Disk-Caching Programs–Do They Really Work?

PC WORLD

September 1987 $2.95
Canada & Foreign $3.95

The Business Magazine
of PC Products and Solutions

See Beyond the Bottom Line

New Programs Make Analysis Easier Than Ever

Accounting With Spreadsheet Power

Lotus Add-In Text Editors

How to Design the Perfect Worksheet

Turbo Prolog: The Natural Language of Artificial Intelligence

Whether you're a first-time programmer or an experienced one, Turbo Prolog's natural implementation of Artificial Intelligence soon shows you how to build expert systems, natural language interfaces, customized knowledge bases and smart information management systems.

Turbo Prolog and Turbo C work hand-in-hand

Turbo Prolog® interfaces perfectly with Turbo C® because they're both designed to work with each other.

The Turbo Prolog/Turbo C combination means that you can now build powerful commercial applications using two of the most powerful languages available.

Turbo Prolog's development system includes:

- ☑ A complete Prolog compiler that is a variation of the Clocksin and Mellish Edinburgh standard Prolog.
- ☑ A full-screen interactive editor.
- ☑ Support for both graphic and text windows.
- ☑ All the tools that let you build your own expert systems and **AI** applications with unprecedented ease.

All Borland products are trademarks or registered trademarks of Borland International, Inc., or Borland/Analytica, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.
Copyright 1987 Borland International

BI-1131

"An affordable, fast, and easy-to-use language that will delight the newcomer . . . You experienced Prolog hackers will likewise be delighted, if not astonished, by the features and performance of the Turbo Prolog development environment.

Turbo Prolog offers generally the fastest and most approachable implementation of that language."

Darryl Rubin, AI Expert

How Turbo Prolog's new Toolbox adds 80 powerful tools and 8000 lines of source code

In keeping with Borland tradition, we've quickly added the new Turbo Prolog Toolbox™ to Turbo Prolog.

With 80 tools and 8000 lines of source code that can easily be incorporated into your own programs—and 40 sample programs that show you how to put these AI tools to work—the Turbo Prolog Toolbox is a highly intelligent, high-performance addition.

Only $99.95!

Turbo Prolog Toolbox features include:

- ☑ Business graphics generation: boxes, circles, ellipses, bar charts, pie charts, scaled graphics
- ☑ Complete communications package: supports XMODEM protocol
- ☑ File transfers from Reflex,* dBASE III,* 1-2-3,* Symphony*
- ☑ A unique parser generator: construct your own compiler or query language
- ☑ Sophisticated user-interface design tools
- ☑ Contains 40 example programs
- ☑ Easy-to-use screen editor: design your screen layout and I/O
- ☑ Calculated fields definition
- ☑ Over 8,000 lines of source code you can incorporate into your own programs

Tur
The most pow
compi

Our new Turbo C generates fast, tight, production-quality code at compilation speeds of more than 13,000 lines a minute!

It's the full-featured optimizing compiler everyone has been waiting for.

Switching to Turbo C, or starting with Turbo C, you win both ways

If you're already programming in C, switching to Turbo C will make you feel like you're riding a rocket instead of pedaling a bike.

If you're never programmed in C, starting with Turbo C gives you an instant edge. It's easy to learn, easy to use, and the most efficient C compiler at any price.

Only $99.95!

"Turbo C does look like What We've All Been Waiting For: a full-featured compiler that produces excellent code in an unbelievable hurry . . . moves into a class all its own among full-featured C compilers . . . Turbo C is indeed for the serious developer . . . One heck of a buy—at any price."

Michael Abrash, Programmer's Journal

bo C: NEW! erful optimizing ler ever

Sieve benchmark

	Turbo C	Microsoft® C
Compile time	2.4	13.51
Compile and link time	4.1	18.13
Execution time	3.95	5.93
Object code size	239	249
Execution size	5748	7136
Price	$99.95	$450.00

Benchmark run on an IBM PS/2 Model 60 using Turbo C version 1.0 and the Turbo Linker version 1.0, Microsoft C version 4.0 and the MS overlay linker version 3.51.

Technical Specifications

- ☑ Compiler: One-pass optimizing compiler generating linkable object modules. Included is Borland's high-performance Turbo Linker.™ The object module is compatible with the PC-DOS linker. Supports tiny, small, compact, medium, large, and huge memory model libraries. Can mix models with near and far pointers. Includes floating point emulator (utilizes 8087/80287 if installed).
- ☑ 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.
- ☑ Development Environment: A powerful "Make" is included so that managing Turbo C program development is highly efficient. Also includes pull-down menus and windows.
- ☑ Links with relocatable object modules created using Borland's Turbo Prolog into a single program.
- ☑ Inline assembly code.
- ☑ Loop optimizations.
- ☑ Register variables.
- ☑ ANSI C compatible.
- ☑ Start-up routine source code included.
- ☑ Both command line and integrated environment versions included.
- ☑ License to the source code for Run-time Library available.

Join more than 100,000 Turbo C enthusiasts. Get your copy of Turbo C today!

Minimum system requirements: All products run on IBM PC, XT, AT, PS/2, portable and true compatibles. PC-DOS (MS-DOS) 2.0 or later. 384K RAM minimum. Basic Telecom and Editor Toolboxes require 640K.

Borland International
4585 Scotts Valley Drive, Scotts Valley, CA 95066
Telephone: (408) 438-8400 Telex: 172373

Why more than 600,000 programmers worldwide are using Turbo Pascal today

The irresistible force behind Turbo Pascal's worldwide success is Borland's advanced technology. We created a compiler so fast, that Turbo Pascal® is now the worldwide standard. And there are more tools for Turbo Pascal than for any other development environment in the world.

You'll get everything you need from Turbo Pascal and its 5 Toolboxes

Turbo Pascal and Family are all you'll ever need to perfect programming in Pascal.

If you've never programmed in Pascal, you'll probably want to start with Turbo Pascal Tutor® 2.0, and as your expertise quickly grows, add Toolboxes like our

- Database Toolbox®
- Editor Toolbox®
- Graphix Toolbox®
- GameWorks®

and our newest,

- Numerical Methods Toolbox™

And because Turbo Pascal is the established worldwide standard, 3rd party, independent non-Borland developers also offer an incredible array of programs for Turbo Pascal. ***Only $99.95!***

> "Borland International's Turbo Pascal took the programming world by storm. A great compiler combined with a good editor at an astounding price, the package quickly came to be called, simply, Turbo—and has sold more than 500,000 copies.
>
> *Stephen Randy Davis, PC Magazine*
>
> Language deal of the century. *PC Magazine*"

For Scientists and Engineers: Turbo Pascal Numerical Methods Toolbox

The Numerical Methods Toolbox is a complete collection of Turbo Pascal routines and programs. Add it to your development system and you have the most comprehensive and powerful numerical analysis capabilities—at your fingertips!

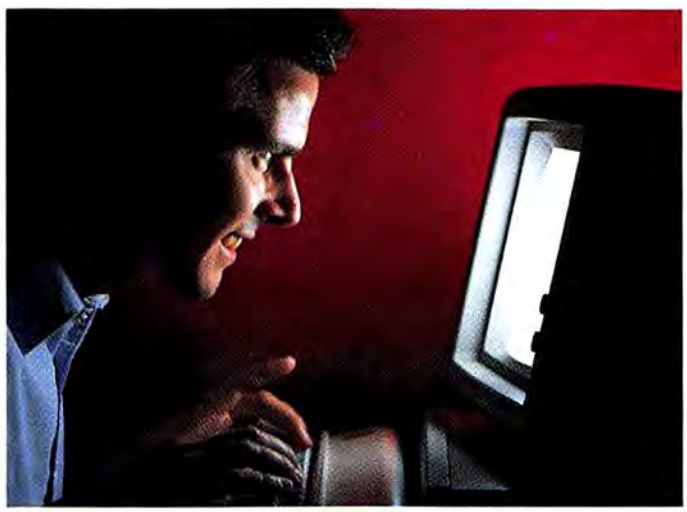
The Numerical Methods Toolbox is a state-of-the-art mathematical toolbox with these ten powerful features:

- ☑ Zeros of a function
- ☑ Interpolation
- ☑ Differentiation
- ☑ Integration
- ☑ Matrix Inversion
- ☑ Matrix Eigenvalues
- ☑ Differential Equations
- ☑ Least Squares
- ☑ Fourier Transforms
- ☑ Graphics

Each module comes with procedures that can be easily adapted to your own program. The Toolbox also comes complete with source code. So you have total control of your application.

Only $99.95!

Turbo C, Turbo Basic, Turbo Pascal and Turbo Prolog: technical excellence



"Borland International's Turbo Pascal, Turbo Basic and Turbo Prolog automatically identify themselves, by virtue of their 'Turbo' forenames, as superior language products with a common programming environment. The appellation also means to many PC users a 'must have' language. To us Turbo C looks like a coup for Borland.

Garry Ray, PC Week "

Turbo Basic introduces its powerful new Telecom, Editor and Database Toolboxes

NEW!

Turbo Basic® is the breakthrough you've been waiting for. The same power we brought to Pascal with Turbo Pascal has now been applied to BASIC with Turbo Basic.

Compatible with BASICA, Turbo Basic is the high-performance, high-speed BASIC you'd expect from Borland.

Basically, Turbo Basic is all you need

It's a complete development environment which includes an incredibly fast compiler, an interactive editor and a trace debugging system. It outperforms all its rivals, and because it's compatible with BASICA, you probably already know how to use it.

Includes a free MicroCalc™ spreadsheet complete with source code. ***Only $99.95!***

A technical look at Turbo Basic

- ☑ Full recursion supported
- ☑ Standard IEEE floating-point format
- ☑ Floating-point support, with full 8087 (math co-processor) integration. Software emulation if no 8087 present
- ☑ Program size limited only by available memory (no 64K limitation)
- ☑ VGA, CGA, and EGA support
- ☑ Access to local, static, and global variables
- ☑ Full integration of the compiler, editor, and executable program, with separate windows for editing, messages, tracing, and execution
- ☑ Compile, run-time, and I/O errors place you in the source code where error occurred
- ☑ New long integer (32-bit) data type
- ☑ Full 80-bit precision
- ☑ Pull-down menus
- ☑ Full window management

> "Borland has created the most powerful version of BASIC ever."
>
> *Ethan Winer, PC Magazine*

NEW!

Telecom Toolbox is a complete communications package which takes advantage of the built-in communications capabilities of BASIC—use as is or modify.

- Pull-down menus and windows
- XMODEM support
- VT 100 terminal emulation
- Captures text to disk or printer
- PhoneBook file
- 300, 1200, 2400 baud support
- Supports script files
- Fast screen I/O
- Supports most of XTalk's command set
- Manual dial and redial options

Use Telecom Toolbox to embed communications capabilities into your own programs and/or build your own communications package. Source code included for all Toolbox code and sample programs. ***Only $99.95!***

For the dealer nearest you or to order by phone call

(800) 255-8008

in CA (800) 742-1133 in Canada (800) 237-1136

BORLAND INTERNATIONAL

NEW!

Database Toolbox means that you don't have to reinvent the wheel each time you write new Turbo Basic database programs.

- ☑ "Trainer" shows you how B+ trees work. (Simply key in sample records and you'll see your index being built.)
- ☑ Turbo Access instantly locates, inserts or deletes records in a database—using B+ trees.
- ☑ Turbo Sort sorts data on single items or on multiple keys and features virtual memory management for sorting large data files.

Source code included.
Only $99.95!

NEW!

Editor Toolbox is all you need to build your own text editor or word processor. Includes source code for two sample editors.

First Editor is a complete editor ready to include in your programs, complete with windows, block commands and memory-mapped screen routines.

MicroStar™ is a full-blown text editor with a complete pull-down menu user interface, and gives you

- Wordwrap
- Undo last change
- Auto-Indent
- Find and Find/Replace with options
- Set left/right margins
- Block mark, move and copy
- Tab, insert, overstrike modes, line center etc.

Includes source code.
Only $99.95!

BI-1131

PC WORLD

The Business Magazine of PC Products and Solutions
September 1987

150 Worksheets by Design

This beginner's guide provides an easy conceptual approach to laying out a worksheet–and avoiding the design errors that lead to chaos.

184 NewViews Breaks the Rules

Audacious accounting? You bet. *New Views* stands convention on its ear, sacrificing batch processing and detailed audit trails in favor of flexibility previously unseen in this genre.

192 Letters From Cell A17

Link live worksheet numbers to your reports and letters with these handy *1-2-3* add-in text editors. Pioneer *4Word* meets newcomers *Write-in* and *InWord* in the race to bring full-featured word processing to the *1-2-3* environment.

Getting Started

150 Worksheets by Design, *William Urschel*

158 Laser-Perfect, *Ralph Blodgett*
WordPerfect and the LaserJet Plus make soft fonts a perfect match for your output.

Community

164 DOS Amigos, *Edited by Ken Greenberg*
Compaq's Rod Canion and Tandy's John Roach, compadres in compatibility, ponder life in a PS/2–and OS/2–world.

172 The Knowledge Engineers, *Eric Bender*
Software designers learn that the way to great expert systems is by getting to know the local expert.

Review

184 NewViews Breaks the Rules, *Charles E. Rundgren and Marlene Nesary*

192 Letters From Cell A17, *Charles Seiter*

200 Dimensional Fortitude, *Ralph Soucie*
Boeing Calc and *MVP Spreadsheet Plus* take distinctly different routes to the third dimension.

208 Magical Multiscan Tour, *TJ Byers*
With a multiscan monitor from NEC, Sony, JVC, Taxan, Magnavox, Thomson, or Nanao, you can keep up with new graphics standards without breaking the bank.

218 Cache on Demand?, *Evelyn Morrison*
The caching software reviewed here–*Flash*, *Lightning*, *PolyBoost*, *Quickcache*, *Super PC-Kwik*, and *Vcache*–can speed up slow applications. But the situation has to be just right.

State of the Art

228 Routines for Rent, *Bob Keller*
APIs help developers build new add-ons for sturdy old applications.

Hands On

234 From Ledger to Spreadsheet, *Charles E. Rundgren*
How to get more flexibility from EasyBusiness Systems' *Inventory Control* using *DOS Exports* and a *1-2-3* template.

240 Up From WordStar, *George Beinhorn*
With these macros, *WordStar* vets can both speed up *Word* and *WordPerfect* and make themselves feel at home.

Cover illustration by Guy Billout

Departments

13 David Bunnell

31 Letters

45 Harry Miller

53 Stewart Alsop

61 Top of the News

68 PC World View, *Edited by Eric Bender*

79 Product Outlook, *Mike Hogan and Ken Greenberg*

102 From the Software Shelf, *Edited by William Rodarmor*
Ventura Publisher, *True BASIC*, *Eureka*, *Opt-Tech Sort*, *Glyphix*

127 From the Hardware Shelf, *Edited by Charles Bermant*
Datavue Spark, Ricoh PC Laser 6000, Maynard Maynstream 60, Cordata Slimline 4200, Bairnware Laser Stacker

247 The Upgrade Path, *Robert Luhn*

263 Consumer Watch, *Anita Amirrezvani*

283 Sourcebooks, *Michael Harper and Marlene Nesary*

319 The Help Screen, *Karl Koessel*

337 *.*, *Edited by Mike Cushman*

357 Kevin Strehlo

372 Next in PC World

392 Another Angle, *Don R. Allison*

PC World Computer Products Shopping Guide

300 A convenient buying guide

Indexes

376 Products featured in this issue

377 Advertisers

PC World Directory

380 A classified guide to products and services

PC WORLD

September 1987
Volume 5, Number 9

David Bunnell
Editor-in-Chief

Jacqueline Poitier
Director/Art & Design

J. Kelley Younger
Editorial Director

Karen Wickre
Editorial Administrator

Harry Miller
Editor

Skip Johnston
Art Director

Editorial
Managing Editor: Richard Landry
Senior Associate Editors: Eric Knorr, Robert Luhn
News Editor: Mike Hogan
Southwest Editor: Ken Greenberg (213/312-8041)
East Coast Editor: Eric Bender (617/482-8470)
Associate Editor: Charles Bermant
Production Editor: Cynthia Hamburger
Senior Copy Editor: Tema Goodwin
Technical Editor: Karl Koessel
Product Review Editor: Dusty Roady Pedersen
Assistant Editors: Anita Amirrezvani, Marlene Nesary, Wesley Nihei, William Rodarmor
Copy Editors: Barbara Lewis, Peggy Nauts, Dan Tynan, Sally Zahner
Editorial Assistants: Scott Spanbauer, Gina Vanlue (Administration)
Administrative Assistant: Nancy Endy
Assistant to the Editorial Director: Daniel C. Berkowitz
Contributing Editors: Stewart Alsop, Stephen A. Blumenthal, Eric Brown, Steven Cook, Bill Crider, Eddie Currie, Judy Getts, Danny Goodman, Jeremy Joan Hewes, Ted Nace, Art Wilcox, Andrew T. Williams

Art and Design
Associate Art Director: Deborah Parker
Assistant Art Director: Donna Sharee
Senior Design Associate: Laura Stoll
Design Associate: Barbara Adamson
Assistant to the Director: Jon Christianson

Corporate Development
Publicist: Shirley Gines
Special Projects: Jeffrey S. Glines
Administrative Assistant: Emily Bower

Production
Director: Herbert Linden
Senior Production Mgrs.: Anne Foley, Linda Manes
Editorial Production Mgr.: Ellyn L. Hament
Production Editor: Susan M. Ford
Ad Traffic Coordinator: Jayne Boyer
Lead Typesetter: Mark L. Duran
Typesetter: Virginia Weir
Display Advertising Supervisor: MaryAnn DePietro
Advertising Billing Coordinator: Hollis Brush
Production Assistant: Rosanne Reynoso

James E. Martin
Publisher

Advertising Sales & Marketing
Director of Advertising Sales: Margaret O'Reilly (415/546-7722)
Northwest: Sharon Van Leuven (Western Regional Mgr.) (415/546-7722)
Northern California (San Francisco): Natalie Wood (415/546-7722)
Northern California (San Jose): Michela O'Connor (415/546-7722)
Southern California (Los Angeles): Vivian Ritondale (Southwest Advertising Mgr.) (213/312-8008)
Southern California (Orange County): Michelle Hornett (213/312-8008)
Southern California (San Diego/Southwest): Joanne Gillis (213/312-5900)
Texas: Jennifer Walker (214/233-3492)
New England (Boston): Bob Ostrow (617/879-0700)
Midwest (Chicago): Robert Diftler (312/827-4477)
Northeast (New York): Jeff Edman (Eastern Advertising Mgr.) (201/967-1350)
Mid-Atlantic: Steve Lincoln (201/967-1350)
Southeast (Atlanta): Judy Sutter (404/394-0758)
Action Ads/Directory: Carol Watson

Circulation
Circulation Business Mgr.: Gail Egbert
Single Copy Sales Mgr.: George Clark
Single Copy Sales Rep.: Martin Garchar
Promotion Mgr.: Daniel Orum
Promotion Coordinator: Billie Brownell
Fulfillment Coordinators: Ed Chittenden, Doug Norde

Research
Director: Cheryl Woodard
Research Mgr.: Gary L. Rocchio
Assistant Mgr.: Ralph Ames
Research Analyst: Ray Petsche
Report Coordinator: Steven York

Administration
Director: Janet D. McGinnis
Accounting Mgr.: Pat Murphy
Admin. Services Mgr.: Joseph Wollenweber
Employee Relations Mgr.: Shelly Ginenthal
Technical Mgr.: Nancy Canning
Assistant to the President: Christina W. Spence
Assistant to the Publisher: Loretta Giglione

Corporate
PCW 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

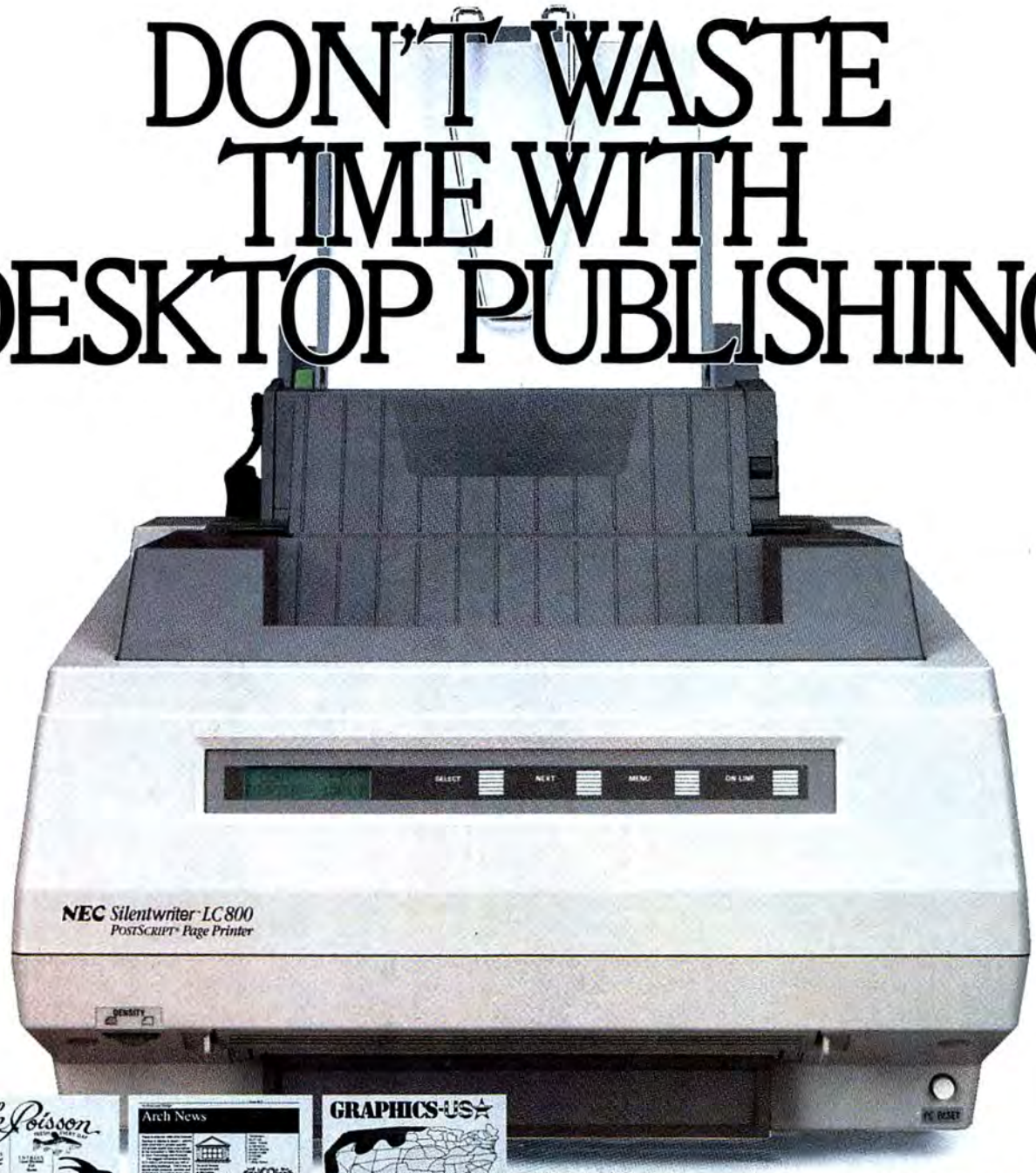
PC World™ (ISSN 0737-8939) is published monthly at $29.90 for one year (12 issues), $53.90 for two years (24 issues), $74.90 for three years (36 issues) by PCW Communications, Inc., 501 Second St., San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $12 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 800/642-9606. 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: 501 Second St., San Francisco, CA 94107, 415/546-7722; CompuServe 74055,412; The Source STE908; MCI Mail PCWORLD/179-3813.

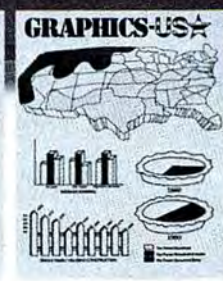
PC World™ is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. Copyright © 1987, PCW Communications, Inc. All rights reserved. The following are trademarks of PCW Communications, Inc.: PC World View, ".", PC World. *PC World* is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the *IDG News Service* offering the latest on domestic and international computer news.

A PUBLICATION OF CW COMMUNICATIONS

BPA

DON'T WASTE TIME WITH DESKTOP PUBLISHING.





You won't have to with our new Silentwriter™ LC890 page printer.

It's the desktop publishing printer with more than twice as much memory as an Apple® Laserwriter,™ for example. Which means it puts information together faster—and saves valuable minutes every time you create a new page of graphics or text. And the more complex the page, the more time saved.

The Silentwriter LC890 is also one of the least expensive printers that uses Adobe PostScript® page description language. Which lets you combine text, line art, and even digitized photographs on the same page.

Of course, you may not need all this pizazz for your printed pages. Then you should look into our Silentwriter LC860 Plus or our Silentwriter LC850, which are ideal for text and less complex graphics applications.

Our Silentwriter series will also keep you from wasting time with breakdowns and service. Because every Silentwriter printer has a life of about 600,000 pages—more than twice as much as ordinary lasers.

So if you want to make the most our of desktop publishing, don't waste a minute. Call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

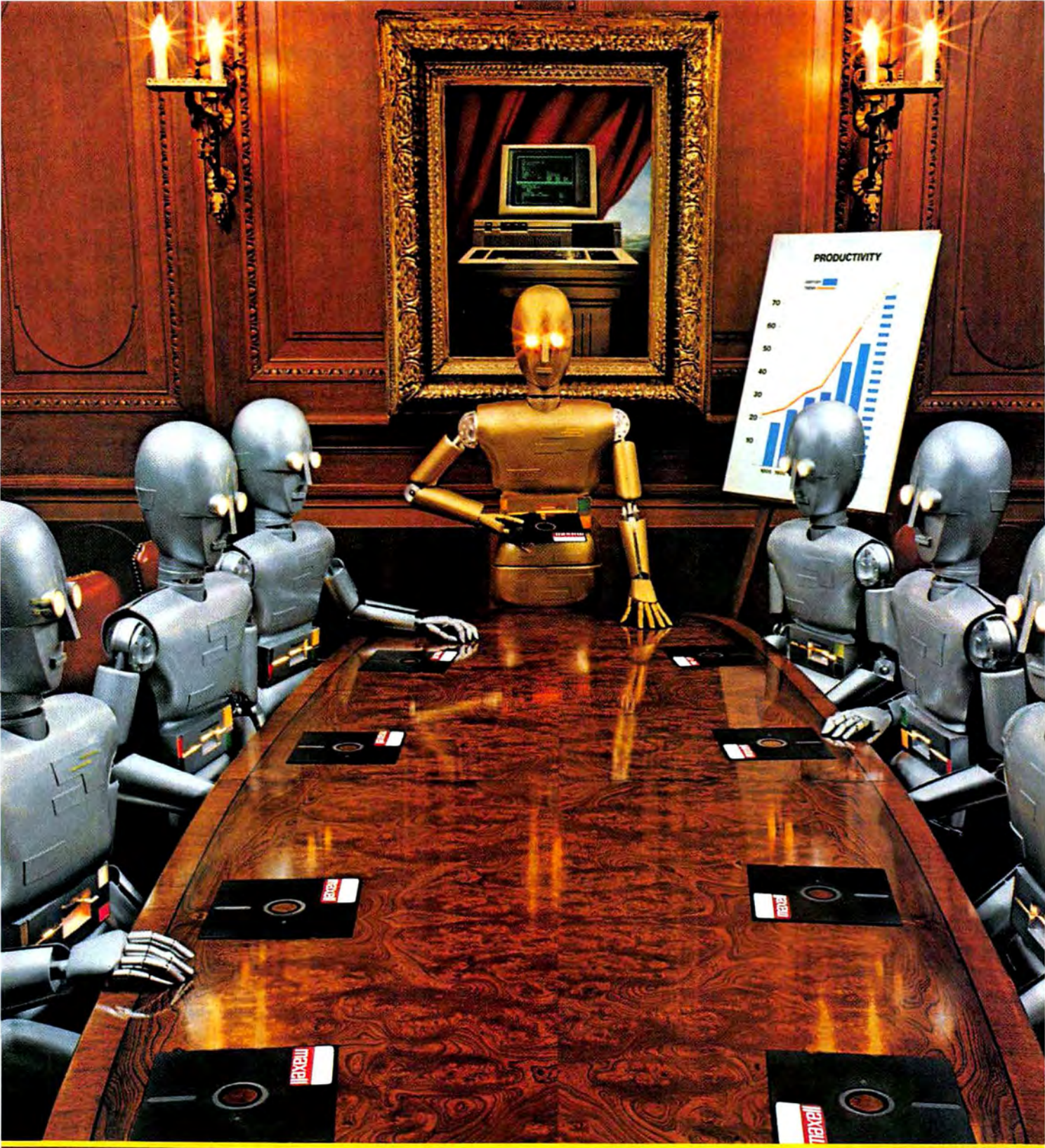
NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

NEC Information Systems, Inc.

C&C Computers and Communications

Get more info. Go to Ad Index.



When computers get down to business, they move up to Maxell.

Maxell was first to provide you with a 5¼" high density floppy disk. Just another example of how we keep you a step ahead.

maxell
THE GOLD STANDARD

Maxell Corporation of America, 60 Oxford Drive, Moonachie, NJ 07074

A disk each month delivered to you...
packed with programs for your PC.

DISCOVER UPTIME. You deserve the best from your PC. Have the best and save the most with UPTIME.

You deserve value. We make it easy and inexpensive — a disk each month. At UPTIME, we believe in value. That's why each month 30,000 people like you enjoy a disk packed full of programs and information.

Make life easier & get the most from your PC. Organize your life and be more productive with **home management** and **finance** programs. Have fun learning with **educational** programs. Relax with **games** and **adventures.** You'll find business, **utilities & more!** It's amazing just how much comes on every disk.

Eight programs and more on every disk. What's the opposite of "downtime"? It's UPTIME, of course. A disk each month, delivered to your door.

It's easy, inexpensive & fun. Too good to be true? There's more! Each monthly disk reviews the latest software, hardware & peripherals.

Subscribe now and save. You won't believe the low price! Satisfaction is guaranteed or your money back. Make the very next UPTIME disk yours. Fill out the coupon. For immediate service, call toll-free:

1-800-437-0033

anytime, day or night.

Get more info. Go to Ad index.

QUALITY PROGRAMS LESS THAN $1.00 EACH

NEW FOR ALL PCs

FROM **Volume 1, No. 1**

ImagePrint ■ Home Safe ■ Longevity ■ Bricks ■ Keyboard Calliope ■ File Mover ■ Calendar Creator ■ Side Winder

I'LL BYTE!!! SAVE $89.90 ← 12 Disk Issues $89

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

6 Disk Issues $59 ☐ **3** Disk Issues $36 ☐ **1** Trial Issue $14.95 ☐

(Add $2 per issue in foreign countries, except Canada and APO)

Name _____

Address _____

City _____ State _____ Zip _____

Type of Computer _____

☐ Payment enclosed. (Make checks payable to **UPTIME**.)

Bill my: ☐ Visa ☐ MC Exp. Date _____

Signature _____

Account No. _____

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

PCW 9/87

Discover AST Premium/286. The First AST Quality, Uncompromising AT® C

More than two million people have made us the first choice in PC Enhancement. For over five years, you've known AST as the leading PC enhancement company. Now, we're introducing the ultimate enhancement: AST Premium/286. The first AT-compatible personal computer with AST performance and reliability. More flexible and upgradeable. Skillfully combining lightning fast processing speed and uncompromising compatibility.

AST FASTslots:™ Processing speedways. Forming the foundation of the AST Premium/286's increased speed are our FASTslots. This advanced architecture improves overall performance so there's enough built-in power to satisfy even the most demanding user.

The AST Premium/286 operates 50% faster than an 8MHz PC AT* as measured by the Norton Utilities™ Version 3.0 SysInfo. And maintains full compatibility with standard PC and AT-based enhancement cards. It also provides for a powerful, easily upgradeable and expandable future, accommodating the next generation of accelerator and high-performance enhancement

A Heritage Of Software Compatibility. Software compatibility has always been one of our strong points. Shipped with the industry-standard MS-DOS* 3.1, AST Premium/286 is compatible with widely accepted operating systems such as IBM* PC-DOS,™ Concurrent DOS™ and XENIX.™ It's also designed to get the most out of multitasking software packages like Microsoft* Windows, DESQview™ and TopView.™

Applications-oriented. Keyboard-selectable operation at 10, 8 or 6MHz means virtually all popular off-the-shelf IBM PC and PC AT application software is immediately compatible. All your favorites, including Microsoft Word, Lotus* 1-2-3,* Framework,™ Symphony,* dBASE* III and AutoCAD.™

Attain your fullest software potential. AST's advanced architecture also provides faster and more flexible memory addressing. While built-in Enhanced expanded memory capabilities – AST FASTRAM,™ expandable to 2MB in a single slot – let you break the 640K DOS barrier. Create bigger spreadsheets and sort larger databases. And enjoy the uninterrupted workflow benefits of multitasking using current DOS versions, with full support for protected mode software built-in.

Fast access disk storage. Complementing AST Premium/286's speedy operation is a full line of disk systems. There's a 20MB, 40MB and a 70MB hard disk. Both the 40MB and the 70MB offer more storage and faster access times – below 30msec – than the PC AT's fixed disk. And our external disk/tape systems, featuring advanced SCSI architecture, allow easy expandability.

Prices Start At $1995.00*

Personal Computer With Legendary ompatibility and Lightning Speed.

More standards are standard. We build-in our AST FASTRAM™ memory card. And most models include our own multimode enhanced graphics adapter, supporting IBM EGA, CGA and Monochrome, and Hercules Graphics Card™ display modes.

Compatible with AST and IBM Products. AST Premium/286 is designed to remain your productivity partner for years to come. Choose it with confidence for single and multitasking applications, individual and shared environments alike. Use it as an engine with other AST products to form powerful application workstations for desktop publishing, CAD/CAE and more. Or to increase connectivity use it as a network file server, to communicate with IBM mainframes and minicomputers, or to manage multiuser environments.

Solutions that are ready to go. We also offer a number of pre-configured workstation solutions tailored for maximum performance in your application. Combining our proven products, from local area networking and data communications to extra memory and I/O to laser printers and disk systems, our solutions are all designed to increase your business productivity.

Quality across the board, around the world. When you buy AST products, you're also purchasing a worldwide reputation for service, support and product dependability. AST Premium/286 is backed by a one year limited warranty, and our worldwide network of certified dealers and service centers.

AST Premium/286—The system and the solutions. For more information call our Product Information Center at **(714) 863-0181** or send the coupon to: AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714-4992.

Yes, I want to know more about AST Premium/286 Solutions. Send me more information today.

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State: _____

Zip: _____ Telephone: ( ) _____

My applications:

_____ Desktop Publishing _____ Multiuser

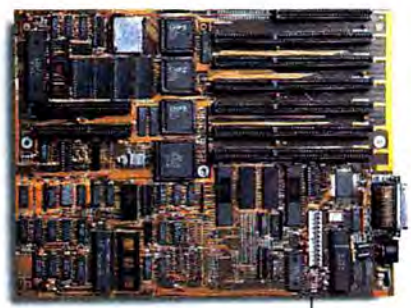
_____ Mainframe/Minicomputer Connection

_____ Multitasking _____ General Business

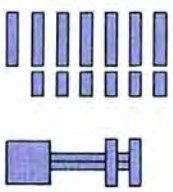
Send to:

AST Research, Inc., 2121 Alton Avenue, Irvine, CA 92714-4992 Attn: M.C. PW 9/87

AST RESEARCH INC.



Seven industry-standard expansion slots; 1 PC-compatible slot, 6 PC AT-compatible slots, including two AST FASTslots. FASTslots provide no wait state *operation with a high-speed direct interface to the 10MHz 80286 processor. Advanced architecture accommodates the next generation of accelerator and high-performance enhancement cards. It's also an open architecture for easy development and system integration.*



Two AT-compatible expansion slots with a plus: a third bus connector featuring lightning-quick CPU access time, for use with specially-designed cards like the AST FASTRAM Enhanced memory card. Expandable to 2MB in single slot, FASTRAM supports a variety of addressing capabilities—Enhanced EMS, EMS, extended (protected mode) and conventional memory addressing.

Enhanced, low-profile 101/102-key keyboard with separate numeric keypad, dedicated cursor control and extra function keys. International versions available.

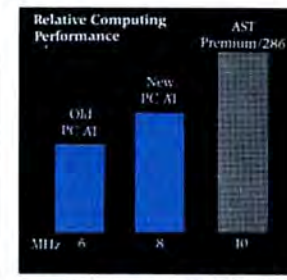
AST Premium/286 is shipped with MS-DOS and GW BASIC,® and it's fully compatible with a wide variety of operating systems, operating environment and utility packages, and application software.

Based on industry-standard native 80286 technology, complemented by AST advanced architecture.

Coprocessor socket accepts 8MHz 80287 devices to execute math- and floating point-intensive programs faster.

"The Perfect 10"

10MHz, 0 wait-state operation, faster than the 8MHz PC AT, with IBM PC AT hardware and software compatibility.



Compare the increased speed of the AST Premium/286 against the top competitors for yourself. (Basis: Norton Utilities SysInfo Version 3.0)

Indicators let you check your clock-speed—user-selectable at 10, 8 or 6MHz. Reset button allows easy cold-booting. Security lock prevents unauthorized keyboard access.

Supports standard PC, PC AT and AST FASTslot cards. With AST, you start with a lot, like our included FASTRAM Enhanced memory card and multimode Enhanced Graphics Adapter, but you've also got a lot of options. We offer the widest range of compatible enhancement products and peripherals to suit your needs—a true one-stop solution allowing you to expand and upgrade your system with the assurance of future service and support.

AST markets products worldwide—in Europe call: 44 1 568 4330; in the Far East call: 852 0499 9113; in Canada call: (416) 826-7514.

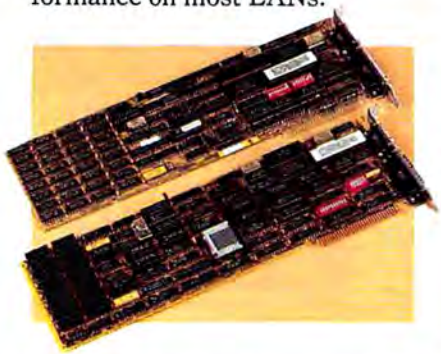
AST Premium/286, FASTslot and FASTRAM trademarks of AST Research, Inc. IBM, Personal Computer AT and PC AT registered trademarks and PC-DOS and TopView trademarks of International Business Machines Corporation. Lotus, 1-2-3 and Symphony registered trademarks of Lotus Development Corporation. dBASE registered and Framework trademark of Ashton-Tate. AutoCAD trademark of AUTODESK, Inc. Microsoft, MS-DOS, XENIX, and GW BASIC registered trademarks of Microsoft Corporation. DESQview trademark of Quarterdeck Office Systems. Hercules Graphics Card trademark of Hercules Computer Technology. Norton Utilities trademark of Peter Norton Computing, Inc. UNIX trademark of AT&T Bell Laboratories, Concurrent DOS trademark Digital Research. Copyright © 1986 AST Research, Inc. All rights reserved.

PC-PLUS™ The No-Nonsense Network

Unlike traditional LANs, PC-PLUS' on-the-bus architecture puts the computing power where you need it — with the data — inside the server.

PC-PLUS: The LAN Engineered for Shared Data

Any local area network can connect PCs. PC-PLUS, however, is engineered to optimize multiuser access to shared databases. We put a PC — or AT — on a card that *plugs into the server.* Putting your computing power on the same bus as your data. Giving you high bandwidth *where you need it.* Without the transmission overhead that steals performance on most LANs.



PC-PLUS Gives You the Power You Need

Our plug-in cards come as 8 MHz PCs or 8 MHz ATs — to match your computing needs exactly. But the real test is in the results — and our benchmarks are second to none! Power to get your job done. Power to grow into new applications without sacrificing performance.

PC-PLUS is Easy to Install and Use

We put the computing engines all in one place — in the server. Not spread all over the building. The easiest software installation of any LAN. Use PC-PLUS with your choice of AT compatible servers. Add a card and terminal to grow. Simple RS-232 data cables — no expensive rewiring with coax. You can often use existing telephone cable. Convenient packaged solutions, with preconfigured hardware and software.

PC-PLUS Runs the Software You Want

Our network operating software runs most popular software — like Lotus 1-2-3 and word processors. And the multiuser software that runs on Novell, IBM and 3COM networks — like dBASE III PLUS w/LANpacks, R:BASE System V, the SMART Series, Revelation.

PC-PLUS: Find Out Before You Invest

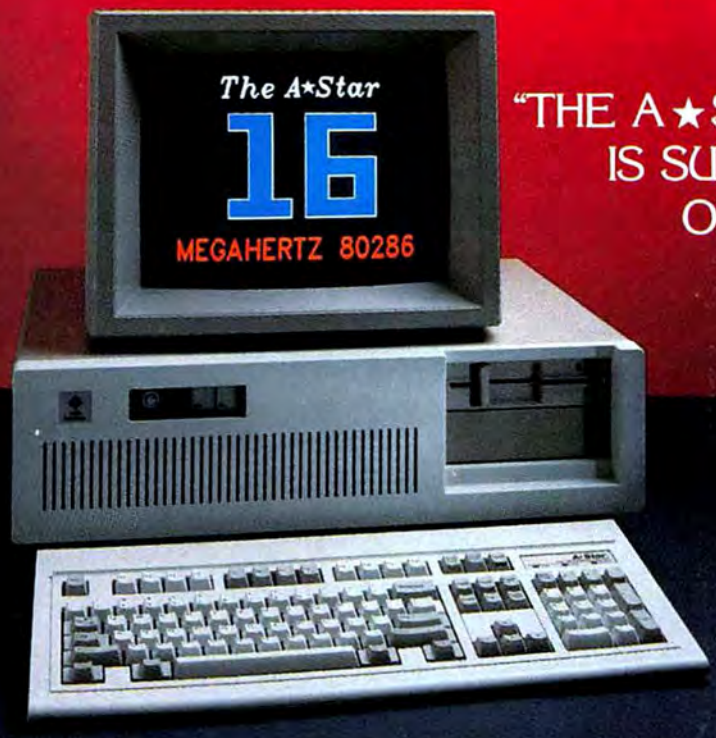
A local area network is a long term investment. Today's applications are just the beginning. Make sure your choice is ready for tomorrow — with mainframe connections, remote access, graphics and the power for growing database applications. Find out more about PC-PLUS today. Ask for our free 24 page brochure "**Choosing the *Right* LAN,**" and get all the facts you need for a wise investment.

ALLOY Computer Products

Lotus 1-2-3 is a trademark of Lotus Development Corp., Novell is a trademark of Novell, Inc., IBM is a trademark of International Business Machines Corp., 3COM is a trademark of 3COM Corp., dBASE III PLUS is a trademark of Ashton-Tate, R:BASE System V is a trademark of Microrim, the SMART SERIES is a trademark of Innovative Software, Inc., Revelation is a trademark of COSMOS.

Alloy Computer Products, Inc., 100 Pennsylvania Avenue, Framingham, Massachusetts 01701. (617) 875-6100, TWX: 710-346-0394
Alloy Computer Products, Inc., 9 Executive Circle, Suite 240, Irvine, California 92714. (714) 261-7661

Get more info. Go to Ad index.



"THE A★STAR'S CPU PERFORMANCE IS SUBSTANTIALLY ABOVE THAT OF THE IBM PS/2 MODEL 60."
-INFOWORLD

NOW OS/2 COMPATIBLE

WHO CARES!

For about $5300, you could own an IBM PS/2 Model 60. But for as little as $1100, you could own a Wells American A★Star® that can outperform it. Of course, for nearly the same money as an A★Star, you could also own any number of Asian built no-name clones. But then you wouldn't be getting the exclusive ownership advantages that *only* the A★Star offers. Advantages like an 80286 CPU that runs the new MS OS/2 operating system and can also run at 6, 8, 10, 12, 14 and now...16 MHz! And you wouldn't be getting schematics. (Ours are free!) Or GE/RCA on-site maintenance. Or a no questions asked money-back guarantee. Oh, and there's one more little item you wouldn't get... peace of mind. Wells American has been making microcomputers longer than IBM! In fact, we've probably been making microcomputers longer than *anybody*!

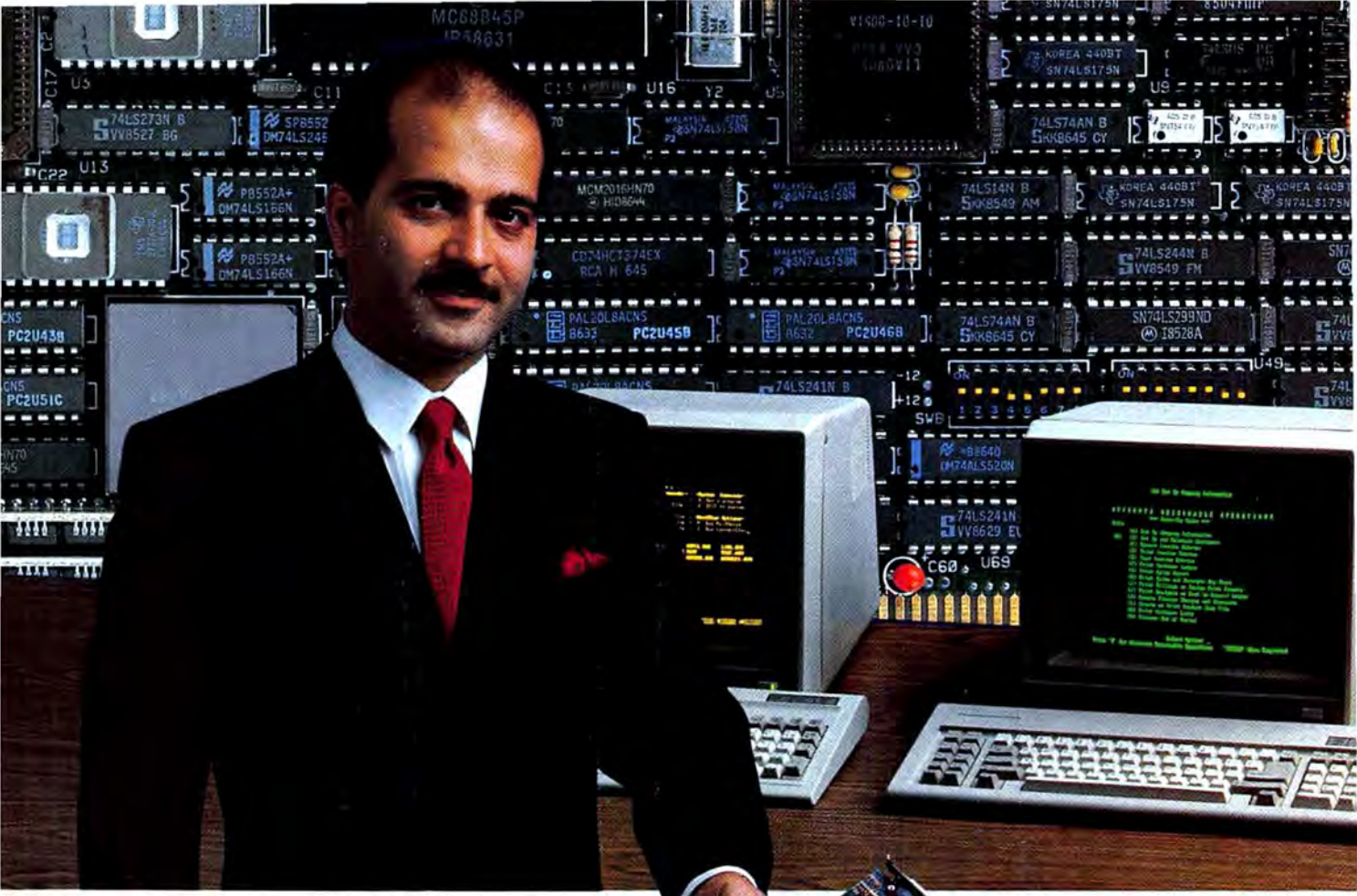
But hey, who are we kidding? Not everyone cares about quality, reputation, support or serviceability. That's why there are mail-order houses. And, as hard as it is to believe, not everyone cares about money or performance. Maybe that's why there's IBM (and Compaq®...and all the others). But, for computer users who *do* care, there is, fortunately, a vendor who also cares...Wells American. And, we'd like to prove it to you. Call us with the page number of this ad. It's worth a big discount on your next A★Star computer system. Call today. 803/796-7800. This offer *is* limited.

Wells American®

Corporate Headquarters: 3243 Sunset Boulevard • West Columbia, South Carolina 29169 • 803/796-7800 • TWX 510-601-2645

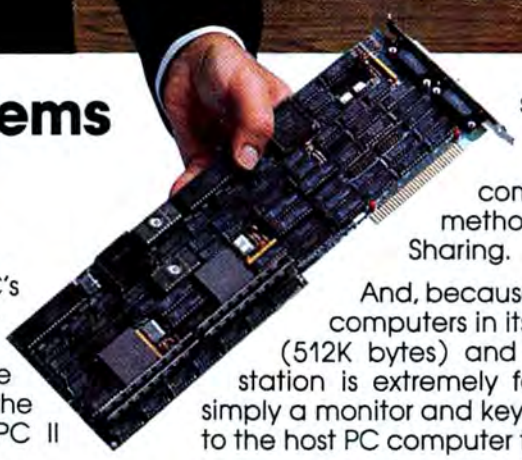
IBM, OS/2 and PS/2 are trademarks of International Business Machines Corporation

Get more info. Go to Ad Index.



Multi-user PC systems become a reality with ADC's PC II...

Does your company have a few PC's around?...And, is your company planning on connecting those PC's together? Before you spend all the time and money in that endeavor, ADC has the perfect solution to that need...The PC II board.

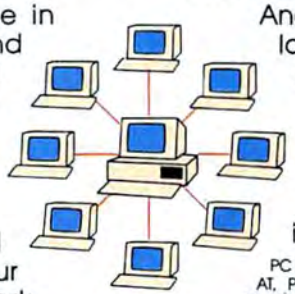


With an IBM PC® (AT)® or compatible in place, a company can quickly expand from 2 to 32 users or more with ADC's PC II without the need of adding another PC.

