANAGEMENT

BREAKTHROUGH
Timeline (Version 2) 255.00

HARVARD SOFTWARE
Total Project Manager 279.00

MICROSOFT
Project 249.00

SCITOR
Project Scheduler Network 329.00

SORCIM / IUS
Superproject Plus 269.00

SPREADSHEETS

LOTUS
Lotus 1-2-3 (Version 2) 349.00
Lotus Report Writer 115.00

MICROSOFT
Multiplan 129.00

SORCIM / IUS
Supercalc III Release 2 189.00

COMMUNICATIONS

HAYES
Smartcom II 95.00

MICROSTUF
Crosstalk XVI 99.00
Remote 99.00
Transporter 145.00

WOOLF
Move-it 95.00

ACCOUNTING

G.N.P.
C.P.A. + 359.00

I.U.S.
All Modules 309.00
Payroll 379.00
Easy Plus 99.00

OPEN SYSTEMS
All Modules 339.00
Business Basic Interpreter 165.00

REALWORLD
All Modules 369.00

PROGRAMMING LANGUAGES

BORLAND INTERNATIONAL
Editor 35.00
Gameworks 35.00
Graphix Toolbox 30.00
Jumbo Pack 139.00
New Pack 50.00
Turbo Pascal 3.0 40.00
Turbo Toolbox 30.00
Turbo Tutor 19.00
With 8087 59.00
With 8087 & BCD 75.00

LIFEBOAT ASSOCIATES
Lattice C Compiler 279.00
Run C 95.00

MICROSOFT
C Compiler 249.00
Fortran Compiler 229.00
Macro Assembler 95.00
Quick basic 65.00

UTILITIES

BORLAND INTERNATIONAL
Sidekick 30.00
Sidekick (Unprotected) 49.00
Superkey 42.00

CENTRAL POINT
Copy II PC 29.00
Copy II Options Board 85.00
PC Tools 29.00

DIGITAL RESEARCH
Gem Desktop 32.00

FIFTH GENERATION
Fastback 99.00

FUNK SOFTWARE
Sideways 38.00

MICROSOFT
Windows 65.00

PETER NORTON
Norton Utilities 55.00

QUAID SOFTWARE
Copywrite 39.00
Zero Disk 55.00

ROSESOFT
Prokey 89.00

SIMON & SCHUSTER
Typing Tutor III 32.00

UNISON
Printmaster 32.00

PERSONAL MANAGEMENT

CONTINENTAL SOFTWARE
Home Accountant Plus 82.00

LIVING VIDEOTEXT
Ready 49.00
ThinkTank 99.00

MECA
Managing Your Money 99.00

MONOGRAM
Dollars And Sense 99.00

HARDWARE

MONITORS

AMDEK
Amdek 310A 155.00

PRINCETON GRAPHICS
Max 12-E 165.00
HX-12 475.00
SR-12 565.00

PRINTERS

C. ITOH
All Models CALL

EPSON
FX 85 395.00
FX 286 595.00
LQ 1500 919.00

OKIDATA
All Models CALL

TOSHIBA
1340 419.00
351 1275.00

MEMORY AND MULTIFUNCTION BOARDS

AST RESEARCH
Sixpak Plus w 64K 225.00
Advantage w 128K 390.00
Rampage w 128K 345.00

HERCULES
Graphics Board 319.00
Color Card 159.00

PARADISE
Modular Graphics Card 245.00
Five Pack with 0 K 120.00

QUADRAM
Quadboard 64K 199.00

SIGMA DESIGNS
Color 400 445.00

TALL TREE SYSTEMS
JRam II w 0 K 175.00

MODEMS

HAYES
1200 B 379.00
1200 399.00

MISCELLANEOUS

KENSINGTON
Masterpiece 89.00

KEYTRONICS
5151 Keyboard 175.00

MICROSOFT
Mouse 129.00

Call for prices on IBM computer systems and for any item not included in this pricelist.

1 818 705-1895 US
1 800 231-6603 CA
1 800 328-4473 US

Order desk & technical support open:
8 a.m. to 6 p.m. Monday – Friday
10 a.m. to 2 p.m. Saturday

ADVANTAGES

- We welcome corporate accounts.
- Free technical support.
- Immediate replacement of defective goods.
- Bulk discounts.

TERMS: All prices subject to change. No surcharge for VISA or MasterCard. 2% surcharge American Express. No returns without RA#. Short shipments must be notified with 48 hours. 15% restocking fee on non-defective goods; $3.00 C.O.D. charge. Shipping $4.00 per item, less on bulk orders. ($8.00 Blue Label).

6924 CANBY ST. SUITE #118 RESEDA, CA 91335

Circle 90 on reader service card

Read what the experts say about the PC's Limited AT.

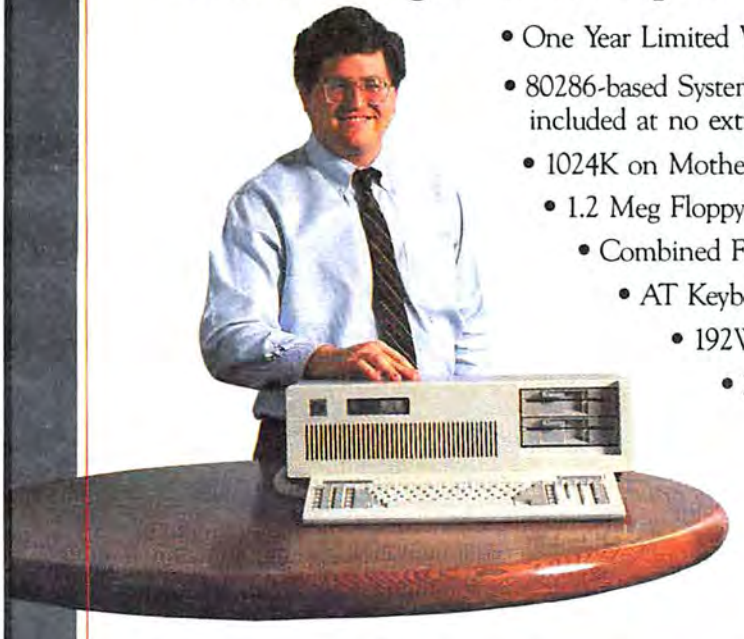
"I have no qualms recommending this system to experienced users who need the added speed."
—Sol Libes,
Micro/Systems Journal,
January/February 1986

"The PC's Limited AT™ proved to be the functional equivalent to the IBM® product, only faster. Priced at roughly one-third less, it rates as one of the best bargains available."
—Winn L. Rosch,
PC Magazine,
February 25, 1986

"If price is your primary consideration, skip both AT&T® and TI® and choose this issue's best buy, the PC's Limited AT™. Check its benchmark results—you won't be sacrificing performance to save money."
—*PC Magazine,*
Editor's Choice,
February 25, 1986

30 DAY Money-Back Guarantee

And if that's not enough to convince you, now we've got a 30-day money-back guarantee.



- One Year Limited Warranty
- 80286-based System Unit (Runs at 6MHZ. 8MHZ option included at no extra charge.)
- 1024K on Mother Board
- 1.2 Meg Floppy Drive
- Combined Floppy/Hard Drive Controller Card
- AT Keyboard
- 192W Power Supply
- 2 Serials and 1 Parallel Port
- Clock/Calendar with Battery Backup
- Operations Manual

$1495

I'm Michael Dell, President of PC's Limited. And I want you to know about your latest industry-leading step. We're so sure that you'll like everything about our PC's Limited AT that we're willing to offer you a 30-day money back guarantee on it. This machine, with 1024K on the Mother Board and an 8MHZ option included at no extra cost, has been a standout since we introduced it. So give us a chance to show you what it can do for your operation. With a deal like this, there's no way you can lose. (And see the opposite side of this page for information about our Turbo PC™, plus details on our guarantee.)

Michael Dell

When a PC's Limited Turbo PC is on your desk, you'll think it's a headliner too.

". . . a good machine. And a heck of a buy. . . a fine box. One I'd happily choose over Big Blue's original . . . no status . . . beyond the status that attaches to getting twice as much for your money."
—Jim Seymour, *PC Week*, August 13, 1985

"It almost sounds unbelievable."
—*MIS Week*, August 21, 1985

TOTAL SATISFACTION GUARANTEE
WARRANTY

For Warranty Service: One year Limited Warranty on PC's Limited products. Contact Technical Support for a Return Authorization Number (RMA). Returns must be accompanied by your RMA, the invoice, and a brief explanation. During the Warranty Period, PC's Limited will repair or replace items at our option.

30-DAY TOTAL SATISFACTION GUARANTEE

Any item bought from PC's Limited may be returned within 30 days from the date it was shipped for a full refund of your purchase price. Returned items must be as new, not modified or damaged, with all warranty cards, manuals, and packaging intact. Returned items must be shipped prepaid and insured, and must bear a PC's Limited Credit Return Authorization (CRA) on the shipping label. Call PC's Limited's Customer Support Department for CRA. No credits issued after 30 days from date of shipment.

CONSUMER TIP

When shopping for PC products, ask our competitors about *their* refund policies.

"We tested a wide variety of software on the machine and everything ran well . . . The bottom line for anyone considering buying one of these computers would seem to be this: PC's Limited sells quality systems for extraordinarily low prices."
—*PC Week*, October 29, 1985

- 16-bit 8088-2 System Unit (runs at 4.77 or 6.66MHZ)
- 640K on Mother Board
- 360K Floppy Drive
- AT Keyboard
- 130W Power Supply
- Operations Manual
- One Year Limited Warranty

$795

Microsoft GW Basic™ $95 • IBM DOS 3.1 $85 • 8087-2 $149

Our Turbo PC™ has sold in large quantities since the first week we introduced it. Of course, that's not surprising, since we were the first company to break the $800 barrier with a machine that outruns the "Big" name by a 40% speed factor. Now, we're going to extend the margin even further by offering a 30-day money back guarantee. If that sounds good, it'll look even better when one of our Turbo PC's is on your desk. So call us today. We're guaranteeing you'll like what you get.

Some quantities may be limited. PC's Limited sells equipment certified to be compliant with FCC Class B standards. Where equipment manufactured by PC's Limited has not yet received certification, PC's Limited will substitute equivalent certified equipment. All prices are subject to change without notice. We are an independent sales organization.

MasterCard VISA

PC'S LIMITED

SALES CALLS OUTSIDE TEXAS, 1-800-426-5150
SALES CALLS INSIDE TEXAS, 1-800-252-8336
1611 Headway Circle, Building 3, Austin, Texas 78754
Sales Calls from anywhere in the country, (512) 339-6962
Technical Support Calls, (512) 339-6963 Customer Service Calls, (512) 339-6964
*Limited Warranty **Telex No 9103808386 PC LTD FAX (512) 339-6721**

30 DAY Money-Back Guarantee

Call for latest prices.

FREE SHIPPING

in the Continental United States via UPS Ground.

30 DAY Money-Back Guarantee

NO SURCHARGE FOR MasterCard OR VISA

Floppy Disk Drive

Also available for AT™ in Gray Color.

$109

MITSUBISHI ELECTRONICS
Half-Height, DS/DD

PANASONIC
Half-Height, DS/DD

TEAC
55-B, Half-Height, DS/DD

64K RAM

$10 per set

Set of 9 chips, 200 or 150 Nanoseconds

256K RAM $29

Set of 9 chips
150 Nanoseconds

PC's Limited AT Multifunction Card

- Expandable To 3 Meg (1.5 on Board/1.5 on Piggy Back Board)
- Supports 64 or 256K Rams
- Parallel Port
- Serial Port (2nd Serial Optional)

$199 w/0K

Piggy Back Board $59 w/0K

PC's Limited Mini I/O

- Serial Port
- Parallel Port
- Clock
- Software
- Fits In Short Slot

$99

300/1200 Baud Hayes Compatible Modem Fits in Short Slot

$159

PC's Limited Monochrome Graphics Fully Hercules Compatible

$159

- Text Mode 80 X 25
- Graphics Mode 720 X 348 Pixels
- One Parallel Printer Port

PC'S LIMITED Six Function Card

- Upgradable to 384K
- Clock/Calendar
- Includes Software
- Parallel Port
- Serial Port
- Game Port

Two Year Warranty

w/0K $99 w/384K $149

Seagate

20, 30 and 40 MEG High Speed 40 MS Access Time Hard Drives for AT™

Uses Linear Voice Coil Activator.

Heads park automatically at power down.

20 MEG $579
30 MEG $699
40 MEG $819

Includes Seagate Full Height Hard Disk, Cable, and Mounting Rails.
Boots from Hard Disk. One Year Warranty

PC's Limited PC-576 RAM Board

- Expandable to 576K
- Supports 64K or 256K RAMS
- Fits in Short Slot

$69 w/0K

SOLVE YOUR POWER PROBLEM.

XT™ POWER 130W

$99

Directly replaces power supply in PC.™ Fully XT™ compatible.
One Year Warranty

PC'S LIMITED MONO-1 MONITOR $169

- 12 inch screen
- Amber
- Compatible with monochrome or color graphics cards

PC'S LIMITED RGB-1 MONITOR $459

- .31MM dot pitch
- RGB Input
- 12-inch screen
- 690X240 resolution
- 16 colors

TOTAL SATISFACTION GUARANTEE

WARRANTY

For Warranty Service: One year Limited Warranty on PC's Limited products. Contact Technical Support for a Return Authorization Number (RMA). Returns must be accompanied by your RMA, the invoice, and a brief explanation. During the Warranty Period, PC's Limited will repair or replace items at our option.

30-DAY TOTAL SATISFACTION GUARANTEE

Any item bought from PC's Limited may be returned within 30 days from the date it was shipped for a full refund of your purchase price. Returned items must be as-new, not modified or damaged, with all warranty cards, manuals, and packaging intact. Returned items must be shipped prepaid and insured, and must bear a PC's Limited Credit Return Authorization (CRA) on the shipping label. Call PC's Limited's Customer Support Department for CRA. No credits issued after 30 days from date of shipment.

CONSUMER TIP

When shopping for PC products, ask our competitors about *their* refund policies.

Seagate HD ▫ Western Digital Controller

20 MEG Hard Disk System for PC

Internal
$449

For Xebec 1220 Combined Floppy/Hard Disk Controller add $75.

Includes Seagate Hard Disk, Western Digital Controller, Cables, Manual, Software, and Mounting Hardware.
Boots From Hard Disk 65 MS Access Time One Year Warranty

Our Hard Disk Systems are compatible with the latest versions of the following Computers: IBM PC, IBM XT, AT&T 6300, Compaq Deskpro, Tandy 1000, Tandy 1200, PC's Limited Turbo PC, Zenith 150, Zenith 151, Leading Edge PC (Both Models), Sperry PC, Wyse PC, Televideo PC, Faraday Mother Boards, Corona PC, Eagle PC, ITT PC, and most other Compatibles.

PLEASE SPECIFY YOUR COMPUTER TYPE WHEN ORDERING.

Some quantities may be limited. PC's Limited sells equipment certified to be compliant with FCC Class B standards. Where equipment manufactured by PC's Limited has not yet received certification, PC's Limited will substitute equivalent certified equipment. All prices are subject to change without notice. We are an independent sales organization.

VISA MasterCard

*Limited Warranty

PC'S LIMITED™

SALES CALLS OUTSIDE TEXAS, 1-800-426-5150
SALES CALLS INSIDE TEXAS, 1-800-252-8336
1611 Headway Circle, Building 3, Austin, Texas 78754
Sales Calls from anywhere in the country, (512) 339-6962
Technical Support Calls, (512) 339-6963 Customer Service Calls, (512) 339-6964
Telex No 9103808386 PC LTD FAX (512) 339-6721

Panasonic, TEAC, Mitsubishi, Intel, IBM, Hercules, Plantronics, Xebec, Seagate, Western Digital, AT&T, Compaq, Tandy, Leading Edge, Sperry, Wyse, Televideo, Faraday, Corona, Eagle, ITT, and Zenith are registered trademarks of their respective companies. IBM PC, IBM XT, IBM AT, are trademarks of IBM Corporation. Leading Edge PC, Sperry PC, Wyse PC, Compaq Deskpro, Zenith 150, Zenith 151, Televideo PC, Corona PC, Eagle PC, AT&T 6300, Tandy 1000 and Tandy 1200 are trademarks of their respective companies.

Ad Number 307/86

Circle 34 on reader service card

NO HIDDEN CHARGES!!

STD STD-AT

- Intel 80286 processor
- MS DOS 3.1 included
- 640K RAM on motherboard
- 1.2 MB Floppy Controller
- Dual floppy & hard drive controller
- Clock/Calendar with battery back-up

$1549

STANDARD PC/XT™

- Intel 8088 (4.77 MHz)
- 1-half height floppy drive
- STD-5150 keyboard
- 135 watt power supply
- 8 expansion slots

$549

STD TURBO/XT

- Intel 8088-2 (4.77 or 6.66 MHz)
- Keyboard selectable clock speed
- Up to 40% faster processing
- STD-5160 AT style keyboard
- 640K RAM • 8 expansion slots
- 1-half height floppy drive

$629

Hard Disk Kits for IBM PC™

Convert your PC to an XT with our hard disk kit. Complete with hard disk controller, cables, manual, mounting hardware and easy-to-use software.

20MB **$415**
30MB... **$539**

Hard Disk Kit for Compaq Portable

Kit includes 3½" shock mounted hard disk, hard disk controller, cables, manual and software.

Plus A One Year Warranty!

20MB..... **$579**

Hard Disk Kits for IBM AT™

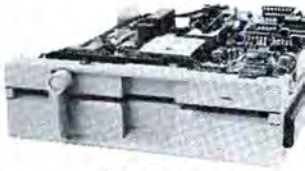
High performance, fast access Includes: cables, manual and mounting rails.

20MB... **$549**
30MB... **$629**

TEAC or Panasonic

$99

360K Floppy Drive for the IBM A



$109

EPSON

LQ-800..... **$619**
LQ-1000..... **$769**
FX-285..... **$589**
FX-85..... **$399**

OKIDATA

192..... **$365**
193..... **$549**

intel®

Math Co-Processor

8087..... **$129**
80287..... **$219**
Above Board/AT. **$429**

Memory

9 Chips Per Set

1 Year Warranty!

64K..... **$10**

256K..... **$29**

PGS Princeton Graphic Systems

HX-12
Color Monitor..... **$459**
HX-12E
Enhance Color Monitor **$559**

AMDEK

310A
Monochrome
Monitor..... **$159**

CompuAdd

"Personal Computer Products"

12303-G Technology Austin, TX. 78727

Call Toll Free:
800-626-4029

VISA

Tech Support
800-527-3125

In Texas Call:
512-250-1489

Circle 393 on reader service card

Toll Free: 1-800-626-4029

IBM PC

- 256K RAM
- One 1.2 MB floppy drive

$1699

IBM AT

- 256K RAM
- 1-360K floppy drive

$3200

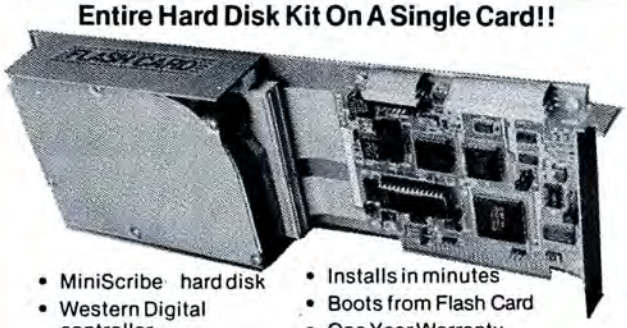
COMPAQ Portable

- 256K RAM
- 1-360K floppy drive
- 20 MB hard disk

$2139

FLASHCARD

Entire Hard Disk Kit On A Single Card!!

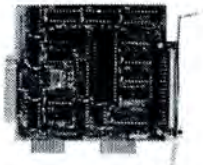


- MiniScribe hard disk
- Western Digital controller
- Installs in minutes
- Boots from Flash Card
- One Year Warranty

20MB for IBM PC..... $485

20 MB for Compaq Portable..... $579

STANDARD FDC



ppy Disk
ntroller

$39

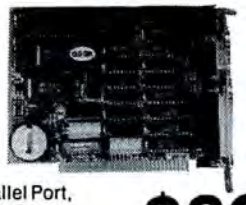
AST SixPakPlus

- Serial Port
- Parallel Port
- Memory Expansion
- Clock/Calendar
- Sidekick Software
- 2 Year Warranty

New Price!

$199

STANDARD I/O



Parallel Port,
Serial Port &
Clock/Calendar

$89

STANDARD ColorCard

lor Display
rd With
rallel Port

$95

STANDARD MFC

Multifunction Card

384K Memory,
Serial & Parallel,
Clock/Calendar
Game Port

$129

STANDARD MonoGraphics Card

Monochrome
Graphic
Adapter
w/Parallel Port

$99

STANDARD MonoCard

Monochrome
Display Card
w/Parallel Port

$79

Enhanced Graphics Adapter by Video 7

Vega EGA Board

Compatible with IBM EGA Board, 256K of Display RAM, Supports Popular Software Written for the IBM PC.

$399

Tiny Turbo 286™

Accelerate Your PC

- Uses 80286 Processor (8MHz)
- Keeps Original 8088 In System
- Processor Seletable To Insure 100% Compatibility
- Optional 80287 Numeric Processor

$489

ORCHID

Policy: All prices include fully insured, UPS ground shipping, on all orders shipped in continental U.S.A. No surcharge for VISA MasterCard or COD payments (Minimum purchase of $50 on COD & net term orders). We accept Fortune 1000, Governmental & Institutional purchase orders on a net s basis (with credit approval) at no additional charge. Allow 7 days for personal check and company checks to clear. No warranty work done without f of purchase.

1/8% sales tax if a Texas resident. Prices are subject to change. All equipment carries a new factory warranty. All returned items must be accompanied by a return rization number and subject to a restocking fee.

orate & Institutional Accounts Welcome: Our national accounts division is dedicated to providing the prompt professional service required to your business running smoothly. We accept P.O.'s on a net terms basis, (minimum order $50 please) offer next day shipping, free fully insured UPS nd shipment. We offer a full-time technical staff to answer any questions that might arise and to make fast repairs if needed. You'll notice the rence.

SixPakPlus, Advantage!, and RAMpage! are registered trademarks of AST Research Inc. IBM, PC, PC-XT and PC-AT are registered trademarks of International ess Machines Corporation. Amdek, Compaq, Epson, Hayes, Hercules, Intel, Okidata, Panasonic, Princeton Graphic Systems, and Teac are trademarks of their ctive Companies.

CompuAdd

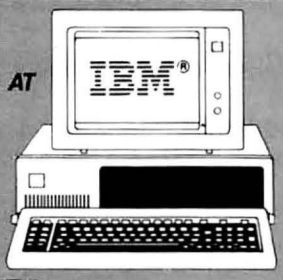
Order Toll Free:
800-626-4029
In Texas Call: 512-250-1489
Tech Support: 800-527-3125

VISA

COMPUTER HUT

FOR THE KNOWLEDGEABLE USER

IBM-PC, XT & AT CALL



COMPAQ®
Portables, Deskpros, 286 Models . . . **CALL**

DISK DRIVES

Tandon TM100-2 DS/DD **$109**
TEAC FD 55-B Slimline **$119**
IBM® drives w/logo **$129**

HARD DISKS/TAPE

ME MAYNARD ELECTRONICS
Hard disks & tape back-ups complete with cont. & cables . . . . . **CALL**
MaynStream tape backup from: **$795**
On board 10 Meg (Hard Card) . . **$609**
On board 20 Meg (Hard Card) . . **$749**
OMEGA Bernoulli from **$2395**
IRWIN tape backups . . . . . **BEST PRICES**
SEAGATE
20 Meg internal w/cont. **$459**
ST4026, ST4038 (AT) . . . . . **CALL**

ADD-ON BOARDS

AST
SixPak Plus 64K . . . . . **SPECIAL**
I/O mini **$135**
Advantage 128K **$369**
dca IRMA board **$795**
HERCULES
HiRes Mono Graphics w/par port **$289**
Color Graphics w/par port **$159**
INTEL Above boards . . . . . **CALL**
PARADISE
Modular Graphics **$269**
Color/Mono Card w/par port **$145**
5-Pack 0K **$109**
EGA . . . . . **CALL**
QUADRAM
Quadboard 0K **$185**
Quad EGA+ **$369**
Microfazer 64K . . . . . **CALL**
STB — full line . . . . . **CALL**
TECMAR
Graphics Master **$449**
Maestro 128K **$369**
Captain 64K . . . . . **CALL**
VICTOR Speed Pack 286 . . . . . **CALL**

MODEMS

Hayes
SMARTMODEM
1200/1200B w-Smartcom II **$389/349**
2400/2400B w-Smartcom II **$579/539**
AST, Quadram . . . . . **CALL**

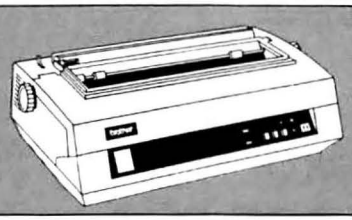
PRINTERS

EPSON
FX-85/286, LX-80, LQ-800/1000 HI-80 plotter, HS-80 ink jet —
BEST PRICES — GUARANTEED!
brother
HR-15XL . . . . . **$369** HR-25 . . . . . **$549**
HR-35 . . . . . **$779** M1509 . . . . . **$399**
Twinwriter . . . . . **CALL**
HEWLETT PACKARD . . . . **CALL**
OKIDATA
182, 192, 193, 292, 293 . . . **BEST PRICES**
NEC . . . . . **CALL**
TOSHIBA
P321 Par . . . . . **$519** P341 Par **$849**
P351 Par/Ser **$1149**

INPUT DEVICES

MOUSE SYSTEMS
PC Mouse w/Dr Halo **$139**
MICROSOFT
Bus Mouse or Ser Mouse **$139**
MAYNARD . . . . . **CALL**

ACCESSORIES . . . . . CALL



SPECIALS

PARADISE SYSTEMS

5-PACK w/0K-expandable to 384K, Ser. Port, clock, Ram disk & print spooler **$109**

CMC color/Mono Card runs IBM Mono or Color Monitor. Par. Port included **$129**

ANY PRODUCT NOT LISTED? CALL

MONITORS

AMDEK
Video 310A . . . **$165** Color 600 . . . **$399**
Color 722 (EGA) **$529**
PGS
HX12 . . . . . **$449** HX-12E **$549**
MAX-12E . . . . . **$179** SR-12 . . . . . **$599**
NEC JC1401 Multisync **$559**

SOFTWARE

WORDPROCESSING
MS Word (IBM)**$239** Word (MAC) . . **$149**
Multimate . . . **$229** Advantage . . . **$269**
Volkswriter 3 . . . . . **$159**
WordStar / Propack . . . . . **$189/$299**
Wordstar 2000 / 2000+ . . . . . **$249/$299**
Word Perfect . **$229** PFS: Write **$84**
DATABASE / SPREADSHEET
Lotus 1-2-3 . . . **$309** Symphony **$429**
RBase 500 . . . **$349** Reflex **$59**
dBase III & Framework . . . . . **In Store**
Cornerstone . . . . **$85** Multiplan **$119**
Symantec Q&A **$219**
Javelin . . . . . **CALL** Pardox . . . . . **CALL**
Ability . . . . . **SPECIAL**
BUSINESS / ACCT.
Microsoft Project **$239**
Harvard Total Project Mgr **$259**
PFS: File, Plan, Graph **$84**
Chart Master . . **$229** Sign Master . . . **$179**
Diagram Master **$199**
Evergreen . . . . . **CALL**
BPI Accounting . . . . . **CALL**
UTILITIES / COMPILERS
Smartcomll (IBM) **$99**
Smartcomll (MAC) **$129**
Crosstalk XVI . . . **$99** Crosstalk Mark IV **$159**
Norton Utilities . . **$59** Sideways **$39**
Sidekick (NP) . . **$48** Superkey **$45**
Turbo Pascal . . . **$45** T.Pascal w/8087 . **$69**
MICROSOFT Macro Assembler **$99**
MS Basic . . . . . **$239** MS Fortran **$219**
LIFEBOAT Lattice C **$269**
OTHER
ATI Training Power Series **$49**
ATI Skill Builder Series **$39**
Flight Simulator **$39**
Copy II PC . . . . **$35** PC tools **$35**

AND LOTS MORE

EAST COAST

COMPUTER HUT
OF NEW ENGLAND INC.
101 Elm St. Nashua, NH 03060
(603) 889-7625
For Orders Only — (800) 525 5012

MID-WEST

COMPUTER HUT *INC.*
524 S. Hunter
Wichita, Kansas 67207
(316) 681-2111
For Orders Only — (800) 572 3333

All products usually in stock for immediate shipment and carry full manufacturers' warranty. Price subject to change — this ad prepared two months in advance. We honor personal checks — allow 20 days to clear. COD up to $500. Visa, MasterCard add 2%. For shipping & insurance add 2% or $6.00 min. for small items and $12. min. for monitors, printers, etc. We accept company checks and P.O.'s from Fortune 1000 Companies. **All prices reflect cash discount for mail & phone orders only. In store prices may differ.**

IBM is a trademark of IBM Corp.

Return authorization and order status call information line *686*

Circle 158 on reader service card

COMPUTER DISCOUNT WAREHOUSE

IBM XT SPECIAL
w/1 FLOPPY, 256K, 30 MEG $2260.44

IBM PC™
w/1 FLOPPY, 64K $1258.40
w/2 FLOPPIES, 64K $1358.40
w/1 FLOPPY, 64K, 1 10 MEG $1658.40
w/1 FLOPPY, 64K, 20 MEG . $1820.44
Monitors & monitor adapter card additional

WHY PAY RETAIL?

Nobody Sells For Less

COMPAQ PORTABLE
2 DRIVE 256K $1543.69
1 DRIVE + 1 10 MEG $1973.50
1 DRIVE + 1 20 MEG $2097.57
COMPAQ PORTABLES INCLUDE MSDOS

286s · PORTABLE II · DESK PRO's
ALL IN STOCK
CALL FOR LOWEST CUSTOM QUOTES
TM-Registered trademark of IBM and COMPAQ

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

COMPUTERS

IBM PC/XT™ SPECIALS

IBM PC w/64K 1 drive	$1258.40
IBM PC w/64K 2 drives	1358.40
IBM PC w/64K 1 floppy 1 10 meg hard	1658.40
IBM PC w/64K 1 floppy 1 20 meg hard	1820.44
IBM XT w/256K 1 drive	1609.53
IBM XT w/256K 2 drives	1707.31
IBM XT w/256K 1 floppy and 10 meg	1999.43
IBM XT w/256K 1 floppy and 20 meg	2099.54
IBM XT w/256K 1 floppy and 30 meg	2260.44

IBM AT™ SPECIALS

IBM AT w/256K 1.2 meg floppy	$2977.07
IBM AT w/256K 20 meg hard drive	3571.07
IBM AT w/512K 20 meg hard drive	3629.39
IBM AT w/512K 30 meg hard drive	3843.47
IBM AT w/512K 70 meg hard drive	4893.96

COMPAQ® SPECIALS

COMPAQ portable w/128K 1 floppy	$1473.50
COMPAQ portable w/256K 2 floppies	1543.69
COMPAQ portable w/256K 1 floppy and 10 meg	1973.50
COMPAQ DeskPro w/128K 1 floppy	1532.96
COMPAQ DeskPro w/256K 2 floppies	1674.26
COMPAQ DeskPro w/640K 20 meg hard drive	1961.96
COMPAQ DeskPro w/640K 30 meg hard drive	2111.94
Call for lowest custom quotes on:	
COMPAQ "286" and the all new	
COMPAQ PORTABLE II in stock now	SAVE

AT&T™ SPECIALS

AT&T 6300 w/128K 1 drive & keyboard	$1368.50
AT&T 6300 w/256K 2 drives & keyboard	1655.71
AT&T 6300 w/256K 1 floppy, 20 meg	1974.23
AT&T 6300 PLUS (AT compatible)	SAVE

SHARP™ PC SPECIALS

2 Drive Portable (18 lb. IBM PC compatible)	$1341.93

Other Computers Available Upon Request

FLOPPY & HARD DISK DRIVES

1/2 height drive	$98.00
IBM Logo Drive	123.16
TANDON full height floppy drive	99.87
SEAGATE 10 meg 1/2 height hard drive	SAVE
SEAGATE 20 meg 1/2 height hard drive	SAVE
XEBEC 10 meg 1/2 height hard drive	387.54
GENOA 20 meg internal tape	693.43
GENOA 20 meg external tape	818.76
GENOA 60 meg tape drives	CALL
IOMEGA removable hard drives systems . From	1754.23
IRWIN 10 meg tape backup	465.00
TALLGRASS Technology Products	CALL

DRIVE CARDS

MOUNTAIN 20 meg	$803.33
MOUNTAIN 30 meg	SAVE
MAYNARD 10 meg	596.23
MAYNARD 20 meg	683.45
WESTERN DIGITAL 10 and 20 meg	CALL

TAPES AND DRIVES FOR IBM ATs

20 meg hard disk: SEAGATE or RODIME	$557.80
30 meg hard disk: SEAGATE or RODIME	687.51
70 meg hard disk	1695.69
360K floppy drive	110.12
GENOA 20 meg internal tape	693.43
GENOA 20 meg external tape	818.76

PRINTERS

EPSON LX 80 80 Col. 100 CPS HLQ STD.	$232.61
EPSON RX 100 Plus 132 Col. 100 CPS Tractor Std.	299.56
EPSON FX 85	SAVE
EPSON FX 286	517.00
EPSON LQ 800	543.22
EPSON LQ 1000	673.43
EPSON, COMREX 420 132 Col. 420 CPS	999.11
IBM Pro Printer	429.40
NEC P6 80 col	475.22
NEC P7 136 col 216 cps	615.35
NEC P5 136 col 290 cps	999.67
NEC 3550 Spinwriter	797.12
NEC 8850 Spinwriter	1127.65
OKI okimate 20	117.72
OKI ML 182	221.40
OKI ML 183	383.00
OKI ML 192	359.84
OKI ML 193	499.21
TOSHIBA P321	509.83
TOSHIBA P341	SAVE
TOSHIBA P351	1023.94

LASER PRINTERS

CORONA Laser Printer	$2223.24
H-P Laser Jet Printer	2376.00
H-P Laser Jet Plus	3023.24

MODEMS

HAYES 300 Smart Modem	$136.08
HAYES 1200B	299.39
HAYES 1200B w/Smartcom	334.89
HAYES 1200B 1/2 Card - New Release	SAVE
HAYES 1200	392.08
HAYES 2400	622.06
HAYES 2400B internal	502.16

MONOCHROME MONITORS

AMDEK 310A	$140.40
COMPAQ monochrome monitor (green or amber)	188.46
IBM monochrome monitor	219.84
PGS MAX 12E amber color	167.40
QUADRAM Amber Chrome	144.10

MONITOR INTERFACE CARDS

GENOA Spectrum (color/monographic w/p)	$259.39
HERCULES color card w/p	144.16
HERCULES monographic w/p	274.93
PERSYST short port color card w/parallel port	137.57
PERSYST short port mono card w/parallel port	134.69
QUADRAM Gold Quad Board w/64K color/P/C	387.33
STB Chauffeur w/p	237.60

COLOR GRAPHIC MONITORS

AMDEK color 600 (Hi-Res RGB)	$399.97
AMDEK color 722	SAVE
AMDEK color 725	SAVE
IBM color monitor	528.77
PGS HX-12 Hi-Resolution RGB	412.32
PGS HX-12E Hi-Resolution RGB	484.32
PGS SR-12 enhanced graphics capability	583.20
QUAD Chrome II Color	354.20

ENHANCED GRAPHICS PRODUCTS (EGA)

GENOA SPECTRA EGA 256K w/p	$343.75
IBM enhanced graphics monitor	679.41
PGS HX-12E Hi-Resolution	484.32
QUADRAM EGA	397.73
STB EGA PLUS 256K w/p	322.85

INTERFACE CARDS & MULTI-FUNCTION CARDS

APPARAT 384K w/Clock Life Time Warranty	$199.89
AST 6 pack with 64K C/S/P expands to 384K	166.24
AST advantage for AT expands to 3 meg	397.65
AST I/O mini (clock/serial port)	125.28
DIGIGRAPHIC expands to 384K W/0K/C	114.90
INTEL above board for PC w/64K	297.76
INTEL above board for AT w/128K	396.36
JRAM-3 w/256K (Lotus 2.0/Symphony compatible)	284.90
Parallel port	69.80
QUADRAM Liberty w/64K	245.41
QUADRAM Silver Quad Board expands to 640K w/P/S/C/G/0K	235.35
QUADRAM Quad Board expands to 384K w/P/S/C/G/0K	189.71
Serial port	49.95

CHIPS

4164 (64K 150 nanoseconds)	$2.00
Nine Chip Set (complete set)	9.98
128K piggy backs for AT	4.00
Nine Chip Set (complete set)	34.50
8087-3 (for PC/XT/COMPAQ portable)	121.50
8087-2 (for COMPAQ DeskPro)	149.33
80287-2 (for AT and AT compatibles)	168.39
41256K (256K chips)	4.00
Nine Chip Set (complete set)	28.12

MISC. & ACCESSORIES

A-B Switching Box (par. or serial)	$45.00
BASF D/S, D/D	12.50
BASF 3.5" Disk for MACINTOSH 10 pack	19.99
Disks for AT (1.2 meg)	26.14
KENSINGTON Master Piece	99.99
KEYTRONICS 5150	108.00
KEYTRONICS 5151	162.00
Printer Cable for IBM	19.99
QUADRAM MICRO FAZERS	140.40
XT Power Supply	99.94

MOST ORDERS SHIPPED WITHIN 48 HOURS.

Call CDW for custom quotes on products not listed.

If you find a better price We'll meet it or beat it.

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE NOW!

SPECIAL! LOTUS 123 $299.00

1-(800) 233-4426

IN ILLINOIS (312) 498-1426

VISA MasterCard AMERICAN EXPRESS

SPECIAL! MULTIMATE or WORD PERFECT $225.00

On all orders under $200.00 please add $5.00 handling fee. All prices reflect 3% discount for cash. Allow 10 business days for shipping when paying by personal check. All pricing subject to change.

CDW 0786 PCW

Circle 91 on reader service card

A DECADE OF SERVICE

TURBO XT

Dual Spd CPU, 2-FD, 640K Grn Monitor, complete

$995

AT&T*† 6300

2-FD, 256K, Keyboard, AT&T Hi-Res Mono Monitor

$1,795

IBM* PC

2-FD, Graphics mono monitor, 256K, list 2810

$1,579

IBM* AT-Enhanced

20-Megabyte Hard Disk, 1.2-MB FD, 512K, Keyboard, Amber Monitor

$3,995

Complete systems shipped overnight.

Specialists in complete computer systems for business applications.

SOFTWARE

ANDREW TOBIAS MANAGING YOUR MONEY	$129
ASHTON TATE FRAMEWORK II	call
ASHTON TATE dBASEIII plus	call
BORLAND SIDEKICK	$39
BORLAND TURBO PASCAL	$45
BORLAND TURBO LIGHTNING	$45
BORLAND SUPERKEY	$35
BORLAND REFLEX	$59
CLIPPER dBASE COMPILER	call
COMPUTER ASSOCIATES IUS Acctg Series	from $299
DECISION RESOURCES CHARTMASTER	$239
DECISION RESOURCES SIGNMASTER	$189
DECISION RESOURCES DIAGRAMMASTER	$259
DIGITAL RESEARCH GEM DRAW/COLLECTION	call
DIGITAL RESEARCH GEM COLLECTION	call
FUNK SOFTWARE SIDEWAYS	$48
HARVARD TOTAL PROJECT MANAGER	call
HAYES SMARTCOM II	$89
IBM DISPLAYWRITER III	$369
LATTICE C-COMPILER	$298
LIFETREE VOLKSWRITER DELUXE	call
MICROSOFT WINDOWS	$179
MICROSOFT WORD	call
MICROSTUFF XTALK XVI	$99
MULTIMATE latest	call
MULTIMATE ADVANTAGE	call
NORTON UTILITIES	$59
OPEN SYSTEMS ACCOUNTING SERIES	call
ROSESOFT PROKEY	$99
SATELLITE SOFTWARE WORDPERFECT 4.1	call
SOFTWARE PUBLISHING CO. PFS SERIES	from $79
SORCIM SUPERCALC III	$197

MASS STORAGE

floppy drives

MITSUBISHI ½ht 360k (bl/gry)	$98
MITSUBISHI ½ht 1.2 mb (gry)	$147
TANDON TM100-2	$125
TOSHIBA ½ ht.	call

internal hard drives

All hard drives complete with controllers, mounting hardware & instructions. All are formatted, tested & have 1 year warranty.

SEAGATE 10MB	$449
SEAGATE 20 MB	$499
SEAGATE 30 MB	call
SEAGATE 20 MB for AT	$689
SEAGATE 30 MB for AT	$796
PRIAM 40MB/60MB	$1395/1595
PRIAM 40MB/60MB for AT	$1425/1625

disk cards

HARDCARD 10MB/20MB	$625/895
CMS 10MB/20MB	call
MOUNTAIN 10MB/20MB	call

disk subsystems

BERNOULLI BOX 20MB/40 MB	$2695/3595
SYSGEN FLATPACK	call
TALLGRASS all models	call

tape drives

IRWIN 10MB/20MB inter.	call
IRWIN 10MB/20MB exter.	call
TALLGRASS 4060	call

BOARDS

multifunction

QUADRAM QUADPORT AT	$119
QUADRAM LIBERTY	call
QUADRAM EMS +	call
AST SIXPAK 384k	$288
AST RAMPAGE XT/AT	call
QUADRAM QUADBOARD 384k	call; new low, low price
THESYS FASTCARD V Ok	NEW!
RAM BOARD 384k half card	$169

video/graphics

AST PREVIEW	$289
HERCULES COLOR	$188
HERCULES GRAPHICS	$319
IBM COLOR	$198
IBM MONOCHROME	$198
QUADRAM EGA +	$399
QUADRAM QUADCOLOR I COLOR CARD w/par.	call
MONOCHROME GRAPHICS Herc comp.	$198

network

ORCHID PCNET	call
QUADRAM QUADNET IX	call

emulation

AST 5251 mod 11/12	call
DCA IRMA	call

MONITORS

monochrome

AMDEK 310a	$168
IBM MONOCHROME	$224
PRINCETON MAX 12	$178
QUADRAM AMBERCHROME	$166

color

AMDEK 600/772	call/$528
IBM ENHANCED COLOR	$594
PRINCETON HX12/H12E	$436/$526
QUADRAM QUADCHROME II	call
QUADRAM ENHANCED Color	NEW!

MODEMS

HAYES 1200/1200B	$398/329
HAYES 2400/2400B	$596/526
US ROBOTICS PASSPORT 1200/2400	call
1200 BAUD EXTERNAL MODEM	$196
VENTEL 1200 w/XTALK	call

SUPPLY HOUSE

PC MART DISKETTES box	$18
case	$159
VERBATIM DISKETTES box	$28
case	$258

PRINTERS

dot matrix

BROTHER HR1509	$398
EPSON LX-80	call
EPSON FX-85/FX-286	call
EPSON LQ-800/LQ-1000	call
IBM PROPRINTER	$425
OKIDATA 182	$268
OKIDATA 192/193	$399/545
OKIDATA 2410	call
TOSHIBA 321	call
TOSHIBA 341/351	$859/1159

laser/letter quality

BROTHER HR15	$198
BROTHER HR25/HR35	$568/798
CORONA LP300	$2995
EPSON DX20/DX35	call
IBM QUIETWRITER II	$1259
QUADRAM QUADLASER	in stock!

plotters

HOUSTON INSTRUMENTS all models available for quick delivery	call

MISCELLANEOUS

MOUSESYSTEMS PC MOUSE w/PAINT	$159
MICROSOFT MOUSE serial/bus	$129
KEYTRONICS 5151/5153	call
AT Keyboard	$149
QUADRAM MICROFAZER 8k	$129
QUADRAM MICROFAZER II	New!
TRIPPLITE ISOBAR from	$45
TRIPPLITE UPS 400w/800w	call
CURTIS PROTECTORS from	$29

CHIPS

64k/128k/256k	call for market price
8087/80287	call for market price

*Registered Trademark †Some systems available to qualified accounts only.

PC MART™

Personal Computer Centers

1-800-241-0286
ORDERS
1-404-634-5995
INFORMATION

MasterCard

VISA®

1485 Northeast Express NE • Atlanta, GA 30329

Visit our showrooms in Atlanta, Charlotte, Durham and Raleigh

SALES • SERVICE • FINANCING • DELIVERY • SUPPORT

Circle 525 on reader service card

SILICON EXPRESS DISKS DS/DD 9.95

VERBATIM OR MAXELL DS/DD 17.95

ELEPHANT DS/DD 14.95

DATACASE 8.99

INSIDE OHIO 1-800-225-0755

YOUR TOLL FREE ACCESS OUTSIDE OHIO

1-800-228-0755

CALL...FOR THE BEST PRICES...
BEST DELIVERY...
We have hundreds of other programs in stock at Fantastic savings.

SILICON EXPRESS

ALL NEW STORE WITH EXPANDED WAREHOUSE

Ability	299.95
Ancient Art of War	26.00
Addition Magician	24.95
Algeblaster	34.95
Algebra I thru IV	ea. 26.95
Alphabet Zoo	18.95
Amazon	27.49
Archon I or II	22.45
ASC II Express	132.95
Bank Street Writer	46.50
Baron	29.50
Basic Compiler	279.95
Basic Interpreter	244.95
Boston Com. Diet	55.95
BPI Acc. Payable	414.95
Acc. Receivable	414.95
General Ledger	414.95
Inventory Control	554.95
Job Cost	554.95
Payroll	414.95
Time Accounting	554.95
Champ. Load Run.	23.95
Chart Master	245.00
Chess	44.00
CIP	204.95
Clip Art Vol 1	16.25
Clout	118.00
Cobol Compiler	489.95
Computer SAT	51.95
Computer GRE	62.95
Copy II PC	18.50
Cornerstone	235.00
Crosstalk	92.00
Cut & Paste	23.69
Cutthroats	23.95
Data Base Manager	139.95
Database Mgr. II	184.95
dBase II	CALL
dBase III+	369.95
Deadline	28.69
Deadline Manager	104.95
dGraph III	138.00
Diagrammaster	225.00
Disk Drive Analyzer	21.95
Dollars & Sense	104.95
Dow Jones Con.	34.95
Inv. Evaluator	99.00
Market Analyzer	210.00
Market Manager	140.00
Prospect Organizer	235.00
Sales Organizer	235.00
Spreadsheet Link	140.00
Dr. Halo	39.95
Dr. Halo II	74.95
Dutill III	48.50
Early Games	19.95
Easy	97.50
Easy as ABC	27.95
Einstein Writer	118.95
Electric Disk	214.95
Enable	489.95
Enchanter	23.95
Esp Statistics	554.95
Executive Org.	69.96
Executive Suite	27.95
Executive Writer	48.95
F-15 Strike Eagle	21.00
Family Roots	149.95
Financial Ckbk.	31.95
Flashcalc	89.95
Flight Simulator	29.00
Fontrix 1.5	84.95
Fontpaks 1 thru 13	ea. 13.00
Fortran Compiler	244.95
Fraction Factory	20.95
Framework II	369.95
Freestyle Word Proc.	206.95
Gato	23.69
Gem Draw	99.95
Gem Desktop	29.95
Get Organized	74.95
Ghostbusters	27.95
Goren Bridge	51.95
Graphics Magician	34.95
GRE (Harcourt Brace)	45.00
Harvard Proj. Man.	199.95
Total Proj. Man.	259.95
Hitchhiker's Guide	23.95
Homeword	46.95
Infidel	27.95
In House Accountant	119.95
Inv. Strategist	206.95
Jet	32.75
Key II Manager 1-2-3	69.95
KeyWorks	49.95
Kids of Keys	17.95
Kid Writer	21.89
Kindercomp	17.95
King's Quest II	28.00
Knowledgeman 1.7	239.95
Knowledgeman 2.0	319.95
Locksmith	64.95
Load Runner	21.00
Lotus	CALL
Magic Spells	22.95
Managing Your Money	104.95
Mask Parade	27.95
Mastering the SAT	69.95
Masterpiece	84.00
Masterpiece Plus	113.00
Mastertype	22.50
Math Blaster	28.00
Micro Cookbook	25.95
Micro Lg. Baseball	24.00
Micro Lg. Team Disk	13.95
Microsoft Access	164.95
C Compiler	349.95
Chart 2.0	299.95
Off. Writer/Speller	249.95
Project	249.95
Word	239.95
Windows	69.96
Millionaire	29.50
Mind Forever Voyag.	30.95
Mind Over Minors	41.95
Mind Prober	26.00
Most Amazing Thing	22.95
Multimate 3.3	229.95
Advantage	279.95
Executive	249.95
Multiplan MS/DOS	119.95
Murder by the Doz.	21.99
Murder on Zinderneuf	23.95
Music Construction	24.99
Net Worth	57.00
Newsroom	30.50
N.Y. Times Crossword	11.50
Norton Utilities	55.95
Nutshell	48.00
One-On-One	25.45
Paperback Writer	27.95
Perry Mason	27.95
Personal Accountant	62.95
PFS: Access	59.95
PFS: File	82.50
PFS: First Success	229.95
PFS: Graph	82.50
PFS: Plan	82.50
PFS: Proof	59.95
PFS: Report	82.50
PFS: Write	82.50
Piece of Cake Math	21.95
Pinball Construction	23.99
Planetfall	23.69
Praticalc III	69.95
Print Master	41.95
Print Master Clip Art	27.95
Print Shop	36.95
Print Shop Gr. 1	22.95
Print Shop Refill	13.95
Probase	244.95
Prokey 4.0	69.95
Quick Basic	69.95
QuickCode 1-2-3	99.95
QuickCode III	138.00
Quicken	51.95
Quick Report	138.00
Qwiknet 2.5 500	549.95
R:Base 4000	289.95
R:Base 5000	339.95
Reader Rabbit	25.95
Ready!	49.95
Reflex	56.95
Remote	92.00
Rendez. w/Rama	27.49
Report Card	33.00
Ret. System 4-1-1	104.95
Samma +	369.95
Sargon III	29.95
Sat (Harcourt Brace)	45.00
Sat (Barron's)	53.00
Seastalker	23.95
Select Write WP 101	69.95
Seven Cities of Gold	25.45
Sidekick protected	29.00
Sidekick n/protected	44.00
Sideways	34.95
Sideways Ver 3	48.95
Signmaster	160.00
Snooper Trps 1 or 2	22.95
Solo Flight	24.95
Songwriter	23.89
Sorcerer	27.95
Speed Reader II	38.00
Speedkey	104.95
Spellagraph	27.95
Spellbreaker	34.95
Spellicopter	23.99
Spell It	28.00
Squire	29.50
Starcross	28.69
State of the Art	
Acc. Payable	369.95
Acc. Receivable	369.95
Bookkeeper	334.95
Budget & Financial	334.95
General Ledger	369.95
Inventory Control	369.95
Payroll	369.95
Pro Time Billing	534.95
Sales Invoicing	334.95
Story Machine	17.95
Story Maker	24.95
SuperCalc 3	239.95
Superkey	35.50
Superkey/Sidek. Combo	67.95
Suspect	26.69
Suspended	29.95
Symphony	CALL
Think Tank	99.95
Tigers in the Snow	27.95
Time Is Money	69.95
Transporter	143.00
Transylvania	24.95
Travelling Sidekick	36.95
True Basic	84.00
Turbo Database Tlbx.	38.95
Turbo Gameworks	37.50
Turbo Lighting	54.50
Turbo Pascal 3.0	36.25
Turbo Pascal 8087	55.00
Turbo Pascal BCD	55.00
Turbo Pas. 8087,BCD	65.50
Turbo Tutor	19.00
Tycoon	29.50
Typefaces	87.95
Typing Tutor III	23.00
Ultima III	35.95
Versaform XL	69.95
Visible 8088	49.95
Volkswriter Deluxe 3	141.50
V.P. Planner	69.95
Websters Spell Checker	41.95
Windows	69.95
Will Writer	31.95
Wishbringer	27.95
Witness	23.95
Wizardry	36.00
Work Attack	28.00
Word Perfect	219.95
Wordstar	214.95
Wordstar 2000	233.00
Wordstar 2000+	277.50
Wordstar Prof.	233.50
Writing Business Plan	34.95
Zerodisk	69.95
Zork I	25.95
Zork II or III	25.95

HARDWARE

Accelerator Board	679.95
Captain Board (384K)	229.00
Compuserve Starter	21.95
Copy II Option Bd.	74.00
Datacase	8.99
Disk Notcher	8.95
Flip-n-File	10.95
Gamecard III	32.95
Hercules Color Card	189.95
Graphics Pak	534.95
Graphics Card	389.95
Kraft Joystick	29.95
Koala Pad +	114.95
Lemon	31.95
Lime	48.95
Mach III IIE Joystick	33.95
Maestro Bd.-2.5 MEG	449.95
Paradise Color Card	164.95
PC Saver	34.95
Peach	41.95
Prometheus 1200B	289.95
Smartmodem 300	232.95
Smartmodem 1200	3299.95
Smartmodem 1200B	429.95
Smartmodem 2400	699.95
System Card (16K)	299.95
System Card (256K)	474.95
Zoom 1200B	279.00

PRINTERS

Star SG-10	219.00
Star SG-15	394.99
Star SD-10	344.99
Star SD-15	474.99
Star SR-10	494.99
Star SR-15	594.99
Star Powertype	344.95
Printer Stand	CALL
Okidata 192P	399.95
Okidata 193P	559.95
Daisywriter 2000	884.95
Juki 6100	424.95
Colored printer rbns	CALL
Color Paper Pack	13.95

MONITORS

Amdek Video 310A	143.00
Amdek Color 500	339.95
Amdek Color 600	414.95
Amdek Color 710	579.95
Amdek Color 722	635.95
Amdek Video 300G	127.95
Amdek Video 300A	137.95

YOUR ORDER FORM
SILICON EXPRESS
5955 E. Main Street Columbus, Ohio 43213

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CHARGE CARD # _____ Exp. Date _____

QTY.	DESCRIPTION	PRICE

Computer Type _____ SHIPPING

Phone No. _____ TOTAL

No additional surcharge on Mastercard, Visa, or School purchase orders. Personal checks allow 2 weeks. Shipping charges are $3.00 minimum. Ohio residents add 5½% state sales tax. Prices subject to change without notice.