By simply adding a PC II board with monitors and keyboards, two additional workstations can be instantly created. Continue to add workstations as needed with additional PC II boards, and soon your entire office can have individual workstations all sharing the programs and data at a fraction of the cost compared to conventional methods such as LAN or Time-Sharing.

And, because ADC's PC II board is two computers in itself, with its own memory (512K bytes) and processors, each workstation is extremely fast. Each workstation is simply a monitor and keyboard that is connected to the host PC computer thru the PC II board.

...Now with Novell's NetWare.®



And, in keeping with the latest in technological advances, the PC II board now comes with the most compatible software in the PC market...Novell's NetWare. PC II is also compatible with the IBM PC Network.®

Call for details and information regarding ADC's other fine products.

PC II is a registered trademark of Advanced Digital Corporation. IBM PC, AT, PC Network are registered trademarks of International Business Machines Corporation. NetWare is a registered trademark of Novell, Inc.

In U.S.
5432 Production Drive
Huntington Beach, CA 92649
(714) 891-4004 (800) 251-1801
Telex 183210 ADVANCED HTBH

ADC
ADVANCED DIGITAL CORPORATION

In Europe
Advanced Digital (U.K.) Ltd.
21 Newman Street
London W1-United Kingdom
(01) 323-1120 Telex 266730 ADCUK

Get more info. Go to Ad index.

David Bunnell

The On-Line Brain Drain

The FCC has proposed to double the costs of telecommunications by imposing a steep access fee for on-line users. Good grief! Don't just stand there–sit down and write your congressman.

If it has its way, the Federal Communications Commission will change the slogan of the Information Age from Don't commute, telecommute, to Telecommute, pay tribute.

Its recent proposal would have the effect of drastically increasing rates for computer owners who communicate via modem over long-distance phone lines.

Don't let the FCC do this to us.

The measure is aimed at private telephone networks such as Tymnet and Telenet, as well as on-line information facilities like CompuServe, The Source, and Dow Jones. The FCC wants to charge these networks a special "access fee" of $4.50 to $5.40 an hour for long-distance service.

But guess who's going to be stuck with that extra fee? The customer, of course. We'll end up paying about 50 percent more than we're paying now.

If enacted, the proposal will go into effect January 1, 1988. Before that happens, however, the FCC is opening the matter up for public comment.

So here goes.

I think a little straight talk is in order. Some judicious arm-twisting of our senators and representatives in the nation's capital may not be a bad idea, either.

But just for the record, I'm not entirely unsympathetic to the FCC's concerns. This may surprise you. In fact, I had a very nice chat with an FCC attorney, Ruth Milkman, who explained why the FCC is doing what it's doing.

"The problem," Milkman told me, "is that computer users are not paying anything right now for the use of the local exchange, as they do when they make a regular long-distance call."

Cast your minds back to 1984 when Ma Bell's giant telephone monopoly was broken up into regional Baby Bells. Long-distance companies like AT&T, MCI, Sprint, and others began using those Baby Bells' local exchanges to connect customers to long-distance lines.

(continues)

Get a new handle on your business with SBT.

Now Available for SCO XENIX

Now you can handle up to 254 users, all working in the same data files, with the SBT MultiNet Database Accounting Library. The accounting software written in dBASE III PLUS.®

So whether your business is large or small, you can grow to the limits of the most advanced PC networks available.

When you want that special report, or your business needs something we didn't think of, you can quickly and easily modify our programs to meet your needs exactly (because our dBASE source code is included).

And if you don't have time to make the changes yourself, there's a nearby consultant who can make them for you.

So if your company has two users or two hundred and fifty, you can add customers, update records, and have as many people enter orders as it takes to keep your business growing.

Isn't it nice to know there's software you can't outgrow? The SBT MultiNet Database Accounting Library.

Now you can get a new handle on your business.

Call today for our demo disk, brochure and for the name of the SBT consultant in your area. (415) 331-9900.

THE SBT DATABASE ACCOUNTING LIBRARY.

dProfessional	Time & Billing	$395
dOrders	Sales Order Processing	$295
dInvoice	Billing/Inventory Control	$295
dStatements	Accounts Receivable	$100
dPurchase	Purchase Order	$295
dPayables	Accounts Payable	$395
dPayroll	Payroll/Labor	$395
dLedger	General Ledger/Finance	$395
dAssets	Asset/Depreciation	$295
dProject	Project/Job Accounting	$395
dProperty	Tenant/Unit Management	$395
dMaterials	Manufacturing Planning	$395
dMenu/Backup	Menu/Backup	$ 65

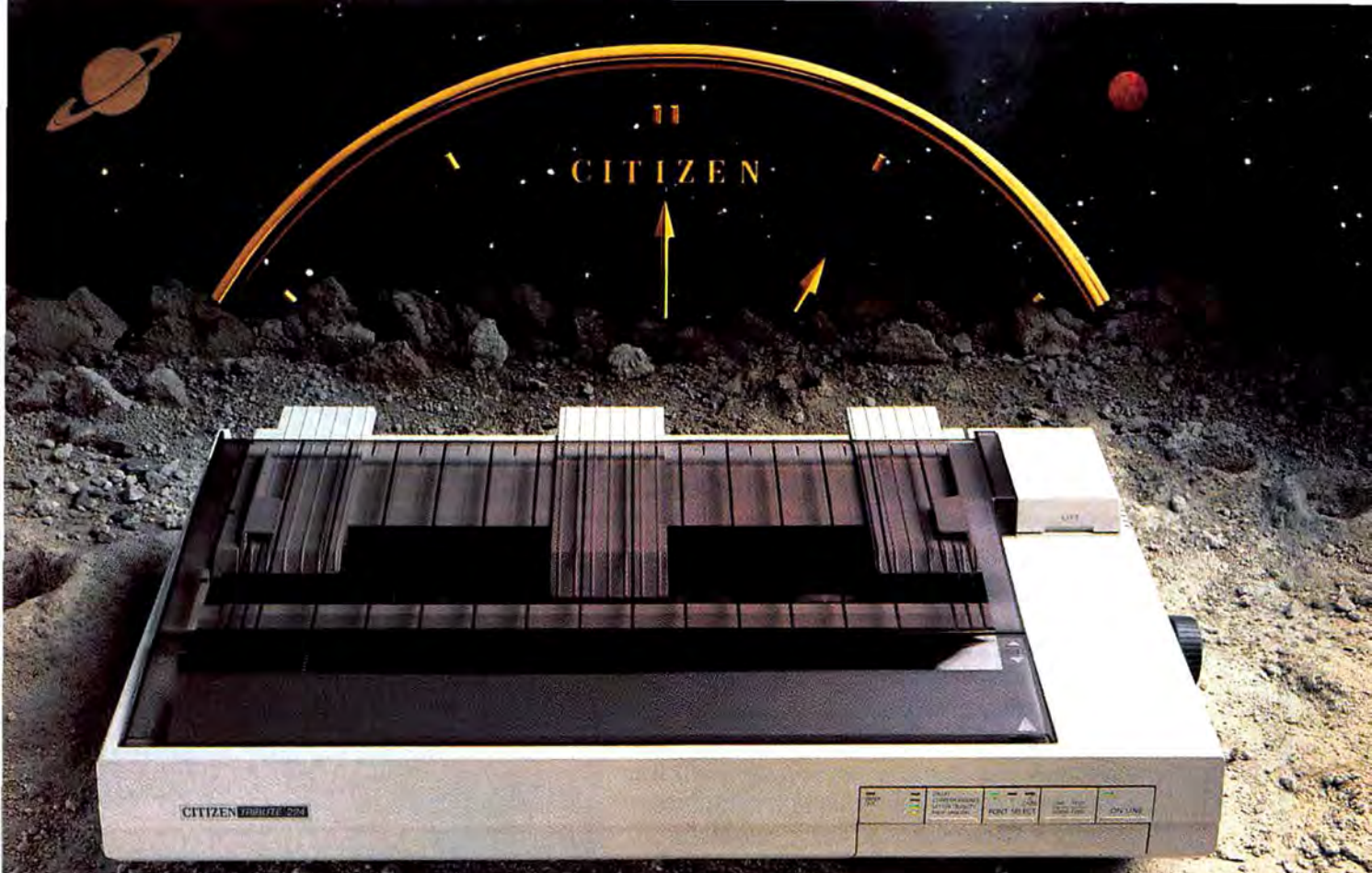
MultiNet versions $200 additional per module

One Harbor Drive
Sausalito, California 94965
(415) 331-9900 Telex 9102404708

SBT CORPORATION

Macintosh, Atari and compiled versions are available. dBASE III PLUS is a registered trademark of Ashton-Tate, Inc. Macintosh is a trademark of Apple Computer, Inc. Atari is a registered trademark of Atari Corp. XENIX is a registered trademark of Microsoft Corp. SCO is an abbreviation of the Santa Cruz Operation. SBT Database Accounting Library and MultiNet are trademarks of SBT Corp. © 1987, SBT Corporation.

Get more info. Go to Ad index.



A TRIBUTE TO THE 24-PIN PRINTER.

The Citizen™ Tribute™ 224 is all the printer your customers will ever need. For virtually any application.

It's today's 24-pin, high-performance solution for superb word processing, spreadsheet, graphics and data processing applications. And its exceptionally affordable price makes it very easy to sell. While still realizing an attractive profit margin.

Your customers receive true letter-quality printing at 66 cps, correspondence-quality at 132 cps, and drafts at 200 cps (at 10 cpi). In standard or proportional spacing. Even optional IC cards that enable character fonts and emulations to be easily expanded.

That's not all. The 224 features high-resolution graphics. Convenient front panel controls. An automatic paper loading system. And both serial and parallel interfaces.

The Tribute 224 is also compatible with industry-standard 24-pin dot matrix and daisywheel printers. So it runs with virtually every popular software package. And it's backed by excellent support materials to insure quick sales.

For more information, call 1-800-556-1234, Ext. 34. In California, call 1-800-441-2345, Ext. 34.

The Citizen Tribute 224. You can't offer your customers a higher tribute.

©1987 Citizen America Corporation. Citizen, the Citizen logo and Tribute 224 are trademarks of Citizen Watch Co., Ltd.

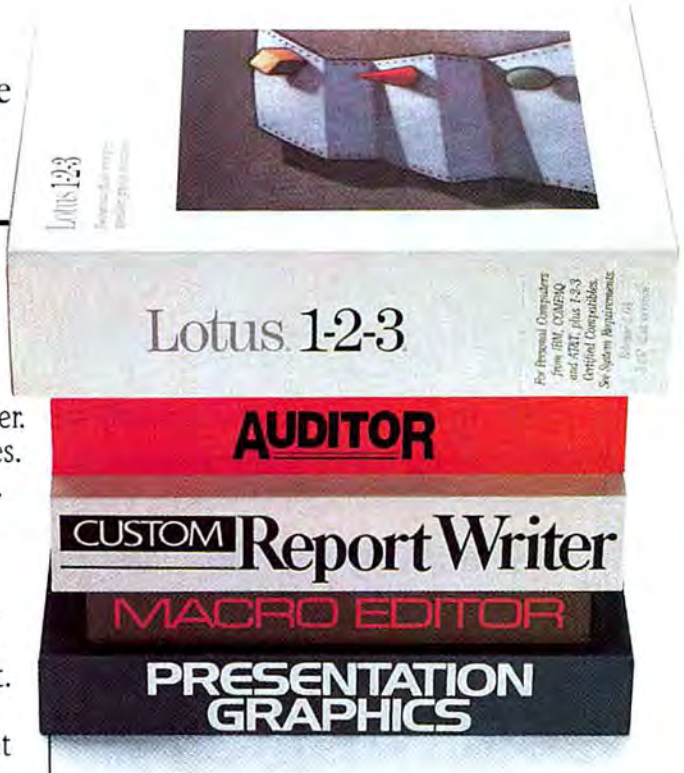
CITIZEN™

Printers that run like clockwork.

Get more info. Go to Ad index.

It all adds up to PFS:

PFS: Professional Plan gives you a 2.0-compatible spreadsheet, plus all the most popular 1-2-3 add-on functions, in one easy-to-use package.



You know Lotus 1-2-3™ is a classic. It might even seem like a part of you. But let's admit one thing: sometimes we all wish it could do a little more. Like make spreadsheet auditing easier. Or offer better macros and reporting capabilities. Or generate true presentation quality graphics. Now there is a program that lets you do all this and more—new PFS: Professional Plan.

Advanced Spreadsheet Capabilities.

Start with your 1-2-3 worksheet or with Professional Plan's own powerful spreadsheet. Professional Plan lets you directly read in and write out 1-2-3 Release 1A and 2.0 spreadsheet formulas and data. With Professional Plan, you can build a spreadsheet limited only by available memory. Plus, you get 94 formula keywords—more than 1-2-3.

Professional Plan has powerful row and column formulas that can replace a whole series of individual cell formulas. When you change data, Professional Plan's advanced affected-cell recalculation updates only those cells for big time savings. It's simple to consolidate data from multiple worksheets, too. Professional Plan even has a unique "Goal Seeking" feature that automatically solves for a goal that you have defined.

Advanced Macro Capabilities.

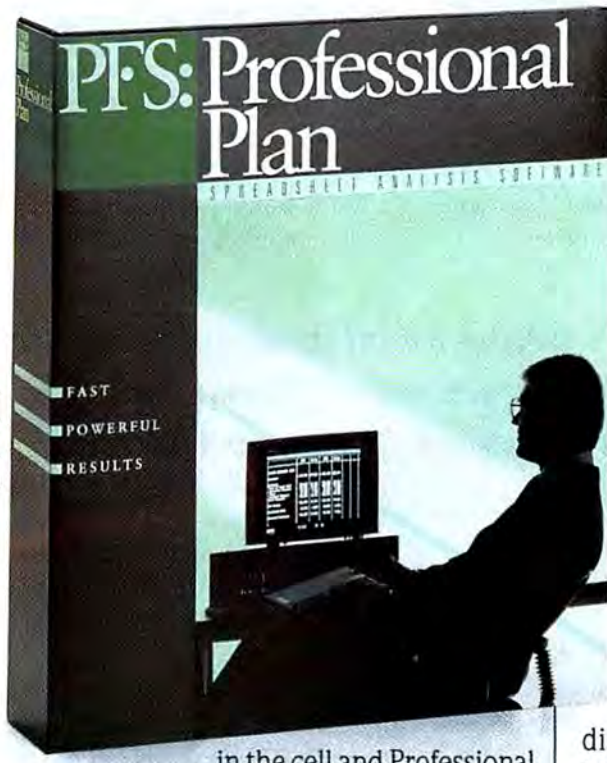
Professional Plan's powerful programming language takes macros to a new level. You can type in a macro, or let Professional Plan record your keystrokes. Editing becomes easy with the built-in macro editor. You can also link macros to multiple spreadsheets with the macro library feature. If you make a mistake, Professional Plan's extensive error handling capabilities tell you what the error is and where it is located.

Built-In Auditor.

Unlike other auditing packages, Professional Plan's interactive auditor lets you audit, edit, and print all your formulas directly alongside your data. Now, you can see at a glance if your formulas are correct. If necessary, you can change a formula

© 1987 Software Publishing Corporation, Mt. View, CA 94043. ™1-2-3 and Lotus are registered trademarks of Lotus Development Corporation.

Professional Plan.



in the cell and Professional Plan instantly recalculates while still in the audit mode.

Custom Report Writing.

Professional Plan gives you an amazing choice of built-in report writing options with the powerful "View" function. More than a simple "Hide/Restore" feature, Professional Plan actually lets you display, sort and print any set of rows and columns—contiguous or not. For example, you can view and print only columns 2, 5 and 12-20 of your spreadsheet. Then, design a page layout with custom headers and footers—even custom page breaks—for complete flexibility.

Presentation Quality Graphics.

Professional Plan makes it easy to create beautiful presentation quality graphics. In fact, Professional Plan offers the same superb output found in Harvard Presentation Graphics for your analytical graphs. Choose from over 13 different graph types with multiple type styles and pitch options. Then, print or plot your graphs directly with a keystroke—without a separate Print Disk utility.

Easy as a Word Processor.

If you can use a word processor, you can use Professional Plan. Enter plain English formulas and data directly to a cell—no separate editing key is required. Pull down menus and extensive context-sensitive "Help Screens" make getting started exceptionally quick and easy.

Part of Your Total Office Solution.

Professional Plan was designed from the beginning to run on a network. Data can be exported directly to PFS: Professional Write for combined text, spreadsheet and graphics output. And, you can both import and export data from mainframe or other products through ASCII.

Free Trial Size.

You know you can do a lot with 1-2-3, but we think you can do even more with Professional Plan. We're so sure, we'll even send you a free trial size. Just call Software Publishing Corporation at 1-408-848-4391 and ask for Operator #16. It all adds up to the best spreadsheet combination yet.

PFS: Professional Plan.

For a FREE Trial Size call 1-408-848-4391 Operator 16.
PFS: Plan owners call 1-800-255-5550 for upgrade information.

Subsequently, so-called packet switchers like Tymnet and Telenet appeared on the scene, offering long-distance services to people wishing to access on-line computer information. These services make highly efficient use of lines leased from the telephone companies, shooting "packets" of data bits through phone lines at the incredible rate of 56,000 bits per second. Customers now pay only for the local call to connect to these networks. Thus users avoid paying regular long-distance telephone fees.

"So who's paying for all those long-distance calls?" I asked Milkman.

"Somebody is," she said. "It's probably all the other long-distance customers. It then becomes a question of 'Should Aunt Minnie subsidize Joe Computer User?'"

Milkman explained that when the FCC first introduced the system of access charges in 1983, it was concerned about what effect a sudden increase of rates might have on a fledgling telecommunications industry. "So we decided to give the enhanced-service providers a temporary exemption –to give them time to figure out how to deal with the situation," she said.

"Why now? Why make them pay now?" I asked.

"It's always been commission policy that anyone who uses the local exchange to provide interstate service should pay for the use of the local exchange," she replied. "They've sort of had a freebie for a while, but now we're proposing to eliminate the exemption. Otherwise consumers will get the wrong signals about how expensive it is to use the telephone system–and about what the real costs are."

Now, there are wrong signals and there are inconsistent signals. I happen to think that the government, in making this proposal to charge fees for on-line access, is sending an inconsistent signal to consumers.

"So who's paying for all those long-distance calls?" "It's a question of 'Should Aunt Minnie subsidize Joe Computer User?'"

This is a view that I share with Charles McCall, president of CompuServe, one of the aggrieved parties in this telecom witch-hunt.

"On one hand, you have the Justice Department telling [District of Columbia] Judge Harold Greene that he should break up the Bell operating companies so that they can help promote the home information service, the videotex-type business," McCall notes. "On the other hand, you have the FCC trying to raise these rates to the point where they would kill that business."

McCall is absolutely right. The fees would kill that business–and if they didn't, then they would cripple it and otherwise render it senseless.

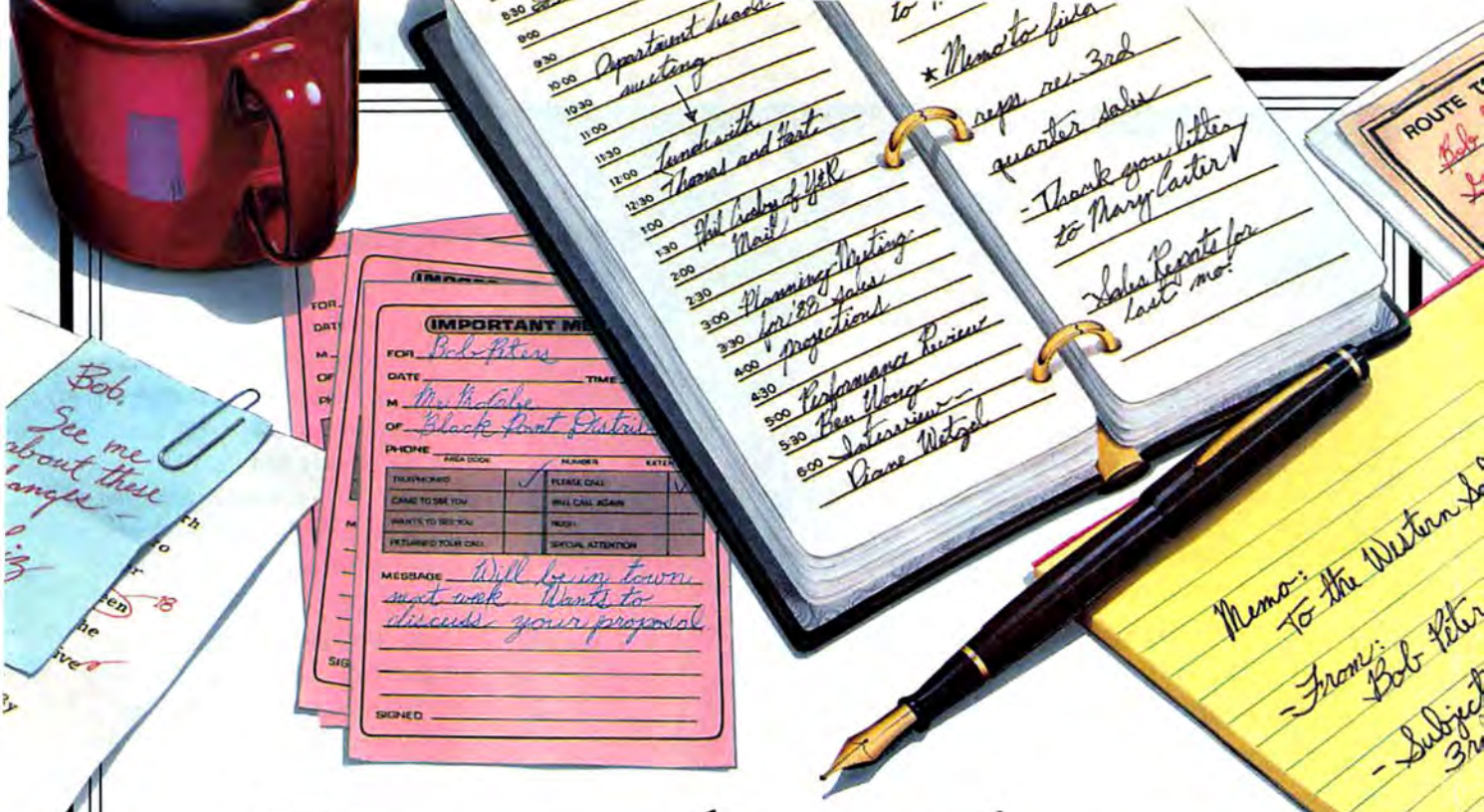
I believe that the pricing of these computer networks is crucial to the development of our information culture and society. I would even venture to say that The Source and CompuServe, which now charge about $6 per hour at a 300-baud rate, are still probably priced too high to be broadly popular. Raising that fee to $9 or $10 would put those information services even further out of reach for most people.

We're talking about a potential on-line brain drain, when people stop using information services or telecommunicating with each other because they can no longer afford to do so.

I'm not so concerned about medium and large-size businesses in this case. They can absorb the increase, probably even pass the extra costs on to their customers. No, I'm mainly worried about users. This money will have to come out of their personal pocketbooks. It's going to have to come from the same hard-earned dollars they use for going to the movies, buying milk, and otherwise staying alive.

By keeping the doors open, by not charging an access fee, the FCC would be encouraging the development of the entire computer industry and of the whole mode of electronic communications.

(continues)



For people too busy to learn word processing. And too busy not to.

PFS: Professional Write is so easy you can learn it in an afternoon.

Professional Write's design is so intuitive, you may never need the manual. Pull-down menus describe all the functions, and on-line help screens are always available to handle your questions. There's no need to memorize special keys or search through confusing reference cards.

Essential features like the spelling checker, thesaurus and printing functions are only a keystroke away, to save you time and hassles. There's even an integrated address book that automatically inserts names and addresses into letters. And easy keyboard macros speed up repetitive tasks like formatting reports, ending letters or typing standard paragraphs.

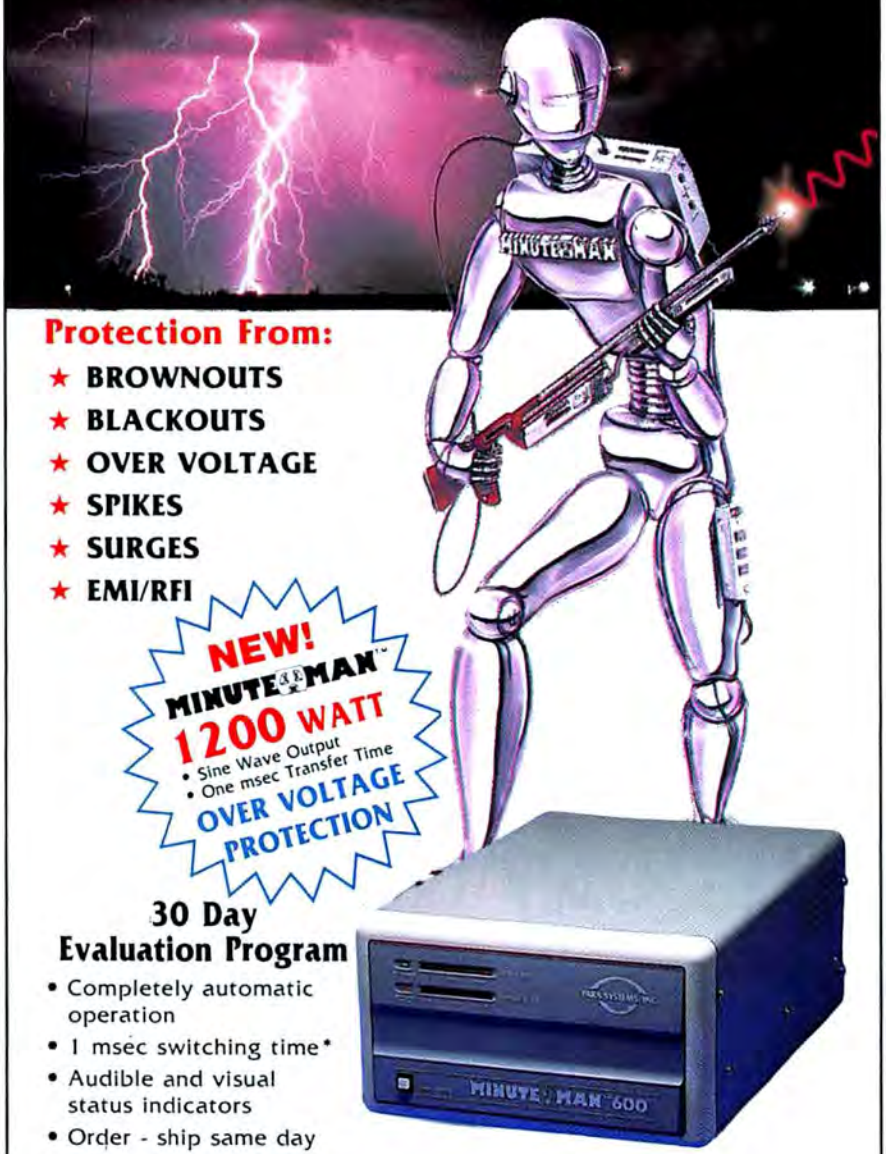
Professional Write lets you instantly trade documents with people whose word processors use the IBM DCA format. And you can import data from other PFS: Professional Series applications. It supports all the popular networks, too.

So if you think you can't afford the time to learn word processing, think again. Maybe you can't afford *not* to. Find out how easy it is. Just call for a free trial disk, and see for yourself as you actually create and print your letter with PFS: Professional Write.

For a free trial disk, call 1-408-848-4391, Oper. #14.
PFS: Write owners, call 1-800-255-5550 for upgrade information.

© 1987 Software Publishing Corporation, 1901 Landings Dr., Mt. View, CA 94039-7210. **(IBM and compatible owners only.)**

MINUTEMAN™
UNINTERRUPTIBLE POWER SUPPLIES



Protection From:
★ BROWNOUTS
★ BLACKOUTS
★ OVER VOLTAGE
★ SPIKES
★ SURGES
★ EMI/RFI

NEW!
MINUTEMAN™
1200 WATT
• Sine Wave Output
• One msec Transfer Time
OVER VOLTAGE PROTECTION

30 Day
Evaluation Program
• Completely automatic operation
• 1 msec switching time*
• Audible and visual status indicators
• Order - ship same day
• Full one year warranty
* 250 Watt and 500 Watt units offer 4 msec switching time.

MINUTEMAN 250 250 WATT (120V) $359.00 Suggested Retail	MINUTEMAN 300 300 WATT (120V) $549.00 Suggested Retail	MINUTEMAN 500 500 WATT (120V) $699.00 Suggested Retail
MINUTEMAN 600 600 WATT (120V) $899.00 Suggested Retail	MINUTEMAN 1000 1000 WATT (120V) $1399.00 Suggested Retail	MINUTEMAN 1200 1200 WATT (120V) $1499.00 Suggested Retail

1455 LeMay Drive
Carrolton, Texas 75007
Telephone:
(214) 446-7363

PARA SYSTEMS, INC.

1-800-238-7272

See Us At:
PC EXPO - New York
Sept. 1-3 Booth #5
PC EXPO - Chicago
Oct. 13-15 Booth #387

Get more info. Go to Ad index.

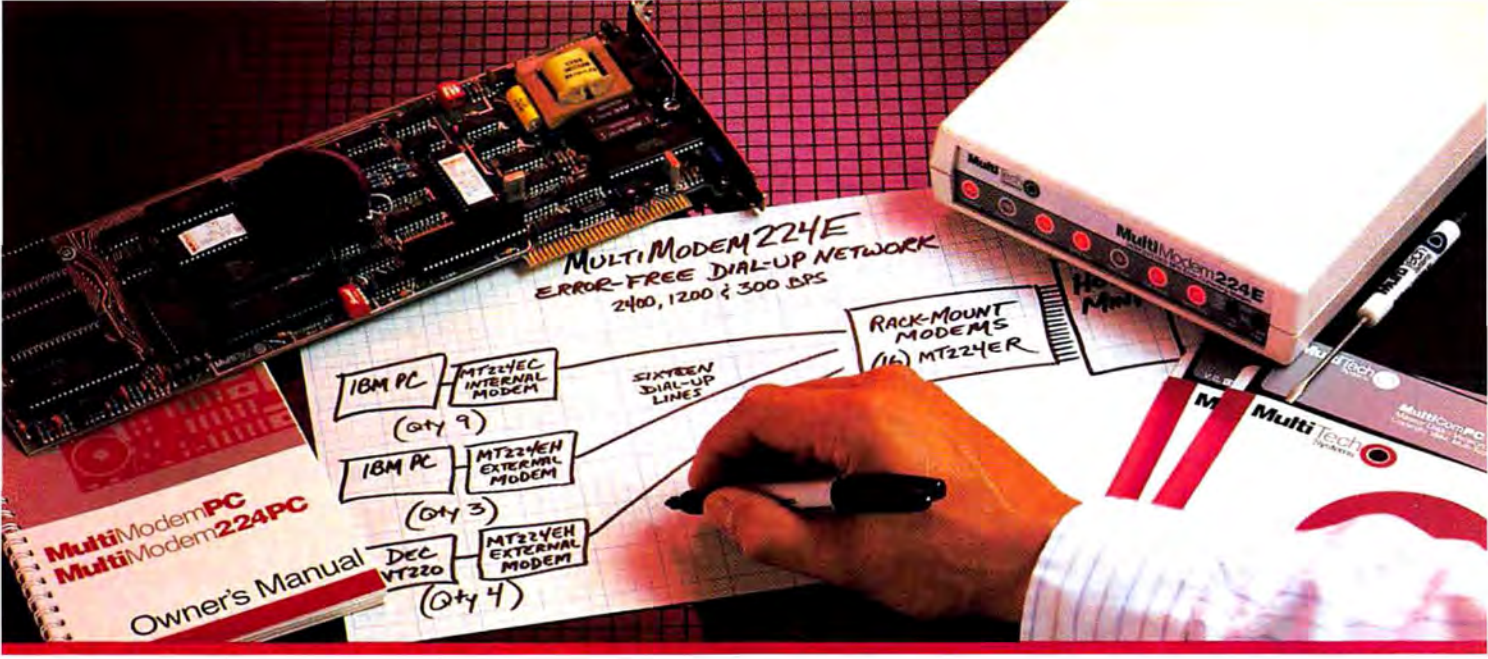
Just look at any of those on-line services and observe the enormous amount of creativity that's going on. Putting a surcharge on long-distance access to on-line bulletin boards and data services would stall this creative momentum. It would also adversely affect sales of modems and communications software.

Not only would the established computer industry be damaged by the FCC's proposal, but at least one fledgling information industry may bite the dust before it's even had a chance to spread its wings.

I'm referring to the advent of videotex services in this country, modeled after France's hugely successful Minitel system. To date, the French phone company, PTT, has installed about 2.5 million of these small, inexpensive videotex terminals in French households at a cost of about $10 per month. It's proven to be a financial bonanza. Last year Minitel generated about $135 million in revenues for service providers, not to mention $94.3 million worth of telephone traffic–on top of who knows how much in untallied packet-switching revenues–for the French state-owned telephone company.

Impressive, *n'est-ce pas?* And, ooh-la-la, the array of services that are being gobbled up by French consumers! I was looking at a recent issue of the French computer magazine, *Science & Vie Micro*, which listed the "300 best services." Among them: dog club bulletin boards, electronic message services, plane and train reservations, local municipal information, tax services, weather

(continues)



Error-Correcting 2400 bps Modems from Multi-Tech Systems:

When it has to be as good as it is fast

- Dial-up 2400 bps modems have arrived. More datacomm users are upgrading from 1200 to 2400 than ever before. But there can be a flip side to increased speed: more transmission errors.
- That's why our MultiModem224E™ offers MNP™ error correction. Available in our 2400 bps desktop, internal and rack-mounted modems, MNP gives you 100% error-free transmissions, no matter how bad the phone line. MNP does it without the speed degradation of less efficient, software-based protocols.
- Another important point: MNP Class 3 has emerged as an industry standard. It's now in the public domain, and has been implemented in virtually all 2400 bps modems that offer error-correction.

- So, why buy error-correcting modems from Multi-Tech? There are many good reasons, including:

1. Multi-Tech modems are 100% Hayes-compatible (more so than Hayes' own 2400 bps modems*), and our MultiModem224E with error-correction costs less than a Hayes Smartmodem 2400™ without this feature.
2. Bonus features, like speed conversion, both synch and asynch operation, battery-backed option settings and phone number memory.
3. Versatility: the auto-dial/auto-answer MultiModem224E runs at 2400, 1200 or 300 bps, with or without error-correction, automatically!
4. Our two year warranty means something. Since Multi-Tech modems are designed and manufactured at our Minnesota headquarters (as they have been for the last sixteen years), you can be sure we'll be here when you need us.

- Please call us toll-free at **1-800-328-9717**, for additional information...get a modem that's as good as it is fast!

**InfoWorld–8/5/85–reprints available*

Trademarks: MultiModem and the Multi-Tech Systems logo: Multi-Tech Systems Inc. • MNP: Microcom Inc. Smartmodem: Hayes Microcomputer Products, Inc.

MultiTech Systems

The right answer every time.

Get more info. Go to Ad index.

Multi-Tech Systems, Inc. • 82 Second Avenue S.E. • New Brighton, Minnesota 55112 U.S.A.
1-800-328-9717 • 1-612-631-3550 • TWX 910-563-3610 (Domestic) • Telex 4998372 MLTTC (International)

"Mace Utilities 4.0 Best Data Recovery There is Gets Better"

PC Magazine
March 31, 1987

. . . And Better!

VERSION 4.10

RECOVERY FEATURES

DIAGNOSE checks any disk for errors.
REMEDY fixes errors, automatically.
UnDELETE recovers deleted files easily, automatically.
UnFORMAT recovers from an accidental format of your hard disk even when MACE was not installed.

new *Floppy* **UnFORMAT** recovers from accidental format of a floppy disk.

new ***FORMAT-F*** floppy formatter. Replaces DOS FORMAT. Includes **'RESURRECT'** option, to revitalize weary disks.

new ***FORMAT-H*** hard disk formatter replaces DOS FORMAT. Guaranteed safe.

HOT-ROD FEATURES

new *Fast* ***UnFRAGMENT*** quickly reorganizes segmented files for speedier disk performance.
VCACHE buffers data reads and writes in regular, expanded or extended memory for dramatic disk speedup.
new ***SORTD*** Directory sort.
new ***SQZD*** Directory path optimizer.
VSCREEN Screen speedup.
VKETTE Diskette caching for floppies.

new ***dbFIX***
Repairs and recovers damaged or lost DBase files, automatically.

Advanced performance at the same good price: $99

To Order Call
800-523-0258
503-488-0224

Paul Mace
SOFTWARE
400 Williamson Way, Ashland, OR 97520

Get more info. Go to Ad index.

Get In on the PC Market Action

Your *PC World* Action Ad takes you to the heart of the IBM PC marketplace. These ⅓-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).

and traffic information, various money management services, even horse-race betting.

There's a phone jack in the back of the Minitel terminal, and within 10 minutes of basic familiarization, you're on. These machines don't even look like computers, although it's possible to run PC applications on specially configured models. The American version of the Minitel even has a retractable keyboard to disguise the computer-like appearance of the machine. In other words, this could be the breakthrough item to captivate the next big wave of computer users—the Aunt Minnies of America, if you will.

But now the FCC wants to roll us back to the baudless Middle Ages by imposing its horrendous access fees.

I was sitting in the office of Nicolas El Baze, a young Frenchman who heads the San Francisco branch of Paris-based Softway, Inc. This international marketing and engineering firm represents French computer companies in America. On one corner of his desk El Baze had an original Minitel—the first one, in fact, to be made according to U.S. standards, a real collector's item, with serial number 000009. A couple of his clients have been on the verge of launching their own Minitel services in this country, but now they're faced with the FCC dilemma.

El Baze was shaking his head disconsolately. "I think it's a shame," he said, referring to the

(continues)

Finally. Accounting made simple.

1st

Choose the best. BPI is the number one pioneering leader in microcomputer accounting systems. Saving hundreds of thousands of businesses millions of hours each month.

2nd

Save with BPI's new Entry One accounting software. Just $89! Undoubtedly the most exceptional accounting software value available today. And the first BPI accounting system so affordably priced.

3rd

Protect your investment. When you're ready for even more accounting power, your Entry One is good for **full credit** toward any BPI system upgrade. And that's an integrated upgrade! Without re-entering data. Or relearning terms or concepts.

4th

Call anytime. You can order toll-free for faster service. And full software support for Entry One is available. Always just as close as your phone.
1-800-531-5236

5th

Entry One accounting software is powerful. Thoroughly proven. And ultra easy to learn and use.

It includes:
- Built-in tutorial with practice company
- Automatic: double-entry accounting, posting, check writing and more
- Pre-assigned prompts save keystrokes
- Accounts Payable subledger
- Accounts Receivable subledger
- Payroll subledger
- Extensive business reporting available
- Transfer data to Lotus, BPI's AURA and others
- 30-Day Money Back Guarantee
  ($10 restocking fee)

Hardware Requirements:
- IBM PC, XT, AT and true compatibles. DOS 2.0 or later with minimum of 256K memory and with two 360K floppy diskettes or one 360K and a fixed disk.

6th Hurry!

PCW

Please rush me:

	QTY.	PRICE	TOTAL
Entry One Accounting	_____	$89.00	$_____
AURA Word	_____	$89.00	$_____
AURA File	_____	$89.00	$_____
AURA Plan	_____	$89.00	$_____
Texas residents must add .0725 Sales Tax:			$_____
Add $4.00 per product shipping charge			$_____
		Total:	$_____

Company Name: _____

Your Name: _____

Your Company Address: _____
(not a P.O. Box) _____

Your Telephone Number: _____

Method of Payment: Check in the amount of: $_____ enclosed.

Credit Card: Check Appropriate One ____ **VISA** ____ **MC** ____ **Am Xpress**

Card Number _____

Name on Card _____ Exp. Date _____

Authorized Signature _____

Mail To:

BPI Systems, Inc.
3001 Bee Cave Road
Austin, Texas 78746
Attn: Customer Services

BPI SYSTEMS™
A Division of Computer Associates.

Get more info. Go to Ad index.

FINALLY!

EASYFLOW

An on-screen flowchart processor that knows about flowcharts - not just another "screen draw" program that makes you do most of the work. EASYFLOW is a powerful full-screen graphics program dedicated to flowcharts and organization charts. With it you can quickly compose charts. More important, you can easily modify charts so they are always up to date.

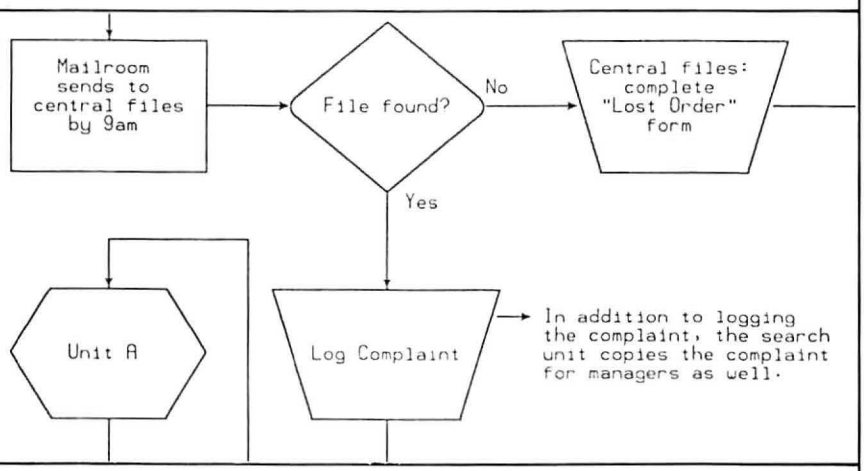
- **Automatic:** Fully automatic text centering within shapes, both horizontally and vertically. Fully automatic line routing & re-routing.
- **Fast:** Written in assembly language for speed.
- **Large:** Charts up to 417 columns wide by 225 lines high. Chart too large for your printer? EASYFLOW automatically breaks the chart up & prints it in page size pieces.
- **Standard:** All standard flowcharting shapes included. Custom shapes can be ordered.
- **User friendly:** Don't take our word for it. PC Magazine* says "EASYFLOW lives up to its name. It's hard to imagine any easier and more flexible way to produce basic and even complex flowcharts".
- **Mouse:** Optional but fully supported.
- **It prints:** On most popular matrix printers including IBM, Epson, Toshiba, HP LaserJet, LaserJet-Plus and many others.
- **It plots:** On HP7440, 7475, 7550, 7570, 7585B and compatible plotters.
- **It works:** We are contractually prevented from mentioning the name of the "big eight" accounting firm that purchased a world-wide site license, but we can tell you that they spent months evaluating all available flowcharting packages before choosing EASYFLOW.
- **Rush delivery:** Order by noon today (eastern time) and we'll have it to you by courier tomorrow**. Rush delivery charge is $15.00 (instead of $2.00) and is available only in USA & Canada.
- **Documented:** 100 page manual plus over 150 screens of context sensitive help.

EASYFLOW works on IBM PC's, IBM PS/2 and compatibles. Requires 384 K memory, DOS 2.0 or higher and an IBM CGA/EGA/VGA or Hercules monochrome compatible adapter card.

Order direct for only **$149.95** + $2.00 S&H (USA/Canada), $10.00 (foreign). Payment by M.O., cheque, VISA, Mastercard or Company PO.

* March 10, 1987 issue, page 278.

** Rush orders are shipped by Purolator Courier and normally arrive the next business day to most locations. Remote destinations take longer.



The chart fragment above was produced on an HP LaserJet-Plus and is actual size and unretouched. Publication quality charts like this can be produced using only minutes of preparation time and seconds of print time.

HavenTree Software Limited
PO Box 1093-M
Thousand Island Park, NY 13692

Order Desk: 1-800-267-0668
Information: (613) 544-6035 ext 47
Telefax(G3): (613) 544-9632

Get more info. Go to Ad Index.

proposed surcharge. "When you see how this works in France, how much people are getting out of it...I can't imagine not having a similar system in the U.S., where people are even more ready to use these types of terminals and services than we are in France."

He gave a Gallic shrug. "The people who stand to lose the most, of course, are all those at home who have never used a computer. They're going to suffer even more, but they don't know it yet. There will be so many services they won't be able to access. Or if they can, it will be at such a cost that they won't want to."

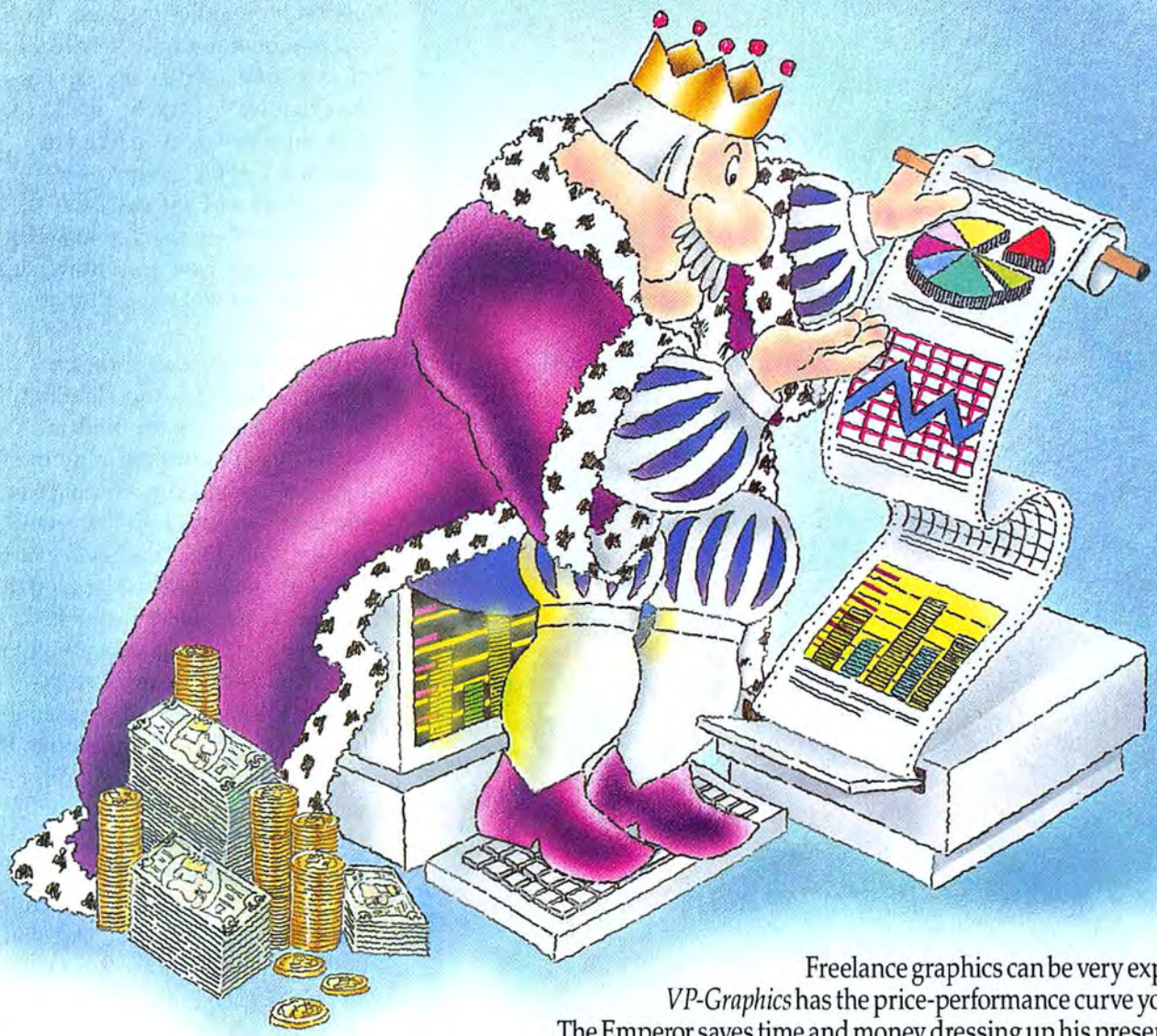
Can America afford to fall behind France and other countries–Switzerland and Singapore, to name two–that currently use videotex services? Doesn't it make more sense for the government to stimulate our economy by adopting a laissez-faire attitude toward on-line access to information services? Just think of what Minitel has done for the French economy. We could be enjoying an economic and electronic boom of our own. It might do wonders for our balance of payments.

I think the FCC should put off its access charges. I'm not insensitive to the problem. But for now, the FCC should think of free access as an investment–an investment in America's high-tech future, as well as in our domestic economy.

So this is David Bunnell's proposal to the FCC: I urge you to

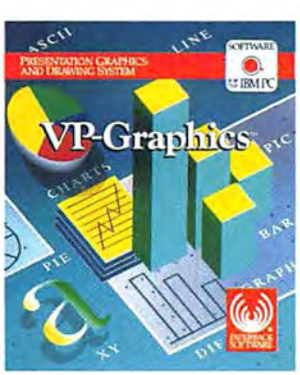
(continues)

Graphics Worth An Emperor's Ransom



Freelance graphics can be very expensive. *VP-Graphics* has the price-performance curve you need! The Emperor saves time and money dressing up his presentations with the easy-to-use, stand-alone graphics and drawing program that has it all: pull-down menus, keyboard or mouse input, pie, bar and line graphs, xy charts, scatter plots, ability to read PIC, DIF, and ASCII files, support for popular printers, plotters, laser printers, EGA, CGA, and Hercules™ video cards. A sophisticated object-based program, *VP-Graphics* lets you use your imagination freely to create illustrations, too. For serious business or serious fun—try *VP-Graphics* and draw your own conclusions.

See for yourself.
The best does cost less.
$99.95



VP-Graphics.™
A GREAT DEAL more.

Software for the IBM® PC from Paperback Software.
2830 Ninth Street, Berkeley, California 94710 Phone (415) 644-2116

VP-Graphics is a trademark and Paperback Software is a registered trademark of Paperback Software International.
Hercules is a trademark of Hercules Computer Technology. ©1987 Paperback Software International

PAPERBACK SOFTWARE

Get more info. Go to Ad index.

ANTHROCART.™

Compact... a key reason why people like the AnthroCart. A lot of hardware arranged in a little space. Stacked up, not out. Sturdy enough to keep it together.

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

The AnthroCart is designed for tight spaces. 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 N.W. Yeon St.
Portland, OR 97210
503-241-7114

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

delay the imposition of these access charges for on-line computer use for a period of ten years. Give the telecommunications industry a chance to really develop. I'm not sure that we've come such a long way since the breakup of giant Ma Bell. Looking at my own phone bills over the past few years, I can't see that my long-distance charges have gone down significantly. So what was all that fuss about?

On the positive side, the cat's already out of the bag. Hundreds of thousands of home modem users are now using various on-line services and contributing to the development of on-line technology. With luck, there's already a critical mass, so that the growth of on-line use cannot be stunted.

I urge you, and all concerned users and potential users everywhere, to contact your representatives in Congress. Let them know you oppose the FCC telecom surcharge.

I would also have urged you to send your E-mail to the FCC's electronic bulletin board, but as Ruth Milkman revealed, "Are you kidding! We still have rotary dials and black telephones. Talk about the Stone Age of the information industry!"

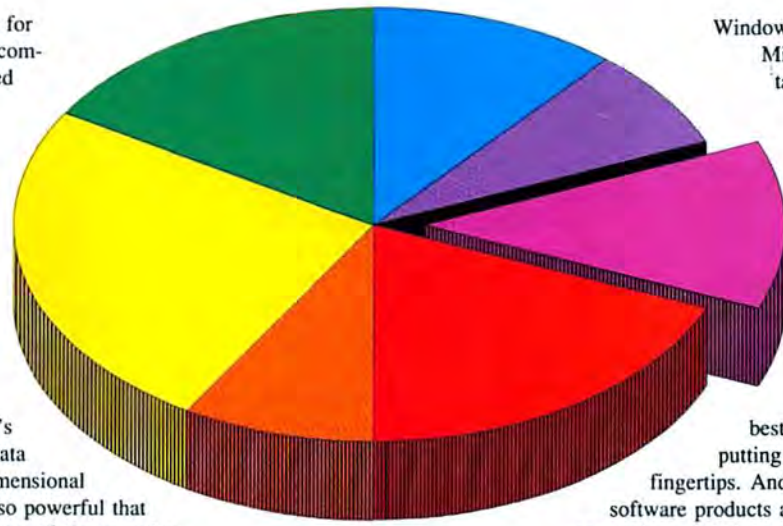
It figures.

So write the FCC instead: The Secretary, Federal Communications Commission, 1919 M St. NW, Room 222, Washington, DC 20554.

Give them your opinion. You want to know what mine is? It's Give 'em the boot, don't pay tribute!

Easier Than Pie

Introducing Windows GRAPH: Now the most powerful business charting program is also the easiest to use.



Choosing a charting package for your business used to be a compromise. Software either required a degree in mathematics or lacked the features to get the job done. But now, with Windows GRAPH, your ideas are no longer pie in the sky.

With Windows GRAPH, you can create charts and graphs with the click of a button. Create area, bar, column, line, pie, exploded pie, scatter, combination, and table graphs. Enter data directly into GRAPH's worksheet or turn spreadsheet data into stunning two- and three-dimensional color graphics. And GRAPH is so powerful that you can create an unlimited variety of charts and an unlimited number of charts per page. Then you can combine and enhance them using GRAPH's free-form drawing and text capabilities. The result: clear, crisp, accurate graphs.

Windows GRAPH is unprecedented in power and ease. Novice users can begin immediately loading data from existing spreadsheets such as 1-2-3, Multiplan, and Visicalc, and selecting default chart types from menus. Experienced users can exercise complete interactive control over customization and layout of charts, drawings, and text.

And with Windows GRAPH, you can create advanced scientific and business graphs such as log-log and semi-log variations, as well as linear, exponential, and logarithmic regressions. Even "hot-link" your graphs to another application for instant access to real-time data.

Windows GRAPH is compatible with Microsoft Windows, so you can take advantage of "state of the art" hardware and other Windows-compatible applications, such as Aldus' PageMaker, Microsoft Windows Write, Micrografx In*a*Vision, and Windows DRAW.

Micrografx is a proven innovator of PC-based graphics products. We are dedicated to developing the best software products available, putting the latest technology at your fingertips. And Micrografx' award-winning software products always put the customer first, combining what the critics call "the most powerful" and "the easiest to use" graphics products on the market.

The complete family of Micrografx products: Windows DRAW, rated as the best free-form graphics program; In*a*Vision, a powerful yet easy-to-use CAD system; Windows ClipArt, a collection of 1000-plus handcrafted artistic images; and Windows CONVERT, a graphics conversion utility for AutoCAD and other programs.

For additional information about putting Windows GRAPH, or any Micrografx product, to work for you, call your local authorized dealer, or contact Micrografx, toll-free, at **1-800-272-DRAW** (in Texas, call 214-234-1769; Telex: 650309-3890) or write to Micrografx, Inc., 1820 North Greenville Ave., Richardson, Texas 75081. Order today and watch your (and our) competition scramble for a piece of the pie.

MICROGRAFX

The Picture of Success

Windows GRAPH is compatible with Windows DRAW and Windows ClipArt.

Windows GRAPH gives users complete control over every aspect of a graph.

The following listing is trademark reference, including registered and unregistered trademarks, for the companies listed: In*a*Vision, Windows ClipArt, Windows CONVERT, Windows DRAW, Windows GRAPH, Micrografx, Inc.; PageMaker, Aldus Corporation; Microsoft Windows, Windows Write, Multiplan, Microsoft Corporation; AutoCAD, Autodesk, Inc.; 1-2-3, Visicalc, Lotus Development Corporation.

© 1987 Micrografx, Inc.

Get more info. Go to Ad index.

ANNOUNCING ORACLE's NEW DIS

THE FIRST PRODUCT TO BREAK

WHY WAIT FOR OS/2? RUN LARGE APPLICATI

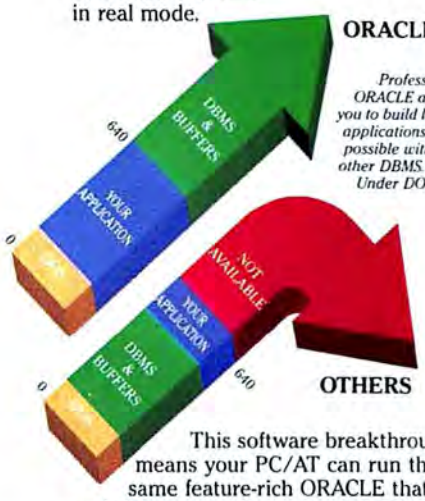
All PC DBMSs have three serious limitations. First, very little room is left for your application after deducting the size of DOS and the DBMS from the available 640K. Second, they don't provide easy, transparent access to minicomputer and mainframe data. Finally, multi-user applications are impractical because of long delays caused by LAN data lock-out. Three serious limitations. Not any more.

In 1979, Oracle Corporation delivered the very first relational DBMS. Oracle also delivered the very first implementation of SQL. And now, we're delivering the first ever distributed DBMS for PCs: *Professional ORACLE,® Networkstation ORACLE® and LANserver ORACLE.®* Three DBMS products that bring mainframe applications, mainframe data, and mainframe power to the desktop. All of which incorporate ORACLE's breakthrough technology. And all deliverable today.

EXPLOITS 286/386 PROTECTED MODE. NOW.

Professional ORACLE is the very first DBMS to exploit the advanced technology of PCs like the Compaq 386, IBM's PC/AT, and the new Personal System/2.

The ORACLE kernel—the relational DBMS engine—executes in protected mode. Above the 640K line in extended memory. At the same time, your ORACLE applications, tools, and DOS 3.x execute below the 640K line in real mode.



Professional ORACLE allows you to build larger applications than possible with any other DBMS. Now. Under DOS 3.x.

This software breakthrough means your PC/AT can run the same feature-rich ORACLE that mainframes run. Not a down-sized subset. Plus it leaves you plenty of memory to develop and execute major database applications. Without giving up your memory-resident utilities.

SEAMLESS CONNECTIVITY. NOW.

When other PC DBMSes claim "connectivity," they mean terminal emulation or file transfer, downloading and uploading static data snapshots.

With Networkstation ORACLE, an ordinary PC (XT as well as 286 or 386) becomes a true distributed application processor. You can dynamically access and update a remote database—either ORACLE or IBM's DB2†—as if it were stored on your PC.

What's more, ORACLE's SQL*Star distributed database architecture—the first ever on PCs—lets you query or update local PC and remote databases simultaneously. Even join them into a single view. Without knowing where your data is located. So you can distribute your data to where it's used the most. Control, secure, and back it up however you want. And still network it all together whenever you need to.

ORACLE Connectivity—PC to Database Server		
Speed Class	*Media*	*Raw Speed*
Low	Async Lines	<19,200 bps
Medium	3270 Coax	50 Kbps
High	Ethernet	10 Mbps

Networkstation ORACLE works over Ethernet using DECnet protocols. Over 3270 coax using LU2 data streams. And over RS-232 and dial-up phone lines. With TCP/IP, APPC LU6.2 and other industry-standard protocols to come.

"Addresses all obstacles that have prevented full PC participation in a corporation's database-management activities."
PC Week

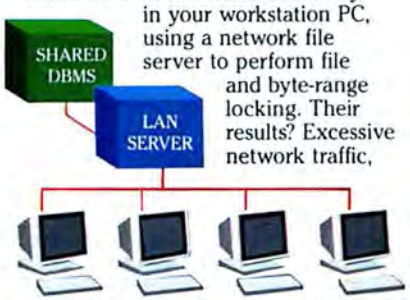
ORACLE H

- Fully Utilizes 286/386 Technology
- Seamless Connectivity To Minis & Mainframes
- Database Server For PC LANs
- True SQL-based
- Portability across VM, MVS, VAX/VMS, UNIX & others
- Develop Mainframe & Mini Applications On Desktop
- True Multi-User Concurrency
- Mainframe Data Integrity
- Distributed Processing
- Distributed Database
- Familiar 1-2-3-like Spreadsheet Interface

DATABASE SERVERS FOR LANs. NOW.

Using an Ethernet LAN, you can connect Networkstation ORACLE PCs to a variety of powerful ORACLE database servers. Such as the MicroVAX 2000. Soon, you'll be able to connect them to PC ATs, Personal System/2s or the new Compaq 386 running LANserver ORACLE.†

Other PC DBMSes execute entirely in your workstation PC, using a network file server to perform file and byte-range locking. Their results? Excessive network traffic,



frequent waits for busy records, and corrupted databases from aborted transaction streams.

ORACLE's database-server architecture ensures minimum network traffic, maximum concurrency, and data integrity for the most demanding multi-user applications. Just like a mainframe. And at one-fifth the cost of the least expensive proprietary database machine.

TRIBUTED DBMS FOR 286/386 PCs

THE 640K BARRIER ON THE PC

ONS ON YOUR DESKTOP UNDER DOS 3.x NOW

AS IT NOW.

ORACLE	dBASE III PLUS	R:BASE System V
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO
NOW	NO	NO

SQL COMPATIBILITY. NOW.

ORACLE is compatible with both the ANSI-standard and IBM-standard SQL database language.

Which means you can develop applications in ORACLE on your PC and run them on the largest mainframe under ORACLE or IBM's DB2.

You can quickly paint, prototype and enhance sophisticated forms-based applications with minimum effort and maximum flexibility, using such optional facilities as SQL triggers and user exits.

UNRIVALED ORACLE PORTABILITY. NOW.

Moreover, your ORACLE PC applications also become automatically portable to over 30 minicomputer and mainframe families. Under VM, MVS, VAX/VMS, UNIX, and other operating systems.

PRODUCTIVITY FOR NOVICES AND EXPERTS ALIKE. NOW.

Both Professional ORACLE and Networkstation ORACLE come with a comprehensive array of fourth-generation tools for reporting, decision support and application development. Tools that are the envy of our mainframe and PC competition alike.

Tools like **SQL*Plus.** For performing complex queries, updates, and database administration with ease.

*ORACLE's SQL*Star distributed architecture allows you to manipulate your database—across multiple, dissimilar systems and operating environments—as if all the information were in a single database on your PC.*

SQL*Report. The comprehensive multi-table report generator.

SQL*Forms. The versatile forms-based application builder. So you can develop applications in record time and train users in no time.

*Manipulate your database from within SQL*Calc by embedding SQL statements in spreadsheet cells, just like formulas.*

SQL*Calc. The 1-2-3-like spreadsheet that marries the world's most popular PC user interface with the world's most powerful PC DBMS.

Optional precompilers also let you access ORACLE from embedded SQL in COBOL or C-language programs.

FOR A LIMITED TIME, BE THE FIRST.

Be the first in your organization to experience how fast you can build complex SQL applications on your PC. If you're a VAR, be the first to expand your markets and make your mainframe applications available on desktop technology. Compare ORACLE's power, features and ease. The more you test, the better we'll look. And the faster you act, the better you'll look, too.

Order ORACLE now. While you can still be the first. So you don't finish last.

SEND ME THE FOLLOWING PRODUCTS. NOW.

Attention PC Marketing • Oracle Corporation
One Oracle Parkway • Belmont, CA 94002

Please send me the products checked off below, now.
I understand both Professional ORACLE and Networkstation ORACLE incl. SQL*Forms, SQL*Plus, SQL*Report & SQL*Calc.

Select Media: ☐ 5¼" or ☐ 3½"

☐ Professional ORACLE. $1,295. Requires IBM PC/AT, System/2 50-80, Compaq 386, or 100% compatible, DOS 3.1+, and 1.5MB of RAM. Precompilers included for Microsoft C and Lattice C.
- ☐ Precompiler for Realia COBOL. Add $395.
- ☐ Networking option with all available protocols. Add $395.

☐ Networkstation ORACLE. $695. Requires DOS 2.1+, on an IBM PC/XT, AT, 286, 386 or compatible with at least 512K of RAM (DOS 3.3 on System/2), and LANserver ORACLE on a mainframe, mini or 286/386 PC.

☐ LANserver ORACLE for the MicroVAX 2000. $6750. Requires VAX/VMS version 4.5+, 2MB memory, an Ethernet Controller and one or more PCs running Networkstation ORACLE.

Prices shown include UPS shipping charges if the order is prepaid. Since Oracle Corporation has offices everywhere, add local and state taxes to the amount below.

$ _____ Amount of purchase checked above.
\+ _____ State and Local Sales Taxes.
= _____ Authorized Total (For purchase orders, shipping charges will be added to your invoice.)

Name _____
Title _____
Company _____
Address _____
City _____ State ____ Zip _____
Phone _____

Enclosed is ☐ a check, ☐ a purchase order or ☐ credit card for ☐ VISA, ☐ MasterCard or ☐ American Express.
Credit card or P.O. number _____
Card Exp. Date _____ Order Date _____
Authorizing Signature _____

CALL ABOUT OUR $199 DEVELOPER'S KIT!

Or Call 1-800-345-DBMS

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

One Oracle Parkway • Belmont, CA 94002
World Headquarters: (415) 598-8000
Calgary (403) 265-2622 • Ottawa (613) 238-2381
Quebec (514) 337-0755 • Toronto (416) 596-7750
ORACLE-U.K. (SURREY) 44-1-948-6976
ORACLE-FRANCE 33-1-49-00-0808
ORACLE-EUROPE (NAARDEN, NETHERLANDS) 31-2159-49344

†DB2 connectivity and LANserver ORACLE for PCs available Q4 1987.

©1987 by Oracle Corporation. ORACLE,® Networkstation ORACLE,® LANserver ORACLE,® Professional ORACLE,® SQL•Calc,® Easy•SQL,® SQL•Report,® SQL•Plus® and SQL•Forms® are reg. trademarks of Oracle Corp. The other companies mentioned own numerous reg. trademarks. TRBA

Introducing a better way to scan images.

HP ScanJet Scanner

It only makes sense. The same company that brought you LaserJet, the world's best-selling laser printer, now brings you ScanJet, a new standard in desktop scanning.

Only ScanJet scanner offers you so much in one package for your MS-DOS desktop publishing system. Consider ScanJet scanner's flatbed design. It works much like your copier, letting you scan anything from wallet-sized photos to hefty, bound documents.

Plus our Scanning Gallery software makes scanning easy. Our exclusive PreviewScan lets you see your image on screen before cropping it. Then you can size the cropped image to fit your dimensions—even if it means enlarging your original 200% or reducing it 50%. HP's ScanJet scanner is compatible with the most popular desktop publishing and optical character recognition software, too.

What's most important, though, is the end result. ScanJet scanner produces professional quality output by letting you input both black and white and color photos, line art and text.

What more could you ask for? How about a price tag of only $1,990* for ScanJet scanner, Scanning Gallery software and the interface kit.

For a ScanJet brochure and name of your HP dealer, call 1-800-367-4772, Ext. 902-A.

MS-DOS is a registered trademark of Microsoft Corporation
*Suggested U.S. list price

HEWLETT PACKARD

Get more info. Go to Ad index.

Letters

Reactions and responses from the PC World community

Beyond the Big Blue Horizon

It may be a party for IBM and its loyal followers ["Welcome to the Party," *David Bunnell, PCW,* June 1987], but for many people the computer hardware business is still rough and highly competitive. Not every company has the financial power to gamble like Big Blue and release hardware two years before any software is available.

He who has the gold makes the rules, and IBM plays by the golden rule. Mr. Bunnell states, "I can't think of a company that will become extinct because of IBM's announcement." A close look at the last five years reveals a multitude of hardware and software companies that, because of Big Blue's rules, have been forced to close their doors.

No thanks for the invite, Big Blue. What David Bunnell calls a "real bash" is going to be a wake for many.

Don B. Gateley
Jacksonville, Texas

Déjà Vu, Big Blue

I recently evaluated the new IBM PS/2 Model 60 and came to several disturbing conclusions.

The so-called enhanced keyboard is one of this system's worst features. IBM appears to have forgotten everything it ever learned about ergonomics. The <Ctrl> and <Alt> keys are duplicated on the right side of the keyboard, which means it's possible to accidentally reboot with a slip of the right hand or by simply dropping a manual on the keyboard.

IBM also installed a password-protection feature in the new hardware. If someone plants a password in the machine and takes the keys to the system, there's no way another person can use the machine. This is a prescription for chaos in most corporations.

IBM's disregard of users' current investment in 5¼-inch floppy disks is clear. The Data Migration Facility does nothing for users who need to transfer copy-protected software to the PS/2.

IBM's advertising campaign for the PS/2 line is remarkably honest. Their slogan, "Here we go again," is exactly correct from the user's point of view. Suddenly it's 1981 again, and there's no software, no hardware add-ons (unless they're IBM's), no technical information, no nothing. We're back at the foot of a steep learning curve, thanks to IBM's arrogance.

James F. Glass
Chatsworth, California

Standards Change, Protection's the Same

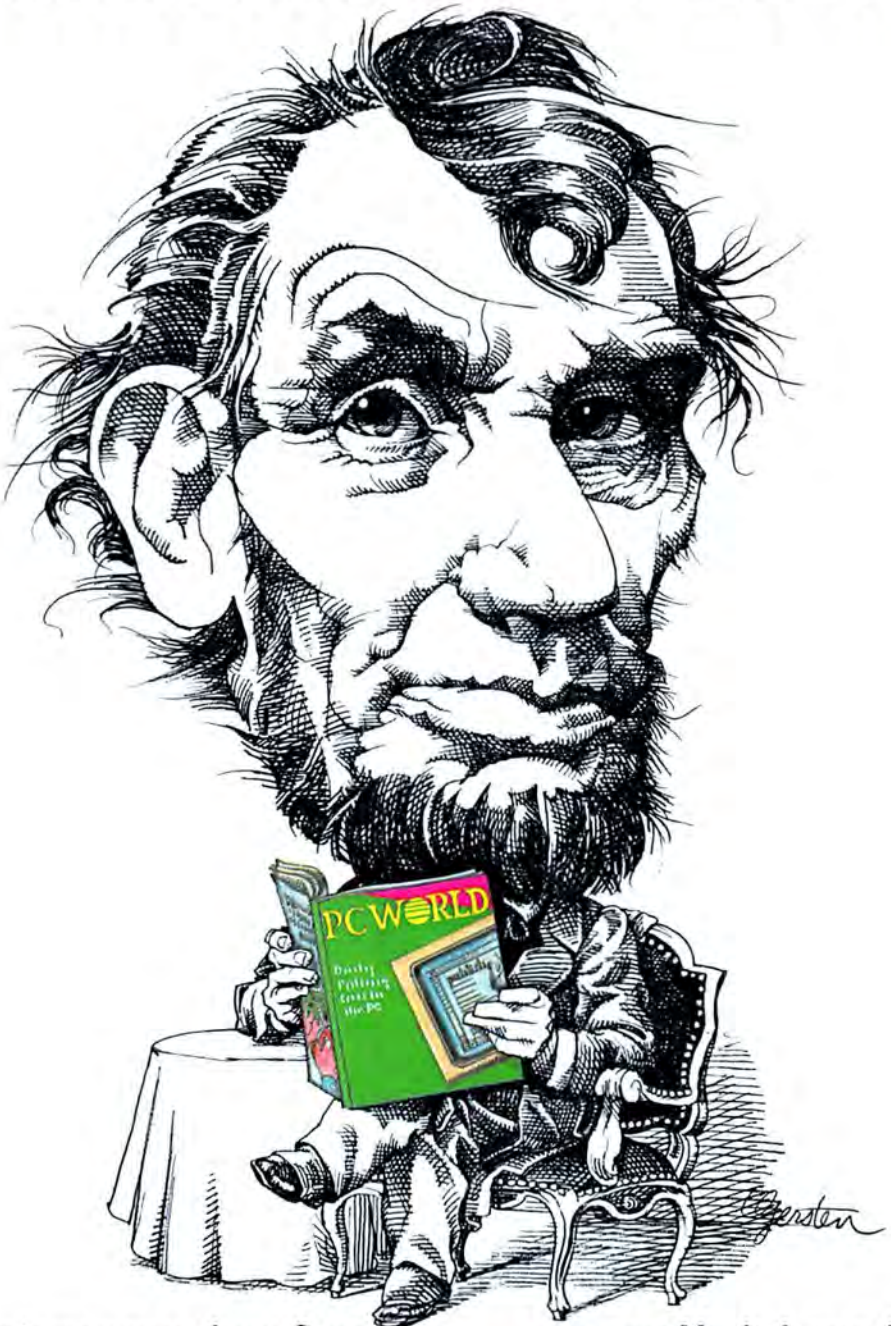
Recently I purchased an IBM Personal System/2 Model 50 equipped with a 3½-inch disk drive. I own several copy-protected programs in the 5¼-inch format; each requires an original disk in drive A: to start up. When I asked the manufacturers for instructions on how to convert the programs to 3½-inch format, I found that they have no intention of providing a means of conversion.

Copy protection is galling enough. But if software publishers use copy protection, the least they can do is provide a way to prevent customers from losing their investment in software when standards change.

Bill Silver
Saratoga, California

(continues)

Not all reviews are created equal.



Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. PC WORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want. Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices. PC WORLD, The Business Magazine of PC Products and Solutions.

PC WORLD GIVES YOU MORE.

SUBSCRIBE NOW!

PC WORLD

SAVE OVER 40% OFF THE ANNUAL COVER PRICE

Limited-time offer!
Take advantage of Special Savings
Call TOLL FREE 800/642-9606
Visa and MasterCard Accepted

More for less. Honest.

☑ YES send me one year (12 monthly issues) of PC WORLD for only $19.97. That's over 40% off the annual cover price of $35.40 and over 30% off the regular subscription rate of $29.90.

☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

PC WORLD

4B390

More for less. Honest.

☑ YES send me one year (12 monthly issues) of PC WORLD for only $19.97. That's over 40% off the annual cover price of $35.40 and over 30% off the regular subscription rate of $29.90.

☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

PC WORLD

4B390

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

Pick a card.

Toshiba® gives Lap-top users:

Modem (Suggested List, $399*)

- 1200/300 Baud Internal Hayes®-compatible Modem
  No communications software

Memory Card (Suggested List, $1,69ϑ*)

- 2 Megabytes Regular Dumb (Extended) Memory
  No EMS software (This board can't use EMS anyway)

all for **$2,098**

Megahertz gives Lap-top users:

EasyTalk® EMS/T1200

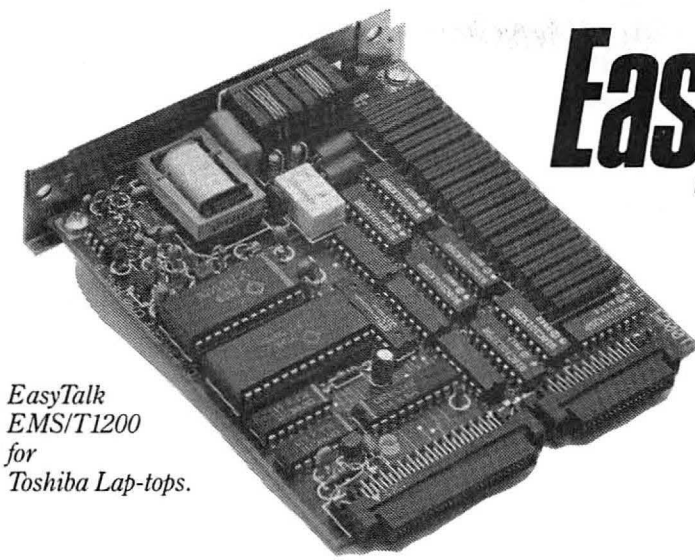
- 1200/300 Baud Internal Hayes-compatible Modem
- **Crosstalk® Communications Software included**
- 1 Megabyte Smart (Can be Extended or Expanded) Memory
- **EMS Software (Lotus®/Intel®/Microsoft® Specification) included**
- Two-year Warranty
- Easy Installation—Only One Board to Install!
- Easy Operation—Software Helps You
- Two Products on One Internal Board

all for **$899**

'nuff said.

Already made the mistake?

Save $300. Send us your Toshiba modem and $599, we'll send you an EasyTalk EMS/T1200 with CROSSTALK.



EasyTalk EMS/T1200 for Toshiba Lap-tops.

EasyTalk EMS/T1200®

MHz

Megahertz Corporation

2681 Parley's Way Salt Lake City, UT 84109 (801) 485-8857

A subsidiary of Vector Development Inc., a public company

For more information and a dealer in your area, call toll-free

1-800-338-8726

*Prices from Toshiba Price List as of April 1, 1987.
Also compatible with the new GRID 286. Trademarks and their owners: Toshiba, T3100—Toshiba America, Inc. EasyTalk—Megahertz Corporation. Crosstalk—DCA. Lotus—Lotus Development Corporation. Intel—Intel Corporation. Microsoft—Microsoft Corporation. GRID—Grid Systems.

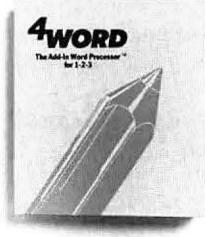
Get more info. Go to Ad index.

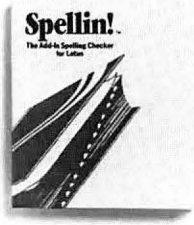
INTRODUCING THE SOFTWARE UTILITY LIBRARY FOR LOTUS.

Now you can maximize all that time you've invested in Lotus. Introducing a whole library of utilities from the leader in Lotus companions, Turner Hall Publishing. Make your Lotus life easier, safer, and more productive than ever before. Here's how.

Squeeze 10 times more on disk for more free space and faster back-up.
Use SQZ! with 1-2-3 or Symphony to insure spreadsheet safety through faster back-up. Reduce spreadsheet files on disk by up to 95%. Automatically, as you use Lotus. You get 95% of your used disk space back. And save up to 95% on data communications and backup time. ONLY $79.95.

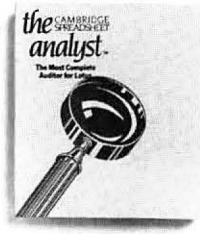
Built-in word processing for the professional look.
Now you'll never have to leave Lotus to create presentation quality letters, memos or documents. 4WORD is complete, add-in word processing right inside your spreadsheet. You get automatic word-wrap, block copy and move, bold, italics, underline, margins, Symphony document and Spellin! compatibility, and more. ONLY $99.95.





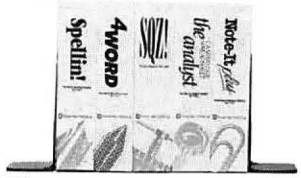
Now 1-2-3 and Symphony Can Spell.
Eliminate embarrassing misspellings with Spellin!. It's the only add-in spelling-checker made specifically for 1-2-3 and Symphony. Spellin! works instantly so labels, or complete spreadsheets are letter-perfect from the beginning. ONLY $79.95.

Error-free spreadsheets today. Accurate spreadsheets forever.
The Cambridge Spreadsheet Analyst is a complete auditing system for 1-2-3 and Symphony. It catches two dozen types of potential spreadsheet errors. Plus, it includes The Comparator which compares spreadsheets and shows the differences, and a macro analyzer, that graphically maps macros. ONLY $99.95.



Note-It Plus, the professional notation and searching system for 1-2-3.
Never forget where a spreadsheet number came from. Know what's in a spreadsheet file without loading each one. Remember, document and search for everything you've ever forgotten about 1-2-3. Copy and paste text and formulas, link notes and much more. Remember and document any size spreadsheet, using notes attached to cells and file names. ONLY $79.95.

(800) 556-1234 Ex. 525
(800) 441-2345 Ex. 525 in CA.
30-Day, Money-Back Guarantee.



Turner Hall Publishing
A Division of Symantec
10201 Torre Avenue • Cupertino, CA 95014
(408) 253-9600

Get more info. Go to Ad Index.

Shareware's Fair Share

The review of PC-SIG's Library [*From the Software Shelf, PCW,* May 1987] implied that only a few shareware programs require payment. Recently, shareware authors formed the Association of Shareware Professionals, chaired by Jim Button (*PC-File*) and Bob Wallace (*PC-Write*), in part to educate the public about shareware.

Shareware distribution gives users a chance to try software before buying it. If you continue to use a shareware program beyond the trial period, you are expected to register. The rules for using individual programs differ on details—some request registration, others require it. Once you register, you get anything from the right to continue using the software to an updated version of the program with a printed manual.

Shareware is a distribution method, not a type of software. The shareware system allows customers to try before they buy. The overhead is low, so the prices are low. Shareware has the ultimate money-back guarantee—if you don't use the product, you don't pay for it.

Neil Rubenking
Association of Shareware Professionals
Bellevue, Washington

The Domestic Clone

The Commodore PC10 review [*Product Outlook, PCW,* May 1987] states, "If nameless Far Eastern clones give you the willies, consider the warm feeling of a familiar domestic: Commodore." My Commodore PC10-2 was made in Taiwan.

Fred L. Karras
Glen Ellyn, Illinois

Free the Renters

The prosecution of a Canadian company for renting computer software ["Breaking the Bootleg Bands," *PC World View, PCW,* May 1987] illustrates the confusing nature of the law prohibiting bootlegging. The U.S. Supreme Court has ruled that it's legal to record television programs for personal use. The same principle should apply to computer software. If it's legal for the corner video store to buy videotaped movies from producers and rent them to customers, it should be legal for the corner computer store to rent out software. What makes software copyrights so special?

I. Switzer
Palm Springs, California

Computerese Spoken Here

I enjoyed "The Future of Computing" [*PCW,* May 1987], but Charles Seiter and Daniel Ben-Horin's predictions of an English-to-Japanese word processor, which would simultaneously write in English and Japanese from text spoken into a microphone, seem wildly optimistic. As a professional translator, I'm acutely aware that translation depends on factors such as nuance and connotation in selecting the right word in each context.

In *The Secret Guide to Computers* [Birkhauser Boston, Cambridge, 1984], Russ Walter cites

(continues)

Get there faster with our frequent filer program.

Mailing labels with a single keystroke. What could be faster?

From mailing lists to inventory control, from form letters to payroll and personnel files, RapidFile™ lets you get where you're going faster.

It's the versatile, easy-to-use file manager that lets you breeze through virtually any filing task.

RapidFile is the fastest file manager, with up to twice the speed. And twice the on-disk storage capacity of any other file manager you can buy.

RapidFile's visual report writer makes it a snap to crank out preprinted forms, checks or mailing labels. Its form letter function lets you create memos or mailmerge with no programming at all.

And with RapidFile, everything is on one disk. Which sure beats changing disks all the time. Especially for laptop and portable computer users.

And RapidFile is the only product of its kind that gives you the choice of pull-down menus or a Lotus® 1-2-3®-like interface. And get this—RapidFile lets you share data quickly and easily with dBASE,® Framework,® 1-2-3, PFS:® Professional File and ASCII files.

Best of all, RapidFile is made by Ashton-Tate.® The same people who make dBASE products, the largest selling database management systems in the world. So you can count on all of the service and support you'll ever need.

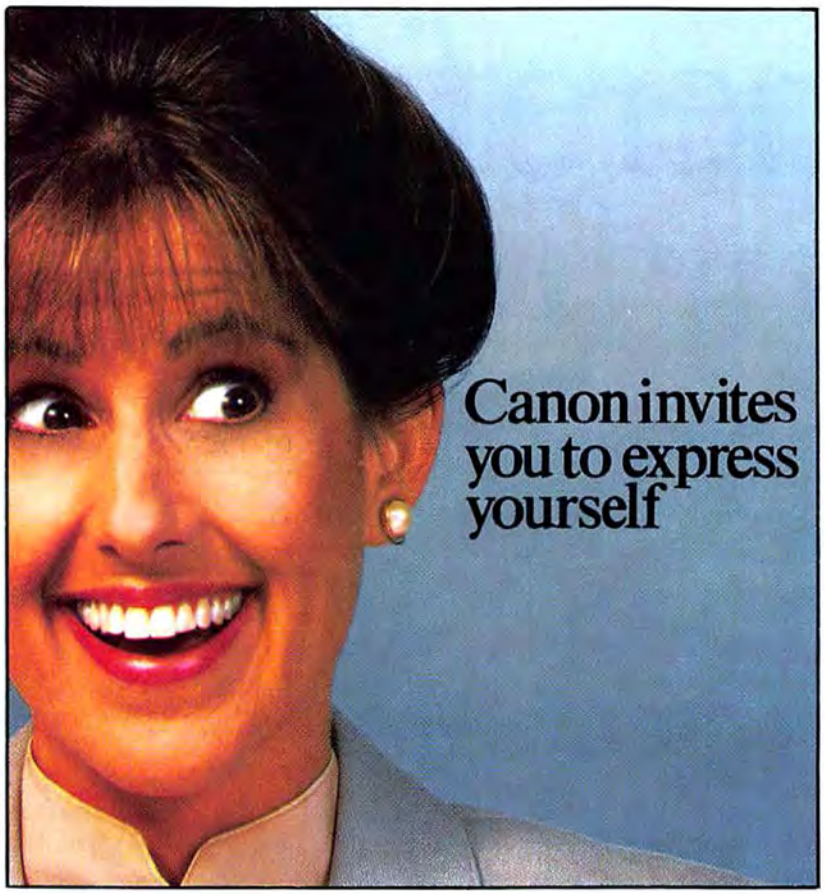
Try out RapidFile's many features and capabilities for yourself with a RapidFile Sampler disk for only $9.95.* Just call (800) 437-4329, Extension 275** to order one. Or ask for the name of the Ashton-Tate dealer nearest you.

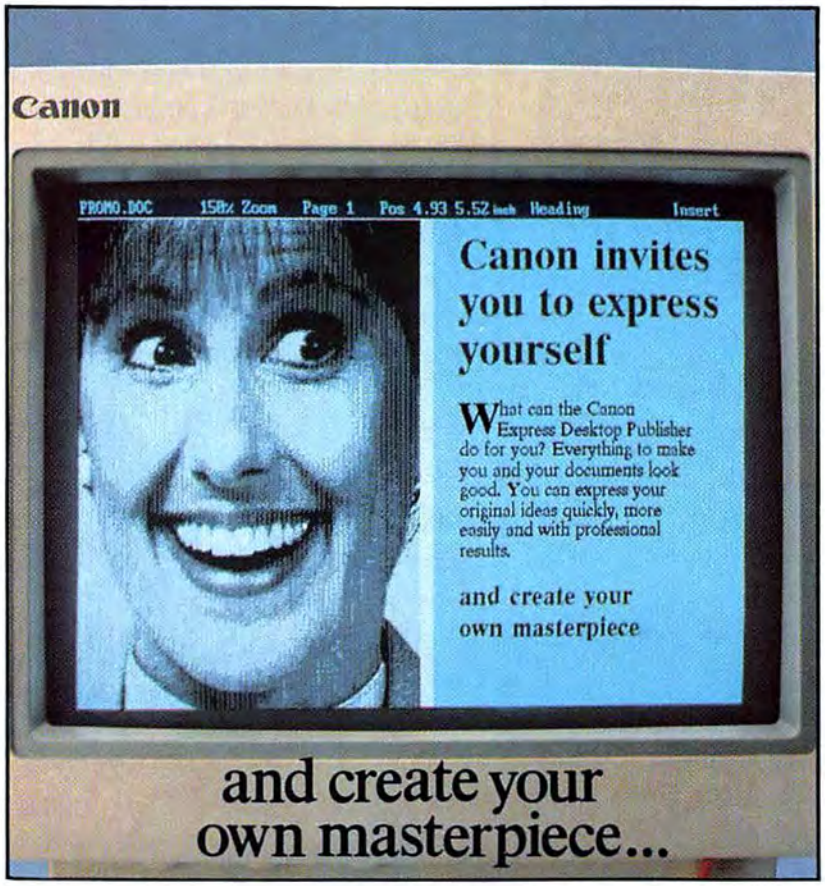
Either way, you'll see how to make your filing really fly.

ASHTON·TATE®

*While supplies last. **In Colorado, call (303) 799-4900, Ext. 275. RapidFile runs on IBM®PC or 100% compatible. Also runs on IBM PC Net, 3Com® 3+,™ and Novell™ Advanced Netware®/86 networks. Trademarks/owner: RapidFile, Framework, dBASE, Ashton-Tate/Ashton-Tate Corporation; Lotus, 1-2-3/Lotus Development Corporation; PFS:/Software Publishing Corporation; IBM/International Business Machines Corp.; 3Com, 3+/3Com Corp.; Novell, Netware/Novell, Inc. RapidFile is written in MMSFORTH © 1984 Miller Microcomputer Services. © 1987 Ashton-Tate Corporation. All rights reserved.

Get more info. Go to Ad Index.





Get more info. Go to Ad index.

several famous examples of attempts by computers to translate Russian into English. "The spirit is willing, but the flesh is weak" became "The booze is strong, but the meat is rotten." "Out of sight, out of mind" became "blind idiot." Purchasing an inexact translation system and then hiring a translator to proofread what a computer has rendered will never be as cost-effective as hiring a translator in the first place.

David A. Coats
Minneapolis, Minnesota

Kinks in the Kyocera

We use Kyocera F-1010 laser printers extensively at our company. I agree entirely with the positive review in "Would-Be LaserJets" [*PCW*, June 1987]. The article, however, didn't discuss two difficulties we've experienced that may also occur with other laser printers.

Unlike the LaserJet, the F-1010 causes regular bond paper to curl. This problem becomes noticeable in documents longer than three pages. Switching to noncurl paper made specifically for laser printers, however, doubled our paper costs.

Also, the F-1010 calculates the left margin 50mm from the edge of the page. Most printers calculate the margins from the actual edge of the paper. Consequently, all documents created with a word processor must be realigned accordingly. Forms that require precision printing must be ad-

justed specifically for the Kyocera –a tedious and expensive process, especially if you have other printers already in place.

Robert North
Richmond, Virginia

Wanted: BBS Bandits

It's time to stamp out software piracy. Westlake Data Corporation offers a $2000 reward to any individual who provides information leading to the apprehension and indictment of persons responsible for placing *PathMinder* or any other Westlake Data product on a computer bulletin board. No Westlake Data software product is, or ever has been, freeware or shareware. Anyone who has information about any bulletin board offering to download Westlake Data software is urged to contact Westlake Data, P.O. Box 1711, Austin, TX 78767; 512/328-1041.

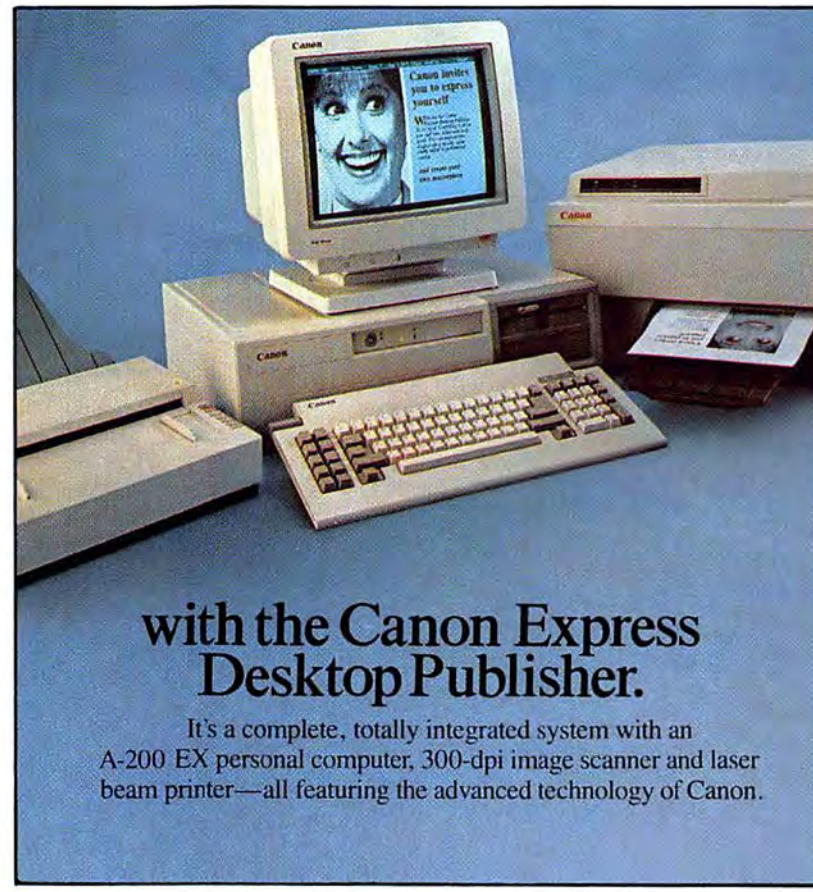
F. P. Tantalo
Vice President
Westlake Data Corporation
Austin, Texas

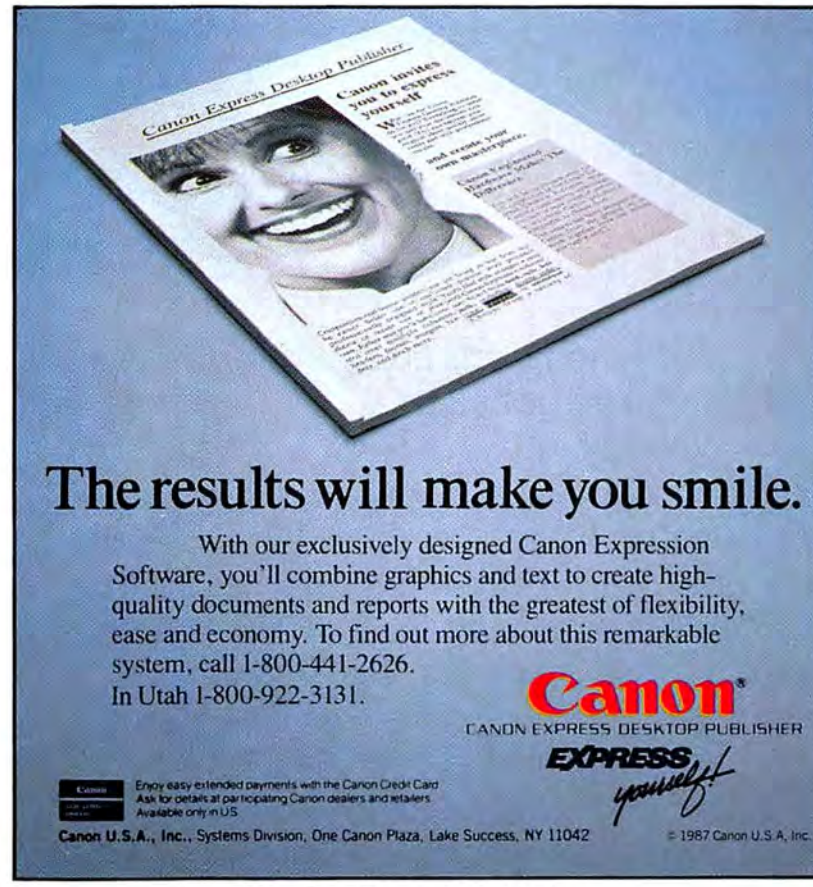
PC-Talk in the Material World

We were more amused than troubled by your review of *PC-Talk4* ["Talk Isn't Free (Any More)," *PCW*, July 1987]. As your loyal readers know, *PC-Talk* was freeware in 1981 and by 1983 had become an industry standard for PC communications software.

Since *PC-Talk* was a proven winner, Headlands Communications decided to improve the program with many new features. *PC-Talk4* is the result. Apparently

(continues)



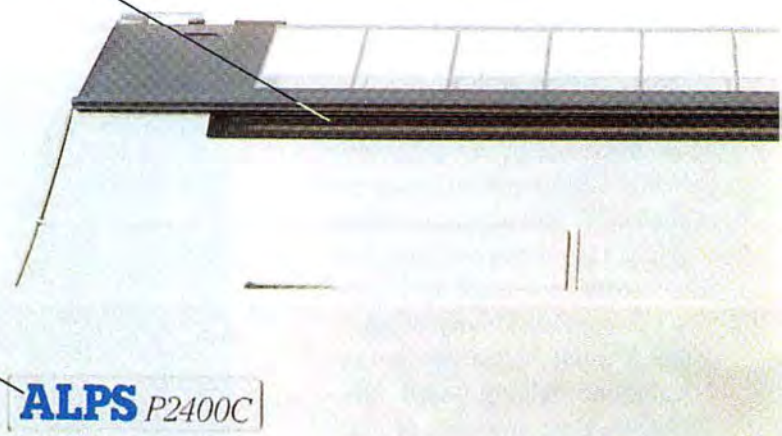


Get more info. Go to Ad index.

ALL IT LACKS IS

A choice of snap-in/out, 24- or 18-pin print heads gives you the versatility and ease of maintenance that other printers lack.

With a top speed of 360 cps, it makes most printers seem downright lackadaisical.



But who needs competition when you've got all this?

Namely, the ALPS P2400C™ Dot Matrix Printer.

No other printer in its class can do so much for so many for so little.

For instance, the P2400C can easily take on all the work an office full of busy PCs can dish out.

For letters, seven-color graphics, spreadsheets or whatever, its output is so brilliant, everything else appears lackluster.

And take care of it faster. Thanks not only to its talents pointed out above, but to its many others, as well.

Like a choice of draft, correspondence and letter quality print modes. A print buffer expandable to 256K. Multiple font cartridges. And full compatibility with the most popular PCs and software.

COMPETITION.

Most printers lack the good sense to include a paper-saving, push/pull tractor for both bottom and rear feed. Not this one.

You also get conveniences that many other printers are lacking. Like control of everything from the front panel, the feature menu, or from software—without using DIP switches.

Not to mention the ability to run quietly. At under 55dBA, the P24000C is one of the least noisy printers around.

One of the most durable, too. It comes with a full, one-year limited warranty. And if you give it normal care, it'll give you over five years of trouble-free performance.

Of course, there's nothing like a live performance to prove there's nothing like the P2400C.

Get more info. Go to Ad Index.

For a free demo, or more information, call us at **(800) 828-ALPS.** In California, (800) 257-7872.

And see what every other dot matrix printer is lacking.

ALPS
AMERICA

IT'S TIME YOU SAW THE ALPS.

P2400C is a trademark of ALPS Electric Co., Ltd. © 1987 ALPS America.

we made the right move. Customer response has been overwhelming.

Over the years, we've discovered that users in business, education, and government want communications software that's reliable and easy to use, and that gets the job done with a minimum of fuss. That's what *PC-Talk4* is all about.

Fred C. Conta
President and CEO
Headlands Communications Corp.
Tiburon, California

Lost and Found

dBASE programmers can get help from *dAnalyst* ["dBASE Power Tools," *PCW*, March 1987] by contacting Transec Systems at its new address: 220 Congress Park Dr., Del Ray Beach, FL 33445; 305/276-1500.

Readers looking for the HP-41 calculator emulator *The Fortyone* [*From the Software Shelf*, *PCW*, March 1987] will find Straightforward at its new location: 3901 Via Oro Ave., Long Beach, CA 90810; 800/553-3332, 800/237-9680 California.

Letters should be mailed to Letters, PC World, *501 Second St., San Francisco, CA 94107, or sent electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. All letters must include the writer's name, city, and state. They should not exceed one double-spaced typewritten page. We reserve the right to edit letters.*

For All IBM PC/XT/AT & Compatibles...
ELIMINATE NUM-LOCK!

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.

IBM PC/XT $89.95
Compatibles ... $89.95
IBM AT $92.95

*Zenith · ITT · Columbia · AT&T Leading Edge · Sperry · Desk Pro · etc.
— PLEASE SPECIFY SYSTEM —
($2.50 Shipping)

A FAST AND SIMPLE WAY TO GET THE MOST OUT OF YOUR SOFTWARE!

For all PC/XT/AT keyboard compatible systems.

COMMANDPATCH® An attachable 32 key mini-keyboard with templates and software patches that pre-define the keys and provide pop-up menus for most popular programs. Also includes special software enabling you to create your own menus and macros.