SILICON EXPRESS
5955 E. Main St. Columbus, Ohio 43213
1-614-868-6868

Circle 380 on reader service card

HERE'S 117 REASONS AND *IS AMERICA'S*

1 LOW PRICES. Micro Mart specializes in giving you the best value on all your PC product needs.

2 QUALITY PRODUCTS. We've got a huge selection of national brand name products. Computer systems, printers, peripherals, and more!

3 FULL SERVICE SALES. Our friendly, knowledgeable sales staff will help you choose the right product at the right price.

4 COMPLETE TECHNICAL SUPPORT. For pre-sale or post-sale advice, give us a call. We're here to help.

5 CUSTOMER SATISFACTION. It's made us famous. Drop in at one of our many store locations or give us a call today.

Shop us today and save on these specials...

6 ProLine XT – A complete system for only **$995!**

Here's a system value that can't be beat. Features full PC compatibility. 640K RAM memory. One 360K half height floppy drive. Six expansion slots. Monochrome graphics card and monitor. Printer and communications ports. Clock/calendar. Game port. MS DOS with GW BASIC. Enhanced IBM-style keyboard. UL and FCC approved. Full 1 year parts exclusive warranty.

All systems built and tested! Call for custom configurations!

FREE!
With the purchase of our ProLine XT
This complete accessory pack: 10 pk. DS/DD Maxell Diskettes. SRW Media Storage Case. Six-outlet Curtis power strip with surge protection. Texwipe PC careware kit with antistatic solution and CRT cleaning fluid and wipes. Perfect Data 5¼" drive head cleaning kit. ProLine XT dust cover. Total Retail Value–**$89.95!**

7 American AT – Powerful AT performance for only **$2,289!**

All the speed and power you need. Features full PC compatibility. 512K RAM memory. One 1.2 Megabyte floppy drive. Eight expansion slots. Monochrome graphics card and monitor. Printer port. Clock/calendar. MS DOS. UL and FCC approved. 90 day exclusive warranty.

All systems built and tested! Call for custom configurations!

FREE!
With the purchase of our American AT
This complete accessory pack: 10 pk. tpi quad density Maxell Diskettes. SRW Media Storage Case. Six-outlet Curtis power strip with surge protection. Texwipe PC careware kit with antistatic solution and CRT cleaning fluid and wipes. Perfect Data 5¼" drive head cleaning kit. American XT dust cover. Total Retail Value–**$99.95!**

MORE WHY MICRO MART PC SPECIALIST!

MULTIFUNCTION BOARDS

We have a complete line of Multifunction Boards compatible with the Portable XT/AT.

8. **SIX PAK** 64-384K, multifunction
9. **I/O MINI** I/O shortboard for Portable & AT ..... New Low Price
10. **ADVANTAGE** 128K-3Mb, expansion for AT
11. **RAMPAGE** 64K-2Mb ..... NEW!
12. **QUADRAM QUADBOARD** loaded, 384K ..... CALL!
13. **QUADRAM GOLDBOARD,** 384K $459
14. **TECMAR MEGAFUNCTION,** 1 Meg of nonvolatile memory $369
15. **TALLTREE** J-RAM II ..... CALL!
16. **INTEL** ABOVE BOARD, PC & AT ..... From $280
17. **THESYS FASTCARD** $235

GRAPHICS CARDS

18. **HERCULES** Mono & Color Graphics cards ..... New Low Price!
19. **TECMAR** Graphics Master, HiRes Color & Mono supports Lotus $449
20. **QUADRAM** Quadcolor I & II color cards
21. **QUADRAM EGA,** Includes 256K memory ..... CALL!
22. **STB EGA** + Mono & Graphics cards also available ..... CALL!
23. **GENERIC** monographic cards ..... From $99
24. **SIGMA** Color 400 for PGS SR-12 ..... New Low Price!

FLOPPY DISK DRIVES

25. **1/2 HEIGHT** Disk Drives from Panasonic, Mitsubishi, & Teac; 360K &
26. **1.2 MEG** Floppy drives for the PC, XT, AT and Compatibles ..... From $99

HARD DISCS

27. **IRWIN** Tape Back-up systems ..... From $495
28. **SYSGEN** Complete line ..... Call for our special Sysgen pricing!
29. **BERNOULLI TECHNOLOGY** Hard disc Subsystems ..... From $2875
30. **SEAGATE** Fast 10, 20, 30 Meg. for PC & AT ..... CALL!
31. **PRIAM** Superfast 40 & 60 Meg. for AT ..... CALL!
32. **TALLGRASS 25,** Through 80 Meg. Hard drive systems, including 60 Meg. tape back-up
33. **WESTERN DIGITAL** File cards ..... CALL!
34. Best availability of voice coil and stepper motor hard drives with highest quality controllers ..... From $495

SOFTWARE

ACCOUNTING

35. **SORCIM/IUS** Complete line including windows ..... From $295/each

SPREADSHEETS & INTEGRATED PACKAGES

36. **SORCIM** SuperCALC 3, Vers. 2.0 ..... New Low Price!

ENHANCEMENTS & UTILITIES

37. **NORTON** Utilities 3.0 ..... $69
38. **ROSESOFT** ProKey 3.0 ..... $89
39. **CENTRAL POINT SOFTWARE** Copy II PC $35
40. **SOFTSTYLE** Set FX+ and Printworks, printer control
41. **SIDEWAYS** Inverts printout $51
42. **BORLAND** SideKick and SuperKey ..... From $40
43. **BORLAND** Lightning and Reflex ..... NEW! CALL!

COMPILERS & LANGUAGE TOOLS

44. **LATTICE** C-Compilers $279
45. **MICROSOFT** Complete line
46. **MICROSOFT** Quick-Basic ..... New Low Price!
47. **BORLAND** Turbo Pascale, Turbo Toolbox, & more ..... From $35/each

GRAPHICS

48. **Z-SOFT** PC Paintbrush, mouse graphics $95
49. **DECISION RESOURCES** Diagram Master ..... From $199
50. **MICROSOFT** Chart ..... CALL!
51. **MICROSOFT** Windows ..... CALL!

COMMUNICATIONS

52. **MICROSTUF** Crosstalk XVI, Latest version $99
53. **HAYES** Smartcom II $85
54. **MICROSOFT** Access ..... CALL!

WORD PROCESSING

55. **MULTIMATE** Advantage $294
56. **MICROSOFT** Word, new version ..... New Low Price!
57. **LIFETREE** Volkswriter Deluxe $169
58. **SSI** WordPerfect, version 4.1 ..... New Low Price, CALL!
59. **MICROPRO** Wordstar Professional series ..... New Low Price!

OFFICE & PLANNING

60. **HARVARD** Total Project Manager $339
61. **SORCIM/IUS** Super Project $209
62. **MICROSOFT** Project, vers. 2.0 ..... $269

DATA BASE MANAGERS

63. Call For Unadvertised Data Base Managers
64. **MICRORIM 5000,** Report Writer & Clout ..... New Low Price!
65. **MICROSTUF** Infoscope $99
66. **D BASE III** plus ..... CALL!

NETWORKING PROTOCOL CONVERSION

67. **SNA & BISYNC** 3780, 5251, Mod 11 & 12, 3274, 3278
68. **PC TURBO** 186/187 board, 128K, 8087 Serial Board attached $875
69. **IRMA** Complete line ..... From $849

PRINTERS

DOT MATRIX

70. **EPSON** FX85/286 ..... NEW!
71. **EPSON** LQ1500/LQ800/ LQ1000 ..... NEW PRICES!
72. **OKIDATA** 292, 293, ML84, Pacemark 2410
73. **NEC** New P-5, P-6, & P-7 ..... Low Price!

LETTER QUALITY

74. **NEC** Spinwriters 2050, 3550, 8850 ..... New Low Prices!
75. **EPSON** DX20 & DX35 ..... NEW LETTER QUALITY PRINTERS

We carry a full range of form handling options.

CHIPS

All our chips are tested and priced for quick sale. Call us!

76. **INTEL** 8087, 80287, high speed coproc ..... Call for Market Price.
77. **64K-256K RAMCHIPS** ..... Call for Market Price.
78. **128K** Piggy-back chips for your AT ..... Call for Market Price.

MODEMS

79. **HAYES** Smartmodem 300, 1200, 1200B & 2400. We have the best stock in the U.S.A. ..... CALL!
80. **VEN-TEL** 1200 Baud Half Card w/Crosstalk $399
81. **PEACHTREE TECHNOLOGIES** P-1200 ext.

MONITORS & CRTS

82. **PGS** Max 12(E), HX12, HX12(E), & SR-12 ..... New Low Prices!
83. **AMDEK** Color 600 ..... CALL!
84. **AMDEK** 722, New alternative to IBM enhanced monitor $569
85. **AMDEK** 310 A ..... CALL!
86. **MAGNAVOX** Monochrome monitors $129
87. **SONY,** monitors in stock ..... CALL!

MISCELLANEOUS

88. **MOUSE SYSTEMS** PC Mouse, optical w/software $139
89. **MICROSOFT** Mouse, bus or serial mechanical ..... New model in stock!
90. **KEYTRONICS** 5151 Keyboards ..... CALL!
91. **KEYTRONICS** 5153 Keyboard w/mouse ..... NEW!
92. **GRAVIS** Joysticks $45
93. **QUADRAM** Microfazer print buffer 8-128K ..... From $129

DISKETTES

94. **Precision** Diskettes by **Xidex,** SS/DD, 10 per box $6.49
95. **Precision** Diskettes by **Xidex,** DS/DD, 10 per box $6.99

For following items, minimum order of 100 each brand.

96. **Precision** Diskettes by **Xidex,** SS/DD ..... $ .65/ea.
97. **Precision** Diskettes by **Xidex,** DS/DD ..... $ .69/ea.
98. **Maxell** SS/DD MD1 ..... $ .99/ea.
99. **Maxell** DS/DD MD2 ..... $1.25/ea.
100. **Maxell** High Density MD2 ..... $2.60/ea.
101. **Maxell** 3½ inch SS/DD MF1 ..... $1.60/ea.
102. **Maxell** 3½ inch DS/DD MF2 ..... $2.35/ea.
103. **Fuji** SS/DD MD1 ..... $ .89/ea.
104. **Fuji** DS/DD MD2 ..... $1.15/ea.

MEDIA STORAGE

105. **Flip N File** Original, stores fifty 5¼" diskettes with free twin pack of Fuji diskettes ($25 retail value) Now ½ price $12.50
106. **Flip N File,** stores 25 5¼" diskettes with lock $12.99
107. **Flip N File,** stores 50 5¼" diskettes with lock $19.99
108. **Innovative Concepts** Data Case ..... $ 9.99
109. **Microdex** by S.R.W., stores 25 3½" diskettes ..... $ 9.99
110. **Microdex** by S.R.W., stores 60 5¼" diskettes $11.99

SURGE PROTECTORS

111. **Curtis** 6 outlet power strip with surge protection $19.99
112. **Curtis** Diamond $31.99
113. **Curtis** Emerald $37.99
114. **Curtis** Sapphire $49.99
115. **Curtis** Ruby $56.99
116. **Networx** Wire Tree, 4 outlet surge and spike protector $44.99
117. **Networx** Wire Tree Plus, 6 outlet surge, spike, and modem protector $64.99

(404) 449-8089 Orders Only **1-800-241-8149**

MICRO MART

America's PC Specialist

© Copyright 1986, Micro Mart, Inc. Technology Corporate Campus 3159 Campus Drive, Norcross, GA 30071

Prices are subject to change without notice and are similar, but may vary at Micro Mart Retail Stores.

Circle 112 on reader service card

Arlington Computer Products gives you the best prices on IBM PCs...

IBM PC

2 Drives, 256K Monochrome Monitor	$1425
2 Drives, 256K, Color Monitor	$1649
2 Drives, 256K, w/10MB Monochrome Monitor	$1799

IBM XT

1 Drive, 640K, 20 MB Hard Disk, Monochrome Monitor	$2349
1 Drive, 640K, 20 MB Hard Disk, Color Monitor	$2575

IBM AT

1.2 Floppy, 512K, 20 MB Hard Disk, Monochrome Monitor	$3675
1.2 Floppy, 512K, 20 MB Hard Disk, Color Monitor	$3899

...and COMPAQ too!

COMPAQ PORTABLE

2 Drives, 256K	$1595
1 Drive, 256K w/20 MB	$1999

COMPAQ DESK PRO

1 Drive, 640K w/20 MB COMPAQ Monitor	$2349

COMPAQ 286

DESKTOP — 1 Drive, 256K w/30 MB, COMPAQ Monitor	$4195
PORTABLE — 1 Drive, 256K, 20 MB Hard Disk	$4195

DRIVES AND TAPES

10 MB Tape Back Up	$439
20 MB Tape Back Up for AT	$549
60 MB Tape Back Up for AT	$785
360K Floppy for AT	$115
360K Floppy for PC/XT	$ 99

SEAGATE

10 MB Hard Disk Kit	$379
20 MB Hard Disk Kit	$429
30 MB for AT	$649
40 MB for AT	$749

BOARDS

HERCULES GRAPHICS CARD	$285
HERCULES COLOR CARD	$139
SIGMA COLOR 400	$419
PERSYST "BOB"	$329
STB CHAUFFER	$249
QUADRAM EGA	$379
AST ADVANTAGE W/128 K	$359
AST RAMPAGE	$299
AST RAMPAGE AT	$399
INTEL ABOVE BOARD	CALL
ORCHID PC TURBO W/DAUGHTERBOARD	$499
AST 5251-11	$569

MODEMS

HAYES 1200	$363
HAYES 1200B ALONE	$279
HAYES 1200B W/SOFTWARE	$335
HAYES 2400	$565

MONITORS

AMDEK		PRINCETON	
310A	$145	MAX 12	$159
600	$399	HX12E	$505
722	$505	SR12	$565

QUADRAM QUADCHROME	CALL
NEC MULTISYNC	$549

★ISSUE HIGHLIGHTS★

AST 6 PACK PLUS 384K $199	EVEREX THE EDGE $219	EVEREX GRAPHICS EDGE $239
HERCULES COMPATIBLE COLOR CARD $69	HERCULES COMPATIBLE GRAPHICS CARD $105	PRINCETON HX12 MONITOR (incl. cable) $415
EVEREX 300/1200 INTERNAL MODEM W/SOFTWARE $165	SEAGATE 20MB KIT FOR PC/XT $429	PC MOUSE W/DR. HALO II $104

SOFTWARE

WORDPERFECT 4.1	$199	D BASE III PLUS	$369
WORDSTAR 2000	$229	FRAMEWORK	$369
WORDSTAR 2000+	$279	ENABLE	$329
WORDSTAR PRO	$239	LOTUS 123	$319
MULTIMATE	$205	SYMPHONY	$429
MULTIMATE ADV.	$245	HARVARD TOTAL PROJECT MGR.	$255
VOLKSWRITER III	$145	SMARTCOM II	$ 79
TURBO LIGHTENING	$ 59	CROSSTALK	$ 95
R BASE 5000	$319	NORTON UTIL	$ 59
REVELATION	$499		

PRINTERS

EPSON

LX 80	$229	LQ 800	$525
LX 90	$259	LQ1000	$639
FX 85	$349	DX 20	$319
FX 286	$499	DX 35	$619

OKIDATA

ML192 IBM	$339
ML193 IBM	$475
84 IBM	$635

TOSHIBA

321	$515
341	$795
351P	$995
351P/S	CALL

NEC

P5	$1149
P6	$475
P7	$595

PANASONIC

1091	$269
1092	$339

SILVER-REED

EXP 800	$669

IBM

PROPRINTER	$409

Arlington Computer Products, inc.
450 E. HIGGINS ROAD
ELK GROVE VILLAGE, IL 60007

VISA MasterCard

FOR ORDERS & SYSTEMS QUOTES:

800-548-5105

CUSTOMER SERVICE AND IN ILLINOIS CALL 312-228-6333

Circle 825 on reader service card

Prices and Availability Subject To Change Without Notice

EPSON

Epson FX-85 – 160cps, NLQ . . . Call
FX-286 – Emulates IBM ProPrinter Call
LX-80 – 80 col., NLQ mode . . . Call
LQ-800 – 80 col., 24-pin head . . Call
LQ-1000 – 132 col., 24-pin head . Call

OKIDATA

182P, 120 cps, 80 Col., Parallel . . $239
84P, 200 cps, 136 col. Parallel . . $649
192P, 160 cps, 80 col. Parallel . . $349
193P, 160 cps, 136 col. Parallel . . $549
293P, 200cps, 136 column, color . $635
2410P, 350 cps, 136 col. Parallel $1895

IBM

IBM ProPrinter – 200cps, 80 col $449
IBM Color Jet – 80 column . . . $645
IBM QuietWriter II- 60cps, 132 col Call
IBM Wheel Printer – 25cps, 132 col Call

TOSHIBA

P321 – 180cps, 24-pin head . . . $475
P341 – 220cps, 24-pin head . . . $799
P351 – 288cps, 24-pin head . . . $999

RICOH

RP1500G – 40cps daisywheel printer, $1,495 value. *Special purchase* $759.

CITIZEN

MSP-10 – 80 column $289
MSP-15 – 132 column $399
MSP-20 – 80 column $349
MSP-25 – 132 column $499

STAR GEMINI

SB-10, 24-pin, 80 column . . . . . Call
SG-10/15, SD-10/15, SR-10/15 . . Call

DIABLO

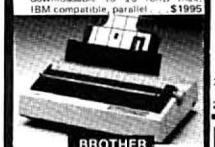
Diablo 630 API, 40 cps daisywheel printer . . . . . *Sale Price* $1,295

H-P ThinkJet Ink Jet Printer
150cps, 80 col., 11x12-dot text . $399

H-P LASERJET PRINTER
300cps, quiet operation, serial . $2,395
H-P LASERJET PLUS $3,295

Canon

Canon Laser Jet A-1, comes w/4 fonts, downloadable to 20 fonts max, IBM compatible, parallel . . . $1995



BROTHER

M-1109 – 100cps, 25cps NLQ, 80 col. 2K buffer, dual interface, . . $199
M-1509 – 180 cps, (45cps NLQ), 132 col., friction feed and the new push type pin-tractor so first form won't be wasted. IBM and Epson FX-100+ compatible. Very quiet operation. Dual interface $399
Sheet Feeder SF-40 for M-1509 . . Call

HR-15XL – 17cps daisywheel printer, 3K buffer, two color printing, can be used as a typewriter w/optional keyboard. Parallel . . . *Sale* $329
Keyboard for HR-15 . . . . . $149
Tractor for HR-15 . . . . . $119
Cutsheet feeder for HR-15. . . . $189

2024L – 160cps, 24-pin head letter quality dot matrix printer, 136 col. w/tractor, parallel $925
TwinWriter – Two heads are better than one! 160cps dot matrix and 36 cps daisywheel combined into one printer. Parallel interface . . . $985
HR-25 – 23cps daisywheel, para $480
HR-35 – 36cps daisywheel, para $685
DM-40 – 160cps, 24-pin dot matrix, 136 col., with tractor, para . . $925

FORTIS – *by Brother*

Fortis 15XL – 17cps daisywheel printer w/3K buffer. Parallel . . $SALE!
Fortis DM-20 – 160 cps dot matrix, 136 col., NLQ mode, both parallel and serial interfaces. $525

Fortis DX-25 – 25cps daisywheel, 132 column, 7K buffer, quiet operation, built-in parallel & serial . . . . Call
Fortis DH45 – Dual head printer, 160 cps dot matrix, 36 cps daisywheel, Epson, Diablo compatible . . . $985
Tractor for 15XL/HR-25. . . . . $119
Keyboard for 15XL $149
Cutsheet Feeder for HR-15/25 . . $189
SF-200 Feeder for DM-40/2024L $275

PANASONIC

KX-P1091, 120 cps, 80 columns, with near letter quality mode . . . $239
KX-P1092 . . . . . $345
KX-P1093 . . . . . $425
KX-P3151 . . . . . $405

HARD DISK SALE!

Now is time to upgrade your computer at tremendous savings. These compact half height hard disks consume little energy and leave room for tape backup units too. All hard disks have been thoroughly tested, formatted, and ready to use.

* Internal hard disk for IBM-PC, XT, and compatibles. Please specify your computer model.
* Compact, half height units.
* Famous brands
* Complete with controller card, cable & mounting hardware.
* Boots directly from hard disk.
* Low power consumption.

10-MB	20-MB	30-MB
$385	$425	$575
Seagate Tulin	Seagate Tulin	Tulin

HARD DISKS FOR IBM-AT

High performance full height hard disks. Complete with cable and mounting rails.

20-MB Disctron. $395
20-MB Seagate / Rodine $549
30-MB Seagate / Rodine $629
40-MB Seagate / Rodine $895

20-MB TEAC TAPE BACKUP

Super fast 4 MB per minute transfer rate. Both mirror image or file by file backup. Uses small ¼" cassette tape. Complete with interface card & tape. Internal unit — $695

External unit comes with power supply, surge protector and lighted selector switches for 3 other accessories — $855

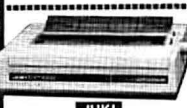
IRWIN 10-MB TAPE BACKUP
Internal half height unit. Direct connects to floppy controller card without taking up a slot. Complete w/$30 tape, software and instruction. $449

EVEREX 20-MB Internal Tape Back-Up for PC and XT, 4 MB/minute transfer rate. Complete w/control card, cable and manual . . . $695
EVEREX 60-MB Internal Tape Back-Up for AT. Complete with controller, cable and manual . . . $885

JUKI

6100 – 18 cps, 13" platen, 2K buffer, par buffer, parallel $379
6300 – 40 cps, 132 col., 3K buffer $689
Tractor $119

$105 ea. 360K DRIVE FOR IBM-AT



NEC

3550 - 33 CPS, 203 col., proportional space, bi-directional, parallel. $795
2050 Similar to 3550 but 19 cps $595

i-MEGA SALE!

Bernoulli Box, 10+10 MB . . . $1,950
Bernoulli Box, 20+20-MB . . . $2,485
Non-bootable interface card. . . . $105
Bootable interface card. $229
10-MB Cartridge. $50
20-MB Cartridge. $60

BROTHER

M-1109 – 100cps, 25cps NLQ, 80 col. 2K buffer, dual interface, . . $199
M-1509 – 180 cps, (45cps NLQ), 132 col., friction feed and the new push type pin-tractor so first form won't be wasted. IBM and Epson FX-100+ compatible. Very quiet operation. Dual interface $399
Sheet Feeder SF-40 for M-1509. . Call

HR-15XL – 17cps daisywheel printer, 3K buffer, two color printing, can be used as a typewriter w/optional keyboard. Parallel . . . *Sale* $329
Keyboard for HR-15 . . . . . $149
Tractor for HR-15 . . . . . $119
Cutsheet feeder for HR-15. . . . $189

2024L – 160cps, 24-pin head letter quality dot matrix printer, 136 col. w/tractor, parallel $925
TwinWriter – Two heads are better than one! 160cps dot matrix and 36 cps daisywheel combined into one printer. Parallel interface . . . $985
HR-25 – 23cps daisywheel, para $480
HR-35 – 36cps daisywheel, para $685
DM-40 – 160cps, 24-pin dot matrix, 136 col., with tractor, para . . $925

FORTIS – *by Brother*

Fortis 15XL – 17cps daisywheel printer w/3K buffer. Parallel . . $SALE!
Fortis DM-20 – 160 cps dot matrix, 136 col., NLQ mode, both parallel and serial interfaces. $525

Fortis DX-25 – 25cps daisywheel, 132 column, 7K buffer, quiet operation, built-in parallel & serial . . . . Call
Fortis DH45 – Dual head printer, 160 cps dot matrix, 36 cps daisywheel, Epson, Diablo compatible . . . $985
Tractor for 15XL/HR-25. . . . . $119
Keyboard for 15XL $149
Cutsheet Feeder for HR-15/25 . . $189
SF-200 Feeder for DM-40/2024L $275

PANASONIC

KX-P1091, 120 cps, 80 columns, with near letter quality mode . . . $239
KX-P1092 . . . . . $345
KX-P1093 . . . . . $425
KX-P3151 . . . . . $405

AST

Cards for IBM PC and XT w/Free SIDEKICK & DESQ VIEW SOFTWARE

SixPakPlus Cards

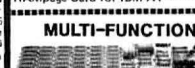
Memory installed on card ------	64K	256K	384K
with parallel, serial ports & clock	$179	$199	$225
above plus game port ----------	$214	$234	$260

Advantage Card for IBM-AT *128K* - $399 *256K* - $429 *384K* $459
512K - $515 *1-MB* - $565 *1.5-MB* - $615

ADVANTAGE PEGGYBACK *512K* - $215 *1-MB* - $265 *1.5-MB* - $315

RAMpage Card for IBM-PC/XT ---------- *256K* - $259 *2-MB* - $525
RAMpage Card for IBM-AT ---------- *512K* - $495 *2-MB* - $659

MULTI-FUNCTION MEMORY CARD



Fully compatible with IBM PC and XT. Comes with Ram disk and print spooler software.

Memory installed on card ----------	*0K*	*256K*	*384K*
w/parallel,serial,game ports,clock	$109	$159	$179

intel Above Boards

FOR IBM-PC/XT - -	*64K* $325	*256K* $399	*2-MB* $795
FOR IBM-AT ----	*128K* 495	*512K* $595	*2-MB* $895

INTERFACE CARDS

Hercules Graphics (+$50 rebate) $289
Hercules Color Card (+$50 rebate) $145
Paradise Multi Display Card . . . $275
Paradise Modular Display Card . $245
Paradise Color/Mono Card $199
Generic Color Graphics card w/printer port. $99
Monochrome Graphics Card w/parallel port. Hercules compatible . . $115
AST Preview graphics w/para. . . $249
Sigma 400H Color for PGS SR-12 $455
Sigma 400L Color for Taxan 440/630/640 monitors $455
Taxan 555 Hi res. color card. . . . $225
Persist BOB Board – Ultra hi res. color card. Ideal for Taxan 630/640 $389
Everex The Edge $275
Everex Graphic Edge $295
PC Peacock Color Card. $279
Ultra Pak by Tzeng Lab $485
Tecmar Graphic Master. $465
Tall Tree J-Diskette Controller to hook up 1.2-MB drives in PC/XT . . $229
Floppy Disk Controller with parallel, serial, game ports and clock . . $145

SOFTWARE

Word Perfect	$199
Lotus 1-2-3-	$319
SYMPHONY	$419
dBASE II	$275
dBASE III	$369
FRAMEWORK	$369
WORDSTAR PRO PAK	$279
Wordstar 2000	$259
R-Base 5000	$389
Q & A	CALL
Turbo Lightning	$57
Reflex	$57
Side Kick	$49
IBM Top View.	Call
IBM DOS 2.1 or 3.1	$69

Modem Sale!

Hayes 300, external, 300 baud	$145
Hayes 1200, external, 1200 baud	$365
Hayes 1200B, internal w/software	$339
Hayes 2400, external 2400 baud	$579
AST Reach, 1200 baud internal	$310
Watson Voice/Data Modem	$375
Watson VIP	$275
Prometheus 1200 external	$295
Prometheus 1200B internal	$265
Omnitel 1200B Half Card Modem	$149

Highest Quality Shielded Cables

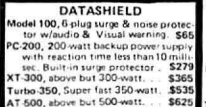
These cables are the very best money can buy. Lifetime warranty. List $65.

Parallel printer cable for IBM . . . $19
Serial modem cable for IBM. . . . $19

6-foot Keyboard extension cable for IBM PC & XT. . . . $8

DATASHIELD

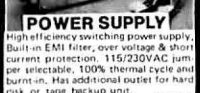
Model 100, 6 plug surge & noise protector w/audio & Visual warning. $69
PC-200, 200-watt backup power supply with reaction time less than 10 millisec. Built-in surge protector . $279
XT-300, above but 300-watt. . . . $365
Turbo-350, Super fast 350-watt. . $535
AT-500, above but 500-watt. . . . $625
AT-800, above but 800-watt. . . . $685



POWER SUPPLY

High efficiency switching power supply. Built-in EMI filter, over voltage & short current protection. 115/230VAC jumper selectable, 100% thermal cycle and burn-in. Has additional outlet for hard disk or tape backup unit.

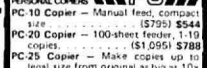
150-WATT ----$85



Canon PC

PERSONAL COPIERS

PC-10 Copier – Manual feed, compact size . . . . . ($795) $644
PC-20 Copier – 100-sheet feeder, 1-19 copies. . . . . ($1,095) $788
PC-25 Copier – Make copies up to legal size from original as big as 11x14. Enlarge 120%, reduce 67% or 78%. . . . . ($1,395) $888
Black toner/drum cartridge $69
Blue, brown, red cartridge $79
Legal cassette for PC-25 . . . . . $49



DYNAMIC RAM CHIPS

64K (4164) 150 ns $1.50 ea. 9 for $10
128K for IBM-AT, 200 ns . . 9 for $34
256K (41256) 150 or 200 ns 9 for $45

8087 CHIP

Intel 8087-3 high speed math co-processor $135
8087-2 chip for Compaq DeskPro $155
80287-3 chip for IBM-AT $199

SPEED UP YOUR PC/XT NOW
with NEC V-20 processor chip. Direct replacement of the 8088-3 chip. *Now* $49

AT&T 6300 COMPUTER

640K memory, 1 floppy drive, serial & parallel ports, clock, Monochrome and RGB color ports, keyboard . . . $1550
Above with two 360K drives ---- $1650
640K memory, 1 floppy drive, 20-MB hard disk, serial, parallel ports, clock, mono & RGB ports, keyboard. $1995
AT&T Green Monitor $259
Taxan 630 super high resolution color monitor $495
D.O.S. $65

MONITOR SALE

Sale $99

SAMSUNG MONITORS

Monochrome TTL monitor, 12" high resolution, 720x350 dots, non-glare screen. Available in green or amber.

★★★★ RGB COLOR ★★★★

IBM RGB Color Monitor. $545
IBM Enhanced RGB Monitor . . $689

NEC Multi-sync RGB monitor –13", 800x560 line, compatible w/IBM EGA, PGA and color graphic cards. *Sale* $599
PGS HX12, 12" RGB color . . . $425
PGS SR-12E – Super high resolution RGB Color Monitor, operates w/ Sigma 400H Color Card . . . $595
Quimax PX-IV – 13" RGB, 720x240 line. Has green switch, tilt & swivel base $445
Taxan 620 RGB Color Monitor . $369
Taxan 630 RGB Hi-Res. monitor $429
Taxan 640 RGB Hi-Res. monitor $479

★★★ GREEN SCREEN ★★★

Taxan 121, 12" green, 1000x360 dots, TTL monochrome $155
Quimax DM-14G – 13" green TTL, 750x350 resolution, tilt & swivel base included. 1 yr. warranty $155
Taxan 115, 12" green composite .$125
IBM Monochrome, 12", 720-dot . $255

★★★ AMBER SCREEN ★★★

Amdek 300A, 12" amber $149
Amdek 310A, 12" amber, 900 dots, non-glare screen, runs off IBM monochrome interface board . $169
Quimax DM-14A – 13" amber TTL, 750x350 resolution, Tilt & swivel base included. 1 yr warranty. $159
Princeton MAX-12, 12" amber, 720 x 350 dot, runs off IBM monochrome display adapter. $169
Taxan 122, 12" amber, 1000x360 dots, TTL monochrome $159
Taxan 116, 12" amber composite $129

★☆★ BLACK & WHITE ★☆★

Roland MB 142, 14" reversible black & white TTL monochrome monitor w/ super hi res. 720x350 dots . $269

PLOTTER SALE

ROLAND

DXY-800 – 8-pen, hi-speed 180mm/sec, IBM compatible. 11x17" paper . $Call
DXY-880 – Similar to 800, 8-pen, Hewlett Packard compatible. . . . $Call
DXY-980 – above but w/digital display & electro-static paper holder. . . Call

HEWLETT PACKARD

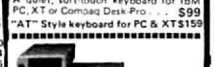
7470A – 2-pen, 8½x11 paper size $899
7475A – 6-pen, 11x17 paper size $1495

TAXAN

710S – 6-pen color plotter, Hewlett packard compatible. *Sale* $795

5151 KEYBOARD

A quiet, soft-touch keyboard for IBM PC, XT or Compaq DeskPro . . . $99
"AT" Style keyboard for PC & XT $159



The POWER DIRECTORS

P-22 – A unique control center & surge protector w/4 lighted and a master switches for computer, printer and accessories. It also filters out EMI & RFI interferences $79
P-2 – like P-22 but w/5 switches .$109
P-12 –Has 6 switches & clock . . . $149

IBM PC XT AT

SALE PRICES

All systems include keyboards and disk controllers. Monitors are available at big savings too.

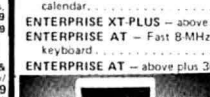
	1-Drive	2-Drive	TWO FLOPPY DRIVES PLUS 10-MB	20-MB	30-MB	Tape
PC 256K	$1295	$1450	$1875	$1950	$2295	add $475
XT 256K	$1725	$1880	$2295	$2395	$2895	add $695
AT 512K	$2995	$3195		$3750	$3950	avail w/1 dr. $899

OFFICE COMPUTER SYSTEMS

- Fully IBM PC/XT Compatible
- Full one-year Warranty
- 640K memory on mother board
- 150-watt power supply
- 8 Expansion Slots

$595

ENTERPRISE XT – 640K CPU and keyboard $595
ENTERPRISE XT – 640K, two 360K drives, controller card with 1 parallel, 1 serial (2nd serial optional), 1 game port, clock/calendar, keyboard $888
ENTERPRISE XT – Same as above but w/20-MB hard disk . $1,388
ENTERPRISE XT-PLUS – This is a true 8-MHz machine! 3X the performance speed according to Norton Utilities measurement. Built-in 4.77–8MHz automatic switching circuit. No boot up problem from copy protected software. Basic 640K CPU & Keyboard. $749
ENTERPRISE XT-PLUS – 640K, two 360K drives, controller card w/ 1 serial (2nd serial optional), 1 parallel, 1 game port, clock/calendar. $1,195
ENTERPRISE XT-PLUS – above but with 20-MB hard disk . $1,595
ENTERPRISE AT – Fast 8-MHz clock speed, 512K, 1.2-MB drive, keyboard. $1,895
ENTERPRISE AT – above plus 360K drive &20-MB disk . . . $2,650



Sperry IT

FULL IBM AT COMPATIBILITY

Sperry IT, 512K, 1.2MB drive . $2,295
Sperry IT, above & 44-MB disk .$3,295
Sperry IT, above but 1-MB memory, 2 drives, and 44-MB hard disk . . $3,595
Sperry Monochrome Monitor . . . $185

AMQUTE PORTABLE COMPUTERS

704K memory on mother board, two 360K drives ---------- $1,395
704K memory on mother board, one 360K drive, one 10-MB hard disk $1,995
Above with 20-MB hard disk ---------- $2,195

COMPAQ

Compaq Portable, 256K, 2 drives. $1,699
Compaq Portable II . . . . . Call
Portable 286, 256K, 1 drive . . . $3,180
Portable 286, 640K, 1.2-MB drive, 22-MB harddisk $4,495
Portable 286, 640K, 1.2-MB drive, 22-MB harddisk, 10-MB tape . $5,150
DeskPro w/256K, 2 drives $1,925
DeskPro w/256K, 1 drive, a 10-MB hard disk $2,650
DeskPro w/640K, 1 drive, a 10-MB hard disk, a10-MB tape backup . $3,750
DeskPro w/640K, 1 drive, a 20-MB hard disk, a 10-MB tape backup . $4,295
DeskPro-286, 256K, 1.2-MB dr. $3,295
DeskPro-286, 512K, 1.2-MB drive, 30-MB harddisk $4,495
DeskPro-286, 512K, 1.2-MB drive, 30-MB harddisk, 10-MB tape . $4,995
Compaq amber monitor $239
Compaq DOS (needed for DeskPro) $60

All goods are brand new and guaranteed. All advertised prices already include a 2% cash discount for full payment by cashier's check, money order or cash. Personal or company checks must clear 3 weeks before we ship. Add 2% for credit card purchases. COD's are accepted for UPS shipments only and require 20% paid deposit and $3 COD fee. No COD's to Canada, Puerto Rico, FPO/APO or P.O. Boxes. Shipping & insurance charges: 3% (Min. $3) of total order value by UPS ground, 5% (Min. $5) by UPS Blue & Parcel Post. P.O.'s accepted from government agencies, Fortune 1000 firms and major institutions. Calif. buyers add sales tax. Prices subject to quantity available, correction or change without notice. You may call for the latest prices. Our high volume & low margin pricing assure you consistent savings on all computer hardware & software.

EASTERN ENTERPRISES, INC.
Mass Merchandising Since 1969
6001 BANDINI BLVD., LOS ANGELES, CA 90040
COME VISIT OUR GIGANTIC SHOWROOM & STORE

VISA MasterCard AMERICAN EXPRESS

TOLL-FREE (ORDERS ONLY) **(800)392-7081**
Hours: Monday to Friday 8:30am – 5:00pm Pacific Time
Calif., Alaska & all info *Call* (213)725-3080

Powerful MS™-DOS Software.

For the IBM®-PC, XT, AT & others with generic MS-DOS/PC-DOS 2.0 or higher.

Not copy protected!

Only **$39.95** Each!

UTAH COBOL™

Whether student, teacher or professional programmer, this is the one you've heard so much about.

- ☐ It's easy to use. Compiles 5000 statements on a 128K machine.
- ☐ 170 clear error messages, i.e. DATA-NAME IS MISSING OR MISSPELLED.
- ☐ Distribute your object code programs royalty free.
- ☐ Small object code programs conserve disk space.
- ☐ Fast compile times to increase programmer productivity. Over 25 times faster than one compiler costing $995!
- ☐ You get a diskette and 213-page manual with lots of examples and 16 complete COBOL source code programs. **$39.95.**

Also available: COBOL Application Packages, Book 1 **$9.95.**

UTAH PASCAL™

- ☐ 14-digit precision, BCD math, no round-off errors with decimal arithmetic for business and floating point +63 −64 for scientific.
- ☐ A very nice TRACE style debugging.
- ☐ Arrays up to 8 dimensions and 64K strings.
- ☐ External procedures and functions with dynamic auto-loading.
- ☐ One-step compile, no assembly or link required.
- ☐ You get a 132-page manual and diskette. **$39.95**

UTAH PILOT™

- ☐ Perfect for industrial training, office training, drill and testing, virtually all programmed instruction, word puzzle games, and data entry facilitated by prompts.
- ☐ John Starkweather, Ph.D., the inventor of the PILOT language, has added a built-in full-screen text editor, and much more.
- ☐ Meets all PILOT-73 standards for full compatibility with older versions.
- ☐ You get a diskette, 125-page manual and ten useful sample programs. **$39.95.**

Also still available for 8-bit machines with CP/M® is our world famous Nevada Software Series used by 50,000 customers in 40 countries. These include Nevada COBOL, Nevada FORTRAN, Nevada PASCAL, Nevada PILOT, Nevada BASIC and Nevada EDIT. **$39.95** each.

Satisfaction guaranteed. If for any reason you're not completely satisfied, just return the package within 15 days in good condition, and we'll refund your money.

IBM is a registered trademark of International Business Machines Corp. CP/M is a registered trademark of Digital Research. MS is a trademark of Microsoft Corp. © 1985 Ellis Computing, Inc.

UTAH FORTRAN™

- ☐ FORTRAN IV based upon ANSI-66 standards.
- ☐ Very fast compile times and easy to use.
- ☐ IF . . THEN . . ELSE constructs.
- ☐ Chaining with blank and named common.
- ☐ Copy statement.
- ☐ ENCODE and DECODE.
- ☐ Free-format input and output.
- ☐ A very nice TRACE style debugging.
- ☐ 150 English language error messages.
- ☐ You get a diskette, and 223-page manual. **$39.95**

UTAH EDIT™

- ☐ A character-oriented full-screen video display text editor designed specifically to create COBOL, FORTRAN and PASCAL programs.
- ☐ Only requires 15K disk space so it can fit on the same disk as your compilers.
- ☐ Completely customizable tab stops, default file type, keyboard control key layout and CRT by menu selection.
- ☐ Diskette comes with easy to read 58-page manual. **$39.95.**

UTAH BASIC™

- ☐ This interpreter has a built-in full-screen editor.
- ☐ Single- and Multi-line user definable functions.
- ☐ BCD Math- no round-off errors.
- ☐ Full Matrix operations.
- ☐ You get 220-page manual and diskette. **$39.95.**

Handling/Shipping: No shipping charge within US. Overseas add $10 for first package, $5 each additional. Checks must be in US Dollars, drawn on a US bank.

Utah Software requires 128K RAM and PC-DOS or MS-DOS 2.0 or higher.

HOW TO ORDER. Send check or money order to Ellis Computing, Inc. with VISA or MASTERCARD order by phone. Sorry no COD's.

Ellis Computing, Inc.
5655 Riggins Court, Suite 10
Reno, Nevada 89502
Phone (702) 827-3030

SINCE 1977

ELLIS COMPUTING™

Circle 424 on reader service card

.

Star-Dot-Star

A global exchange of personal computer discoveries

Change the colors of 1-2-3 release 2, create a 43-line ANSI.SYS, make ECHO OFF the default for batch files, print sideways with a Pascal program, put a clock in the corner of your screen, and more

Edited by Steven Cook

Colors With 1-2-3 Release 2

Here's an update to Albert Bleakley's very useful patches for changing the screen colors of *1-2-3* release 1A [*.*, *PCW*, October 1985]. Unfortunately, release 2 uses new video drivers, so release 1A patches don't apply. I used DEBUG to examine the 123.SET driver file and discover where the screen color information is stored. The values won't necessarily be at the same locations in every case, but you can find them and select new colors.

Four separate values control the foreground and background colors of the worksheet's cells, menus, and help screens; the border and cursor; the unprotected cells and help screen headings; and the help screen cursor and unprotected cell cursor. I searched through the 123.SET file with DEBUG for the default values that were published in the original *.* item. Because release 2 sets the fourth value for a different color, I searched for only the first three.

Once the values are located, changing them is easy using Mr. Bleakley's instructions. Make sure you modify a copy of the 123.SET file and not the original. [Once modified the default values are no longer present in the file, so you will not be able to locate them later. For this reason you should copy 123.SET to another disk for safekeeping and only use a new copy of this original 123.SET file each time you want to change *1-2-3*'s colors.]

The only problem I've encountered is that these patches do not affect the screen's outside border color. I use a short utility program to set the border color, but I'd prefer to know how to patch 123.SET to do the job.

Larry Phox
Houston, Texas

Editor's note: The program 123COLOR.BAS performs the steps necessary to change release 2 screen colors. To create this program, load BASIC, then type in the lines shown in 123COLOR.BAS. Save the program to disk, then type **RUN**. *123COLOR.BAS will search through the 123.SET file to locate the three default color values. If it finds them, it will prompt you to enter the new foreground and background values (only values 0 through 7 are allowed for background values) and then modify the 123.SET file. Choose the desired color values from Figure 1.*

EGA at Length

The IBM Enhanced Graphics Adapter is capable of displaying 43 lines of text when used with an Enhanced Color Display or a Monochrome Display. [See "Compressed WordStar and the EGA," *The Help Screen*, *PCW*, September 1985.] However, the IBM-supplied ANSI.SYS device driver does not handle scrolling properly in the 43-line mode; only the upper 25 lines of the screen are active.

The solution is to modify ANSI.SYS to accommodate the additional lines. You will also have to modify COMMAND.COM so the CLS command will work properly. The steps apply to IBM's PC-DOS 3.10 only; do not attempt to use them with any other DOS version.

(continues)

MICROTECH PERIPHERALS, INC.