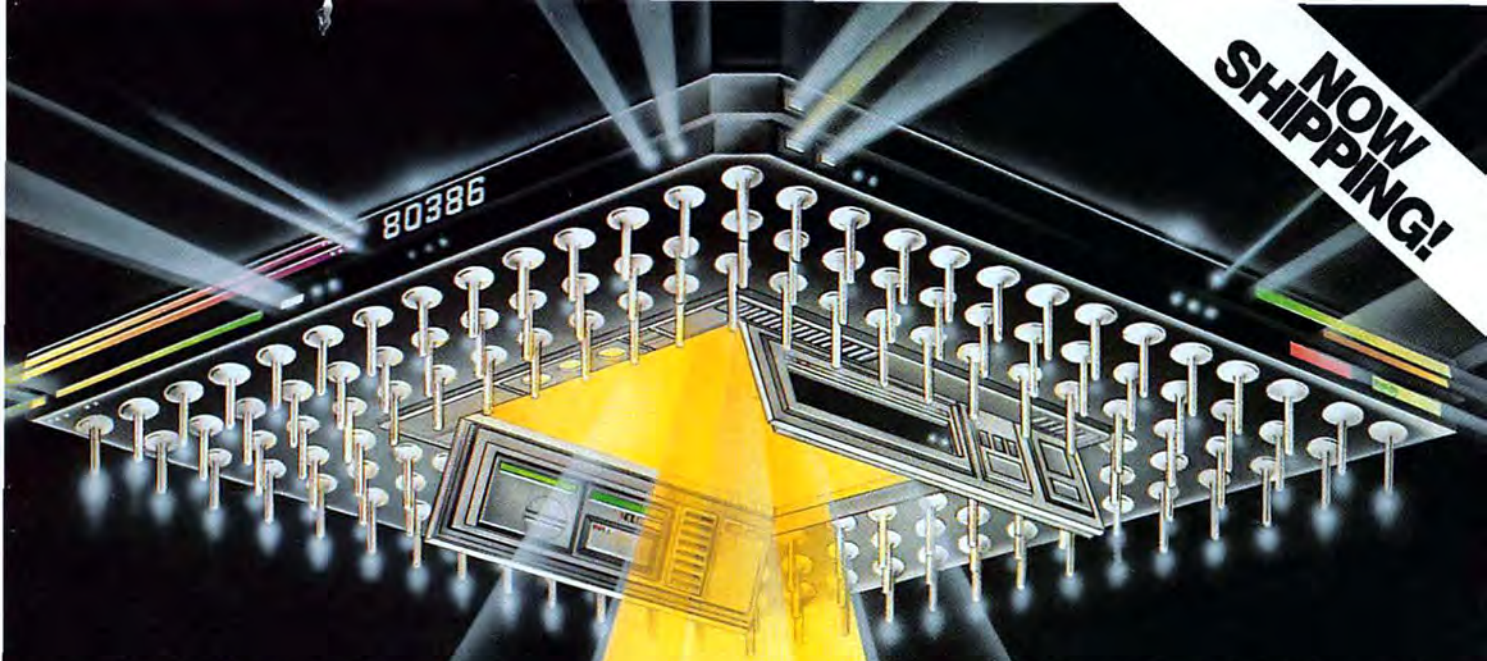
Just select the function desired from the **template** or **screen pop-up menus** and the **COMMANDPATCH®** executes that function for you. No need to learn keystroke sequences. Patches available for Lotus, Supercalc, Word, Word Perfect, Multimate, Wordstar, Autocad, etc. Provides virtually **all** program commands. Creates **standard menus and keystrokes** for all programs supported. Pays for itself again & again with ease, speed, and super fast program mastering. 30 day money back trial period.

COMMANDPATCH® $159.95
Program Patches $29.95 (except Autocad $69.95)
Specify computer model. Shipping $4.50.

GTi
For immediate shipment:
Genest Technologies, Inc.
1331 East Edinger Ave., Santa Ana, Calif. 92705
CA (714) 547-0880 Out CA 1 (800) 826-9641
Telex 5101005421 GEN

Cal. res. add 6% tax. Visa/MC/Check/Money Order
COMMANDPATCH® is a registered trademark of GTI. Keypatch™ is a trademark of GTI.
IBM is a registered trademark of International Business Machines, Inc.
Programs listed are trademarks of respective companies.

Get more info. Go to Ad index.



NOW SHIPPING!

Imagine the speed and power of a $100,000 minicomputer in a desktop PC costing under $7,000. Now imagine all that power going to waste because the operating system you chose was never meant to take advantage of a computer this powerful. It will take more than just a "window environment" or an outdated operating system to unlock the 80386.

It will take PC-MOS/386™.

The First 80386 Operating System. Specifically designed for the 80386 computer, PC-MOS/386™ opens doors. Doors to more memory and multi-tasking. Doors to thousands of DOS programs as well as upcoming 80386-specific software. It's the *gateway* to the latest technology..., and your networking future.

Memory Management Without Boards. PC-MOS exploits the memory management capabilities built into the 80386. So, up to four GIGABYTES of memory are accessible to multiple users and to future 80386-specific applications requiring megabytes of memory.

Multi-Tasking, Multi-User Support for One, Five or 25 Users. PC-MOS/386™ allows up to 25 inexpensive terminals to be driven by a single 80386 machine. So the features of the 80386 can be utilized at every terminal. And it comes in three versions so you can upgrade your system as your company grows...without having to learn new commands or install new hardware.

UP TO 25 USERS.

MADE FOR THE 80386.

RUNS DOS PROGRAMS.

MULTI-TASKING

Software Support for Thousands of DOS Programs. Although PC-MOS/386™ totally replaces DOS, it doesn't make you replace your favorite DOS programs. So you can run programs like Lotus 1-2-3, WordStar, dBASE III, and WordPerfect on the 80386. Best of all, it uses familiar commands like DIR and COPY–so you'll feel comfortable with our system.

The Gateway to Endless Features. Distinctive characteristics like file/system security, remote access, file/record locking, and built-in color graphics support for EACH user set PC-MOS/386™ apart from all previous operating systems.

Open the Doors to Your Future TODAY! Call The Software Link TODAY for more information and the authorized dealer nearest you. PC-MOS/386™ comes in single, five & 25-user versions starting at $195.

PC-MOS/386™

MODULAR OPERATING SYSTEM

THE SOFTWARE LINK
Developers of LANLink™ & MultiLink® Advanced

3577 Parkway Lane, Atlanta, GA 30092
Telex 4996147 SWLINK
FAX 404/263-6474

For the dealer nearest you,
CALL: 800/451-LINK
In Georgia: 404/448-LINK

OEM/Int'l Sales: 404/263-1006
Resellers/VARs: 404/448-5465

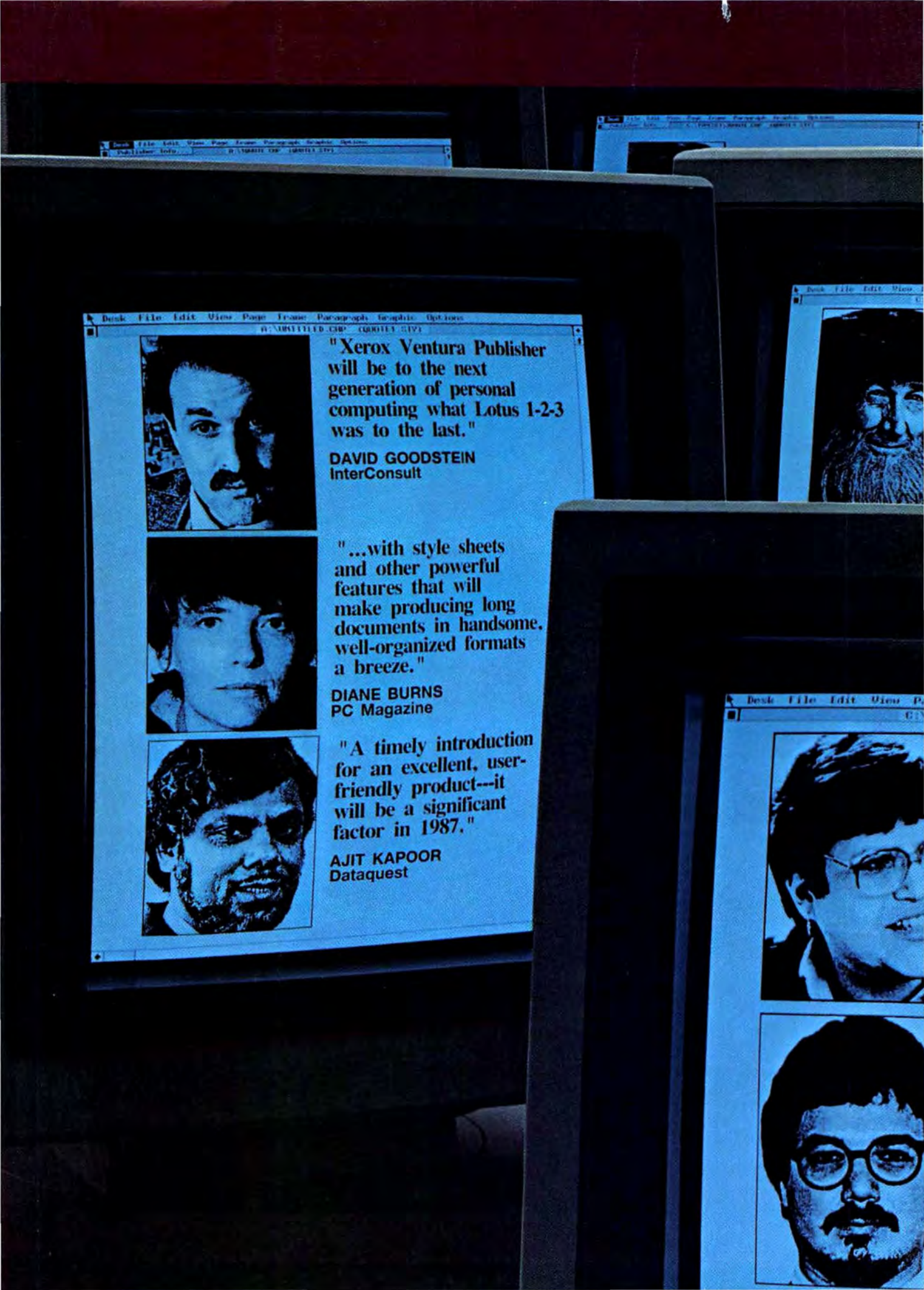
OEM/Dealer Inquiries Invited

THE SOFTWARE LINK/CANADA CALL: 800/387-0453

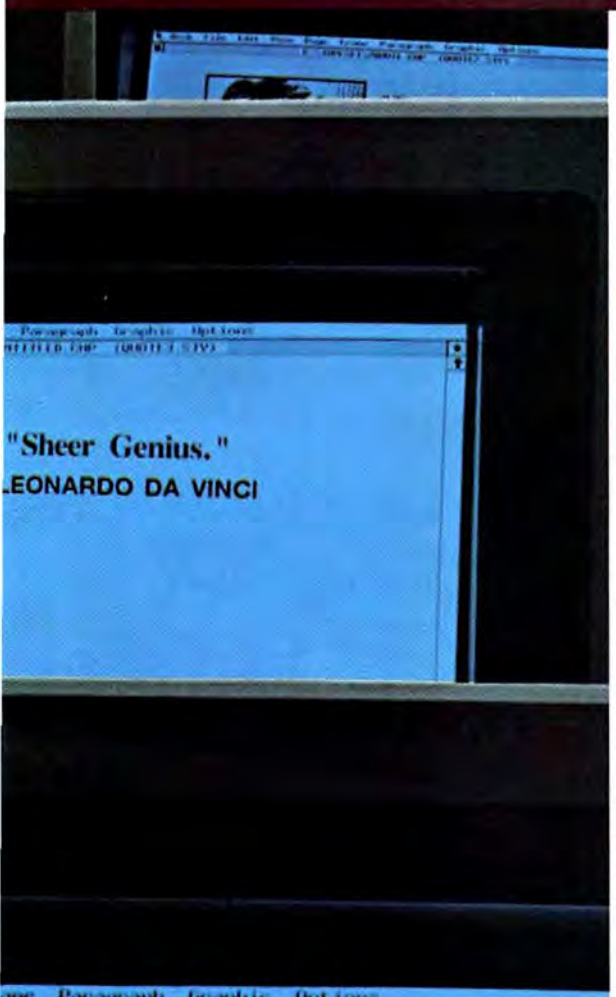
Get more info. Go to Ad Index.

More Than Just Windows, We've Opened Doors.

TRADEMARK ACKNOWLEDGEMENTS: MultiLink® is a registered trademark of The Software Link. PC-MOS/386,™ MultiLink® Advanced, and LANLink™ are trademarks of The Software Link. Lotus 1-2-3, WordStar, dBASE III, & WordPerfect are trademarks of Lotus Development Corp., MicroPro, Ashton-Tate, & WordPerfect Corp., respectively. Prices and technical specifications subject to change.


Desk File Edit View Page Frame Paragraph Graphic Options
"Xerox Ventura Publisher will be to the next generation of personal computing what Lotus 1-2-3 was to the last."
DAVID GOODSTEIN
InterConsult
"...with style sheets and other powerful features that will make producing long documents in handsome, well-organized formats a breeze."
DIANE BURNS
PC Magazine
"A timely introduction for an excellent, user-friendly product---it will be a significant factor in 1987."
AJIT KAPOOR
Dataquest

XEROX



"This product could set the standard for desktop publishing. It's fast, it's fully featured, it allows you to do things never thought possible."

AMY WOHL
Wohl Associates

"Will set the standard of comparison in desktop publishing."

JAMES CAVUOTO
MicroPublishing

They raved about Version 1.0. Now read about Version 1.1.

Xerox Ventura Publisher, the easily mastered, industrial-strength publishing genius that runs on a standard IBM XT or AT, or compatible, just got better. Version 1.1 offers 80 significant enhancements for short document handling; text, graphics and font support; and broader output capability.

Xerox Ventura Publisher already gets raves for long documents; now Version 1.1 offers 20 additional features for producing short documents. There's automatic kerning, support for multicolumn frames, improved hyphenation, cropping and sizing of art, on-screen rulers, and automatic letter spacing, to name a few.

For documents of any length, page layout and type control have been raised from excellent to sensational. Pictures are now anchored to text during batch pagination. Documents up to 128 chapters in length, each containing 150 to 300 pages of text, are easily handled. The result is a desktop publishing package that can be judged by printing industry graphic standards.

To the longest list of text and graphics input support in desktop publishing comes even greater capability. Version 1.1 adds word processing interfaces for XyWrite, Displaywrite III and IV and DCA files. There's graphic conversion for more than 500 graphics packages based on a dozen file formats, including Macintosh "PICT" and image files. Plus downloaded PostScript fonts, conversion of H-P Soft-fonts and support for Adobe screen fonts.

This new release makes Xerox Ventura Publisher the first desktop publishing program to support the industry-standard page-description languages: PostScript and Interpress. That means total compatibility with all popular laser printers, including, of course, the Xerox 4045 Laser CP and the Xerox 4020 Color Ink-Jet Printer.

Team Xerox

Xerox Ventura Publisher 1.1—industrial-strength publishing genius that lets you do so much more, so much faster, ever so easily—right on the desktop.

Xerox brings out the genius in you.

Xerox Corporation, P.O. Box 24, Rochester, NY 14692.
For more information about Xerox Ventura Publisher 1.1, stop by any computer store featuring Xerox software, contact your local Team Xerox sales office, or call 1-800-TEAM-XRX, ext. 213B.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

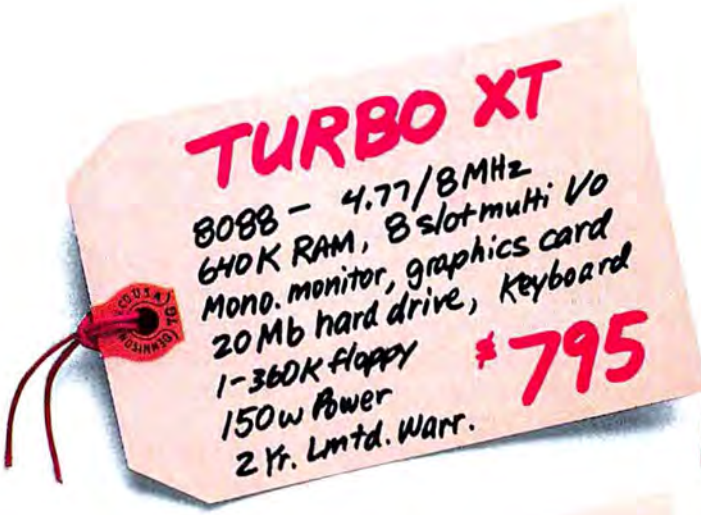
CITY _____ STATE _____ ZIP _____

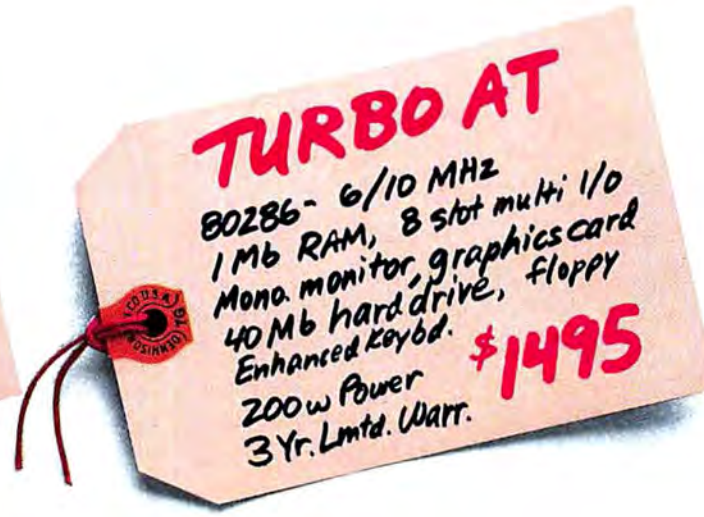
213B 4150987

XEROX® is a trademark of XEROX CORPORATION.

Get more info. Go to Ad Index.

Our Prices Are So Low They're Downright Embarrassing





Our low prices are leaving a lot of people red-faced.

Like manufacturers who charge twice as much for similarly-configured systems. And managers who paid twice as much for their company's computer equipment.

Our low prices include all the things that other manufacturers leave out — like monochrome monitors, graphics cards, and hard drives. SST Quantus business computers are complete, ready-to-run systems, featuring name-brand components. At unbelievably low prices.

So when you need high-performance computer systems at the right price, call SST. Anything else will leave you in the red.

QUANTUS

Scientific Storage Technology
One Butterfield Park Spofford, NH 03462

(800) 255-0125 (603) 363-4564
(800) 356-9001 (603) 886-3220

Get more info. Go to Ad index.

Harry Miller

Making the Numbers Work

Don't go into the Budget Wars unarmed. A host of new tools can perform financial analysis in ways your spreadsheet never dared.

This autumn. As the New England leaves show the first hint of color and Indian summer begins to burn through the fog of one more blustery San Francisco August, yet another ritual is being played out across the land: Budget Wars. This year some among our number are taking advantage of several innovative new tools to explain this year's expense overruns or justify next year's revenue projections. In the spirit of the season, this issue of *PC World* offers some guidance in the selection and use of those tools.

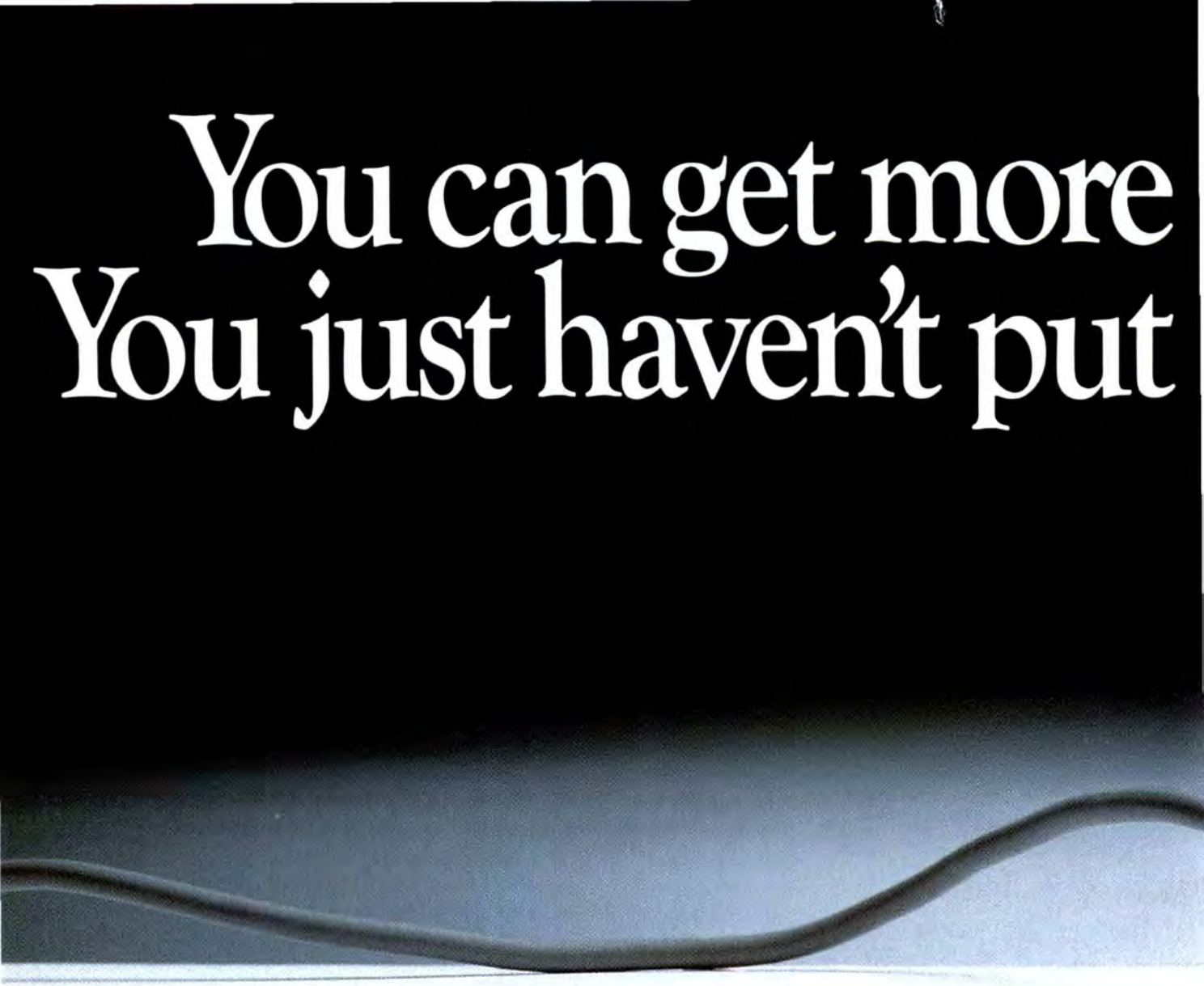
For budgeting and monitoring, the products examined in "Dimensional Fortitude" extend the financial modeling paradigm beyond the rows and columns of conventional spreadsheets. The added dimensions make consolidation of product lines, divisions, regions, and departments much more manageable. For financial reporting and analysis, our review of *NewViews* presents a unique alternative to the range of tiresome and inflexible, but proven and reliable, accounting products. It also points out the price you pay for this program's accounting sizzle: the loss of a clear audit trail.

Do we really need such innovation in planning tools? Well, in the case of three-dimensional spreadsheets, the ease of consolidation they provide seems to justify the small effort required to learn to think in three dimensions. But you'll really have to believe in and appreciate *NewViews*' greatly increased analytical capabilities and flexibility to overcome the intuitive resistance to change that the program initially inspires.

If accounting adventure is not in your blood, Chuck Rundgren's article will demonstrate how you can move data "From Ledger to Spreadsheet." The brief tutorial shows you how to convert the data created with a popular conventional accounting package to a format you can use in *1-2-3* for more flexible analysis and reporting.

Are you just starting out with electronic spreadsheets? Have you recently been plagued by circular

(continues)



You can get more You just haven't put

Just put your finger on a Microsoft® Mouse and you'll be getting more done in no time.

Because the Microsoft Mouse comes with a fistful of software including presentation graphics programs like Show Partner™ and Microsoft Paintbrush® and Expert Mouse Menus for your favorite business programs.

To enter a command with a Microsoft Mouse, just find it on the on-screen menu and click. Not having to enter a handful of keystrokes means you can work much faster.

Easier word processing from load to print.

With the Microsoft Mouse, you can give your cursor keys a rest. Editing is a breeze because it's easy to highlight and change or replace text.

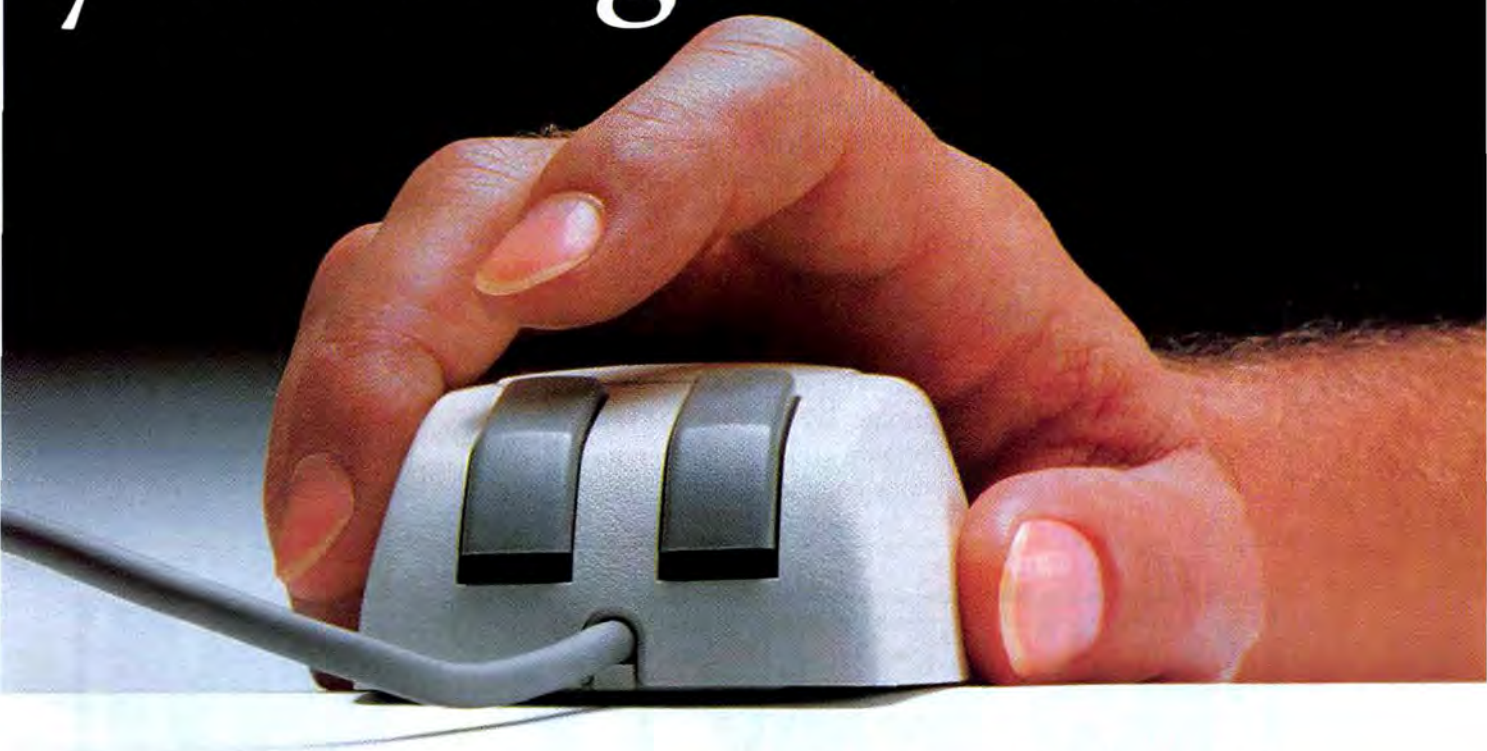
And when you're finished, use an Expert Mouse Menu to back up a DisplayWrite™ 3 document with just two clicks. Or use our mouse to load MultiMate® documents without ever having to type out a file name again.

This mouse knows its 1-2-3's.

The Expert Mouse Menu for use with Lotus® 1-2-3® gives you faster access to functions you use all the time like displaying graphs, setting titles and opening windows. Then print out your worksheet with one click of our mouse rather than seven keystrokes.

Microsoft is a registered trademark of Microsoft Corporation. DisplayWrite and Personal System/2 are trademarks of International Business Machines Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. MultiMate is a registered trademark of Multimate International Corporation, an Ashton-Tate company Show Partner is a trademark of Brightbill-Roberts & Co. Ltd. Paintbrush is a registered trademark of ZSoft Corporation.

out of your PC. your finger on it.



And now you can use the numeric keypad on your PC because, with our Expert Menu, you'll never suffer from not being able to use num-lock again.

Draw attention to your presentation.

Show Partner and Microsoft Paintbrush help you and your Microsoft Mouse create presentation graphics and special effects that will keep your audience focused on the point at hand.

Show Partner lets you bring your presentations to life: Like building a graph piece by piece as you're presenting your case point by point. It even lets you pull graphic images from other programs like Paintbrush or 1-2-3.

You'll never be alone with a Microsoft Mouse.

The Microsoft Mouse is supported by over 200 software applications and multitudes of users. In fact, the readers of *PC World* magazine have given the Microsoft Mouse the World Class Award for the past three years. No wonder it's the best selling mouse on the market.

1986 PC WORLD · WORLD CLASS AWARD ·

Buy a Microsoft Mouse and get a ton more done by just lifting a finger.

Microsoft® Mouse

Now Available For Personal System/2™

For a list of mouse-compatible software or the location of your nearest dealer call (800) 426-9400. In Washington State and Alaska, (206) 882-8088. In Canada, call (416) 673-7638.

reference warnings? Is that what's been bothering you lately? William Urschel's article "Worksheets by Design" will help you create structure from chaos and provides a few simple guidelines for a successful career in modeling.

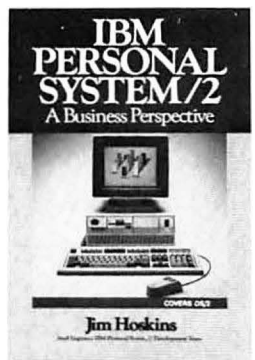
Unfortunately, none of these tools can provide justification for cost overruns or revenue shortfalls. (*There's* an artificial intelligence product waiting to be born.) But with the right mix of traditionalism and innovation, these products can help you back up your assumptions and demonstrate just what's beyond the bottom line.

Next month this page will bring you the insights of a new Editor. It is with great confidence that I pass the torch to Richard Landry, who has been *PC World*'s Managing Editor for the past year. In that time he's shown himself to be a skilled editor, with a finely honed sense of the reader's needs and a deft hand (or more accurately, keyboard) with a manuscript. Rest assured, dear reader: Your interests will be well served by Rich's advocacy.

During the past four-and-a-half years it has been my privilege to guide *PC World* through a dynamic market and a changing audience profile. We have tried to make the book useful to readers in their daily computing lives. That our efforts have been so well received has been a constant source of satisfaction. As I take a small step up the corporate ladder, I'd like to express my sincere appreciation to a truly superior editorial staff who have never failed to make me look good, and to the thousands of readers whose enthusiastic feedback and loyalty have made the whole endeavor worthwhile.

Harry Miller is Corporate Editor and Director of Strategic Products for PC World Communications.

NOW, GET THE REAL STORY.



Let Jim Hoskins, engineer on the Personal System/2 development team, show you how to put PS/2's enhanced power and connectivity to work for your business...

- How to choose the PS/2 computer that's right for you
- Applications software—what's here now and what's in development
- How to link PS/2 to PCs, PC/ATs, PC/XTs, and mainframes
- A hands-on look at PS/2 technology—graphics, communications, and the OS/2 operating system
- Over 100 illustrations!

$19.95
At your local bookstore.

JOHN WILEY & SONS

Get more info. Go to Ad index.

3M

3M

5¼"

	5 Box	10 Box
S·Side D·Den.	7.95 MIN 3 Bx	7.80	7.75
D·Side D·Den.	9.95 MIN 3 Bx	9.30	8.75
HIGH Den.	17.95	17.00	16.60

S·Side 96tpi 15.75 | D·Side 96tpi 19.95 | LANIER NP 25.95

3½" S·Side	11.95	DC 100A	12.95	8" S·Side S·Den.	15.40
		DC 1000	12.95		
3½" D·Side	16.50	DC 2000	17.50	8" S·Side D·Den.	18.95
		DC 300A	16.50		
3½" H·Den.	49.95	DC 300XLP	19.75	8" D·Side D·Den.	20.95
		DC 600A	21.95		

"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 12396, LAS VEGAS, NV. 89112

Minimum Order $25.00 · Visa, MasterCard accepted · C.O.D orders add $3.00 · Surface Shipping: on 3.5 or 5.25" add $3.00 per 100 disks. 8" add $4.00 per 100 disks. UPS delivery only. U.S. mail for APO, FPO, AK, HI or PR add an additional 5% for PAL. Prices subject to change without notice!

Get more info. Go to Ad index.

The queen of
the PROM has just
graduated at
the top of her class.

IRMA™ has been the most reliable and most popular PC-to-mainframe link ever created. But as good as our IRMA is, we've never said we couldn't do better. Fact is, a PROM is still a PROM. And you have better things to do with your time than spend it upgrading PROMs.

But now there's IRMA 2™; it marks a whole new era in terminal emulation technology.

IRMA 2 is software-loaded. So you can upgrade by simply changing diskettes instead of PROMs. What you also gain is an easy path to multiple host sessions, sophisticated mainframe graphics, and all that DFT technology can offer you down the road. And with our new E78 Plus™ software, you gain even more.

Like Mod 5 support. And easy-to-use menus for quick custom-configurations. And keyboard-remapping and key programmability. And perhaps best of all, you gain speed.

Introducing IRMA 2. The most reliable software-loaded PC-to-mainframe link.

All this new power of IRMA 2 is available right now for the IBM® PC,™ XT,™ and AT™ and the PS/2™ Model 30. And soon for all other PS/2 Models.

There's some especially good news for our current IRMA and Forte PJ customers, too. Because they can also take advantage of the new power of E78 Plus software.

For not a lot of money.

For a limited time, you can get E78 Plus at a special low conversion price. But you'll have to act soon.

Contact your local DCA distributor for all the details of IRMA 2 and E78 Plus software. Or call 1-800-241-IRMA, Ext. 520. In Georgia, call 1-404-442-4500.

dca®

IRMA, IRMA 2, E78 Plus and Forte PJ are trademarks of and DCA is a registered trademark of Digital Communications Associates, Inc. IBM is a registered trademark of and PC, XT, AT and PS/2 are trademarks of International Business Machines Corp. • 1987 Digital Communications Associates, Inc.

Get more info. Go to Ad index.

START HERE WITH HOUSTON INSTRUMENT

Whether you're a newcomer to CAD or just looking for a reliable, low-cost plotter for your PC CAD system—start here. With the popular Houston Instrument™ DMP-41/42 series plotters.

Priced at $3,295*, these single-pen plotters give you the features you need for a sensible start—field-tested reliability, C and D size plots, good resolution, a wide selection of plotting media and pens, and compatibility with hundreds of software packages.

Enter the PC CAD world with the DMP-41/42 series—the plotters that offer superb reliability and excellent performance at a very affordable price. Learn about the advantages of HI's Priority Response Programs featuring a competitive leasing plan and an express service agreement that can replace your plotter overnight.

Begin by calling 1-800-531-5205 (512-835-0900 if in Texas) or writing Houston Instrument, 8500 Cameron Road, Austin, Texas 78753. In Europe, contact Houston Instrument, Belgium NV., Rochesterlaan 6, 8240 Gistel, Belgium. Tel.: 32-(0)59-277445. Tlx.: 846-81399.

houston instrument DIVISION / AMETEK

*U.S. suggested retail price. Prices subject to change.
Houston Instrument is a trademark of AMETEK, Inc.

Get more info. Go to Ad Index.

Stewart Alsop

The Product Announcement Game

Some companies have figured out how to turn new product announcements into a strategic advantage.

It's the pits for computer columnists these days. Writing columns, you see, is just one little part of a well-orchestrated game: new product announcements.

The principal players in this game are the computer manufacturers who make the announcements and the potential buyers who peruse those proclamations. In between is a panoply of middlemen: market researchers, Wall Street analysts, consultants, industry gurus, and yes, columnists.

Most people can't decide if a computer is any good unless they ask all the computer owners they know about their machines and read at least 15 magazine articles about a particular model. Even when they decide that a particular computer is the one they want, they still don't really know why.

Such uncertainty among consumers leads to the product announcement game. The objective is to turn a new computer into a roaring success by gauging the right amount of time between announcing a product and actually delivering it. The problem is that while new machines require support from software and peripherals companies to succeed, manufacturers don't want to tip their hand to the competition too early.

Computer companies must also be careful not to create such high expectations for a new machine that the actual product, once it's available, can't satisfy customers. A perfectly timed product introduction can turn normally sober consumers into a crazed mob panting for a chance to plunk their money down for the latest and greatest machine.

A computer company has three options for announcing a new product. It can confidentially alert software and peripherals companies to the impending product so they can begin to produce goods for the new computer and then make an official announcement when the new machine is ready to ship. A manufacturer can also "officially" announce a new computer in advance of shipment, giving third-party companies time to develop products for it. Finally, a company can keep the computer

(continues)

No Other Portable PC Can Make This Statement.

At 6.4 pounds, the new T1000 is the lightest portable PC in the world.

It's a good ten pounds lighter than some "portables." And you know how it feels to carry around ten extra pounds.

Yet within its diminutive footprint (it's about a foot wide and not even that deep) lies all the power of a desktop PC.

Included are 512KB of RAM and a built-in 720KB 3½" floppy drive, plus MS-DOS® 2.11 in ROM.

It comes with a new supertwist screen that's adjustable a full 180°, and folds flat when you want to add a CRT.

The IBM®-compatible T1000 offers you some very intelligent options. Like a numeric keypad and a 1200 bps Hayes®-compatible internal modem. Or an expansion card that will improve its memory by another 768KB.

All in all, it's the perfect way to go to work without going to work. Or to get home early, even when you'll be working late.

Call 1-800-457-7777 for the Toshiba computer and printer dealer nearest you. And see how it feels to pick up the most portable portable in the world. Nothing is as easy to take.

Except, maybe, its price.

MS-DOS is a registered trademark of Microsoft Corporation. Hayes is a registered trademark of Hayes Corporation. IBM is a registered trademark of International Business Machines Corporation.

In Touch with Tomorrow

TOSHIBA

Toshiba America Inc., Information Systems Division

under wraps and make an announcement only when it's ready to ship.

The smart companies know that the only way to give a new machine a running start is to beat the drums well in advance of actually delivering it. Most companies, however, have also learned not to announce a new computer until they *know* they can deliver it, to avoid being accused of hawking vaporware.

When IBM prepares to announce new computers, for example, it doesn't tell anybody about them in advance, which is why preannouncement rumors about IBM products are usually so inaccurate. Big Blue spent more than ten years in court fighting an antitrust suit brought by the government. Although the case was eventually dropped, IBM still shies away from any appearance of unfairly manipulating the computer marketplace. This taboo includes controlled leaking of information about new products.

Instead, IBM frequently announces new products as much as six months to a year before shipping them. This is ostensibly to "inform the market"—which means giving the competition the heebie-jeebies while prompting customers to evaluate new products that aren't available yet. Sometimes, as in the case of the PS/2 announcements, IBM waits to announce new products until it has at least some of them available.

This approach frequently hurts IBM in two ways. First, since the company doesn't try to control speculation, industry and user expectations often get wildly out of hand (as they did in the case of the PCjr, the never-announced PCII, and the PC Convertible). Second, software and peripherals companies don't get enough advance information to be ready with supporting goods. Consider the doldrums the industry is currently experiencing with the PS/2: There are no add-in boards for the new computers (other than those announced by IBM), and no soft-

ware currently supports the VGA display modes.

Another case in point involves Apple Computer, which has probably made more mistakes than any other computer company in the business. In the process, however, it has learned the art of leaking information about new computers without revealing anything concrete. Apple gets potential buyers salivating over nonexistent computers. When the machines finally appear, there are not only thousands of ready customers but also plenty of supporting software and peripherals to make them feel like they're buying into a good thing.

Apple accomplishes this by making everybody—software and peripheral designers, market researchers, dealers, and columnists—sign Confidential Disclosure Agreements (CDAs), which say you're not supposed to tell anybody else about the new products until they've been officially announced. Everybody then promptly ignores the CDAs, since you can't show how much of an industry insider you are unless you let everybody know that you've signed one. This is why the trade press carries such accurate rumors about Apple's new products well before they're announced.

The CDA approach helps Apple enormously because it ensures that people have accurate expectations about the new computers and gets third-party companies the information they need to begin developing supporting products. However, it doesn't create the impression that Apple promotes vaporware.

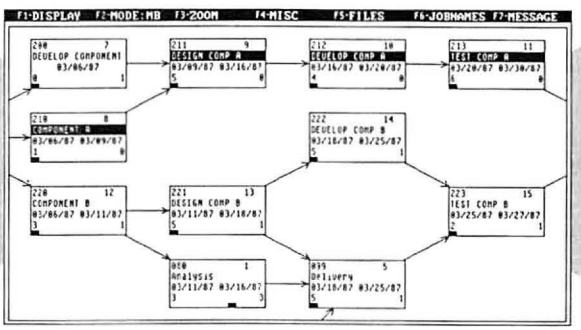
Compaq Computer, on the other hand, has a history of neither telling anyone what it's doing nor announcing products in advance. Instead, Compaq has developed an interesting twist on the game. The company always designs products that use the latest and greatest technology, announces them the same day they're shipped to retailers, and then hopes that customers agree that the technology is indeed the latest and greatest. Given that Compaq has be-

(continues)

PROJECT SCHEDULER NETWORK™

VERSION 2.5

- Work Breakdown Structures
- Gantt Chart
- PERT Chart
- Project Costing
- Project Cost and Schedule Tracking
- Resource Allocation
- Resource Leveling
- Comprehensive Reports



- Interactive Graphics
- Multi-Project Operation
- Sub-Project Integration
- Lead and Lag
- ASAP/ALAP Scheduling
- Required Dates
- Reverse Scheduling
- Negative Slack

What you want is what you get!

Are you tired of PERT Charts that are a maze of crossing lines or that stretch endlessly in a single row of little boxes? With Project Scheduler Network you get the PERT (Network) Chart in the format you want! You construct and view networks at selectable zoom resolutions ranging from project details to the entire network on a single display. Computer-aided drawing tools assist in editing the network diagram to your satisfaction. You can also easily combine and link multiple projects to form larger projects. And sideways printing of the network and full plotter support are standard. Project Scheduler Network helps you define, understand, and communicate project dependencies in a clear, concise, and comprehensive manner. After all, isn't this the purpose of a PERT Chart?

SCITOR **(415) 570-7700**

SCITOR CORPORATION **250 Lincoln Centre Drive** **Foster City, CA 94404**

It's ironic. These days, modems bring the world to you at the speed of light. But for all their awesome speed and power, these high-performance machines just sit there on your desk like a low-tech toaster.

But now, we're introducing the Migent Pocket Modem. It's 100% Hayes-compatible, so it works with virtually any PC: IBM, Apple, or whatever. It runs at both 300 and 1200 bps. It has a full set of Hayes AT commands. A 28-character non-volatile memory. Remote ring and tone sensing. Busy and dial tone monitoring. And even dual phone jacks.

But that's where all similarities end. The whole modem is smaller than a 3" x 5" card and works on a 9 volt battery or AC power. So you can put it in your shirt pocket or briefcase, and take it home, on the road, or anywhere else you need your PC.

The Migent Pocket Modem. If you'd like to know more, send in this coupon or call **800-633-3444,** Dept. 302, and ask for Alexis. We'll send you full information and the name of your nearest dealer. But in the meantime, you may be wondering why this modem isn't beige like the rest. Because we think it's about time a high-powered information machine looked like one.

☐ Please send me more information about the Migent Pocket Modem. And send me the name of the dealer in my area.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____

MIGENT™

Send to: Migent, Inc., 865 Tahoe Blvd., Call Box 6, Dept. 302, Incline Village, Nevada 89450-6062, Attn: Alexis

Registered trademarks: Apple, Apple Computer; Hayes, Hayes Microcomputer Products; IBM, International Business Machines. Trademark: Pocket Modem, Migent.

THE MIGENT POCKET MODEM.™
A STATE-OF-THE-ART INFORMATION MACHINE THAT LOOKS LIKE ONE.

Get more info. Go to Ad index.

come an $800 million company in less than five years, its unique strategy seems to work well enough. Since the company builds computers that are compatible with IBM's PC line, it doesn't depend on other companies to make products that work specifically with Compaq computers.

Columnists, unfortunately, are bit players in this grand game; most of us write our columns two or three months in advance of publication. Look at the PS/2 announcements from our perspective. As long as IBM hadn't actually introduced new computers, we had free rein to speculate, start rumors, beat up on the company for not doing anything, and generally do those things that columnists are expected to do.

Now we're waiting for everyone else to catch up. Software companies have to write new drivers for VGA graphics, Microsoft has to finish the new operating system, peripherals companies have to figure out how to build boards for the new slots, and compatibles makers have to figure out whether they want to build clones of the new architecture. IBM still has to ship its new laser printer and the high-end 80386-based PS/2 machines and tell us when it plans to deliver the operating system, interface, and extensions.

In the meantime, we columnists stare vacantly at our "old" PCs, trying to figure out what to say until the game begins anew.

Stewart Alsop is editor and publisher of P.C. Letter *and a Contributing Editor for* PC World.

CONTROL YOUR PROJECTS

- Activity Duration up to 999 Days
- Target Date Controls
- Contractual Completion Date Control
- Dynamic Statusing all Activities
- Interactive Logic Diagram
- On Screen Bar/Milestone Charts

Cost Loading and Control
- Planned and Actual Costs
- Cost Variance Reporting
- Funding Schedule
- Earned Value Analysis

Presentation Quality Graphics
- Graphic Printers and Plotters
- Bar/Milestone Charts
- Time Scaled Project Diagrams
- Funding Schedule Graphs
- Earned Value Analysis Graphs

Power Tools
- Select/Sort "Query" Language
- Cut & Paste Networks
- Context Sensitive Help Messages
- On Screen Technical Reference
- Direct Interface to dBASE-II/III
- ASCII Interface to Spreadsheets

PMS-II MEANS BUSINESS!

"We're finishing up the $100 million dollar Naval Hospital project on time and under budget. We are a very competitive company and that's why we use PMS-II project management software. It has the power and capability to do the job right."
— *Blake Construction Co., Inc.*

Virtually Unlimited
- 3,000 Activities per Network
- Super and Sub Networking
- Internetwork Dependencies

Exceptional Planning and Tracking
- Critical Path Scheduling
- + and − Lag between Activities
- Variable Work Week and Holidays

Call for newsletter & free literature

(619) 458-1327

Systems starting at $1295
Demonstration disk for PC/MS DOS $50

NORTH AMERICA MICA, INC
MICA

5230 Carroll Canyon Rd., Suite 110
San Diego, CA 92121
(619) 458-1327 Telex 701257

Get more info. Go to Ad Index.

STATS-2™

A COMPLETE STATISTICAL PACKAGE

$149

A powerful tool for data analysis and forecasting

- Super-fast (8087 support), double precision
- Easy to use, no commands to memorize (menu driven)
- Full-featured Data Editor for entering/transforming/editing of data; **easy access to data from spreadsheets and data bases (e.g., Lotus 1-2-3, Symphony, dBIII)**
- Descriptive statistics, t-tests, Correlations (including "economically" formatted matrices), Crosstabulations, Comparisons of Distributions, Significance Tests, Powerful General Multiple Regression module (Durbin-Watson statistic, autocorrelation of residuals, forecasting subprogram, and more), Flexible General ANOVA/ANCOVA module (up to five factors, repeated measures, unequal n, contrasts, and more), 10 Non-parametric Statistics, Bargraphs, Scatterplots, and much more
- Presentation quality tables and graphs can be printed vertically or horizontally on 80 printers (all major brands supported)
- Requires IBM-PC (or compatible), 2 dd, 256k

To order send check or money order for $149 (plus $5.00 shipping and handling) to:

MasterCard VISA

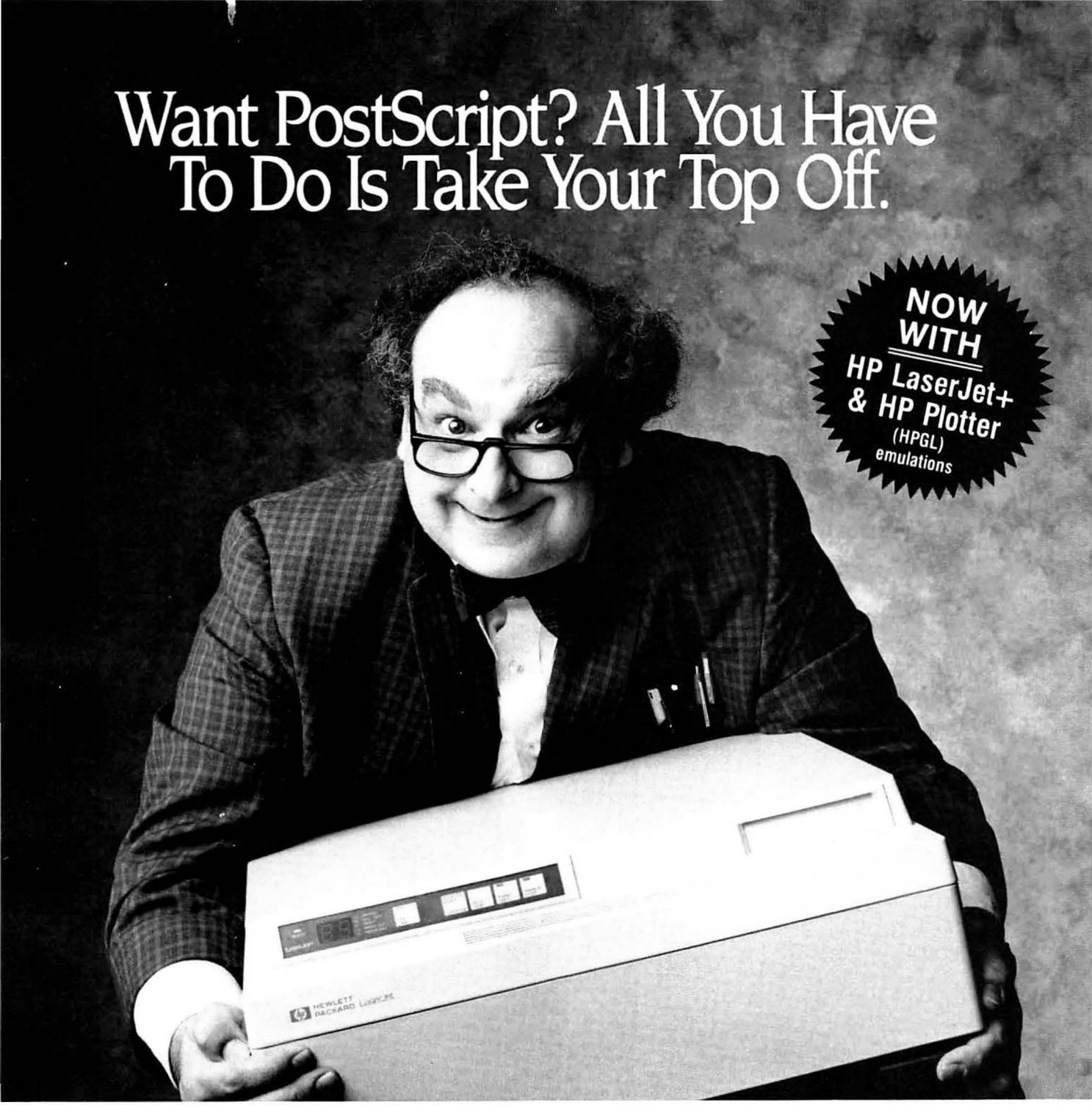
StatSoft™

2832 East 10th Street, Suite 4, Tulsa, OK 74104. (918) 583-4149

NOW includes **GRAFPLUS™**, a memory resident utility to produce presentation quality graphics "screen dumps" from all popular programs. Quickgraphics screen shots from **LOTUS 1-2-3!**

Get more info. Go to Ad Index.

Want PostScript? All You Have To Do Is Take Your Top Off.

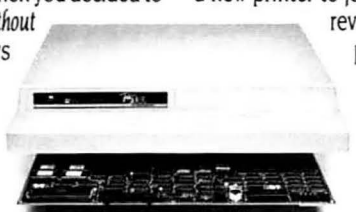


Daring? You bet. But the revolution demands that you do something revolutionary.

"What revolution?" you say? Desktop publishing, of course!

It all started with PostScript,™ the marvelous page-description language from Adobe Systems.™ The first PostScript machines were phenomenal. But so was the price. That's when you decided to settle for a laser printer *without* PostScript. But those days are gone. Now you can add PostScript to your Hewlett-Packard LaserJet™ or LaserJet Plus.™ And for only $2995.

Just take your top off and put on PS Jet, the PostScript enhancement from The Laser Connection.™ It replaces the top cover assembly on laser printers from H-P, Canon,® NCR® and QMS.® And PS Jet provides 13 typefaces, in any point size, for 100% compatibility with the Apple® LaserWriter™ and it supports all PostScript programs available for your IBM®PC.™ You don't have to buy a new printer to join the desktop publishing revolution. You just need to perform a revolutionary act. Like mailing in this coupon to find out more about PS Jet.™ Or calling 1-800-523-2696. (In Alabama, call 1-633-7223).



PS Jet Only $2995.

THE LASER CONNECTION™
Enhancement products for laser printers
A QMS Company

Name: _____ PCW 0787

Company Name: _____

Address: _____ City _____

State: _____ Zip _____ Phone _____

☐ Please have a salesman call ☐ Please send dealer information

The Laser Connection, P.O. Box 850296 Mobile, AL 36685

PostScript is a trademark of Adobe Systems, Inc. LaserJet and LaserJet Plus are trademarks of Hewlett-Packard Corp. Apple is a registered trademark of Apple Computer, Inc. LaserWriter and LaserWriter Plus are trademarks of Apple Computer, Inc. QMS is a registered trademark of QMS, Inc. NCR is a trademark of NCR Corp. IBM is a registered trademark of International Business Machines Corp. Canon is a registered trademark of Canon U.S.A., Inc. The Laser Connection and PS Jet are trademarks of The Laser Connection, Inc.

Get more info. Go to Ad index.

No matter where you take CROSSTALK® Mk.4 . . .
You won't encounter a PC communications program with as much versatility as CROSSTALK® Mk. 4. It has everything we could imagine you needing today. More protocols — X.PC, Xmodem, Kermit, and our own CROSSTALK. More terminal emulations, including complete IBM 3101, DEC VT-100, and TeleVideo 900 series. Concurrent communications capability — up to 15 sessions, each displayed in its own expandable window, or on separate "pages." Error checking at high speeds. Prepared script files to extract information from most popular information utilities. A powerful programming language to create customized scripts. Finally, we've built-in a bit of tomorrow. CROSSTALK Mk. 4 is based on a modular architecture that means we can add new capabilities by phone, as they come along. So you're getting more than today's standard in communications software. You're getting tomorrow's as well.
CROSSTALK® COMMUNICATIONS
Digital Communications Associates, Inc.
1000 Holcomb Woods Parkway
Roswell, Georgia 30076
CROSSTALK® Mk.4
CROSSTALK® is a registered trademark of Digital Communications Associates, Inc. / DEC VT-100 is a registered trademark of Digital Equipment Corp
IBM is a registered trademark of International Business Machines Corp. / TeleVideo is a registered trademark of TeleVideo Systems, Inc. / X.PC is a trademark of Tymshare, Inc.

Top of the News

Toshiba Threatened With "Corporate Life Sentence"

Owners of Toshiba computers or printers may face service problems in the future. The company is literally taking a beating in Congress right now for selling submarine propeller manufacturing technology to the Soviet Union. The U.S. Senate voted overwhelmingly to ban Toshiba Corporation products from these shores for up to five years, and the House is even more hostile. Ten congressmen lined up at the Capitol recently to bash a Toshiba radio to pieces with sledgehammers. Perhaps the angriest is Congressman Duncan Hunter (R-Calif.), who has sponsored a bill to banish the company from U.S. shores forever. Unappeased by recent resignations of Toshiba brass, he insists on a "corporate life sentence" for both Toshiba and its Norwegian partner in the deal, Kongsberg-Vaapenfabrikk. Even the two-to-five-year ban would cost Toshiba America $2 billion annually in lost sales and up to 4000 American jobs, estimates Chairman and CEO Nobuo Ishizaka. Toshiba's U.S. sales already have been severely affected, he reveals. Ishizaka isn't sure how the company will service its estimated 35,000 current customers, unless a compromise is worked out. Hunter insists that Toshiba customers won't mind making the sacrifice, and he is helping to organize a nationwide boycott of Toshiba products.

Laptop-Size Desktop Announced

Koryo Systems is about to upstage IBM's efforts to shrink PCs by introducing a 286/386-upgradable desktop the size of a laptop. The Inchon, Korea, manufacturer expects to ship prototypes of its 15-by-15-by-3½-inch computer to current OEM customers in September. A final version could be on dealer shelves by the first of the year, says General Manager Sung Lee. The computer incorporates VLSI and surface-mount technology with a passive backplane bus to facilitate upgrades and achieve its diminutive size. Phoenix Technologies designed the ROM BIOS, as well as 80286 and 80386 CPU boards with 4MB and 8MB of RAM, respectively. Phoenix also designed a function-rich I/O board with a floppy controller, serial and parallel ports, a Microsoft-compatible mouse port, and MDA, CGA, EGA, and Hercules graphics compatibility. Two slots are available for expansion. The machine will ship with one 5¼-inch floppy drive and an option for a 3½-inch 20MB, 30MB, or 40MB hard disk. The sixth largest manufacturer in Korea, Koryo also is preparing to sell several larger passive backplane designs.

Mix and Match

Companies planning to mix and match the new Micro Channel-equipped IBM Personal System/2 computers with their so-called classic PCs face a number of compatibility problems. But incompatibility with the 720-by-348 graphics standard won't be among them. Hercules Computer Technology has introduced its Hercules PS/2 Card, giving PS/2 owners immediate access to more than 150 leading graphics packages that take advantage of the resolution standard of Hercules-compatible graphics boards. About 2 million of these monochrome graphics boards from Hercules and other manufacturers are already installed in classic PCs. The new board, which will offer the Hercules extended-column RamFont mode and a choice of 16 colors from a palette of 64, is scheduled to ship in the fourth quarter, possibly as early as October. A price had not been established at press time, but the board probably will go for around $299.

Daybreak to Release Integrated Package

Satin is the only logical name for Daybreak Technologies' new product, an integrated package that follows in the path of the company's *Silk* spreadsheet. The product will be formally announced at COMDEX Fall and is scheduled to ship during the first quarter. Daybreak refuses to confirm details, but reportedly will integrate the *Silk* spreadsheet and graphics capabilities with a disk-based file manager, word processor, communications package, and idea processor. Because *Satin* requires more than 640K of memory, it's likely to be delayed until after the release of OS/2.

COMDEX Swells With Corporate Customers

If you're a mubbie (multiple-unit buyer) planning to make the trek to COMDEX Fall in November, you would do well to book your flight and hotel reservations soon. As show registration opens, The Interface Group predicts that more than 90,000 people will jam Las Vegas's 60,000 hotel rooms. The first 30,000 rooms are blocked out for staff members of an expected 1400 exhibitors. During COMDEX's halcyon days, attendees had to sleep in campers, triple up in fleabag motels, even commute daily from nearby metropolises. This year, a large percentage of those crowding the aisles will be corporate customers who, until recently, had to sneak into COMDEX.

Computer Dealers Slash Brands Sold

Expect a scarcity of lesser-known products on the shelves of leading computer stores. Dealers are winnowing out slow-moving or unprofitable brands. For example, MicroAge has reduced brands carried by 20 to 25 percent in recent months, while Businessland is cutting back by one-third and reducing sales commissions on off brands. It's more than simply a way to save on inventory costs, say the leaders of those chains. Heavy discounting of some products has trimmed margins to the point where store owners have to choose between supporting some products well or all poorly. Dealers with purchasing clout are forming "strategic product relationships"—typically with vendors of the best-selling computers and those that require more complex and expensive software, peripherals, and accessories. Dealers will stock up on these computers, increase their service commitment to them, and even gain some influence in their design. The newer and less popular products can still be acquired from smaller retailers or, in some cases, through the mail. But nail down support commitments up front.

Epson to Release Low-End Clone

While most of us are still nurturing our summer tans, microcomputer vendors are busy wrapping Christmas packages. One that may wind up under your tree is a low-end IBM compatible from Epson America that will be bundled with the popular *pfs:first choice* integrated software from Software Publishing. A familiar name among specialty retailers, Epson is preparing an all-out push to make its $900 Apex (sans monitor) the first truly successful IBM compatible available from department stores and other mass merchandisers. The standard configuration is a dual-speed 8088-2 CPU (4.77 and 8 MHz), 512K of memory, and two 360K floppy drives. Target customers include office-at-home and take-work-home business users whose application needs are broad but not deep. That group has been a key factor in *pfs:first choice*'s success. The integrated $179 package ($99 street price) with data base, word processor, telecommunications, and spreadsheet modules has sold more than 100,000 units to date. An enhanced version of *first choice* is planned for pre-Christmas delivery.

The Word Publisher.

Introducing Wordstar 2000 Plus,® a powerful and innovative tool for word publishers that turns novices into professionals. It features: automatic reformatting of text based upon your font choice, multiple fonts in a document, newspaper style columns and automatic or discretionary hyphenation. It will even allow you to change fonts mid-line or mid-word and maintain right justification.

And here's something that'll stop the presses: when you order Wordstar 2000 Plus, you'll also get $300. worth of additional software, *absolutely free*! Like **Inset**™ (Release 2.0) for importing graphic images directly into a document: **Conofonts Manager**™ for easy downloading of fonts, a set of **Commercial Script**® fonts and TRUE **Postscript**™ support.

Other Wordstar 2000 Plus power features give you access to electronic mail and information services, macros, three editing windows, indexing, footnotes and a host of other capabilities.

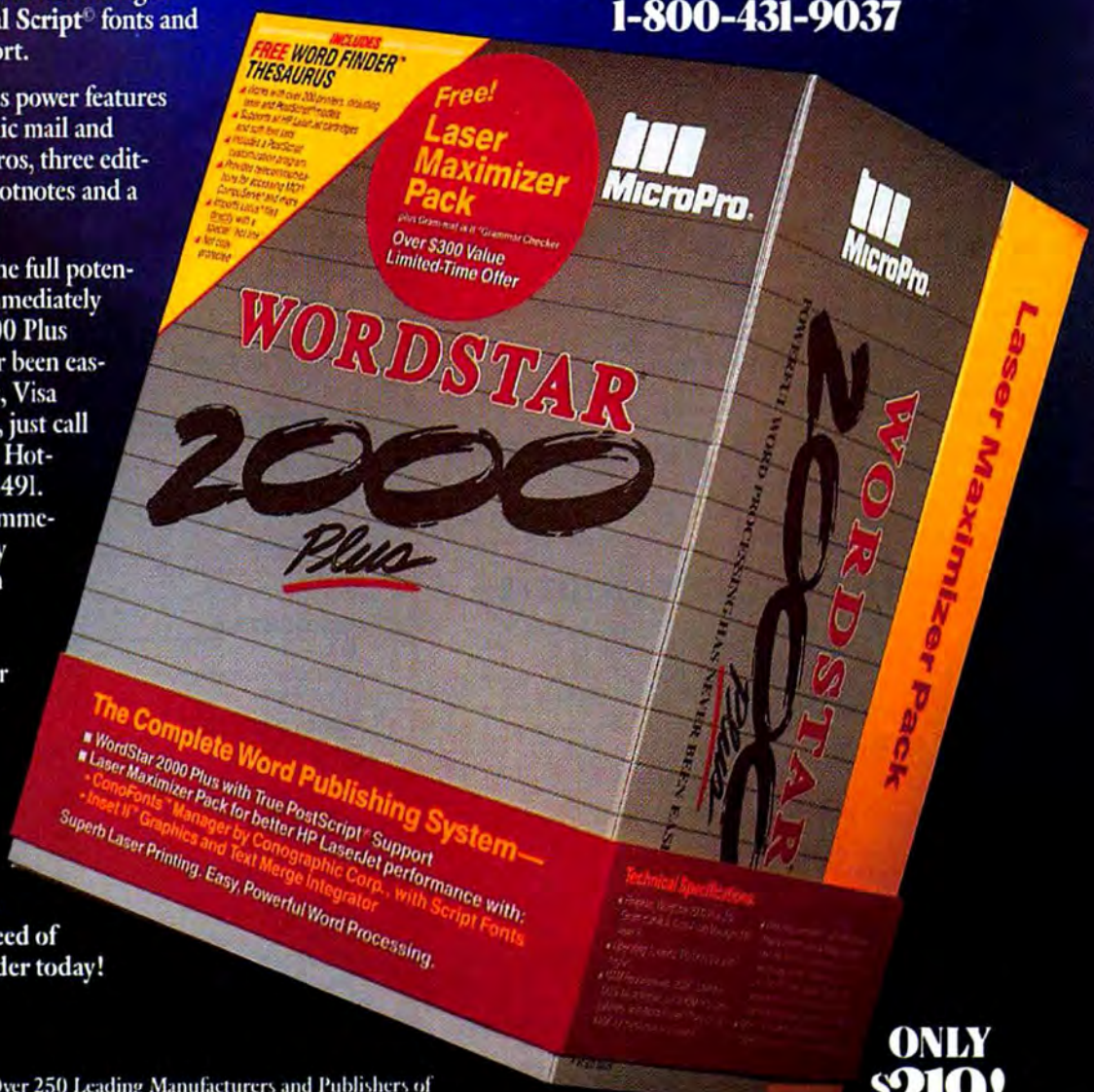
You can begin exploring the full potential of word publishing immediately by ordering Wordstar 2000 Plus from Logicsoft – it's never been easier. For American Express, Visa and MasterCard ordering, just call our National Credit Card Hotline toll-free 1-800-645-3491. We'll process your order immediately, and ship it the very same day. Or, if you are on open account status with Logicsoft, send us a purchase order and one of our experienced account executives will be ready to discuss our corporate program and services.

At only $219, become your own "publisher-in-chief" with the power, versatility and speed of Wordstar 2000 Plus. Order today!

The Largest Direct Distributor of Software and Hardware Products *...in the World.*

LOGICSOFT®
AN MSC INTERNATIONAL COMPANY
110 BI-COUNTY BLVD., FARMINGDALE NY 11735

NAT'L CREDIT CARD HOTLINE
1-800-645-3491
PURCHASE ORDER HOTLINE
1-800-431-9037



Logicsoft is a Distributor for Over 250 Leading Manufacturers and Publishers of Computer Products Including: Ashton Tate • AST • Compaq • Epson • Hayes • IBM • Leading Edge • Lotus • MicroPro • Microsoft • Okidata • Quadram • Seagate • Tecmar • Word Perfect

ONLY $219!
MFG. LIST PRICE $595.

NEW YORK 516-249-9700 SAN FRANCISCO 415-621-4411 BOSTON 617-247-6406 CHICAGO 312-372-0939 BOCA RATON 305-392-4644 HOUSTON 713-227-0201 EUROPE 020-83-4864

NEW! 30 day

We carry all available 3½" formats

SOFTWARE

WORD PROCESSING

Display Write IV	$325
Lotus Manuscript	349
Microsoft Word 3	229
Multimate	229
Multimate Advantage II	279
Office Writer w/Spell	259
PFS Professional Write	115
Volkswriter 3	145
Word Perfect	209
Word Perfect Executive	**Low Price Call!**
Wordstar Professional Rel. 4	239
Wordstar 2000 Plus	219
XY Write III Plus	245

WORD PROCESSING ADD-ONS

Fancy Font	$139
Punctuation & Style	89
Turbo Lightning	59
Word Finder	55
Word Perfect Library	59

DATABASE MGMT.

Cornerstone	$ 65
d Base III Plus	409
d Base III Lan Pak	599
Foxbase Plus	225
Foxbase Plus Multiuser	335
Paradox	309
PFS Professional File	145
Powerbase	185
Q & A	229
R: Base System V	455
Reflex	89
Revelation	519
Rapid File	235

DATABASE MGMT. ADD-ONS

Clipper	$399
Genifer	215
Quickcode Plus	145
Quick Report	145
Quicksilver	329
R Base Ext. Report Writer	179
R Base Graphics	179

SPREADSHEET/INTEGRATED

Ability Plus	$149
Boeing Calc	235
Enable	389
Framework II	409
Lotus 1-2-3	315
Microsoft Multiplan	119
PFS First Choice	105
Silk	179
Smart Integrated	459
Supercalc IV (NEW)	305
Symphony	459
VP Planner	59

SPREADSHEET ADD-ONS

4 Word	$69
HAL	109
Lotus Report Writer	79
Lotus Metro	59
Quickcode for 1-2-3	79
Sideways	45
Spreadsheet Auditor	79
SQZ	59

DESKTOP PUBLISHING

Click Art Personal Publisher	$99
Print Shop	39
Harvard Pro Publisher	445
Page Maker	499
Ventura	545

GRAPHICS

Chartmaster	$215
Diagram Master	195
Energraphics (NEW)	309
Freelance Plus	339
Harvard Presentation	239
Microsoft Chart	189

CAD/CAM

Auto CAD 2.6	$2359
Auto CAD Basic	269
Drafix Plus	209
Generic CADD	69
Pro Design II	179

LANGUAGES

BASIC Compiler (MS)	$255
C Compiler (MS) (4.0)	269
COBOL Compiler (MS)	425
FORTRAN Compiler (MS)	269
Lattice C Compiler	239
Macro Assembler (MS)	95
Pascal Compiler (MS)	179
Quick Basic (MS)	65
True Basic	95
Turbo C	65
Turbo Basic	65
Turbo Pascal (plus BCD & 8087)	65

PROJECT MANAGEMENT

Harvard Total 2	$375
Microsoft Project	239
Super Project Plus	305
Timeline	235

FINANCIAL

Managing Your Money	$115
Dollars N' Sense	105

ACCOUNTING

BPI Entry One	$69
Computer Associates	**Call!**
Great Plains	449

MISC/UTILITIES

Brooklyn Bridge	$109
Carbon Copy Plus	125
Concurrent XM DOS	255
Copy II PC	39
Crosstalk XVI	99
Disk Optimizer	35
Disk Technician	85
Eureka	65
Fastback	89
Fixed Disk Organizer	49
Mace Utilities	69
Microsoft Windows	65
Norton Commander	45
Norton Utilities	55
Norton Utilities Adv. Ed.	85
PC DOS	**Low Price Call!**
Remote	149
Sidekick	55
Smart Com II	89
Superkey	45
Take Two	89
Watch Dog	189
XTREE	39

HARDWARE

LAPTOPS

TOSHIBA

T1100+	**Low Price Call!**
T3100+	$3249

ZENITH

Z-183	2359

PRINTERS

BROTHER

HR 20	$425
HR 40	689
M-1409	349
M-1509	389
M-1709	509

DICONIX

Diconix 150	339

EPSON

EX 800	409
EX 1000	545
FX-86E	339
FX-286E	479
LQ 800	479
LQ 1000	679
LQ 2500	949

NEC

P 660	479
P 760	659
CP 660 Color	589
CP 760 Color	799
P 560 XL	1049
P 960 XL	1249

OKIDATA

M182	265
M192	369
M193	559
M293	735
2410P	1759

PANASONIC

KX-P-1080 i	209
KX-P-1091 i	279
KX-P-1595	489

TOSHIBA

P 321 SL	559
P 341 E	775
P 351	999
P 351C	1179

CITIZEN

MSP 10	289
MSP 15	365
MSP 20	329
MSP 25	499
Premier 35	509

PRINTER BUFFERS

QUADRAM

Microfazer Series	**Low Price Call!**

DIGITIZER

Summa Sketch 12x12	$439
Summa Sketch 12x18	725

SCANNER

SABA (Hand Held)	$499
HP Scanjet	1195
DATACOPY 730	1329

• No surcharge for MasterCard, VISA, American Express, C.O.D., money order, check of PO's (please call for price verification) • No sales tax on orders shipped outside NY State • Please add 2% for insurance and handling ($3.00 minimum) (intl orders add'l) • We do not bill until we ship. All products covered by mfg's warranty. We do not guarantee compatibility. All prices and policies subject to change without notice.

MIGENT POCKET MODEM

Miniature 300/1200 bps Hayes-compatible modem. Compact size lets you carry it anywhere you go. Battery powered • Bell 212 and 103 compatibility • Unique surface mount design • Plugs directly into your computer RS232 port.

$159

SPECIALS

BOCARAM/AT

Unforgettable! Expand with the powerful new BocaRam/AT and forget about memory problems. Provides conventional expanded and extended memory all on one board, in one slot. You can extend the BocaRam/AT up to a whopping 4mb. Compatible, expandable, and reliable.

BocaRam/AT 128K	**$165**
BocaRam/AT 512K	**$209**
BocaRam/AT w/2mb	**$349**

INTRODUCING THE WORK PROCESSOR.

New XyWrite III Plus® is the only word processor that increases your productivity without limiting your creativity.

Great news for business professionals: now you don't have to choose separate PC software for word processing and desktop publishing. XyWrite III Plus does it all.

As a word processor, XyWrite III Plus's speed, power and flexibility make it ideal for people who produce large amounts of text. Automatic pagination and reformatting allow you to implement your ideas as quickly as they occur. Extensive macro capabilities significantly save you time and effort. And our new 100,000 word spelling checker protects you from embarrassing errors while our 220,000 word thesaurus enhances your creativity.

To help you even more, XyWrite III Plus contains additional advanced features like redlining, which lets you track additions and deletions to your file without losing the original text. Or hidden notes, which allows you to imbed non-printing comments in your text and is perfect for flagging spots where significant changes have been made.

For desktop publishing XyWrite III Plus lets you make the most of today's sophisticated laser printers. You can mix different type fonts within a document (even on the same line), and XyWrite III Plus automatically adjusts the spacing, horizontally and vertically. And our advanced INCLUDE command lets you merge files from other sources into your text, as well as spread sheets for annual reports, charts, graphs and scanned logos and other illustrations.

All totaled, you get over 475 hard-working features to help you produce more words in less time, with greater meaning. **At only $239, shouldn't you put XyWrite III Plus on your payroll?**

ORDER XYWRITE III PLUS FROM LOGICSOFT BY CALLING TOLL-FREE, OR SEND IN THE COUPON AND WE'LL GUARANTEE SAME-DAY SHIPPING.

ONLY $239
Retail Price $445.

XyWrite III Plus®

☐ **YES,** I can't wait to put the power of work processing to work for me. Please rush me XyWrite III Plus.
☐ I'm interested in learning more about Logicsoft's line of quality PC products at 30% to 50% off list price.

Name _____
Company _____
Address _____
City _____ State/Zip _____
Phone (_____) _____
☐ Check or money order enclosed (N.Y.S. residents please add sales tax) AMOUNT _____
☐ MasterCard ☐ VISA ☐ _____
Card # _____
Signature _____
MAIL TO: Logicsoft, 110 Bi-County Blvd., Farmingdale, NY 11735

1009

Available From

LOGICSOFT®
AN MSC INTERNATIONAL COMPANY
110 BI-COUNTY BLVD. FARMINGDALE NY 11735

NAT'L CREDIT CARD HOTLINE
1-800-645-3491

PURCHASE ORDER HOTLINE
1-800-431-9037

NEW YORK 516-249-9700 **SAN FRANCISCO** 415-621-4411 **BOSTON** 617-247-6406 **CHICAGO** 312-372-0939 **BOCA RATON** 305-392-4644 **HOUSTON** 713-227-0201 **EUROPE** 020-83-4864

Get more info. Go to Ad index.

1008

money-back

LASER PRINTERS*

CANON
Laser Printer LBP8A1 . . . $1899
Laser Printer LBP8A2 2899
HEWLETT PACKARD
Series 2 1949

PLOTTERS*

HEWLETT PACKARD
7475A $1629
7550A 3275
HOUSTON INSTRUMENTS
DMP 40 879
DMP 41 2599

MONITORS*

AMDEK
Color 600-S $335
Color 722 449
Color 725 559
310A 149
410A 159
IBM
Color Monitor 8513 499
Monochrome Monitor 8503 . 225
Enhanced Color Display . . . 599
LOGICSOFT
★EGA 359
★RGB 14" 275
★Monochrome 12" 89
NEC
Multisync color 579
PRINCETON GRAPHICS
LM 300 559
RGB HX-12 449
RGB SR-12 569
Amber Max 12 159
MITSUBISHI
Diamond AUM 1371A 629
THOMSON
12" MONO 95
14" CGA 315
14" EGA 385
14" Ultrascan 539

MULTI-FUNCTION BOARDS

AST RESEARCH
Six Pack Premium (512K) . $199
Six Pack Plus (384K) 199
Rampage w/256K 275
Rampage 286 w/512K 429
Advantage (128K) 349
I/Ø Mini II 115
BOCA RESEARCH
BOCARAM/AT (w/128K) . . 165

COMPUTER PERIPHERALS

Half Pint I/O 105
Overachiever 512K 349
LOGICSOFT
★Logic Board EMS PC ØK . . . 99
★Logic (AST Compatible) Multifunction Board w/ØK . 99
w/384K 155
★Logic EMS AT ØK 79
★Logic (AST Compatible) AT Multifunction Board w/128K (Expandable to 2.0 Mb) 195
★Logic (AST Compatible) 576K RAM Board ½ Card w/ØK 45
w/384K 119
w/576K 145
★Logic (AST Comp.) I/O Mini Half Card 85
QUADRAM
Quadboard (384K) 165
Silverboard (384K) 345
INTEL
Above Board Series
(PC) w/64K 229
(PS/PC) w/64K 259
(286) w/512K 349
(PS/286) w/512K 379
(PS) 256K 389
8087-2 Math Co-Processor 179
8087-3 Math Co-Processor 125
80287 Math Co-Processor 6 MHz 199
80287 Math Co-Processor 8 MHz 269
80287 Math Co-Processor 10 MHz 345

TURBO CARDS

INTEL
Inboard 386/AT $1249
MAYNARD
Surprise 286 99
ORCHID
Jet 386 879
Tiny Turbo 429
Turbo EGA 575
LOGICSOFT
★Accelerator 286 299

GRAPHICS BOARDS

AST
3G+ $295
Preview 239
Six Pack Premium/ EGA Series . **Low Price Call!**

LOGICSOFT CUSTOMER SERVICES

30 DAY MONEY-BACK GUARANTEE

We stand behind what we sell. If for any reason you are not satisfied with your order, simply call for a return authorization number for a full refund of product purchase price, replacement or credit within 30 days of receipt of order. Product must be undamaged in original package and contain all documentation and its unexecuted warranty card. (Due to certain manufacturer copyright restrictions, some items may not apply.)

CURRENT VERSION GUARANTEE

We carry only the latest versions available and guarantee to ship the version quoted to you.

TOLL-FREE CUSTOMER SERVICE

One on-line mainframe allows instant access to customer and product information.

SAME DAY SHIPPING

Because we are *the* largest direct distributor we stock the most popular products in-depth so we can ship same day to get your order to you fast.

LOGICSOFT®

A MSC INTERNATIONAL COMPANY

110 Bi-County Blvd., Farmingdale, NY 11735

▼ TO ORDER CALL ▼

VISA · MasterCard · AMERICAN EXPRESS

CREDIT CARD HOTLINE

1-800-645-3491

For instant processing of your credit card orders.

TERMS HOTLINE

1-800-431-9037

Our terms customers can be assigned a personal account executive and may qualify for special corporate considerations.

New York • 516-249-9700 San Francisco • 415-621-4411 Boston • 617-247-6406 Chicago • 312-372-0939 Boca Raton • 305-392-4644 Houston • 713-227-0201 Europe • 31-20-834864

guarantee

ATI
EGA Wonder Board . . . 279
HERCULES
Color Card . . . 155
Graphics Card Plus . . . 189
In Color Card . . . 325
LOGICSOFT
★Logic (Hercules Comp.) Color Graphics Board . . . 89
★Logic (Hercules Comp.) Monographics Board . . . 89
★Logic EGA (IBM Comp.) . . . 179
★Logic EGA 480 (IBM Comp.) 249
NEC
GB1 EGA Board . . . 349
PARADISE SYSTEMS
Auto Switch EGA Card . . . 215
Auto Switch EGA 480 . . . 299
QUADRAM
EGA Plus Graphics . . . 319
Pro Sync EGA . . . 349
STB
Chauffeur HT . . . 199
EGA Plus . . . 249
TSENG LABS
EVA 480 . . . 345
VIDEO 7
VEGA (½ Card) . . . 249
VEGA Deluxe (½ Card) . . . 349
ZUCKERBOARD
Monochrome Graphics Card . 85

COMMUNICATIONS BOARDS

AST
5251-11 Plus . . . $655
5251-11 . . . 609
DCA
IRMA Board . . . 759

MODEMS

EVEREX
Evercom II . . . $109
Evercom 2400B Int. . . . 199
HAYES
Smartmodem 1200 . . . 309
Smartmodem 1200B w/Smartcom II . . . 369
Smartmodem 2400 . . . 465
Smartmodem 2400B w/Smartcom II . . . 465
LOGICSOFT
★Logic (Hayes Comp) 1200B Internal Modem . . . 89
★Logic (Hayes Comp.) 1200 Baud External Modem . . . 129
★Logic 2400B Internal Modem 2400B w/Software . . . 199
★Logic (Hayes Comp.) 2400 Baud External Modem . . . 229
MIGENT
Pocket Modem . . . 159
PROMETHEUS
Pro-modem 1200 . . . 215
Pro-modem 1200B . . . 139
TOSHIBA
1200B Laptop Modem (T1100 Plus) . . . 299
VEN-TEL
1200 Plus . . . 249
PC Modem 2400B Half Card 499
ZENITH
1200B Laptop Modem . . . 299

MOUSE INPUT DEVICES

IMSI
PC Mouse w/DR Halo 2 . . $119
MICROSOFT
Microsoft Mouse (Serial) . . . 129
Microsoft Mouse (Buss) . . . 119

SURGE PROTECTORS

TRIPPLITE
Isobar 8-15 . . . $65
Isobar RM 8-15 w/RM . . . 69
CURTIS
Diamond . . . 29
Ruby . . . 59
KENSINGTON MICROWARE
Masterpiece . . . 95
Masterpiece Plus . . . 119
LOGICSOFT
★Logic Spike Bar . . . 25
★Logic Spike Block . . . 19
NETWORX
Power Mouse . . . 115

KEYBOARDS

KEYTRONIC
5151 (Deluxe) . . . $169
5151 (AT&T) . . . 159
KB 101-1 . . . 129

MEMORY STORAGE

IOMEGA
Bernoulli Box (10 + 10) . . $1449
Bernoulli Box (20 Mb) . . . 1299
Bernoulli Box (20 + 20) . . 1899
Bernoulli 10Mb Cartdg. Tripak 169
Bernoulli 20Mb Cartdg. Tripak 255

HARD DISK DRIVES

MOUNTAIN COMPUTER
Hard Drive Card (20 Mb) . . $565
Hard Drive Card (30 Mb) . . 639
MINISCRIBE
Complete Line . **Low Price Call!**
PLUS
Hard Card 20 Mb . . . 699
Hard Card 40Mb . . . 975
SEAGATE
20 Mb ½ Ht Int . . . 369
30 Mb ½ Ht Int . . . 469
20 Mb Full Ht . . . 569
30 Mb Full Ht . . . 609
40 Mb Full Ht . . . 739
80 Mb Full Ht . . . 1079

CARTRIDGE TAPE BACK-UP

SYSGEN
Image Tape Backup 20 Mb Int . . . $599
Image Tape Backup 20 Mb Ext . . . 699
TECMAR
QIC 60 AT (Int.) . . . 1239
QIC 60 Ext Tape Backup . . . 1599
QIC 60 Host Adapter Card . . . 125

FLOPPY DISK DRIVES

Panasonic 360K ½ Ht . . . $109
Tandon TM-100 360K ½ Ht . . . 99
Toshiba 360K ½ Ht . . . 105
Toshiba Ext. 5.25 360 Drive . . . 389

BACK UP POWER SUPPLIES

DATA SHIELD
200 Wt (PC) . . . $249
300 Wt (XT) . . . 359
500 Wt (AT) . . . 569
800 Wt (AT) . . . 655
LOGICSOFT
★Logic 325 Watt . . . 305
★Logic 450 Watt . . . 385
★Logic 675 Watt . . . 549
★Logic 1000 Watt . . . 819

MAIL-IN REBATE

SAVE $10 — **Dollars N' Sense**
$95 FINAL PRICE
AFTER $10 REBATE

SAVE $15 — **Microsoft Mouse Buss. Version**
$104 FINAL PRICE
AFTER $15 REBATE

LIMITED TIME ONLY!
LIMIT-10 PER CUSTOMER

5 YEAR UNCONDITIONAL WARRANTY ON ★ ITEMS

Each product carries our 5 year unconditional replace or repair warranty.

Look for the ★ items. It identifies our Logic line of computer hardware products. They are fully compatible with, but priced well below, the major manufacturers. You save – not by our use of inexpensive labor and parts – but through state-of-the-art technology.

PC WORLD

Ashton-Tate at the Crossroads

As data base management becomes ever more strategic to software firms, what's Ashton-Tate's strategy for holding on to its turf?

Ashton-Tate is large, diversified, and firmly entrenched as one of the Big Three of PC software, behind Microsoft and Lotus. But it still seems embarked on a Dangerfield-like quest for respect.

Optimistic observers applaud the firm's hefty gains in first-quarter earnings, the fairly successful launches of *RapidFile* and *Byline*, and the overdue revamping of *MultiMate*. Skeptics grumble about the long overdue *dBASE Mac* and *dBASE IV* and a host of corporate defections.

All the while, Ashton-Tate is cooking up responses to OS/2 Extended Edition, a rash of *dBASE* clones, the Lotus-IBM partnership, and new pressure from firms like Oracle and Relational Technology. *PC World* Southwest Editor Ken Greenberg recently met with Ashton-Tate CEO Edward Esber, Jr., to check the level of water in the proverbial glass.

PCW: Whenever the next dBASE *ships, it'll inhabit an environment in which at least two operating systems prevail.*

Esber: We've articulated a strategy that IBM confirmed on April 2—low fork, which is DOS 3.*xx*, and high fork, OS/2. We'll bring out versions of *dBASE* for both worlds.

But there's pessimism about how fast OS/2 will take off. Some are saying that it won't really fly until the early nineties. My best guess is that OS/2 with the Presentation Manager will ship during the second quarter of 1988.

Nobody's terribly eager to jump on the OS/2 bandwagon, from either a hardware or a software standpoint. With the Extended Edition, you begin to walk down an IBM proprietary path. The industry simply fears that IBM will exercise too much control over its customers' choices.

PCW: What does this mean for Microsoft Windows?

Esber: Most companies have been on the sidelines, waiting to see what IBM will support. That's why you'll now see software vendors—including us—rallying around Presentation Manager, which is a convoluted version of *Windows*. To the extent that there's a third industry standard that follows *Windows 2.0*, we must support that as well.

PCW: With the data management component of OS/2 Extended Edition, is IBM just another competitor?

Esber: IBM doesn't have the marketing muscle and reputation at the low end that it does at the high end. While IBM *is* a competitor, the company has said only that it will offer a relational [Structured Query Language, or SQL] engine. We're viewing it

View

News and notes for the computing community

Cynthia Moore

Chief executive Ed Esber plans to beat back serious new competition from IBM, Lotus, and other data base contenders.

more as an essential element of system software than as an application. With it, you've got room to build report generators, application generators, fourth-generation languages, a *dBASE* interface, a *1-2-3* interface—all kinds of things.

PCW: Speaking of micro/mainframe bridges like SQL, what do you make of the Lotus-IBM alliance?

Esber: My first impression was that it's primarily a product announcement—1-2-3/M on the mainframe. I view the rest of it as smoke. The economics of 1-2-3/M will be dubious at best.

PCW: You've been in an acquisition mode; are you looking at alliances as well? Would you be just as happy teaming up with IBM?

Esber: We're constantly looking at both alliances and acquisitions. But long-term, true joint development and marketing agreements are harder to make work than acquisitions or mergers. Would I be happy with an IBM alliance? The right one. Am I working hard to get an alliance to announce? Absolutely not. We have a good relationship with IBM, and it's getting even better.

PC World View reports items of interest to computer enthusiasts and significant insights about industry trends and personalities.
—Eric Bender

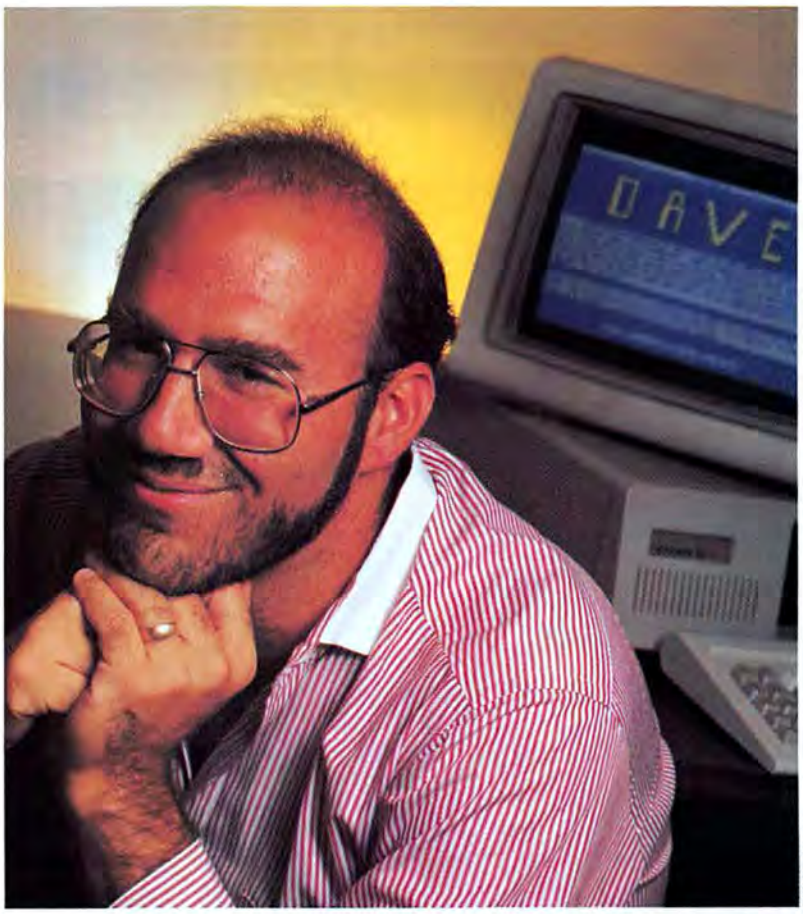
Gold-Digging '87

Many hardware marketers first honed their selling skills on everything but computers–Leading Edge founder Michael Shane started with wigs, Computerland of Kansas owner Bruce Burdick with worms. But software entrepreneurs like Elliot Goldberg often enter from the opposite corner–emerging from the quiet of the computer room into a turbulent sales arena where fancy footwork is everything.

Goldberg, 35, started with Goldata Computer Services in 1976, offering contract programming and, later, time-sharing services. "Those were great years; we made a ton of money," he recalls fondly. But by the early 1980s, as the Apple II and other personal computers began slicing into this market, "it was becoming clear that time-sharing as we knew and loved it would no longer exist."

So Goldberg began to turn more and more of his attention to microcomputer data bases. "It seemed silly to keep reinventing the wheel," so he didn't. He developed *Goldatabase*, first offered on the Apple II. By fall 1983, he had a version for the IBM PC.

Although *Goldatabase* enjoyed some early success in a crowded field, by 1985 it started losing ground, and Goldberg began exploring other opportunities. "We tried vertical packages, but that wasn't the way to go either, so we attacked utilities." This move paid off in a string of packages–*Your Move*, a memory-resident package that captures and transfers screen data; *S.O.S.*, which automatically saves working files to disk at regular intervals; and *Help*, a development tool for creating on-line help windows.



Ken Collins

Capping a string of software utilities with DAVE, Elliot Goldberg is gambling that the Lotus link will bring a big payday.

While *S.O.S.* sold itself, the other products needed more detailed explanation. So Goldberg put together a catalog, and by swapping customer lists with other software vendors, he amassed 180,000 prospect names. This direct marketing ploy was a pure numbers game, with a few employees reaching hundreds of thousands

of customers. "It's fun because there's so much leverage in it," Goldberg notes.

He considered adding third-party products to the catalog and transforming Goldata into a marketing organization. "There's a lot of good software out there that just can't be marketed properly with limited resources. We're probably two orders of magnitude above most people in marketing our products," he explains. But he put that move on ice when heavyweight distributors began to pick up his products–including Corporate Software and then Lotus Development.

This summer, he's hawking a new package–*DAVE* (for *Data Addition and Verification Editing*). "*DAVE* is an add-in data entry vehicle for *1-2-3*," Goldberg says. It allows nonprogrammers to quickly draw customized data-entry forms, with fields tied into *1-2-3* worksheets. *DAVE* also boasts other handy features, like the ability to check whether values exceed a specified amount.

Goldberg cheerfully answers the call for a quick response in developing and marketing products, drawing the line only at extreme scenarios. "Will it become Crazy Elliot's Software? You know, 'He has to be insane to sell software at these prices'?" he asks laughing. "No." –*E. B.*

DAVE
Goldata Computer Services
2 Bryn Mawr Ave.
Bryn Mawr, PA 19010
800/432-3267, 215/525-1036
List price: $99.95

Requirements: 40K, DOS 2.00 or later version
Not copy protected

A Few Minutes With...

Amy Wohl, information management consultant: "By saying 'office automation', we scared a lot of people. We convinced them we'd have robot secretaries working for robot professionals."

Herbert Schorr, IBM group director for products and technology, on expert systems: "We're now moving into applications that are more crucial than payroll. There are tremendous security and maintenance problems, and reliability becomes key."

Mitchell Kapor, Lotus founder and independent software developer, on ease of use: "Unfortunately, things appear to be getting worse in terms of complexity–unnecessary complexity. Things will have to be made simpler for users, or there will be a user revolt. Maybe it won't happen until the year 2000, but it will happen."

Peter Hansen, marketing vice president, Corporate Software: "For most corporate users, *1-2-3* is an operating environment. It is what *Microsoft Windows* wants to be."

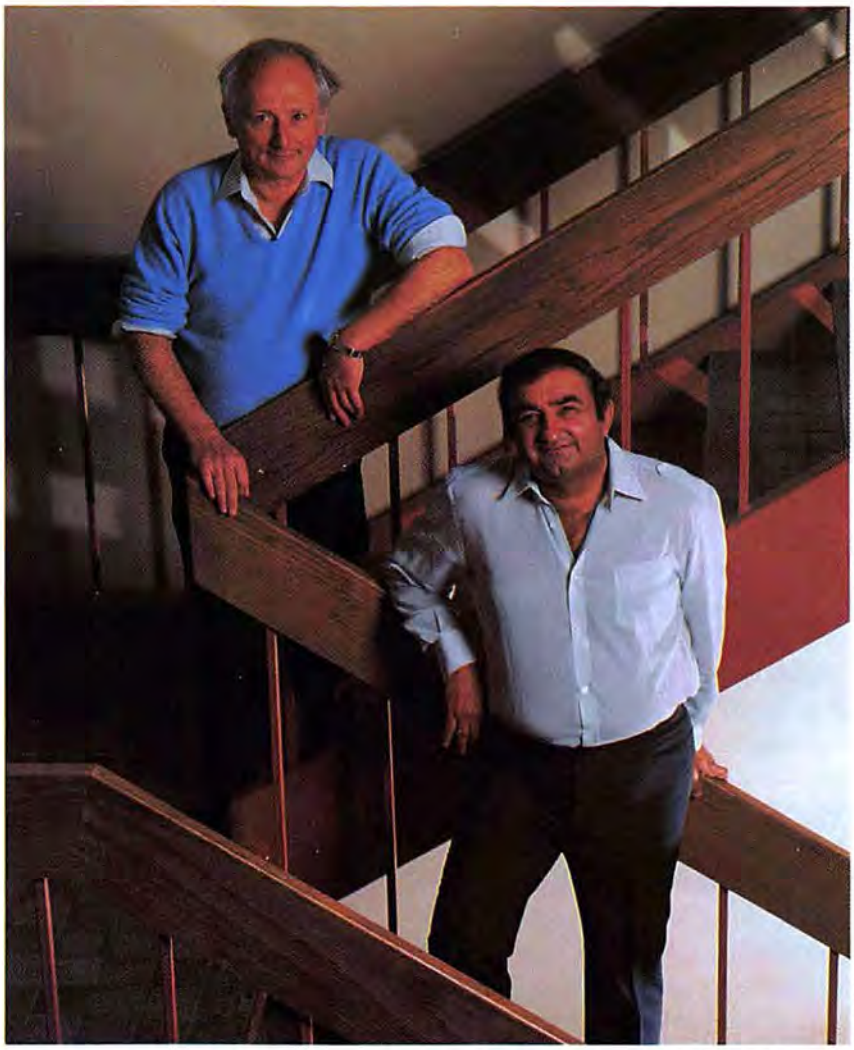
Ken Currier, chairman, SoftSync: "Long-term planning in this business is lunch next week."

Consultant Seymour Merrin, Merrin Resources: "Each compatible, including each IBM model, has its quirks. How many quirks can a company afford to support?"

William Zachmann, vice president, International Data Corporation: "Consultants and market researchers have a role in modern society analogous to that of the old Central Asian shamans. Like them, we act as intermediaries between the known world and the unknown realms that lie beyond it. In the case of the shamans, the unknown world is populated by demons and spirits. For us, it is populated by emerging technologies."

Working in Tandon

Jugi Tandon staked out his PC claim after the gold rush, but his move has panned out.



Blake Little

Chuck Peddle and Jugi Tandon have seen Tandon's PC business climb rapidly.

Back in 1975 when 32 floppy disk drive companies were crowded into a tiny market, Sirjang Lal "Jugi" Tandon raised $7000 and formed yet another drive company in his garage. So it should come as no surprise that the Indian immigrant decided to move his company into the PC clone business in late 1985, three years after the great boom of PC compatibles.

"We have never been the first company in a market," Tandon says. "People said we were crazy to enter the drive business, but I figure you don't have to worry about the market if you have the technology, engineering, and manufacturing know-how."

He assembled a management team that included IBM veterans Dan Wilkie and H. L. "Sparky" Sparks, as well as former Commodore and Victor Technologies executive Chuck Peddle.

Tandon admits the move into PCs was one of desperation. Devastated by the sudden drop in microcomputer sales and the loss of a major contract to supply disk drives to IBM, the Chatsworth, California, company cut its U.S. work force by 39 percent in March 1985 and then again by 25 percent in May of that year.

The red ink continued to flow, and heads continued to roll. Tandon's sales plunged from $400.8 million in fiscal 1984 to $214.1 million in fiscal 1986. When its losses continued–$135.4 million in 1985 and $62.8 million in 1986–many people thought bankruptcy was near.

Yet Tandon's last-ditch move into the PC business seems to be paying off. The company earned

$6.1 million on sales of $156.8 million during the six months that ended March 29, 1987. It's hiring again, and it has ambitions of becoming the next Compaq.

"The numbers speak for themselves," admits Ronald Elijah, analyst at Robertson, Colman & Stephens in San Francisco. "[Tandon's] strategy of getting into the clone business may have been two years late, but it's working. In fact, it saved the company."

Emphasizing inexpensive but well-built PCs, Tandon already offers more than a dozen models, including its new AT-compatible PAC286, which features an innovative portable hard disk drive. Tandon's computers now generate 65 percent of its sales, but most people still think of the company as a maker of disk drives.

"The company really has an identity crisis," says one industry veteran, a statement that irks both Tandon and Peddle.

"We've made the fastest start of any personal computer company in the world–including IBM and Compaq–and in another year maybe we'll run an ad matching our sales curve against theirs," boasts Peddle. "We're already outselling Compaq outside the United States, and we will surpass Compaq in revenues in five years. I'm willing to bet on it."

Some people wonder, though, whether Tandon's management team will survive that long. Sparks, who developed the retail-dealer networks for IBM and Compaq, bailed out quickly, although insiders maintain that the move was strictly for family reasons. Like the founder, both president Wilkie (a no-nonsense IBM manufacturing expert) and marketing chief Peddle (former chip designer and ex-president of Victor Technologies) are strong-willed individuals who might tend to clash.