Part of the worldwide Microtech International Group with affiliate and branch offices in:
CONNECTICUT TEXAS CALIFORNIA TOKYO HONG KONG KOREA

IBM® AT COMPATIBLE

"MAX" BY MICROTECH
The Ultimate Compatible Computer
FULLY IBM PC/XT/AT COMPATIBLE *all in one*
RUNS ALL PC/XT/AT SOFTWARE
ONE YEAR WARRANTY

- Mother board features: Turbo system, 80286, 640K expandable to 1meg, 8 expansion slots
- 200 watt power supply
- Microtech multifunction card expandable to 2.5meg
- Microtech color graphics card
- Microtech floppy controller card
- DTC, WD, or SMC winchester controller card
- Teac or Chinon 360K floppy disk drive
- Teac or Chinon 1.2meg floppy disk drive
- Seagate 20meg winchester
- NEC or Panasonic RGB high-res color monitor
- Microtech 5060 keyboard with LED indicator light
- AT style case with lock & key *not pictured
- FCC/UL approved

$4350.00 Dealer inquiries welcome

Call for pricing if you would like modifications to "MAX"
Pictured with NEC "MULTISYNC" Monitor (extra cost)
IBM® is a registered trademark of International Business Machines Corporation

PORTABLE COMPUTERS

NEC PC-8401 *Desk Top Power-To-Go* Suggested List $999	$ 825.00
SHARP PC-7000 *IBM Software Compatible* Suggested List $1795	1450.00

MONITORS

NEC #JB1280DA 12" Green TTL	$120.00
*NEC #JC1216DFA 12" RGB High-Res Color	290.00
*Monitor Cable	20.00

NEC MULTISYNC *"The Intelligent Monitor"*
#JC1401P3A 14" RGB High-Res Color
Suggested List $799 ... THIS MONTH SPECIAL ... 530.00

DISK DRIVES

FLOPPY DISKS 5.25" Half Height

TEAC 55BV 360K (new version)	$ 98.00
TEAC 55GFV 360K & 1.2meg *PC/XT/AT Compatible* Dual speed/Dual mode	128.00
CHINON 502L 360K	90.00
CHINON 506 1.2meg	122.00
TANDON TM65-2 360K	94.00
TANDON TM65-8 1.2meg	114.00

HARD DRIVES

TANDON 502 Limited Quantity	10meg full height	$240.00
	w/card & cable	335.00
TANDON TM262	20meg half height	300.00
	w/card & cable	410.00
SEAGATE ST225	20meg half height	300.00
	w/card & cable	410.00
	30meg w/card & cable	500.00
SEAGATE ST225N	20meg w/controller	440.00
SEAGATE ST4038	30meg w/linear voice-coil	695.00
SEAGATE ST4051	40meg w/linear voice-coil	765.00
SEAGATE ST4096	80meg w/linear voice-coil	1195.00
CMI 6640	30meg full height *39 msec access time*	480.00

CARDS & BOARDS

HARD DISK CONTROLLER CARDS

WESTERN DIGITAL #FO22/FO19	$125.00
DTC #5150CX	125.00
SMC #4002 PC	110.00
ADAPTEC #2070 *Increases hard disk storage 50%*	190.00
EXPANSION CARDS	**CALL**
MULTIFUNCTION CARDS	**CALL**

DISKETTES

5.25" SS/DD *box of 10*	$10.00
DS/DD *box of 10*	12.00
High density for AT *box of 10*	25.90
3.5" SS/DD *box of 5*	$11.80
DS/DD *box of 5*	15.90

BASF LIFETIME WARRANTY

COMPONENTS

4164-150 Dram	$1.10
41256-15 Dram	3.25
8087 5 mhz	149.00
8087-2 8 mhz	189.00
80287 5 mhz	210.00
V20 5 mhz	8.00
V20 8 mhz	12.00
2764	5.00

CALL FOR ANY ADDITIONAL I.C. NEEDS

MACINTOSH™ COMPATIBLE

800K DOUBLE SIDED 3.5" EXTERNAL DISK DRIVE

Auto Eject
Reads both double & single sided disks

100% Macintosh™ Compatible
Including the new MAC PLUS

One year warranty

MICROTECH MAC535 $259.00

$50 OFF WITH 400K TRADE-IN

ASK ABOUT OUR NEW 20MB HARD DISK

Macintosh™ is a trademark of Apple Computer, Inc

UNINTERRUPTIBLE POWER SUPPLY ★NEW★

SPECIAL OF THE MONTH

MICROTECH INTRODUCES THE TRUE UPS
Absolutely NO Switchover Time

ULTRA COMPACT, SLIM-LINE CASE
Made to fit on top of your personal computer
DIMENSIONS: 17¾" x 15¾" x 3"

The UP350 will protect you from serious data losses or hardware damage due to power failure or input voltage variations during operation.

Featuring: **500W Output Capacity**
Extended Battery Life
Overload LED
Adjustable-Volume Alarm
Key Switch
ONE YEAR WARRANTY

Suggested List $800 **$625.00**

ORDERS ONLY 1-800-325-1895

CORPORATE & USER GROUP DISCOUNTS
Call for quantity pricing

IN CONNECTICUT 203-488-8993

TERMS
- Immediate delivery on COD Cash/Certified or Prepayment with Money Order or Bank Check. Shipping charges vary, so call for exact amount. Personal checks take two weeks to clear.
- Prices based on cash sales. Add 5% for MasterCard & Visa. Minimum order $50.
- Connecticut residents add 7.5% sales tax.
- Availability and price subject to change without notice.
- Returns require authorization and may be subject to 15% restocking charge.
- All products carry manufacturers warranty.

MICROTECH PERIPHERALS, INC.
29 Business Park Drive/Branford, CT USA 06405
Dealer inquiries call Microtech International 1-800-626-4276

Circle 544 on reader service card

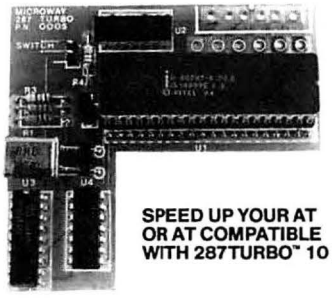
A MEGABYTE FOR DOS!

MicroWay is the world's leading retailer of 8087s and high performance PC upgrades. We stock a complete selection of 8087s that run from 5 to 12 MHz. All of our coprocessors are shipped with a diagnostic disk and the best warranty in the business – one year! We also offer daughterboards for socketless computers (NEC PC) and 287Turbo which increases the clock speed of the 80287 from 4 to 10 MHz. Our NUMBER SMASHER/ECM™ runs at 12 MHz with a megabyte of RAM and achieves a throughput of .1 megaflops with 87BASIC/INLINE, Intel Fortran, or Microsoft Fortran. Software reviewers consistently cite MicroWay software and 8087 expertise as the best in the industry! Our customers frequently write to thank us for recommending the correct software and hardware to meet their specific needs. They also thank us for our same-day shipping! In addition to our own products which support the 8087 and 80287, we stock the largest supply of specialized software available. For more information call us at

617-746-7341

NUMBER SMASHER/ECM™
THE FASTEST ACCELERATOR CARD AVAILABLE

gives you 12 MHz speed in two modes: 704K or one megabyte of "Extended Conventional Memory." MEGASWITCH MMU and MegaDOS software make it possible to run DOS applications with up to 1015K using PC compilers, AutoCAD and Lotus 1-2-3. Does not require EMS software. Totally compatible ..... from **$599** to **$1098**
Optional 8087-12 ..... **$295**



SPEED UP YOUR AT OR AT COMPATIBLE WITH 287TURBO™ 10 MHz

MicroWay® 8087 Support

For the IBM PC, PC XT, PC AT and Compatibles.

87SFL™ MicroWay's Scientific Function Library contains 170 scientific and engineering functions. Callable from most 8087 compatible compilers ... First Language **$250**; Additional **$100**.

A2D-160™ MicroWay's Data Acquisition Board performs 160,000 12 bit Analog to Digital conversions per second! Includes software drivers. The fastest 12 bit A to D board available. For the IBM PC XT and compatibles..... **$1295**

MATRIXPAK™ manages a **MEGABYTE!** Written in assembly language, our runtime package accurately manipulates large matrices at very fast speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from RM or MS Fortran, MS Assembler, or 87BASIC/INLINE..... each **$99**

87FFT™ Written in assembly language, performs Forward and Inverse FFTs on real and complex arrays which occupy up to 512 Kbytes of RAM. Also does convolutions, auto correlations, hamming, complex vector multiplication, and complex to radial conversions. Callable from most 8087 compatible compilers..... **$200**

87FFT-2™ performs two-dimensional FFTs. Ideal for image processing. Requires 87FFT **$100**

MICROWAY UDI runs RTOS or RMX compilers under DOS **$300**

FASTBREAK™ employs the 8087 to increase the speed of Lotus 1-2-3™ Version 1A or 1A* by up to 36:1 ..... **$79**

FASTPAK™ includes FASTBREAK software and a 5 MHz 8087 chip..... **$179**

87Verify™ For users who have to be absolutely sure of their results! This background task periodically performs an 8087 accuracy and stress test..... **$49**

INTEL ABOVE BOARD ..... **CALL**
JRAM, AST, MAYNARD..... **CALL**
RM, IBM, MS Fortran ..... **CALL**

MegaPage™ Our Intel-Lotus EMS memory card. The only EMS board which comes with two megabytes of cool-running, low power drain CMOS RAM installed. Includes RAM disk, print spooler, disk cache, and EMS drivers. For the IBM PC, XT and compatibles..... **$549**

MegaPage AT/ECC™ EMS card for the PC AT and compatibles includes Error Correction Circuitry. With ECC, 11 RAM chips cover 256K so the user never encounters RAM errors. With 1 megabyte CMOS **$799**; with 3 megabytes CMOS **$1295**. Optional serial/parallel daughterboard..... **$95.**

DFixer™ Our disk utility which thoroughly checks PC or AT hard disks for bad sectors and updates the MS DOS file allocation table accordingly. Solves the AT hard disk problem! ... **$149**

DOptimizer™ Optimizes the way your hard disk or floppy stores its files. Speeds up accesses by recombining fragmented files..... **$49**

DCache™ Our disk caching software speeds up your I/O by storing repetitively used tracks in memory. The amount of memory used can be selected in 64 Kbyte banks **$49**

87MACRO/DEBUG™ Contains all the pieces needed for writing 8087/80287 assembly code & MicroWay's 87DEBUG debugger **$199**

OBJ→ASM™ A multipass object module translator and disassembler. Produces assembly language listings which include public symbols, external symbols and labels commented with cross references. Ideal for patching object modules for which source is not available..... **$200**

87BASIC™ includes patches to the IBM BASIC or MS Quick BASIC Compiler for USER TRANSPARENT 8087 support. Provides super fast performance for all numeric operations including trigonometrics, transcendentals, addition, subtraction, multiplication, and division..... each **$150**

87BASIC/INLINE™ converts the output of the IBM BASIC Compiler into optimized 8087 inline code which executes up to seven times faster than 87BASIC. Supports separately compiled inline subroutines which are located in their own segments and can contain up to 64 Kbytes of code. This allows programs greater than 128K! Requires the IBM BASIC Compiler Version 1 and a Macro Assembler. Includes 87BASIC ... **$200**

In London, please phone 223-7762

8087 UPGRADES

All MicroWay 8087s include a one year warranty, complete MicroWay Test Program and accurate installation instructions.

8087 5 MHz **$109**
For the IBM PC, XT and compatibles.

8087-2 8 MHz **$149**
For Wang, AT&T, DeskPro, NEC, Leading Edge.

80287-3 5 MHz **$179**
For the IBM PC AT and 286 compatibles.

80287-6 6 MHz **$229**
For 8 MHz AT compatibles.

80287-8 8 MHz **$295**
For the 8 MHz 80286 accelerator cards.

NEC V20, V30 ..... **$16, $30**
64K RAM Set 150ns **$10**
256K RAM Set 150ns **$34**
256K RAM Set 120ns **$39**
128K RAM Set PC AT **$49**

287Turbo™ 10 MHz If you own an AT, Deskpro 286 or AT compatible, this is the card you need to get reasonable numeric performance. It plugs into your 80287 socket and includes a specially driven 10 MHz 80287. The card comes in three configurations. The IBM AT version includes a hardware RESET button **$450**

287Turbo 8 MHz **$369**

87/88Turbo™ is a stubby card which includes a clock calendar and a speed controller which changes the speed of your motherboard from 4.77 to 7.4 MHz. Its use requires your PC to have a socketed 8284. Typical speed increase is 1.6 to 2.0. The card overcomes slow hardware by slowing up only when such devices are accessed and running at full speed otherwise **$149**
Optional 8087-2 ..... **$149**

286TurboCache™ This new MicroWay accelerator uses 8K of cache memory and 80286/80287 processors to provide an average speed increase of 3:1 for most programs. Call for specifications and benchmarks **$595**

Call for our complete catalog of software which supports the 8087.

MicroWay
P.O. Box 79
Kingston, Mass.
02364 USA
(617) 746-7341

Circle 118 on reader service card

CopyWrite

BACKS UP IBM PC SOFTWARE

Hundreds of the most popular copy-protected programs are copied readily. CopyWrite needs no complicated parameters. It needs an IBM Personal Computer, or an XT or an AT, 128k bytes of memory, and one diskette drive. CopyWrite will run faster with more memory or another drive.

CopyWrite is revised monthly to keep up with the latest in copy-protection. You may get a new edition at any time for a $15 trade in fee.

CopyWrite makes back up copies to protect you against accidental loss of your software. It is not for producing copies for sale or trade, or for any other use that deprives the author of payment for his work.

To order CopyWrite, send a check for $50 U.S., or call us with your credit card. We will ship the software within a day.

Quaid Software Limited
45 Charles Street East
Third Floor
Toronto, Ontario M4Y 1S2
(416) 961-8243

Ask about ZeroDisk to run copy-protected software from a hard disk without floppies.


```
100 DEFINT A-Z : KEY OFF : CLS
110 DATA 07,30,0A
120 F$="123.SET" : G!=1 : C$=""
130 VALID$="0123456789ABCDEFabcdef"
140 FOR J=1 TO 3 : READ A$ : DF$=DF$+CHR$(VAL("&h"+A$)) : NEXT
150 FOR J=1 TO 4 : READ T$(J) : NEXT
160 FOR J=1 TO 2 : READ S$(J) : NEXT
170 '
180 OPEN F$ AS 1 LEN=1
190 FIELD 1,1 AS BYTE$ : SIZE!=LOF(1)
200 '
210 LOCATE 4,1 : PRINT "Searching for color data..."
220 FOR J=1 TO 3 : GET #1 : C$=C$+BYTE$ : NEXT
230 IF C$=DF$ THEN 280
240 G!=G!+1 : IF G!>SIZE! THEN PRINT "Values not found":GOTO 560
250 GET #1 : C$=MID$(C$,2)+BYTE$
260 GOTO 230
270 '
280 LOCATE 6,1,1:PRINT "Values located.  Choose new colors:"
290 FOR J=1 TO 4
300    PRINT : PRINT T$(J)
310    FOR K=1 TO 2
320       PRINT S$(K);"  ? ";
330       A$=INPUT$(1) : PRINT A$
340       P=INSTR(VALID$,A$) : IF P>0 THEN 360
350       PRINT "Invalid response" : GOTO 320
360       IF K=2 THEN IF P>8 THEN 350
370       Z$(K)=A$
380    NEXT
390    N$(J)=Z$(1)+Z$(2)
400 NEXT
410 '
420 PRINT : PRINT "New color bytes will be:"
430 FOR J=1 TO 4 : PRINT N$(J), : NEXT : PRINT : PRINT
440 PRINT "Do you have a backup copy of 123.SET (Y/N)? ";
450 A$=INPUT$(1) : PRINT A$
460 IF INSTR("Yy",A$)=0 THEN 560
470 '
480 PRINT : PRINT "Now modifing file ";F$
490 FOR J=0 TO 3
500    LSET BYTE$=CHR$(VAL("&h"+N$(J+1)))
510    PUT #1,G!+J
520 NEXT
530 CLOSE : PRINT "Modification complete."
540 END
550 '
560 PRINT "Process halted." : STOP
570 '
580 DATA "Worksheet cells, menus, & help screens"
590 DATA "Border & cursor"
600 DATA "Unprotected cells & help screen headings"
610 DATA "Help screen cursor & Unprotected cell cursor"
620 DATA "Foreground:"
630 DATA "Background:"
```

123COLOR.BAS: This program changes the default colors used by 1-2-3 release 2.

0 Black	6 Brown	C Light red
1 Blue	7 White	D Light magenta
2 Green	8 Gray	E Yellow
3 Cyan	9 Light blue	F Bright white
4 Red	A Light green	
5 Magenta	B Light cyan	

Figure 1: Select new colors for 1-2-3 using this chart.

(continues)

- GOOD Product Knowledge
- FREE Technical Support
- FAST DELIVERY
- Warranty & Return Policy
- SERVICE - Before & After

800 382-3888

STOP

YOU'VE FOUND US

NITRO MICRO SM

THE LOGICAL ALTERNATIVE To Your Mail Order NEEDS....

ORDER TOLL FREE 800-382-3888

Call for the Best Prices on Software!

Add 2% shipping and handling on all orders.

NO SALES TAX

All items subject to availability and price change. Software found to be defective will be replaced ASAP. Hardware will be repaired or replaced at our discreation within warranty period of manufacturer. No surcharge on Visa or MasterCard.

VISA MasterCard

Store Hours: Eastern
Mon.-Fri. 10 a.m. - 10 p.m.
Sat. 11 a.m. - 5 p.m.

QUICK SHIP *FAST DELIVERY SERVICE*

COMPUTERS

AT&T

6300 128K 1 Drive Monochrome	$ 1678
6300 256K 2 Drives Monochrome	$ 1798
6300 640K 20MB Monochrome	$ 2344
6300 PLUS 512K 20MB Mono	$ 3819
7300 1MB RAM W/20MB Mono	$ 4486

NITRO MICRO

XT™ 640K 1 Drive 4.77/8MHz	$ 695
AT™ 512K 1.2MB Drive 6MHz	$ 1439

Panasonic

Sr. Partner 256K 1 Drive	$ 1398
Sr. Partner 256K 2 Drives	$ 1544
Sr. Partner 256K 10MB	$ 2496
Executive Partner 1 Drive	$ 1798
Executive Partner 2 Drives	$ 1870
Executive Partner 10MB	$ 2545

EPSON

Equity I 256K 1 Drive	$ 785
Equity I 256K 2 Drives	$ 955
Equity I 256K 20MB	$ 1449
Equity II 256K 1 Drive	$ 1178
Equity II 640K 20MB	$ 1759
Equity III 128K 1.2MB Drive	$ 2169
Equity III 640K 20MB	$ 2845

QUADRAM

Quadview 640K 1 Drive	$ 1480

IBM

PC™ 256K 1 Drive	$ 1129
PC™ 256K 2 Drives	$ 1229
XT™ 256K 1 Drive	$ 1548
XT™ 256K 2 Drives	$ 1648
XT™ 512K IBM 20MB	$ 2169
AT™ 512K IBM 30MB	$ 3778
Convertible 256K 2 Drives	$ 1498

ZENITH

171 256K 2 Drive Portable	$ 1699

MODEMS

AST

Reach 1200 Card w/Crosstalk	$ 359

AT&T

# 4112 1200 Card w/Softcall	$ 329
# 4000 1200 External	$ 314

EVEREX

300/1200 Internal	$ 182

Hayes

1200B Internal w/Smartcom II	$ 348
2400B Internal w/Smartcom II	$ 546
Smartmodem 300 External	$ 136
Smartmodem 1200 External	$ 355
Smartmodem 2400 External	$ 592

PROMETHEUS

Promodem 1200B Internal	$ 228
Promodem 1200B w/Mite	$ 254

QUADRAM

1200 Internal w/Crosstalk	$ 289
2400 Internal w/Crosstalk	$ 448

VENTEL

1200 Halfcard w/Crosstalk	$ 326
2400 Halfcard w/Crosstalk	$ 428
PC 1200 External	$ 319
PC 2400 External	$ 428

WATSON

1200 Data/Voice	$ 344

INTERNAL BOARDS

AST

Preview	$ 268
6 Pack - 64K w/Sidekick	$ 219
6 Pack - 384K w/Sidekick	$ 249
Advantage 1.5MB	$ 678
Advantage 3MB	$ 997
5251-11 Package	$ 588
5251-12 Package	$ 525

DIGIGRAPHICS

Extend Series 384K	$ 149

EPSON

Monochrome Board	$ 95
Color Video Board	$ 109

EVEREX

Edge	$ 269
Graphics Edge	$ 298
Magic Card 384K	$ 118

HERCULES

MonoGraphics Card	$ 281
Color Card	$ 149

INTEL

PC Above Board 2MB	$ 638
AT Above Board 1.5 MB	$ 649

QUADRAM

EGA -	$ 384
Quadcolor I	$ 208
Quadboard 384K	$ 229
QuadSprint	$ 436
QuadLink	$ 349

SIGMA

Color 400	$ 462

STB

Chauffeur	$ 259

TAXAN

555 Color Graphics Card	$ 178

MONITORS

AMDEK

300G Green	$ 119
300A Amber	$ 128
310A Monochrome Amber	$ 155

EPSON

Monochrome Monitor	$ 109
RGB Color Display	$ 388

PGS Princeton Graphic Systems

Max 12E Monochrome	$ 168
HX-12 Color Display	$ 419
HX-12E HiRes Color	$ 525
SR-12 HiRes Color	$ 539

TAXAN

115 Green composite	$ 118
116 Amber composite	$ 127
121 Green monochrome	$ 139
122 Amber monochrome	$ 148
610 RGB Color	$ 328
620 RGB Color	$ 379
630 RGB Color	$ 428
640 RGB Color	$ 488

ZENITH

1230 Green composite	$ 99
1220 Amber composite	$ 99

DRIVES

i-MEGA

Half Height 10MB	$ 1719
Half Height 10 - 10	$ 2398
Hall Height 20MB	$ 2096
Hall Height 20 - 20	$ 3098

IRWIN MAGNETICS

10MB Tape Backup Internal	$ 462
20MB Backup Internal AT	$ 566
10MB Tape Backup External	$ 655

MICROSYSTEMS

25MB Tape Backup External	$ 798

MOUNTAIN

20MB Drivecard	$ 812
27MB Backup Internal AT	$ 1248
60MB Backup Internal AT	$ 1298

SEAGATE

10MB Internal w/cont	$ 429
20MB Internal w/cont	$ 488
30MB Internal AT	$ 668
20MB External w/cont	$ 578

PRINTERS

CITIZEN

MSP-10 160 cps	$ 278
MSP-15 160 cps 132 col	$ 378

EPSON

LX-80 100 cps	$ 218
FX-85 160 cps	$ 333
FX-286 200 cps 132 col	$ 549
JX-80 160 cps color	$ 328
LQ-800 NLQ 200 cps	$ 528
LQ-1000 NLQ 132 column	$ 624
DX-10 LQ 10 cps	$ 228
DX-20 LQ 20 cps	$ 312
DX-35 LQ 35 cps	$ 559
SQ-2000 Inkjet	$ 1410

HEWLETT PACKARD

LaserJet	$ 2298
LaserJet Plus	$ 2919
ThinkJet	$ 398

IBM

Proprinter™	$ 384
Proprinter XL™	$ 584
Quietwriter I™	$ 998
Quietwriter II™	$ 1132
Wheelprinter™	$ 1298

QUADRAM

Buffer 8K Par-Par	$ 138
Buffer 64K Par-Par	$ 165
Buffer 128K Par-Par	$ 198

QUME

Letterpro 20 LQ 20 cps	$ 422
Sprint 11/40 LQ 40 cps	$ 1298
Sprint 11/55 LQ 55 cps	$ 1475
Sprint 11/90 LQ 90 cps	$ 1698

Texas Instruments

TI 850 XL	$ 469
TI 855	$ 698
TI 860 XL	$ 644
TI 865	$ 910

TOSHIBA

P321 Parallel	$ 479
P341 Parallel	$ 788
P341 Parallel & Serial	$ 829
P351 Parallel & Serial	$ 1032

ORDER TOLL FREE 800-382-3888

P.O. Box 90200
Indianapolis, IN
46290-0200

NITRO MICRO SM

IBM PC™, PC/XT™, AT™ & Quietwriter™ are Registered Trademarks of International Business Machines Corporation.

Circle 434 on reader service card

View from F-16 Cockpit

Ejection from F-16 (Control Tower View)

Enjoy Microsoft Flight Simulator Scenery

Jet

From the author of Microsoft Flight Simulator comes a new dimension in flight simulation. Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 or a carrier-based F-18. The Jet simulation includes modern electronic flight instrumentation and the most advanced weaponry available. Jet's combination of simulation sophistication, excellent visual attitude references, and fast animation speed makes it truly enjoyable to fly.

Excellent aircraft control plus ballistic thrust gives you the kind of aerobatic maneuverability only a modern jet fighter can provide. The attitude indicator is easy to read no matter what your orientation. This indicator, combined with a full-screen out-the-window view, helps you get the most out of Jet's excellent flight controls. An important consideration when traveling at speeds in excess of 1300 MPH.

With Jet you can fly through either structured on non-structured environments. Engage in a deadly variety of combat missions. Explore the wargame territory, or relax by practicing precision aerobatic maneuvers. Load in scenery from optional United States Scenery Disks. You can even load in scenery off the Microsoft Flight Simulator disk.

Jet's technology incorporates our newest high-speed graphic drivers, and introduces new scenery concepts for improved viewing on non-color and RGB monitors.

Jet requires an IBM™ PC, PC jr, PC AT, Compaq™, or Tandy™ 1000-series computer, with 128K minimum memory and the Color/Graphics Monitor Adapter, Hercules™ Graphics Card, IBM Enhanced Graphics Adapter, or Sublogic High-Speed Graphics Card.

See Your Dealer . . .
or write or call for more information. For direct orders please enclose $49.95 plus $2.00 for shipping and specify UPS or first class mail delivery. Visa, MasterCard, American Express, and Diners Club cards accepted.

SCENERY DISKS FOR MICROSOFT FLIGHT SIMULATOR AND JET ARE NOW AVAILABLE.

IBM is a trademark of International Business Machines Corp.
Compaq is a trademark of Compaq Computer Corp.
Tandy is a trademark of Tandy Corp.
Hercules is a trademark of Hercules Computer Technology.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

SIDESADDLE

AFFORDABLE VALUE—This is it! From the leader in computer workstation furniture. A quality, full-featured computer security workstation that everyone can afford. Check out these features and compare.

- **RUGGED**—Right down to our exclusive shock isolation steel base, every Sidesaddle is built to withstand years of use. Full bearing steel slides support the computer, keyboard, and printer shelves. And, a special combination of high density laminates, real wood tambour doors and moldings result in a cabinet that is rock solid and simply beautiful. We back it with a full 10-year warranty.
- **COMPATIBLE**—Any computer with separate keyboard, system unit, and monitor will fit easily without the need for additional cabling, etc. There is even a place for an expansion chassis or external disc drive.
- **UNHANDED**—Set it up for left or right printer exit, whichever works best in your workspace. The inset pictures below show a walnut grain Sidesaddle set up for the printer to exit from the left.
- **SECURE**—The door on the Sidesaddle locks to protect your computer and software. Even the optional monitor cover has its own lock.
- **MOBILE**—Check out the large twin wheel heavy duty casters, standard.
- **OPTIONS**—So complete we can only offer two options: a locking monitor cover and a vertical diskette organizer for your favorite software.
- **OUR GUARANTEE**—If for any reason you are not completely satisfied with your new Sidesaddle, return it within 30 days for a full and courteous refund.

$390

NATURAL OAK

WALNUT

WALNUT WITH MONITOR COVER

SPECIAL OFFER—Take advantage of our Special Introductory Offer. If you order now, you will receive the vertical diskette organizer (a $29.95 value) at no charge. CALL NOW!

(714) 598-2502

OUTSIDE CALIF. **1-800-255-5069**

MasterCard VISA

SIMONTON INDUSTRIES
803 Tucker Lane • Walnut, CA 91789

Circle 520 on reader service card

Do Your Own Surveys with

PeopleFacts™

the Opinion Processor™

☐ ☐ ☐ ☑ ☐

Do you know what people think of your organization? Your products? Your services? Your programs? **PeopleFacts** helps you make better decisions with survey results at your fingertips.

With **PeopleFacts** you can:

Create and print survey questionnaires • Use multiple-choice, numeric, and comment questions • Process survey data • Print customized survey reports • Study sub-populations • Do cross-correlations and other special statistics.

All essential survey statistics • Easy to learn and use
Menu-oriented, fully prompted • Easy-to-read manual

• IBM PC, 128K, 1 drive, DOS 2.0 or higher • $395.00 + $5.00 shipping (CA customers add 6%) • Money-back guarantee • Full-feature preview $25.00, applies to purchase • Payment required with order (or *corporate* P.O.) • ***Dealers invited.***

To order: *Call* **(619) 272-3880**

Or write to: **Shamrock Press**
4490 Fanuel St., Suite 204
San Diego, CA 92109

NEW

Create fast, flexible business forms with your LaserJet™

Now traditional printed forms are obsolete. Because with Polaris Forms™ software, you can create your own typeset-quality forms instantly.

Blank forms or completed forms. Single or multiple page forms. Even forms with automatic serialization, date, or time. All with text, lines and shading precisely where you want them.

Form information can originate from as many sources as you like. Merge or include text files from any word processing program or text editor. Merge graphics or text from other programs. Or enter information directly from the keyboard in response to prompts you select.

Polaris Forms software even justifies text with any combination of LaserJet or LaserJet PLUS fonts. A single keystroke justifies text to the center, right, or left.

Recommended by HEWLETT PACKARD

And all with an ease you won't believe. Special formatting commands repeat symbols, lines, boxes or charts across or down the page. So you no longer have to painstakingly measure and position repeated form elements.

Polaris Forms is only $149 non-copy protected, plus $6 shipping and handling. Versions are available for IBM-PC/100% compatibles and the HP 150. There's a 30-day money-back guarantee, so order now with confidence.

For orders call:
Inside California 1 (800) 231-3531
Outside California 1 (800) 338-5943

POLARIS SOFTWARE
310 Via Vera Cruz
Suite 205
San Marcos, CA
92069 (619) 471-0922

Some features only available on the LaserJet PLUS.
Registered trademarks: LaserJet, Hewlett-Packard Corp.; Polaris Form, Polaris Software.

Circle 359 on reader service card

```
A>copy ansi.sys ansi43.sys
A>debug ansi43.sys
-e 29d 90 90
-e 2a1 90 90
-e 27c 2b
-e 283 2a
-e 50c 2b
-e 58f 2b
-w
Writing 0673 bytes
-q
A>debug command.com
-e 263b 2a
-w
Writing 0673 bytes
-q
```

EGAPATCH: Steps to modify ANSI.SYS and COMMAND.COM to use the Enhanced Graphics Adapter's 43-line mode

First, make a copy of ANSI.SYS called ANSI43.SYS, make a backup copy of COMMAND-.COM, and then follow the steps shown in EGAPATCH to perform the modifications. Remember to edit CONFIG.SYS to refer to the ANSI43.SYS driver.

Even without an EGA, you should find the following tip to be of interest. The default setting of ECHO ON for batch file commands can be quite annoying. The obvious solution is to include an ECHO OFF command at the beginning of every batch file. This of course has the equally annoying effect of displaying the ECHO OFF command whenever the batch file executes. The ultimate solution is to patch COMMAND.COM to make ECHO OFF the default.

(continues)

INTRODUCING THE NEW RELEASE OF PAC MICRO™

AGS Management Systems' PAC MICRO is a project planning and management system created for the IBM® PC (and compatibles). It virtually assures that you'll use all of your resources to best advantage to get the job done on time and within budget.

PROJECT MANAGEMENT JUST GOT A WHOLE LOT EASIER.

PLAN AND MANAGE ANY JOB, LARGE OR SMALL

PAC MICRO has everything you need to manage any size project, including scheduling, budgeting, "what if" simulations, easy-to-read reports, and color graphics. (Optionally, use PAC MICRO with the Hewlett-Packard 747x™ plotter for sharp, bold networks or gantt charts.) And PAC MICRO also interfaces with our mainframe project management systems.

This new release of PAC MICRO improves your capabilities significantly. Now you can schedule 3 different ways: duration, effort, or to availability of resources. You can now enter target start dates for each activity. You can specify the project due date. You can enter up to 30 holidays or shutdowns. You can use project models to build new projects. And you can export data to Lotus 1-2-3® and Wordstar.®

SURPRISINGLY EASY TO USE

Just tell PAC MICRO what to do and in what sequence. PAC MICRO does all the rest. And it's all done in simple, uncomplicated English. The System will tell you where problems could occur, and also how to deal with them. PAC MICRO's scheduler uses the critical path method, and allows an unlimited number of projects and up to 400 tasks per project. Although project management specialists find PAC MICRO to be an invaluable desktop aid, even those with little or no experience have no trouble using it.

PAC MICRO costs $990 (the optional HP plotter module is $495). A demo disk is available for $100, which is applied toward purchase.

If you'd like more information, or a demo disk, just call or send us the coupon. PAC MICRO is brought to you by the company that for almost two decades has made project management—software systems, education, and consulting—its one and only business.

AGS Management Systems INC.

The world's leader in project management systems

880 First Avenue
King of Prussia, PA 19406
(215) 265-1550
Telex: 510-6603320

AGS Management Systems is a division of AGS Computers, Inc.

C76

Yes, I'm interested in PAC MICRO

- ☐ Send me a demo disk. Enclosed is $100. (PA & CA add tax)
- ☐ I'd like more information.

Name _____

Title _____

Organization _____

Address _____

City _____ **State** _____ **Zip** _____

Telephone ( ) _____

I have access to the following computers:
Micro _____ Mainframe/Mini _____

Mail to: AGS Management Systems, Inc.
880 First Avenue, King of Prussia, PA 19406

IBM is a registered trademark of International Business Machines Corporation; Hewlett-Packard 747x is a registered trademark of Hewlett-Packard; Lotus 1-2-3 is a registered trademark of Lotus Corporation; Wordstar is a registered trademark of MicroPro International Corporation.

Circle 858 on reader service card

THE TPA TEMPLATE SERIES

"Answers at your fingertips."

- The 10 function keys are directly referenced. Colors are used to indicate if a key is to be used in conjunction with the Alt, Ctrl, or Shift key.
- A handy display of commands, menu structures, key assignments and cursor control information is at your fingertips.
- The Mini-Manual is a specially condensed software quide containing references, examples and tables needed most often.

Designed to fit IBM (PC, XT, AT), Compaq and most compatable PC's.

WordPerfect 4.0/4.1	$22.95	Lotus 1-2-3	$19.95	MS Word	$19.95
Wordstar	19.95	Multimate	19.95	Displaywrite 3	19.95
Wordstar 2000	19.95	Symphony	24.95	Blanks	12.95

Include $3.00 per order for shipping & handling.

445-A Carlisle Dr., Herndon, VA 22070 703-437-4148

Circle 713 on reader service card

We've Been Around and We'll be around.

Chang Lei is part of an industrial conglomerate that has been making everything from cars to computer peripherals for years. So, even though we started making personal computers in 1984, we already know our business—the business of manufacturing and marketing. And because Chang Lei is just one part of a very large and prosperous organization, you can count on us to be around in the future.

Many computer companies will come and go in the next few years. A lot have come and gone already. That's because they were engineers with a new idea and a little capital, but not much else. We are manufacturers with adequate capital and facilities to stay in business for the long run. If you plan to be around for the long run, get in touch with us. We're very supportive of O.E.Ms, VARs and distributors.

CHANG LEI ELECTRONIC INDUSTRIAL CO., LTD.

6TH FL., NO. 99, FU HSING N. ROAD TAIPEI, TAIWAN, R.O.C.

TELFAX: 7168796 TELEX: 21405 LEICHU

CABLE: "LEICHU" TAIPEI TEL: (02) 7128877

For DOS 3.10, simply change the appropriate byte from 1 to 0. To do so, first type **DEBUG \COMMAND.COM** to start the DEBUG program. At DEBUG's hyphen prompt, type **E 1967 00 <Enter> W <Enter>** to make the change and save it to disk. Finally, type **Q** and press **<Enter>** to return to DOS.

Photios G. Ioannou
Ann Arbor, Michigan

Editor's note: The ECHO OFF patch is a winner. It's now a permanent part of DOS on my disks.

Turbo Asides

When I needed to print extra-wide lines, I decided to write my own sideways printing program in Turbo Pascal version 3.0. The result is SIDEPRNT.PAS.

The biggest hurdle I encountered was finding a font to use; I solved the problem by using the graphics character screen font built into the PC's ROM. The font data may be stored in different locations on some "compatible" computers, but on the PC it resides at address F000:FA6E.

SIDEPRNT reads a text file to accumulate pages of 53 lines and prints the text sidways, 9 characters to the inch. This process continues until the entire document has been printed. The formfeed character (Control L) is recognized and causes a page eject, even in the middle of a line.

Each character's bit map is 8 bytes long, defining the character in an 8-by-8 matrix. Because most characters don't fill the entire matrix, space is left between displayed characters. SIDEPRNT

(continues)

The price of power just went down.

Before you buy DBase III, QuickCode and Clipper, look at TAS-Plus

TAS-Plus just made it faster, easier and cheaper to build database applications.

TAS-Plus combines the power of a Relational Database with the ease of a Program Generator. Then TAS-Plus adds a Runtime Compiler to produce lightning-fast finished code.

Look at what TAS-Plus gives you:

Relational Database
4th Generation Language
Screen Painter
Program Generator
Report Writer
Source Code Editor
Runtime Compiler

TAS-Plus gives you power where it counts. You can store up to 65,000 records, open up to 16 files at a time and enter up to 10,000 characters per record. TAS-Plus even reads your old DBase files.

BUSINESS TOOLS INC.

The following are registered trademarks of these companies: TAS-Plus, The Accounting Solution, Business Tools, Inc; DBase III, Ashton-Tate; CP/M, Digital Research; IBM PC/XT/AT, International Business Machines Corp; QuickCode, Fox&-Giller; Clipper, Nantucket Inc.

* Copyright 1986 Business Tools, Inc.

TAS-Plus writes the program for you

With TAS-Plus, you can start building professional database applications on day one. Just "paint" the screen the way you want and TAS-Plus writes the program for you. You can even paint using different colors or graphic characters. And custom reports are just as easy.

TAS-Plus has over 86 commands and 200 options available in its Source Code Editor, so you won't run out of room to grow.

Easy to use features

Add new databases quickly and easily.
Add, change or delete records without any programming at all.
Browse through your database and see multiple records on the screen at the same time.
Restructure capability allows you to change existing databases without loss of any data.

All this for just $69

TAS-Plus would be respectable at any price, at $69 it's awesome.

30 day Money Back Deal

TAS-Plus comes with a 30 day money back guarantee (less $15 handling fee). TAS-Plus is available for the IBM PC/XT/AT and fully compatible computers. Limited versions available for CP/M and non-IBM machines.

Order Today 1-800-648-6258

Call our Toll-Free Hotline. Use your VISA, MasterCard or American Express to order today. For information or Washington residents call 1-206-644-2015.

TAS+™

NOT COPY-PROTECTED

YES! Rush me the following items.

Qty.	Item	Price	Subtotal
____	TAS+	$69	____

Shipping add $8 USA, $25 outside USA — Shipping ____
WA res add $5.59 Tax — Tax ____
Amount Enclosed (US funds only) ____

Name: _____
Shipping Address: _____
_____
City: _____
State: _____ Zip: _____
Telephone: _____
Payment: VISA MC AMX Check
Credit Card Expiration Date: _____
Card Number: _____
Name on Card: _____

BUSINESS TOOLS INC.
4038-B 128th Ave. S.E., Suite 266
Bellevue, Washington 98006
(206) 644-2015

VISA MasterCard

Circle 444 on reader service card

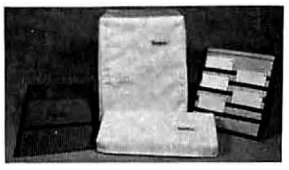
"CPYAT2PC"
IS LIKE HAVING A
FREE
360K FLOPPY DRIVE

Allows copying of IBM AT file for use on IBM PC's & compatibles with no modification of existing hardware or software. A 360K floppy drive is not required. CPYAT2PC may reside on your IBM PC/AT hard disk and copies 1 file or entire subdirectories in 1 step. Also runs on other AT compatibles such as COMPAQ 286, ZENITH Z-200, and KAYPRO 286I. Dealer inquiries welcome. **ONLY $79 + shipping.**

MICROBRIDGE COMPUTERS
Sky Way Building, Suite 125
655 Sky Way, San Carlos, CA 94070
(415) 593-8777 • (415) 595-2150
CHECK, COD WELCOME
(Prepayment Required)

Circle 171 on reader service card

CompuCover®



COVER YOUR INVESTMENT
DUST COVERS

IBM PC, XT or AT Keyboard	7.95
IBM PC, XT or AT CPU with Monitors	16.95
IBM PC, XT or AT CPU/Monitor/Keyboard	21.95
IBM PC JR CPU/Monitor/Keyboard	18.95
IBM PRO Printer	15.95

DISK WALLETS

5 1/4" Disk for 10 Disks	15.95
5 1/4" Disk for 6 Disks	12.95

Anti-Static-Different Colors
Other IBM Products Available Call for Free Catalogue

ORDER LINE
1-800-874-6391
FLORIDA ORDER LINE
1-800-342-9008
Dealer Inquiries Invited

CompuCover
P.O. Box 310 Dept. PC
Mary Esther, FL 32569

Customer Service
(904) 243-5793
Telex 469783

Circle 416 on reader service card

PC EXPANSIONS

AST SixpackPlus (384K)	$219
Advantage (128K)	$369
Advantage (1.5M)	$529
Advantage (3M)	$809
Rampage (2M)	$499
RampageAT (2M)	$659
INTEL AboveAT (2M)	$xall
Quadboard (384K)	$249
Gold Quadboard (384K)	$429
LibertyAT (2M)	$call
QuadportAT	$135
Tecmar Maestro (2.5M)	$629
HERCULES graphics board	$299
Color Card	$159
HAYES Smartmodem 1200B	$349
Smartmodem 1200	$389
Maynard Disk Controller	$100
Sandstar Series	$call
MaynStream Tape backup from	$979
WDFile Card (10M)	$769
Tandon Diskard (20M)	$789
Set of 9 chips (64K)	$10
Set of 9 chips (256K)	$29
8087-3	$119
Qume 142A:$99 **Teac**	$109
Teac FD55BV (for AT)	$109
CDC 9409: $119 **Tandon**	$109
Verbatim (Box of 10)	$19
Maxell (Box of 10 for AT)	$39

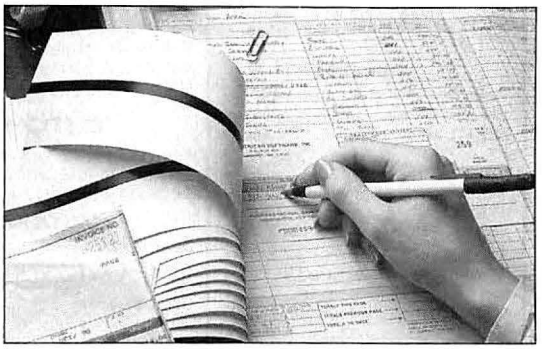
VLM Computer Electronics
10 Park Place • Morristown, NJ 07960
(201) 267-3268 • Visa, MC, Check or COD


```
(*
   SIDEPRNT ... sideways (rotated) printing ...
   Author --- John T. Bagwell, Jr.

   Uses Character tables in the BIOS ROM  to do a simple form of
   sideways printing. Character values above 127 aren't supported.

   FormFeed acts as a 'page' eject, even in the middle of a line;
   a line ends at CR/LF, FF, or end-of-file.

   This program is designed for the Epson FX-80 or FX-85 printer.
*)

program SidePrint;
const
   PrintMultipleSpacing = #27'3';
   JiggleDown = #13#27'J'#1;
   NormalSpacing = #27'2';
   GraphicsPrint = #27'*';
   LineFeed = ^J;
   FormFeed = ^L;
                              { ... possible choices ... }
   BitsPerChar =      9;    { 9   8   9   8   9   8   9   8 }
   ModeCode =        #0;    {#0  #0  #4  #4  #5  #5  #6  #6 }
   MaxLinesPerPage = 53;    {53  60  71  80  64  72  80  90 }
   MaxLineLen =    1000;    {adjust to match max lines and available space}
type
   BitMap = array [0..7] of char;
   Line = array [1..MaxLineLen] of char;
var
   Paper: array [1..MaxLinesPerPage] of Line;
   InFile: text;
   InChar: char;
   LineNo, CharNo, i, j, k, BitsPerPage, LineLen: integer;
   Cindex, PrintMultiple: byte;
   CharTable: array [0..127] of BitMap absolute $F000:$FA6E; {BIOS Table}

(*---------------------------------*)
(*         READ ONE 'PAGE'         *)
(*---------------------------------*)

procedure ReadOnePage;
var
   LineSize: array [1..91] of integer;  {big enough for all options}
   eject: Boolean;
begin
   LineNo := 1;
   CharNo := 0;
   LineLen := 0;
   eject := FALSE;

   for i := 1 to MaxLinesPerPage do   {erase old lines}
     LineSize[i] := 0;
repeat
        {accumulate a line...}
  while (not eoln(InFile)) AND (not eject) do
    begin
      read(InFile,InChar);
      if InChar = FormFeed then  {watch for page ejects}
        if (LineNo = 1) AND (CharNo = 0) then
           {ignore redundant page ejects}
        else
           eject := TRUE
      else
        if CharNo <= MaxLineLen then  {build a line}
          begin
            CharNo := CharNo + 1;
            Paper[LineNo,CharNo] := InChar;
          end;
    end;

       {at end of each line ...}
    if CharNo > LineLen then   {save longest line length}
      LineLen := CharNo;
    LineSize[LineNo] := CharNo;
    LineNo := LineNo + 1;
    CharNo := 0;
    if eoln(InFile) then
      readln(InFile);         {get the end-of-line mark}
```

SIDEPRNT.PAS: Turbo Pascal program to print sideways

(continues)

The Manual Method of Bookkeeping.



BEFORE.

The manual one-write check-writing system revolutionized bookkeeping for small businesses. Millions trust and use it. But it's tedious, time consuming, prone to error, and only works when you have the time to update the journals. By then, it's too late! *Now, there's a better way from Great American Software, Inc. One-Write Plus*™ makes automating your bookkeeping simple and easy because you're already familiar with everything you need to know. It works with your IBM™ personal computers and most compatibles.

The best ideas are the simplest.

Unlike a manual system, One-Write Plus gives you all the financial information you need to run your business right at your fingertips. *That gives you up-to-the-minute control over your money.* And makes life a lot easier for you and your accountant.

You won't have to change the way you're used to working to become more productive, like other software programs! You'll spend your valuable time making important business management decisions instead of sorting out confusing paperwork.

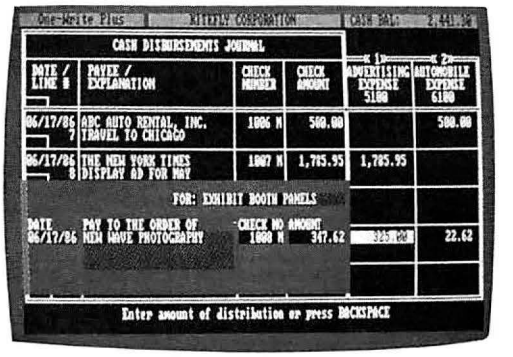
As your business needs expand, you can add Accounts Payable, Accounts Receivable, and Payroll . . . they're all based on the one-write concept, too. So they all work together to help you build your business the way you want to.

The bookkeeping system anyone can use. We guarantee it!

Nothing is easier to use than the One-Write Plus system. On-screen instructions guide you through fully automated versions of the one-write type forms you're used to. And if you're ever stuck, there's a special "Help" menu, too.

One-Write Plus is a registered trademark of Great American Software, Inc.
IBM is a registered trademark of International Business Machines Corp.

One-Write Plus.™



AFTER.

And although it's easy, it's also extremely powerful. There are complete audit trails built in, so you can follow transactions. It even automatically recalculates your checkbook balance. As a matter of fact, it can handle as many as three separate checking accounts.

To help you decide, here's our special offer:

Try One-Write Plus for 30 days from purchase. If you're not completely satisfied, all you have to do is return it within 30 days for a full refund. No questions asked.

Why wait to benefit your business? To arrange for a demonstration at your nearest dealer or to order direct, call our toll-free number today. In NH, call 1-603-889-5410.

To order by mail, simply fill out the order form and return it to: Great American Software, Great American Building, 9 Columbia Drive, Amherst, NH 03031. Make checks or money orders payable to Great American Software, Inc.

Great American SOFTWARE, INC.

CALL 1-800-528-5015 TODAY!

★★★★★★★★★★★★★★★★★★★★★★★★★

Send me the following:

	Price		
One-Write Plus Master Module @ $295	_____	Accounts Payable @ $245	_____
Payroll @ $245	_____	Accounts Receivable @ $245	_____
		Shipping ($3 per package)	_____
		Total	_____

Name _____ Title _____

Company _____

Address _____

City _____ State ___ Zip _____

Phone _____

VISA ____ MasterCard ____

_____

Exp. _____ Signature _____

PPWOO76

Circle 888 on reader service card

COMPUTER MAIL ORDER

THE CMO ADVANTAGE

TO ORDER
CALL TOLL FREE
1-800-233-8950
DEPARTMENT B207

OR MAIL YOUR ORDER TO:

COMPUTER MAIL ORDER
Department B207
477 E. Third Street
Williamsport, PA 17701

AMERICAN EXPRESS · VISA · MasterCard · DINERS CLUB

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. Pennsylvania residents add 6% sales tax. All prices are subject to change and all items are subject to availability. Defective software will be replaced with the same item only. Hardware will be repaired or replaced at our discretion within the 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.

EDUCATIONAL INSTITUTIONS
CALL TOLL FREE
1-800-221-4283
CUSTOMER SERVICE
& TECHNICAL SUPPORT
1-717-327-1450

CANADIAN ORDERS
1-800-268-3974
Ontario/Quebec
1-416-828-0866
In Toronto
1-800-268-4559
Other Provinces
TELEX: 06-218960
2505 Dunwin Drive,
Mississauga, Ontario
Canada L5L1T1

All prices shown are for U.S.A. orders. Call the Canadian Office for Canadian prices.