"We've got several strong personalities because Jugi is not afraid to bring them on and let them manage," Peddle says. "But there's only one guy at the top, and his name is on the door." *–John Eckhouse*

Going Down, Down, Down

PC sales traditionally slacken in the summertime. Suppliers often kick off the season by suddenly discovering more efficient manufacturing techniques that will allow a round of price cuts. Right on schedule this year, many sticker prices slimmed down by one-tenth or more, and prices should continue to drop well into next year.

"For the past several years on an annual basis, price decreases have averaged about 20 percent over virtually all classes of PCs," points out Bill Lempesis, research analyst at Dataquest. "It's an ongoing cycle."

Want a vanilla dual-floppy PC with monitor? "There won't be anything selling at over $800 by Christmas," predicts Michael Goulde, industry analyst at The Yankee Group. "Once [the machines] hit that level, they'll stay there for most of 1988," he adds, because vendors must make *some* profit.

AT and compatibles prices will vary more widely, from $1100 for bargain-basement models to $3000 for fully loaded machines from Compaq and other prestige suppliers. You already can buy an Intel 80386-based machine for around $2000, although complete systems with sizable hard disks from more prominent vendors will set you back three times that amount.

With the possible exception of memory boards, whose pricing depends on the vagaries of the chip market and government policy, add-in hardware also is getting more reasonable, Goulde notes. But he cautions about the risks of those ever-narrowing profit margins. "I'm expecting a major shakeout–there are too many people selling these things." *–E. B.*

Everybody Into the Pool

Marc Rosenthal

If you watched the New York Giants disassemble the Denver Broncos in the last Super Bowl, odds are that you regarded it as just an innocent football game. Unless, of course, you were among the millions who had a few bucks on the outcome.

In that case, you're forgiven for thinking of the contest in terms of lions and gladiators, with a share of your bank account as the bait.

Sports betting has become a subterranean economy worth $40 billion annually, according to government estimates. Some 50 million of us bet now and again; five million others lay their money down lavishly and often. The landscape is said to be populated with 50,000 bookies. Whether you're betting on horses, hockey pucks, or home runs, that's serious money, made all the more so by complicated betting vehicles like parlays, teasers, and round-robins. That's where Sports System Design fits in.

Entrepreneur and longtime Las Vegas denizen Marty Mendelsohn has teamed up with programmer Robert Bentsen to bring that city's legalized bookmaking operations into the PC era. SSD has devised a trio of products that addresses the business side of bookmaking–and leaves room for a little fun as well.

Mendelsohn had long sought to bring software into the betting parlor through his American Association of Documented Sports Services. He finally got together with Bentsen in 1985, and the initial result is *SOAP–Sports Office Accounting Program.*

SOAP is a pricey and elaborate package, designed for "the house" and written for PCs linked via a Novell network. The package keeps tabs on betting traffic and cash flows and will set big-time bookies back anywhere from $1500 to $60,000.

But as Bentsen readily concedes, casino bookmakers along the Vegas strip constitute a limited market for a budding software firm. If you're among those who check the sports pages as avidly as the stock tables–and you don't trust your bookie to keep your accounts–SSD offers *Sportslog,* a svelte but capable version of *SOAP.* Of course, what's legal in a small corner of Nevada is verboten virtually everywhere else, so the program is being marketed discreetly.

Sportslog's purpose is as plain as the point spread between Penn State and Slippery Rock. "People usually know how they're doing week to week, but not for the entire [football] season," says Bentsen. "If you're an investor in sports, you ought to know how you're doing overall."

With *Sportslog*, you can track your wagers with up to ten bookies, generate a profit and loss statement, and even entrust your gambling urges to a warning system that flags unsettling imbalances.

If you'd prefer to bet with funny money, SSD has further whittled down *SOAP* into a $50 simulation called *Sportsbook*, published by Micro Illusion of Granada Hills, California.

Sportsbook could prove ideal for your neighborhood watering hole or the office around World Series time. As the house, you guesstimate a betting line, which you can change at any time. The program spits out tickets to bettors, lets you play with hypothetical results, handles intricate bets, and even extends credit. The simulation of Vegas is nearly complete, lacking only a bank of TV screens, cigarette butts on the carpet, and the stench of too many Bud Lights.

Still, technology has its limits. Not even the SSD programs can help you cover your bets with the IRS. *–Ken Greenberg*

Sports System Design
P.O. Box 14255
Las Vegas, NV 89114
503/344-6759

Put on a Happy Face

Quick–pick a single vendor to define a friendly, flexible user interface standard for the next decade of computing.

You probably wouldn't choose the inventor of the 3270 terminal, but that is precisely the role that IBM is assuming for itself. Creating a common appearance among applications is one crucial component of IBM's new Systems Application Architecture (SAA), a framework designed to smooth out the bumps in traveling between software and Big Blue hardware.

Initially, the common user interface will enforce some consistency in screen layout, interactive techniques, keyboard layouts, and terminology. It kicks off a massive effort to increase ease of use that will eventually encompass graphics, voice, and image presentations as well. "We want to deliver as little documentation to the end user as possible," says Jon Hemming, IBM's manager of office system planning.

SAA will simplify life for users, not just on PCs but all the way up to mainframes. The approach will be to promote the PC's interactive abilities and then extend as much of those capabilities as possible to the dumb terminals connected to the big machines. "We are not going for the least common denominator," emphasizes IBM's Bob Berland, head of software products planning.

IBM's in-house developers are currently chewing over issues like how many key definitions should be mandated. Perhaps <F1> should always mean Help, but what other keys, if any, should be predetermined? The developers are soliciting feedback on such issues from independent software firms, Hemming says.

The results should begin to appear, along with a trickle of other SAA components, late this year. At that time, outside suppliers will have another set of development issues to attack and another chance to decide how Blue they'll be. *–E. B.*

John Eckhouse reports on business for the San Francisco Chronicle *and Ken Greenberg is* PC World*'s Southwest Editor.*

You're about to witness something amazing.

The Saba Handscan. A significant advance in data

Faster than the fastest typist.

It actually reads co

You sc

computer supplier and ask for a demonstration.

And witness the most significant productivity tool ever devised for IBM XTs, ATs and true compatibles. Hands down.

The ad that launched 15,000 requests.

In fact, so many requests that we've put our Handscan demo on video.
It answers most questions you've asked on our (800) line.
Now you'll see just what Handscan can read. Learn how to pre-program Handscan for your software.
And discover why *PC Magazine** said, "If you've ignored OCR... think again."
So, call again and request your videotape demo. The $9.95 charge covers cassette costs and handling.
MasterCard, Visa and American Express accepted.

ectly into word-

ght into data bases, like

072				
072				
072				.05
072		8,076,402.28	8,098,854.34	22,452.06
073	PRINCIPAL BEG BAL ITD	2,027,738.21	2,027,840.21	102.00
073	INTEREST EARNED MTD	7,378.14	7,378.14	
073	INTEREST ACCRUED ITD	17,689.27	17,677.98	11.28808
073	GROSS BEG BAL ITD	0.00	0.00	
073	DISCOUNT UNEARNED ITD	0.00	0.00	
073	DISCOUNT EARNED MTD	0.00	0.00	
073	GROSS BEG BAL ITD-I	552,455.06	558,703.44	6,248.38
073	DISCOUNT UNEARNED ITD-I	76,879.28	77,218.25	338.97
073	DISCOUNT EARNED MTD-I	1,503.47	1,574	70.99122
073	DEALER RESERVE BEG BAL-I	40,201.21	40,201	
073	INSURANCE BEG BAL MTD	2,149.65	2,149	
073	FORCE-CLOSE LOSS BEG MTD	0.07	0	
073	LOANS IN PROCESS BEG BAL	27,337.77	27,337	
073	SECONDARY PRIN BEG BAL ITD	5,257.55	,182	2,
073	SECONDARY INT EARNED MTD	6.78	15	
073	SECONDARY INT ACCRUED ITD	68.11		
073	BRANCH TOTALS	2,754,365.		

Speed up data entry. Do it by hand.

In Oregon call (503) 641-8520. The following are registered trademarks: IBM XT and AT of International Business Machines Corporation; Lotus of Lotus Development Corporation; WordStar of MicroPro International Corporation;

*PC Magazine June 9, 1987

VALUE

You're about to witness something amazing.

It actually reads computer printouts. And typed sheets.

You select the information you need.

For less than $650, scan directly into Lotus 1-2-3.

PRINCIPAL BEG BAL ITD	2027738.21	2027840.21
INTEREST EARNED MTD	7378.14	7378.14
INSURANCE BEG BAL MTD	-2149.65	

Handscan™

Call (800) 654-5274.

saba™ TECHNOLOGIES

Get more info. Go to Ad index.

Power tools for the office.™

dBase of Ashton Tate; R:Base of Microrim Incorporated; Saba and Handscan of Saba Technologies, Inc.

GET SERIOUS

...ABOUT ANALYZING YOUR DATA.

You might be spreading your spreadsheet a little too thin. Or maybe you're starting from scratch. But if you're serious about data analysis, you're ready for SPSS/PC+™—a full software family that brings you eight high-powered ways to complete any data analysis task.

Enter it. SPSS Data Entry II™ is a fully integrated data entry, cleaning and editing tool.

Analyze it. The SPSS/PC+ base package provides a powerful array of statistical and reporting procedures.

Picture it. SPSS/PC+ Graph-in-the-Box™ featuring New England Software's Graph-in-the-Box™ offers full color "snapshot" graphics.

Examine it. SPSS/PC+ Advanced Statistics™ lets you get more serious with your data.

Predict it. SPSS/PC+ Trends™—our latest option—is the complete time series analysis/forecasting tool.

Table it. SPSS/PC+ Tables™ produces presentation-ready tables instantly.

Chart it. SPSS/PC+ Graphics™ featuring Microsoft® Chart creates show-stopping graphs and charts.

Map it. SPSS/PC+ Mapping™ featuring MAP-MASTER™ creates maps where vast amounts of data can be summarized and presented in one, simple picture.

SPSS/PC+ products are being put to productive use by serious fact finders in business, government and education. For countless purposes such as market research. Wage and salary studies. Survey analysis. And quality control. Plus each product is superbly documented and supported by SPSS Inc., a leader in statistical software for nearly 20 years. While specially tailored customer support is available through the VALUE PLUS™ plan.

So if you're serious about data analysis, step up to SPSS/PC+. For details, contact our Marketing Department.

CALL 1/312/329-3314

SPSS inc.

SPSS Inc. • 444 North Michigan Avenue, Suite 3000 • Chicago, Illinois 60611
In Europe: SPSS Europe B.V. • P.O. Box 115 • 4200 AC Gorinchem, The Netherlands • Telephone: +31183036711 • TWX: 21019

SPSS/PC+ runs on IBM PC/XT/AT's with hard disk. Contact SPSS Inc. for compatible microcomputers, SPSS/PC+, SPSS Data Entry II, SPSS/PC+ Graph-in-the-Box, SPSS/PC+ Advanced Statistics, SPSS/PC+ Trends, SPSS/PC+ Tables, SPSS/PC+ Graphics and SPSS/PC+ Mapping are trademarks of SPSS Inc. VALUE PLUS is a trademark of SPSS Inc. Chart and Microsoft are trademarks of Microsoft Corporation. MAP-MASTER is a trademark of Ashton-Tate. Graph-in-the-Box is a trademark of New England Software, Inc.

© 1987, SPSS Inc.

Get more info. Go to Ad Index.

Product Outlook

News you can use about recent PC product announcements and upcoming releases

Ashton-Tate stakes out the desktop publishing middle ground, Zenith makes computing a cinch, AST's users can see clearly now, sales professionals hold automation in their laps, and much more

Mike Hogan and Ken Greenberg

A Publishing Nom de Plume

Need to spiff up a product catalog, but *PageMaker* is overkill and *Newsroom* simply isn't ammunition enough? For projects that require professional polish–but don't demand a degree in graphic design–Ashton-Tate is offering ◆***Byline,*** a $395 entry in the lengthening desktop publishing parade.

Although *Byline* supplies a what-you-see display and a rich set of page design tools, this is desktop publishing for managers more concerned with their data than with the niceties of graphic presentation. The program's canvas is one size only–8½ by 11 inches–and no mouse, color, or page-dummying capabilities are provided. Within those constraints, *Byline*'s publishing repertoire is well suited for budgets, overhead transparencies, newsletters, price lists, and all manner of forms. The program gobbles *dBASE* data and *1-2-3* worksheet files as readily as it does word processing documents. You can even embed and print *dBASE* field names in a document. That talent, coupled with a special *dBASE* font, makes *Byline* an unusually versatile report writer for Ashton-Tate's mainline data manager.

With *Byline,* you typically work with a single page and an accompanying layout spec sheet, although the program displays left- and right-facing pages without flinching. You control type size, weight, and leading for the program's five downloadable fonts, and *Byline* handles kerning. The package includes a serviceable text editor, a screen-capture utility that can grab any graphics screen, and a zoom capability for fine-tuning. Text flows automatically around graphic elements, and if you like your handiwork, you can save formatting information in a style sheet or as a Master Page transparency. You can further automate routine layout chores with your own macros or those supplied with the program.

In keeping with this workaday approach, *Byline*'s hardware demands are modest: an XT with 384K and a graphics board will do nicely. You can use *dBASE, MultiMate, WordPerfect, WordStar, XyWrite, 1-2-3,* and *Symphony* files without conversion, and *Byline* respects source text styles, graphs, and tables. Indents, boldface, italics, superscript, and footnotes arrive similarly intact. The program accepts images from most popular scanners; welcomes art from *PC Paintbrush, MacPaint,* and *Windows Paint;* and supports PostScript. With *Byline*'s *dBASE* component, hardware requirements escalate to 512K. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; 213/329-8000.

Eazy Does It

If all you want to know about computers is that the Micro Channel bus won't take you downtown, Zenith Data Systems may have just the PC compatible for you.

The ◆**Eazy PC** is a complete, elegant machine that takes much of the befuddlement out of systems buying. Forget the dizzying array

(continues)

Choose ALR's 16-MHz 80386 system for less than $2,000, or a blazing 20-MHz system for less than $2,500.

Last year, Advanced Logic Research introduced the first 80386 systems. Now we're introducing the ALR 386/2™ the second generation.

Until now, if you wanted three times the speed of an AT™ you paid about three times the price of an AT. Now Advanced Logic Research announces second-generation 386 systems—designed to do to the price barrier what our first generation did to the performance barrier. Annihilate it.

32-BIT $1990 MEMORY

Starting at $1990, ALR's totally new 386/2 systems couple the power of 32-bit processing with true 32-bit memory. Even the system and graphics BIOS are implemented in a 32-bit architecture. That simply means your applications will run faster on a 386/2 than any other available computer. And ALR 386/2 systems let you use all the peripherals, graphics, enhancements and applications developed for the most widely adopted computer operating environment in history.

Phoenix ROM BIOS

Which makes you wonder why others want thousands more for less flexible, first-generation 386 systems.

How to run circles around the competition.

Sure, Compaq and IBM use the fastest available hard disks and controllers with 1:1 interleaving, just like Advanced Logic Research. But they don't buffer a full 17-sector hard disk track, settling for sector by sector buffering. Our way makes the fastest even faster where it counts— in the real world.

- Advanced Logic Research
- Compaq
- IBM

And with up to 2 MB of RAM on the motherboard, you get flexibility with your power.

Naturally the raw speed of the 80386 means the 386/2 series make great EGA graphic workstations for CAD/CAM. Or choose enhanced EGA™ or GA 786™ graphics from ALR and a variety of sources and get the most advanced resolutions available.

You can even run applications without memory limitations. Because all enhanced ALR systems include the Phoenix Control/386 Software utilities with 32 bit disk caching, Vdisk and EMS/EEMS Software.

The 386/2 series makes the best use of floor or desk space.

Speed to burn. Without having money to burn.

Read the reviews and compare the 386/2 to the others. Then compare more. If you find more power, flexibility and quality somewhere else, buy somewhere else.

You won't find a more competitive price anywhere else—the ALR 386/2 Model 10 delivers 80386 power and 1 MB of RAM for $1990 and includes a 1.2 MB floppy disk drive and controller. Models with hard disk storage to 130 MB and included Control/386 software reaffirm ALR's ability to define leading edge performance. At leading edge prices.

A full range of high-performance communications, memory and storage enhancements are available from ALR.

The ALR 386/2 Model 40 with EGA adapter is similar to the IBM Model 80-041 and Compaq Deskpro 386 Model 40 with EGA adapter. Except for a lower price and twice their standard RAM.

Advanced Logic Research. Faster, first.

Advanced Logic Research got its start designing high-performance microcomputers for customers that demanded more power than they could get off the shelf. We designed one of the first IBM PC-compatibles. Developed the enhanced performance AT-compatible *PC Magazine* called "...the most judicious choice..." And introduced the first 386 system, which *PC Tech Journal* said "...brings up-to-date technology to affordable 386 systems."

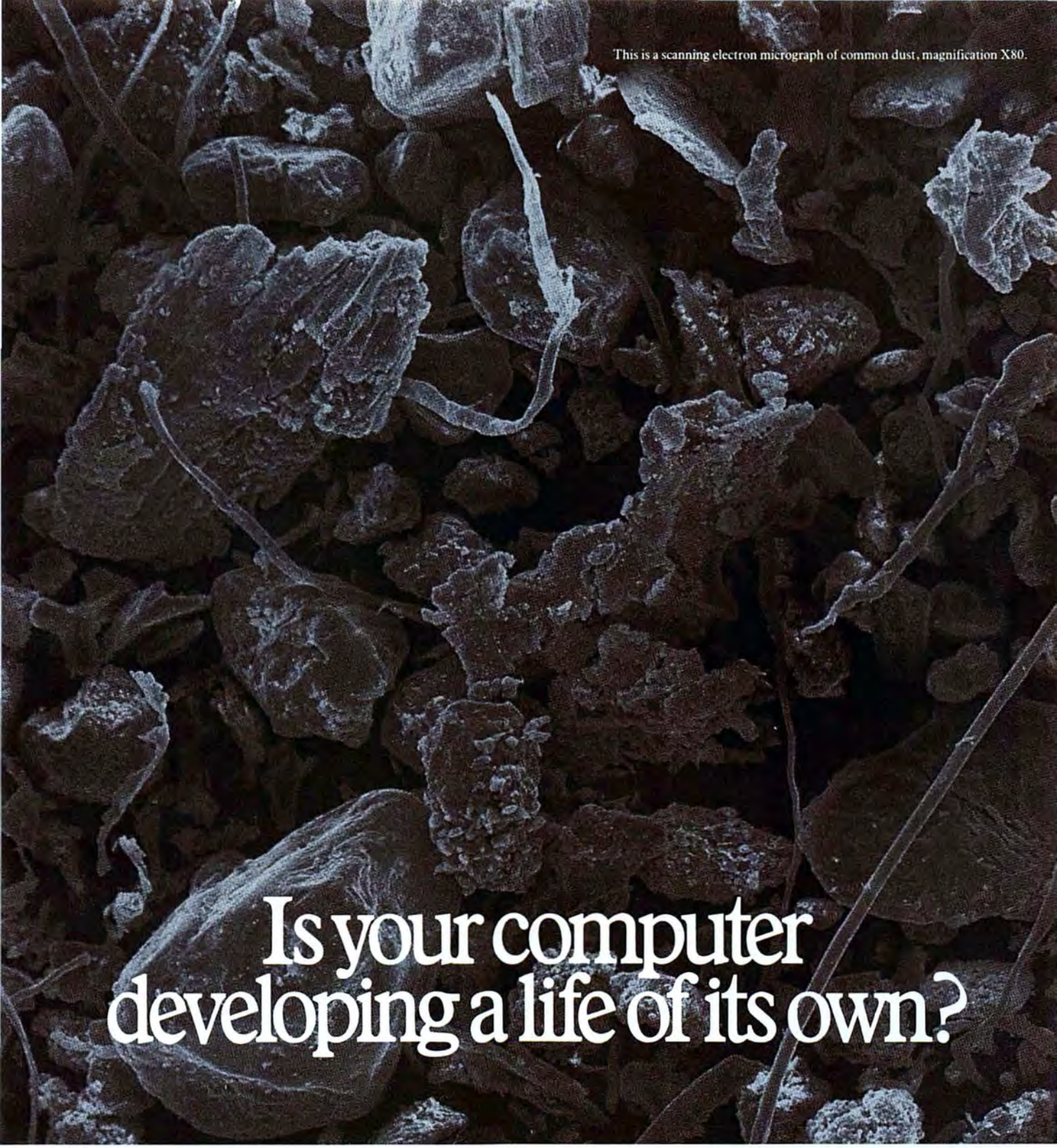
FREE
20-MHz OPTION
ON 386/2 Model 130
systems until November 1

Call Advanced Logic Research today for the name of your local ALR dealer. And discover the price of power isn't as high as it used to be.

Advanced Logic Research, Inc.
10 Chrysler, Irvine, CA 92718 (714) 581-6770
FAX: (714) 581-9240 TELEX: 5106014525, Answer back Advanced Logic
From Asia or Europe call ALR/Wearnes Technology
Phone: (65) 2592521 TELEX: RS38113WRNTEC

Specifications, configurations and prices subject to change without notice. Copyright 1987 Advanced Logic Research. All rights reserved.
386/2 and GA 786 are trademarks of Advanced Logic Research, Inc. AT a trademark of International Business Machines Corp.
Phoenix and Control/386 are trademarks of Phoenix Technology, Ltd.

Get more info. Go to Ad Index.



Is your computer developing a life of its own?

It's there. Underneath the keys, clinging to your CRT's.

Sitting right on top of your "Help" button.

Dust. Grime. Even ordinary oxide buildup on disc drive heads.

Without regular cleaning, it can shorten the life of your hardware. Cost money in repair bills. It can even cause a loss of data.

That's why we recommend the new, Liquid Paper Computer Care Product line.

Products that not only wipe away the nasties, but also help control sticky static.

New Liquid Paper Computer Care Products. Get the dirt on your computer. Before it gets you.

LIQUID PAPER™ COMPUTER CARE LINE.

© 1987 Liquid Paper Corporation

LABELING SOFTWARE

For Epson/IBM/Okidata and NOW! LaserJet Printers

- Labels for shelves, bins, inventory
- Text readable up to 50 ft.
- Bar Codes: I 2 of 5, UPC/ EAN MIL-STD, AIAG, Code 39
- Any size label • Flexible format
- Color options • Reversals • Fast
- File input • Menu driven • $279
- Other bar code programs from $49.

30 Day Money Back Guarantee!

WORTHINGTON
DATA SOLUTIONS
417-A Ingalls Street
Santa Cruz, California 95060
408/458-9938

Bar Code Readers for PC, XT, AT, PS/2

RS-232 and PS/2 model $399
PC/XT/AT Internal/External ... $385

- Rugged Metal Pen
- Reads I 2 of 5, UPC/EAN Codabar, Code 39, etc.
- Attaches as 2nd Keyboard
- No software needed to add bar code reading to your system

30 Day Money Back Guarantee!

WORTHINGTON
DATA SOLUTIONS
417-A Ingalls Street,
Santa Cruz, California 95060
408/458-9938

Get more info. Go to Ad Index.

The Zenith Eazy PC is a simple but stylish solution for those who have relatively uncomplicated computer needs.

of options that adorn most machines. The NEC V40-based Eazy PC, to paraphrase Henry Ford, comes in any configuration you like–as long as it's an 8088-based CPU with 512K and a 640-by-400-pixel white-on-black monitor. The monitor and system unit are one, and–shades of IBM's PS/2 family–the floppy disk media is strictly 3½ inch.

Your most difficult decision may be whether to buy the single-drive $995 model, the $1199 dual-floppy version, or the $1699 20MB hard disk edition. Indeed, this lightweight box with the size-5 footprint is virtually closed to the public. You can count the options on one hand: a 128K memory module, a serial port/1200-bps modem/memory module, a real-time clock, and a mouse.

If you're a student or home user who'd rather not delve into DOS, the pulldown menus of Microsoft's *Menu Manager* (which is bundled with the system) will spare you a close encounter with the A> prompt. In classic Zenith fashion, the Eazy PC is as simple to operate as, well, a television set.

Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; 312/699-4848.

◆

On the Other Hand...

If you'd prefer to keep your options and computer chassis open, you might consider the latest systems quartet from Wyse. Thanks to passive backplane architecture that parks the CPU on a plug-in board, your PC can grow along with your appetite for computing power.

The ◆Wyse PC line consists of four models, which can host any of three 80286-based boards (topping out at 12.5 MHz) or a 16-MHz zero-wait-state 80386. The Wyse PC 286 Model 2108 and Model 2112 include four available AT-compatible expansion slots–and that's after the CPU, the floppy/hard disk drive controller, the serial/parallel port, and the display

(continues)

Enter A New Age In Accounting Software.

Dac-Easy Version 2.0, The Most Amazing Combination Of Speed, Power, Flexibility, Ease Of Use And Value Ever Offered.

We proudly announce Dac-Easy Accounting, the next generation. It will set new standards of performance and value.

PC MAGAZINE EDITOR'S CHOICE

InfoWorld 1985 PRODUCT OF THE YEAR

Version 2.0 is a dramatic improvement over our revolutionary, best selling original package that won InfoWorld's 1985 overall "Best Software Value" and PC World's 1986 World Class Award.

Naturally, we've kept all the impressive features that have led nearly 200,000 users worldwide to rely upon Dac-Easy Accounting. The new Dac-Easy Accounting 2.0 has over 50 major enhancements from our first record setting package.

Experts Will Love Its Power. Beginners, Its Simplicity. And Everyone, Its Price.

New Dac-Easy Accounting destroys the myth you have to trade-off power for ease of use. Version 2.0 has awesome power that can help you better manage virtually any type business--fast. You'll have quick, finger-tip access to vital information about cash flow, pricing, inventory turns, sales trends, profitability, and more.

$69.95

Version 2.0 is also unbelievably easy to install. To set up your files, you simply answer five easy questions. Dac-Easy has a new expanded manual plus context sensitive help to guide you every step of the way.

Best of all, Version 2.0 is available at the amazingly low price of $69.95.

General Ledger
Accounts Payable
Accounts Receivable
Inventory
Purchase Order
Billing
Forecasting

Feature For Feature, The Number One Accounting Package On The Market.

Seven powerful accounting modules work in perfect harmony in one system. Data entered once is automatically posted to all other modules!

New capabilities include departmental profit & loss by product line or customer, multi-company, point of sale invoicing, automatic back-order control, sample Chart of Accounts & Financial Statements, service business billing, full help screens, on-line and batch processing, financial ratios and much, much more.

Add these to the features which have made Dac-Easy the fastest selling, most highly praised accounting package in history, and you'll see why Dac-Easy Accounting 2.0 is the best accounting software for your business.

Take Advantage Of Our Special Upgrade Offer.

Upgrades are available to current users at special discounted prices for all Version 2.0 products. Call 1-800-992-7779 with your serial number to order today!

Get Version 2.0 Performance For Your Business.

You win. Version 2.0 gives you absolutely the best combination of user conveniences, power, efficiency, and speed in the industry...at the same phenomenal price of the original. Act now. And put the New Age In Accounting Software to work for your business!

TO ORDER CALL TOLL FREE

1-800-992-7779

IN TEXAS CALL 1-214-458-0038

dac software, inc.

FREE* SUPPORT

GENERAL: •Multi-company, multi-departmental •Password protected •Extensive 430 page manual with accounting primer •On-line context-sensitive help •Fast-Start installation •Point-of-sale •Menu-driven •Over 700 different reports •Billing module for services •Free phone support* available •Batch & on-line processing

GENERAL LEDGER: •Modifiable pre-designed Chart of Accounts & Financial Statements •3 Year account history •Pencil & pen feature for corrections •Unlimited journals •Unlimited accounts •Automatic budgeting •Financial ratios and more

ACCOUNTS RECEIVABLE: •Open invoice or balance forward •Flexible aging •On-line automatic posting •Departmentalization by customer •Customized text on statements •Cash flow analysis •Mailing labels •Flexible invoice allocations •3 Year history •Automatic finance charges •Notepad window •Supports partial payments •Sales analysis and sales budgeting and more

ACCOUNTS PAYABLE: •Check printing from multiple bank accounts •Automatic allocation of available cash •Vendor directories and labels •Flexible aging •On-line posting to other modules •Flexible invoice allocations •Automatic reprinting of checks •Notepad window •Purchase forecasting •Unlimited allocations per invoice •10 Invoices per check •Browse invoice and more

BILLING: •Invoicing on plain or pre-printed forms •Special service billing routine •Sales journals •Invoice remarks •On-line posting to other modules •Credit memos •Revenue & cost allocation •Packing lists •Point-of-sale invoicing and more

INVENTORY (PRODUCT OR SERVICE): •Supports 3 most popular costing methods •Physical inventory routine with count sheets •Accepts any measure of units •Special services file •Automatic changing of costing methods •3 Year history for all products and services with automatic forecasting •Automatic pricing assignments •Alert & activity reports •On-line posting and more

PURCHASE ORDER: •99 Items per P.O., per line and total discounts in $ or % •Full back-order control •Purchase journal •P.O. status report •On-line processing and more

FORECASTING: •Forecasts budgets for all principal files using 3 different calculation methods •Powerful forecasting reports with tri-dimensional totals

Minimum Hardware Requirements: All Dac-Easy products run on IBM PC or compatibles, 2 disk drives, MS-DOS or PC-DOS 2.0 or later, 80 column printer able to print 132 columns in compressed mode, color or monochrome monitor, 256K memory (Mate requires 384K).

IBM & PC-DOS trademarks of International Business Machines, Inc. MS-DOS trademark of Microsoft Corp. Dac-Easy trademark of Dac Software, Inc. Dallas TX 75244.

CODE 210

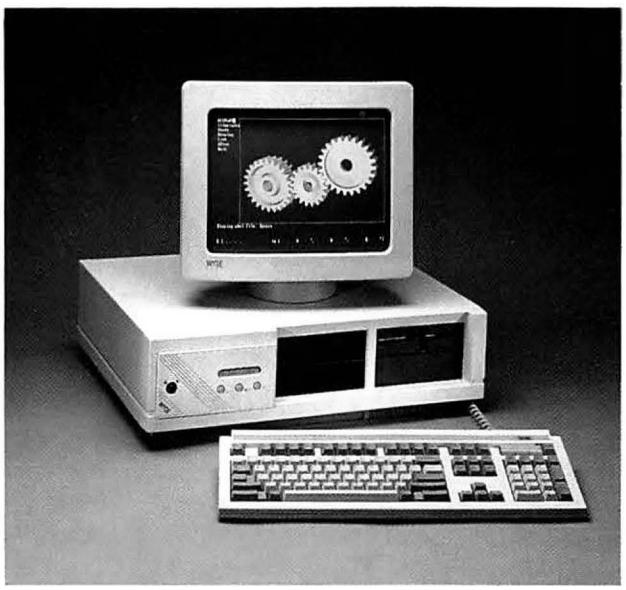
30 Day Money-Back Guarantee

Dac offers 30 day unconditional guarantee on all products bought directly from Dac Software (less shipping charges). There is a $10 restocking fee if the disk envelope is opened.

***FREE SUPPORT NOW AVAILABLE**

Registered users receive 10 minutes within 60 days free support on every Dac-Easy software product (does not include upgrades).

Get more info. Go to Ad index.



The modular system architecture of the new Wyse PC line lets you upgrade your computer with any of three 80286-based boards or one 80386-based board. The Model 3216 shown here offers up to 24MB of memory.

adapter are installed. The petite 15-by-16½-by-6-inch unit contains room for up to three half-height mass storage devices.

The 2108 comes standard with 512K, while the 2112 offers a full 1MB. Models 2214 and 3216 are roomier (seven extra slots) and feature 1MB of memory as standard fare. Wyse is pitching the Model 2214 as a sophisticated workstation or multiuser system; the Model 3216, aspiring to minicomputer status, is designed as a CAD workstation or a network file server. Wyse Technology, 3571 N. First St., San Jose, CA 95134; 408/433-1000.

Door Number Three

Looking for a PC with all the trimmings at a fast-food price? Need to get a colleague up to computing speed with few questions asked? The closely held Dutch conglomerate Vendex—which is as invisible as a $9 billion concern can be—has devised a means of elevating the low end of the market. Its Vendex Pacific unit has joined with Samsung Electronics to craft the **◆Turbo 888-XT Headstart Computer System.** The result is more than just a box; it amounts to an insurance policy for PC novices.

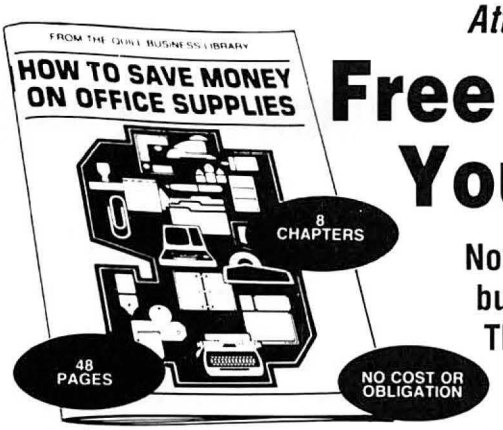
The Turbo 888-XT's design is austere but decidedly high-tech. The unit's two-speed (4.77-MHz/8-MHz) 8088-2 CPU resides on an expansion board; its dual-mode Hercules/CGA-compatible graphics chips share board real estate with 768K of bank-switched RAM (ideal for a RAM disk or print spooling); and its enhanced Phoenix BIOS won't balk at networks. Rounding out the $995 system are two 5¼-inch floppy drives; a 135-watt power supply; seven expansion slots; an AT-style keyboard; a high-resolution monochrome monitor with a tilt-and-swivel base; and mouse, parallel, serial, joystick, and light-pen ports. Adding a color monitor brings the tab to $1295. Thanks to Vendex Pacific's alliances with Paperback Software, ATI, and Software Toolworks, the system is embellished with starter spreadsheet, word processing, and file management applications—all topped off by a fresh version of *Hot,* Executive Systems' DOS shell. You can upgrade the unit with an optional $549 20MB board-mounted hard disk and a $149 1200-bps modem (with ROM-based telecommunications software), both of which virtually install themselves.

Every bit as interesting as the hardware is a setup and support scheme designed to instill confidence in even the most reticent small-business user. For a modest fee, Vendex will even make house calls. Although the Headstart system is available from mass merchandisers, Vendex itself is fielding all service inquiries, and promises to respond within 4 hours in the nation's 70 largest cities. Vendex Pacific, 40 Cutter Mill Rd., Great Neck, NY 11021; 516/482-4255.

Truly Seeing What You Get

Desktop publishing as we know it was born within the intimate confines of the Macintosh screen. On the Mac, what you saw was a lot

(continues)



Attention computer and office supply buyers...

Free Buying Guide Helps You Save Big Money!

Now you can pocket important cash savings when buying computer supplies and office equipment. This new, eye-opening guide to supply sources and buying techniques will show you how.

The more you know about the computer supply and office products industry—the better and smarter you can buy. And buying smarter can save you hundreds (even thousands) of dollars a year.

This amazingly frank new booklet, *"How to Save Money on Office Supplies,"* gives every office supply buyer valuable insights and facts and will help you get the best values when you buy anything from floppy disks to software.

Wouldn't you like to know what types of suppliers make the most sense for *your* company? How to get the best prices without sacrificing quality and fast service? When to ask for special quotes? What to look for when buying certain products?

This information-packed booklet was written by our team of office supply experts. It includes helpful features on:

- ☐ How to get the best buys and avoid surprises on your invoice.
- ☐ How to avoid wasting money on "unused quality."
- ☐ Why some "discounts" don't always mean lower costs for you.
- ☐ How to use your microcomputer more efficiently.
- ☐ Plus much, much more.

This booklet isn't about Quill. Neither the company nor its policies or practices are even mentioned. Its only purpose is to help make you a better, more informed buyer. And that means you'll learn money-saving tips and techniques, whether you add suppliers, change suppliers, or continue using your present sources.

To be really useful to you, a booklet like this could only be developed by experts in the computer supply and office products field who weren't afraid to step on a few toes. Quill fills the bill on both counts.

We've been serving office supply buyers nationwide for more than 30 years...in all sizes of offices...in all kinds of businesses. We've become the nation's largest independent office products distributor by constantly challenging industry traditions, finding ways to cut waste, and selling for less.

So if you're really serious about saving money on your office and computer supplies, call 1-312-634-4800 or send for your free booklet today!

HERE'S JUST ONE EXAMPLE OF THE SAVINGS...

QUILL® SUPER BRIGHT-WHITE PRINTOUT PAPER

Cut 28% off our low regular price! Quill® 20-lb. bond bright white computer printout paper makes others seem grey by comparison. It's certainly the brightest paper in its price range. Overall sheet size: 9½x11" with ½" carrier strips. Micro-perforated edges tear off neatly leaving a smooth 8½x11" sheet. All 2500 sheets are continuous-form; guaranteed no breaks in this box or your money back. Sale ends 10/15/87.

456-S-7-10766 .....Sale, Per Carton **$22.88**

Regular $31.99
SALE PRICE
only

22.88 per carton

BONUS OFFER!
FREE 6-month subscription to our microcomputer product sale book

Along with your FREE "How To" booklet, we'll also include our current Quill Microcomputer and Word Processing Products bi-monthly sale book. Plus, in the months ahead, you'll receive two more issues FREE. You'll find the most popular computer supplies at industry-leading discount prices, plus hundreds of items at special monthly SALE prices. Start saving on all your microcomputer and word processing products right now. Simply return this coupon or call us at

1-312-634-4800

QUILL® **America's Source for the Best Values in Office Products**

SEND THIS COUPON TODAY!

Mail to: **Quill Corporation • P. O. Box 4700**
100 S. Schelter Rd. • Lincolnshire, IL 60197-4700

☐ **YES,** send my FREE *"How to Save Money on Office Supplies"* Savings Guide along with my first FREE Microcomputer and Word Processing Products bi-monthly sale book.

☐ Also send me _____ carton(s) of Quill 20-lb. bond bright white printout paper (#456-S-7-10766) for the low sale price of just $22.88 per carton and bill me later. I understand that if I am not 100% satisfied, I may return the paper within 90 days for full credit or refund. UPS shipping charges will be added to the total. Sale ends 10/15/87.

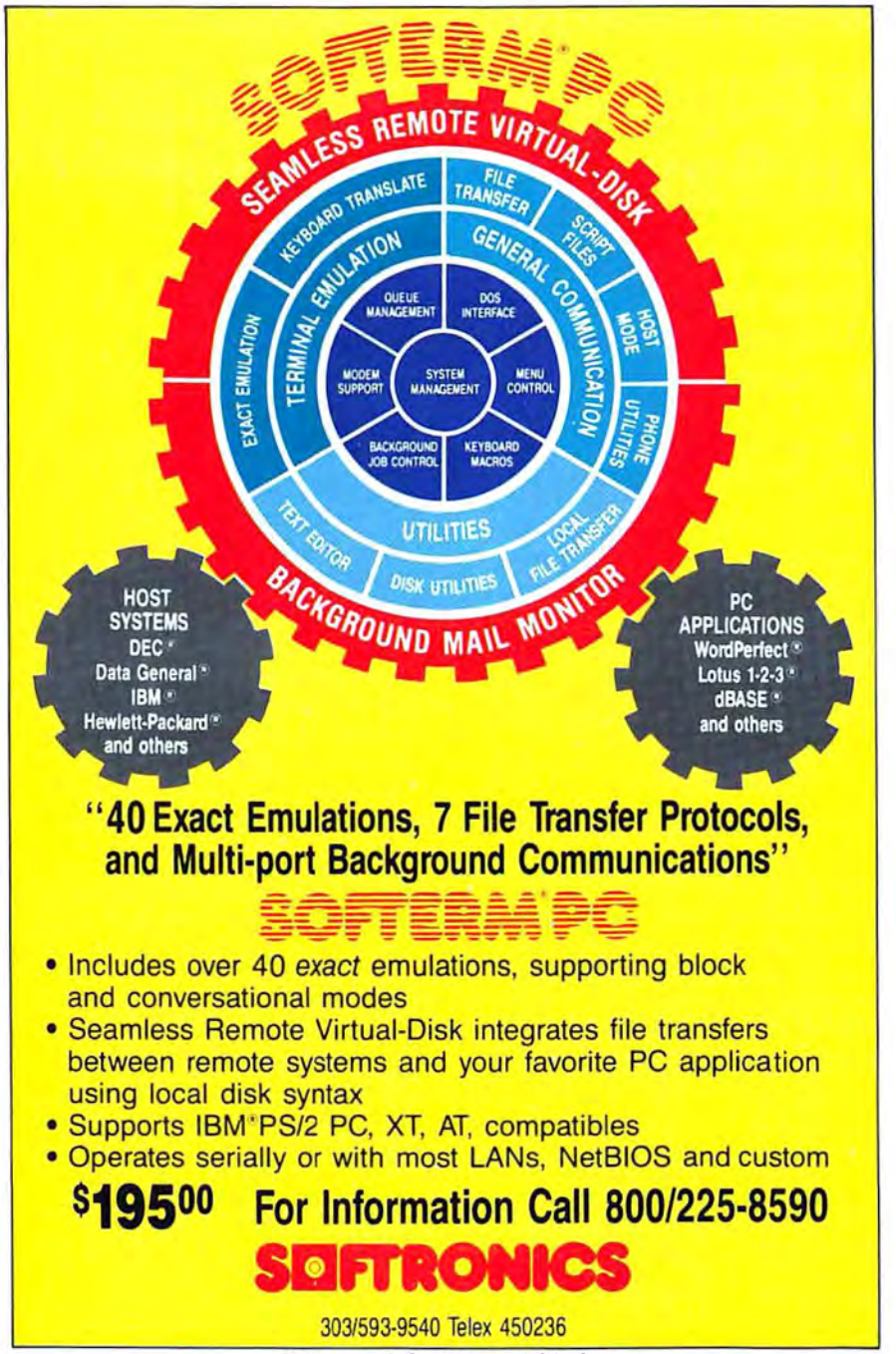
Business Name _____

Your Name _____

Address _____ Suite _____

City, State, Zip _____

Phone (_____) _____ ■ PW7456-IP



Get more info. Go to Ad index.

Get In on the PC Market Action

Your *PC World* Action Ad takes you to the heart of the IBM PC marketplace. These ⅓-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).

smaller than what you wanted to get. But now that personal publishing has stepped up to DOS-based machines, high-resolution hardware has begun to mirror the dimensions of the printed page.

With its ◆**TurboVision** graphics board and monitor, AST Research delivers crisp, full-size 8½-by-11-inch images to would-be publishers. Built around the potent TI 34010 graphics coprocessor, the TurboVision board lifts the graphics processing burden from the CPU—and that can mean up to a hundredfold increase in graphics performance.

The $1995 combination encompasses a 1024-pixel-by-1280-line monochrome monitor, whose paper-white flat screen and high-contrast characters simulate the printed page. Page layout and typeface characteristics appear as vivid on screen as they do on hard copy, eliminating the need for drafts. TurboVision features Hercules emulation and DOS system fonts, and the board snaps into either an 8-bit or a 16-bit connector. AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714; 714/863-1333.

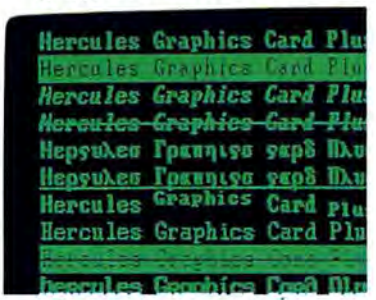
Birth of a Sales Program

Out there in the blue, riding on a shoeshine and a smile? Not any more. Office productivity tools are on the road with increasing

(continues)

Improve Your Word Processor With Hercules.

Now your word processor can have full display and printing flexibility without slowing down. The secret is the exclusive Hercules graphics card mode called RamFont. Which isn't really graphics at all.



RamFont lets most popular word processors display italics, subscripts, superscripts, foreign languages, different font styles and symbols etc. at lightning speed.

You see, graphics mode is slow. That's why most IBM compatible word processors run in fast, but limited text mode (they can only display 256 ASCII characters).

No Compromises with RamFont.

Some choice. Slow down software by using graphics mode to display italics, subscripts, superscripts, large characters, different fonts, etc. Or forget all that in favor of speedy text mode.

Hercules solved the problem without compromise some time ago... almost 200,000 graphics cards ago to be specific. Because in addition to text mode and 720x348 graphics, we include RamFont. Today's standard for text-based programs. RamFont gives the flexibility of graphics at the speed of text by displaying 3072 software defined characters instead of ASCII's limited 256. Available in two versions for your PC: the Hercules Graphics Card Plus (for monochrome TTL monitors) and the Hercules InColor Card (for "EGA-type" and multi-sync monitors).

Improve Today's Software.

RamFont runs Microsoft Word complete with its excellent on-screen display of attributes and fonts. But there's a difference. It's up to four times faster than the graphics mode in which it was written. Only Hercules cards let Lotus Manuscript display boldface, italics, subscripts, superscripts, and many equations in text processing mode. And RamFont expands Broderbund ForComment's viewing area to a full 80x43.

Programs like Design Enterprise's Alexander use it to display symbols (musical notes and foreign languages) which, before RamFont, were possible only in the much slower graphics mode. Other programs including Nota Bene, WordMARC, and Qalam all have optimized displays with RamFont.

In fact, every word processor can run better with Hercules. Independent add-on packages (TurboFonts, the Enhance Star series, etc.) let word processors like Word Perfect, Multimate, WordStar, and Displaywrite take advantage of the same sort of display and printing flexibility.

Tomorrow's software will display large and small characters in an almost infinite variety of styles at speeds heretofore impossible.

Improve The Software of Tomorrow.

WYSIWYG for underlining, italics, subscripts, font display, etc. is just the beginning. A whole new generation of word processors will use RamFont to mix a nearly infinite variety of fonts in different sizes on-screen at sizzling text speed. Which will make them look like, but run much faster than most of today's desktop publishers.

So, for better word processing, ask for Hercules with RamFont. It's the most compatible way to improve your writing.

Hercules Graphics Card Plus
(For monochrome monitors)
Includes the three modes your software needs most:
- *Standard Text—For thousands of text-based programs*
- *Hercules 720x348 graphics—highest popularly supported standard*
- *Hercules RamFont—3,072 software definable characters improve many popular software programs. (Call for the latest list.)*

Hercules InColor Card
(For multi-synchronous and enhanced color "EGA-type" monitors.)
Runs all Hercules monochrome software in 2 colors, most popular software in up to 16 colors selected from a palette of 64.
- *Standard Text—All programs run in 2 or more colors.*
- *Hercules 720x348 graphics in up to 16 colors—15% higher than EGA.*
- *Hercules RamFont—3,072 software definable characters in 16 colors up to 12,288 in 2 colors.*

For more information call Hercules toll-free at: 1-800-532-0600 Ext. 303. In Canada, 1-800-323-0601 Ext. 303.

Hercules
We run your software better.

Hercules Computer Technology, 2550 Ninth Street, Berkeley, California 94710; Tech Support: (415) 540-0749; Sales: (415) 540-0212. Hercules, RamFont and InColor are trademarks of Hercules Computer Technology. Other products are trademarks of their respective holders. © 1987 Hercules Computer Technology.

Get more info. Go to Ad index.

NOW NETWORK COMPATIBLE!

No matter what shape your data is in.

EZ-Fax™ makes it easier to get it there.

Imagine the possibilities if you could combine the power of your PC with a state-of-the-art Fax machine. EZ-Fax does it.

EZ-Fax gives you all the capabilities of the top Fax machines and more. Without the drawbacks. And that makes any other Fax machine wasted office space.

For instance - you don't have to create hard copy unless you want to. EZ-Fax can send documents to multiple locations. You can store speed dial numbers as names and/or numbers - all limited only by the size of your disk. EZ-Fax doesn't hold things up. If it can't get through, it reschedules the call and then goes on to the next document in line. Simple commands and built-in "Help" windows make EZ-Fax easy to use. Plus, EZ-Fax keeps a log of its daily activity for you.

But the most significant advancement? No more waiting. Select the documents you want to send (the only limit is your disk capacity) and the on-board microprocessor lets EZ-Fax work in the background, freeing you and your computer.

EZ-Fax works with PC's, XT's & AT's™ or compatibles, provides scanner, telephone and serial ports. EZ-Fax also has an optional Hayes compatible modem and DES encryption chip available.

Best of all, EZ-Fax is easy to afford. It costs 1/3 the price of Group III Fax machines. And by changing the price of overnight mail to the price of a phone call, EZ-Fax can pay for itself overnight!

To order or for more information call 1-800-443-0500. Or Fax your request to 305-994-9661.

EZ-Fax Board $1495
EZ-Scan™ Scanner $ 895
EZ-Data™ Modem $ 149
EZ-Code™ Encryptor $ 195

VISA & Mastercard accepted. Dealer or distributor inquiries invited.

EZ-FAX™

GULFSTREAM MICRO SYSTEMS

1065 South Rogers Circle
Boca Raton, FL 33431

EZ-Fax, EZ-Scan, EZ-Data and EZ-Code are registered trademarks of Gulfstream Micro Systems. Patents Pending. AT is the registered trademark of International Business Machines Corp.

Available from these fine distributors:

FA Components
Seattle, WA
In state 800-321-6012
Out of state 800-426-1412
Ft. Wayne, ID
In state (219) 432-8540
Out of state 800-331-7567
New York, N.Y.
800-847-4148
Greenville, S.C.
In state (803) 288-2422
Out of state 800-845-2747
Largo, FL
In state 800-237-5563
Out of state (813) 541-2616
Birmingham, AL
(205) 979-5776

MP Systems
Dallas, TX
In state 800-441-1325
Out of state 800-854-8885
Laguna Hills, CA
In state (714) 770-6411
Out of state 800-624-1688

Federal Data
Washington, D.C.
In state (301) 961-3892
Out of state 800-638-8018

Phoenix Electronics
Orlando, FL
(305) 291-7604
Baltimore, MD
(301) 785-2066

Tek-Aids, Inc.
Austin, TX
In state 800-252-8156
Out of state 800-531-5168
Philadelphia, PA
In state (215) 337-3220
Out of state 800-235-3200
Chicago, IL
In state (312) 870-7400
Out of state 800-323-4138

Americom Distributors
Marietta, GA
In state (404) 428-8400
Out of state 800-762-6652
Tampa, FL
800-762-6652
Memphis, TN
800-762-6652
New Orleans, LA
800-762-6652

Crystal Computers, Inc.
Kansas City, KS
In state 800-432-0170
Out of state 800-541-3030
Denver, CO
In state 800-824-4966
Out of state 800-824-9259
Dallas, TX
In state 800-442-4551
Out of state 800-452-2533

Get more info. Go to Ad index.

numbers of America's 5 million-plus salespeople.