THE CMO ADVANTAGE

- Next day shipping on all in-stock items.
- Free easy access order inquiry.
- Orders from outside Pennsylvania save state sales tax.
- Free technical support from our factory trained technicians.
- There is no limit and no deposit on C.O.D. orders.
- There is no extra charge for using your Visa or MasterCard and your card is not charged until we ship.
- No waiting period for cashier's checks.
- We accept purchase orders from qualified corporations. Subject to approval.
- Educational discounts available to qualified institutions. (See the toll free educational phone number above.)
- FREE CATALOG MEMBERSHIP

DRIVES

CMS
10 meg Internal (IBM)....$399.00
20 meg Internal (IBM)....$499.00
Rambo-AT....$229.00

CORE
AT20-AT72MB....CALL

EVEREX
60 meg internal tape backup....$799.00

I-MEGA
A110H Bernoulli Single 10....CALL
A210H Bernoulli Dual 10....CALL
A220H Bernoulli Dual 20....CALL
Save on Bernoulli Carts....CALL

IRWIN
Tape Backup....CALL

MOUNTAIN
Hard Card 20....CALL

PRIAM
40, 60MB Inner Space....CALL
Shared Data....CALL
Shared Space....CALL

RACORE
1500 Expansion Chassis....$379.00
1500 Chassis w/DMA....$429.00
2101 256K Memory....$179.00
2103 512K Memory....$199.00

SYSGEN
Back Ups....$CALL

TALLGRASS TECHNOLOGIES
COMMITTED TO MEMORY
25, 35, 50, 80 meg. (PC)
....from $1499.00

Tandon
360K 5¼" ½ HTS....$99.99

TEAC
360K 5¼"....$109.99

MODEMS

ANCHOR
Volksmodem....$59.99
Volksmodem 300/1200....$189.00
Signalman Express....$259.00
Lightning 2400 Baud....$399.00
Expressi halfcard-PC....$189.00

AST
Reach 1200 Baud Half Card....$399.00

EVEREX
1200 Internal w/software....$179.00

Hayes
Smartmodem 300....$139.00
Smartmodem 1200....$389.00
Smartmodem 1200B....$359.00
Smartmodem 2400....$589.00
Smart Com II....$89.99
Chronograph....$199.00
Transet 1000....$309.00

Novation
J-Cat....$99.99
Smart Cat Plus....$319.00
Novation 2400....$499.00

QUADRAM
Quadmodem II
300/1200....$339.00
300/1200/2400....$499.00

INTERFACES

DIGITAL DEVICES
Printer Buffer 16K....$74.99

PRACTICAL PERIPHERALS
Microbuffer II (64K)....$169.00

QUADRAM
Microfazer....from $139.00
Efazer (Epson)....from $79.99

GRAPHICS

Polaroid Palette....$1399.00
Power Processor....$229.00
Illuminated Slide Mounter....$39.99
Polacolor 2 pack film....$18.99

MONITORS

AMDEK
300 Green....$129.00
300 Amber....$139.00
310 Amber IBM-TTL....$169.00
Color 600 Hi-Res (640x240)....$399.00
Color 722 IBM Enhanced....$529.00
Color 725 (AT&T Compat.)....$619.00
Color 730 Analog....$799.00

MAGNAVOX
8562 RGB/Composite....$279.00
613 TTL Green....$99.99
623 TTL Amber....$99.99

NEC
JB 1205 A....$79.99
JB1270 G/JB 1275 A (ea.)....$99.99
JB 1280 G TTL/1285 A TTL(ea.) $129.00
JC 1401 Multi Sync RGB....CALL

PRINCETON
MAX-12 Amber....$179.00
HX-9 9" RGB....$469.00
HX-9E Enhanced....$519.00
HX-12 12" RGB....$469.00
HX-12E Enhanced....$559.00
SR-12 Hi-Res....$599.00
SR-12P Enhanced....$649.00

QUADRAM
8400 Quadchrome....$479.00
8410 Quadchrome II....$339.00
8420 Amberchrome....$179.00
8500 Quad Screen....$1499.00

TAXAN
115 12" Green Mono....$119.00
116 12" Amber Mono....$129.00
121 Green TTL....$139.00
122 Amber TTL....$149.00
220 Color Composite....$179.00
620 640x200 RGB....$439.00
630 640x200 RGB....$489.00
640 720x400 RGB....$539.00

ZENITH
ZVM 1220A/1230G....(ea.) $99.99
ZVM 1240 IBM Amber....$149.00
ZVM 135 RGB....$459.00
ZVM 1330 RGB....$459.00
ZVM 1360 RGB....CALL
ZVM 1380 E G Comp....CALL

DISKETTES

Dennison
Elephant 3½" SS/DD....$24.99
Elephant 5¼" SS/SD....$9.99
Elephant 5¼" SS/DD....$11.99
Elephant 5¼" DS/DD....$14.99
Elephant Premium DS/DD....$16.99
Premium DS/DD (50 pack)....$69.99

IBM
5¼" DS/DD Floppy Disks
(box of 10)....$25.99

maxell.
3½" SS/SD....$18.99
3½" DS/DD....$29.99
5¼" MD-1 w/Hardcase....$11.99
5¼" MD-2 w/Hardcase....$16.99
5¼" MD-2-HD for AT....$29.99

Verbatim.
5¼" SS/DD....$19.99
5¼" DS/DD....$24.99
Disk Analyzer....$24.99

DISK HOLDERS

AMARAY
50 Disk Tub 5¼"....$9.99
30 Disk Tub 3½"....$9.99

INNOVATIVE CONCEPTS
Flip-n-File 10....$1.99
Flip-n-File 50....$14.99
Flip-n-File 50 w/lock....$19.99
Flip-n-File Data Case....$9.99

PRINTERS

Canon
A40, 50, 55....CALL
LBP-8A1 Laser....$1999.00

CITIZEN
MSP-10 (80 col)....$279.00
MSP-15 (132 col)....$389.00
MSP-20 (80 col.)....$349.00
MSP-25 (132 col.)....$509.00
MSP-35 (LQ)....$449.00

C.ITOH
Prowriter 1550....$449.00
Starwriter 10-30....$459.00
C.I. 3500....CALL

corona
Lazer LP-300....$2399.00

DIABLO
D25 Daisywheel....$549.00
635 Daisywheel....$1099.00
D80IF Daisywheel....CALL

daisywriter
2000....$699.00

EPSON
Homewriter 10, LX-80....CALL
FX-85, FX-286, RX-100....CALL
DX-10, DX-20, DX-35....CALL
SQ-2000, Hi-80, HS-80, AP-80....CALL
LQ-800, LQ-1000....CALL

JUKI
5510 Dot Matrix....CALL
5510C Color....CALL
6000 Letter Quality....CALL
6100 Letter Quality....CALL
6200 Letter Quality....CALL
6300 Letter Quality....CALL
6500 Letter Quality....CALL

LEGEND
PERIPHERAL PRODUCTS
808 Dot Matrix 100 cps....$179.00
1080 Dot Matrix 100 cps....$259.00
1380 Dot Matrix 130 cps....$289.00
1385 Dot Matrix 165 cps....$339.00

NEC
P560, P660, P760....CALL
3550 IBM....$779.00
8850 IBM....$1099.00
ELF 360 IBM....$399.00

OKIDATA
182, 183, 192, 193, 2410, 84....CALL
Okimate 20 (IBM), 282, 283....CALL

Panasonic
KX1091....$249.00
KX1092....$389.00
KX1592....$469.00
KX1595....$659.00

QUADRAM
Quadjet....$379.00
Quadlaser....CALL

SILVER-REED
500 Letter Quality....$239.00
550 Letter Quality....$299.00
800 Letter Quality....$699.00

star
SB/SD/SR/NX....CALL
Powertype Letter Quality....CALL

Texas Instruments
TI855....$639.00
TI865....$799.00

TOSHIBA
PB321 (80 Column)....$489.00
PB341 (132 Column)....$799.00
PB351 (132 Column)....$1049.00

COMPUTER MAIL ORDER

SPECIAL THIS MONTH

ZENITH 158
256K Dual Drive Desktop with MS-DOS

$1499.00

SOFTWARE FOR IBM

ANSA SOFTWARE
Paradox $499.00

ASHTON-TATE
Framework II $389.00
dBASE II $299.00
dBASE III Plus $389.00

BATTERIES INCLUDED
Isgur Portfolio $159.00

BORLAND INTERNATIONAL
Turbo Pascal 3.0 ..... $49.99
Superkey $44.99
Sidekick (Unprotected) $57.99
Reflex $59.99
Lightening $59.99
Travelling Sidekick $44.99
Turbo Prolog $64.99

BRODERBUND
Printshop $39.99
Graphics Library $24.99

CENTRAL POINT
Copy II PC-Backup $29.99
PC Option Board $84.99

Continental Software
Home Accountant Plus $79.99
1st Class Mail $79.99
Tax Advantage $49.99

DECISION RESOURCES
Chartmaster $229.00
Signmaster $159.00
Diagram Master $209.00

FIFTH GENERATION
Fastback $99.99

FIRST STEP
Golf's Best $34.99

FUNK SOFTWARE
Sideways $44.99

Harvard Software Inc.
Total Project Manager $269.00
Presentation Graphics $239.00

Hayes
Please (Data Base) $199.00

LIFETREE SOFTWARE INC
Volkswriter III $159.00

LIVING VIDEO TEXT
Think Tank $109.00
Ready $64.99

Lotus
Symphony $429.00
1-2-3 2.0 ..... CALL

meca
Manage Your Money $99.99
Manage Your Market $89.99

MicroPro
Easy $94.99
WordStar 2000 + ... $289.00
WordStar Professional $249.00
WordStar Pro Pak/GL Demo $189.00

MICRORIM
R:Base 4000 ..... $259.00
R:Base 5000 ..... $359.00
Clout 2.0 ..... $129.00

MICROSOFT.
Flight Simulator $34.99
MulliPlan $129.00
Microsoft Word $249.00
Microsoft Project 2.0 ..... $259.00
Microsoft Chart 2.0 ..... $189.00
Microsoft Mouse $139.00
Windows $69.99

MICROSTUF
Crosstalk XVI $89.99
Crosstalk IV $149.00
Remote $89.99

MONOGRAM
Dollars & Sense $99.99

MOUSE SYSTEMS
PC Mouse/Paint + ... $139.00

MultiMate
Multi Mate $219.00
Advantage $289.00
Just Write $89.99

NORTON UTILITIES
Norton Utilities 3.0 ..... $57.99

pfs: IBM
File/Graph/Plan ..... (ea.) $84.99
Report $74.99
Write/Proof combo $84.99
Proof $59.99

Professional Software
PC Plus/The Boss $249.00
Write & Spell $89.99

RoseSoft
Pro Key 4.0 ..... $69.99

SOFTWARE GROUP
Enable $329.00

SORCIM/IUS MICRO SOFTWARE
Accounting
AP/AR/GL/IN/OE ..... (ea.) $299.00
Supercalc III $199.00
EasyWriter II System $239.00
Super Project $199.00

SSI Software
Word Perfect 4.1 ..... $219.00

SUBLOGIC
Jet $37.99

synapse
File Manager $4.99

Z SOFT
PC Paintbrush $89.99

PC COMPATIBLES

IBM PC
IBM-XT
IBM-AT
SYSTEMS

Configured to your specifications.

Call for the price and availability of your system requirements.

AT&T
6300 ..... CALL

COMPAQ
Portables ..... CALL
Desk Pros ..... CALL
AT286 ..... CALL

corona
PPC400 Dual Portable $1289.00
PPCXT 10 meg Portable $1989.00
PC40022 Dual Desktop $1389.00
PC400-HD2 10 meg $1989.00

ITT
ITT X-TRA
256K, 2 Drive System ..... CALL
256K, 10 meg Hard Drive System ..... CALL
XP5, 20 meg ..... CALL

KAYPRO
KP-2000 Portable ..... CALL
Kaypro-PC ..... CALL

SANYO
MBC 550-2 Single Drive ..... CALL
MBC 555-2 Dual Drive ..... CALL
675 Portable ..... CALL
880 Desktop ..... CALL
775 Portable ..... CALL

SPERRY
Sperry-HT ..... *As Low As* $1749.00
Sperry-IT ..... *As Low As* $2699.00
Call for Specific Configuration!

ZENITH
PC-138 ..... *As Low As* $899.00
PC-148 ..... *As Low As* $999.00
PC-158 ..... *As Low As* $1499.00
PC-160 ..... *As Low As* $1399.00
PC-170 ..... *As Low As* $1699.00
PC-240 ..... *As Low As* $2699.00

ACCESSORIES

AMARAY
80 Column Printer Stand $14.99

CURTIS
Side Mount SS-1 ..... $19.99
Side Mount AT SS-2 ..... $34.99
Universal Stand SS-3 ..... $19.99
Diamond SP-1 ..... $29.99
Emerald SP-2 ..... $39.99
Sapphire SPF-1 ..... $49.99
Ruby SPF-2 ..... $59.99
Static Mat $29.99
Universal Printer Stand $14.99

KENSINGTON
Master Piece $99.99
Master Piece + ... $119.00

DATA SHIELD
300 Watt Backup $379.00
500 Watt Backup $589.00
Turbo 350 Watt Backup $449.00
P125 Power Director $99.99
P150 Power Director w/Modem $119.00

KEYBOARDS
KEYTRONICS
KB5150/KB5151/KB5151Jr ..... CALL
KB5152B/KB5153/KB5149Jr ..... CALL

MEMORY CHIPS
4164 RAM Chips ..... (ea.) $1.59
128 RAM Chips ..... (ea.) $5.99
256 RAM Chips ..... (ea.) $4.99

MULTIFUNCTION CARDS

AST
Rampage-PC $299.00
Rampage-AT ..... CALL
Six Pack Plus $229.00
I/O Plus II $139.00
Advantage - AT $369.00
Preview Mono $299.00
PC Net Cards $379.00
5251/11 On-line $669.00
Ramvantage $349.00
5251/11 Plus $719.00

dca
IRMA 3270 ..... $839.00
IRMA Print $999.00
IRMA Smart Alec $779.00

EVEREX
Edge Card $259.00
Graphics Edge $219.00
Magic Card I $99.99
Magic Card II $159.00

HERCULES
Graphics $299.00
Color $159.00

IDEAssociates
5251 Emulation $549.00

INTEL
PCNC8087 5MHz ..... CALL
PCNC8087-2 8 MHz ..... FOR
PCNC80287 6MHz ..... YOUR
1010 PC-above board ..... PC
2010 AT-above board .....
1110 PC-above board-P,S .....

MYLEX
The Chairman $439.00

PERSYST
Bob Board $359.00
Mini Mono $159.00

PARADISE
Color/Mono Card $149.00
Modular Graphics Card $199.00
Multi Display Card $199.00
Five Pack C, S, C-384K $99.99
High Res Mono $169.00

QUADRAM
Quadport-AT $119.00
Liberty-AT (128K) $349.00
The Gold Quadboard $449.00
The Silver Quadboard $239.00
Expanded Quadboard $179.00
Liberty-PC $309.00
QuadSprint $499.00
QuadLink $399.00
QuadColor $199.00
Quadboard-AT $399.00
Quadram EGA $399.00

SIGMA DESIGNS
Color 400 Princeton $479.00

STB
EGA Plus $379.00

TECMAR
Captain - 64 ..... $199.00
Graphics Master $469.00

VIDEO-7
IBM EGA Card $399.00

1-800-233-8950 Dept. B207

Circle 430 on reader service card

```
          {force eject when page is full ... }
      if LineNo > MaxLinesPerPage then
        eject := TRUE;

    until eof(InFile) OR (eject);

  (* make each line the same length *)

    for i:= 1 to MaxLinesPerPage do
      for j:=LineSize[i]+1 to LineLen do
        Paper[i,j] := ' ';
end;

(*-----------------------------------*)
(*         PRINT ONE 'PAGE'          *)
(*-----------------------------------*)

procedure PrintOnePage;
begin
  for j := 1 to LineLen do   {each rotated 'line'...actually, each character}
    begin
      for LineNo := 1 to PrintMultiple do
        begin
          write(LST,GraphicsPrint,ModeCode,
            char(lo(BitsPerPage)),char(hi(BitsPerPage)));
          for i := MaxLinesPerPage downto 1 do  {lines in reverse order}
            begin
              Cindex := ord(Paper[i,j]);
              if BitsPerChar = 9 then {FOR loop (9 to ...) req'd if it is > 9}
                write(LST,#0);
              for k := 7 downto 0 do
                write(LST,CharTable[Cindex][k]); {bottom up each char}
            end;
          write(LST,JiggleDown);   {C/R + microspace down}
        end;
      write(LST,LineFeed);         {next 'line'}
    end;
end;

(* ------ MAIN PROGRAM ------ *)

begin

            (* GET FILE PARAM *)
    if paramcount < 1 then
      begin
        writeln(^G'Missing file name on command');
        halt;
      end;
    assign(InFile,paramstr(1));  {OPEN the file}
    {$I-}
    reset(InFile);
    {$I+}
    if IOResult <> 0 then
      begin
        writeln('File "',paramstr(1),'" not found.');
        halt;
      end;

            (* GET /D DOUBLE-PRINT OPTION *)
    PrintMultiple := 1;
    if paramcount >=2 then
      if (paramstr(2) = '/d') OR (paramstr(2) = '/D') then
        PrintMultiple := 2;

            (* SET-UP *)
    BitsPerPage := BitsPerChar * MaxLinesPerPage;
    write(LST,PrintMultipleSpacing,char(24-PrintMultiple)); {nn/216th inch}

            (* MAIN LOOP ... *)
    repeat                  {do one "page" at a time}
      ReadOnePage;
      PrintOnePage;
      write(LST,FormFeed);      {do a page eject to line up properly}
    until eof(InFile);

            (* ALL DONE *)
    close(InFile);
    write(LST,NormalSpacing);    {resume normal spacing vertically}
end.
```

SIDEPRNT.PAS (continued)

also adds a minuscule space between lines to improve readability. The size of this space is controlled by the program variable BitsPerChar.

After you have compiled the program, run it from the DOS prompt by typing **SIDEPRNT** *filename* followed by an optional /D switch. The switch causes each line to be printed twice, the second pass offset slightly to further enhance print quality. Using the switch, of course, doubles the printing time.

Graphics characters above ASCII 127 are not supported. If you have DOS 3.00 or later, you can use its GRAFTABL program and modify SIDEPRNT to check interrupt vector 1F for the table. The control characters (those below ASCII 32) are printed, except for Control J, Control L, Control M, and Control Z, which have other purposes.

I tested SIDEPRNT with the various graphics modes available on my Epson FX-80 printer and decided that mode 0 seemed most suitable. Program comments tell you how to modify the program and try the other modes, or, if you are so inclined, how to improve the program by adding your own font or changing it to work with another printer.

John T. Bagwell, Jr.
Torrance, California

Editor's note: Aside from its usefulness, SIDEPRNT.PAS is a good tutorial for anyone interested in learning how to write Pascal programs that process characters and graphics data.

(continues)

15,000 SAVED FROM CRASH.

No hysteria. No panic. No reports of data loss. No wonder more than 15,000 Alpha Micro users have chosen our Videotrax™ backup technology over streamer tape or floppies.

The best news is it's now available for the IBM® PC-AT, XT and true compatibles.

BETTER TO BE FAIL-SAFE THAN SORRY.

Exhaustive testing and long term use of Videotrax technology prove it more reliable than any other backup option available. Even more reliable than the hard disk you're backing up.

High-tech. Open your PC and slide the controller board into any expansion slot. Low-tech. Hook up VCR to computer with standard connector cables.

At the heart of the system is a patented video tape controller board that employs a standard video cassette recorder for copying data. Which means Videotrax offers the sophisticated technology of today's VCRs. And the dependability of a durable consumer good.

EASY DOES IT.

If you own a VCR, you already own half the system. And you already know how to use it. Or you might opt for the complete subsystem (controller board plus enhanced VCR) and experience the joy of its automatic, unattended backup capabilities.

Your basic video cassettes. Reliable, cheap, easy to find.

Either way, our menu driven software, clear documentation and wide range of backup modes keep it simple: Insert a blank video cassette tape and follow the directions that appear on your screen.

You can copy or restore your entire hard disk, specific files, or only files modified since the last backup, while the system busily self-monitors for proper functioning.

And for the price of taping your favorite TV shows, you can record your most valued computer data. Up to 80MB can be stored on a single cassette at less than a third of the cost of streamer tape.

Of course, if you ever require service, your authorized Alpha Micro dealer and our worldwide network of factory service centers will provide all the support you need.

For more information on how Videotrax can keep you off the crash course, call your local dealer or Alpha Micro at 1-800-992-9779 (in California call 1-800-821-0612).

VIDEOTRAX™
DATA BACKUP FROM ALPHA MICRO.

Corporate Headquarters: 3501 Sunflower, P.O. Box 25059, Santa Ana, CA 92799 *© Alpha Microsystems 1986. IBM is a registered trademark of International Business Machines.*

Circle 318 on reader service card

AT LAST: Professional Typesetting Capability For PC Users

With **PC TEX**™ — the best-selling full implementation of Professor Don Knuth's revolutionary typesetting program TEX.

FINEST Typeset Quality Printing From:
dot matrix laser phototypesetter

$$\sum_{i=1}^{\infty} \frac{1}{i} \qquad \begin{pmatrix} a_{11} & \dots & a_{1n} \\ a_{21} & \dots & a_{2n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{pmatrix} \qquad \int_{-\infty}^{\infty} e^{-x^2}\,dx$$

WIDEST Range Of Output Device Drivers:

- Epson FX, LQ
- Toshiba
- Corona LP-300*
- HP LaserJet*
- Apple LaserWriter
- APS-5 phototypesetter
- Screen preview, with EGA or Hercules card

MOST COMPLETE Product Offering:

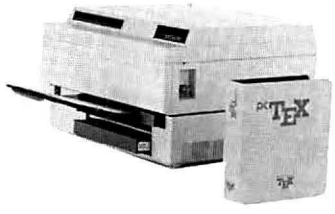
PC TEX (not copy protected) includes the following:

- Our specially written *PC TEX Manual*, which enables you to start using TEX right away.
- Custom "macro packages" that provide formats for letters, manuals, technical documents, etc.
- The LATEX document preparation system, a full-featured macro package for preparing articles, books, reports, etc., and LATEX User's Manual.
- AMS-TEX, developed by the *Amer. Math. Society* for professional mathematical typesetting.

Site licenses, volume discounts, and interfaces to PC Paintbrush, PC Palette, FancyFont and Fontrix are also available.

PRICED FROM ONLY $249.00!

(Printer drivers and interfaces additional.)



Laser printer, fonts & software from $2995.00

For IBM PC/XT, AT or compatible, DOS 2.0 or higher, and 512K RAM. Hard disk required for printer drivers and fonts. *HP LaserJet and Corona require additional interface boards.

For more information call or write:

Personal TEX, Inc.

20 Sunnyside, Suite H, Mill Valley, CA 94941 (415) 388-8853

This ad, with space for the photograph, produced by PC TEX. Typeset on the Epson FX80, the Corona LP-300 laser printer, and the Autologic APS-5 phototypesetter.

TEX is a trademark of the American Mathematical Society. Manufacturers' product names are trademarks of individual manufacturers.

Circle 615 on reader service card

OUR COMMUNITY NEEDS MORE CORPORATE HEROES.

The United Way volunteer gives a gift that's hard to measure.

Because without his or her contribution of time, energy and dedication, the community services and local programs of United Way simply cannot exist.

United Way has much to do in our community. From day care for the young to services for the elderly.

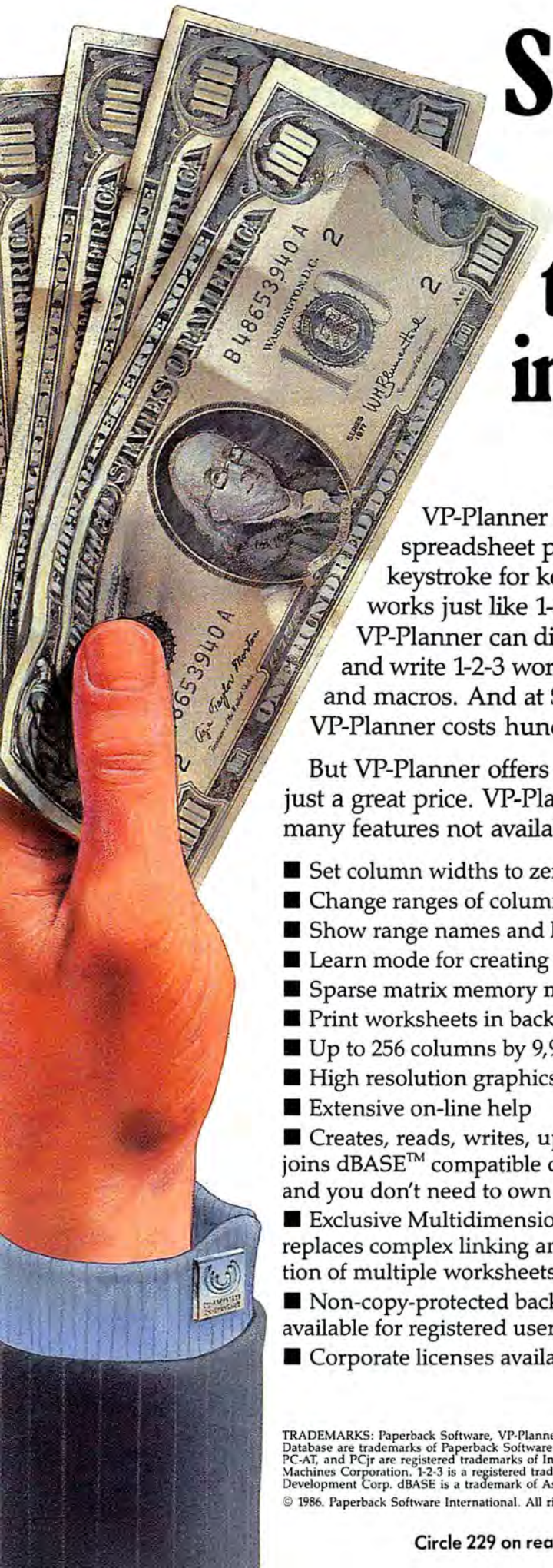
So this year, be generous.

Give yourself.

United Way

THANKS TO YOU IT WORKS FOR ALL OF US.

© United Way 1984



Saving Money...

just one reason to buy VP-Planner™ instead of 1-2-3®

VP-Planner is a powerful spreadsheet program that, keystroke for keystroke, works just like 1-2-3 Release 1A. VP-Planner can directly read and write 1-2-3 worksheets and macros. And at $99.95, VP-Planner costs hundreds less.

But VP-Planner offers more than just a great price. VP-Planner has many features not available in 1-2-3:

- Set column widths to zero
- Change ranges of column widths
- Show range names and locations
- Learn mode for creating macros
- Sparse matrix memory management
- Print worksheets in background
- Up to 256 columns by 9,999 rows
- High resolution graphics
- Extensive on-line help
- Creates, reads, writes, updates and joins dBASE™ compatible database files... and you don't need to own dBASE.
- Exclusive Multidimensional Database™ replaces complex linking and consolidation of multiple worksheets
- Non-copy-protected backup disks available for registered users
- Corporate licenses available

$99.95

VP-Planner

Available at computer, software stores and bookshops everywhere.

To order ONLY call toll-free:
1-800-443-0100
Ask for operator 456. Order Code: WO
For information call: 415-644-2116

OR MAIL ORDER TO:
Paperback Software International
2612 Eighth Street, Berkeley, CA 94710

____ copies @ $99.95 per copy = _____
CA residents ONLY add $6.50 per copy = _____
VISA MasterCard Shipping = $3.00
TOTAL = _____
☐ Check ☐ VISA ☐ MC Expires: _____
Card #: _____
Ship to: _____
Address: _____
City: _____
State: _____ Zip: _____ Phone _____
Signature: _____

Offer good in USA only. Allow 2-4 weeks for delivery.

SYSTEM REQUIREMENTS: VP-Planner works on the IBM PC, PC-XT, PC-AT and compatibles with DOS 2.xx or higher and at least 256K memory. Graphics card optional to display graphics. WO

TRADEMARKS: Paperback Software, VP-Planner and Multidimensional Database are trademarks of Paperback Software International. IBM, PC-XT, PC-AT, and PCjr are registered trademarks of International Business Machines Corporation. 1-2-3 is a registered trademark of Lotus Development Corp. dBASE is a trademark of Ashton-Tate.

© 1986. Paperback Software International. All rights reserved.

Circle 229 on reader service card

MICROstar-XT™ System

(100% XT COMPATIBLE)

20 MB HARD DISK SYSTEM
MONITOR, CARD, KEYBOARD
- SHIPPED WITHIN 1 WEEK* -

$1099

WARRANTY 1 YR PARTS AND LABOR

• FULLY ASSEMBLED & TESTED •

SYSTEM INCLUDES:

- 16 Bit 8088 CPU (V-20 optional)
- 640K Motherboard with 256K installed
- 360K Floppy Drive & 20MB Fixed Disk
- TTL Hi-Res Monitor & Adaptor with Port
- 8 Expansion slots, 135W Power Supply

HALF HEIGHT - 1 YR. WARRANTY	20 MB	30 MB	48 MB
HARD DISK KIT	**449**	**549**	**799**
IBM-XT 256 K, 1 Drive, 20 MB H. Drive			**$2249**
IBM-PC 256K, 2 Drive			**$1449**
SPERRY-IT, 1 MB, 44 MB Hard Drive			**$3299**
AT&T 6300, 256K, 2 Drives			**$1799**
COMPAQ PORTABLE 256K, 2 Drive			**$1649**

OPTIONS

- TURBO (4.77 & 8 MHZ) **$99**
- 640K Memory **$99**
- 360K Floppy Drive **$99**
- 5151 Keyboard **$59**
- Color System **$299**

• PRINTERS •

TOSHIBA P 321	**$479**
BROTHER M 1509	**$399**
EPSON FX-286	**$549**

• MODEMS, ETC. •

HAYES 1200b with S/W	**$349**
PROMETHEUS 1200b S/W	**$249**
20 MB DRIVE CARD	**$599**

ALL SOFTWARE 25 - 40% OFF LIST

IF YOU DON'T SEE IT - CALL

MICROstar™

(312) 968-3323

1303 Ogden Ave.
Downers Grove, IL 60515

1-800-MIC-STAR

Circle 560 on reader service card

*All orders must be prepaid • We may substitute equivalent items • All prices subject to change without notice. Add 3% for MC/VISA. 5% American Express.

How four issues free could change your business forever.

Can't Afford A Translator? Multilingual computers, able to translate text as needed, are available *right now.* InfoWorld readers are profiting from this technology—before competitors even know it exists.

Growth Industry? How about a $35 million industry projected to become $2.7 billion strong by 1987? Voice recognition technology promises to rewrite the book on computer use. Users and investors, among InfoWorld's readers, are miles ahead of the competition.

InfoWorld

THE NEWSWEEKLY FOR THE MICROCOMPUTING COMMUNITY

Bill Gates of Microsoft, Page 15

Lisa Victim Of Success

Apple Phase-Out Plan May Have Been Too Good

Palace Revolt at Apple

Problems Plague AT Owners

Big Blue Denies Troubles With Its Hard Disk Drive

IT'S APPLE OVER IBM IN THE RETAIL MARKET

Apple Total 46%

IBM Total 26%

Other Total 28%

Lotus Strives to Diversify

Company Acquires Report Writer Rights, Hardware Maker

Mainframes on Micros? Commercial fourth-generation mainframe programs are coming to Everyman's PC. How should it affect buying decisions, training, investments? InfoWorld knew what to expect months ago.

Giving Spies An Open Line? Electronic conferences via personal computer are easy to join, as well as profitable. But who owns what's spoken on the wire? The unwary could helplessly watch hard-earned business info merge with the public record. Thanks to our timely warnings, that trap won't catch InfoWorld readers.

The people who read InfoWorld *every* week have no time for fluff or fanfare. They have work to do—and competitors to watch—and the weeklies they read are tools that must perform without fail.

InfoWorld is such a tool. But don't take our word for it. *Inc.* magazine calls us "the best single news source on micros." And *Business Systems Update* refers to us as ". . . a weekly with class—the one magazine that *everyone* involved in micros needs to read."

In fact, don't take *their* word for it, either. Take a look at four issues, *free,* all at our risk. Then decide for yourself.

Four Free Trial Issues Can Be Yours Risk-Free Just By Calling 800 544-3712

A month's free trial of InfoWorld can be yours just for the asking. No risk. No obligation. No commitment. No strings attached. Quite simply, if you like what you see, pay less than 77 cents per copy for 39 weekly issues (35 additional issues)—$29.95 in all. But if for any reason you're not delighted, just write "cancel" on the bill, return it, and owe nothing. The four free issues will be yours to keep.

To start your issues coming, mail in the order card, or call **800 544-3712.** InfoWorld: we help you work smarter.

Nashua Diskettes

5¼" DS/DD with hub ring and sleeve, factory warranteed, packaged in 50's. Shipping Extra. Quantity 50, 85¢ each.

The same low price our volume copying customers pay! 75¢ each Qty. 100

We sell 3½" & 5¼" disks—all types, major brands. Call toll free:

1-800-321-4668
in Colorado, 303-234-0871
VISA, MASTERCARD, OR COD ACCEPTED

ALF 1315-F Nelson St. Denver, CO 80215

```
10 DEFINT A-Z:CLS:KEY OFF:DEF FNHEX(X$)=VAL("&h"+X$)
20 LOCATE 3,1:PRINT "X-Maker":READ F$
30 LOCATE 5,1,1:PRINT "Now testing for data errors...please wait";
40 SUM=0:READ LN:IF LN<0 THEN 80
50 READ H$:IF VAL(H$)<0 THEN 70
60 SUM=(SUM+FNHEX(H$))*2:SUM=(SUM\256)+(SUM MOD 256):GOTO 50
70 READ CKSUM$:IF SUM=FNHEX(CKSUM$) THEN 40 ELSE GOTO 170
80 RESTORE:CLS:LOCATE 3,1:PRINT "X-Maker":READ F$
90 LOCATE 5,1,1:PRINT "Press any key to create ";F$;": ";
100 A$=INPUT$(1):PRINT:IF A$=CHR$(27) THEN END
110 LOCATE 6,1:PRINT "Working...";
120 OPEN F$ AS #1 LEN=1:FIELD #1,1 AS BX$
130 READ LN:IF LN<0 THEN 160
140 READ H$:IF VAL(H$)<0 THEN READ CKSUM$:GOTO 130
150 LSET BX$=CHR$(FNHEX(H$)):PUT #1:GOTO 140
160 CLOSE:PRINT:PRINT F$;" has now been created.":END
170 PRINT:PRINT "Error in DATA line";STR$(LN);". ";
180 PRINT "Check your work.":BEEP:END
```

X-MAKER.BAS: Star-Dot-Star's program-creating program

```
1000 DATA "a:clocktic.com"
1010 DATA 1,E9,20,01,00,00,00,00,00,00,54,07,49,07,4D,07,45,-1,D0
1020 DATA 2,07,20,07,20,07,00,00,00,00,00,00,00,00,00,FB,9C,-1,76
1030 DATA 3,1E,06,50,51,52,56,57,B8,40,00,8E,D8,A1,49,00,2E,-1,C5
1040 DATA 4,A3,1C,01,A1,6E,00,2E,A3,19,01,2E,3B,06,15,01,74,-1,8F
1050 DATA 5,05,0E,1F,E8,8E,00,2E,A1,1C,01,3C,04,72,06,3C,06,-1,56
1060 DATA 6,77,02,EB,73,2E,A1,03,01,8E,C0,0E,1F,BF,8C,00,BE,-1,14
1070 DATA 7,09,01,B9,06,00,FC,F3,A5,2E,8B,0E,03,01,8E,D9,2E,-1,DB
1080 DATA 8,A1,19,01,3D,0C,00,76,03,2D,0C,00,3D,0A,00,72,0A,-1,10
1090 DATA 9,B9,31,07,89,0E,96,00,2D,0A,00,05,30,00,B4,07,A3,-1,8F
1100 DATA 10,98,00,C7,06,9A,00,3A,07,B8,40,00,8E,D8,A1,6C,00,-1,E2
1110 DATA 11,BA,00,00,B9,50,04,F7,F1,BA,30,07,3C,0A,72,06,FE,-1,41
1120 DATA 12,C2,2C,0A,EB,F6,2E,8B,0E,03,01,8E,D9,89,16,9C,00,-1,22
1130 DATA 13,04,30,B4,07,A3,9E,00,5F,5E,5A,59,58,07,1F,9D,2E,-1,41
1140 DATA 14,FF,2E,05,01,2E,83,3E,17,01,1C,75,16,E4,61,24,FC,-1,B1
1150 DATA 15,E6,61,2E,A1,19,01,2E,A3,15,01,2E,C7,06,17,01,00,-1,28
1160 DATA 16,00,C3,2E,83,3E,17,01,00,75,13,B0,B6,E6,43,B8,0C,-1,04
1170 DATA 17,02,E6,42,8A,C4,E6,42,E4,61,24,FC,E6,61,E4,61,8A,-1,15
1180 DATA 18,E0,24,FC,80,F4,03,80,E4,03,0A,C4,E6,61,2E,FF,06,-1,1F
1190 DATA 19,17,01,C3,1E,B8,40,00,8E,D8,B8,63,00,1F,3D,B4,03,-1,B9
1200 DATA 20,75,0A,2E,C7,06,03,01,00,B0,EB,08,90,2E,C7,06,03,-1,75
1210 DATA 21,01,00,B8,1E,B8,40,00,8E,D8,A1,6E,00,2E,A3,15,01,-1,39
1220 DATA 22,1F,B8,1C,35,CD,21,2E,89,1E,05,01,2E,8C,06,07,01,-1,98
1230 DATA 23,BA,1E,01,B8,1C,25,CD,21,BA,23,02,CD,27,-1,CF,-1
```

CLOCKTIC.DAT: Add these lines to X-MAKER.BAS to create the CLOCKTIC.COM screen time-display program.

Tic-Toc-Clock

The program CLOCKTIC.COM displays the current time in 12-hour format in the upper right corner of the PC's screen. It should work with most PC compatible computers, because it writes the time directly to the screen buffer. CLOCKTIC is a memory-resident program that uses the PC's timer interrupt to update the currently displayed time. The clock will ring the PC's speaker at the beginning of every hour. The current CRT_MODE is checked, and the time display will be omitted if the screen is in graphics mode. The PC's speaker, however, will continue to ring on

(continues)

EMULATE *HP* TERMINALS WITH YOUR IBM PC

Now your IBM Personal Computer can be used as a Hewlett-Packard 26XX family terminal. Instead of just a terminal, you'll have a general purpose microcomputer. **VDTE 2.1** is the powerful, easy to use terminal emulation program that provides the features you need!

HP2624, HP2648 and DEC VT52 modes
Block/format mode
Eight displayed softkeys (program controlled)
Subset of HP2648 vector graphics
Supports both serial ports simultaneously
Fourteen pages of off-screen scrolling memory
Ten speeds include 300, 1200 and 9600 baud
ASCII file transfer between PC and host

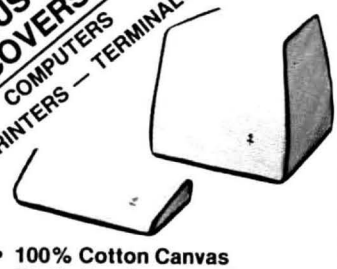
Price: $200. Visa and MasterCard welcome.

Inner Loop

Inner Loop Software
5456 McConnell, Ste 120
Los Angeles, CA 90066
(213) 822-2800

Circle 624 on reader service card

DUST COVERS
COMPUTERS
PRINTERS — TERMINALS



- **100% Cotton Canvas**
- **Static-Free/Breathable**
- **Beige with Grey Trim**
- **Embroidered Emblem**

For: IBM PC, PC-AT, Compaq, AT&T Leading Edge "D", Epson Equity

Printers: OKIDATA, EPSON, IBM, NEC.

Contemporary ComputerWear
1320-36th Avenue/San Francisco, CA 94122
(800) 826-5761
Dealers Please Inquire. CA: (415) 759-1466

Circle 276 on reader service card

This work of art is priced less.

Beauty and intelligence

Introducing **SigmaEGA!**™ a new high-resolution display adapter from Sigma Designs. It is a true work of art for business graphics. Crisp text, sharp graphics, brilliant colors, precise high resolution, and the broadest compatibility of any color graphics adaptor made.

Art for the masses

SigmaEGA! is uncommonly compatible. No one drives more monitors,* color and monochrome. No one can run more software programs. And no one else can display IBM Enhanced Graphics (EGA), Color Graphics (CGA), Monochrome Display and Hercules Graphics software as true to the original.

Art from science?

SigmaEGA! incorporates Sigma Designs' own pioneering CGA software emulation technique, the one that made our Color 400™ the standard for ultra-high resolution color graphics. It is this technique that provides the closest, most compatible emulation of all current display standards.

And our ingenious design lets us make **SigmaEGA!** very small, very reliable, and exceptionally affordable.

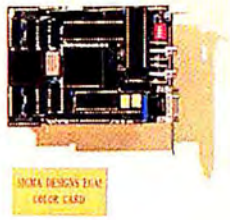
Unexpected flair

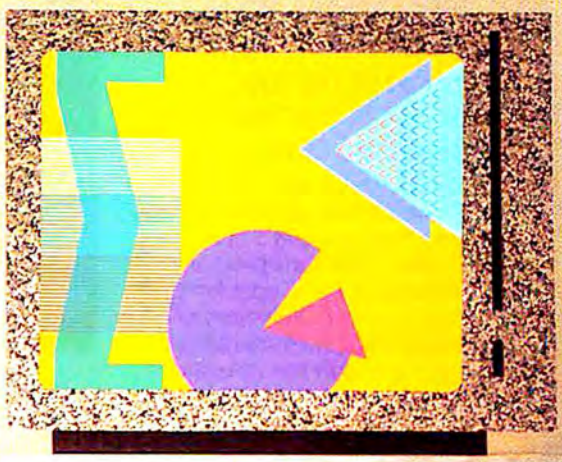
And every **SigmaEGA!** includes **PC Paintbrush** for free-form imaging.

For a private showing of **SigmaEGA!**, call 408/435-1480 or see your local Sigma Designs dealer.

Sigma Designs
2023 O'Toole Avenue
San Jose, CA 95131

SigmaEGA! Functional, affordable art.





ΣGA!

SIGMA DESIGNS

*Includes IBM Enhanced Color Display, Princeton HX12E, Amdek 722, Electrohome ECM-1311, Hitachi CM-1455S, Mitsubishi XC1410C, NEC 1401P3A, Tatung CM1380, and others.

SigmaEGA!, ΣGA!, and Color 400 are trademarks of Sigma Designs, Inc. IBM EGA and Hercules Graphics are trademarks of International Business Machines Corp. and Hercules Computer Technology, respectively.

Circle 169 on reader service card

Multitech-
the computer family that carries many famous names.

Introducing a new family of IBM compatible computers that's not new. You've seen and admired Multitech systems for years, the only difference is the name on the front. Until now it was always that of very well known companies.

Now computer distributors can match the big names with Multitech computers. Join the Multitech distributor family and share the excitement that comes with offering your dealers the right stuff.

MULTITECH PLUS 700 . . . Cornerstone of the Multitech IBM compatible family.

More performance for the business user than ever before. Up to 640K bytes of user memory and a dual speed processor that runs programs faster than the IBM PC. Consider the PLUS 700's array of built-in time and money saving features; features such as memory expansion from the standard 256 Kbytes to 640 Kbytes, a real time clock, two serial ports and a parallel port.

The PLUS 700 features the 8088-2 microprocessor. In normal mode it runs at 4.77 MHz, a simple keyboard command shifts the PLUS 700 into a high speed mode of 8 MHz, for a performance increase 60% greater than the IBM PC.

Dual half-height diskette drives, and a full line of IBM expansion cards to meet most special requirements add to the excitement of the PLUS 700. Its the ideal computer for users who demand personal computer performance together with PC reliability at an economical price.

Multitech Corporation

Multitech . . . it's not just another new computer company. It is a leading manufacturer in the computer age, and its Taiwan manufacturing facility is the largest for personal computers. Since 1976, Multitech has been a pioneer in microcomputer technology. Today its products are sold in more than 40 countries. Earning a worldwide reputation for consistent high-quality, Multitech products have captured the loyalty of large OEMs, VARs and distributors.

Call today to become a Multitech reseller. The product selection, quality, service, and support from one of the industries foremost leaders ensures dealer loyalty, end user acceptance and success for your business.

Distributor, VAR and OEM inquiries welcome.

POPULAR 500 . . . The IBM PC compatible with outstanding quality and economy.

PLUS 700 . . . The 8 MHz IBM compatible computer for high speed applications.

ADVANCE 900 . . . The IBM PC-AT compatible for high performance and advanced applications.

Multitech ELECTRONICS INC.

Committed to Excellence, Quality & Service

1012 Stewart Drive
Sunnyvale, CA 94086

Call toll-FREE 800 538-1542
In CA call 408 773-8400

A Division of MSC International
Serviced Nationwide by TRW

Circle 505 on reader service card

7 GOOD REASONS WHY YOU SHOULD LET *LE MENU*™ TAKE CONTROL OF YOUR HARD DISK

1. *Le Menu* makes using a hard disk easier by giving you single key-stroke access to all your programs and batch files.

2. No special commands to remember because *Le Menu* is a menu. Choices are displayed in simple, elegant menus. With 27 menus available, you can have up to 676 choices in all!

3. *Le Menu* provides all the DOS help you could ever need, with over 25 DOS functions available. But, best of all, we don't expect you to be an expert with DOS, so we provided on-line HELP for every command. And, each command can also be menu-driven so you will never need to look at your DOS manual again!

4. Our Directory Window's greatest power lies in its ease of use. You can window to any directory in two key strokes. It allows you to change attributes of, copy, delete, encrypt, execute, mark, rename, print, or view any file.

5. The Batch File Generator is so simple to use that anyone can take advantage of it immediately. Batch commands are automatically placed on the menus so you will never lose a batch file again!

6. With the optional two-level password protection, you can control the access to your hard disk.

7. Value! For $59.95 you're getting three programs for the price of one. (1) A powerful menu system; (2) An easy-to-use DOS command generator; and (3) A fast, versatile Directory window. You would normally pay this amount for each of the above, separately.

WHAT OUR FRIENDS SAY ABOUT LE MENU

"LE MENU IS FAST! No waiting to get to my programs."
— Steve Harvey, Software Resources

"I finally learned how to make DOS work for me, with Le Menu."
— Dave Tucker, FFKR Architects

"We're printers, not programmers. Le Menu helped us to get the most out of our computer without spending hours pouring over a DOS reference manual."
— Bill Bengtzen, Artistic Printing

BARTEL COMPUTER SYSTEMS
1275 Fort Union Blvd. Suite 160
Midvale, Utah 84047
(801) 566-5544

VISA **$59.95** MasterCard

Place your order today! Call toll-free:

1-800-4LE-MENU

Credit card orders shipped same day.

Send in this coupon with your credit card number, money order, or check for $59.95 plus $4.50 postage and handling. In Utah, add 5¾% sales tax ($3.70). No C.O.D.'s. Allow 10 days for checks to be processed.

☐ CHECK ☐ MONEY ORDER ☐ AMEX
☐ VISA ☐ MASTERCARD Expiration Date _____

Account No. _____

Name _____

Company Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Signature _____

Minimum Hardware Requirements: IBM Personal Computer XT, AT or true compatible. DOS version 2.1 or greater. 256Kb RAM minimum.

60-Day Money-Back Guarantee: BCS, INC. warrants that if the product does not perform as described, you may return within 60 days for full refund.

Circle 11 on reader service card

the hour. As with all resident programs, you will have to experiment to determine its compatibility with other software.

Michael J. Mefford
Gleneden Beach, Oregon

Editor's note: To create CLOCKTIC.COM, load BASIC, then type in the lines shown in X-MAKER.BAS, followed by the lines shown in CLOCKTIC.DAT; then type **RUN** *and press* **< Enter >**. *To use CLOCKTIC, simply type* **CLOCKTIC** *at the DOS prompt or insert the command CLOCKTIC in your system's AUTOEXEC.BAT file. Do not run CLOCKTIC more than once after you start the computer because it loads another copy of itself into memory each time it is run. Note that some programs, including BASIC, intercept the clock interrupt signal and thus disable CLOCKTIC's time display.*

At Your Command

More and more programs can execute DOS commands while running, but most are limited to just one command at a time. *WordStar 3.3*, *dBASE III Plus*, *KnowledgeMan/2*, and *Microsoft Word* are such programs.

This single-command limitation can be a real nuisance. For example, if the DOS command you want to execute is not in the current subdirectory, or if you wish to perform several commands in sequence, completing your task can take several steps.

I have discovered that if COMMAND.COM is executed, DOS will load a copy of itself into memory, and you can then execute as many other commands as you like. When you have finished, simply enter the EXIT command at the DOS prompt, and the application program is returned.

Before issuing the EXIT command, be careful to return to the subdirectory and logged disk drive that were originally in effect. If you don't, the application program might not be able to find its overlay files or other information that it needs to continue.

William R. Mumpower
Big Stone Gap, Virginia

Editor's note: Even so, this may not work for all programs, all versions of DOS, or on some "compatible" machines.

Troubleshooting Tip

Recently my 3-year-old Juki 6100 printer began an intermittent pattern of halting and illuminating its Check lamp in the middle of printing. At first I could correct the problem by pressing the Reset button, but after a while the printer would print only a few lines before halting.

My local computer dealer charges $50 per hour just to look at a printer. I balked and instead searched through the printer manual and determined that the Check lamp lights only under three conditions: when the printer is out of

(continues)

The greatest value ever
Special Offer on BASF Qualimetric diskettes!

Buy 10, get 12 and a FREE storage case!

This is an *exclusive* offer from **DISK WORLD!**...your chance to buy 5.25" BASF Qualimetric diskettes at our low prices and ***...get 12 instead of 10 and ...get a FREE plastic storage case (a good one, not a cheapie)!***

.79 ea. <- SSDD DSDD -> **.90** ea
Qty.50 Qty.50

Quantities are limited, so act now!

BASF special promotion diskettes are in plastic boxes of 12 with Tyvec sleeves,

LIFETIME WARRANTY!

Regular BASF Price List:

5.25 Diskettes:	Qty. 20-40:	Qty. 50+:	(BULK) 150+:
SSDD (P/N3406)	.81	.79	.72 *
DSDD (P/N3407)	.92	.90	.83 **
SSDD96 (P/N3404)	.92	.90	N/A
DSDD96 (P/N3405)	1.03	1.01	N/A
DSDDHD (P/N3403)	2.07	2.04	N/A

* Bulk is (P/N3408) **Bulk is (P/N3409)

Regular (non-bulk) product is packed 10 to a box with Tyvec sleeves, user-ID labels and write-protect tabs. **BULK** product is in cartons of 150 diskettes with Tyvec sleeves.

3.50 Diskettes:	Qty. 20-40:	Qty. 50+:	(BULK) 200+:
SSDD (P/N3402)	1.53	1.48	1.52
DSDD (P/N3412)	2.06	2.01	2.05

BASF 3.5" diskettes, exept for bulk, are packed in boxes of 10 and include user-ID labels. BASF bulk productt is in boxes of 100 and includes user-ID labels.

PRINTER RIBBONS!

Brand new ribbons to factory specs!
EPSON MX-70/80(P/N2500) $2.70ea.
EPSON MX-100(P/N2501) $4.08ea.
Okidata Micro83(P/N2505) $1.37ea.
Okidata Micro84(P/N2502) $2.98ea.
Add 25¢ per ribbon for shipping!

STORAGE CASES!

DISKMINDER II(P/N2850) Holds 75 5.25" diskettes with dividers. $9.69ea + $2.00 Shpng.
DISK MINDER 36(P/N2950) Holds 36 3.50" diskettes with dividers. $6.49ea + $2.00 Shpng.
DISK CADDIES(P/N2200) Beige. Holds 10 diskettes. $1.65 ea. + .20 Shpng.