One such program is Conductor Software's ◆*Act*, a tightly integrated complement of utilities built around a data manager—an efficient core application for anyone whose day is consumed by attending meetings and managing client lists. *Act* on a laptop can replace an account manager's Rolodex, calendar, notes, and correspondence files, providing instant access via modem to customer records, product specifications, and meeting agendas back at the office. The program also helps maintain itemized expense accounts and two kinds of to-do lists and offers instant on-screen records of prior customer contacts.

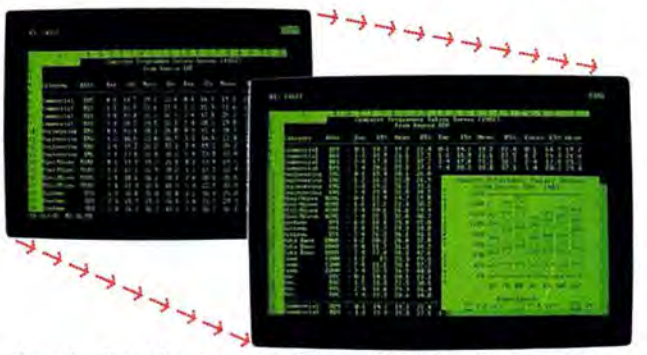
Using either *1-2-3*-like commands or pop-up menus, you can leap from one *Act* utility to another in a single bound. You can program *Act*'s electronic reminder to sound multiple alerts—and ensure that you never again miss a meeting. Dispatching thank-you notes to daily contacts is as simple as customizing the pertinent entry from *Act*'s library of form letters and then using its mail-merge facility to retrieve relevant names from the data base. Developed by sales professionals, the $395 program is available in 3½-inch and 5¼-inch formats and requires 420K. Conductor Software, Inc., 5215 N. O'Connor Blvd. #200, Irving, TX 75039; 214/869-9124.

(continues)

Better Spreadsheets, Fast With Hercules.

Like to know a secret shared by nearly 200,000 Hercules RamFont users? Your 1-2-3, Symphony, Framework or Multiplan* will run better on a Hercules Graphics Card Plus or Hercules InColor Card.

And we run them better in a number of ways.



Hercules RamFont lets spreadsheets like 1-2-3 display nearly twice the data with no loss in scrolling speed.

Display More Data.

First, you get more data on the screen without sacrificing your ability to scroll or move around the spreadsheet fast. Hercules' exclusive RamFont mode lets 1-2-3 and Symphony display nearly twice as much data (from 2,000 characters to about 3,400) expanding your view from 80 columns x 25 rows to a full 90x38. Microsoft Multiplan's display expands from 80x25 to 90x30 with the ability to toggle between the two. And Ashton-Tate's Framework goes from 80x25 to 90x43.

More data on screen without a loss of scrolling speed means you get a more functional spreadsheet. And you get it fast.

Crisp Graphics. Mono & Color.

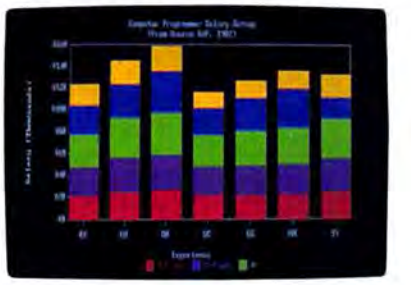
Hercules 720x348 graphics is the highest popularly supported resolution available for IBM PCs/XTs/ATs, and a wealth of compatibles.

Our industry-standard 720x348 graphics mode and RamFont mode are now available for both monochrome TTL monitors (Hercules Graphics Card Plus) and enhanced color "EGA type" and multi-sync monitors (Hercules InColor Card).

All of which means that built-in graphics on 1-2-3, Symphony, Framework II, SuperCalc 4, Javelin, Open Access, and Enable will be able to run in both mono and full color on either card. And so can add-on packages like Microsoft Chart, VP Graphics, and Stella Business Graphics.

Compatibility Plus.

Which brings us to yet another big benefit for spreadsheets and graphics. Hercules cards are completely compatible with each other. Any monochrome standard text, Hercules graphics or Hercules RamFont compatible program (and there are thousands of them) will run in two to sixteen colors on the Hercules InColor Card without changing video drivers.



Hercules 720x348 resolution is now available in both mono and color for integrated or add-on graphics programs.

And that makes moving (or networking) between mono and color systems a breeze.

So, for better spreadsheets ask for Hercules with RamFont. We're the graphics cards you can count on.

Hercules Graphics Card Plus
(For monochrome monitors)
Includes the three modes your software needs most:
- *Standard Text—For thousands of text-based programs*
- *Hercules 720x348 graphics—highest popularly supported standard*
- *Hercules RamFont—3,072 software definable characters improve many popular software programs. (Call for the latest list.)*
- *$299 suggested U.S. retail price.*

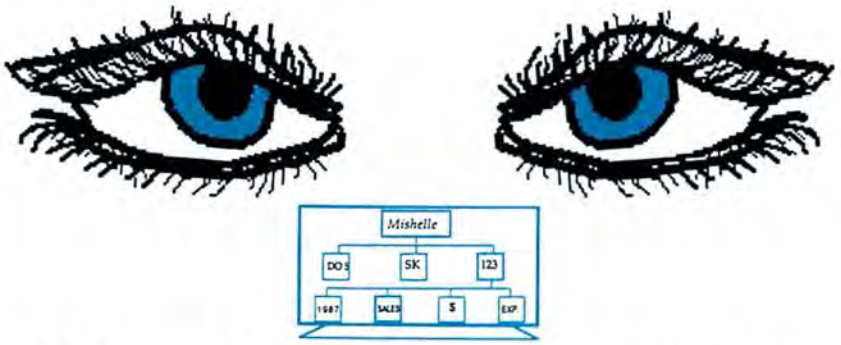
Hercules InColor Card
(For multi-sync and enhanced color "EGA-type" monitors.)
Runs all Hercules monochrome software in 2 colors, most popular software in up to 16 colors selected from a palette of 64.
- *Standard Text—All programs run in 2 or more colors.*
- *Hercules 720x348 graphics in up to 16 colors—15% higher resolution than EGA.*
- *Hercules RamFont—3,072 software definable characters in 16 colors up to 12,288 in 2 colors.*
- *$499 suggested U.S. retail price.*

For more information call Hercules toll-free at: 1-800-532-0600 Ext. 303. In Canada, 1-800-323-0601 Ext. 303.

Hercules
We run your software better.

Hercules Computer Technology, 2550 Ninth Street, Berkeley, California 94710; Tech Support: (415) 540-0749; Sales: (415) 540-0212. Hercules, RamFont and InColor are trademarks of Hercules Computer Technology. Other products are trademarks of their respective holders. © 1987 Hercules Computer Technology.
*Multiplan French and German version now available. English version available fall 1987.

Get more info. Go to Ad Index.



"Use me to access your files quicker."

Mishelle™, your perfect companion, may be seen privately in *Mishelle's*™ PREVIEW Videocassette.

Mishelle™ is two programs in one. She will provide rapid access to all your files, data and DOS functions, with the stroke of a single key. And *Mishelle*™ will organize your files by providing a powerful hard disk manager with file manipulation routines, including sorting, copying, moving, and deletion functions.

Features:
- ✔ Visually appealing tree formatted menus
- ✔ Easy to use with on-line help
- ✔ One key stroke rapid access to any file
- ✔ IBM compatible, monochrome or color

Call 1 800 345-6832 or send this coupon to The Software Network, P.O. Box 1447, Herndon, VA 22070 to place your order.

☐ *Mishelle*™	$79.95	Name
☐ PREVIEW Videocassette and Demo Diskette	$12.95	Address
(Shipping & Handling)	$ 3.00	Credit Card #
VA residents add 4.5%.		Expiration Date
TOTAL	$_____	Signature

VISA MasterCard

The Software Network™
P.O. Box 1447, Herndon, VA 22070

Get more info. Go to Ad index.

PolyDesk III™ *The Next Generation Desktop Organizer & dBase III File Manager*

Access your dBase III files instantly, even while running another program! *Only $99.*

30 Day Money-Back Guarantee

PolyDesk III includes 12 powerful memory-resident desktop tools that are more flexible than Metro or SideKick. Includes exclusive tools like PolyFile, the dBase III compatible database manager, a visual DOS shell & fast Keyboard Macro utility.

- *PolyFile • DOS Shell*
- *PolyKey • Text Editor*
- *To-Do List Manager*
- *Calendar • Alarms*
- *Appointment Book*
- *Calculators*
- *Auto Dialer*
- *Clipboard*
- *ASCII Table*

PolyDesk III lets you read and write dBase III databases! Create new databases or update and modify existing dBase III files — all without using dBase III. Merge names and addresses with letters, find information instantly, generate custom dBase reports and much more. With PolyDesk III anyone in your company can quickly design databases, search for data and display data. This makes dBase III, and existing dBase III databases, more useful for everyone from top management to the dBase III experts.

If you use dBase III, you need PolyDesk III!

If you use PolyDesk III, you may never need dBase III!

Requires IBM PC/XT/AT or compatible, DOS 2.0 or higher, monochrome, CGA or EGA monitor. Uses 90K of RAM. Hard Disk recommended.
NOT Copy-Protected.

dBase III is a trademark of Ashton-Tate Corp.

POLYTRON
High Quality Software Since 1982

VISA/MC ORDERS
1-800-547-4000
Ask for Dept. 305
In OR (503) 684-3000
Send Check, P.O.'s to:
POLYTRON Corp.
1815 NW 169th Pl., Suite 2110
Beaverton, OR 97006

Circle 804 on reader service card

The People's LAN

If the primary considerations keeping you from local area networking are price and complexity, Quadram has come up with a simple solution. ◆**QuadStar** is an entry-level offering consisting of a six-node StarLAN network that costs around $400 per connection. With this 1-megabit network, economy and ease of installation are jobs 1 and 2.

The system is packaged in a ◆**QuadStarter Kit** that contains everything a work group needs to get two stations up and running immediately. The kit includes a half-size board for one workstation, a hub adapter that will accommodate an additional five workstations, 50 feet of twisted-pair wiring, Torus Systems' icon-based *Tapestry* network operating system, and step-by-step tutorials on installation, network hardware, and the operating system—all for $1095. Additional adapters are only $375.

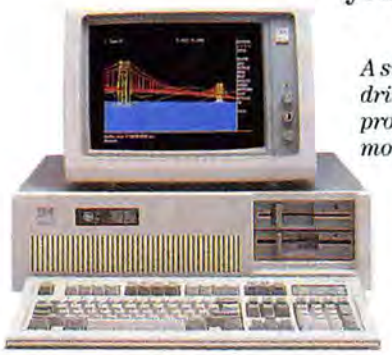
Using gateways, QuadStar can converse with other StarLAN networks as well as with Ethernet and IBM Token-Ring systems. If you'd like to double your connections, the ◆**QuadStar Hub-12** can bring 12 nodes into the LAN fold. Given QuadStar's twisted-pair wiring and modest price tag, it appears Quadram is seeking to follow the AppleTalk trail to prolific network connections. Quadram, One Quad Way, Norcross, GA 30093-2919; 404/923-6666.

(continues)

Networks Love Hercules.

Mono to Color Compatibility Make Driver Worries a Thing of the Past.

If you're trying to tie together your IBM compatible PCs, you don't need us to tell you about the hassles of different kinds of color and monochrome monitors and graphic cards requiring different video drivers for different software spread throughout your network.



A single unified driver runs many programs in monochrome...

... and in full color on different PC/monitor combinations.

installed with the program at the file server will work with both your mono and color PCs. And that's one less thing to worry about.

We Run Software Better.

That great compatibility and unified driver concept is just one of the ways we improve the way software runs, on or off a network.

Hercules can make your life a bit easier. And while we're at it, improve the way your software runs. Our suggestion:

You've probably already standardized on Hercules cards for your *monochrome* PCs. We suggest you also standardize on Hercules for your *enhanced* color systems.

Good-bye Driver Worries.

Our new InColor Card is fully compatible with Hercules monochrome cards. This means it will run every one of the thousands of programs written for those cards in two colors, using the standard monochrome driver included with the software.

And most popular programs... like 1-2-3, Symphony, Framework, AutoCAD, and many others use a single driver to run in full color (up to 16 colors selected from a palette of 64) on our InColor Card, and in mono on our monochrome cards.

What it all adds up to is this: If you've standardized on Hercules, a single driver

Your software also benefits from Hercules' crisp 720x348 resolution—the highest popularly supported standard in monochrome or full color.

And Hercules exclusive RamFont mode improves the performance of spreadsheets and word processors (1-2-3, Symphony, Framework, Word, Manuscript, and many others) by letting them display up to 3,072 software definable characters instead of the fixed 256 ASCII character set.

So, to get the most from your software and your network, specify the Hercules Graphics Card Plus, or the Hercules InColor Card for your systems. Your network will love you for it.

Hercules Graphics Card Plus

(For monochrome monitors)

Includes the three modes your software needs most:

- *Standard Text—For thousands of text-based programs*
- *Hercules 720x348 graphics—highest popularly supported standard*
- *Hercules RamFont—3,072 software definable characters improve many popular software programs. (Call for the latest list.)*
- *$299 suggested U.S. retail price.*

Hercules InColor Card

(For multi-sync and enhanced color "EGA-type" monitors.)

Runs all Hercules monochrome software in 2 colors, most popular software in up to 16 colors selected from a palette of 64.

- *Standard Text—All programs run in 2 or more colors.*
- *Hercules 720x348 graphics in up to 16 colors—15% higher resolution than EGA.*
- *Hercules RamFont—3,072 software definable characters in 16 colors up to 12,288 in 2 colors.*
- *$499 suggested U.S. retail price.*

For more information call Hercules toll-free at: 1-800-532-0600 Ext. 303. In Canada, 1-800-323-0601 Ext. 303.

Hercules
We run your software better.

Hercules Computer Technology, 2550 Ninth Street, Berkeley, California 94710; Tech support: (415) 540-0749; Sales: (415) 540-0212. Hercules, RamFont and InColor are trademarks of Hercules Computer Technology. Other products are trademarks of their respective holders. © 1987 Hercules Computer Technology.

Get more info. Go to Ad index.

AccountMate.™
The Business Accounting Software Solution.

"Put the power of AccountMate to work for you."

AccountMate™ Simply the best accounting software available. AccountMate offers you more creative freedom. AccountMate's full featured library of powerful dBASE III® and dBASE III Plus® integrated accounting modules, come with Free Source Code. Source Code gives you the choice. You can use our full featured accounting programs as they are, or quickly modify them to meet your company's specialized needs.

Authorized AccountMate Regional Support Centers, throughout the U.S. and Canada, will make the modifications for you if you are unfamiliar with dBASE® Our Clipper™ compiled versions of AccountMate do not require dBASE®

AccountMate expands with your business. AccountMate modules fully integrate, or work as powerful stand-alone programs. Each menu based program module has multi-company and departmental capabilities. Each module maintains from one to 10 companies, operating up to 1 billion records per file. Modules supporting up to 99 companies are also available.

Whether your company has one personal computer or a LAN/multi-user system with 254 PCs, you should investigate the many advantages of AccountMate.

AccountMate is PC-DOS/MS-DOS compatible and integrates with most popular spreadsheet programs. Put the power of AccountMate to work for you. Call us today for the dealer nearest you.

"It outperforms any other dBASE accounting package. SourceMate has a good reputation for supporting its products." *Data Based Advisor*

AccountMate Modules:

- General Ledger
- Consolidated Ledger
- Purchase Order Inventory
- Accounts Receivable
- Accounts Payable
- Payroll
- State Tax
- Time and Billing
- Fund Accounting
- Manufacturing/Inventory Control
- Sales Orders
- TelemarketMate
- SearchMate
- Job Costing

Nationwide *800-228-8896*

California *800-762-7788*

Your Source for Success™

SourceMate™

INFORMATION SYSTEMS, INC.

20 Sunnyside Ave., Mill Valley, CA 94941

For the AccountMate dealer nearest you call (415) 381-1011.

dBASE III and dBASE III Plus are trademarks of Ashton-Tate, Inc. Data Based Advisor is a trademark of Data Based Solutions. PC-DOS is a trademark of International Business Machines Corp. MS-DOS is a trademark of Microsoft Corp. Clipper is a trademark of Nantucket. AccountMate and AccountMate III Plus are trademarks of SourceMate Information Systems, Inc.

Get more info. Go to Ad index.

Smooth Talking

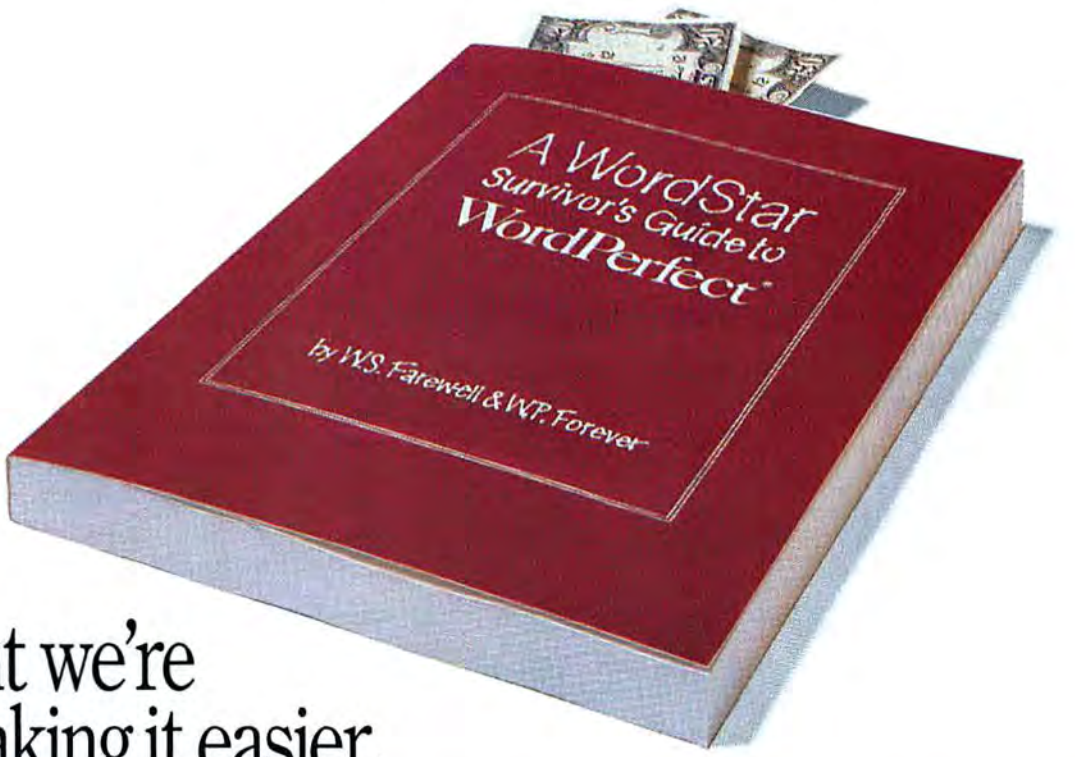
Absence may make the heart grow fonder, but it often makes long-distance computing projects confusing, time-consuming, and expensive. If an associate has ever walked you through an application over the phone (or if you've had to escort a colleague through the fog), you know that what's said on one end isn't always what ends up being typed on the other.

Welcome to what Harmony Technology Associates calls "cooperative computing." Its ◆***Co-Compute 2.0*** smooths out some of the kinks by handling voice conferencing and data transfer simultaneously on a single telephone line. In the program's Symmetric mode, either conferee can execute DOS or application commands or modify or transfer a data file. Unlike other remote control packages, *Co-Compute* lets you instantly toggle the phone connection between voice and data. Conferees are then free to conduct a dialogue in a pop-up window as an application runs—or to freeze the action and simply chat. A similar pop-up window makes tutorials a snap by displaying all keystrokes (including otherwise-invisible control characters) as they occur.

If you don't want the person at the other end to reach out and touch your data, you can switch to the program's Terminal mode. In that case, one user calls the shots and operates the host from afar—also a useful capability for those seeking entrée to the office

(continues)

Breaking up is hard to do.



But we're making it easier.

It's tough to say goodbye. But you know it's time. Your old word processor was a star in its day, but that was yesterday. Today's word processor is waiting to introduce you to on-screen columns, auto reformat, line drawing, better file security and sophisticated footnoting. For a start. And we want to help.

We found two terrific writers who know your old word processor inside and out, and have used it for years. Now they've written a guide to help you switch to WordPerfect. So instead of starting from scratch, you can use what you've learned, to learn WordPerfect.

The book is easy to read, yet comprehensive. And from now until October 31, we'll send you a copy for just $1 (to help cover postage).* But that's not all. In the book you'll find a rebate coupon, worth $40 when you purchase WordPerfect from your favorite software supplier (pirates excluded) before December 31, 1987.

The rebate offer is limited to diehard WordStar users in the United States and Canada only. Large account, government or school customers with special pricing may request copies of the book, but are not eligible for the rebate.

It's never been easier to change. So call (801) 225-5000 and order your survivor's guide today. All you need is your WordStar serial number and a credit card number (for the $1 postage charge).

WordPerfect CORPORATION

*While supplies last.

ORDER NOW: (801) 225-5000

Get more info. Go to Ad Index.

"Dear Genifer..."

Q: "You saved me time with dBASE but gave me a guilty conscience. Aren't you ashamed?

O.K. I admit it. Genifer is a fabulous application generator that produces complete applications in minutes, not days. But that's the problem. I told my client his project would take a full three days. With Genifer it took me just forty-seven minutes! I billed him for the full time and now I feel just awful. Don't you understand? Genifer is a moral blight on the nation!"

– Righteously Indignant

A: Dear Righteously:

Give me a break! What am I, your Sunday School teacher? Look pal, how you bill is your business. Knocking out clean, sparkling, self-documented code is Genifer's business. You want to spend three days cranking out spaghetti code? Go for it. You want custom-made applications in minutes? Genifer can't be beat. P.S. Anyone out there who would rather get more work done than hack away in dBASE, should see their dealer today. Genifer knows what she's talking about!

To find out more about how Genifer can change *your* life, visit your dealer or call toll-free: **1-800-631-2229** for a FREE brochure.
In CA: 1-800-541-3366

Genifer.

For dBASE III applications without tears.

bytelcorporation

1029 Solano Avenue, Berkeley, CA 94706
(415) 527-1157 Telex: 176609

Trademark/Owner: Genifer/Bytel. dBase III/Ashton-Tate.
©Copyright 1987 Bytel Corporation.

Get more info. Go to Ad index.

desktop while on the road. Otherwise, every feature of the Symmetric mode is at the ready. The program's memory-resident component requires just 52K. Single copies list for $279; a twin-pack is $495. A 2400-bps modem is recommended for Terminal mode. Harmony Technology Associates, 3700 S. Sepulveda Blvd. #332, Los Angeles, CA 90034; 213/398-0878.

Saved by the Speller

Weary of burning the midnight oil trying to clean up errant labels in overstuffed *1-2-3* worksheets? Relax. Instead of pressing the panic button, push the ◆***Spellin*** hot key.

Spellin–Turner Hall's $79.95 spelling checker for *1-2-3* release 2 and *Symphony*–puts a 90,000-word dictionary and an unlimited user-programmable dictionary at your disposal. *Spellin* will check all or part of a worksheet, and its search-and-replace function is sharp enough to turn acronyms and other common abbreviations into full-fledged words. It even adds unusual spellings to your personal dictionary. As a release 2 add-in that lives comfortably within *1-2-3*, *Spellin* doesn't clash with products like Lotus's HAL or Borland's *SideKick*. (Speaking of Borland, *Spellin* is the first commercial implementation of The Finder, Borland's powerful linguistic processor.)

(continues)

MENU

Guess Edit Ignore Add Context Options Quit
Guess at spelling

Questionable word : Figurs Location : J3

GraphPax Corporation, 218 Industry Way, Boomtown, CA 95089

Fiscal 1986 Sales Figurs
PLAN vs ACTUAL
=
Month
=
July '86

13	November '86	$30,000	$32,089	$2,089	9%
14	December '86	$24,000	$23,402	($598)	-2%
15	January '87	$29,500	$33,563	$4,063	14%
16	February '87	$31,000	$32,094	$1,094	4%
17	March '87	$30,500	$40,050	$1,550	4%
18	April '87	$41,000	$44,402	$3,402	8%
19	May '87	$43,000	$47,865	$4,865	11%
20	June '87	$47,500	$53,902	$6,402	13%

10-Jun-87 09:30 AM

Turner Hall's Spellin searches out those annoying spreadsheet label misspellings that often seem to hide in plain view. It can't help you check your numbers, but Spellin quickly spotted the 'Figurs' error in the spreadsheet above.

To Over 30,000 Installations, MultiLink® MEANS Multi-User.

At over 30,000 sites, as many as one-quarter of a million users tap into the power of MultiLink® Advanced everyday.

Since 1983, they've come to rely on our multi-tasking, multi-user system for compatibility with their favorite software, and the ability to share disks, files, printers, and programs in a *true* PC-DOS environment.

From the largest of the Fortune 500 to the smallest in small business, MultiLink® has provided a cost-effective multi-user solution that's available from no one else.

MultiLink® Means Cost-Effective Timesharing on a PC. MultiLink® Advanced utilizes the principle of timesharing by sharing a central PC's peripherals, files, and processor time among nine users. Up to eight inexpensive terminals can be connected to a single non-dedicated IBM PC, XT, AT or 100% compatible using standard RS-232 ports. Each terminal effectively emulates a PC having up to 512K RAM.

PC-Shadow™ Workstations, shown below, even have an AT look-alike, as well as work-alike, keyboard, display, and serial port. In addition, password-protected remote access via modem can be made with either dumb terminals or PCs running our terminal emulation software.

MultiLink® Means PC-DOS Compatibility with a *Software-Driven* System. Lotus 1-2-3, Symphony, WordStar, dBASE III, & Multimate are just a sampling of the wide variety of PC-DOS software that's fully compatible.

Our software-driven system is also IBM NETBIOS compatible, so programs that are written for IBM's Token Ring will run on our multi-user system, as well.

MultiLink® Means Multi-User to Leading Computer Publications. Whether you read *PC Magazine*, "MultiLink® Advanced delivers on...convenience, speed, and flexibility," or *InfoWorld*, "If you want a low-cost multiuser system with up to eight terminals, MultiLink® Advanced is worth a serious look," it becomes clear that MultiLink® Advanced is a formidable contender in the multi-user marketplace.

See What MultiLink® Can Mean to You. Learn, firsthand, how our multi-user system can benefit your company. Call The Software Link TODAY for complete information and the authorized dealer nearest you. MultiLink® Advanced is $595 and comes with a money-back guarantee.

MultiLink® ADVANCED

THE SOFTWARE LINK

MultiLink® is a registered trademark of The Software Link. MultiLink® Advanced & PC-Shadow™ are trademarks of The Software Link. IBM PC, XT, AT, PC-DOS, Token Ring, & NETBIOS are trademarks of IBM Corp. WordStar, dBASE III, Multimate, Lotus 1-2-3 & Symphony are trademarks of MicroPro, Ashton-Tate, Multimate International, & Lotus Development Corp., respectively.

3577 Parkway Lane, Atlanta, Georgia 30092 Telex 4996147 SWLINK FAX 404/263-6474

For the dealer nearest you. **CALL: 800/451-LINK** In Georgia: 404/448-LINK

OEM/Int'l Sales: 404/263-1006 Resellers/VARs: 404/448-5465

Dealer Inquiries Invited

THE SOFTWARE LINK/CANADA CALL: 800/387-0453

Get more info. Go to Ad index.

BUY ONE GET FIVE FREE!!

America's Astounding Accounting Software Value !

BALANCE

Integrated Accounting

ONLY $ 149.95 !

This package with individual modules sold for $ 2,500. Now we've brought them together in one complete integrated package.

When you buy BALANCE you get these **6** modules for the price of **ONE** regular accounting module by other software houses!

30 Days Free Support!
30 Day Guarantee!
Royal American pledges to give 30 days of support over our toll-free numbers. If for any reason you are not satisfied you can return BALANCE for a refund. ($20.00 restocking fee applies)

GENERAL LEDGER
* Departmental/Multi Company Accounting * Make your own Financial Reports * Modifiable pre-defined chart of accounts * Accounts always in balance * Automatic Audit trail * And More !

ACCOUNTS RECEIVABLE
* Look up all balances and transactions on-screen * Modify Statement Formats * Open Item or Balance Forward Customers * 30/60/90 or 7/14/21 day aging * Flexible Reporting * And More !

ACCOUNTS PAYABLE
* Open item or Balance Forward * Up to 32,000 Vendors * Make your own check formats * 30/60/90 or 7/14/21 day aging * Automatic Inventory Update * On-Line Posting * And More !

INVENTORY CONTROL
* Multi-level Pricing * Dynamic Moving Average Costing * Full sales history by product * Physical Inventory * Automatic price modification * On-line Posting * And More !

BILLING
* Automatically updates inventory and receivables * Modifiable Invoice Format * Both Product and Service Invoicing * After the fact invoice entry * Invoice Reports * And More !

ORDER ENTRY AND SALES ANALYSIS
* Back orders, Partial orders, Reserve Inventory * Full sales analysis by multiple criteria * Back Orders Reports * And More !

PLUS MUCH MORE ! * Export To Spreadsheets, etc., Multi-level Passwords, On-Line help, Full 250-page manual.

"We have been using the BALANCE Series for 2 1/2 years. Our staff were able to use it with no previous PC experience. "

John Tilley, Dunlop Group

"BALANCE was our first PC accounting system. Our financial reporting needs were extensive. The package performed extremely well in this area."

Bruce Cook, Airconditioning Division, Hitachi

"We have over 100 client companies. BALANCE is extremely easy to install. We have most of our clients on the system within 2-3 days."

Mike Kuhn, Micro Management Services

ROYAL AMERICAN Technologies Corporation

EASY INSTALLATION !
LOAD AND GO IN 5 MINUTES !

Also Available For ***BALANCE:***
BILL OF MATERIALS / MANUFACTURING - $ 99.95
JOB COSTING / CONTRACTORS SYSTEM - $ 99.95
POINT OF SALE / RETAIL SYSTEM - $ 99.95

320 Harris Ave. Suite A
Sacramento CA 95838
(916)920-2412

VISA, MC, AMEX, checks accepted
Requires IBM PC,XT,AT or compatible with 512 K RAM and Hard Disk

To Order Call: **(800)654-7766**
In California call: (800)851-2555
Include $ 6.00 for shipping. 6% sales tax applies in California

Get more info. Go to Ad Index.

Portrait of the Great American Investor

She'll go wherever the story takes her. She invests her time in her work and her money in U.S. Savings Bonds. Bonds now pay competitive rates, like money market accounts. Find out more, call 1-800-US-BONDS.

U.S. SAVINGS BONDS
THE GREAT AMERICAN INVESTMENT

Bonds held less than five years earn a lower rate. A public service of this publication.

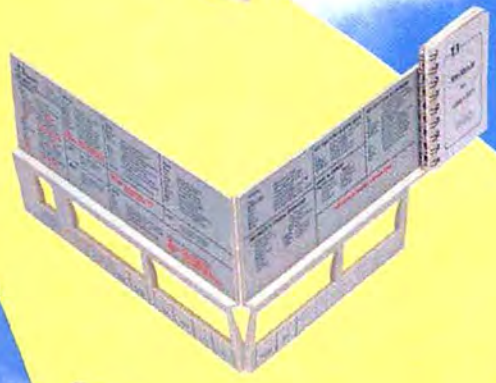
For more ambitious word processing tasks, *Spellin* will work with Turner Hall's own *4Word*. If you've got an AboveBoard or equivalent memory expansion board, you can even place half of *Spellin*'s 95K of code in expanded memory, keeping RAM requirements well within bounds. Turner Hall Publishing, 10201 Torre Ave., Cupertino, CA 95104; 408/253-9600.

Briefly Noted

For veterans of the network wars, the only battle wounds deeper than those caused by LAN cabling costs are those inflicted by ripping apart your office to string the wire. Telegence's ◆**Tokenstar** wants to be a peacemaker. A data-over-voice system, it uses everyday twisted-pair wiring—without turning voice communications into block party lines. The $595 Tokenstar 3301 network board fits into any PC, while the $695 Tokenstar 3201, a compact external unit, connects to a PC like a modem. Complementing both boards are hub units of various capacities that rely on multiplexing to separate voice and data signals. The Tokenstar system serves as both an asynchronous LAN offering VT 100 emulation and a NETBIOS-compatible network that cruises at 1 megabit per second. You can dial a host (or another PC or a modem) as easily as you would a colleague in a crosstown office. And Tokenstar works with

(continues)

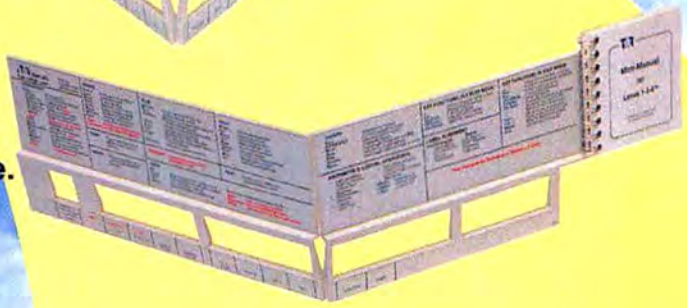
SOMETHING NEW IS UNFOLDING AT TDA ...



TEMPLATES FOR IBM® ENHANCED-STYLE KEYBOARDS!

TDA Templates are designed to help you productively use your software in the least amount of time.

- Well organized, compact and complete.
- Presents the right information in the right order.
- Color coded keystroke references.
- Mini-manual averages 150 pages of examples, graphs and explanations.



Also available for the original PC-style keyboard.

Fits all IBM® and most compatible keyboards.

A Quality Keyboard Deserves A Quality Template!

CALL:

800-423-7140

IN WASHINGTON STATE
CALL (206) 883-6954

THE TDA TEMPLATE SERIES
"Answers at your fingertips"
Talisman Development Associates, Inc. CODE 210 PCW
15353 N.E. 90th Street, Redmond, WA 98052

NAME: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP: _____

PHONE: _____

Please. No Post Office Box Address. Deliveries via UPS.
☐ Check Enclosed ☐ VISA ☐ MC 30 Day Guarantee

Card # _____

Expiration Date: _____

(Washington State Residents Add 8.1% Sales Tax)

QUANTITY E	QUANTITY PC	DESCRIPTION	PRICE	TOTAL
		WordPerfect 4.1/4.2	22.95	
		WordPerfect Keytronics KB 5151	22.95	
		Lotus 1-2-3 1(a)/2.0	22.95	
		Symphony	24.95	
		Wordstar 3.3 Professional	19.95	
		Wordstar 2000+	19.95	
		dBase III+	24.95	
		DisplayWrite 3	19.95	
		DisplayWrite 4	22.95	
		Turbo Pascal	19.95	
		Microsoft Word	22.95	
		DOS/BASIC	19.95	
		Multimate 3.3/3.6	22.95	
		Electric Desk	19.95	
		Blanks - Create your own	12.95	
		U.S. Only- Shipping & Handling		3.00
		*Washington Sales Tax		
		TOTAL:		

E=Enhanced Style
PC=Original PC Style
(Function keys on the left)

AVAILABLE AT YOUR LOCAL COMPUTER STORE

DEALER INQUIRES WELCOME

Get more info. Go to Ad index.

PCW

just about any PBX. Telegence, 5655 Lindero Canyon Rd. #722, Westlake Village, CA 91362; 818/707-3200.

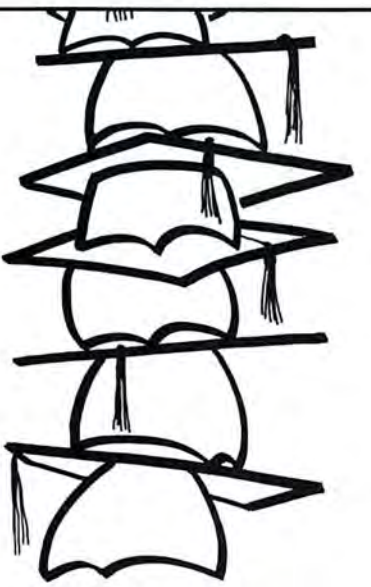
◆◆◆◆◆

Tired of turning your corporate presentations into squinting sessions? Thanks to recent technical breakthroughs, everyone in your company can get the big picture without having to huddle around the computer screen as if it were a campfire. ◆**Data Display** from Computer Accessories provides a lightweight, low-cost alternative to large projection systems that cost as much as $30,000. The $1199 tablet, used with an overhead projector, can project any PC-generated monochrome image onto a wall or screen, where everyone can take a gander. More useful in interactive training situations than a simple slide show, Data Display translates a moving software demo into full-motion projection. You can stop and discuss what's on screen or branch off into other software areas as it suits you. Download the latest data from the company mainframe or play "what if" games with a spreadsheet–you can do it on the keyboard in real time. Data Display incorporates proprietary technology for binding video chips directly to its LCD, producing more reliable connections, higher resolution (640 by 200), and a slimmer profile than similar systems using printed circuit boards. With an aspect ratio of 4 to 3, its circles look like circles rather than eggs. Data Display comes with *Presentation Partner*, a program for capturing screen images, and includes RGB and composite video cables and an AC power adapter. Computer Accessories, 6610 Nancy Ridge Dr., San Diego, CA 92121; 619/457-5500.

◆◆◆◆◆

Want to shift into overdrive but find your keyboard stuck in fourth? Touch typists using IBM-compatible keyboards can cruise

© 1987, Zenith Data Systems



Over 600 College Campuses Have Graduated To Zenith PC's.

From libraries to labs, Zenith gives them the speed and power to tackle the most ambitious projects. With PC's like a battery-powered hard drive laptop. One of the quickest AT-compatible systems on the market. And the lightning fast Z-386. Best of all, Zenith PC's routinely take nonstop pounding with remarkable durability, backed by full service support. To learn how we can help you, call 1-800-842-9000 ext. 1. We promise it'll be an educational experience.

ZENITH data systems

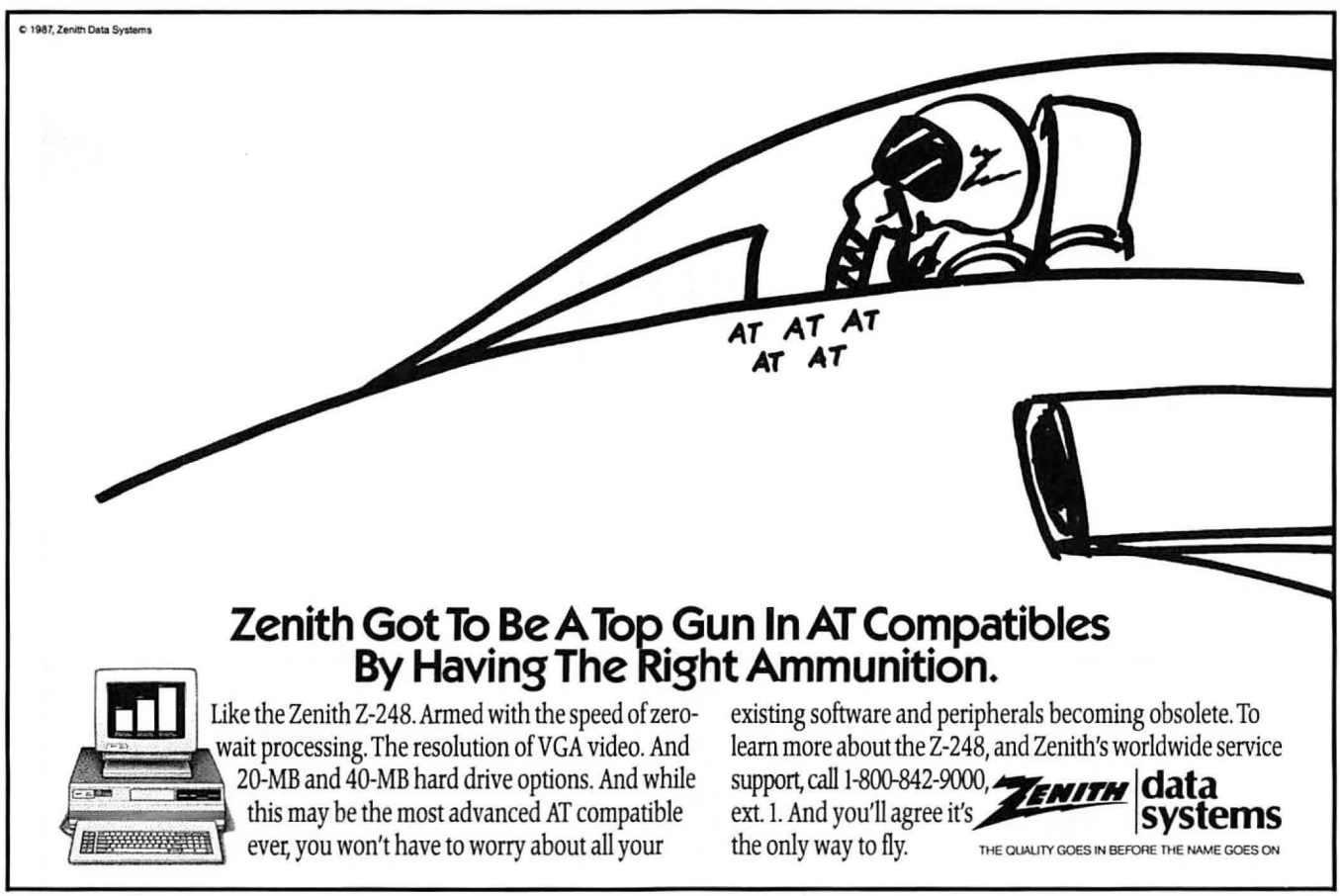
THE QUALITY GOES IN BEFORE THE NAME GOES ON

Get more info. Go to Ad Index.

right along with ◆***Repeat Performance 1.40*** from WordPerfect Corporation. A nifty 2K utility, *Repeat Performance* unleashes high-speed typing, scrolling, and editing by increasing cursor speed from 11 characters per second to as high as 1000 cps. The program virtually eliminates dropped characters by expanding the type-ahead buffer from 15 to 1000 characters. Continually forgetting to turn off <CapsLock>? *Repeat Performance* ensures that letters won't be displayed in lowercase when the <Shift> key is depressed. The $59 program can be installed with a single command. WordPerfect Corp., 288 W. Center St., Orem, UT 84057; 801/227-4000.

◆◆◆◆◆

Now that a beachhead has been established in the colonies, Britain's Amstrad PLC is bringing yet another member of its PC family to these shores. The ◆**PC1640** is big brother to the PC1512, whose $799 sticker and bevy of features has, since its February debut, sold like scones at high tea. Like the PC1512, the PC1640 sports the same 8-MHz 8086 processor, Microsoft-compatible mouse, tilt-and-swivel base, and bundle of software. But the new kid carries a motherboard brimming with 640K, a hard disk controller, and a chipset offering MDA-, CGA-, EGA-, or Hercules-compatible graphics. You can again choose between monochrome or color monitors and opt for a single 5¼-inch floppy drive, dual floppies, or a 20MB hard disk. The single-drive model with a monochrome monitor lists for $899, the 20MB system with a color monitor for $1999—roughly $100 more than the PC1512 models. The Amstrad PC1512 line will continue to be distributed through mass merchandisers, while the PC1640 is available through specialty dealers and value-added channels. Vidco Electronics, 1915 Harrison Rd., Longview, TX 75604; 214/297-4898.



Get more info. Go to Ad Index.

Chief Running Bull(dog) Says— "How Cheap-Um!"

IBM COMPATIBLE

PERSONAL SYSTEM/2

Model 30 w/2 floppy.....**$1305**
Model 30 w/1 floppy & 20 mg. **1769**
Model 50.....**2769**
Model 60 & 80.....**CALL**

XTs & ATs

IBM XT 286.....**$1749**
XT Systems.....**CALL**
IBM AT 339.....**3495**
AT Systems.....**CALL**

PC II TURBO XT

8 mhz, 1 floppy, 640K, AT style keyboard, game port, clock calendar, monographics card, mono monitor, DOS & manuals.....**$849**
Color System add $200 w/20mb add $329, w/30 mb add $359

CLUB AT

10 mhz, 1.2 floppy, 1 mb Ram memory, hi res, monographics, monochrome monitor, clock calendar.....**$1295**
Color system add $200 w/30 mb add $525, w/40 mb add $595

COMPAQ

386 Desk Pro 40/70/130
$4699/5299/6399

286 Desk Pro 12 mhz .....**CALL**

Compaq II Model II/IV **2250/3350**

Compaq III 20mb/40mb.....**3795/4450**

LAPTOPS

NEC Multispeed.....**$1495**
Toshiba 3100.....**2895**
Toshiba T1100 Plus w/640K **1525**
Zenith 2 Drive.....**1695**
Zenith w/10 mg **2695**

AT&T SYSTEMS

6300
2 Drive System.....**$1259**
10 mb System **1495**
20 mb System **1550**
Upgrade to 640K.....**50**
Systems include Keyboard, Bit Image Graphics, Green Monitor, 256K DOS, and On-Board Clock Calendar.

AT&T Color Monitor **675**

GRAPHICS CARDS

EVEREX EGA **$185**
EVEREX THE EDGE.....**189**
GENOA SUPER EGA/SUPER EGA HI RES **255/295**
GENOA SPECTRUM **159**
HERCULES GRAPHICS **181**
ORCHID TURBO EGA **459**
PARADISE EGA Auto Switch.....**335**
PARADISE Auto Switch 480 .....**365**
QUADRAM EGA PLUS **289**
QUAD PRO SYNC.....**309**
SIGMA COLOR 400 .....**399**
NEC GB-1 Multisync **349**
STB EGA PLUS **259**
VEGA DELUXE.....**339**

MULTI FUNCTION BOARDS

AST Advantage w/128K.....**$329**
AST Advantage Premium w/512K.....**449**
AST 6 PACK PLUS w/384K.....**164**
AST 6 PACK PREMIUM w/256K **199**
AST 5251-11 PLUS.....**615**
AST FLASHPACK.....**289**
AST RAMPAGE for AT w/512K.....**359**
EVEREX MAGIC CARD II w/384K.....**159**
EVEREX MINI MAGIC w/o K.....**69**
FAST 88/V20 w/Switch **89**
INTEL Above Board for AT w/128K **349**
INTEL Above Board PS for AT w/128K **369**
INTEL Above Board for PC w/256K **269**
INTEL Above Board PS for PC w/64K.....**229**
INTEL Inboard 386 w/Adapter **1290**
IRMA BOARD.....**699**
J RAM III for PC w/o K.....**179**
J RAM III for AT w/o K.....**239**
J LASER PLUS PC/AT **489/589**
ORCHID JET 386.....**875**
ORCHID PC Net Starter Kit **735**
ORCHID Tiny Turbo 286 .....**349**
ORCHID Ramquest 50/60 w/2mb **679**

MICE &MISC

MICROSOFT MOUSE w/PC paint brush.....**4119**
MOUSESYSTEMS MOUSE.....**139**
LOGITECH MOUSE.....**74**
KODAK DATA SHOW **1050**
KENSINGTON Masterpiece/Plus **129**
MICROFAZER w/8K.....**129**
MICROFAZER II w/512K.....**309**
POLAROID PALETTE PLUS **2050**
35mm EXPRESS **450**
MATH CO-PROCESSORS.....**CALL**

Sales Hot Line 1-800-438-6039

BULLDOG

COMPUTER PRODUCTS

We accept VISA, MasterCard, American Express

3241-E Washington Road • Martinez, Georgia 30907
Incorporated as Georgia Micro

RETURN POLICY
Returned items must be in original packaging with all warranty cards & manuals intact. No credit issued after 30 days from date of shipment. We do not guarantee compatability. All returned items must have a return authorization number assigned.