HOW TO ORDER:

ORDERS ONLY:
1-800-621-6827
(In Illinois: 1-312-256-7140)
INQUIRIES:
1-312-256-7140

FOR FASTEST SERVICE, USE NO -COST MCI MAIL. Our address is DISKORDER. It's a FREE ,MCI MAIL letter. No charge to you. (Situation permitting, we'll ship these orders in 24 hours or less.)

SHIPPING: 5.25" & 3.50" DISKETTES-Add $3.00 per each 100 or fewer diskettes. **OTHER ITEMS:** Add shipping charges as shown in addition to other shipping charges. **PAYMENT:** VISA, MASTERCARD and Prepaid orders accepted. **COD ORDERS:** Add $5.00 special handling charge. **APO, FPO, AK, HI & PR ORDERS:** Include shipping charges as shown and additional 5% of total order amount to cover PAL and insurance. We ship only to United States addresses, except as shown above. **TAXES:** Illinois residents add 7% sales tax.

MINIMUM ORDER: $35.00

DISK WORLD!, Inc.
629 Green Bay Rd.• Wilmette IL 60091

DISK WORLD!, Inc.

Circle 780 on reader service card

An end to diskette lies!

Super Star™ Diskettes are of equal or *higher* quality than 3M, Maxell, TDK

and many other "famous" brand names. They simply cost about half as much!

Super Star™ diskettes are manufactured to equal or exceed the same specifications as 3M, Maxell, TDK and many other "famous" brand name products.

They are designed for 60% or higher clipping levels, not the 40% used in IBM and ANSI standards. Each is guaranteed for ten million read/write passes. Every Super Star™ diskette is 100% verified and carries a LIFETIME WARRANTY!

Yet Super Star™ diskettes cost only about half as much...

How can we deliver Super Star™ diskettes of such high quality at such a low price?

Simple...we don't make fools out of our customers.

We bargain hard with the same people who turn out many of the "famous name" brands. Their manufacturing capacity far exceeds their capability to sell everything they make. So, as large scale purchasers, we are able to obtain significantly lower prices than others for ***high-quality*** diskettes.

For example, we pay one of the big name manufacturers 98¢ for their "famous name" diskette in a pretty box. In an unequalled display of favoritism, that same manufacturer sells the same diskette in the same fancy box to a major corporation for 42¢ each. Finally, a software duplicator can buy the same diskette *without* the box for 37¢!

A 265% price difference: for what?

In the example above, that's a difference of 265% in price for the very same diskette!

So you see, paying for a "famous name" on a diskette doesn't guaranty you that you're getting any more for the money.

You may be paying for some big corporation's fleet of aircraft and their executive retreats in Minnesota and Canada, but you are not paying for any more quality.

You're simply getting rooked out of money you could have in your own pocket.

There are four kinds of diskettes: And Super Star™ is right up there with the best.

As you leaf through the pages of this magazine, you will see diskettes advertised at prices as low as 33¢. Every one, of course, claims to be the "best".

It's simply not true.

Here are the only kinds of diskettes you can buy:

High-Clip Product: this is what you get when you buy Super Star™, 3M™, Maxell™, TDK™ or any number of other famous and not so famous name diskettes. They have clipping rates of 60% or more, are certified for ten million read/write passes or more and are simply the best diskettes available. You can expect perhaps 1 out of 100,000 to fail...and that will usually be the result of dirty or misaligned drives.

ANSI Spec Product: These are "okay" diskettes. They have a clipping level of 40%. Usually they are the fall-out from a manufacturer's "high-clip" product line. You can expect about 1 out 20 to fail in normal use. (But that failure rate has more to do with the disk *drive* rather than the diskette.) The price difference between an ANSI-spec disk and a High-Clip product is only a few cents. But the failure rate of ANSI product is 50,000 times higher!

Duplicator Product: This is a catch-all category. Some of it may be High-Clip Product, some ANSI spec, some cosmetically blemished, some garbage. Usually anyone who buys product in this class justifiably anticipates that 20 out of every 100 diskettes will not format properly.

Floor Sweepings: This is just plain "garbage". For example, the 5.25" SSSD diskettes that you see advertised for 39¢ are exactly that: garbage. No decent manufacturer has sold any 5.25" SSSD diskettes in several years. SSSD is the absolute bottom of the line in terms of quality. Most of the discount diskettes you see advertised are "floor sweepings"...bought up by brokers and passed on to the unsuspecting public by unscrupulous merchants who are simply out to make a fast buck.

When every bit counts, you can count on Super Star™!

Well, I wish we had more space, but we don't.

So, here's the message in a nutshell:

1. Super Star™ diskettes are high-clip product, 100% certified, tested to 60% or higher clip levels and not less than ten million read/write passes.
2. Super Star™ diskettes carry a LIFETIME WARRANTY.
3. Super Star™ diskettes equal or exceed the published specifications of such "famous" brand names as 3M, Maxell, TDK, etc.
4. Super Star™ diskettes give you this quality *at about half the price of the big names!*

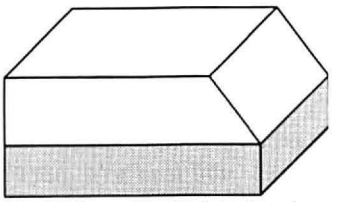
Save your money: buy Super Star™ diskettes!

That's the message:

Super Star™ diskettes mean the highest quality at about half the price!

SUPER STAR SPECIAL!

Your choice of storage for $ 4.95!



Buy 50 Super Star™ diskettes of either size and you can get a nice plastic storage case for only $ 4.95 (shipping included!).

These are durable plastic cases with dividers.

The 5.25" unit holds 50 diskettes and the 3.50" unit holds 40 diskettes.

5.25" Storage Unit (P/N3100) $ 4.95ea.
3.50" Storage Unit (P/N3102) $ 4.95ea.

Super Star™ 5.25"

SSDD (P/N3800)	**.55ea.**
DSDD (P/N3801)	**.62ea.**
SSDD96 (P/N3802)	**.78ea.**
DSDD96 (P/N3803)	**.82ea.**
DSDDHD (P/N3804)	**$ 1.61ea.**

ORDER IN MULTIPLES OF 50 ONLY!

All Super Star 5.25" Diskettes are poly-bagged in lots of 25 with Tyvec sleeves, write-protect tabs and user ID labels

QUANTITY DISCOUNTS: 350-500 diskettes, deduct 3%. 550-700 diskettes, deduct 6%. 750-1,000 diskettes, deduct 9%. 1,050+ diskettes, deduct 12%

Super Star™ 3.50"

SSDD (P/N3805)	**$ 1.52ea.**
DSDD (P/N3806)	**$ 1.67ea.**

ORDER IN MULTIPLES OF 50 ONLY!

Super Star 3.50" diskettes are packaged in boxes of 50 with user ID labels.

QUANTITY DISCOUNTS: 350-500 diskettes, deduct 1.5%. 550-700 diskettes, deduct 3%. 750-1,000 diskettes, deduct 4.5%. 1,050+ diskettes, deduct 6%.

TAKE A CLOSE LOOK AT OUR DISCOUNTS!

Take a real close look at our discounts. They're some of the best around.

HOURS:
8AM-6PM Central Time
Monday - Friday

HOW TO ORDER:

ORDERS ONLY:
1-800-621-6827
(In Illinois: 1-312-256-7140)

INQUIRIES:
1-312-256-7140

FOR FASTEST SERVICE, USE NO-COST MCI MAIL. Our address is DISKORDER. It's a FREE ,MCI MAIL letter. No charge to you. (Situation permitting, we'll ship these orders in 24 hours or less.)

SHIPPING: 5.25" & 3.50" DISKETTES-Add $ 3.00 per each 100 or fewer diskettes. **OTHER ITEMS:** Add shipping charges as shown in addition to other shipping charges. **PAYMENT:** VISA, MASTERCARD and Prepaid orders accepted. **COD ORDERS:** Add $ 5.00 special handling charge. **APO, FPO, AK, HI & PR ORDERS:** Include shipping charges as shown and additional 5% of total order amount to cover PAL and insurance. We ship only to United States addresses, except as shown above. **TAXES:** Illinois residents add 7% sales tax.

MINIMUM ORDER: $ 35.00

DISK WORLD!, Inc.

629 Green Bay Road
Wilmette, Illinois 60091

Circle 780 on reader service card

DVORAK SAYS: "I advise you to **run (don't walk)** to the phone or Post Office and order a copy of the **Mace Utilities** for the IBM PC."

InfoWorld, 3-24-86

MACE + UTILITIES™

Eliminate Hard Disk Risks!

UnFORMAT recovers from an accidental FORMAT of your hard disk. Magic? It just seems like it.

UnDELETE gets back deleted files with four keystrokes.

REMEDY automatically finds and cures bad spots on the disk. Moves endangered files to safety.

Optimize Hard Disk Performance!

CONDENSE unfragments any disk, from 160K to 32 megabytes at a rate of 1–2 minutes per megabyte.
☞Just as fast on a full disk.
☞*Doubles* the speed at which programs load, find and store data by placing files in one physical piece on the disk, reorganizing directories, data and free space into separate blocks.

SQUEEZE/SORT sorts directories on any field.
☞Speeds up the path by squeezing deleted references from your directories.

Paul Mace Software
206 Alicia Ave.
Ashland, OR 97520
(503) 488–0224

$69.95 Visa,MC,Check

Order Toll Free
1-800-523-0258

Circle 614 on reader service card

ribbon, out of paper, or when the operator has pressed the Pause switch.

There was plenty of ribbon and paper, and I hadn't pressed the Pause switch, so I figured that something was erroneously lighting the Check lamp. Closer inspection revealed a small sensor beneath the ribbon spool.

The bottom of the spool has a pattern of alternating silver and black spokes, so I reasoned that the silver spokes reflect light into the sensor. The turning spool alternates the reflection; when the ribbon runs out, the spool stops turning, and the reflected light stops alternating. Because the sensor was covered with residue, I thought that it might not be receiving enough light, thus causing the erroneous signal. A little polishing (I cleaned the bottom of the spool, too) proved my assumptions correct.

Now my printer works like new, and I've saved time and money. I hope this tip will help other readers solve similar problems.

Marc J. Verber
Address Unavailable

Editor's note: Many computer and peripheral problems are surprisingly easy to correct. Often just a little investigation and some common sense will lead to a quick solution. Take a few moments to check the obvious. Are all the cables connected? (The cliché about "it wasn't plugged in" has wide application.) Are they connected to the proper locations? Are there any indicator lamps? What do they indicate? If possible, test the "broken" device with something that is known to work. Don't forget to try different cables, too. A few minutes spent determining exactly what is wrong can save hundreds of dollars and many days of lost time. If you can't solve the problem, be sure to tell the technician the exact symptoms and describe the steps you took to isolate the trouble.

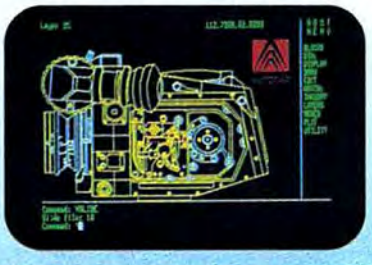
*Join the *.* global exchange. We'll pay $25 to $100 for each item published. Send your personal computer discoveries to* Star-Dot-Star, PC World, *555 De Haro St., San Francisco, CA 94107, or electronically to MCI Mail PCWORLD, CompuServe 74055,412, or The Source STE908. All published submissions become the property of* PC World *and are subject to editing for length and style. Due to the volume of mail, we cannot return any submitted materials.*

The New $119 SummaMouse.™ The power and reliability of an electronic mouse, for about 1/2 the cost.

Our new all electronic, optical mouse is an amazing engineering feat.

No Mouse is smarter. SummaMouse comes with built-in microprocessor controls and Microsoft® emulator driver/menu software to help you get maximum performance from both your mouse and your computer.

Cursor movement, windowing and interaction with spreadsheet, graphics, general business and other software applications is a snap. For more sophisticated applications like CAD and workstation graphics,



Two-way communication aids in the performance of sophisticated graphics.

SummaMouse offers diagnostics and full, two-way communications so you can program our mouse to perform complicated tasks.

Our electronic technology delivers 100 times the reliability of mechanical mice.

Mechanical MTBF* 1,500 hrs.

Electronic MTBF* 150,000 hrs.

*Mean Time Between Failure

No mouse is more reliable. Unlike mechanical mice which are susceptible to wear and damage, our electronic technology delivers 150,000 hours of maintenance-free performance. That's 100 times greater than the industry standard.

No mouse is mightier. Summa-Mouse offers a high resolution of 100 lines per inch for smooth cursor control and performance; 3 action keys to program up to 6 functions; variable baud rates from 1200 to 19,200 BPS and Auto-Baud plus compatibility with over 200 leading graphics and windowing software programs, including IBM® Drawing Assistant® and Top View;™ AutoCAD,™ VersaCAD™ and CADKEY;™ DR™ Series; Dr. Halo II;™ GEM™ Series; GSS™ Series; Imigit;™ Lotus 1-2-3® and VisiCalc;® Microsoft® Windows and Microsoft applications; PC™ Series; and major word processing programs.

Compatible with over 200 leading software programs.

All this for only $119. That's about half the price of other electronic mice and of mechanical mice which can't come close to the performance of SummaMouse.

Why mickey mouse around with a more costly, less useful mouse. Contact your dealer or Summagraphics today for more information about SummaMouse.

Or complete and return the coupon below.

NEW SUMMAMOUSE

Please send me more information.

☐ User ☐ GEM ☐ Dealer

Application type?: _____

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Mail to: **Summagraphics Corporation,**
777 State St. Ext., Fairfield, CT 06430
(203) 384-1344

Summagraphics® CORPORATION

©Summagraphics Corporation 1986, All rights reserved.
Product trademarks are of their respective companies.

Circle 661 on reader service card

THE SMARTEST BUY YOU'LL EVER MAKE:

20 MBYTES OF *AUTOMATIC* TAPE BACK-UP FOR JUST $795.

ONLY FROM SYSGEN.™

The Sysgen Smart Image.™
More capacity. More features. More value.
The best-selling tape back-up system for the IBM® and compatibles gets even better!

Now the Sysgen Smart Image delivers *double* the storage capacity: 20 Mbytes on a high density cassette. It backs your data up *automatically*. And it comes in two convenient versions: The internal model, for just $795—or the slim, half-height external chassis for $895.

Only Sysgen gives you *unattended* back-up.
Set the Smart Image once, like a VCR, and it will back up your data up to twice daily, seven days a week. And, if you're using your system, the Smart Image will wait until you're through, then back up your files automatically. *That's* smart.

You *can't* pass up a buy like this.
You won't find a smarter solution—or a better price. Sysgen's entire disk and smart tape family offers an unbeatable combination of capacity and value. Our systems are IBM® standard compatible, and run all software written for current versions of PC DOS.® Compare for yourself: For a Sysgen dealer near you, call **1-800-821-2151, Dept. 48**

Trademarks: Sysgen, Smart Image–Sysgen, Inc. Registered Trademarks: IBM, PC DOS–International Business Machines Corporation.

47853 Warm Springs Blvd., Fremont, CA 94539
(415) 490-6770, Telex 4990843

SYSGEN
INCORPORATED

Kevin Strehlo

Tales of a Weakened Publisher

A computer-savvy graphic designer grapples with the shiny new tools of personal computer publishing—and nearly misses a deadline.

As Bill Hill walked home in a downpour late Friday night from an all-night store carrying a six-pack under his arm, he was completely preoccupied with the thought that he might not get the newsletter done on time.

It wasn't a pleasant possibility. Bill worked as a graphic designer for David Kelley Design in Palo Alto, California, a firm that had a record of exemplary work done under the tough deadline pressures of high-tech product launches. Bill himself had designed the Macintosh mouse for Apple (pleasing Steve Jobs, which was no easy task). He couldn't let the firm down now over a little newsletter.

It had been easy to talk the client, Silicon Compilers, into letting him design and produce *Compiled Times* on a computer. But by the same token, people who make it possible for engineers to simply specify what a chip is supposed to do and then watch the computer pump out tested, 200,000-transistor chip designs aren't likely to buy the "my computer ate it" line when their six-page newsletter comes out too late for an important trade show.

But if the computer hadn't eaten the newsletter, it had at least chewed it a bit and, with it, Bill's confidence that he could handle *PageMaker* personal publishing software. He had worked from early evening until nearly midnight trying unsuccessfully to fit copy into a rough layout he had done at LaserWrite, a firm that specializes in helping clients turn out newsletters using *PageMaker.* Earlier, he had gone to LaserWrite for advice and ended up taking a 2-hour *PageMaker* lesson from the firm's chief designer, Deanna Trimble. He'd left that session feeling confident. But that was before he had tried *PageMaker* by himself. Now, each time he managed to get one or two of the ten stories to fit, he'd make a change in one of the remaining stories and watch in frustration as the change rippled through the entire newsletter, ruining the stories he'd just fixed.

Returning from the store at 1 a.m., he sat down at the keyboard with a beer to try out a possible

(continues)

From COMPUTER PLUS to YOU . . .

Tandy 1000 $685
1 Drive 128K

Tandy 3000 $1969
1 Drive 512K

BIG SAVINGS on TANDY Compatibles

TANDY 1000/1200/3000

Tandy 1000 HD 256K 10 Meg.	1539.00
Tandy 1200 HD 256K 10 Meg.	1599.00
Tandy 3000 HD 512K 20 Meg.	2699.00
Tandy 1000 Disk Drive Kit	159.00
Tandy 256K Ram Board (inc. 128K)	179.00
Tandy 300 Baud Modem Board	129.00
Tandy RS-232C Serial Board	89.00
Tandy Hard Disk Controller	249.00
Tandy 10 Meg. External Hard Disk	579.00
Tandy 1200 Text Monitor Adapt.	219.00
Tandy 1200 Color/Graphics Adapt.	240.00
PBJ MFB-1000 (512K)	299.00
Quadram Exp. Quadboard 384K	279.00

MONITORS

Tandy CM-2 RGB Color Monitor	379.00
Tandy VM-2 Green Monitor	129.00
Tandy VM-3 TTL Green Monitor	179.00

PRINTERS

Okidata 192	375.00
Okidata 193	529.00
Star Micronics SG-10	245.00
Star Micronics SG-15	410.00
Star Micronics SD-10	365.00
Panasonic P-1091	259.00
Toshiba 1340	439.00
Silver Reed EXP-550	400.00
Epson FX, LX, JX, LQ, SQ, DX, HS	CALL

computer plus
P.O Box 1094
480 King Street
Littleton, MA 01460
SINCE 1973

CALL TOLL FREE
1-800-343-8124

IN MA CALL (617) 486-3193

Circle 210 on reader service card

GET PROJECT RESULTS

RELY ON PMS-II®

Make your job easier with tools you can rely on. Professional, quality reports that give you accurate information for making key decisions – and graphics you can be proud of.

Control dates, slippage, gains, slack time and money with assurance and confidence. All you need is PMS-II software, proven on multi-million dollar projects to give managers the results they expect.

Virtually Unlimited

- Super and Subnetwork file linking (2700 activities per file)
- "Clone" old networks into an existing or new network and renumber

Exceptional Planning and Tracking

- Menu driven, easy to use
- Rapid calculations
- Early & Late Start/Finish dates
- Critical paths
- Percent Complete/Days Remaining
- Lead/Lag scheduling

Versatile Reporting

- Extensive data selection
- Multi-level sorting
- Project diagrams
- Gantt/bar charts
- Earned Value & Funding Req.
- "As Planned" vs. "As Built"

Plus add-on modules for multi-project resource and materials management, custom report creation, unattended batch reporting, high resolution printer graphics and plotter support.

Send for free newsletter and literature.

PMS-II – $1295; Demo –$50
Formatted for PC-DOS, MS-DOS & CP/M-86
Europe: SISTA, Kloten, Switzerland
Phone (011) 411-8132635

NORTH AMERICA MICA, INC
MICA

5230 Carroll Canyon Road, Suite 110
San Diego, California 92121
(619) 458-1327 Telex 701257

Circle 985 on reader service card

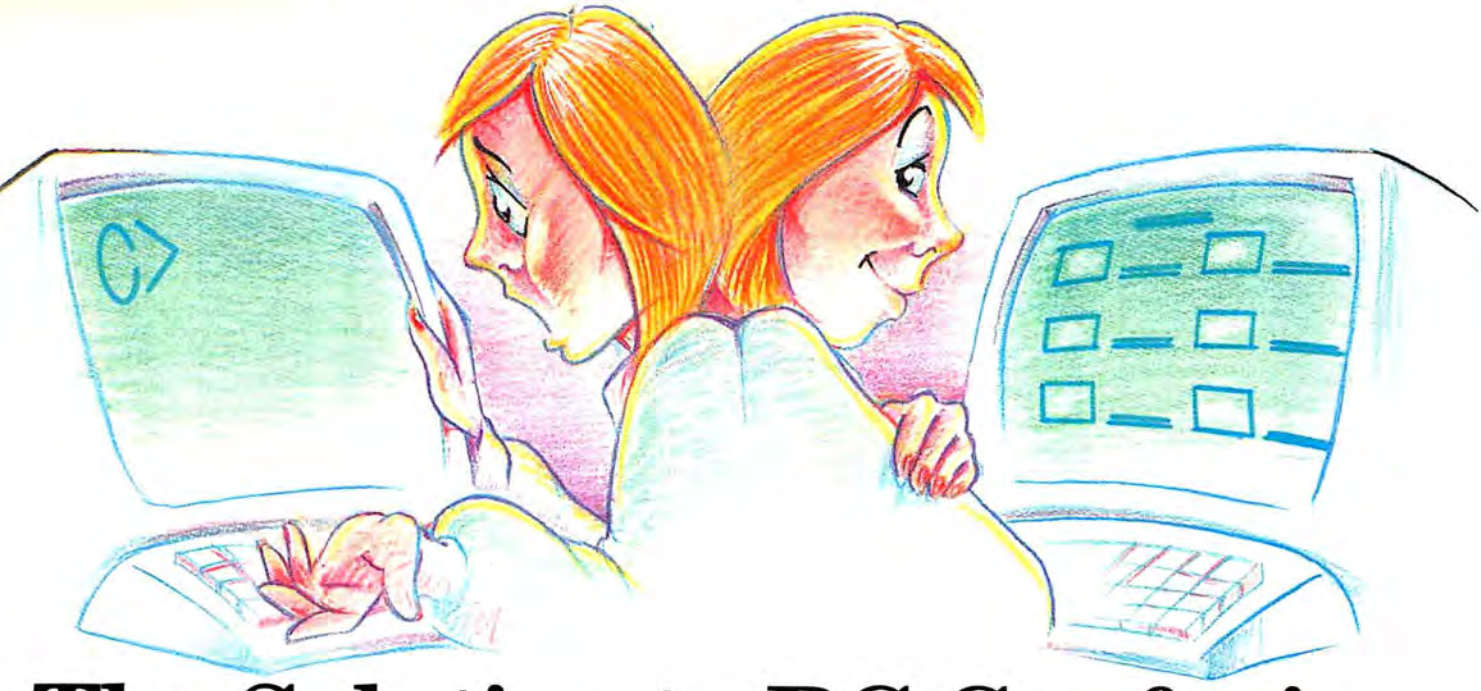
solution. That was when the storm knocked out the power.

When Bill's wife saw him sitting at the dead keyboard, still dripping wet, she told him he looked like hell. But she listened sympathetically as he told her what he thought about the latest labor-saving technology for graphic designers.

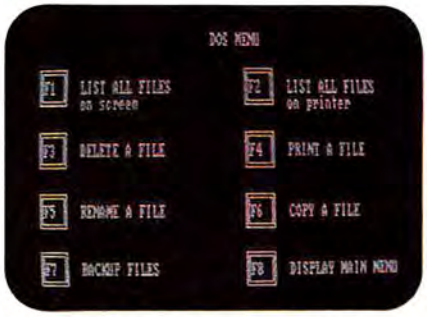
Diane Burns is never surprised when she hears about people having trouble with personal computer publishing. Burns has been at it since Compugraphic used Apple's Lisa as part of a page composition system three years ago, and now her firm, TechArt of San Francisco, spends a good deal of time rescuing would-be PC publishers who get into trouble on the Mac. "It's the old misconception with a new twist–you know, all you need to do is get a computer, and your books take care of themselves," Burns says. "People get the idea that because they can figure out how to do some useful things with *MacDraw* in 30 minutes, they can take on a big project."

Personal computer publishing tools can be incredible timesavers, she says, and yet she often sees people spending more time on a publishing project than if they had done it the traditional way. She recalls the new TechArt employee who worked on the art for a crossword puzzle for 5 hours. "She could have inked that puzzle by hand in an hour. And she was wasn't a novice with *MacDraw*." Her problem? Instead of using

(continues)



The Solution to PC Confusion



MENU MANAGER
the PC program organizer

MenuManager makes it easy for **anyone** to use a PC. It organizes programs, applications and commands into menu entries that are selected simply by pressing a single function key. Its menu screens present a clean, neat appearance—comfortable even for the first-time computer user.

Organize All Your Programs

MenuManager allows any number of separate programs and utilities to be combined into complete integrated applications. It comes with an example menu, and you simply add your own programs and any commands that are desired. Then the push of a key is all it takes to make your selection. When each task is completed, the menu automatically returns.

No Need to Learn DOS

MenuManager is ideal for insulating novice computer users from the complexities of DOS. Display directories with a single keystroke. Depress the function key labeled COPY A FILE and MenuManager asks for the "copy from" and "copy to" file names! Anything DOS can do can be done with one finger with MenuManager.

Loaded with Features

MenuManager is loaded with features: its MenuEditor allows quick and easy organization of all of the messages, questions, programs and operations available on each menu; all common DOS commands are included in the supplied sample menu, and you can add or alter any you wish; straightforward questions ask the operator for variable information such as filenames that may be needed on any entry; paths and sub-directories are fully supported; any function key can start a program or batch file, execute a DOS command, or go to another menu; up to 3 lines of text can describe each function key; up to 10 entries per screen, 90 entries per menu, and menu chaining for unlimited total entries; passwords available on every entry; both color and monochrome fully supported; ScreenSaver feature avoids image burn-in; and much more.

Circle 565 on reader service card

To quote a senior analyst: *"MenuManager is the only program we've seen that let's* ***me*** *do what* ***I*** *need to do* ***and*** *that won't intimidate any of our [over 200] users."* MenuManager will quickly become the most indispensable organizing tool that you have.

CONFIGURATION: Runs on IBM PCs, XTs, ATs, and compatibles. Typical free main memory requirement is 20K (varies with size of full menu). DOS 2.0 or higher, color or monochrome monitor. MenuManager is network compatible, and does NOT generate any batch files.

MENU MANAGER™
the PC program organizer

INTRODUCTORY PRICE 49.95

Not Copy Protected
30 Day Guarantee*

VOLUME, SITE and CORPORATE LICENSE Plans Available. (Inquire directly to the SCS Marketing Department at the address below.)

TO ORDER CALL: 1-800-642-9606

or (205) 251-2985 or send this form to the address below.

YES! Please send_____copies of MenuManager at $49.95 (U.S. $ plus 3.00 ea. S&H)

Check enclosed for $ _____ Bill my ☐ Visa ☐ MC ☐ Am Ex

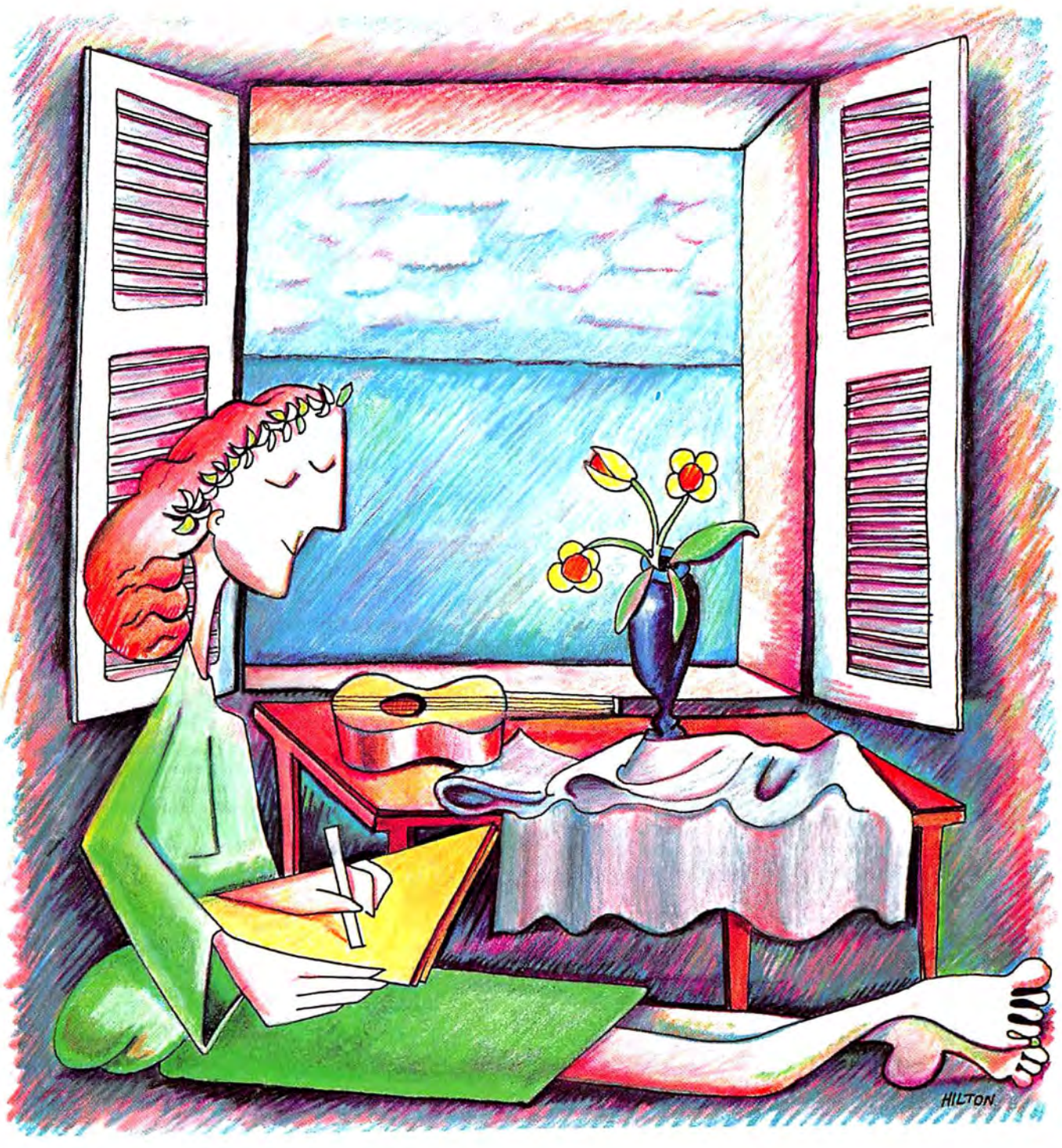
Acct # _____ Exp. Date_____

Name _____
Company _____
Address _____
City/State/Zip _____
Phone _____

Signature _____

*30-day Money-Back Guarantee: SCS warrants that if MenuManager does not perform as described, you may return it within 30 days for a prompt refund.

SCS
SOUTHERN COMPUTER SYSTEMS, INC.
2732 Seventh Avenue South
Birmingham, Alabama 35233
(205) 251-2985 • Telex 75514



HOW TO GET A BETTER VIEW FROM A WINDOW

The new Palantir Filer with its runtime version of Microsoft Windows is more than just a filing program. It's a powerful data management system that lets you design your own filing systems, build custom databases and write fully integrated reports.

Palantir Filer has pull down menus, full mouse interface and nine levels of indexing and sorting. All this while you work with the multi-tasking abilities of *your* Microsoft Windows program.

Get a much better view from your Windows today. The Filer from Palantir: the same people who brought you the famous Word Processor. See your computer dealer.

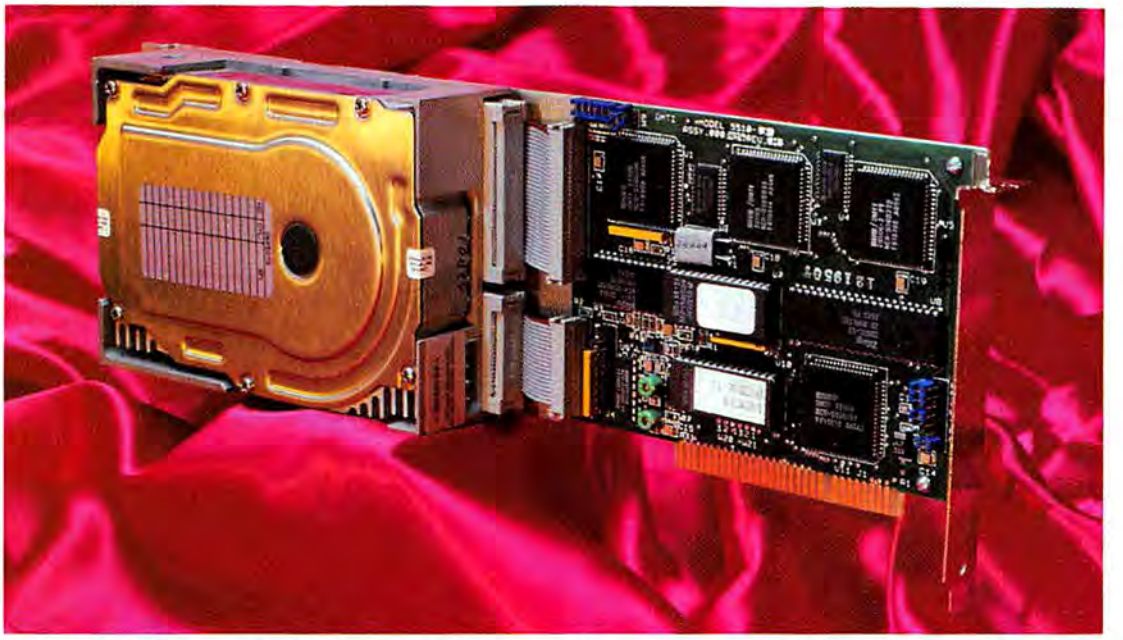
PALANTIR® SOFTWARE

12777 Jones Road, Suite 100, Houston, Texas 77070
(800) 368-3797, Canada (800) 235-0025, Texas (800) 831-3119

© 1986 Palantir, Inc. Microsoft is a registered trademark of Microsoft Corp.

Circle 399 on reader service card

Gold-Card™: Buy The Numbers!



21Mb PC □ 31Mb XT □ 15.5w □ 65ms □ 2K sb

$695 2 year warranty

$695* for 21Mb!

Now That's Price Performance

Silicon Valley Computer brings you the Gold-Card: the fastest, lowest powered, longest warrantied, most durable, highest capacity, most reliable, lowest priced Hard-Disk-On-A-Card available in the world today.

Silicon Valley Computer

Silicon Valley Computer has been a leading supplier of IBM PC/XT/AT quality disk drive, tape and memory expansion devices to the OEM/VAR/Dealer market since 1982.

Expand Your Memory

Maximize your capacity and performance by adding 21Mb of hard disk storage (with a 2K bonus buffer) to your IBM PC/XT or compatible computer with Gold-Card.

Give Your XT 31MB!

Add our optional *Big File*™ enhancement program to your Gold-Card and instead of a 10Mb and a 21Mb, your XT will operate as if it has one large 31Mb disk (XT Adapter Kit required for 31Mb operation)

Super Tough – *The Gold-Card's automatic head unloading mechanism is key to its high reliability and makes it perfect for portables.*

Compare These Features

- Automatic Head Unloading–*Protects Heads and Media*
- 65ms Access Time–*Fastest Available*
- 15.5 Watt Power Consumption–*Lowest Available*
- 2K Sector Buffer–*Increases System Throughput*
- 2 Year Warranty–*Longest Available*
- High Reliability: 28,000 hr. MTBF–*No One Else Comes Close*
- Highest Shock Rating: 80Gs–*Perfect For Portables*
- 3.5" Plated Disk Mechanism–*Planned Non-Obsolescence*

Price/Power/Performance Leadership

Silicon Valley Computer can provide you with everything from a half height floppy to our massive **150Mb MegaDrive™.** No one else comes close to our performance or pricing! All SVC kits come complete with pre-tested and formatted drive, controller, necessary software, cables and installation manuals.

High Power, Low Power Consumption

The Gold-Card accomplishes all this speed and performance using a low 15.5 Watts during operation. This means you won't risk voiding your factory warranty by having to add an extra power supply to your standard PC.

Look and compare these outstanding values:

60Mb Tape Archive Kit $795*
32Mb AT Hard Drive 38ms $695*
40Mb AT Hard Drive Kit 21ms $1295*
2MB AT RAM Board, Complete $595*

Available NOW at your local Dealer!

Call today for the dealer nearest you!

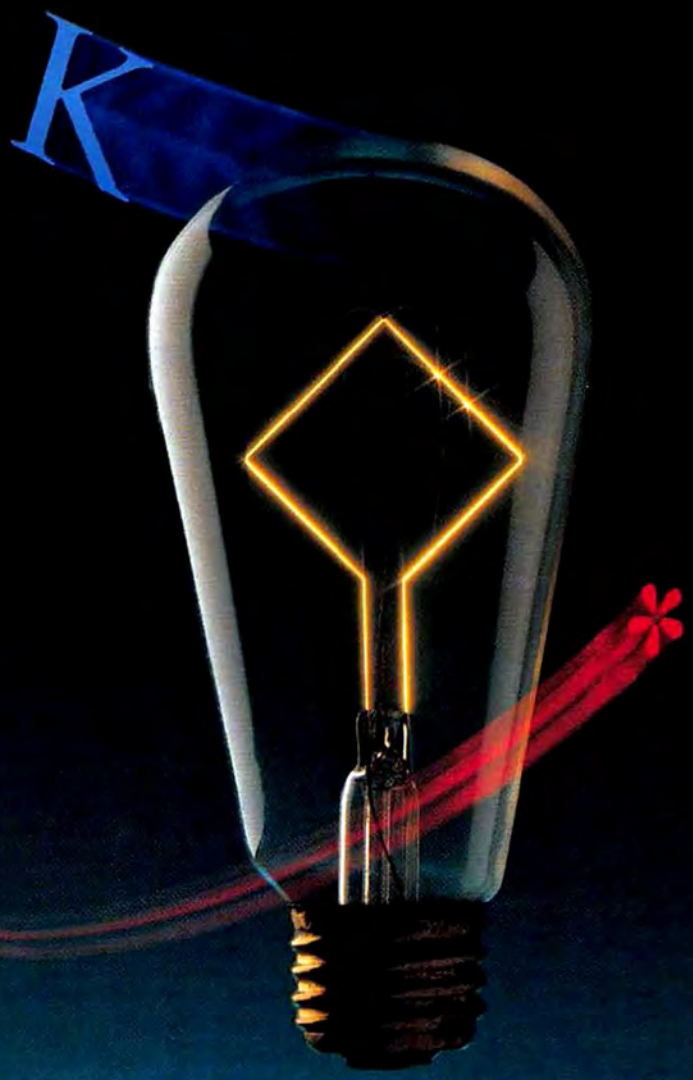
(408) 288-8837

Silicon Valley Computer □ 140 Archer Street □ San Jose, California 95112

*Manufacturer's suggested retail price. Prices are subject to change without notice.
IBM PC, XT and AT are registered trademarks of International Business Machines, Inc.
Gold Cards are formatted to run PCDOS 3.X when shipped from SVC.

Circle 468 on reader service card

For bright new ideas in personal computing...



...subscribe to PC WORLD today.

You'll save $17 and ensure access to the best new ideas in business and personal computing!

VISA and MasterCard accepted—
call TOLL-FREE:
800/628-2900
(from Nebraska call 402/895-7284)

YES! Enter my subscription for 12 issues of *PC World* at just $17.97. I'll save $17 off the single copy price!

☐ Payment enclosed ☐ Bill me

Name _____

Company _____

Address _____

City, State, Zip _____

Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires December 31, 1986.

PC WORLD

4BMB4

YES! Enter my subscription for 12 issues of *PC World* at just $17.97. I'll save $17 off the single copy price!

☐ Payment enclosed ☐ Bill me

Name _____

Company _____

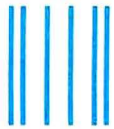
Address _____

City, State, Zip _____

Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires December 31, 1986.

PC WORLD

4BMB4



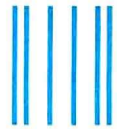
NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 51833
Boulder, Colorado 80321-1833



NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 51833
Boulder, Colorado 80321-1833

lines to make the puzzle grid, she had drawn individual boxes that refused to align properly.

So although part of TechArt's business is training people to do their own newsletter or business documents in-house with PC publishing tools, a larger part of it is start-to-finish projects or clean-up work on a project someone started but couldn't finish.

Lacking the time to master the software, many customers have had TechArt design *PageMaker* templates for newsletters they wanted to produce in-house. For TechArt, it means steady—and easy—production jobs.

"Don't get me wrong," Burns says. "There's a big leap just in going from daisy wheel print to Times Roman on a laser printer. And sure, the pitfalls are there, but they aren't insurmountable." Burns hopes that *PageMaker* on the PC will be less temperamental than it has been on the Macintosh. She pins her hopes on the thought that *Microsoft Windows*—which will provide the Macintosh-like interface for *PageMaker* on the PC—will prove less quirky than the Macintosh operating environment.

But even expert use of flawless personal computer publishing tools won't guarantee good results, she notes. "A brochure still needs copy that makes sense. And we've certainly seen billions of ugly, poorly designed brochures. Now that the production process is easier, we'll probably see zillions. And most of them will be done at the very last minute."

(continues)

#1 in a series

volkswriter® rates rave reviews

"Volkswriter 3 has one of the most graceful spelling checkers we have ever seen . . . the response ranges from fast to virtually instantaneous."
John Lombardi InfoWorld

"Volkswriter 3 has taken a big leap forward into the upper reaches of word processing . . . I'm waiting for the big boys to catch up with this important challenger."
Peter Norton PC MAGAZINE

"At this point it appears that Volkswriter stands alone in offering so much for so little." datapro

Call 1-800-543-3873 (in California 1-800-831-8733), to order your $5 demo diskette, or stop by your local computer store for a demonstration. Judge for yourself.

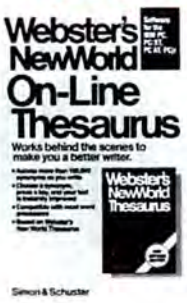
volkswriter® 3
the best buy in word processing

lifetree
Lifetree Software Inc
411 Pacific Street
Monterey, CA 93940
Telephone: 408-373-4718

Volkswriter and the Lifetree logo are trademarks of Lifetree Software Inc

Circle 93 on reader service card

Teach your old word processor the newest tricks



"Truly amazing . . . outclasses every other program of its type." —John C. Dvorak, *S.F.Examiner*

Feature for feature, *Webster's New World® On-Line Thesaurus* leaves the competition at a loss for words. With 20,000 root words, 120,000 synonyms, 500,000 replacement alternatives, and much more (see our comparison chart below)—*Webster's New World® On-Line Thesaurus* guarantees that you'll never be without the right word again. For the IBM PC, XT, AT and PCjr. $69.95

The phenomenal software that catches complicated yet common misspellings—like "fenomenal." Just type in a word the way you think it sounds, like "potenshal," and the Spelling Checker automatically corrects it for you. Think of the potential that gives you! No wonder *PC Magazine* hails it as **"the knock-down, drag-out, clear-cut winner!"** (Editor's Choice 1985) For the IBM PC, XT, AT, PCjr and Apple II + , IIe, and IIc. $59.95

LOOK HOW WE COMPARE:

WEBSTER'S NEW WORLD® ON-LINE THESAURUS			
	Webster's New World	Turbo Lightning	Random House Reference Set
Root word entries	20,000	5,000	5,000
Root words + derivatives	64,000	5,000	5,000
Number of synonyms	120,000	50,000	50,000
Replacement alternatives	500,000	50,000	50,000
Word processors supported	33	11	14
Resident RAM required	44K	64K min.	24K min.
Disk space required (full dictionary)	360K	160K	208K
Find synonyms for synonyms repeatedly	y	n	n
Undo synonym replacement	y	n	n
Backtrack through selections	y	n	n
Note pad	y	n	n
Multiple on-screen synonym pages	y	n	n
Edit synonym before insertion	y	n	n
WEBSTER'S NEW WORLD® SPELLING CHECKER			
	Webster's New World IBM, Apple	Turbo Lightning IBM	Random House Reference Set IBM
Ram Resident	n	y	y
# of words	114,000	83,000	50,000 or 80,000
Help windows	y	y	n
Browseable dictionary	y	n	y
Catches: Phonetic misspellings You type: FENOMENAL	PHENOMENAL	FELLOWMEN	FEMININE

SIMON & SCHUSTER COMPUTER SOFTWARE

To order call: **1-800-624-0023** (National) **1-800-624-0024** (In N.J.)

WEBSTER'S NEW WORLD™
When Every Word Counts™

Circle 928 on reader service card

On Saturday, Bill Hill called in the reserves: his wife Kathy, also a graphic designer, and a friend, Gail Blumberg, who was not only a graphic designer but also a *PageMaker* buff. After Gail rearranged the files on Bill's disks to eliminate the 'disk full' errors he was getting, they got down to serious work, with Bill issuing instructions, Gail running *PageMaker*, and Kathy doing a dash of design and a pinch of gofer work. Gail was pessimistic—finishing a newsletter in a weekend was a pretty unreasonable expectation when you hadn't made any real progress by noon Saturday—but Bill seemed downright cheerful.

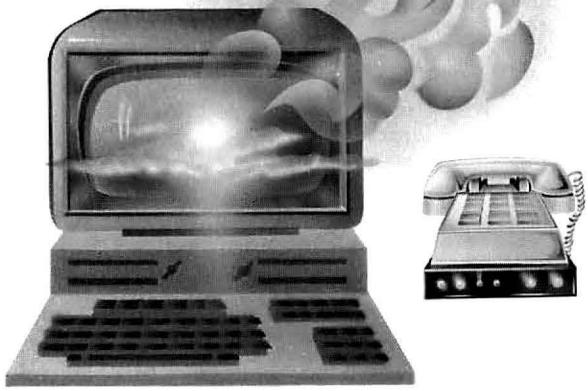
It was only a front; Bill was worried enough for the both of them. It was midafternoon before a change in one article's layout stopped rippling through all the other articles. But by evening, when Bill called Silicon Compilers' Laurie Souza to postpone the final approval meeting on the newsletter, they had made real progress, and Bill had real hope.

Bill hadn't sold Souza on *PageMaker* because of quick turnaround times. It was a matter of cost. LaserWrite charged $10 an hour for the use of one of its Macintoshes and 50 cents a page for printing on the LaserWriter, "which made the cost of type practically free," says Bill. And since Bill figured he'd spend no more time designing and producing the newsletter on the Macintosh than he'd spend doing it by hand, they would save on pasteup costs, too.

(continues)

If you compute after dark...

...switch to the magic of GEnie™ and stay on-line longer, for less!



Introducing GEnie, the General Electric Network for Information Exchange. It's part of General Electric Information Services—the largest commercial teleprocessing network.

Now the power of GEnie stands ready to bring a little magic into the life of PC owners just like you. And for potentially much less than other on-line information services.

With GEnie, you pay no hidden charges or monthly minimum fees. You pay only for the actual time you're on-line and the $18.00 registration fee. Nothing more.

Compare & Save

	Services						Pricing			
	SIGs/User Groups	Electronic Mail	CB Simulator	Computing News	Games	2400 baud access	Registration fee	Monthly minimum	Non-prime time rates	
									300 baud	1200 baud
GEnie*	**X**	**X**	**X**	**X**	**X**	**X**	**$18.00**	**none**	**$5.00**	**$5.00**
CompuServe	X	X	X	X	X	X	$39.95	none	$6.25	$12.75
The Source	X	X	no	X	X	X	$49.95	$10.00	$8.40	$10.80

**Rates and Services shown in effect 12/85. Non-prime time rate applies Mon–Fri, 6pm–8am local time, all day Sat., Sun., and nat'l. holidays. Subject to service availability. Additional surcharge applies for 2400 baud service.*

Save up to 60%

Check out the chart above and compare it for yourself. You'll find GEnie can deliver all of your favorite services for an incomparable price at incomparable savings!

Put the power of GEnie at your command

- Discuss the latest in computer products and accessories or download public domain software with GEnie's ***RoundTable™ Special Interest Groups.***
- Meet new people, share ideas with friends—old and new—with ***LiveWire™***, GEnie's CB simulator that has everybody talking!
- Get your message across and back again with ***GE Mail™***, GEnie's electronic mail service.
- Organize a local, regional or national get-together in one of GEnie's 40 "conference rooms" with GEnie's ***Business Band Real-Time Conferencing.***
- Go one-on-one with classic computer games, match your wits against others with multi-player games, or download for future play in GEnie's ***Game Room.***
- Stay in touch with what's new on the microcomputer scene, courtesy of GEnie's news service, ***News and Commentary.***

GEnie can take you to new highs in speed and keep you there. Because our non-prime time rate for 300 OR 1200 baud is only $5.00 an hour. And that means you save 20 to 60%. Or if you prefer, 2400 baud service is now available.

With services and prices like these—talk, read, learn, or play to your heart's content. Because now you can keep your eyes on the screen, not on the clock.

With your personal computer, modem, communications software, and telephone, you already have everything you need to make GEnie come to life. So why not Sign-Up today. Let GEnie bring a little magic into your life!

Sign Up From Your Keyboard Today 4 Easy Steps:

1. Have ready your VISA, MasterCard or checking account number to set up your personal GEnie account.
2. Set your modem for half duplex (local echo)—300 or 1200 baud.
3. Dial **1-800-638-8369.** When connected, enter HHH
4. At the U# = prompt, enter **XJM11942,GENIE** then RETURN.

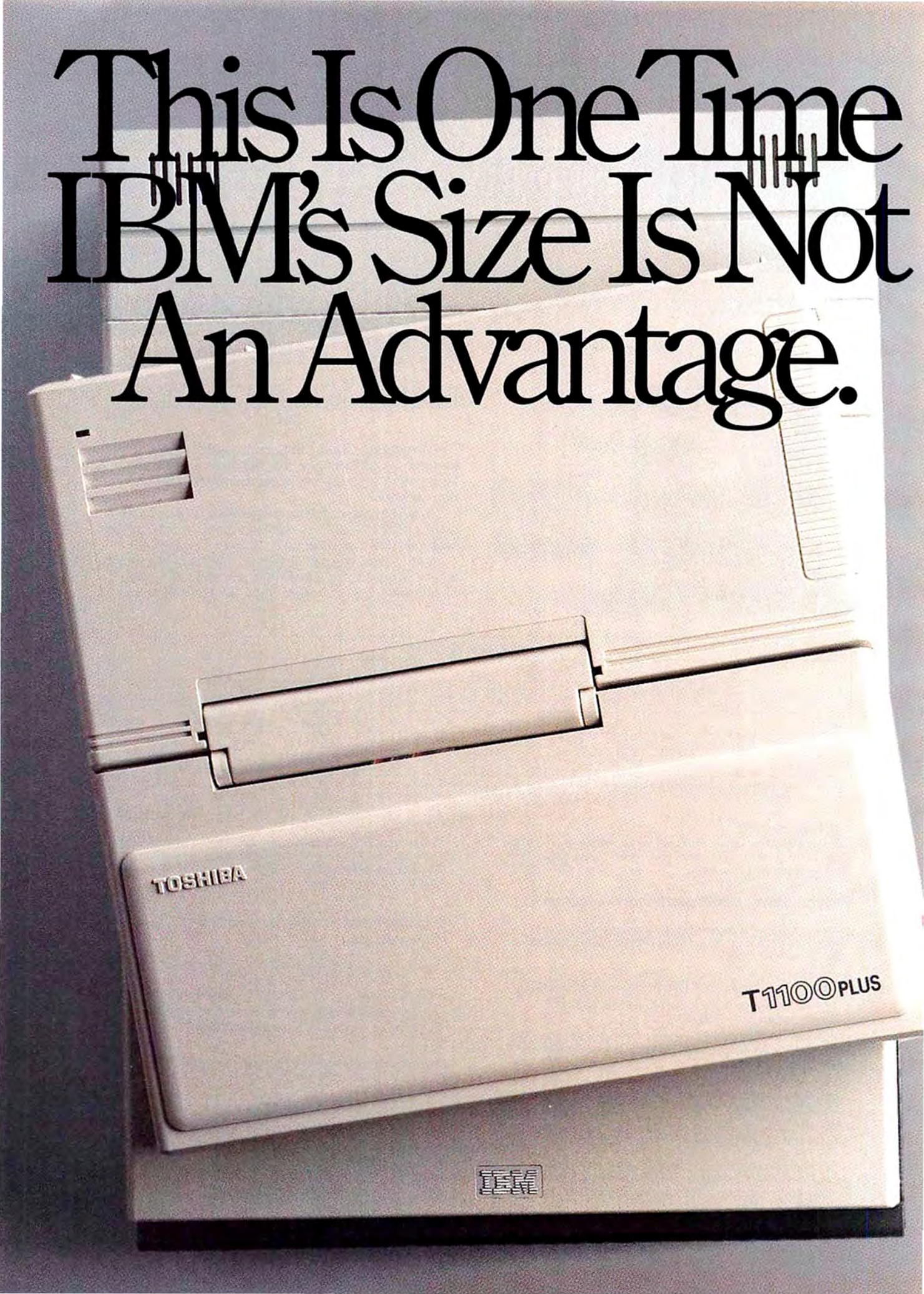
No Modem Yet? Need more information or assistance?
We can help! Call **1-800-638-9636, ext. 21.**

Get on-line with GEnie. And stay longer, for less.

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

This Is One Time IBM's Size Is Not An Advantage.



When it comes to a portable computer, smaller is better.

That's one reason the new dual disk drive Toshiba T1100 PLUS has it all over the IBM PC[1] Convertible.

But our new portable PC is not only smaller than the IBM. It's also lighter. And more powerful.

How much smaller? A full 20%. And theirs weighs 12.2 pounds. Ours is under 10 pounds.

And with theirs, if you want serial and parallel ports or a CRT port, you have to add add-ons.

Which makes it even bigger and heavier. And more expensive.

With the T1100 PLUS, the serial, the parallel and the CRT ports are standard built-in features. Simple mathematics tells you which portable is more portable. And more affordable.

WE TAKE THE PORTABLE PC TO A HIGHER POWER.

Before we go any further, we have to tell you there is one thing about the T1100 PLUS that's bigger than the IBM portable. It's maximum memory capacity. Ours is 640K of RAM. Theirs is only 512K of RAM.

Now we can tell you that the T1100 PLUS is faster than the IBM. Our 80C86 microprocessor lets you zip through work at twice the speed.

ANOTHER CLEAR ADVANTAGE.

The Toshiba T1100 PLUS uses a high-contrast, high-resolution LCD display screen. It shows 25 lines by 80 characters of text with 640 x 200 resolution, tilts to any convenient viewing angle and folds flat when you use a CRT monitor.

The IBM portable also uses an LCD display screen. But it doesn't have as much contrast. It doesn't tilt to as many convenient angles. And you have to pull it off to hook up another monitor.

ONE MORE THING THAT MAKES US EXCEPTIONAL.

Of course, the Toshiba T1100 PLUS is fully IBM-compatible. So you can run popular software like Lotus 1-2-3,[2] WordStar[3] and dBASE III.[4]

And, as we mentioned, it has two built-in 720K 3.5" disk drives. It also has an optional 1200-baud Hayes[5]-compatible internal modem and runs on built-in rechargeable batteries. Just like the IBM portable.

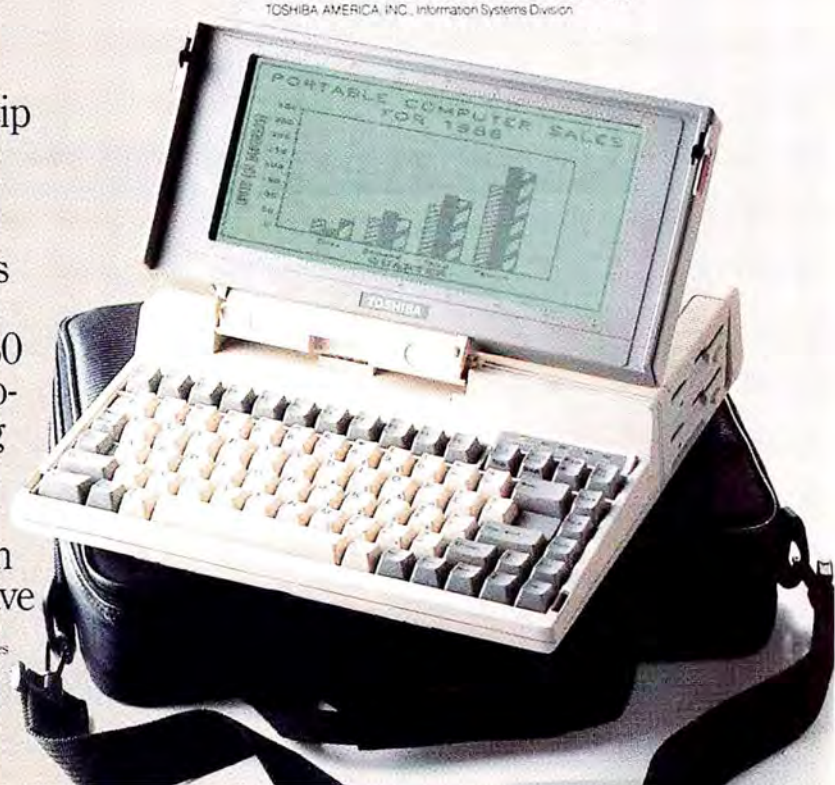
But should either stop running, only Toshiba guarantees you overnight delivery of a replacement while yours is being fixed. It's all part of our "Exceptional Care" program.

To find out more about the T1100 PLUS, call 1-800-457-7777 for the name of the authorized Toshiba dealer near you. And see why being small is going to make us one of the biggest things in PCs.

In Touch with Tomorrow

TOSHIBA

TOSHIBA AMERICA, INC., Information Systems Division



1. IBM and IBM PC Convertible are registered trademarks of International Business Machines Corporation. 2. Lotus 1-2-3 is a registered trademark of Lotus Development Corporation. 3. WordStar is a registered trademark of Micropro. 4. dBASE III is a registered trademark of Ashton-Tate. 5. Hayes is a registered trademark of Hayes Corporation.

Circle 285 on reader service card

telemart

Doing Business Since 1980 A Division of CW Marketing, Inc.

2222 East Indian School Road / Phoenix, Arizona 85016

ORDER LINE **1-800-426-6659**

Your Hardware and Software Source

Just Arrived!!
Best Prices On PC Work-A-Likes
640K, 2 Drives PC XT With Keyboard
$599

★ NOW Even Lower Prices ★

★ NO CHARGE FOR VISA AND MASTERCARD ★
★ OUR CUSTOMERS HAVE RATED US #1 IN PRICE & DELIVERY ★
★ CORPORATE & INSTITUTIONAL PURCHASE ORDERS ACCEPTED ★
★ ASK FOR NATIONAL ACCOUNTS ★

FREE* AIR EXPRESS SHIPPING
You Pay the Ground
We Pay the Air

Low Prices are **BORN** Here, **RAISED** Elsewhere

SOFTWARE

WORD PROCESSORS

Easy	$ 88
Just Write	65
Leading Edge Word Processor	48
Leading Edge W/P with Spell & Merg	95
Lightening	55
Microsoft Word 3.0	Call
Multimate 3.3	Call
Multimate Advantage	Call
PFS: Write w/Spell Checker	76
Ready	49
Volkswriter 3	142
Volkswriter Scientific	239
Webster	33
Word Perfect (Ver. 4.1)	196
Wordstar w/Tutor 3.31	162
Wordstar Pro Pack 3.31	233
Wordstar 2000 2.0	233
Wordstar 2000 Plus 2.0	278

ACCOUNTING

Accounting Partner	$167
Accounting Partner II	483
BPI – G/L, A/R, A/P, Payroll	280 ea.
CYMA	Call
In-House Accountant	88
One Write Plus	145
Open Systems-G/L,A/R,A/P,Payroll 3.0	389 ea.
Peachtree – G/L, A/R, A/P, Payroll	249 ea.
Sorcim/IUS – G/L, A/R, A/P	299 ea.
State of the Art–G/L,A/R,A/P,Payroll	369 ea.

TRAINING

Flight Simulator	$ 28
Mastertype	23
Mind Prober	26
PC Logo	75
Turbo Tutor	19
Typing Instructor	28
Typing Tutor III	28

DATA BASE MANAGEMENT

Clipper	$ 339
Clout 2	117
Cornerstone	Call
dBase II	Call
dBase III Plus	Call
Extended Report Writer	74
Knowledgeman II	279
Knowledgeman Upgrade Kit	145
Nutshell 2.0	95
PFS: File	76
PFS: Report	67
Quickcode	138
QuickReport	138
Revelation	449
R:Base 5000	319
R:Base 5000 Multi-User	Call
Reflex	Best Price
Think Tank	92

GRAPHICS/MICE

Chartmaster	$205
Diagram Master	189
Energraphics	159
Energraphics w/Plotter Option	205
In-A-Vision	249
Microsoft Buss Mouse	107
Microsoft Chart	164
Microsoft Serial Mouse	119
News Room	32
PC Draw	199
PC Mouse w/Dr. Halo II	104
PC Mouse w/Paint Plus	115
PFS: Graph	76
Printmaster	30
Print Shop	33
Signmaster	134
Turbo Graphix Tool Box	30

LANGUAGES

Basic Compiler (Microsoft)	$219
C Compiler (Microsoft)	219
Cobol Compiler (Microsoft)	386
Fortran Compiler (Microsoft)	195
Lattice C Compiler	242
Macro Assembler (Microsoft)	84
Run C Interpreter	82
Pascal Compiler (Microsoft)	166
Quick Basic	55
Turbo Jumbo Pack	134
Turbo Pascal 3.0	38
Turbo Pascal w/8087 3.0	59
Turbo DataBase Tool Box	30

SPREADSHEETS

Lotus 1-2-3	Call
Multiplan	$108
PFS: Plan	76
Spreadsheet Auditor 2.0	82
Supercalc 3 (Ver. 2.1)	Call
VP Planner	49

PROJECT MANAGEMENT

Harvard Total Project Manager	$ 262
Microsoft Project	219
Super Project Plus	Call
Timeline 2.0	219

COMMUNICATIONS

CompuServe Starter Kit	Best Price
Crosstalk XVI	$ 92
Microsoft Access 1.01	139
PFS: Access	76
Remote	92
Smartcom II	83

ACCESSORIES

Copy II Option Board	$ 75
Masterpiece	84
Masterpiece Plus	113
Summasketch 12x12 Tablet	339

MONEY MANAGEMENT

Dollars & Sense w/Forcast	$ 94
Home Accountant Plus	76
Tobias Managing Your Money	Call

INTEGRATIVE SOFTWARE

Enable 1.1	Call
Framework II	Call
Smart Software System	Special Price
Symphony	Call

DISKETTES

Maxell MD-2 (Qty. 100)	$125
Sony MD-2 (Qty. 100)	119

UTILITIES

1 DIR	$ 47
Copy II PC	19
Copywrite	39
Desqview	55
DR DOS	27
Fastback	87
Homebase	Best Price
Gem Collection	109
Gem Desktop	27
Keyworks	49
Microsoft Windows	55
Norton Utilities 3.1	48
PC Tools	19
Printworks	36
Prokey 4.0	69
Sidekick	30
Sidekick/Superkey Bundle	71
Sidekick (Unprotected)	47
Sidways 3.1	34
Superkey	39
Turbo Editor Tool Box	38
XTree	27

HARDWARE

PRINTERS

Anadex Printers	Call
Brother Printers	Call
Canon Laser Printer	$1949
Citizen Printers	Call
Data South Printers	Call
Diablo D-25	519
Epson Printers	Call
Juki 6100	349
Juki 6300	669
NEC P5,6,7 Series	Call
NEC 3550	729
NEC 8850	1039
Okidata Printers	Call
Panasonic Printers	Call
Silver Reed Printers	Call
Star Micronics	Call
Toshiba 321	449
Toshiba 341	769
Toshiba 351	969

PLOTTERS

Epson HI-80	$ 309

MODEMS

Anchor Modems	Call
AT & T 4000 External	$ 309
Hayes Smartmodem 300	135
Hayes Smartmodem 1200	379
Hayes Smartmodem 1200B	325
Hayes Smartmodem 2400B	495
Prometheus 1200B	179
US Robotics Password 1200	180
US Robotics Courier 2400	379

DISK DRIVES

Alpha Omega Turbo Disk Drives	Call
Bernoulli Box	
10 Meg	$1349
20 Meg	2229
20 Meg Plus	2299
Segate 20 MG w/Controller	445

KEYBOARDS

Keytronics 5151	$159

COMPUTERS

Panasonic	
Sr. Partner	$1165
Executive Partner	2129
Zenith	Call

MONITORS

Amdek Monitors	Call
NEC Monitors	Call
Princeton Monitors Call	Call
Zenith Monitors	Call

BOARDS

AST Six Pack	$ 210
AST Rampage	Call
Hercules Color Card	149
Hercules Graphics Card	299
Intel Above Board	Call
Paradise 5 Pack	115
Quad EGA Plus	379
Quadlink	325
Tecmar Graphics Master	445
Tecmar Captain (No Memory)	155

AMERICAN EXPRESS · MasterCard · VISA

• No Charge for VISA and Mastercard
• You Pay the Ground – We Pay the Air

• Ground Shipping & Handling $6.00
• Free Air applies ONLY to orders up to 10 lbs.
• Personal and Company Checks Will Delay Shipping 2 weeks
• Prices & Availability Subject to Change Without Notice
• Due to Copyright Laws No Returns on Software Purchases
• Add 3% for C.O.D. Orders
• **We Do Not Guarantee Machine Compatibility**

Mailing Address:
2222 East Indian School Road / Phoenix, Arizona 85016

• Order Line Hours: Mon-Fri 8:30-5:30
Saturday 9:00-1:00
• Order Processing: 602-224-9345
10:00 a.m. – 3:00 p.m. Monday – Friday

Circle 921 on reader service card

Sample the world's largest electronic information source.

There's a lot we can tell you about InfoMaster®—the revolutionary new business information service from Western Union that puts over 700 databases at your fingertips. All through a single source.

But, frankly, our claims may sound too good to be true. That's why we want you to experience InfoMaster firsthand.

You'll see alternatives from a wider perspective. Feel really prepared. InfoMaster delivers the vital business information you want, in minutes—not days. So you spend less time looking for information...and have more time to think about it.

This can make a big difference in your reports, presentations, recommendations, decisions. Not to mention your career.

Experience how easy it is to use. InfoMaster eliminates the obstacles that have prevented you from taking advantage of electronic information services in the past.

Try it. There's no computerese. No commands to learn. No training needed. All it takes is simple English phrases.

You don't even have to know which database to choose. InfoMaster acts as your guide...leading you there, one easy step at a time. There's even free on-line assistance from a specialist, 24 hours a day. So you're never alone.

One more thing. You can use InfoMaster with any PC or terminal. No advanced communications software is needed.

Fact is, whatever business you are in, we've got the information you need: corporate descriptions, census data, market assessments, legal references, financial statements and analyses, government documents, the world's major trade and technical publications, newspapers, business magazines—and more.

Right now. FREE.

But don't take our word for it. Call now for your complimentary password. Then get on-line and experience InfoMaster FREE.

1-800-247-1373
Dept. 501

InfoMaster®

western union

© 1986 The Western Union Telegraph Company.

a last-minute problem with Silicon Compilers' trade show booth (which Bill had also designed), and unexpected trouble in getting *PageMaker* to wrap text around photographs, they finished on time. When Gail left for home at midnight on Sunday, Bill was printing out the final, camera-ready pages.

Bill says he has no regrets about traveling the personal computer publishing route. "It was the best way to get it done. We would have paid huge rush charges to have type set in a single day during the week. It would have eaten up the whole budget, never mind the cost of my time and the pasteup." The only alternative would have been a newsletter produced on a daisy wheel printer—a church bulletin kind of effort—but that would have been unacceptable to Silicon Compilers.

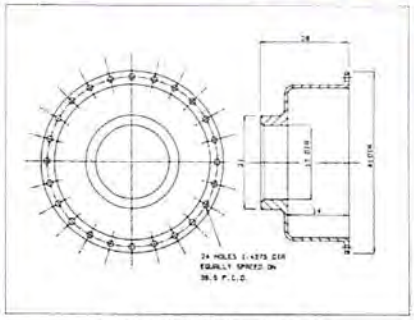
Bill is still excited about the potential of *PageMaker*. He just hadn't expected a tool that was supposed to make the job so much easier to cause so much frustration.

As it was, the newsletter had a few flaws. Type reversed out of a heavy black line wasn't centered properly—a result of *PageMaker*'s regrettable what-you-see-isn't-exactly-what-you-get. The newsletter still needed the final polish that would bring it up to Bill's normal high standards. There just wasn't time. But the inaugural issue of *Compiled Times* is still good enough for Deanna Trimble at LaserWrite to keep a copy around to show off to potential customers. And Bill says the second one will be terrific. "This time," he says, "we're going to do it right."

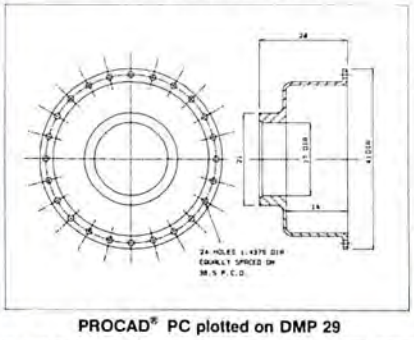
Meanwhile, Silicon Compilers' has already missed the deadline for assigning stories for the second issue . . .

Kevin Strehlo is a freelance writer and PC World *columnist who hunts for PC tales from an office overlooking Silicon Valley.*

Can You See The Difference?



AutoCAD® plotted on DMP 29



PROCAD® PC plotted on DMP 29

If you can't, you should be using PROCAD® PC.

PROCAD PC sets the CAD standard for the IBM PC/XT/AT® and compatible computers with features like:

- Mouse-Driven Icon-Based Commands
- Multiple Scales On The Same Drawing
- Edit and Replace Symbols
- Unlimited Parallel Lines
- Screen Visual Line Types and Pen Thicknesses
- Zoom In and Out Beyond Full Window Size
- Gaps In Lines and/or Rectangles
- Global and/or Individual Symbol Library
- Stretch and Re-Dimension Items
- Mirror Copy Around *Any* Line
- Complete Tutorial In Plain English

PROCAD PC is the full-featured computer-aided design program for the IBM PC/XT/AT and compatibles with a unique mouse-driven, icon-based command structure that lets you spend more time designing and less time memorizing command structures.

To order **PROCAD PC,** contact your local dealer or **PROCAD Systems Inc.** directly:
435 Broad Street
P.O. Box 37
Sewickley, PA 15143-0037
Telephone (412) 741-1930

AutoCAD is a trademark of Autodesk Inc.
IBM PC/XT/AT are trademarks of the IBM Corp.
PROCAD is a trademark of PROCAD Systems Inc.

If you don't feel PROCAD PC is equal to or better than AutoCAD, return the software within 30 days for a full refund.

$995.00
30-Day Money-Back Guarantee

PROCAD SYSTEMS INC.

Circle 542 on reader service card

Actually, we give you two things free.

Our source code. And your freedom.

Just buy part or all of our excellent integrated business accounting system, the SBT Database Accounting Library.

We'll give you our source code absolutely free.

Which, in turn, gives you the freedom to customize our software to fit your business needs.

Say, for instance, you want to change the way a management report is formatted. Our free source code enables you to change it.

What's more, the change will be quick and simple because our software is written in easy-to-use dBASE.

In fact, the entire SBT Database Accounting Library runs with dBASE III or dBASE II,* so you get the power and flexibility of those best-selling programs. Plus the freedom to use any computer that runs dBASE.

The SBT Database Accounting Library. Great software and freedom. All in the same box.

Call today for our demo disk and brochure. (415) 331-9900.

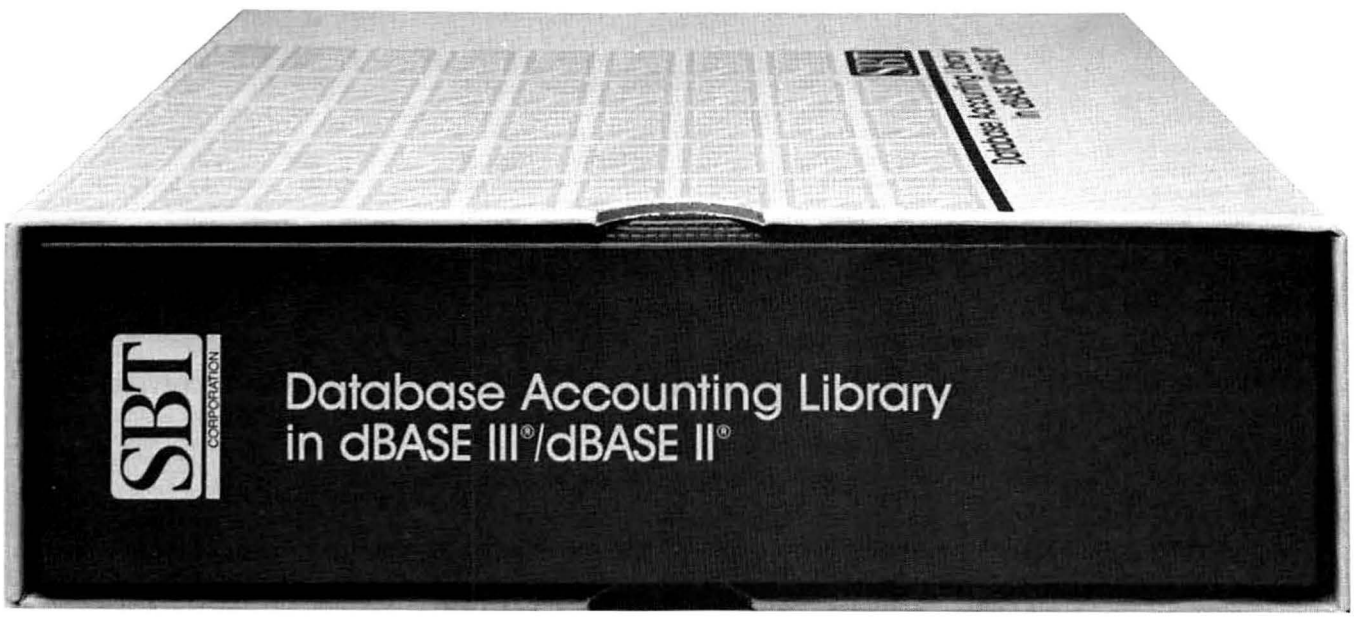
THE SBT DATABASE ACCOUNTING LIBRARY.		
dProfessional	Time & Billing	$395
dOrder	Sales Order processing	$195
dInvoice	Billing/Inventory Control	$195
dStatement	Accounts Receivable	$ 95
dPurchase	Purchase Order	$195
dPayable	Accounts Payable	$295
dPayroll	Payroll/Labor	$395
dLedger	General Ledger/Finance	$395
dAssets	Asset/Depreciation	$295
dProject	Project/Job Accounting	$395
dBackup	Menu/Backup	$ 65

SBT CORPORATION

Three Harbor Drive
Sausalito, CA 94965
(415) 331-9900

Call today for the name of the SBT consultant in your area.

Free source code in every box.



Compiled and Multi-User versions also available. dBASE III and dBASE II are registered trademarks of Ashton-Tate, Inc. Copyright 1985, SBT Corporation.

Circle 431 on reader service card

Advertiser Index

Reader Service Number	
858	AGS Management Systems, 323
—	ALF Products, 336
	AST Research, 8-9
583	Abel Int'l., 169
944	Advanced Digital Corp., IFC
318	Alpha Micro, 331
543	American Small Business Computers, 74
953	Anthro Corp., 16
825	Arlington Computer Products, 312
501	Ashton-Tate, 189
867	Ashton-Tate, 240-241
595	Award Software, 20
372	BarComp, 42
317	Barr Systems, 58
504	Barrington Systems, 18-19
11	Bartel Computer Systems, 339
622	Bittner Electronics, 108
423	Boca Research, 131
975	Boeing Computer, 355A
571	Boosboos Corp., 156
477	Borland Int'l., 47
481	Borland Int'l., 49
480	Borland Int'l., 51
479	Borland Int'l., 53
552	Borland Int'l., 55
865	Bulldog Computer Products, 242-243
235	Business Computers of Peterborough, 65
444	Business Tools, 325
561	CW Communications, 97
154	Cauzin Systems, 293
—	Chang Lei, 324
935	Chorus Data Systems, 281
999	Citizen America, 146
879	Command Technology, 54
393	CompuAdd, 304-305
416	CompuCover, 326
28	CompuData Translators, 108
856	CompuServe, 88
90	Compuclassics, 300
91	Computer Discount Warehouse, 307
158	Computer Hut, 306
420	Computer Mail Order, 328-329
210	Computer Plus, 346
257	Computer Support Corp., 64
554	Conroy-LaPointe, 142-143
276	Contemporary Computerwear, 276
562	Control System, 59
346	Cordata, 138-139
612	Cougar Mountain Software, 48
439	Cullinet Software, 165
—	Curtis Mfg. Co., IBC
534	DCA, 29-31
602	DEST, 166
33	Dac Software, 25
592	Data Transforms, 135
591	DataBlocks, 56
572	Datacopy, 145
365	Decisionware, 28
780	Disk World, 340-341
691	Diskette Connection, 124
3	Dow Jones Software, 273
—	Eastern Enterprises, 313
493	Ecosoft, 68
424	Ellis Computing, 314
—	EndUser/Software, 96
699	Everex, 12
610	FTG Data Systems, 104
—	GE Information Services, 353
877	General Parametrics, 73
78	Genest Technologies, 122
392	GoldStar, 159
563	Grafpoint, 164
502	Graphic Communications, 101-103
888	Great American Software, 327
891	H & E Computronics, 33
442	HDG Software, 355
489	HavenTree Software Ltd., 26
815	Hayes, 289
77	Hercules, 39
684	I.C. Express, 160
—	IBM, 6-7
517	ITT Information Systems, 23
—	Indian Ridge Enterprises, 161
—	InfoWorld, 335
499	Information Builders, 272
624	Inner Loop Software, 336
788	Innovative Software, 70-71
300	Intel, 106
353	Iomega Corp., 86-87
—	James River Group, 108
683	Kamerman Labs, 1
474	Kensington, 76
577	Keytronic, 148
941	Kimtron, 27
593	Leading Edge Software Products, 11
93	Lifetree Software, 351
400	Logicsoft, 113-118
598	Logitech, 105
484	Low Cost Solutions, 164
—	Maxell, 34
98	Maynard Electronics, 5
—	Megasoft, 288
639	Merritt Computer Products, 288
102	Micro Marketing, 100
112	Micro Mart, 310-311
560	MicroStar, 334
171	Microbridge Computers, 326
718	Micrografx, 21
103	Microprocessors Unlimited, 156
—	Microsoft Press, 152
—	Microsoft, 14-15
275	Microstuf, 154
544	Microtech Peripherals, 316
118	Microway, 317
120	Mountain Computer, 147
678	Mouse Systems Corp., 62-63
505	Multitech Electronics, 338
55	Mylex, 77
194	NEC Home Electronics, 155
124	NEC Information Systems, 10
458	NewsNet, 22
434	Nitro Micro, 319
985	North America Mica, 346
381	Northeastern Software, 268-269
621	Norton Utilities, The 149
628	Norton Utilities, The 151
619	Norton Utilities, The 153
391	Oak Park Software, 156
533	Office Solutions, 168
133	Orchid Technology, 17
136	PC Connection, 198-201
—	PC Expo, 360-361
525	PC Mart, 308
460	PC Network, 282-285
34	PC's Limited, 301-303
293	PC-SIG, 140
515	PCollier Systems, 141
399	Palantir Software, 348
229	Paperback Software, 333
—	Paradise Systems, 66-67, 290
388	Patton & Patton, 288
614	Paul Mace Software, 342
238	Perry Computers, 132
142	Persoft, 60
604	Personal Computer Support Group, 270
236	Personal Computer Support Group, 287
615	Personal Tex, 332
455	Plus Development, 126-127
359	Polaris Software, 322
241	Polaroid Corp., 99
148	Primavera Systems, 276
542	Pro Cad Systems, 356
570	Qua Tech, 160
217	Quadram, 150
616	Quadram, 24
—	Quaid Software Ltd., 318
564	Quixote Corp., 134
265	Rocky Mountain Medical Software, 112
608	Rose Assoc., 119
451	Royal American, 123
453	Royal American, 125
431	SBT, 357
618	STSC, 106
282	STSC, 128-129
425	Seagate, 111
886	Secure-It, 72
457	Server Technology, 52
—	Shamrock Press, 322
429	Shanner Int'l., 43
169	Sigma Designs, 337
380	Silicon Express, 309
468	Silicon Valley Computer, 349
928	Simon & Schuster, 352
520	Simonton Industries, 321
850	Soft/Plus Research, 160
648	SoftCraft, 279
744	SoftLogic Solutions, 167
862	Software Bottling Co., The, 45
168	Software Channels, 110
263	Software Directions, 130
526	Software Link, The, 36-37, 94-95
—	Software Publishing, 69
301	Software Solutions, 277
449	SourceMate, 72
565	Southern Computer Systems, 347
—	Sperry, 136
319	Star Micronics, 92-93
175	StatSoft, 122
467	SubLogic, 158
308	SubLogic, 320
661	Summagraphics, 343
—	Sysgen, 344
252	T/Maker Graphics, 44
713	TDA, Inc., 107
150	TDT Group, 275
51	Tall Tree Systems, 163
329	Tech PC, 121
331	Tech PC, 121
701	TeleVideo, 40-41
921	Telemart, 354
285	Toshiba, 353A-B
—	TranSec Systems, 46
707	Tseng Labs, 120
487	Turner Hall Publishing, 295
415	Turner Hall Publishing, 50
—	VLM Computer Electronics, 326
193	Ven-Tel, BC
590	Victor, 109
521	Victor, 157
581	Videx, 162
522	Vogue Imports, 57
700	Votrax, 98
220	Warehouse Data Products, 292
486	Wells American, 89
383	Western Digital, 297
—	Western Union, 355B
165	WordPerfect Corp., 133
438	Wyse Technology, 75

Publish! Advertisers

Reader Service Number	
P7	Adobe
P8	Aldus
P6	Allied Linotype Co.
—	Apple
P4	Indigo Software
P2	MacConnection
P3	Prentice-Hall
P10	Tangent Technology
P5	Writing Consultants

Anyway, time was simply not an issue when Silicon Compilers hatched the idea for a newsletter. They had three months before the deadline—a trade show at which the company planned to announce some important new products. The one time-related consideration that came up, Bill says, was that with personal computer publishing tools, he could finish the newsletter and make last-minute changes without any trouble.

But by the time the project really got off the ground, only a couple of weeks remained before the show. Silicon Compilers had hired a freelance writer to produce the copy, but when she turned it in, they told her it was too flamboyant, too sales-oriented: Try again in a more journalistic vein, they suggested.

Meanwhile, Bill watched the clock tick.

Even when the writer's second draft came in and was approved by Silicon Compilers' top executives, Bill didn't get the copy. There was the usual hitch in telecommunications—LaserWrite was having trouble receiving the copy without dropped characters. The firm's president, Vince Dorn, blamed it on the writer's system, an old CP/M machine. For whatever mysterious reason, it was the Friday before the trade show's Tuesday opening that the copy, stripped of *WordStar*'s high-order bit and formatting characters, was finally on a Macintosh disk for Bill.

Turning that copy into an a professional-looking newsletter in two days took exceptional effort. Despite fierce rain, power outages,

(continues)

Take the law into your own hands.

Introducing LegalEase™—The simple, ready-to-use business agreement and form system for IBM® PCs.

Now get the legal protection you need in your business and personal dealings, instantly. Without hiring expensive lawyers.

LegalEase™ gives you over 150 time-tested contracts, agreements, leases, notices, waivers, releases and binding business forms—right at your computer keyboard. The simple on-screen menus guide you to exactly the right LegalEase™ document. Just retrieve, edit and print using PC Write, one of the best selling word processor programs of all time. It's yours free if you order now.

You can also use LegalEase™ with any standard word processor, including WordStar® and MultiMate.™ Or copy the forms you need directly from the manual.

LegalEase™ was written by Richard H. Gens, a respected Boston attorney who has made a career of drafting and enforcing documents just like these for small to medium size businesses, as well as individuals.

Get LegalEase™ and stop paying lawyers to do what you can do for yourself. It'll more than pay for itself the first time you use it.

LegalEase™ comes complete with these ready-to-use business documents, and many, many more:

- Promissory Notes (7 versions)
- Notice of Delinquent Account
- Credit Application
- Security Agreement (2 versions)
- Power of Attorney (2 versions)
- Short Form of Residential Lease
- Commercial Leases (2 versions)
- Bills of Sale (4 versions)
- Lease of Personal Property
- Offer of Employment
- Employment Agreement
- Employee Non-Compete Agreement (3 versions)
- Firm Price Quote
- Notice of Defective Goods
- Contract for Sale of Goods
- Escrow Agreement
- Notice of Shareholders' Meeting
- Notice of Directors' Meeting
- Minutes of Annual Meeting (Shareholders/Directors)
- Certificate of Corporate Vote
- General Partnership Agreement
- Real Estate Brokerage Agreement
- Simple Form of Will
- Realty Trust—Nominee

LegalEase™ requires an IBM® PC, XT, AT or compatible, DOS 2.0 or higher and 128K RAM.

Yes,

please send me LegalEase™ for $129.95 plus $7.50 postage and handling (Mass. residents add 5% sales tax). Don't forget my free copy of PC Write which I am eligible to register with the publisher.

I have 30 days to review this product and may return it for a full refund if I am not totally satisfied.

☐ Enclosed is my check/money order
Charge to my ☐ Visa ☐ MasterCard

NO COD'S OR PURCHASE ORDERS.

Card No. _____ Expir. Date _____

Signature _____

Name _____

Address _____

City _____ State/Zip _____

LegalEase™

HDG Software, Inc., 54 Whitney Street, Sherborn, MA 01770-9990
For faster service, call us at (617) 651-1881.

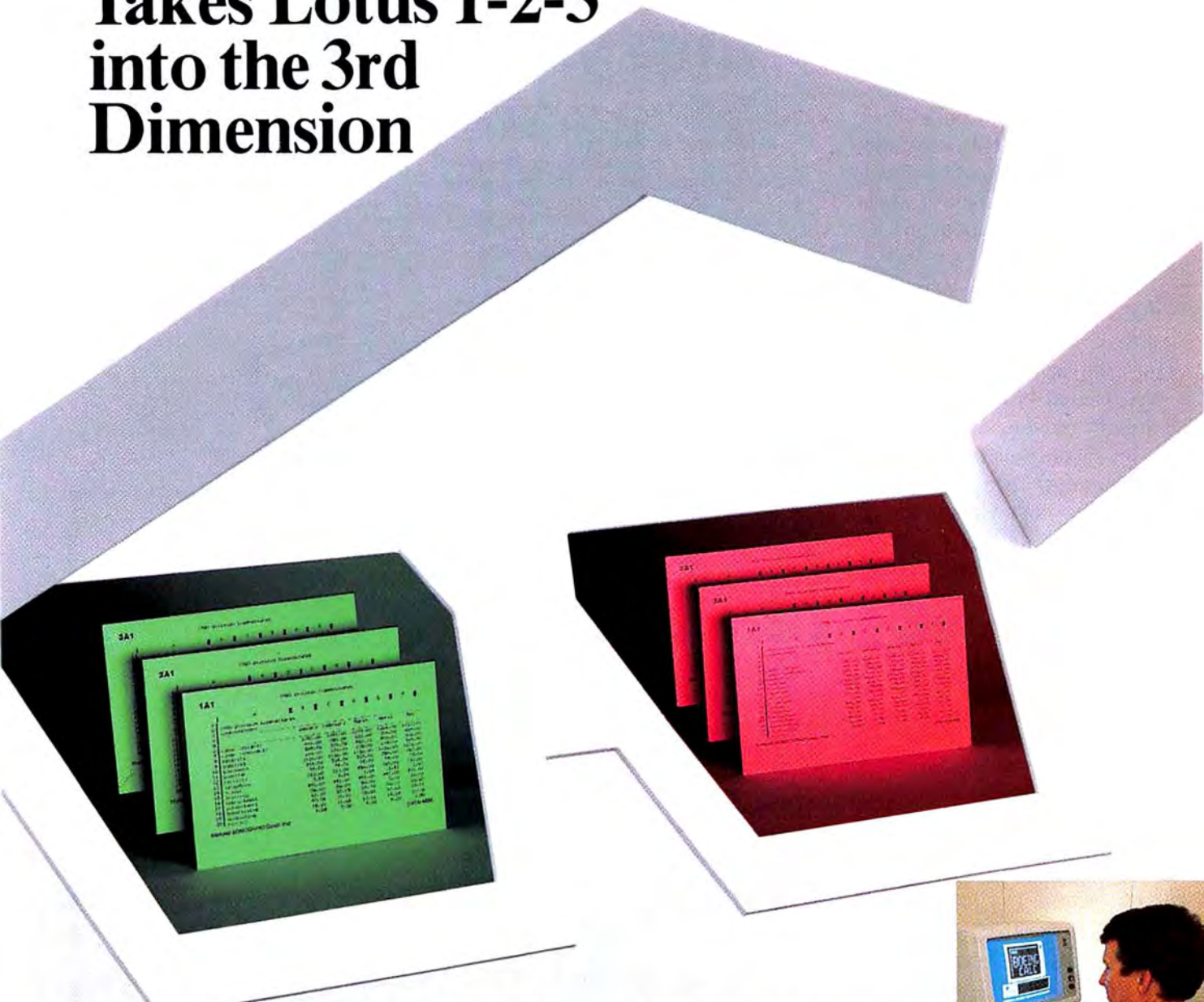
LegalEase™ is a Trademark of HDG Software, Inc. Copyright 1986, HDG Software, Inc.

Circle 442 on reader service card

PC World Creates a Long Buy-Line for You

Queue up! *PC World* readers mean big business—for you. Call your Account Manager to reserve your advertising space today—please see page 4 for phone numbers.

BOEING CALC Takes Lotus 1-2-3 into the 3rd Dimension



Say good-bye to file combines and expensive memory expansion boards.

. . . with Boeing™ CALC, the most powerful 3-D spreadsheet on the market. Its 16 MB PC file capacity lets you consolidate spreadsheet information into a single file with rows, columns, and PAGES.

Boeing CALC is like a giant ledger book allowing up to 16,000 pages. You can do arithmetic and command execution between pages as easily as you would on one. That means no more complex multi-page consolidations and cross-file analysis.

And you don't need to spend laborious hours reconstructing equations when you add or delete pages. Boeing CALC reassigns the equations automatically, keeping all your old relationships and maintaining the integrity of your formulas.

The perfect complement to Lotus 1-2-3® and Symphony®. Boeing CALC uses a command structure familiar to 1-2-3 users. Plus it reads and writes 1-2-3 and Symphony binary files directly. That makes consolidating your existing spreadsheets quick and simple. Rekeying is not required. And you don't need retraining.

Give your spreadsheet real power users . . . Boeing CALC picks up when the others run out of steam.

Call TOLL-FREE 1-800-551-0800, ext. 12 (in Washington State and Canada, call 1-206-763-5000, ext. 12). Or write BOEING COMPUTER SERVICES, P.O. Box 24346, M/S 7K-11, Seattle, WA 98124.

Another quality software product from Boeing.

BOEING

Boeing is a trademark of The Boeing Company. Lotus, 1-2-3, and Symphony are registered trademarks of Lotus Development Corporation.

Circle 975 on reader service card

PC WORLD

Get more data on products you're interested in— simply return this card today. There's no cost. And no obligation.

It's easy to get more information on products advertised in PC World. Here's how:

- Print or type your name and address in the spaces provided, and answer the questions that apply to you or your company. (These questions help us to better meet your needs and the needs of our advertisers.)
- Circle the number(s) on the card that correspond(s) to the reader service number(s) for the product(s) in which you're interested. For your convenience, the reader service number appears in the ad and in the Advertisers Index.
- Detach the card from the magazine, fold, seal with tape (please do not staple), apply first-class postage, and mail. Literature on the products you're interested in will be mailed to you directly from the manufacturer, free of charge.

Free Reader Information Service

Please print or type all information.

_____
Name

_____
Company

_____
Address

_____
City, State, Zip *(Zip code needed to ensure delivery)*

_____
Phone: Area code/Number

PLEASE NOTE: This card is for your convenience in obtaining information on products advertised in *PC World*. Please send editorial comments or inquiries to: The Editor, *PC World*, 555 De Haro St., San Francisco, CA 94107. Thank you.

1. Your primary job function:

- ☐ (A) Corporate or general management
- ☐ (B) Department manager
- ☐ (C) MIS manager
- ☐ (D) Professional
- ☐ (E) Other _____

2. Number of employees in your company:

- ☐ (1) 25 or less
- ☐ (2) 26-99
- ☐ (3) 100-499
- ☐ (4) 500-999
- ☐ (5) 1000 or more

3. Information requested for:

- ☐ (A) Business applications
- ☐ (B) Home applications

4. Reason for inquiring:

- ☐ (1) Plan to buy–next 3 months
- ☐ (2) Plan to buy–4-6 months
- ☐ (3) Plan to buy–7-12 months
- ☐ (4) Plan to buy–beyond 12 months
- ☐ (5) Reference only

5. For how many IBM PCs and compatibles do you buy products? (Include both company and personal units, please.)

- ☐ (A) 1
- ☐ (B) 2-4
- ☐ (C) 5-9
- ☐ (D) 10 or more

6. How much do you expect to spend in the next 12 months for peripherals and other add-ons?

- ☐ Less than $250
- ☐ $250-$499
- ☐ $500-$999
- ☐ $1000 or more

7. How much do you plan to spend in the next 12 months for software?

- ☐ Less than $250
- ☐ $250-$499
- ☐ $500-$999
- ☐ $1000 or more

8. How much do you plan to spend in the next 12 months for personal computers?

- ☐ (1) Less than $2500
- ☐ (2) $2500-$4999
- ☐ (3) $5000-$9999
- ☐ (4) $10,000 or more

☐ Please bill me $29.90 for a 1-year (12-issue) subscription to *PC World* (U.S. and Canada only). **4BMW5**

Valid through 10/6/86 W July 86

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10

1	2	3	4	5	6	7	8	9	10	11	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	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264
265	266	267	268	269	270	271	272	273	274	275	276
277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312
313	314	315	316	317	318	319	320	321	322	323	324
325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348
349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372
373	374	375	376	377	378	379	380	381	382	383	384
385	386	387	388	389	390	391	392	393	394	395	396
397	398	399	400	401	402	403	404	405	406	407	408
409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441	442	443	444
445	446	447	448	449	450	451	452	453	454	455	456
457	458	459	460	461	462	463	464	465	466	467	468
469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492
493	494	495	496	497	498	499	500	501	502	503	504
505	506	507	508	509	510	511	512	513	514	515	516
517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550	551	552
553	554	555	556	557	558	559	560	561	562	563	564
565	566	567	568	569	570	571	572	573	574	575	576
577	578	579	580	581	582	583	584	585	586	587	588
589	590	591	592	593	594	595	596	597	598	599	600
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	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	951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970	971	972
973	974	975	976	977	978	979	980	981	982	983	984
985	986	987	988	989	990	991	992	993	994	995	996
997	998	999	1000								

Complete this card, fold, seal with tape (please do not staple), apply postage, and mail. Manufacturers will mail you literature directly, free of charge.

PC WORLD

Free Product Information Service

Just return the card–
to get more facts on the products that interest you!

(Fold on this line)

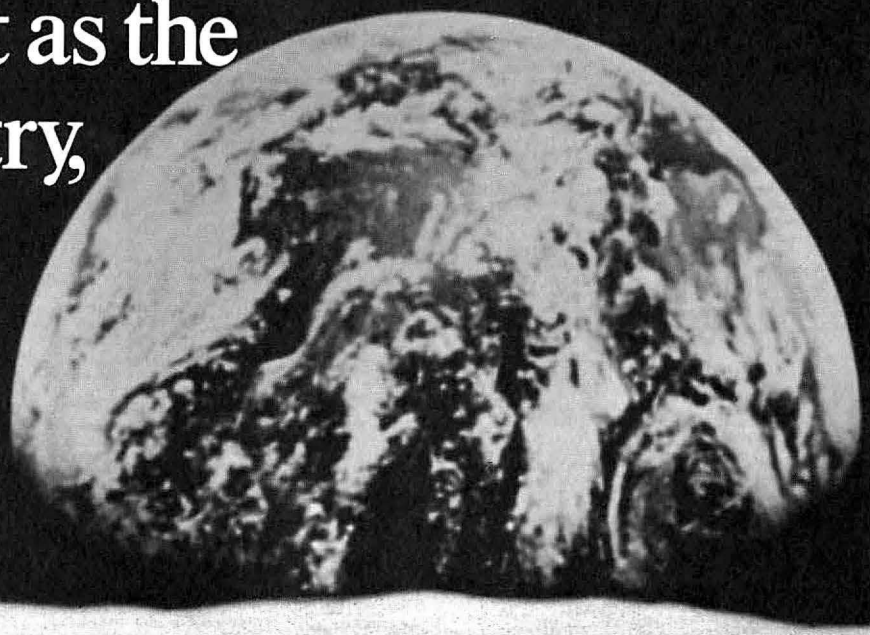
PLACE
FIRST-CLASS
POSTAGE HERE.

(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP.)

PC WORLD

Product Information Service
P.O. Box 92843
Rochester, NY 14692

If the space program had advanced as fast as the computer industry, this might be the view from your office.



And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost $486,840.22 in 1946 dollars. Today a $2,000 kneetop portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of the computers sold in the next two years will equal that of all the computers sold from the beginning to now. Four years from now it will have doubled again.

It's hard to remember that this is science fact, not fiction. How do people keep pace with change like this? That's where we come in. We're CW Communications Inc.—the world's largest publisher of computer-related newspapers and magazines.

Every month, over 9,000,000 people read one or more of our publications

Nobody reaches more computer-involved people around the world than we do. And nobody covers as many markets. In the United States we publish three computer/business journals. Micro Marketworld, for businesses selling small computers and software. On Communications, the monthly publication covering the evolving communications scene. And Computerworld, the newsweekly for the computer community, is the largest specialized business publication of any kind in this country.

We also offer seven personal computer publications. InfoWorld, the personal computer weekly, is a general interest magazine for all personal computer users.

The other six are monthly magazines that concentrate on specific microcomputer systems. PC World, the comprehensive guide to IBM personal computers and compatibles. inCider, the Apple II journal. Macworld, the Macintosh magazine. 80 Micro, the magazine for TRS-80 users. HOT CoCo, the magazine for TRS-80 Color Computer and MC-10 users. And RUN, the Commodore 64 & VIC-20 magazine.

And we have similar publications in every major computer market in the world. Our network of more than 55 periodicals serves 25 countries. Argentina, Australia, Brazil, Canada, Chile, Denmark, Finland, France, Greece, India, Italy, Japan, Korea, Mexico, The Netherlands, Norway, People's Republic of China, Saudi Arabia, Southeast Asia, South Africa, Spain, Sweden, United Kingdom, United States, and West Germany.

The sooner we hear from you, the sooner you'll hear from our readers

Simply put, we'll make it easy for you to reach your target audience—and for them to reach you. Call today for more information. You'll find the number below.

CW COMMUNICATIONS/INC.
375 Cochituate Road, Box 880
Framingham, MA 01701 (617) 879-0700

FOURTH ANNUAL PC EXPO IN

SEE 400 EXHIBITORS

PC EXPO is your one opportunity to visit, talk and conduct business solely about IBM PC-compatibles with these and other four-star exhibitors:

AST RESEARCH, INC. • AT&T INFORMATION SERVICES • ADACOM CORPORATION • AIRMOLD • ALLOY COMPUTER PRODUCTS • ALTOS COMPUTER SYSTEMS, INC. • AMERICAN PROGRAMMER'S GUILD • ANCHOR PAD INTERNATIONAL, INC. • ANDERSON SOFT-TEACH • ANEX TECHNOLOGY, INC. • APPLIED TECHNOLOGY ASSOCIATES, INC. • AUTODESK INC. • AVECO COMPUTER SERVICE • BASF SYSTEMS CORP. • BANYAN SYSTEMS INC. • BEAMAN PORTER, INC. • BELL & HOWELL/QUINTAR DIVISION • BLACK BOX CORP. • BLUE LION SOFTWARE • BREAKTHROUGH SOFTWARE CORP. • BROTHER INTERNATIONAL CORP. • BYTEL CORPORATION • CANON • CDEX CORP. • CDI SYSTEMS, INC. • CIE TERMINALS • CMP PUBLICATIONS • CPT CORPORATION • CXI, INC. • C.W. COMMUNICATIONS, INC. • CAHNERS PUBLISHING • CENTER FOR ADVANCED DATA PROCESSING • CHASE TECHNOLOGIES INC. • CHUBB INSTITUTE FOR COMPUTER TECHNOLOGY • CITIBANK/DIRECT ACCESS • CITIZEN AMERICA CORPORATION • COMMUNICATIONS RESEARCH GROUP, INC. • COMPUCOVERS • COMPUTER ASSOCIATES • THE COMPUTER CLASSROOM • THE COMPUTER CONSULTING CENTER • COMPUTER APPLICATIONS LEARNING CENTER • COMPUTER CENTER • COMPUTER EXPERT • COMPUTER LIVING • COMPUTER MAINTENANCE CORP. • COMPUTER PERIPHERALS, INC. • COMPUTER RETAIL NEWS • COMPUTERPREP, INC. • COMPUTER SYSTEMS NEWS • COMPUTERWORLD • CONOGRAPHIC CORP. • CONSUMER EDUCATION TRAINING • CONTROL DATA • CORDATA • CORE TECHNOLOGIES INC. • CORVUS • CULLINET SOFTWARE INC. • DATA ACCESS CORP. • DATA CLEAN • DAYNA COMMUNICATION • DATAPRO RESEARCH • DECISION RESOURCES, INC. • DELTA TECHNOLOGY INTERNATIONAL • DICONIX • DIDAK • DIGITAL COMMUNICATIONS ASSOCIATES • DIGITAL PRODUCTS • DIRECT•AID, INC. • DIRECT INC. • DIVERSIFIED INFORMATION SERVICES, INC. • DRIVE PHONE • DUNCAN-ATWELL COMPUTERIZED TECHNOLOGIES • DYNAX, INC. • EXEC•U•STAT INC. • EAGLE COMPUTER • EASTMAN KODAK COMPANY • EDUTRENDS, INC. • EMERY WORLDWIDE • ENERTRONICS RESEARCH, INC. • EPSON • EVEREX SYSTEMS, INC. • EXTENDED APPLICATIONS INC. • EXTENDED SYSTEMS INC. • FIFTH GENERATION SYSTEMS • FISCHER INNIS SYSTEMS CORP. • FOGLE COMPUTING CORP. • FORTE COMMUNICATIONS • FOUNTAIN TECHNOLOGIES INC. • FOX RESEARCH INC. • GENERAL PARAMETRICS CORP. • GENERAL POWER SYSTEMS • GENERAL TECHNOLOGY, INC. • GENOA SYSTEMS CORPORATION • GOULD INC. • GRAPHIC COMMUNICATIONS • GRID SYSTEMS CORP. • GULFSTREAM MICRO SYSTEMS • HAUPPAUGE COMPUTER WORKS, INC. • HANDIC SOFTWARE • HAYES MICROCOMPUTER PRODUCTS • HITACHI SALES CORP. OF AMERICA • IBM CORP. • IMSI, INC. • IMUNELEC INC. • IRWIN MAGNETICS, INC. • IVY COMPUTER SYSTEMS • ITT INFORMATION SYSTEMS • INFORMATIONWEEK • INFORMATION BUILDERS • INNOVATIVE TECHNOLOGIES • INS/INTEGRATED NETWORK SYSTEM • INTEL CORPORATION • INTERDYNE SYSTEMS • IOMEGA CORP. • JACOBS COMPUTER SERVICES • JUKI OFFICE MACHINE CORP. • KAMERMAN LABS • KLS INC. • KEY TRONIC • KIMTRON CORPORATION • KRAFT SYSTEMS • KURZWEIL AI • KURZWEIL COMPUTER PRODUCTS, INC. • LEADING EDGE PRODUCTS, INC. • LEXISOFT INC. • LIFETREE SOFTWARE • LOTUS DEVELOPMENT CORP. • MARC SOFTWARE INTERNATIONAL • MANNESMANN TALLY • MANSFIELD SOFTWARE GROUP • MANUFACTURERS HANOVER • MARTIN MARIETTA DATA SYSTEMS/ITSOFTWARE • MATRIX INSTRUMENTS • McCORMACK & DODGE • MCI MAIL • MEMOREX, MEDIA PRODUCTS GROUP • MICROCOMPUTER MANAGERS ASSOCIATION • MICRO DATA BASE SYSTEMS, INC. • MECA/MICRO EDUCATION CORP. OF AMERICA • MICRO RENTALS • MICROCONCEPTS INC. • MICROPRO INTERNATIONAL INC. • MICROVIDEO LEARNING SYSTEMS • MICRORIM, INC. • MICROSOFT CORP. • MICROSTUF, INC. • MICROVITEC, INC. • MINDSOFT • MINI-MICRO SYSTEMS • MINITAB, INC. • MITSUBISHI ELECTRONICS AMERICA, INC. • MOUNTAIN COMPUTER • MSR CORP. • NEC INFORMATION SYSTEMS • N/HANCE SYSTEMS • NYPC • NATIONAL MEMORY SYSTEMS CORP. • NESTAR SYSTEMS, INC. • NETWORK DEVELOPMENT CORP. • NEW YORK TELEPHONE • NORTH EDGE SOFTWARE CORP. • NOVELL, INC. • OFFICIAL AIRLINE GUIDES • • OMNIOFFICES • OASYS/OFFICE AUTOMATION SYSTEMS, INC. • OFFICE SOLUTIONS • OCLI/OPTICAL COATING LAB, INC. • OTC OUTPUT TECHNOLOGY CORP. • PC EXCHANGE • PC EXECUTIVE TRAINING CENTER • PC MAGAZINE • PC PRODUCTS • PC WEEK • PC WORLD • PARA SYSTEMS, INC. • PARAMETER DRIVEN SOFTWARE • PEOPLE & TECHNOLOGY • PERCOM DATA CORP. • PHILIPS INFORMATION SYSTEMS, INC. • PIVAR COMPUTING SERVICES • POLAROID • PRIAM • PRIMAGES INC. • PRIMAVERA SYSTEMS • PRINCETON GRAPHIC SYSTEMS • PRINTRONIX, INC. • QUADRAM CORP. • QUE CORP. • QUINTAR • QUME • RT/KATEK COMPUTER SERVICE • RACET COMPATS • RACORE CORPORATION • RIBNER B.F. INC. • REPLITECH • ROLAND DG • ROMULUS PRODUCTIONS, INC. • RUBBERMAID COMMERCIAL PRODUCTS INC. • SAS INSTITUTE INC. • SAMNA CORPORATION • SANYO BUSINESS SYSTEMS CORP. • SATELLITE SOFTWARE INTERNATIONAL • SCITOR CORP. • SHARP ELECTRONICS CORP. • SMALL COMPUTER CO., INC. • SOFTKEY SOFTWARE PRODUCTS, INC. • SOFTEST INC. • THE SOFTWARE BOTTLING COMPANY OF NY • SOFTWARE NEWS • SOFTWARE SOLUTIONS, INC. • SOFTWARE SYNERGY, INC. • SORBUS, A BELL ATLANTIC CO. • SOURCE EDP • SOUTHERN COMPUTER SYSTEMS, INC. • SPECTRAFAX, CORP. • SPECTRUM HOLOBYTE • STANHOPE ASSOCIATES INC. • STAR MICRONICS, INC. • STB SYSTEMS, INC. • STRATEGIC LOCATIONS PLANNING • STRATEGIC SOFTWARE PLANNING CORP. • STSC, INC. • SYSGEN INCORPORATED • TAVA U.S.A. INC. • TACTICAL COMPUTER CONSULTANTS, INC. • TALLGRASS TECHNOLOGIES CORP. • TANDY CORPORATION • TATUNG COMPANY • TEAMMATE DIV. DATA TECHNOLOGY • TECHLAND SYSTEMS, INC. • TECMAR • TELEVIDEO SYSTEMS, INC. • TELEBYTE TECHNOLOGY, INC. • THE SOFTWARE GROUP • TIARA COMMUNICATIONS SYSTEMS, INC. • TORI CORPORATION • TOSHIBA AMERICA, INC. • TSENG LABORATORIES, INC. • UNISOURCE SOFTWARE CORP. • UNIVATION INC. • UPPER BOUND MICRO COMPUTERS, INC. • VICTORY ENTERPRISES TECHNOLOGY INC. • VIDEO BILLBOARD • W.R. GRACE & CO. • WANG LABORATORIES • WATERLOO MICROSYSTEMS INC. • WELCOM SOFTWARE TECHNOLOGY • WESTERN COMPUTER • WESTERN DIGITAL • WESTMINSTER SOFTWARE • WYSE TECHNOLOGY • XEBEC • ZAKI CORPORATION • ZENITH DATA SYSTEMS • ZIFF-DAVIS PUBLISHING CO.

FREE SEMINAR SERIES

Wednesday, July 9, 11:00-11:50, Room A
PC EXPO Keynote Address
Wednesday, July 9, 12:00-12:50, Room A
Compatibility Issues in Enhancement Products
Wednesday, July 9, 12:00-12:50, Room C
Personal Computer Training in Corporate America
Wednesday, July 9, 12:00-12:50, Room D
The Information Center—A Case History
Wednesday, July 9, 12:00-12:50, Room E
Avoiding Computer Nightmares
Wednesday, July 9, 1:00-2:50, Room A
Site Licensing Panel
Wednesday, July 9, 1:00-1:50, Room C
Multi-Processor Micro-Systems Challenge Minicomputers
Wednesday, July 9, 1:00-2:50, Room D
The Direct-Sales Dilemma
Wednesday, July 9, 1:00-1:50, Room E
Purchasing Decisions Using LAN Standards and Benchmarks
Wednesday, July 9, 1:30-3:30, Room B
A Technical Presentation by IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements
Wednesday, July 9, 2:00-2:50, Room C
Microcomputer Service and Repair
Wednesday, July 9, 2:00-2:50, Room E
Managing Personal Computing: What's Hot, What's Not
Wednesday, July 9, 3:00-4:30, Room A
Graphics: What's Now, What's Next
Wednesday, July 9, 3:00-4:30, Room C
Voice Recognition: Less Talk and More Action
Wednesday, July 9, 3:00-4:30, Room D
Choosing a Local Area Network: A Multi-Faceted Decision
Wednesday, July 9, 3:00-4:30, Room E
Issues and Alternatives of Micro-to-Mainframe Connections
Thursday, July 10, 10:00-12:30, Room B
A Technical Presentation by IBM (see Wed. July 9, 1:30)
Thursday, July 10, 11:00-12:50, Room A
Portable Computers: Solutions Finally Finding Application
Thursday, July 10, 11:00-11:50, Room C
The Role of Management in Securing Computer Systems
Thursday, July 10, 11:00-12:50, Room D
Migration Patch and Time Bombs
Thursday, July 10, 11:00-12:50, Room E
The Write Stuff: A Word processing Panel Discussion
Thursday, July 10, 12:00-12:50, Room C
Customized Microcomputer-Based Information Systems
Thursday, July 10, 1:00-2:50, Room A
Information Management for Corporate Decision Makers
Thursday, July 10, 1:00-1:50, Room C
The System/36 and Networked PCs: A Hands-On Comparison
Thursday, July 10, 1:00-2:50, Room D
Electronic Printing: A Demystifying Look at The Options
Thursday, July 10, 1:00-1:50, Room E
Forces of Change in the Microcomputer Industry
Thursday, July 10, 1:30-3:30, Room B
A Technical Presentation by IBM (see Wed. July 9, 1:30)
Thursday, July 10, 2:00-2:50, Room C
Automation of the System Development Process on the PC
Thursday, July 10, 2:00-2:50, Room E
Software Buying Plans of Corporate PC Users
Thursday, July 10, 3:00-4:30, Room A
Multi-User Systems and LANs: How They Fit Into a Company's Plans
Thursday, July 10, 3:00-4:30, Room C
Micro-to-Mainframe Communications: The Industry Catches Up
Thursday, July 10, 3:00-4:30, Room D
On-Line Meetings: A Telecommunications Application With a Competitive Edge
Thursday, July 10, 3:00-4:30, Room E
Project Management Using Microcomputers
Friday, July 10, 10:30-12:30, Room B
A Technical Presentation by IBM (see Wed. July 9, 1:30)
Friday, July 11, 11:00-11:50, Room A
Graphics In Word Processing and Database Applications
Friday, July 11, 11:00-12:50, Room C
Presentation on the State of the Industry
Friday, July 11, 11:00-11:50, Room D
Corporate Training: An Integrated Approach
Friday, July 11, 11:00-11:50, Room E
Office Automation from the Bottom Up
Friday, July 11, 12:00-12:50, Room A
Computer Contracts—Upgrades, Support, and Service
Friday, July 11, 12:00-12:50, Room D
PCs and Expert Systems: Costs/Benefits
Friday, July 11, 12:00-12:50, Room E
Handling Dissimilar Data Using a Chart of Accounts
Friday, July 11, 1:00-2:20, Room A
What Makes an Information Center Tick?
Friday, July 11, 1:00-1:50, Room C
Computer Security: Is Your System Safe and Sound?
Friday, July 11, 1:00-2:20, Room D
LANs: Assessing User Needs
Friday, July 11, 1:00-2:20, Room E
Micro-to-Minicomputer Communications: An Overview
Friday, July 11, 2:30-4:00, Room A
Beyond Keyboard Entry: Options in Data Input
Friday, July 11, 2:30-4:00, Room C
CAD/CAM, Candidly
Friday, July 11, 2:30-4:00, Room D
Memory Storage: Past Dreams/Future Visions
Friday, July 11, 2:30-4:00, Room E
The Revolution in PC Publishing

NEW YORK

JULY 9-11, 1986

Jacob K. Javits Convention Center of New York

The biggest trade show and conference ever for corporate buyers and resellers of PC-compatibles!

PC EXPO is For You,
If you buy or influence the purchase, management or implementation of PC-compatible systems, hardware, software and services, or if you are a dealer, distributor or other "value adding" reseller, then you can't afford to miss this year's only opportunity to see what's new and what works in the PC-compatible industry.

PC EXPO is Big,
Five New York City square blocks of PC-compatible exhibits all come under one roof at the stunning new Jacob K. Javits Convention Center of New York this July! Meet more than 400 principal vendors who are waiting to talk to you "face-to-face" about your PC-compatible needs and purchases. PC EXPO exhibitors are prepared to provide you with everything you need to know in order to make informed buying decisions.

PC EXPO is Easy,
Past PC EXPO attendees know that they can learn more in one day at PC EXPO's free seminar and lecture series (more than 50 topics presented by industry experts) than they could after three months of research elsewhere. You'll be able to listen to what's hot and timely in today's market presented in plain and practical terms at PC EXPO's free seminar and lecture series. 147 speakers! 74 hours!

More Good News,
PC EXPO is designed to maximize buyer convenience—you don't have to weed out exhibits that have nothing to do with the PC-compatible market. PC EXPO is "pre-focused" to match your needs and provides you with the ease of "salon-buying" rather than the havoc of fighting with crowds of non-buying literature hounds and hackers found at other industry events. You will have the time to get the attention you deserve from PC EXPO exhibitors.

Save your valuable time and Money! Register Now! We'll send you a complete program for your conference planning.

Hours : 10 a.m. - 5 p.m.

FOURTH ANNUAL PC EXPO IN NEW YORK ADVANCE REGISTRATION

NAME
BUSINESS TITLE
COMPANY
COMPANY ADDRESS
CITY STATE
MAIL STOP (if any) ZIP
TELEPHONE - -

Use one form per person. Photocopy if necessary.

JACOB K. JAVITS CONVENTION CENTER JULY 9-11 1986

PC EXPO

PC EXPO attendees must be qualified. Please check one box only in *each* of Fields I and III or Fields II and III. (Minors may not register.)

TRADE RESELLERS—YOUR COMPANY'S MAIN BUSINESS ACTIVITY

I
1 ☐ Computer consultant
2 ☐ Computer dealer/dist.
3 ☐ Computer OEM
4 ☐ Office products dealer
5 ☐ Service vendor
6 ☐ Software developer
7 ☐ Systems house
8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify) _____

CORPORATE VOLUME BUYERS—YOUR COMPANY'S MAIN BUSINESS ACTIVITY

II
A ☐ Accounting firm
B ☐ Advertising
C ☐ Banking
D ☐ Communications
E ☐ Construction/Architects
F ☐ Credit
G ☐ Education
H ☐ Engineering
I ☐ Government/Military
J ☐ Hospital
K ☐ Hotel
L ☐ Industrial design
M ☐ Insurance
N ☐ Law office
O ☐ Management consultant
P ☐ Manufacturing
Q ☐ Publishing
R ☐ Real estate
S ☐ Research/ Development
T ☐ Retail sales
U ☐ Securities broker
V ☐ Transportation (all)
W ☐ Utility
X ☐ Wholesale/Retail sales
Y ☐ Other specify _____

YOUR JOB FUNCTION (Check main one only)

III
AA ☐ Accountant
BB ☐ Administrator
CC ☐ Consultant
DD ☐ Corporate officer
EE ☐ Creative arts (all)
FF ☐ Designer (all)
GG ☐ DP/WP manager/ operator
HH ☐ Engineer (all)
II ☐ MIS Dir./Mgr.
JJ ☐ Programmer
KK ☐ Purchasing
LL ☐ Sales/marketing
MM ☐ Scientist
NN ☐ Securities financial analyst
OO ☐ Service technician
PP ☐ Systems analyst
QQ ☐ Other (specify) _____

Save Money and Time! Register by Mail

☐ 1 day $20 — Date must be given here _____

☐ 2 or 3 days — $40
(On-site registrations are $25 for 1 day, $50 for 2 or 3 days.)

MAIL ORDERS must be received by PC EXPO no later than June 19, in which case your show badge will be mailed to you on or before June 25. Mail orders received after June 19 will be processed and the badge held for arrival under the individual's name at the "Will Call" desk in the show lobby. Registration fees must be in U.S. funds. All foreign mail orders, except Canada, must be received by June 9, and such badges will not be sent by return mail, but held at the "Will Call" window for pick-up on arrival. All registrations are non-refundable.

Mail check payable to PC EXPO with completed registration form to: PC EXPO, P.O. Box 1026, Englewood Cliffs, NJ 07632-2705.

PC World Directory

PC World Directory *is a comprehensive listing, by category, of products and services for the IBM PC, look-alikes, and compatibles. It provides rapid access to the burgeoning PC marketplace for both readers and advertisers.*

FORMAT: *The standard format includes a product ID, a 300-character descriptive ad, and company name, address, and telephone number.*

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the PC World Directory *for increased exposure at low cost.*

RATES: *Listings are accepted for three-time consecutive insertions at a rate of $975 ($325 per issue). We offer a six-time insertion, 15 percent discount contract for a total of $1626 ($271 per issue). Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, VISA, and MasterCard are acceptable.*

DEADLINE: *For copy deadlines, contact a* PC World Directory *sales representative at 415/861-3861 or 800/435-7766 (nat'l), 800/435-7760 (CA). Please send copy and prepayment to* PC World Directory, *555 De Haro St., San Francisco, CA 94107.*

Accessories

Computer Forms

Lowest Price Guaranteed!
Now you can make your BEST deal on any stock or custom printed computer paper product. THAT'S RIGHT! If you see a lower price advertised in any current catalog or publication, "WE'LL BEAT THAT LOWER PRICE BY 10%." Call or send for our FREE fully illustrated computer paper catalog. Top quality, premium papers. 100% Satisfaction Guaranteed. Visa/MC. *Datasource Computer Forms, 171 Florida St., Farmingdale, NY 11735, 800/643-9090 (Nat'l), 516/752-8088 (NYS)*

Supplies

Ribbons
Wholesale Prices. Call collect! All new for all printers. Diablo II: $42.65/dz • Epson MX-100: $67.50/dz • Qume SprintV: $27.60/dz • Okidata 93: $23.25/dz • TRS-80: $57.80/dz • Wang 5: $42.90/dz. Also Commodore, Mannesmann Talley, Facit, TI 850/855, NEC Pinwriter, NCR 2140, Star Micronics, & all others. *BDP (Bargains Delivered Promptly), P.O. Box 1330, Fair Lawn, NJ 07410, 201/791-0226*

Assembly Language

Free 8088 Tutor Monitor
Learn 8088 assembly language using the new book, *IBM PC-8088 Assembly Language Programming*, by Richard E. Haskell. Order the book for $25 plus $3 s/h & get the powerful TUTOR monitor software *free*. Load & examine any disk file, disassemble any 8088 code, debug EXE files. Satisfaction guaranteed. *REHI Books, 54 N. Adams #130-W, Rochester Hills, MI 48063, 313/853-1941*

Bar Code

Bar Code Printing
Programs $49-$299 to print labels, catalogs, pages of bar codes and/or large graphics chs on PC with Epson/Oki/IBM printers. Bar Codes 39, I 2of5, UPC, MSI, AIAG, GSA, DOD-LOGMARS. Ten sizes of large graphics letters up to 1". Programs print from disk data files. Menu-driven, assembly-language speed. Also bar code subroutines for MS/Lattice C, BASIC, MS-COBOL, Clipper, TurboPas, Pascal/FORTRAN, dB3+. *Worthington Data Solutions. See our ad under Bar Code Readers*

Bar Code Readers
Readers attach in parallel with keyboard. Transparent to PC & *all* software—no slot. $595 for PC/XT/AT, AT&T, ITT, Tandy, Zenith, Ld'g Edge, Sperry, etc. Other models for Mac, IBM 3178, 3278, 3180, 5251, 5291, & Serial Trm. Options: Badge Readers, Laser Readers, 16 readers/port. Cigar-sized 2 oz. portable readers $325. *Worthington Data Solutions, 130 Crespi Court, Santa Cruz, CA 95060, 408/458-9938*

Data Input Devices
TPS provides Bar Code & Magnetic Stripe Readers for simple installation on IBM PC, AT, 3161, 3163, & 3180 terminals, as well as many other microcomputers & terminals. No card slot or RS-232 port is required, & the readers are transparent to all software. Bar Code Printing Program $50 w/reader purchase. *TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833*

Low Cost Reader
For PC/XT/ATs & compatibles. Features: rugged stainless steel wand, non-contact scanner option, auto discrimination among all major bar code symbols, exceptionally high first read rate, menu-driven support software. BCR-1000 list price $485. Call for attractive quantity/dealer discounts. *Seagull Scientific Systems, 601 University Ave. #150, Sacramento, CA 95825, 916/485-7320*

Books

DOS Shell Kit
Non-technical, 100 pg. tutorial helps you use DOS to assemble a menu-driven, automated & organized file structure on hard disks. Disk version has prewritten files. Also covers batch files, key assignments, file protection, etc. Supplements DOS manual to version 3.2. By author & *PC World* writer Tom Sheldon. Bk: $12; Disk & Bk: $25. $1.50 s/h. Visa/MC. *Sheldon Publishing, 789 Casiano Dr., Santa Barbara, CA 93105, 805/687-0865/964-2480*

WordStar in English I
Simple memory codes help you master *WordStar* and *MailMerge* in a few hours. A great reference with 184 pages full of practical examples. Saves time & money for anyone writing letters, charts, envelopes, mailing labels, or form letters. Block moves & IBM special keys fully explained. Order your copy today. Send $12.95 or MC/Visa to: *English I Computer Tutorials, 1617 N. Troy St., Dept. B, Chicago, IL 60647, 312/489-1588*

LaserJet Unlimited
The definitive guide to the LaserJet and LaserJet Plus. Find out how to create manuals, forms, worksheets, mailing labels, envelopes, math symbols, music scores, foreign languages, logos, drawings, bar codes, and fancy fonts. $24.95 plus $3.50 s/h. CA residents add 6.5% tax. Check/M.O./Visa/MC. *Peachpit Press, 2110 Marin Ave., Berkeley, CA 94707, 415/524-0184*

Consultants

California

ASCii

Let our qualified consulting staff provide you with the following services:

- Develop custom data base & "C" applications
- Mainframe/micro integration
- Local Area Networks
- Word Processing
- Data Conversion
- Hardware & Software Installation

ASCii, Suite A-308, 417 Associated Rd., Brea, CA 92621, 714/671-2244

What Do You Do

when there is no off-the-shelf solution to your problem? Call us! We specialize in tailor-made programming.

- We provide design, programming, consulting & documentation services
- We write data base software: accounting, order entry, mailing list mgmt. & more
- Experts in *dBASE II, III*
- 20+ yrs computer experience
- Free brochure

Call or write: *David Jenkins, Midway Software Inc., 1609 Bancroft Way, Berkeley, CA 94703, 415/644-2369*

CompuSult

Now you can be assured that a qualified computer technician is available to speak with you about your computing questions. CompuSult is a computer consultant's agency. We can provide you with a specialized computer consultant who will zero in on your computing requirements & describe them to you in plain English. *CompuSult, 808 N. Kenter Ave., Los Angeles, CA 90049, 213/472-2568, 415/924-7027 (No. CA)*

Contracts

For Entrepreneurs

Legal forms for hardware/software developers. Employee agreement, non-disclosure form, contracts for sale (hardware and/or software), consulting, development, hardware/software maintenance, non-competition, copyright notices, software licenses, project delivery & more. Complete, documented, modifiable. $50. *Waters Publishing, 8235 Douglas #1000, Dallas, TX 75225, 800/628-2828, ext. 539*

Data Conversion

Don't Rekey-Convert!

We use the latest disk, tape, scanning, & telecommunications technology to reformat data. *Quickly & Accurately. Usually at one tenth your current cost.* We transfer data between word processors, typesetters, micros, minis, mainframes, & software packages. Full range of consulting services includes Data Customization & Data Base Development. *Data Conversion Laboratory, 67-27 168 St., Fresh Meadows, NY 11365, 718/939-4921*

Full Spectrum

of Data Conversion Services

- Quick Turnaround
- Highly Professional
- Disk or Tape Conversions
- DisplayWriter, Wang, IBM PC & Hundreds of Other Formats

Computer Systems Services, Inc., 5 East 16th St., New York, NY 10003, 212/242-5255

Disk Copy Service

Duplication Solutions

We have the answer to your software duplication needs, no matter what your volume. We supply autoloaders, disks & technical support. We provide duplication; technical assistance with copy protection, serialization & proprietary formats; package assembly & distributive shipping. *MegaSoft, Inc., P.O. Box 710, Freehold, NJ 07728, 800/222-0490, 201/462-7628*

BLANKET SERVICES

- Diskette duplication
- Packaging
- Stocking/Drop Shipping

Place a BLANKET ORDER *with releases as you need them for any quantity at a fixed price*

- 48-hour delivery
- SUPERLOK copy protection
- Lifetime guarantee
- No "mastering" charge
- No charge for standard labels

Star-Byte, Inc., A Div. of Robinson-Halpern Co., 2564 Industry Lane, Norristoun, PA 19403, 800/243-1515, 215/539-4300

Hardware

Add-on Boards

256K & Clock: $99.95!

U.S.-made Turner Hall Card comes with 256K RAM installed & clock/calendar with battery back-up. Even beginners can install. Free software includes print spooler & RAM disk emulator. Designed for IBM PC, XT, Portable PC & Compaq. Fits in short slot (only 5 inches long). 30-day money back guarantee. *Turner Hall Publishing, 10201 Torre Ave., Cupertino, CA 95014, 800/556-1234, ext. 526; 800/441-2345, ext. 526 (CA)*

BIOS

Fixed Disk BIOS/Boot

FiXT boots from most popular Hard Disks–DAVONG, TECMAR, IOMEGA, GT LAKES, etc. Adds XT-like BIOS interface to your disk for PC. Security, multiple volumes, removable media support optional. No-slot plug-in installation. Specify controller & computer with order. $80-$110 + $3 shpg, CA tax. *Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349*

Memory Upgrade

640K on MotherBoard

Now for IBM PC, too! 640K upgrade on *Mother Board!* Does not use an expansion slot. *For IBM XT, PC & Compaq Port. only!* Easy insertion of 256K chips on system board. Highly reliable due to reduced heat & chip count. 100% compatible. 30 day $ back gtd. Compaq upgrade: $29; $99 w/ memory. IBM XT: $39/$109. IBM PC: $59/$129. $4 s/h. Site discount. *Aristo, 16811 El Camino Real, 213-J, Houston, TX 77058, 713/480-6288, 800/3ARISTO*

768K of No-Slot PC RAM

We install 768K of RAM on your IBM-PC1 or PC2 system board. 768K installed w/3-month warranty–$350; 768K IBM w/no down time motherboard exchange–$388 (requires deposit); DO-IT-YOURSELF-KITS: 640K XT KIT–$115 (NO SOLDERING), 768K-PC1 or PC2 KIT–$250 (REQUIRES SOLDERING), add $7 Kits, $12 syst/bds. s/h. *Add-MEM, 22151 Redwood Rd., Castro Valley, CA 94546, 415/886-5443*

Security

Secure AT/XT/PC

Control system access, data access! FiXT/S controls system boot for most popular XT/PC hard disk controllers. Vfeature for AT & XT–compatible HD controllers segments hard disk by volumes, controls access with passwords, supports hard disk expansion. $80-$95 + $3 shpg, CA tax. *Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349*

Storage Devices

CP/M & 1.2MB on PC
With MULTI-DISK & UniForm-PC use 3.5, 5.25 & 8-inch single & double density CP/M formats as DOS diskettes on your IBM PC or XT. Many MS-DOS formats supported including IBM AT, HP-150 & Data General 1. Over 200 formats. Both MULTI-DISK & UniForm-PC $225. Drives & adapter cables available. *P S Engineering, P.O. Box 51068, San Jose, CA 95151-5068, 800/369-2398; 800/423-7171 (CA)*

Insurance

Safeware
If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media & purchased software. As little as $39 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 a.m. to 8 p.m. Mon. thru Fri. Call Sat. 9 a.m. to 5 p.m. *Safeware, The Insurance Agency Inc., 2929 North High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469 (Nat'l), 614/262-0559 (OH)*

Data Security Insurance
The "all risk" Personal Computer Policy from DSI includes essential coverages not available with other policies: protection against loss of data (even from accidental erasure), loss of custom programs, & fraud. Especially intended for business computers. Coverage can be bound by telephone, 9 to 4 Mountain Time. *Data Security Insurance, 4800 Riverbend Rd., P.O. Box 9003, Boulder, CO 80301, 303/442-0900, 800/621-8385, ext. 494*

Leasing/Rental

IBM • Compaq • Apple
Quick delivery throughout U.S. All configurations. Excellent selection of peripherals including laser printers. Attractive rates and flexible terms. Rent from 1 month to 3 years. Purchase options available. Credit cards accepted. Offices in L.A., Phoenix, Dallas, Minneapolis. *Use 'r Computers, Inc., 5929 Baker Rd., Minnetonka, MN 55345, 800/624-2480, 612/938-1100*

Mailing Lists

IBM Mailing Lists
Now over 1,500,000 computer owners. Select from 311K Apple, 315K IBM + PCjr, Mac & many others. 8 phone verified reseller lists including 6,026 stores + VARs, chains, etc.: 40,000 UNIX users. 16,000 computer companies. Schools, specialty lists . . . over 50 lists total. Call/write for free catalog. Indicate phone & type of business. *Irv Brechner, Targeted Marketing Inc., Box 5125, Ridgewood, NJ 07451, 201/445-7196*

IBM PC Mailing Lists
IBM PC end users, business users, VARs, retailers, etc. Geographic sorts with a fast turnaround & low minimum order. *Foothill Marketing, P.O. Box S-3464, Carmel, CA 93921, 408/373-8373*

Software

Accounting

Open Systems, Inc.
- Open Systems™ Accounting Software–a powerful multi-user line of 15 modules for any business need.
- Harmony™ Integrated Business Software–7 accounting/productivity applications for a total business solution.
- Open For Business™ I & II–entry-level accounting solutions for DOS & the Macintosh.

Open Systems, Inc., 6477 City West Parkway, Eden Prairie, MN 55344, 800/328-2276

Joe Lynn's Payroll
Complete menu-driven user-friendly payroll. Calculates FWT, SWT, FICA, 4 misc. deductions. Prints paychecks, W2s, 941. Hourly & salary, manual or automatic. IBM PC & most compatibles. $49.95 + $3 shipping. Visa/MC/chk. 30 day money back guarantee. *Joe Lynn Computer Services, 23501 W. Gagne Lane, Plainfield, IL 60544, 800/243-8563, 815/436-4477*

Myte Myke™ Business Sys
Commercial grade, integrated business application software. Order Entry, Inventory Control, Sales Analysis, Accounts Receivable, Accounts Payable, General Ledger, Purchase Orders. Pro-Time–time & billing. Install & support avail. PC-DOS, MS-DOS, NOVELL Networks, XENIX & UNIX. *M & D Systems, Inc., 3885 N. Buffalo Rd., Orchard Park, NY 14127, 716/662-6611*

Fixed Assets System
CFAAS™ is a powerful tool for fixed assets accounting which calculates separate financial & tax depreciation using all standard methods. Easy to learn & simple to use, it edit checks for tax code compliance & prepares tax worksheets. Demo disk $35, complete program $695. Visa/MC. *Comprehensive Microsystems, Inc., 609 Fifth Ave., Safford, AZ 85546, 602/428-7225*

MIP Fund Accounting
The MIP Fund Accounting System meets the financial & managerial reporting requirements of not-for-profit & governmental organizations. Modules offered: G/L, A/P, A/R, Payroll, Encumbrance, Expenditure Budget, Revenue Budget & Lotus/dBASE Interface. MIP FAS is available for IBM XT/AT. *Micro Information Products, 6300 La Calma #100, Austin, TX 78752, 800/647-3863*

CPA Review, CPE Credits
CPA Review with Pass or Refund Program. CPE Hours. Diagnostics for CIA, CMA, CPA exams. Personnel Evaluator. Recruitment. IBM PCs or compatibles. Individual, office & college packages available. Advanced Software for Advancing Accountants. *MicroMash, P.O. Box 6512, Huntsville, TX 77340, 800/241-9700, 409/295-1597 (TX)*

$25 Business System
Integrated accounting (GL/AR/AP/OE/INV/PO/PR). Phone support available. Manuals on disk (500+ pages). Free Spreadsheet & Word Processor included. 8-disk set $25 + $4 p/h. 90-day money back guarantee. (Programmers: High royalties paid for software that fits our low cost/high volume format–send for details). *Dollarware, P.O. Box 17116, Salt Lake City, UT 84117)*

Backup Utilities

Copy II PC Option Board
Makes floppy backups of virtually all protected software for the IBM (except those "protected" by physical disk damage) quickly & easily. Works on IBM PC/XT/AT, Compaq Deskpro & Portable, Zenith 150, 151, 158, 256K Tandy 1000, new AT&Ts. Extra $15 cable required for Compaq Portable & Tandy 1000. All require 1 360K drive & full slot. Just $95! *Central Point Software, Inc., 9700 SW Capitol Hwy. #100, Portland, OR 97219, 503/244-5782*

Business Applications

Linear Programming
MINI-MAX ($395) is saving a copper refiner $10,000 a month. "It's extremely easy to use," says an investment counselor in Oakland, CA. See how linear programming can boost your profits. The demo disk ($35) includes a Beginner's Guide and 70-page manual with 7 examples from business & industry. *Agricultural Software Consultants, P. O. Box 32, Dept. P, Kingsville, TX 78363, 512/595-1937. Telex 757375*

dBASE II/III Software

- GENERAL LEDGER
  Integrates w/departmental accounting
- dINVOICER
  Billing & A/R
- SALES ANALYSIS
  Works with dInvoicer
- JOB COSTING
  For Contractors
- JOB ESTIMATING
  Works with Job Cost

ONLY $99 each including source code. MC/Visa/Chk/COD. *dATAMAR Systems, 1152 Albion St., San Diego, CA 92106, 619/584-2727*

BILLPRO

A menu-driven system that easily prepares invoices on the IBM PC screen. Includes: INVOICING, INVENTORY, & A/R. Item inventory & invoice subtotals automatically updated. Auto retrieval of "Bill To" & "Ship To" addresses, cursor driven corrections, 14 pricing columns per inventory item.

Complete Package:	$395
Invoicing Alone:	$165
Demo Diskette:	$15

Digitan Systems Inc., 5007 16th Ave., Brooklyn, NY 11204, 718/436-3777

TSA88-Transportation

Solves problems with 510 origins and/or destinations. Fully menu-driven, spreadsheet style display, Transportation Simplex Algorithm start/restart options, primal & dual solutions, sensitivity analyses, report generator, storage of problems & solutions, user's guide & examples. $99. *Eastern Software Products, P.O. Box 15328, Alexandria, VA 22309, 703/549-5469*

Resident Calculator

d*Jinn*^{cal}–A PC and compatible memory resident, pop-up calculator. Operates in 7 modes: standard, scientific, financial, statistical, date, interest rate conversion, and print-tape (for hard copy). HELPs plus 55-page manual, Works with *1-2-3, SideKick*, etc. $25 + $4 s/h. Visa/MC. *d'Jinni Software, Ltd., Box 818-W, 810 W. Broadway, Vancouver, BC V5Z 4C9 Canada, 604/682-2669 (ext. 105)*

Business/Home

MoneyCounts™ 3.1

Control your cash w/our COMPLETE MONEY MANAGEMENT SYSTEM. Includes: checking, savings & credit card mgt, budgeting, financial statements, graphics, financial data base w/multiple inquiry levels, special reports, pop-up calculator, tutorial & on-line help screens. Simplifies tax prep. Great for home/small business. $ back gtd. Only $69.95. Visa/MC. *Free brochure. Parsons Technology, 6925 Surrey Dr. NE, Cedar Rapids, IA 52402, 319/373-0197*

PC-Checkbook

Quick & easy to use. No more hassel keeping your checkbook balanced. PC-CHECKBOOK is loaded with the best features. CHECKING: Auto Balancing, Check Editing, Analysis Report & Auto Filing. PRINT LISTING: Checkbook, Selective & Screen. HELP MENUS: POP-UP prompters, Hi-lighted & full-screen menus. For all these features & more send $29.95, chk/MC/Visa. *DEB/SOFT Applications, P.O. Box 35398, Houston, TX 77235, 713/729-2362*

Calendar

Time-Keeper (Calendar)

A calendar/scheduler featuring a weekly or monthly graphic display: multiple calendars, conference locating, copy or move appts. within or between calendars, search, tickler reminder, print selected appts., on-line help, user configuration files. PC/XT/AT or compatible. 192K PC-DOS 2.0. Mono/color–any printer. $195. Demo–$15. *DuraSoft, 7210 Washington Ave., New Orleans, LA 70125, 504/486-6081*

dCALENDAR™

The ultimate dedicated full-screen calendar/scheduler. Business or personal. Prints weekly, monthly, yearly calendars. Add, copy, delete, edit, reschedule events. On-line help, user configuration files. Print schedules by dates or event symbols. PC/XT/AT & compatibles. 256K DOS 2.0+. Any monitor, printer. A real value at $39.95 MC/Visa/chk. *Computer Affirmed Technology Corp., P.O. Box 12406, Lexington, KY 40583, 606/272-7306*

Checking

LEDGER DOMAIN™ 2.1

Rave reviews from users for feature-packed, menu-driven checking system for *1-2-3* & *Symphony*. Latest version. Prints checks, one-key entry of bills, auto reconciliation. Entry sorting & extraction by dates, check numbers, categories, more. Simple, intuitive, powerful. Req. Lotus *1-2-3* v.1a (320K), rel.2 (384K), or *Symphony* (448K). $49.95. MC/Visa. *Richard Rapfogel, Ph.D., 6219 Washington, St. Louis, MO 63130, 800/222-4747, ext. 3001; 314/727-6343*

Church Applications

Parish Data System™

Comprehensive church program, menu-driven, extremely easy to operate. Family, Member, Financial info & all reports integrated into one package. Ability to get selective listings, mailing labels; contribution, tuition statements; personalized letters. User able to create own reports & letters. $950. *Parish Data Systems, Inc., 3140 N. 51st Ave., Phoenix, AZ 85031, 602/247-3341*

PowerChurch Plus!™

Church office software–fast, friendly & reliable, suits any denomination. Membership, mailing, contributions, accounting, attendance plus 7 other modules integrated into one high performance system. Interfaces to *dBASE III*, Lotus & word processors. Unlimited capacity. Just $495. Demo $10. Details: *F1 Software, P.O. Box 3096, Beverly Hills, CA 90212, 213/464-0625*

Romar Church Systems™

Membership—61 fields plus alternate address; labels, letters, reports any field(s). Offering—256 funds; optional pledge; statements; post to 255x/year. Finance—G/L with budget; up to 500 sub-totals & 99 depts: month & YTD reports anytime for any month. Size 2000 people/floppy; 25000/10 meg. Ad too short! Write! *Romar Church Systems, Attn: CCP, P.O. Box 4211, Elkhart, IN 46514, 219/262-2188*

Collectors

"THE COLLECTOR"™

Organize your collectibles (stamps, coins, dolls, antiques, trains, you name it) all on one disk. Single disk holds up to 4000 items. Has unlimited capacity. Sorts alph/numeric with cost/cur val at touch of key. For PC/PCjr/XT/AT or similar (128K-DOS 2.0+). Write/Call for free brochure, or $65 + $3 s/h. Visa/MC. *The Third Rail, P.O. Box 143, O'Fallon, IL 62269, 618/632-7424*

Communications

Computer-Telex-Link

Use your computer for telex communications! Replace that old telex machine with your PC & Cawthon's Computer-Telex-Link. Save Money! Save Time! Increase Productivity! Cawthon's Telex-Link is easy to install & easy to use. Since 1978 Cawthon has been linking computers to U.S. & overseas telex services. Many satisfied customers. Excellent support. *Cawthon Scientific Group, 24224 Michigan Ave., Dearborn, MI 48124, 313/565-4000. Telex: 4970016 CAWTHON*

Bulletin Board Special

- IDEA-TREE–Our acclaimed multiple-topic system. Offers public & private message areas each with file transfer capability, Xmodem, data base, DOS interface & more. Powerful; easy to operate! $89
- PC-DATE-matchmaking sys: $69
- On-line BBS demo at 206/932-7125. Visa/MC.

Protosoft, P.O. Box 16756, Seattle, WA 98116, 206/932-5310

Construction

The Construction System
Job cost accounting system for construction; fully integrated with accounts payable, general ledger, payroll, accounts receivable. Complete self training course included. Sold through dealers who provide local support. Over 1500 satisfied users. Runs on IBM PC/XT or AT. Networking available. Contact: *Software Shop Systems, P.O. Box 728, Farmingdale, NJ 07727, 800/554-9865, 201/938-3200 (NJ)*

Cross-Referencing

EASYINDEX PLUS™
Write a book or program, create a print ready index by page number or cross reference by file name. Unlimited number of indexes & accessed files. Can index single words or phrases up to 59 characters. Performs typesetting, print formatting, & table of contents generation. Supports over 100 printers. $39.95 + $3 shipping. (CA residents add $2.60 tax). *Foreman Software, 977 Clayton St. D3, San Francisco, CA 94117, 415/665-6414*

Culinary Arts

$3 Gets You Cooking!
Diskette Cookbook Series–VANILLA® publishes 25 popular printed cookbooks transcribed to disk. Search, scale & print recipes from 1000s available. Hard disk search supported. Create your own cookbooks. No user manual needed. jr/PC/XT/AT/compatible. Software $40; most cookbooks $12. Demo $3. Free catalog. *Vanilla Software, 3345 Lakeshore Ave., Dept. W, Oakland, CA 94610, 415/482-4756*

Cursor Control

New–Cruise Control™
Increase cursor speed. Stop annoying cursor run-on. Repeat any key without having to hold it down. Time/Date stamping. Turn off screen from keyboard, or after time delay. Compatible with: *1-2-3, Symphony, dBASE III, Framework, WS-2000, MS-Word, WordPerfect, Q&A, DisplayWrite III, Reflex, Lightning, SideKick, Ready, ProKey,* & most others. $29.95 + $3.50 s/h. Check/MC/Visa/AmEx. *Revolution Software, Inc., 715 Route 10 East, Randolph, NJ 07869, 201/366-4445*

Data Base Compilers

FREE dBASE Compiler
Evaluation Kit includes: demo disk with 14 PRG, 5 FMT, 6 FRM, & the results of compiling them with WordTech & Clipper. Also complete reprints of 6 magazine reviews of both compilers including 16 benchmark tests. Also detailed brochures with all features & limitations of both. FREE. No obligation. Call 24 hours. *dataBASE Specialties, P.O. Box 2975, Oakland, CA 94618, 415/652-2790*

Data Entry

Data Entry Emulator
Heads-down data entry for PCs will allow fast & accurate preparation of batch data files. Features: auto-dup, two-pass verification, constants, format chaining, table lookups, range checks, batch totals, 129 keyboard option, & much more. Easy formatting in minutes. 30-day trial period. Only $395. *Computer Keyes, 21929 Makah Rd., Woodway, WA 98020, 206/776-6443*

Entrypoint
Most widely installed data entry system for PC/XT/AT. Heads-down speed, sophisticated multi-screen applications. Features: paint the screen form design, data validation, table & file lookups, Help keys, logic processing, reformatting, batch totals, verification, 129 KB remapping & more. Demo $30, Operator $545, Developer $845. Volume pricing. *Datalex, 650 5th St., San Francisco, CA 94107, 800/962-8888, 415/541-0780*

RODE/PC Data Entry
Top-rated PC data entry software. Fastest & easiest to use. Extensive features to meet every data entry requirement. Standalone & LAN versions. High-speed data entry keyboard available. Demo version includes all programs & documentation: $40 (+$5 shipping, CA add tax) creditable to full version for 30 days. *DPX, Inc., 20823 Stevens Creek Blvd., CI-C, Cupertino, CA 95014, 408/973-9292, TELEX 701111*

Data Management

Wilkes Data Base
For IBM-PC and compatibles: Paint screens to create/view/update/delete/sort/search/print/reformat/arithmetically manipulate new or extant files. ASCII, 16/32 bit integer & 32/64 bit floating point storage. Powerful key sort & report formatting. $325. Demo $40. *Wilkes Software, 5231 Longwood Dr., Memphis, TN 38134, 901/386-4712*

Data Mgt. Environment

The Andsor Collection™
Unique concept: creates complete, self-contained, window-based data management environment, in one DOS file. Simplifies everything. Combine functions to create your own solutions in any application: calculations, database management, modeling, text processing, charts, data analysis, statistics, reports, labels, forms, presentations, etc. Simple enough for a PCjr, sophisticated enough for a PC AT.
SEE ALSO THE AD BELOW

The Andsor Collection™
From simple calculations, files, inquiries, to complex models, data structures, reports. Superb 400-page hard-cover manual, with many examples. U.S. $95 + $5 s/h. 60-day money-back guarantee. Visa/MC/AmEx/Chk/MO/COD. Call or write now to order. IBM PC/XT/AT/PCjr, 128K, one drive or hard disk, monochrome and/or color, DOS 2.0+. Not copy-protected. *Andsor Research Inc., 181 University Ave. #1202, Toronto, Ontario M5H 3M7 Canada, 416/364-8423*

dBASE III Catalogue & Search

Multikey Boolean Search
GENERAL-PURPOSE system for cataloguing keyword abstracts. One keyword field, 1st chr = category. FAST single-index search method. Queries driven by lists of keywords. List types: MATCH, NON-MATCH, >= and <=. Satisfy ALL lists or ANY. Encode keywords into 2,3 bytes. SOURCE CODE. $49 + $3.50 s/h. *Tom Lewinson, Thinker's Apprentice, 392 Central Park W., Apt. 12X, NYC, NY 10025, 212/222-5050*

Development

MK
Program Maintenance Utility. End errors caused by forgetting to compile a module. Let MK build it for you. Based on the UNIX Make utility. With extensions for MS-DOS. For IBM XT, AT & compatibles running DOS 2.01 or later. $80 for a 5¼" DSDD diskette with documentation. Send chk/MO to: *Eggplant Software Tools, P.O. Box 3531, New Haven, CT 06525, 203/389-8680*

Development Tools

BASIC or "C"

BASIC Development Tools
- Screen Builder Sys.
- B-Plus Tree Sub-Sys.
- Help Message Sys.
- Pop-Up Windows

all four for $89

BlackStar "C" Function Lib.
- Over 200 Functions
- For Microsoft V.3/Lattice
- Complete Source Code
- Demos & User Manual

Limited Time offer $79
Order Hot-Line 800/7Castle
Sterling Castle, 702 Washington St. #174, Marina Del Rey, CA 90292, 213/306-3020

Menus/Compiled BASIC

Generate user-friendly menus in color with one CALL from your compiled BASIC program. Features include horizontal bounce bar, 2-line HELP by menu choice, menu headings, letter/number choices, box around choices. Returns choice number to your program. No royalty/not copy protected. $39.95 + s/h. *GOLDATA Computer Services, Inc., 2 Bryn Mawr Ave., Bryn Mawr, PA 19010, 800/432-3267, 215/525-1036*

PC/VAX Development

Avocet's Macro Assemblers & Software Simulator/Debuggers let you develop software on your PC for virtually any microprocessor. EPROM Programmers, In-circuit Emulators & other tools help you complete the job. For PC-DOS/MS-DOS, VAX-UNIX; most popular disk formats available. $299 & up. *Avocet Systems, Inc., P.O. Box 490, Rockport, ME 04856, 800/448-8500, 207/236-9055*

Edit

Lil' Jake

"The WORLD'S GREATEST Editor" say users of Lil' Jake. We're so sure you'll like it, we'll send you a copy for a FREE 60-day evaluation. Using an unfriendly mainframe lookalike? Disappointed with your editor's performance? Wondering if there's something better? CALL NOW! IBM PC/compatibles. $49.95 + s/h. *Fooks Mathewson Company, P.O. Box 2424 (Oper-31), Arlington, VA 22202, 703/684-8284*

Educational

PC-Pilot

Language for education & training. Now offered also by IBM as IBM Pilot. Support for color, graphics, fonts, windows, files, video control. We offer upgrades, advanced feature library ($300), tutorial ($125), authoring prompter. Single use license ($200) & unlimited campus/site license ($2000). 20% ed. discount. *Washington Computer Services, 3028 Silvern Lane, Bellingham, WA 98226, 206/734-8248*

Tutor or Test Maker

STUDENTS: Learning a foreign language? POLYGLOT tutor can be used to make word lists & take a variety of quizzes. POLYGLOT & manual $24.95 + CA tax. (DEMO disk $2.50).
TEACHERS: Use TESTMAKER to compile question files & make tests. Use for any subject. TESTMAKER & manual $24.95 + CA tax. *Alchemy Software, P.O. Box 1057, Aptos, CA 95001, 408/688-6252*

Engineering

Structural Design

Fast, highly interactive, integrated programs for structural analysis & design of BEAMS, COLUMNS, TRUSSES & FRAMES of any material. Easily mastered programs result in dramatic time savings while producing efficient, accurate designs. Specify PC, XT or AT & send $25 for demonstration disk to: *C-Squared B-Squared Software Design, Inc., Dept. A-1, 763 27th Ave., San Francisco, CA 94121, 800/621-0851, ext. 330, 415/751-1337*

Eng./Sci. Graphics

Engineering/scientific graphics. *OMNIPLOT [S]* (screen graphics) & *OMNIPLOT [P]* (plotter driver) provide integrated eng./sci. 2D & 3D graphics w/NO PROGRAMMING! Menu-driven, flexible, professional. Choice of formats: tabular/line, contour, 3D wireframe & more! *OMNIPLOT [S]*: $195. Add [P]: both $295. *Microcompatibles, 301 Prelude Dr., Silver Spring, MD 20901, 301/593-0683*

Simulation

GPSS/PC is a full-power version of GPSS, the most popular mainframe simulation language. Using GPSS/PC it is possible to predict the effects of managerial or engineering decisions on complex real-world systems. More than just a language, it is a simulation environment specifically designed for interactive use on today's high-speed microprocessors. *Minuteman Software, P.O. Box 171/W, Stow, MA 01775-0171, 800/223-1430, 617/897-5662*

Entertainment

John Wayne's Films

A Complete Compilation for 1-2-3. (152 films chronicle the Duke's career). Sort & Extract fields include film name, year, filmographer, director, cast, role ... & more. Keep the Duke's legend alive with your PC for $14.95 plus $2 s/h, Visa/MC/chk. Available for IBM PC & compatibles. *CompuList, P.O. Box 893, Staunton, VA 24401*

Estate Planning

Will-Planner™

Use your PC to write a personalized will! Educational, easy to use program; powerful dictionary function; info on probate & using lawyers. Create typed will/trust document, asset inventory & estate tax estimate. Save money! Written by lawyers for non-lawyers. For IBM PC & comp. $79.95 copy protected, $129 unprotected (+ $4 postage, $8 foreign). Will-Planner™ by *Noetic Technologies Corp., P.O. Box 3085, Englewood, CO 80155, orders & info 303/770-2380, 8:30 am —4:30 pm*

File Utility

For Your Eyes Only™

Password protect your private files on floppy or hard disk. Our Advanced Data Encryption Algorithm (ADEA) alters each byte from 5 to 103 times in a single run! Faster & more powerful than DES. HIDE/UNHIDE files & make files UNERASABLE. Includes $50 of free software & 160-pg manual. Only $54.95. *GREBAR, P.O. Box 2926, Winnipeg, Manitoba R3C 4B5 Canada, 204/942-3301*

Financial

IRRworks™ $25

Attention anyone using a spreadsheet for IRR's!
- Full screen menu & pop-up windows make IRR & PV simple
- Fast computation, up to 360 uneven periods
- Easy input: steps, % growth, replication
- Automatic rate conversion
- DATES AND FRACTIONAL PERIODS!
- Name, save cases & case mgt.

256K, color/mono, 30-day $ back guar., $25 + $5 s/h + NY tax; chk/Visa/MC. *Keep It Simple Software, Inc., 580 5th Ave., New York, NY 10036, 800/848-8909*

Flow Charting

Flow Charting II Is Here

The latest advance from specialists Patton & Patton. Create, edit, store, update both process-flow & organizational charts simply, accurately, professionally. Uses 120 or 200-column work area, prints on 8½" or 14" paper. IBM mouse utility available. Many user features save time & motion. *Patton & Patton, 340 Lassenpark Circle, San Jose, CA 95136, 800/538-8157, ext. 897 (nat), 800/672-3470, ext. 897 (CA)*

Gambling

CrapsMaster
Learn the fast, exciting game of casino craps at your own pace! Test strategies without risk, learn the house odds.
- Graphic display of table
- Graphic display of bets and your chip stack
- Try all popular bets
- Includes "odds" bets for best strategy
- Manual includes house odds, bet strategies
- PC/XT/AT w/graphics

$40 chk/MO ppd. U.S.A. *Hitech Management Corp., P.O. Box 2121, Boca Raton, FL 33433, 305/392-3678*

Games

CYBRON™
Significant advance in computer bridge. Bidding convention options. Computer bids and plays any desired position(s). Random and special deals (game score, slam hands, notrump, past score, 2-bid, specific contract, user input/stored hand). Undo, re-deal, re-bid, re-play, play out, claim, concede, hint, help keys. Super display, many more options. IBM PC 256K. $125. *Alurus™, Dept. B, P.O. Box 6310, Falls Church, VA 22046, 800/437-5200, oper. 251, 703/532-3355*

Genealogy

Family Reunion 3.1
Pedigree charts, family group sheets, descendant charts, birthday charts, address labels, histories, surname indexes, searches, worksheets, user defined fields, exciting screens, logical design, virtually unlimited capacity, & MUCH MORE! IBM PC or compatibles. 256K. DOS 2.0 or above. $155. MC/Visa/AmEx welcome. *Personal Software Company, 1580 East Dawn Dr., Salt Lake City, UT 84121, 801/943-6908*

ROOTS II™
Powerful organizer for family historical info. Lightning fast searches & sorts. Print camera-ready paginated books with pedigree, descendant & ahnentafel charts, family group sheets, text & index. Display maps w/graph adapter. Any PC or compatible. Satisfaction guaranteed. $195 (+ tax in CA). *COMMSOFT, 2257 Old Middlefield Way, Ste. B, Mountain View, CA 94043, 415/967-1900*

Graphics

Grafmatic/Plotmatic
Grafmatic (screen graphics): 70 MS FORTRAN/Pascal (3.2, 3.3) IBM 2.0, PROFORT callable graphics routines. 100-page user manual. General utility, 2D interactive, total 2D plot support, 3D plots & solid models. $135. HP, HI plotter? Try Plotmatic for complete plotter capabilities–use with GRAFMATIC $135. Both $240. *Microcompatibles, 301 Prelude Dr., Silver Spring, MD 20901, 301/593-0683*

HALO
The most powerful library of subroutines under MS-DOS. Extensive functions include point, line, arc, circle, ellipse, hatch styles, pattern fills, clipping, dithering, world coordinates, image compression, multiple viewports, rubberband mode, etc. Compatible with multiple devices & languages. *Media Cybernetics, Inc., 8484 Georgia Ave. #200, Silver Spring, MD 20910, 301/495-3305*

35mm Slide From Your PC
COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into brilliant 35mm color slides with color resolution 400% better than your monitor. Leave your printouts behind. Use high-resolution color slides (up to 4000 line) at your next presentation. COMPUTER SLIDE EXPRESS $9/slide. *Visual Horizons, 180 Metro Park, Rochester, NY 14623, 716/424-5300*

MATC CAD for $99.95
The most powerful industrial-like 2-D CAD system available, for the IBM PC, XT, AT, or Apple II computers. MATC CAD is $99.95 (pre-paid)/system. The package, including instructional materials & technical support, is $395 (pre-paid). $99.95 for add. units. Qty. disc. available. Prices good thru 8/31/86. Visa/MC accepted. *MATC CAD, 1015 North Sixth St., Milwaukee, WI 53203, 414/278-6743*

Hard Disk Expansion

AT/XT HD Expansion
Replace hard disk with a bigger one, or add a second drive! Vfeature supports high-capacity drives on standard AT, XT, & compatible hard disk controllers. Includes multiple volumes, security features, selectable clusters, keyboard lock. $80 + $3 shipping, CA tax. *Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349*

Home Use

Shop Cheap–Eat Smart
- COUPONOMIZER–Save more money with your discount coupons & rebates. 64K.
- DIET ANALYZER–Lose those extra pounds! Tracks calories + 23 nutrients. Ideal for menu planning. 128K.

Immediate shipment, 2 week money back trial. $49.95 ea. + $2.50 s/h. AmEx/MC/Visa. Call for free brochure. *Natural Software Ltd., 7 Lake St. #7E, White Plains, NY 10603, 800/626-2511, 914/761-9329*

Inventory Control

Mr. QuarterMaster
Features: receipts & issues updating; inventory, reorder, usage and other reports; file maintenance; issue slips/invoices; reorder points adjusted automatically or manually. Price: $123. Manual alone with demo: $23. Specify stockroom or retail version. Also available: Sales reporting, pricing, and purchase order systems. *RJL Systems, 106 New Haven Avenue, Milford, CT 06460, 203/878-0376*

dFeller Inventory
A business inventory program written in *dBASE II* source code, so you can modify the program to fit your particular needs. The menu-driven program lets you locate items by inventory name or number. It keeps track of reorder points, vendors, average cost, & other information. List price, $150. Requires *dBASE II* or *dBASE III. Feller Associates, 550 CR PPA, Route 3, Ishpeming, MI 49849, 906/486-6024*

Land Surveys

L-PLOT
A metes & bounds program to plot & print a plat of any scale from virtually any legal description. Calculates area & error of closure, plots multiple tracts, saves to file & more. Versions available for Apple & IBM with graphics capability. Supports most dot matrix printers. Under $200. Call or write to: *LAN/SCAN, Inc., P.O. Box 6863, Abilene, TX 79608, 214/824-6419*

Laser Printer Utilities

Laser Forms & Graphics
IPRINT: Interactive forms & graphics design for laser & LCD printers. What You See Is What You Get. Use mouse or keyboard. Replace pre-printed forms & draw all your business graphics. Integrate WP output & graphics including PC Paint & LOTUS graphics. CANON, HP, IBM, NCR & other printers. Only $259! *Indigo Software, 1568 Carling Ave., Ottawa, Ontario K1Z 7M5 Canada, 613/728-0016, ext. 102*

Loans

LOAN Maker™
The Godfather of Loan Calculation & Amortization Programs. Instantly computes results on any change in Loan Parameters. Computes/makes amort schedules for Level, Specified Amt., & Decreasing Payments for any time period. Balloon Payments. Save/Recall/Delete schedules. Printer options. Superb manual. PC/XT/AT/compat. $89.95. Demo + manual, $20, credited on program. Visa/MC/AmEx/chk. *Powder River Properties, Ltd., 1510 Stone St., Falls City, NE 68355, 402/245-2029 (24 hr)*

Lotus

End NumLock Madness
Kursor software eliminates switching back & forth with the <NumLock> key. Kursor moves the cursor keys on your IBM PC, XT or AT to the function keys. Function keys are accessed by shift + function key. Speeds data entry & reduces errors. Regain control of your ten keypad for only $35. *Kursor Software Company, 1340 West Irving Park #126, Chicago, IL 60613*

Macro UtilitEase™
COPY PROTECT your spreadsheets. BATCH PRINT from disk. Compose macros with a MACRO GENERATOR. Multi font printing simplified. Macro UtilitEase *includes 16 easy-to-use utilities* that advance the Lotus programmer into the next generation of creativity. *1-2-3* 1A & 2, *Symphony* 1.0 & 1.1 compatible. Send $49.95. Visa/MC/AmEx. *Newman Consultants, P.O. Box 2050, Laguna Hills, CA 92654, 714/458-7766*

Mail List Programs

Pony Express XL 2000
For commercial & large lists. Fast machine code multisort. Prints labels 1-5 across, single line or user-defined format. Also CHESHIRE FORMAT. Records selected by user-defined codes, zips or zip ranges. Auto repeat for ease of record entry, corrections & deletions. Phone list option. Includes full function word processor. Merges w/most other word processors. $238. *Computech, 975 Forest Ave., Lakewood, NJ 08701, 201/364-3005*

Label Master–$49
All menu-driven & easy to use. 65,000 record capacity. Autosorts by last name, ZIP, & user-assigned codes. Prints labels (1-4 across), Rolodex cards, envelopes, hard-copy lists, etc. Finds duplicates. Many powerful features. Ideal for small & large businesses. User's Manual. 10 day free trial. Fact sheet available. Visa/MC/chk. *EMMA Inc., 5230 Navaho Dr., P.O. Box 11259, Alexandria, VA 22312, 703/941-0604*

FlowMail–$100
Create/Name, separate files. Merge files. Eliminate Dups. Sort by company, name, zip, state, or data line. Select records by zip, data line, or user-defined codes. Print labels 1,3,4 across. Report format listing. Very easy to use. Free demo disk. Carrier route system available for bulk mailers w/HD. Call TOLL FREE TODAY! *FLOWSOFT custom programming, 875 Franklin Rd. #1635, Marietta, GA 30067, 800/628-2828, ext. 886*

MY - T - MAILER™ $30
Our users love this sturdy menu-driven worker. Secretaries say "Terrific!" Print labels, 3 × 5 cards, envelopes, any format. Customize labels with line-by-line printer fonts. Sort, Search & Select with powerful, flexible, easy user-interface. EZ Browse, Edit & Delete. Print up to 5000 copies of one label. PCjr too! Requires 128K. $30. *Johnson Software Company, P.O. Box 16507, Dept. 6, Seattle, WA 98116, 206/935-4861*

SUPER MAIL™ $25
This easy-to-use, powerful menu-driven program is used by thousands of happy customers. Find names in 1-2 secs.–no sorting. Features unlimited records & labels per name AND full screen editing. Select labels by zip or name. Password protection available. Take memos + more! Only $25. Call for details. Visa/MC. *Place Management Corp., 50-25 65th Place, Woodside, NY 11377, 718/651-6700*

Best Programs–try free
- Mail-Track-I with LetterMerge ($49.95) is our easiest program in use since 1982.
- Mail-Track-II with LetterMergeII ($95) is most flexible & powerful, allows up to 24 fields.
- Mail Bulk Rate II ($195) will presort your labels for 1st & 3rd class mail.

Write for free demo & catalog. *Sapana Micro Software, Dept. WCPI, 1305 So. Rouse, Pittsburg, KS 66762, 316/231-5023*

Third Class Mailer
Save time, postage & drudgery! Automatic USPS bulk sort with 5-digit & unique 3-digit discount check. Generates a label file with EMBEDDED BUNDLING & SACKING instructions. Calculates total & presort counts. PC/MS-DOS, ASCII & *dBASE III* files. File size limited only by disk space. $49. *MarketPro, 10113 Joerschke Dr. #2, Grass Valley, CA 95945, 916/477-0248*

Mailing Programs

Postage Saving Software
PostWare processes 1st, 2nd & 3rd Class mail according to U.S. Postal regulation to achieve the lowest postage rates:
- First Class-17¢
- Second Class-2.5¢
- Third Class-8.3¢, Nonpft-4.8¢

PostWare automatically adds carrier route numbers, sorts & prints addresses in package & sack/tray mailing order. Works w/ASCII files & many popular data bases. IBM PC/equiv. Demo avail. *PostalSoft, Inc., 515 Division St., La Crosse, WI 54601-4544, 800/831-MAIL(6245); 608/784-3500*

Manufacturing

TwinOaks mrp2
Real-time, mainframe-featured software for manufacturers. Highly modular, integrated system for B/M, inventory, purchasing, cost control, master scheduling, order tracking, shop floor control, material & capacity planning. For the 256K IBM PC/XT/AT with PC-DOS. Demo disk, IBM/COBOL source available. *TwinOaks Inc., Box 136, Cottage Grove, MN 55016, 612/458-1604*

Manufacturing Inventory
Integrated Inventory Control, Bills of Material, & Purchase Orders with direct accounting interface. Designed for small & medium-sized manufacturing firms. IBM PC/XT/AT version costs only $995. Special money-back guarantee. Explore MISys yourself & print sample reports using our demo ($5 ppd). *Microcomputer Specialists, Inc., 18 Lyman St., Westboro, MA 01581, 800/833-1500, 617/366-1200*

MFG. Control System
A comprehensive system for repetitive or job shop type manufacturers consisting of: B/M, Inventory, Order Processing, Purchasing, Mat. Req. Planning MRP, MPS, Shop Floor Ctrl. & CRP, Cost devel., Job & W/O Costing, Accounting. 1 yr. warranty included. Train & consult avail. Compare our system & prices for best value. *Production Systems Inc., 410 Macklyn Ave., Santa Rosa, CA 95405, 707/526-1294*

Myte Myke™ Mfg Control
Integrates with Business System. Std Cost provides Bill of Material, operations routing, where used, same as except & projection capabilities. Inv. Control, Forecast/Sched, MRP, MPP, Prod Cost, Prod Orders, Shop Floor Control. Install & support avail. PC-DOS, MS-DOS, NOVELL Networks, XENIX & UNIX. *M & D Systems, Inc., 3885 N. Buffalo Rd., Orchard Park, NY 14127, 716/662-6611*

Medical

Medical Systems w/ECS
All PPM products have electronic claims submission (ECS) to Medicare & commercial carriers, paper claims too.
*PC*CLAIM $89.95, claims only.
*PC*CLAIM w/ICD's, CPT's & HCPC codes $229.95.
*PC*CLAIM PLUS claims only w/patient file. Complete a claim in one minute $459.
Physicians Practice Management, 1810 South Lynhurst, Ste. Q, Indianapolis, IN 46241, 317/248-0357; 800/428-3515 (Nat'l); 800/792-3525 (IN)

Medical Systems w/ECS
*THRESHOLD™ $1,995 claims, A/R, patient billing. *THRESHOLD $3,995 claims, A/R, patient billing, complete practice management, statistics, analysis. *CLAIM*NET Nationwide claims clearinghouse. Full 100% credit on product upgrade. PC*CLAIM & PC*CLAIM PLUS both house 30-day money-back guarantees. IBM PC/XT/AT/compatibles, MS-DOS, 256K. *Physicians Practice Management, 1810 South Lynhurst, Ste. Q, Indianapolis, IN 46241, 317/248-0357; 800/428-3515 (Nat'l); 800/792-3525 (IN)*

Menu Systems

ScreenWorks™ $50
Awesome screen management!
- Full screen panel editor & designer
- Design your most complex screen in 10 min
- Supports C & Turbo Pascal
- Screen handler written in assembler as BIOS extension
- 50+ library routines give full control of screen, fields, colors & keybd.

Developer lic. avail., 256K all monitors, no snow, 30-day $ back guar., $50 + $5 s/h + NY tax, chk/Visa/MC. *Keep It Simple Software, Inc., 580 5th Ave., New York, NY 10036, 800/848-8909*

Music

SongWright III
Music Processor prints professional sheet music, including lyrics. Full-screen graphics editor. Transposes to any key; plays tunes. Features multiple staffs & voices, harmony, counterpoint, bass/treble, all time signatures. IBM, Epson or Gemini printers. Send $49.95 or write for free sample output. *SongWright, Cherry Creek Box 61107, Denver, CO 80206, 303/691-4573*

Nutrition

Diet and Exercise
Now you can plan & calculate a healthy diet & exercise program for you & your family. DIET WISE analyzes diets, recipes, & menus for 16 nutrients. ENERGY WISE calculates & tabulates calories used in your daily activities. Designed by dietitians. PC/MS-DOS. $39.95 to $120. Educational & Professional/versions available. *Nutritional Data Resources, P.O. Box 540 A, Willoughby, OH 44094, 216/951-6593*

Eat To Win™
Used by Dr. Robert Haas to analyze & construct diets for Martina Navratilova, Ivan Lendl, & many other world class athletes. Monitors diet & body weight over time. Comprehensive, versatile, easy-to-use, & very fast. IBM PC or compatible. $125. Visa/MC. 60-day money back guarantee. *Small Planet Systems Corp., P.O. Box 4011, Tallahassee, FL 32315, 904/224-9004*

Printing Industry

W / T ESTIMATOR
Designed by a printer to increase productivity, this program can save you hours of tedious calculations, & recalculations. Use your own rates & production standards to generate a detailed estimate in 10% of the time it takes manually. For information & a free demo diskette write to: *W / T Computer Systems, P.O. Box 205, Latham, NY 12110, or call 518/272-6650*

Professional Billing

TIMESLIPS™
Tracks time & expenses with pop-up "stopwatch" screens or time sheet posting. Creates professional bills: over 4000 formats with auto aging, project subtotaling, flat fee, retainer payments & more. Generates reports, graphs, pie charts, mailing labels & IRS log. User-definable screen & bill language allows use by all professions. Not copy protected. $99.95. *North Edge Software, P.O. Box 286, Hamilton, MA 01936; order: 800/225-5669, 617/468-7358*

Public Domain

$4.50 IBM PC Software
490 disks: $4.50 ea.
Arcade games, 4 disks $18.
Utilities, 4 disks $18.
1-2-3 WKS, 8 disks $36.
Directory, 2 disks $9.
"c" routines, 6 disks $27.
Turbo pascal routines, 8 disks $36.
Unprotect software, 4 disks $18.
Sample, word proc, DBMS, games & utilities, 5 disks $22.50. Catalog $1. Add $4 s/h. MC/Visa. *The Computer Room, P.O. Box 1596, Dept. 101, Gordonsville, VA 22942, 703/832-3341 (M-F 10-5)*

Public Domain
Gain access to thousands of useful IBM PC programs such as File & Word Processing, Utilities, Financial, Spreadsheets, Templates, Macros, Assemblers, Tutors, Arcade-quality games. Unerase & unprotect programs w/manuals & documentation right on the disks! Catalog, directory book & 3 disk set of program listings available: just $25 ppd! 3 minute info recording: 619/727-1015; free catalog: 619/941-0925 or SASE to: *National PD Library, 1533 Avohill, Vista, CA 92083*

Real Estate

Property Management +
A new easy-to-use system for single or MultiFamily properties. Print checks, rent statements & receipts reports—late rents, expired leases, vacancies, income/expenses & operating statements. Includes a bank reconciliation feature & graphics capabilities. Up to 70% reduction in management time. *Realty Software Co., 1926 S. Pacific Coast Hwy. #229 Redondo Beach, CA 90277, 213/372-9419*

Management & Analysis
"Real Property Management" $395 to $595, for apts., offices ... Records and budgets income/expenses by month/account/unit. No retyping of recurring monthly data. "Real Analyzer" $195 to $295 for detailed analysis of residential & commercial properties. Easy WHAT IF. PC/XT/jr. 30 day money back guarantee. Visa/MC. *Real-Comp Inc., P.O. Box 1263, Cupertino, CA 95015, 408/996-1160*

EZ-RE Investor Templates
Real Estate Investor Templates. Equity Share, Houses, Apartments, Warehouses, Office Bldgs. 10 year projection of cash flow, deduction, tax at sell, after tax IRR. Expenses, int., rent & apprec. adjustable annually. Mortgage types—ARM, FHA 245, amort, deferred int., int. only. Professional report. Req. *1-2-3*. $ back guar. $50 ppd. Visa/MC. *LB Associates, 8817 Skokie Lane, Vienna, VA 22180, 703/938-9093*

Property Managers
Two systems to match your exact property management needs. *Rental Manager* handles all tenant activities; features built-in general ledger. Flexibility allows multiple properties per owner. *Condo Manager* is designed for community associations. Handles member payments, charges, & generates accounting reports. *Coleman Business Systems, 3654 Arcadian Dr., Castro Valley, CA 94546, 415/581-7125*

Property Management
Comprehensive program for managing residential & commercial properties. Many management reports including operating statement, delinquent rent, lease expiration & transaction register. Provides check writing, check reconciliation, posting of late fees, recurring expenses-$395. Investment analysis-$245. *Yardi Systems, 3324 State St., Ste. "O", Santa Barbara, CA 93105, 805/687-4245*

Resort Property Mgmt.
RESORT PROPERTY MGMT. Menu-driven for ease of use. Designed for properties that rent on a daily, weekly, monthly basis. Automatic searching & booking of available units, check-in check-out listings, monthly/yearly owner statements, check printing, mailing labels, history file. Demo available. $895 plus COBOL *Run-Time. Contemporary Computer Services Inc., P.O. Box 3086, Atlantic Beach, NC 28512-3086, 919/247-3130*

HomeWorks™ $25
Attention realtors, lawyers, home-buyers, bankers!

- Compute mortgage payments & totals, any payment period
- Determine $ you can borrow
- Print detailed amortization schedules & yearly totals
- Name & save cases; simple case management

Full screen, windows, fast, 196K, color/mono, 30-day $ back guar., $25 + $5 s/h + NY tax, chk/Visa/MC. *Keep It Simple Software, Inc., 580 5th Ave., New York, NY 10036, 800/848-8909*

Report Writer

ACCESS: Report Writer
A Query & Report Writer for RM/COBOL applications. Powerful but easy to use. Quickly retrieves data, Sorts & prints Reports. Supports computed columns, control break, totals & sub-totals, report headings, mailing labels & cataloged reports. Bridges data to *1-2-3, Multiplan* & word processor. Only $149. *DCM Data Products, 1710 Two Tandy Center, Fort Worth, TX 76102, 817/870-2202*

Scientific

STATS: 1-2-3/Symphony
ADDaSTAT: Linear Regr (±95% limits or 3 LR lines/graph), 2 t-tests, Error Bars, anova, χ^2, more: 256K $80. MULTIFIT: Fourier Plot & Mult Regr: 256K $90. SYMPHONY version (both): 512K $160. All menu-driven load & transform data, print, graph, auto-significance & p-values. $5 s/h. Dealers invited. *ABACUS Scientific Software, 4521 Campus Dr. #111, Irvine, CA 92715, 714/786-6264.*

Sort

Opt-Tech Sort/Merge 3.0
Extremely fast Sort/Merge program. Run as a DOS command or Call as a subroutine. Many datatypes & filetypes supported including Btrieve & *dBASE*. Sort multiple files of unlimited size on multiple keys. Now featuring record selection, record reformatting & much more! Call or write for more info. $149. *Opt-Tech Data Processing, P.O. Box 678, Zephyr Cove, NV 89448, 702/588-3737*

Sortex
A flexible, general purpose select/sort/merge facility with the ultimate in performance & reliability. All the commonly used file & data types are supported. No practical limitations on the size or number of records & fields. $100 + $5 s/h with 10-day money-back guarantee (less $10 restocking fee). *Systemat Corporation, 19715 Gravina St., Rowland Heights, CA 91748, 714/594-9567*

Statistics

Statistician's Mace 2.00
A *full-feature* program. Calculate multiple regression, correlations, several ANOVAs, nonparametric tests, descriptive stats, data transformations & much more. Read data from keyboard or files created by spreadsheet, data base, WPs, etc. For IBM PC, XT, AT, PCjr & compatibles. Buy direct or from dealers. $255. *The MAtrix Calculating Engine (MACE) Inc., 2313 Center Ave., Madison, WI 53704, 608/244-3331*

BMDP Statistical Software
Professional statisticians have relied on BMDP for over 20 years. For XT/ATs, 29 programs to choose from, starting at $450 for 6. Featuring descriptive statistics, ANOVA, regression, time series, multivariate, nonparametric, cluster & survival analyses. Site licenses & free program info available. *BMDP Statistical Software, Inc., 1964 Westwood Blvd. #202, Los Angeles, CA 90025, 231/475-5700*

RATS!
RATS is a fast, accurate & comprehensive regression package with unsurpassed POWER. Has both time-series & cross section analysis. Includes Box-Jenkins, logit, & probit. Spectral analysis & graphics available as options. Requires 256K RAM, IBM PC or compatible. Base program: $200. MC/Visa. *VAR Econometrics, Inc., 134 Prospect Ave. S, Minneapolis, MN 55419, 612/822-9690*

P-STAT®
Combines data & file management, data display, statistics, report-writing & survey analysis capabilities in a single package. Full mainframe package runs on the PC/XT, PC/AT & compatibles. Online HELP & EDITOR. Reads DIF & ASCII files. Multiple copy & site licenses are available. *P-STAT Inc., 471 Wall St., P.O. Box AH, Princeton, NJ 08542, 609/924-9100*

NCSS-PC
Menu-driven. Multiple & stepwise regression. Up to 4-way ANOVA. Time Series, Discriminant, Principal Components, Cluster & Factor Analysis. Scatter plots. T-tests. Cross tabs. Nonparametrics. Spreadsheet input. Reads ASCII files. Sort, Join, Merge. $79. Visa/MC. 30 day money-back guarantee. *Number Cruncher Stat Systems, 865 East 400 North, Kaysville, UT 84037, 801/546-0445*

StatPlan II
Statistics software for IBM PC computers. Easiest to use program available. Complete range of statistics including cross tabs, ANOVA, correlation, curve fitting, multiple regression, etc. Detailed graphic & tabular output. Interfaces with Lotus, *dBASE III* & other DIF or ASCII files. Only $99! *The Futures Group, 76 Eastern Blvd., Glastonbury, CT 06033, 203/633-3501*

1-2-3 Statistics
Complete Statistical Package designed to process data from *1-2-3*; Menu-driven; T-Tests, Correlations, Cross-tabulation, Powerful Multiple Regression routine, ANOVA/ANCOVA (with Repeated Measures), Nonparametric Statistics, Bar graphs, Scatterplots; Super fast (8087 Support); for 256K PC; $149. *StatSoft, 2832 East 10th St. #4, Tulsa, OK 74104, 918/583-4149*

Statistics/Forecasting
Many statistics packages claim to be the most comprehensive, but consider the importance of quality service, prompt technical support & frequent updates. For the best support & best packages to meet your needs: StatPac, StatPac Gold, Forecast Plus & Goodness-of-Fit. Call for free brochures. *Walonick Associates, Inc., 6500 Nicollet Ave. S, Minneapolis, MN 55423, 800/328-4907*

Stock Market

A Steal!
Manage your portfolio like a professional with NET WORTH. New low price of just $49.95*. Capabilities & performance usually only found in systems costing hundreds of dollars more. Take advantage of our 30-day money-back guarantee or ask for our free brochure. For the IBM PC/XT/AT & compatibles with 256K. *$5 s/h chg. Visa/MC. *Bullish Investment Software, P.O. Box 853, Mansfield, TX 76063, 800/433-3605, 817/473-9249*

Survey

Do Surveys With Your PC
People Facts: *The Opinion Processor.* Find out what people think about your company, products, services. Create survey questionnaires, process results. Easy to use, all essential statistics. $395. Full-feature preview $25. Manuals with both. Call or write for details. *Shamrock Press, 1277 Garnet Ave. #206-P, San Diego, CA 92109, 619/272-3880*

The Survey System
A complete, easy-to-learn package for the entry, editing, processing & presentation of questionnaire data. Produces banner format crosstabs & related tables, statistics (incl. regression) & bar charts. Also codes & reports open-ends. All reports are camera-ready for professional presentations. *Creative Research Systems, 1649 Del Oro, Dept. W, Petaluma, CA 94952, 707/765-1001*

Terminal Emulation

VT-102 & 4010 Emulation
PC 102 turns an IBM PC/XT/AT/jr to a VT-102/100/52 terminal with printer/file transfer support. Optional: 132 col., 4010 graphics support. Guaranteed compatibility with all VT-100/52 applications including EDT, WORD11, All-In-One, DEC-CALC, & UNIX. Exceptionally easy to use. 3000+ sold. From $89. Visa/MC/COD. Call for free info package! *General Micro Systems, P.O. Box 5330, Hopkins, MN 55343, 612/944-0593*

A Family of Emulators!
Low-cost emulators for IBM PC/XT/AT/compatibles! *PC-100/220* ($59) emulates DEC VT100/220, *PC-4010/4014* ($99) emulates TEK 4010/4014, *PC-4105* ($299) emulates TEK 4105. Include support for:
- IBM CGA, EGA, Hercules, Tecmar cards
- KERMIT file transfer
- Store, recall, print, plot graphics utilities

ATC, 5711 Slauson Ave. #238, Culver City, CA 90230, 213/568-9119

VAX/PDP11 • IBM PC
DECkHAND Utilities: Dir, Copy, Delete, Rename, & Type with VAX/PDP11 like switches for dates, query, backup: $49. ZSTEMpc-VT100 with 132-column by windows. Double high/wide, smooth scroll, XMODEM & KERMIT. ISO & mapped color: $150. 4014 option with Zoom & Pan, Disk images, printer, plotter, & mouse support: $99. *KEA Systems Ltd., #412-2150 West Broadway, Vancouver, BC V6K 4L9 Canada, orders: 800/663-8702; support: 604/732-7411*

Thought Organizer

THOR™–Now $79.95
Record memos, letters, research notes, speeches, follow-ups, briefs, & appointments. Retrieve them instantly by category, time period, or matching text. THOR combines the free-format simplicity of a word processor w/the organizational power of a data base. Critically acclaimed in *PC World, PC, PC Products, Pers. Computing.* New ver. 1.9 includes disk tutorial. Chk/MC/Visa/AmEx; + $5 s/h. *Revolution Software, Inc., 715 Route 10 East, Randolph, NJ 07869, 201/366-4445*

Typesetting

Laser Fonts
H-P PLUS, CANON LBP-8 CORDATA LP-300 & NCR 6416 Laser Printers.
- FONTS ($50/disc) 4 to 24 pt. for some models. Over 200 available.
- FONTGEN, Release 3 ($250) *The* laser font editor. Visa/MC/COD

VS Software, P.O. Box 6158, Little Rock, AR 72216, 501/376-2083

User Supported

Great Software, Cheap
Only $5.95 per disk for absolutely smashing Freeware & Public Domain programs. PC-Outline, PC-Write, File Express, PC-Desk, TurboSpell, Poster/Banner plus utilities, data bases, educational programs, games & lots more! IBM PC, PCjr, or compatibles. Send for FREE CATALOG. *PLUS, 33495 Del Obispo #160P, Dana Point, CA 92629*

Utilities

Padlock/Padlock II Disks
PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS commands. $99. PADLOCK II disks come preformatted with fingerprint & serialization. PADLOCK II disks offer superior protection. Ask about our fast data encryption product. All work w/hard disk, EXE/COM files & all DOS versions. MC/Visa. *Glenco Engineering, 3920 Ridge Ave., Arlington Hts., IL 60004, 312/392-2492*

IBM Uses CP/M & Apple!
"The best CP/M to DOS converter" *PC* mag. 4/85. UniForm PC transfers files/formats/reads & writes DIRECTLY TO 100 CP/M disk formats on your IBM PC, XT, AT (also 96 TPI & 8"). Use normal DOS commands. $59.95 + $3 s/h. By Micro Solutions. NEW! MatchPoint card copies Apple DOS & CP/M files to IBM. BOTH products at $185 + $3 s/h. Dealers invited. *Blue Heron, 1108 S. Second St., DeKalb, IL 60115, 815/758-2355*

ZeroDisk
Run dozens of copy-protected business packages from your hard disk without floppies. Call for the latest list of software it handles. Needs IBM AT, XT, PC, or compatible, DOS 2.0 or higher. ZeroDisk is revised monthly & is not copy-protected. $75 US. Chk/credit cards accepted. *Quaid Software Limited, 45 Charles St. East, 3rd Floor, Toronto, Ontario M4Y 1S2 Canada, 416/961-8243*

Easy Laser Printer Setup!
SetHP or CanSet: Simple menu-driven and/or batch utilities allow full control over HP LaserJet or Canon printers. Supports ALL cartridges. Control margins, copy count, LPI, CPI, lines/page, etc. No ESC CODES! Network compatible. Over 150 commands. NEW SCREEN DUMP UTILITY w/SetHP. Only $49.95 + $4 s/h. Visa/MC/chk. *Orbit Enterprises, Inc., P.O. Box 2875-L, Glen Ellyn, IL 60138, 312/469-3405*

Path Command for Data
DPATH+ allows Lotus, *dBASE, WordStar,* etc. to read & write data files located in other directories. No more copying files from directory to directory! Uses hard disks, floppies, RAM disk, any combo. Allows "virtual disks," too. Requires only 4K. MS-DOS 2/3. $45 + $5 s/h. MD add 5%. Visa/MC/PO/chk. *Personal Business Solutions, P.O. Box 757, Dept. D, Frederick, MD 21701, 301/865-3376*

dirWorks™ $25
PC users: avoid DOS drudgery!
- Complete disk mgt. made easy: copy, erase & all directory commands and TONS more
- Multiple file & directory operations & alpha filter
- Edit files bypassing DOS
- For both novices & experts

Full screen, windows, help. Fast, 196K, color/mono, 30-day $ back guar. $25 + $5 s/h + NY tax, chk/Visa/MC. *Keep It Simple Software, Inc., 580 5th Ave., New York, NY 10036, 800/848-8909*

MenuWorks™ $25
Using a PC becomes as easy as turning it on: start up all programs from a menu.
- Customize selection screen
- Just Tab & Enter to Run
- Prompts for input if needed
- Slick editor to set up menu, easy to change

Full screen, windows, fast, 196K, color/mono, 30-day $ back guar. $25 + $5 s/h + NY tax, chk/Visa/MC. *Keep It Simple Software, Inc., 580 E. 5th Ave., New York, NY 10036, 800/848-8909*

JetWorks™ $25

Attention HP LaserJet users!

- Control LaserJet & forget escape sequences forever
- Full menu & window selection for all options & cartridges
- Creates batch files to avoid repetitive setups
- Prefab font files for all current cartridges

Full screen, windows, fast & simple, 196K, color/mono, 30-day $ back guar., $25 + $5 s/h + NY tax, chk/Visa/MC. *Keep It Simple Software, Inc., 580 5th Ave., New York, NY 10036, 800/848-8909*

YOUR MOVE!

Changing word processors? With our RAM-resident package, move data from one WP to YOUR MOVE!'s RAM-buffer. From there, save to disk/edit/move to new WP. Lotus to WP? No problem with YOUR MOVE!. Documenting your application? YOUR MOVE! will capture screens as they appear on the screen & move into your WP. $59.95 + s/h. *GOLDATA Computer Services, Inc., 2 Bryn Mawr Ave., Bryn Maur, PA 19010, 800/432-3267, 215/525-1036*

Flight Accessories

Run Flight Simulator & Jet from a hard disk/RAM disk or 3.5-inch micro floppy. Bypass the startup menus on Flight Simulator. Also includes a utility that removes the copy protection from Sidekick ver. 1.5. Requires DOS 2.x or above, 192K, IBM PC/XT/AT/comp. $14.95 plus $2.50 s/h. *Baker Street Software, P.O. Box 622, Bloomington, CA 92316-0622, 714/686-0638*

File Print Manager

GLISTER™ lets you:

- use DOS wildcards to build a sorted list of up to 100 files
- save/restore file lists
- restart a file on any page after a printer jam
- print multiple copies
- control: margins, line/page length, spacing, user-formatted header/footer lines & more. $49. *Aldridge Real-Time Software, Inc., 800/443-4160, 201/846-7242(NJ)*

Word Processing

PC-Write™ Now 2.6

Fast, friendly, flexible. New automatic reformatting, menus, more on-screen help, great new printed manual. Mail merge, split screen, footnotes/index/contents, ASCII files. Supports LaserJet. Software/QuickGuide on disk $10. Register for bound manual/support $75. Visa/MC. Ok to copy & share! *Quicksoft, 219 First Ave. N. #224G, Seattle, WA 98109, 206/282-0452*

MY WORD!™ Just $35

Full-featured word processor for IBM PC/jr/AT or most compatibles. Features: merge-print, calculator, sort, macros, color, word wrap, search/replace, block ops, all 256 characters, 100+ operations. 30-day money-back guarantee. Includes printed 100 page manual. Source code: add $35. C.O.D. add $3. *T.N.T. Software, Inc., 34069 Hainesville Rd., Round Lake, IL 60073, 312/223-8595*

Textra® Now $9.95!

A word processing dream come true. Elegant simplicity, blinding speed. Thousands of you are switching to Textra from *pfs:write*, *MultiMate*, *WordStar*, etc. Give it a try & find out why. You will be *stunned* with the quality of Textra! Send $13.95 (Ver. 3.1) or $29.95 (Ver. 3.1A). Prices include s/h. *Ann Arbor Software, 407 N. Main, Ann Arbor, MI 48104, 313/769-9088*

Hebrew/English/Greek

Russian/Arabic ... Type all languages on your PC with Multi-Lingual Scribe. Full featured multi-language word processor does not require hardware modifications. Req: 256K, 2 drives, color graphics card, B/W or color monitor, Okidata, IBM, Epson, C. Itoh printer. Price, $349.95 ($15 demo). To order program or receive brochure: *Gamma Productions, 710 Wilshire Blvd. #609, Santa Monica, CA 90401, 213/394-8622*

The IDEA LIBRARIAN

Creative workers get organized with SQUARENOTE™. Type & edit notes up to 500 lines/100 keywords each. Global ops. on keywords; transfer text to & from most word processors; browse thru set of notes; online help + manual. No risk: read manual before breaking seal. $69.95 + $5 s/h. Chk/Visa/MC. *UnionSquareware, 265 Washington St., P.O. Box 228, Somerville, MA 02143, 800/334-0854, ext. 583; 617/623-3023*

Tape/Disk Conv.

Conversion Services

Conversion services to or from over 500 computer systems:

- Mag tapes
- Micro Computers
- Mini Computers
- Word Processors
- Typesetters

Our conversion capabilities surpass most in the industry. *Pivar Computing Services, Inc., 165 Arlington Heights Rd., Dept. W, Buffalo Grove, IL 60089, 312/459-6010*

Data/WP Conversions

MAGNETIC TAPE TO DISK
DISK TO MAGNETIC TAPE
(800/1600 BPI)
DISK TO DISK
SPECIAL APPLICATIONS

Over 2000 Conversions Available. $35 per disk. Quantity discount available. *Magnetic Data Conversions Inc., 180 N. Michigan Ave. #1040, Chicago, IL 60601, 800/621-9155, 312/726-6455*

Mainframe/Mini/Micro

Conversion of Tape/8"/5¼"/3½" disk for most formats. IBM SYS/??, 3740, APPLE, CP/M and hundreds more. Convert 360K or 3-billion chrs from/to any word processor or data base. Also Data Entry and OCR input. *Amwork Systems Inc., 314 W. Downer, Aurora, IL 60506, 800/255-2255, ext. 4130*

Typesetting

High-Tech Typesetting

Transmit your text toll-free, error-free via modem to our fully automated typesetting system. $2 per thousand characters, $5 minimum. Same-day service. 200-typefaces, sizes up to 72 point. Send $20 ppd. for our 200 page guidebook, or call toll-free & use your MC/Visa/AmEx. *Intergraphics, 106A South Columbus St., Alexandria, VA 22314, 800/368-3342 or 703/683-9414 in DC area*

Used Computer Products

National Listing Service

Buy or sell used products directly from 1000 now listed. It's easy. Our Price Estimating & Mailing services can help you. Is it worth paying more for new? NO CHARGE for Buying. NO RISK for Sellers—6% fee when sold ($20 min., 3% over $5000). Any product over $100. Use a touch-tone phone if you can. If you do, we are open 24 hrs every day. *Comp-Used, 203/762-8677*

August Preview

Corporate Strategies

IBM's new laptop Convertible is put through the paces in a test drive next month.

Careful planning, implementation, and monitoring of the role of PCs in large businesses will help maximize their contribution to the bottom line.

- **Cost/Benefit Analyses**
  How some companies monitor what they're spending on PCs and what they're getting in return.
- **Training and Support**
  How to assess and utilize outside training consultants and how corporate information centers encourage and support corporate PC users.
- **Plus**
  In-depth assessments of tape backup systems, the Bernoulli Box, and Enhanced Graphics Adapter clones; hands-on applications for gateways to mainframes and business graphics with *Framework;* and much, much more.

The Experts in Accessories
Manufacturing Company, Inc.
CURTIS
Compaq Deskpro
IBM-PC, XT
adjusts from
4 to 7½ inches

Simply Adjustable

Universal System Stand

The new SS-3 System Stand from Curtis adjusts from 4 to 7½ inches to accommodate almost any system unit including the IBM-PC, XT, AT, Compaq Deskpro, hard disk drives, and the Bernoulli Box. Constructed of high-impact ABS, it is colored and textured to match or complement all microcomputer systems. Clean up your workspace — put your system unit on the floor. Get organized and more productive with the SS-3 System Stand from Curtis — the experts in accessories. Retail...$29.95

Curtis products are available nationally from leading Dealers, Distributors, and Retail Chains.
In Canada: Micro-Computer Products, P.O. Box 235, Ajax, ONT, Canada L1S 3C3, (416) 427-6612

For the Curtis dealer nearest you call (603) 924-3823

Adjust from
4 to 7½ inches.

High-impact ABS.
Matches or complements
all microcomputer systems
in color and texture.

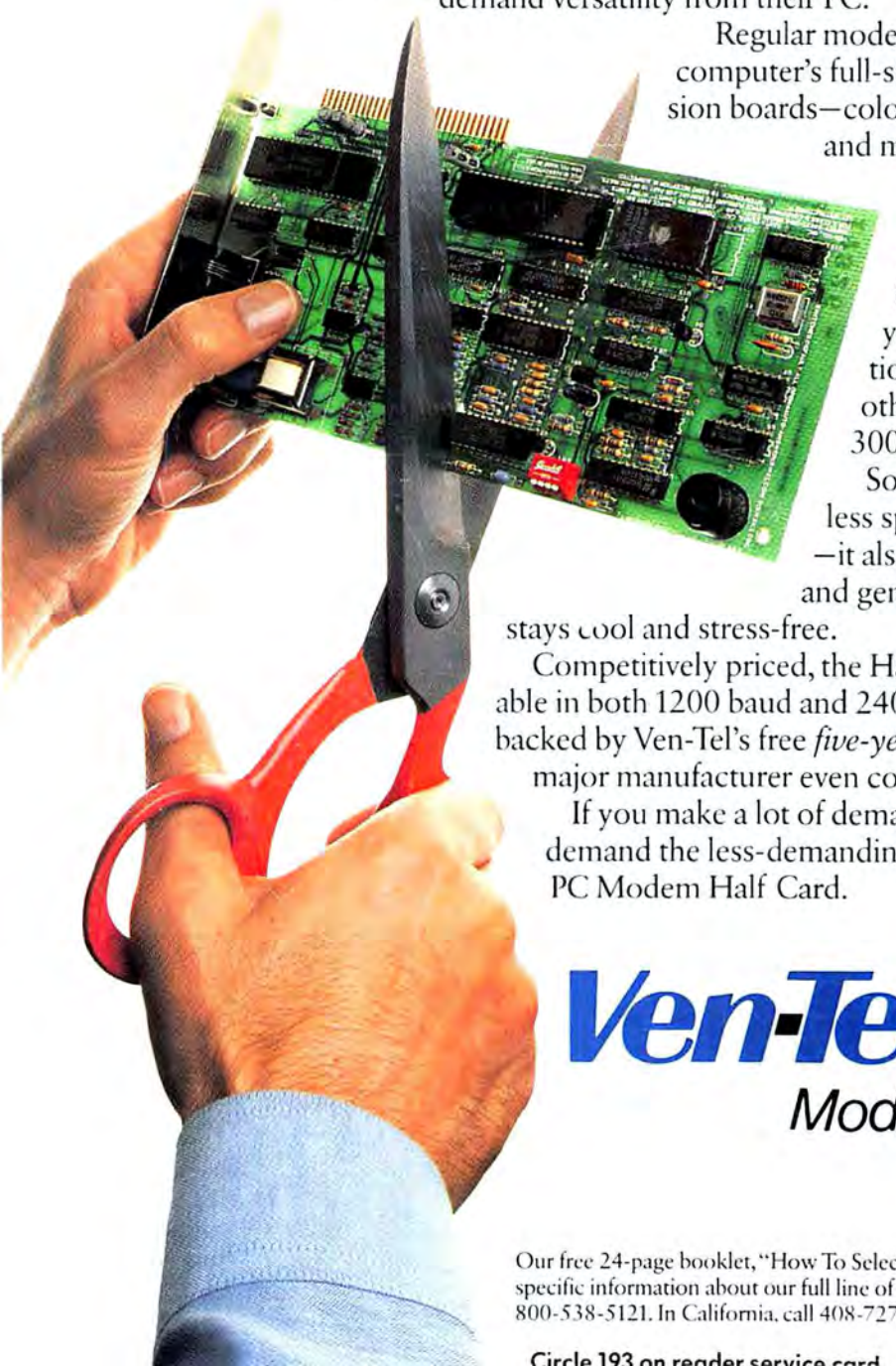
Lifetime
Warranty.

Rugged design.
Proven stability for desktop
or floor use.

Manufacturing Company, Inc.
CURTIS
305 Union Street, Peterborough, NH 03458

We invented the modem that makes fewer demands on your PC.

The Ven-Tel Half Card™ modem. All the power and speed of our regular modems, but with some major advantages for people who demand versatility from their PC.



Regular modems plug into one of your computer's full-size slots. Just like expansion boards—color boards, graphics cards and memory expanders.

The Ven-Tel Half Card modem is different. It plugs into a short slot, freeing up a long slot so your PC can handle an additional function. And while other modems have about 300 components, ours has 70. So it not only demands less space from your computer—it also demands less power and generates less heat. Your PC stays cool and stress-free.

Competitively priced, the Half Card modem is available in both 1200 baud and 2400 baud speeds. And it's backed by Ven-Tel's free *five-year* warranty. No other major manufacturer even comes close.

If you make a lot of demands on your PC... demand the less-demanding modem: The Ven-Tel PC Modem Half Card.

Ven-Tel
Modems

Our free 24-page booklet, "How To Select The Correct Modem," contains specific information about our full line of modems. To request your copy, call 800-538-5121. In California, call 408-727-5721.

Circle 193 on reader service card.