Bulldog's Hunting Up Low-Flying Prices

PRINTERS

EPSON

LX 800 *NEW*	$169
FX 86E 240 CPS, 40 NLQ	299
FX 286E 240 CPS, 40 NLQ	419
LQ 800 180 CPS, 60 NLQ	429
LQ 1000 180 CPS, 60 NLQ	549
LQ 2500 324 CPS, 108 NLQ	839
EX 800 300 CPS, 60 NLQ	365
EX 1000	489

OKIDATA

182 120 CPS	229
192 Plus 200 CPS	339
193 Plus 200 CPS	510
292 Plus 200 CPS, 100 NLQ	519
293 Plus 200 CPS, 100 NLQ	649
294 Plus 400 CPS	1025
Laser Line 6	1599

TOSHIBA

321 SL 180 CPS, 60 NLQ	499
351 II 300 CPS, 100 NLQ	910
341E 180 CPS, 72 NLQ	689
351 Color 240 CPS, 100 NLQ	1069

NEC

P6/P7	435/595
P5XL/P9XL	985/1195
3550/8850	725/1020

PRIMAGE 90

w/Pagemate III 90 CPS Daisywheel	1350

PANASONIC

1080i	$199
1091	259
1092	319
1592	418
1595	459

HEWLETT-PACKARD

Laser Jet	$2295
Laser Jet Plus	3050
Laser Series II	1895

HARD DRIVES

Seagate 10mb w/contr. ST213	$325
Seagate 20mb w/contr. ST225	359
Seagate 30mb w/contr. ST238	379
Seagate 20 mb for AT ST4026	495
Seagate 30 mb for AT ST4038	525
Seagate 40 mb for AT ST4051	659
Seagate 40 mb for AT ST251	595
Seagate 80 mb for AT ST4096	869
IOMEGA BERNOULLI	
10 mb w/card	1039
10 + 10 w/card	1495
20 + 20 w/card	1950
BERNOULLI PLUS	3495
SYSGEN Durapack single	995
dual external/internal	1850/1595
Mountain 20 mb drive card	499
Western Digi. 30 mb drive card	589
Western Digi. 20 mb drive card	549
Plus Hard Card 40	859
Plus Hard Card 20	625
Priam 60 mb AT	869
Priam 43 mb AT	685

MODEMS

Everex 1200/2400	109/209
Hayes 1200B or 1200	299
Hayes 2400 int or ext	449
US Robotics 2400 direct internal	179
Ventel Half Card 1200 w/Crosstalk	259
Vental Half Card 2400 w/Crosstalk	369
Ventel 1200 Plus	239
Ventel 2400 Plus	369

MONITORS

AMDEK

410	$145
310-A	135
Color 600S	359
Color 722	455

PRINCETON

MAX12	149
HX12	419
HX12E	469

IBM

Mono 850	$199
Color Display 8512	449
Color Display 8513	515
NEC Multisync	549

SOFTWARE

Chartmaster	$209
Clipper	399
Corefast	109
Crosstalk XVI	99
D Base III	399
Enable 2.0	379
Fastback	89
Foxbase +	199
Freelance Plus	339
Framework	399
IBM Display Write IV	339
Lotus	309
Lotus Hal	109
Managing Your Money 3.0	125
Microsoft Word 3.1	229
Multimate Advantage II	249
Multiplan	119
Office Writer 5.0	259
PFS Prof Write	149
PFS Prof File	159
PFS 1st Choice	99
R Base System V 1.1	419
Revelation	575
Super Calc IV 1.0	269
Symphony 1.2	439
Ventura Desktop Publishing	565
Volkswriter III	149
Word Perfect 4.2	205
Word Perfect Library	59
Wordstar 2000 +	279
Wordstar Pro 4.0	249

TAPE DRIVES

Everex 60 m.b. internal	$550
external	635
Genoa Galaxy 60 mb internal	799
external	929
Achives 40 mb internal	359
Sysgen Quic 60 internal	949
external	995
Sysgen 20 mb internal	575
external	650
Tallgrass 20 mb int/ext	395/550
Tallgrass 20 mb internal tape plus 25 mb hard disk	995
Tallgrass 60 mb external tape	1050

Prices Subject To Change

For Orders Call: 1-800-438-6039

For Shipping Call: 404-860-6905, For Returns Call: 404-860-6899

And In Georgia Call: 404-860-7364

BULLDOG

COMPUTER PRODUCTS

Incorporated as Georgia Micro

Get more info. Go to Ad index.

From the Software Shelf

PC World offers first impressions of recent software releases

This month: Ventura updates a winner, Dartmouth returns to basics, Borland solves your equations, the Cadillac of sort utilities brings order to large files, and a build-your-own-typeface program makes headlines

Edited by William Rodarmor

Xerox Ventura Publisher

Desktop publishing program

Pros: *Professional-grade typographic capabilities; what-you-see page makeup; powerful style sheet formatting*

Cons: *No undo or help capabilities; can't stretch or rotate text*

Version 1.1
Xerox Corp.
101 Continental Blvd.
El Segundo, CA 90245
800/822-8221

List price: $895
Requirements: 512K (640K recommended); hard disk; Microsoft bus mouse or serial mouse, Mouse Systems PC Mouse, or Xerox optical mouse; graphics board
Not copy protected

How do you improve a program that has already drawn rave reviews? In the case of *Xerox Ventura Publisher,* you keep the program's structure pretty much the same, add features, and plug the holes you missed the first time around.

Ventura's new version 1.1 offers improved typographics, support for more text and graphics standards, better graphics handling, and support for more fonts and laser printers. But Xerox missed a few potholes. *Ventura 1.1* can't stretch or rotate text, lacks a mail merge capability, and won't print out all the settings in a style sheet. Moreover, this somewhat daunting multimode program still doesn't offer on-line help or an undo command (see "Ventura: Complete Desktop Publishing," *PCW,* March 1987).

The modus operandi of creating a publication with *Ventura* is unchanged. But start the program and open up a document on screen, and you'll notice a pair of *PageMaker*-like sliding markers on the ruler bars that track the movement of the cursor. Those guides only hint at the scores of new features that are hidden from view in *Ventura 1.1*'s pulldown menus.

Xerox has vastly expanded *Ventura*'s typographic controls. Version 1.1 boasts a variety of fixed spaces, optional letterspacing, tracking, and programmable tab characters (see Screen 1). It raises the spaceband controls from two to three, adds automatic kerning, and flags loose lines.

Ventura 1.1 also offers a host of less flashy but equally useful enhancements. It provides frame anchors, which keep graphics in a specified position relative to the text (if the text is reformatted, the program automatically moves the frames). And if you add a new monitor or mouse, you no longer have to reinstall the entire program.

Power users will be happy to learn that *Ventura* can now handle even heftier text files and larger style sheets than before: 500K of text and 128 formatting tags per chapter, compared to the previous limit of about 100K for text and 64 tags.

To *Ventura 1.0*'s already considerable list of word processing formats, Xerox has added *WordStar,*

MultiMate, Microsoft Word, Xerox Writer, WordPerfect, XyWrite, and IBM's Document Content Architecture (used by *DisplayWrite* and *Samna*).

The list of acceptable graphics formats has also swelled dramatically. Version 1.1 allows you to import pictures in 9 different object-oriented graphics formats and 3 bit-mapped graphics formats. Together, these 12 formats provide a gateway for output from hundreds of graphics packages, such as *Video Show, Freelance, Computergraphics CGM, HPGL*–graphics programs that work with *Windows*–plus *MacPaint* and *MacDraw.* Via the latter two, the Macintosh's extensive clip-art libraries are now easily accessible on the PC. And version 1.1 accepts Encapsulated PostScript files, so you can print the output of Adobe's *Illustrator* program with true PostScript curves.

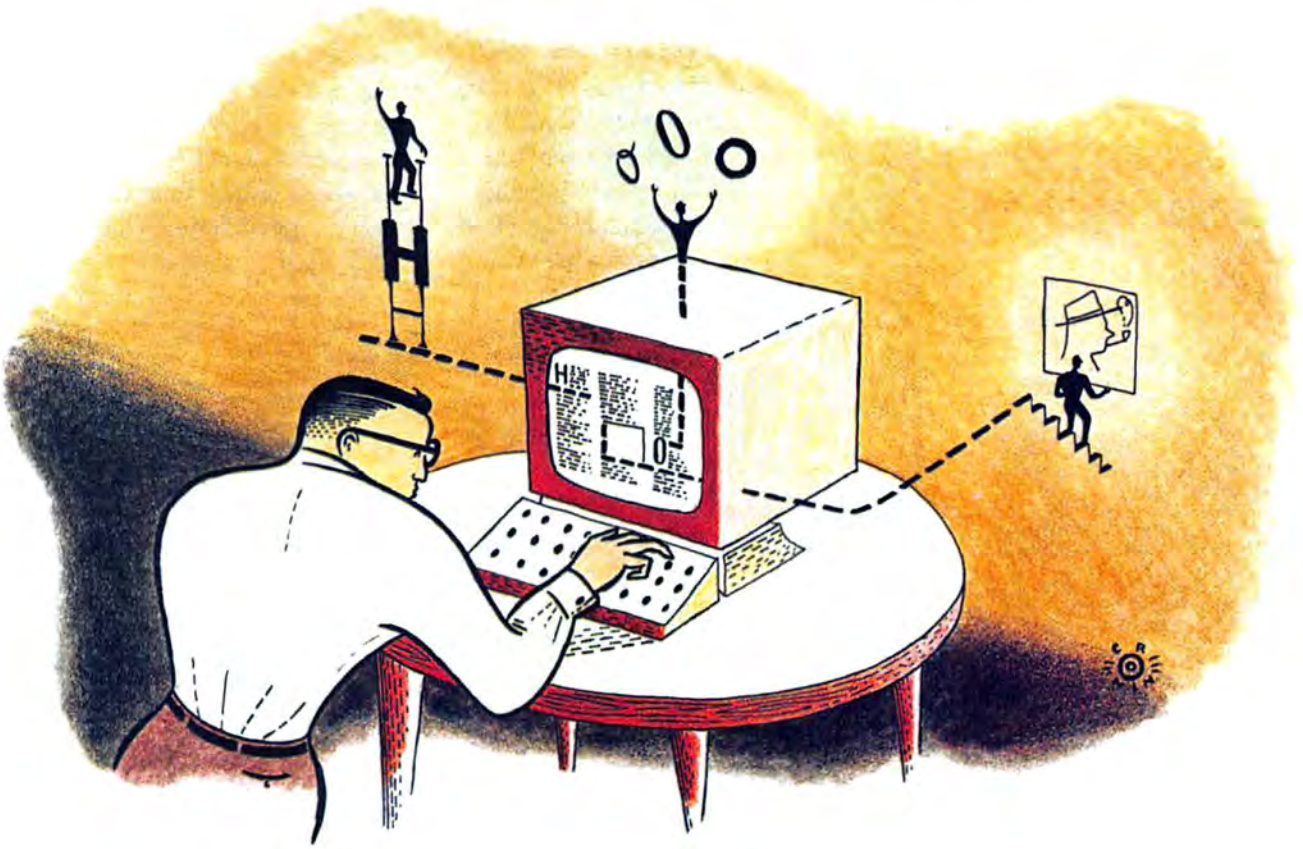
Ventura's ability to manipulate graphics has also been significantly improved. With version 1.0, you could crop only bit-mapped graphics. Now you can crop object graphics generated by any program, from *1-2-3* to *MacPaint.*

Many desktop publishing programs work only with costly PostScript printers or add LaserJet support as an afterthought. But *Ventura*'s laser ambitions are apparently unquenchable. The new program supports all PostScript- and LaserJet Plus-compatible printers and adds drivers for the Cordata and Interpress laser printers. Moreover, the PostScript and JLaser drivers are noticeably faster.

The new release also opens the door to more third-party fonts and streamlines the process of converting them. You can now transform fonts in LaserJet format for use with the AST TurboLaser, the JLaser board, the Xerox 4045, and the Cordata. If a font developer includes the necessary files, you can convert the fonts from *Ventura*'s menus. If not, you'll have to exit *Ventura* and go through a multiple-step process using utilities provided with the program.

The list of improvements continues: automatic shingling of 11-by-17-inch pages, support for a host of large-screen monitors, an adjustable zero point on the ruler (handy when working within a box), and enhanced automatic numbering.

(continues)



Brian Cronin

MicroCom Systems
OUTSTANDING SOFTWARE
For IBM PC's and Compatibles

$3.50 PER DISK
SMALL QUANTITIES

$3.00 PER DISK
FOR TEN OR MORE

$1 OFF 5 DISKS OR MORE WITH THIS COUPON

☐ **BUSINESS 1**—EZ-Forms business form generation, completion and printing program.
☐ **CAD 1**—Altamira, a 4 color object oriented drawing program. Color required.
[5] **COMM 4a,b,c,d,e**—(5 disks) RBBS Bulletin Board System 14.1D.
[2] **DATABASE 1a,b**—(2 disks) File Express menu driven general purpose database mngr.
☐ **EDUCATION 1**—Interactive DOS tutorial for new PC users. Makes learning DOS painless.
☐ **GAMES 1**—3-D PacMan, Kong, SpaceWar, JanitJoe, and more. Color required.
☐ **GAMES 2**—Qubert, Pango, Centipede, Monopoly, Zoarre, and more. Color required.
☐ **GAMES 3**—Blackjack (you set rules), Arm Chair QB, and Empire (War Game).
☐ **GAMES 4**—Castle, StarTrek, and the original Colossal Caves Adventure.
☐ **GAMES 5**—The Hack adventure game from the universities. Like Rogue, only more complex.
☐ **GAMES 6**—Pinball, Othello, Dragons, Sopwith (fly one), and more. Color required.
[2] **INFO 1a,b**—(2 disks) Cooking recipes database with keyword/ingredient retrieval.
☐ **LANGUAGE 5**—Turbo Pascal interactive debugger, pop-up help, formatters, et cetera.
☐ **LANGUAGE 7**—Complete Pascal interpreter/compiler. Great for learning Pascal!
☐ **ORGANIZER 1**—DeskMate, a Sidekick clone, and the Judy calendar program.
☐ **PINUP 2**—Provocative high res digitized graphics pinups. Graphics required.
☐ **PRINTER 1**—Font and sideways utilities, spoolers, banner makers, and more.
☐ **UTILITIES 1**—A collection of invaluable general purpose DOS utilities. A must!
☐ **UTILITIES 2**—More invaluable DOS utilities. Too many to list here!
☐ **UTILITIES 3**—A comprehensive set of debugging and diagnostic utilities.

PCW 9/87

NEW RELEASES/UPDATES

[2] **CAD 2a,b**—(2 disks) An advanced 2D/3D drafting prog. 640k and color required.
[2] **COMM 1a,b**—(2 disks) Version 2.4 of the ever-popular Qmodem comm. program.
[2] **COMM 2a,b**—(2 disks) Procomm 2.42, an excellent modem program with terminal emulation.
☐ **EDUCATION 2**—Learn the Presidents, States (and capitals) and more. Color required.
☐ **EDUCATION 5**—Learn Origami, the Japanese art of paper folding. Color required.
[2] **FINANCES 3a,b**—(2 disks) Express Calc 3.12, a powerful spreadsheet program.
☐ **GAMES 8**—Striker helicopter attack, and Risk, world domination. Color required.
☐ **GAMES 9**—EGARisk, the game of world domination in very high resolution. EGA required.
☐ **GAMES 10**—Solitaire, Teed-Off golfing, and Sailing in the Bermuda triangle. Color required.
☐ **GAMES 12**—MyChess (9 levels), Backgammon, and Wheel of Fortune. Color not required.
☐ **GRAPHICS 1**—Record and play back screen images! Excellent for demo, etc. Color required.
[2] **INFO 2a,b**—(2 disks) Zip-Phone, national areacode/ prefix to zip-code cross reference.
[2] **LANGUAGE 3a,b**—(2 disks) The A86 2.18 macro assembler and debugger.
☐ **SHELL 4**—Automenu and HDM II 4.04 hard disk menus. Create custom full-screen menus.
☐ **UTILITIES 5**—Utilities for formatting, parking, and optimizing hard disk drives.
☐ **UTILITIES 6**—Advanced utilities including Dpath, Esc, Hotdos, Resident program utilities.
☐ **UTILITIES 7**—More Advanced utilities including MasterKey (undeletes files from hard disks).
[2] **WORD 1a,b**—(2 disks) PC Write 2.71, a powerful word processing system, w/spell checker.

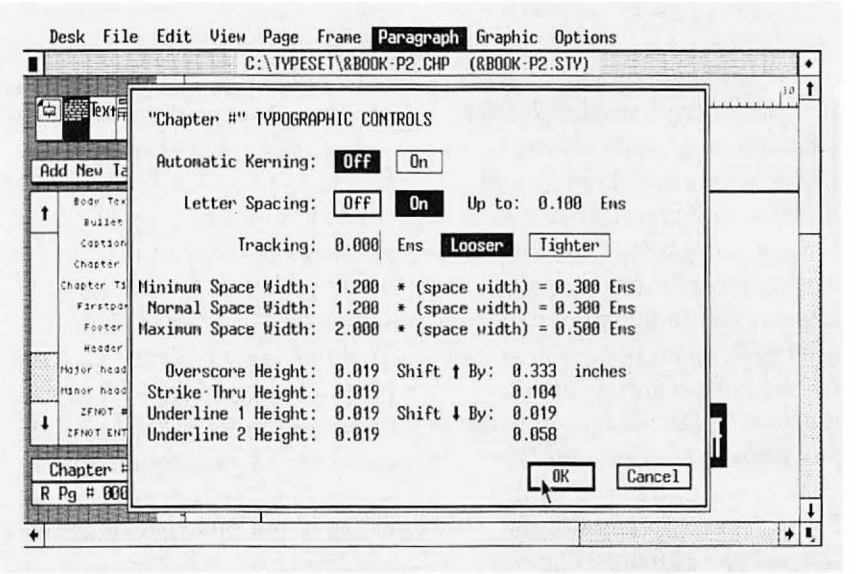
Catalog available, add $2. 3.5" format add $1/disk.

MicroCom Systems
P.O. Box 51657
Palo Alto, CA 94303

Cost of Items
Ship/Handling $1.00
CA Res. Tax
Total Enclosed

VISA

(415) 325-6500
M-F 7am-9pm
Sat-Sun 8am-5pm



Screen 1: Ventura Publisher's new typographic controls include automatic kerning; letterspacing for spaces within words; tracking; and minimum, maximum, and optimal space between words.

Version 1.1 also has a more extensive hyphenation algorithm than the fast but somewhat absentminded one in version 1.0. For the international market, hyphenation algorithms have been added for UK English, French, Italian, and Spanish. And multilingual desktop publishers can use two hyphenation utilities simultaneously, automatically hyphenating adjacent columns of English and French, for instance.

The biggest disappointment of version 1.1 is Xerox's continued refusal to extend users a helping hand. A printed tutorial and some sample preformatted documents are better than nothing, but they aren't much. Not only does *Ventura* lack context-sensitive help screens, it lacks a help facility, period. And on-screen blunders will cost you: Version 1.1 still doesn't have an undo command. Mastering *Ventura* is challenging enough, and the lack of help effectively bars many users from grasping the program's nuances. With version 1.1, *Ventura* has clearly strengthened its claim as the publishing program of choice for the features and speed crowd, but novices should approach with caution.
–Ted Nace

True BASIC 2.0

BASIC compiler

Pros: *Elegant, systematic language; powerful arithmetic and graphics capabilities*
Cons: *Not compatible with IBM BASIC; produces large .EXE files; expensive developer license*

(continues)

NEW

Eureka: The Solver™

Anyone and everyone who routinely works with equations needs Eureka: The Solver

It solves the most complex equations in seconds. Whether you're a scientist, engineer, financial analyst, student, teacher, or some other professional, you need Eureka: The Solver!

Any problem that can be expressed as a linear or non-linear equation can be solved with Eureka. Algebra, Trigonometry and Calculus problems are a snap.

Eureka: The Solver also handles maximization and minimization problems, does plot functions, generates reports, and saves you an incredible amount of time.

X+exp(X) = 10 solved instantly instead of eventually!

Imagine you have to "solve for X," where X + exp(X) = 10, and you don't have Eureka: The Solver. What you do have is a problem, because it's going to take a lot of time guessing at "X." Maybe your guesses get closer and closer to the right answer, but it's also getting closer and closer to midnight and you're doing it the hard way.

With Eureka: The Solver, there's no guessing, no dancing in the dark—you get the right answer, right now. (PS: X = 2.0705799, and Eureka solved that one in .4 of a second!)

System requirements

IBM PC, AT, XT, PS/2, Portable, 3270 or true compatibles. PC-DOS (MS-DOS) 2.0 and later. 384K.

How to use Eureka: The Solver

It's easy.

1. *Enter your equation into the full-screen editor*
2. *Select the "Solve" command*
3. *Look at the answer*
4. *You're done*

You can then tell Eureka to

- *Evaluate your solution*
- *Plot a graph*
- *Generate a report, then send the output to your printer, disk file or screen*
- *Or all of the above*

Eureka: The Solver includes

- ☑ *A full-screen editor*
- ☑ *Pull-down menus*
- ☑ *Context-sensitive Help*
- ☑ *On-screen calculator*
- ☑ *Automatic 8087 math co-processor chip support*
- ☑ *Powerful financial functions*
- ☑ *Built-in and user-defined math and financial functions*
- ☑ *Ability to generate reports complete with plots and lists*
- ☑ *Polynomial finder*
- ☑ *Inequality solutions*

Some of Eureka's key features

You can key in:

- ☑ *A formula or formulas*
- ☑ *A series of equations—and solve for all variables*
- ☑ *Constraints (like X has to be < or = 2)*
- ☑ *A function to plot*
- ☑ *Unit conversions*
- ☑ *Maximization and minimization problems*
- ☑ *Interest Rate/Present Value calculations*
- ☑ *Variables we call "What happens?," like "What happens if I change this variable to 21 and that variable to 27?"*

All this power for only $167.00!

Equation-solving used to be a mainframe problem, but we've solved that problem.

Eureka: The Solver is all you need—and it's yours for only $167.00!

That kind of savings you can calculate with your fingers!

Eureka: The Solver is a trademark of Borland International, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders. Copyright 1987 Borland International

BORLAND INTERNATIONAL

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

For the dealer nearest you or to order by phone call

(800)255-8008

in CA (800) 742-1133 in Canada (800) 237-1136

BI-1102C

Get more info. Go to Ad index.

IT'S TIME TO GET OUT OF THE DARK.

Open your eyes and see just how many subjects are covered in the new edition of the Consumer Information Catalog. It's free just for the asking and so are nearly half of the 200 federal publications described inside. Booklets on subjects like financial and career planning; eating right, exercising, and staying healthy; housing and child care; federal benefit programs. Just about everything you would need to know. Write today. We'll send you the latest edition of the Consumer Information Catalog, which is updated and published quarterly. It'll be a great help, you'll see. Just write:

Consumer
Information Center
Department TD
Pueblo, Colorado 81009

True BASIC: The Speedy Sort

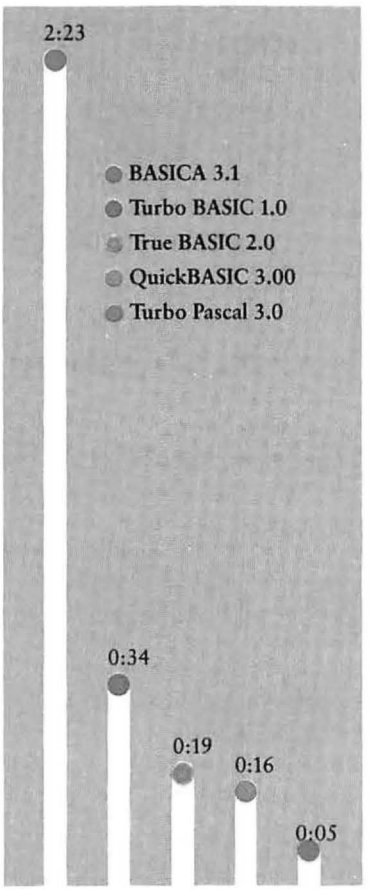


Figure 1: Though it uses intermediate code, True BASIC is nearly as fast as native-code compilers. In this selection sort test, the task was to sort into ascending order an array of 200 floating-point numbers initially in descending order. In BASICA, QuickBASIC, Turbo BASIC, and Turbo Pascal, array subscripts and loop counters were integers; in True BASIC, all numbers were of the same type.

Tests were performed on an IBM PC running at 4.77 MHz without an 8087. Times are in minutes:seconds.

True BASIC, Inc.
39 S. Main St.
Hanover, NH 03755
603/643-3882

List price: compiler $99.95, run-time utility $99.95, both $149.95; commercial-use license $350; BASICA program converter $49.95; Toolkits $49.95 each
Requirements: 192K, one disk drive, DOS 2.00 or later version
Not copy protected

True BASIC version 2.0 is the latest brainchild of John G. Kemeny and Thomas E. Kurtz, the Dartmouth professors who invented BASIC 23 years ago. An intermediate-code compiler, version 2.0 adds 8087 support, EGA and Hercules graphics, modular grouping of subroutines, and the ability to generate stand-alone .EXE files by using an optional run-time utility.

Version 2.0's strengths include powerful arithmetic and graphics functions and compatibility with compilers for the Amiga and Macintosh. Moreover, its performance is a tribute to efficient design. Though True BASIC creates intermediate code, which is interpreted at run time, its programs run as fast as those of native-code compilers (see Figure 1). Its accuracy with numeric variable types falls midway between other compilers' single and double precision (see Figure 2).

On the downside, True BASIC is not compatible with IBM's BASIC, produces bulky .EXE files, and is hampered by a misguided

(continues)

The New Standard In PC-Compatible Keyboards.

The Honeywell Silent-Tactile Series.

Now, you can touch the quality...

The latest in ergonomic design and silent-tactile feel is now available to you in Honeywell's ST Series keyboards. They all feature the same unsurpassed Honeywell quality OEMs have chosen for more than 25 years.

Now, when you need a PC-compatible keyboard for replacement or upgrade, you have a real choice. Ask for a Honeywell Silent-Tactile keyboard.

For the dealer nearest you, call toll free:
1-800-445-6939
In Texas call collect: 915-543-5566

Together, we can find the answers.

Honeywell

Keyboard Division, 4171 North Mesa, Building D, El Paso, Texas 79902 915/544-5511

Get more info. Go to Ad index.

QuickBASIC 3.00 double precision:	0.999999999999999
Turbo BASIC 1.0 double precision:	1.000000000000001
BASICA 3.1 double precision:	0.999999999999998
True BASIC 2.0:	1.000000000476630
Turbo BASIC 1.0 single precision:	0.999990701675415
QuickBASIC 3.00 single precision:	0.999985810000000
BASICA 3.1 single precision:	0.999985700000000

Figure 2: Not only is True BASIC 2.0 fast, it's accurate, falling midway between its competitors' single and double precision. The result of this numeric calculation (modified Savage benchmark with ATN, TAN, EXP, LOG, and SQR) should be 1.0.

pricing scheme. Since the company charges $350 for a commercial license, True BASIC will appeal mainly to students, engineers, and scientists who need to perform computations but aren't planning to produce software for distribution.

True BASIC's incompatibility with existing BASIC programs may seem unfortunate, but it is no accident. Faithful to the Dartmouth motto, "A Voice Crying in the Wilderness," Kemeny and Kurtz feel strongly that BASIC has become too complex. At last count, BASIC had nearly 200 kinds of statements, each with its own syntax.

True BASIC has fewer types of statements, and each type is more systematically designed. Open-ended statements such as SET, CALL, and OPTION let True BASIC's designers extend the language without complicating its syntax. More important, the language adheres to some industry standards—ANSI BASIC syntax and GKS graphics—which the microcomputer world has largely ignored. True BASIC is living proof that a simple, uniform language can be as powerful as BASIC and far easier to learn.

Strikingly easy to use, True BASIC offers a simple, full-screen editor with an adjustable command area; on-line help is readily available. Files are saved in standard ASCII format, so you can easily read programs and data files with any program editor or word processor.

Another of version 2.0's selling points is hardware independence. Most True BASIC programs can

(continues)

New FoxBASE+ 2.00

Blazing Speed
New Features
Easier to Use

Complete dBASE III PLUS Replacement . . . And Much More

Don't change your programs, databases, screens, or reports!
FoxBASE+ makes your dBASE applications run like lightning *without changing one line.* And you can still use the best parts of dBASE—great interactive features like EDIT and BROWSE *plus* the full power of the "dot-prompt." Use FoxBASE+ in exactly the same, familiar, user-friendly way you use dBASE.

30+ Major Enhancements

User-Defined Functions, screen save & restore, VALID clause in GET's, built-in "light-bar" menus, 10 new commands, 4 new functions, and *much* more.

Faster Than Fast

FoxBASE+ was already the fastest dBASE product in existence—but based on *independent* benchmarks,* new FoxBASE+ 2.00 averages 73% faster. That's an average 3.2 times faster than Clipper, 4.3 times faster than Quicksilver, and 5.9 times faster than dBASE III PLUS.

80386 Version Available NOW

For ultimate speed *now,* FoxBASE+/386 runs about 50% faster than standard FoxBASE+ 2.00—over 10 times faster in some operations. It takes full advantage of protected mode and the giant memory capacity of the 80386 chip *today* . . .yet runs under standard MS-DOS.

Easier To Use

Don't worry about memory configuration or size. New FoxBASE+ 2.00 *automatically* optimizes memory usage as it runs. . .requires less memory yet runs faster. And because FoxBASE+ is completely interactive, you don't have to waste hours compiling and linking your programs.

FoxBASE+ Is Economical

Best of all, single-user MS-DOS FoxBASE+ 2.00 costs just $395 and FoxBASE+/386 2.00 just $595. Multi-user versions are also available.** And with our Royalty-Free Runtime you can distribute your FoxBASE+ applications freely and never pay another dime.

FoxBASE+ runs on the new IBM Personal System/2 and 3.5″ diskettes are available at no additional cost.

So call (419) 874-0162 and ask for the details about FoxBASE+ 2.00 and our **money-back guarantee.** After all. . .

Nothing Runs Like a Fox.

FoxBASE

FoxBASE, FoxBASE+, and FoxBASE+/386 are trademarks of Fox Software. dBASE III PLUS is a trademark of Ashton-Tate. Clipper is a trademark of Nantucket. Quicksilver is a trademark of WordTech Systems. Personal System/2 is a trademark of IBM.

* Using the suite of 48 comprehensive benchmarks published in Data Based Advisor, March 1987.

** Multi-User FoxBASE+ 2.00 for MS-DOS costs $595. Multi-User XENIX version available at $795.

Fox Software
27493 Holiday Lane, Perrysburg, Ohio 43551
(419) 874-0162 Telex: 6503040827

Get more info. Go to Ad Index.

run unchanged on the PC, Amiga, and Macintosh. Graphics are handled the same way on any machine, and the programmer can define the coordinate system. You can use turtle graphics, your own Cartesian coordinate system, or even an optional 3-D graphics library. A program can define "pictures"–graphical procedures–and move or scale them for display.

Structured programming statements and constructs such as SUB, DO...LOOP, SELECT CASE, and IF...THEN...ENDIF make line numbers unnecessary. The use of GOTO and GOSUB statements is actively discouraged: If you use them, you must line-number the entire program, not just the lines referred to.

You can group subroutines into modules as in Modula-2. Recursion is permitted, making it possible to implement efficient sorting and tree-searching routines that are impossible in ordinary BASIC.

Surprisingly, there is only one numeric data type–floating point–similar to the double-precision variables of IBM's BASIC. Version 2.0 uses the 8087 coprocessor automatically if it is present, and supports error trapping, windowing, and even the Microsoft Mouse. An optional Developer's Toolkit lets you call any machine function available through DOS and BIOS calls and create pull-down menus. Other Toolkits (Mathematician's, Sorting, Communications, and Advanced String Library) offer multidigit arithmetic, buffered serial communications, and other functions.

Instead of translating source code directly into machine code, True BASIC produces B-code, which can be run only when True BASIC is loaded. The run-time utility transforms B-code into a stand-alone .EXE file, but such files are more than twice as large as those produced by QuickBASIC and Turbo BASIC (see *From the Software Shelf, PCW,* August 1987).

Although True BASIC's user manuals are readable and include numerous example programs,

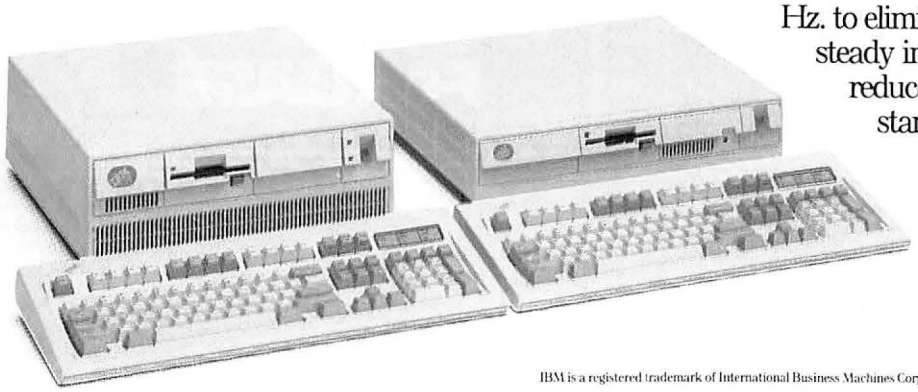
Big Blue introduced a new standard.

By now you've heard that Big Blue has introduced a new PC standard. Naturally, Amdek® is right on top of this technology.

Introducing our latest technical achievements–the Amdek 732 color and 432 monochrome monitors.

Sharper, cleaner text. Richer, more vibrant color. Vertical refresh as high as 70 Hz. to eliminate flicker and maintain a crisp, steady image. An anti-glare screen that reduces eye fatigue. And a tilt/swivel stand that prevents neck strain.

The 732 allows you to choose from a palette of over 256,000 colors. And the text switch delivers clear single color text for word processing.



IBM is a registered trademark of International Business Machines Corp. Personal System/2 is a trademark of International Business Machines Corp.

they'll give you double vision: The designers added a 65-page booklet instead of revising the 1.0 manual, so you have to hunt for information in two different places.

If the documentation is inconvenient, the pricing scheme is unacceptable. Instead of including the run-time utility with the program, the company charges an extra $50 for it, then extracts $350 for an unlimited license if you want to distribute your .EXE files commercially. The obvious intent is to charge those who can afford to pay, but the effect is to price True BASIC right out of the developer market. Who is going to shell out $500 for an excellent compiler when so many nearly excellent ones are priced under $100?

The education market is another story. Teachers both, Kemeny and Kurtz well know that True BASIC is ideal for classroom use and sell it to students for as little as $35 per copy. The only possible reason not to use it is that, unlike Pascal programming, True BASIC programming is not presently a salable skill.

If the run-time utility were included at no extra charge and there were no restrictions on its use, True BASIC would be a useful programming tool. As it is, the company's pricing policy virtually guarantees that this professional-quality language will never be used by professionals. *–Michael Covington and Melody Covington*

Eureka: The Solver

Equation solver

Pros: *Excellent, Turbo Pascal-style interface; free-form entry of problems; fast execution; wide selection of built-in functions*

Cons: *Limited to relatively small problems; inefficient solution method for linear programming problems*

Version 1.00
Borland Int'l
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
800/255-8008, 800/742-1133
California

(continues)

We can top that!

For the ultimate in monochrome, the 432 features a large 14-inch, flat-surface screen that actually displays larger type for easier viewing.

And because the Amdek 732 and 432 are compatible with IBM®'s new Personal System/2™ Video Graphics Array (VGA) and MultiColor Graphics Array (MCGA), the image of all your programs will look better than you've ever imagined.

At Amdek, we weren't content with just meeting the new standard.

Our goal was to exceed it!

AMDEK

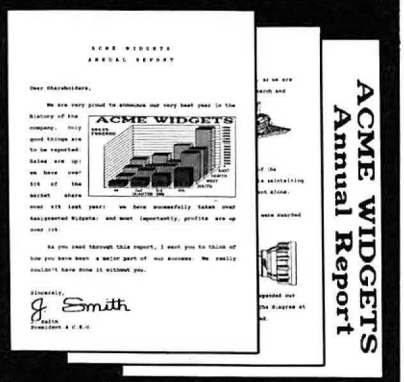
Clearly the finest in monitors.

1901 Zanker Road, San Jose, CA 95112 Phone: 800/PC-AMDEK FAX: 408/436-8187

Get more info. Go to Ad index.

INSET 2

Have you considered **desktop publishing** but didn't want to leave your wordprocessor? Then you need INSET!

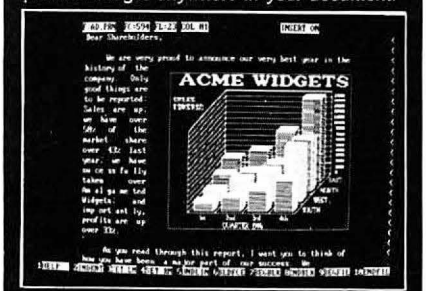


Text and graphics integration.

INSET is a memory resident program which will INSET screen images into your printouts. You can use screens captured from your own graphics package or...

...create your own graphics with INSET!

INSET has its own pop-up graphics features which allow you to create, place, resize and preview images anywhere in your document.



"Considering how completely INSET changes the basic nature of the output of standard application programs, the simplicity of the program itself is astonishing." —PC Week

"INSET can be highly recommended to anyone who needs to mix text and graphics in printed output." —LOTUS Magazine

INSET requires 95k memory.
Supports most laser and dot matrix printers.
Graphics boards supported are IBM CGA & EGA, Hercules, and AT&T DEB.

Works with LOTUS 1-2-3, Wordperfect, Wordstar, Multimate Advantage, Microsoft Word, OfficeWriter and most report generation software.

Introductory Price $99

30 day money back guarantee

INSET SYSTEMS

12 Mill Plain Rd
Danbury, CT 06811
Tel. 203-794-0396

For orders and information call
1-800-828-8088

Get more info. Go to Ad index.

List price: $167
Requirements: 384K, DOS 2.00 or later version
Not copy protected

When I was studying math in college, I used to dream about having a computer to solve those tiresome differentials and integrals the prof was always throwing at us. When I finally took my first FORTRAN course, I was bitterly disappointed to learn that the computer's inherent math abilities were roughly equivalent to those of my pocket calculator.

Eureka: The Solver is proof that software is getting smarter at math. Borland International's latest offering is part of an emerging class of equation solvers, led by *TK!Solver*, designed to help users find solutions to sets of algebraic and differential equations. *Eureka* won't magically transform your PC into a Cray supercomputer, but it makes solving–and understanding–mathematical problems a lot easier.

Suitable problems for *Eureka* might come from business (loan amortization, determination of the net present value of a series of investments), economics (analysis of income distribution, calculation of consumers' surplus), statistics (calculation of least-squares fits, determination of probabilities), engineering (heat-flow analysis, production scheduling), plus mathematics, physics, chemistry, or any other discipline that uses the tools of mathematical analysis.

Eureka sports the Borland interface familiar to fans of Turbo Pascal and Turbo BASIC. The opening screen is divided into four windows (Edit, Solution, Report, and Verify) with a command line across the top (see Screen 2). To describe a problem, you select Edit from the command line, then type in the problem as one or more free-form statements, using the Edit window's *WordStar*-like editor. You can liberally sprinkle the problem statements with comments prefaced with semicolons or enclosed within brackets.

When the mathematical model has been specified to your satisfaction, press <Esc> to leave the Edit window, then turn *Eureka* loose by selecting Solution. A Progress window immediately pops up to give you a blow-by-blow account of the solution process, showing the elapsed time in seconds and the status of the solution at each step. (For many problems *Eureka* is so fast you'll never see the Progress window at all.) As soon as *Eureka* finds a solution, a summary appears in the Solution window. As with most of *Eureka*'s windows, you can move and size the window or annotate the data in it.

After the solution has been found, you can verify it, plot or list a function, and send a report summarizing the solution (including the results of your verification, plot, and list) to the Report window, to your printer, or to a disk file. *Eureka* uses text characters to create plots, so charts can be generated on a monochrome display and easily included in word processed reports.

(continues)

Boeing Calc. The next step.

Boeing® Calc is the next logical step in spreadsheet evolution. It's a unique program that lets you build related spreadsheets as separate pages within a single file.

The result: quick, accurate consolidations between pages automatically even if the pages are formatted differently. *Business Software* magazine says that once you try this faster, more efficient spreadsheet you'll never go back to your old one.

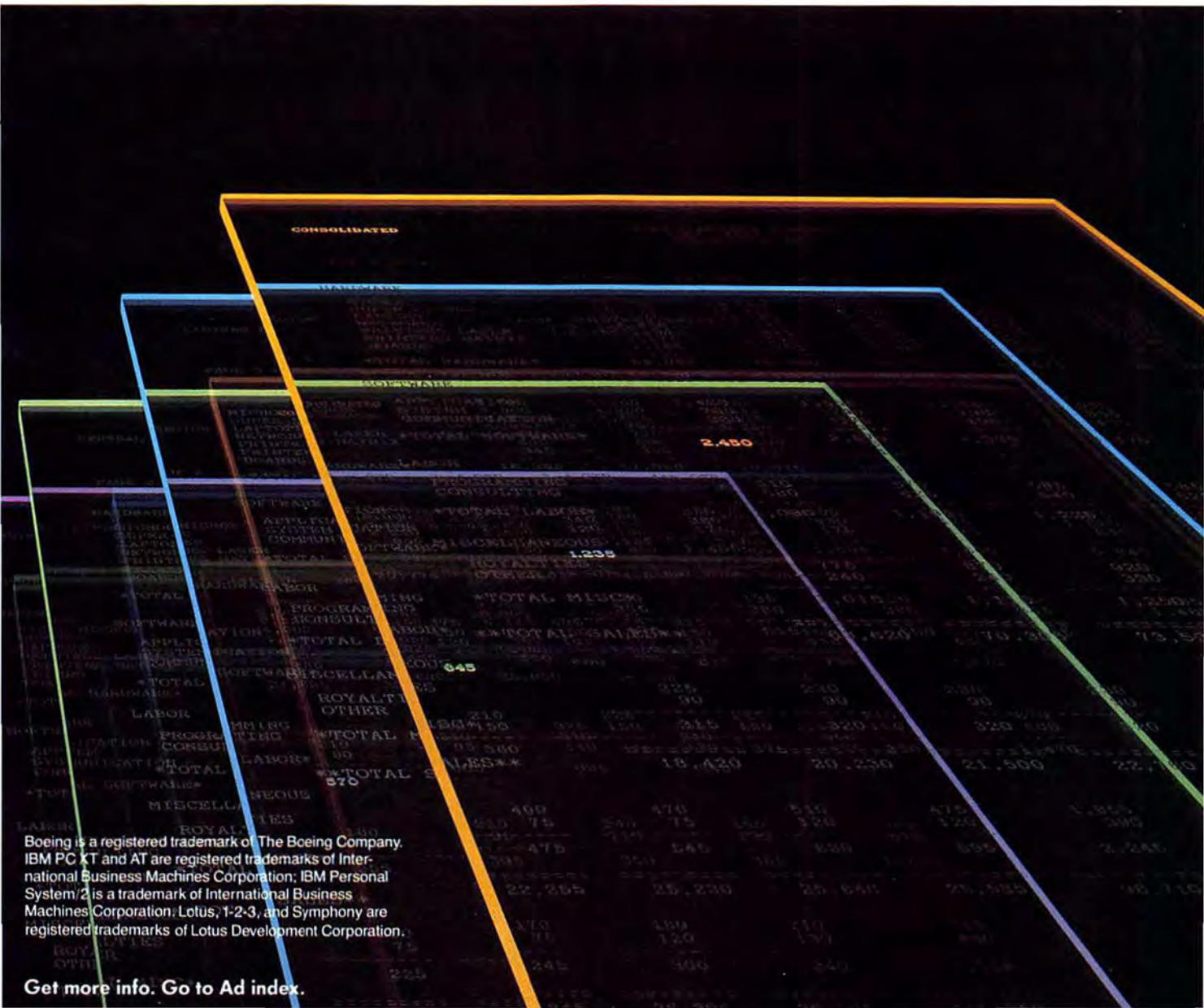
And you won't exceed memory limits or need expensive expansion boards for your IBM PC XT,® AT,® Personal System/2™ or compatible. Boeing Calc memory management techniques let you use its 16,000 rows, columns and pages to create files as large as 32 MB.

The multi-user version supports Local Area Networks. As many as 32 users can access the same spreadsheet at the same time, with separate security levels for each. Right down to the cell. The system administrator has full control and can match task and security requirements to each user.

You can automatically import 1-2-3® and Symphony® files directly — formulas, macros and all. Boeing Calc's command structure works like Lotus® and permits you to move quickly to its more efficient command option.

For a demo diskette and the name of the nearest dealer, call 1-800-368-4555. Or write Boeing Computer Services, P.O. Box 24346, M/S 7W-05, Seattle, WA 98124-0346.

BOEING



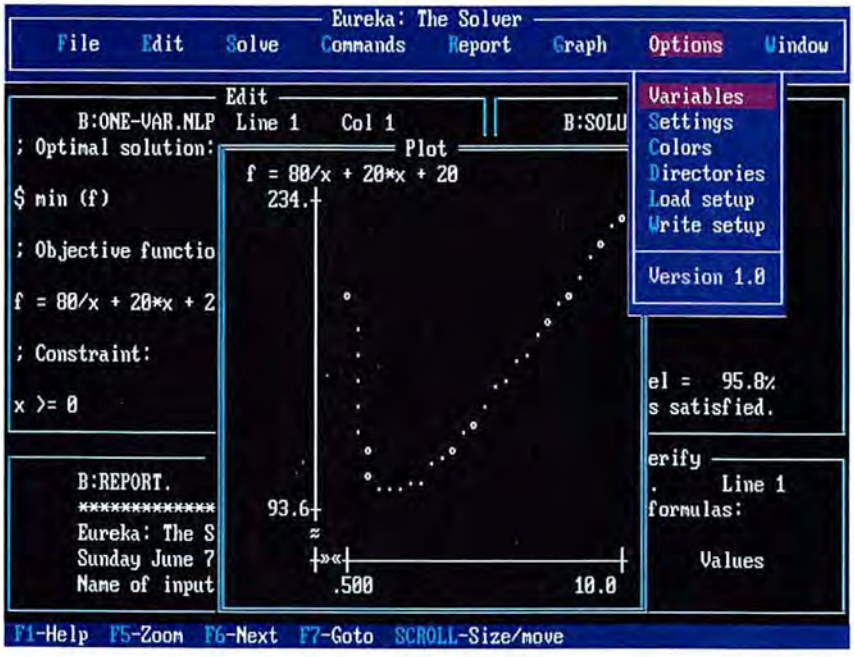
Boeing is a registered trademark of The Boeing Company. IBM PC XT and AT are registered trademarks of International Business Machines Corporation; IBM Personal System/2 is a trademark of International Business Machines Corporation; Lotus, 1-2-3, and Symphony are registered trademarks of Lotus Development Corporation.

Get more info. Go to Ad index.

To help keep problems down to a manageable size, *Eureka* includes 29 built-in functions, such as pval(), which calculates the present value of a stream of equal periodic payments, and integ(), which numerically evaluates the integral of a function with respect to a specified variable. Illustrated by 15 examples (with corresponding files on the disk packaged with the manual), such functions can help you solve in a few minutes problems that might take hours with conventional methods.

Eureka is a great idea, nicely executed, but it isn't the final answer in the numbers game. Problem statements are limited to ten user-defined functions, and while this is probably enough for problems involving nonlinear functions or differential equations, it won't do for complex practical business problems. Nor does *Eureka* offer an algorithm geared to linear programming problems, such as business production planning.

Finally, *Eureka* is much too expensive for the audience that would benefit most from a good equation solver: university students. If it cost $40, *Eureka* would be a runaway best-seller on campus. At $167, its market will be limited to financial analysts, engineers, scientists, businesspeople—and parents who want to give their university-bound offspring an outstanding equation-solving program. *–Dennis Dykstra*



Screen 2: In this display, Eureka's four primary windows (Edit, Solution, Report, and Verify) are partially hidden behind the Plot window, in which values of the function f = 80/x + 20*x + 20 have been plotted for values of x between 0.5 and 10.

Opt-Tech Sort

DOS sort utility

Pros: *Sorts large data files fast; interfaces with many languages; sorts files of any size*
Cons: *Expensive*

Version 3.0
Opt-Tech Data Processing
P.O. Box 678
Zephyr Cove, NV 89448
702/588-3737

List price: $149
Requirements: 64K, DOS 2.00 or later version
Not copy protected

When you're competing with dozens of free and dirt-cheap public-domain utilities that sort data files, you'd better have a great product if you want to stay aloft. *Opt-Tech Sort* is like a jumbo jet: It's fast, has enormous capacity, and flies all the popular routes.

Opt-Tech Sort recognizes a tremendous number of data and file types and will save a sort to disk in the supported format. The number of fields is unlimited, but the program can sort only to ten levels. It's a must for anyone who needs to sort a mailing list, a parts inventory, or practically any size data file. Although the program costs $149, Opt-Tech Data Processing has sold thousands of copies all over the world.

The roster of file and data types supported by *Opt-Tech* reads like a *Who's Who* of data processing. Supported file types include B-trieve, Indexed COBOL, Relative

(continues)

Winner of the PC MAGAZINE EDITORS' CHOICE for Backup Software!

End your backup nightmares.

With CORE*fast*™ backup software.

- *Simple*— Backs up an entire disk using only 5 keystrokes.
- *Fast*— Fills a 360KB floppy in 17 seconds; a 720KB, 3 1/2" floppy in 34 seconds; or a 1.2MB floppy in only 28 seconds *(a full 10MB in only 8 minutes).*
- *Reliable*— Advanced Error Checking protects data against damaged floppies and accidental loss.
- *Flexible*— Operates from command line *or* easy-to-use menu.

"an unbeatable combination of virtues: speed, versatility, and reliability."
—PC Magazine

"CORE*fast offers more flexibility, and therefore more value, than Fastback."*
—InfoWorld

- *Powerful*— Easy file management to view, copy, rename, and delete files and directories.
- *Compatible*— Backs up Novell Netware *(even hidden files)*and works on IBM's PC, PC-XT, PC-AT, the new Personal System/2, and compatibles.
- *Complete*— Can backup on any DOS device *(diskette, hard disk, tape, removables, etc.).*

Call us direct or see your CORE Authorized Dealer for details.

CORE INTERNATIONAL
7171 N. Federal Highway
Boca Raton, FL 33431
305/997-6099

Get more info. Go to Ad index.

Copyright 1987 CORE International, Inc.

COBOL, *dBASE III,* tab compressed, and FORTRAN unformatted. Data base types comprise character (ASCII), signed binary integer, trailing signed ASCII, IEEE floating point, Borland reals (both 6- and 10-byte formats), and zoned decimal. If you don't see what you need, just call; the company is eager to add new language, file, and data types when demand warrants, and I can prove it.

I once needed to sort a list of dates entered in a worksheet in 10 NOV 1986 format. The numbers presented no problem, but even using *Opt-Tech Sort*'s alternate-collating sequence option (which lets you define the order of a single character field), I couldn't work out a scheme to sort the month abbreviations in the proper order. When I called Opt-Tech for suggestions, the technician said he would make three-character months a user-defined data type the next time he worked on that section of the program. Within a week I got an updated version that sorted months in order. IBM, Microsoft, Lotus, take note: That's customer service.

Opt-Tech Sort is installed by copying a 27K file to a hard or floppy disk. The user interface is quite friendly: The program prompts you to enter an input file name, an output file name (which can be the same), and a control statement telling *Opt-Tech* how to order the records. Mainframe veterans will find the control statement syntax familiar: beginning position, length of field, type of data, and either ascending (0-9, A-Z) or descending (Z-A, 9-0) order. Thus the control to sort character data in three fields might be S(30,15,CH,A,10,12,CH,A,23,1,CH,A). The control statement may be typed directly from the keyboard or issued by a batch file.

Opt-Tech can run as a standalone DOS utility (just like the DOS SORT filter), be included in a batch file to sort a file or group of files automatically, or be embedded within a program as a subroutine call. In this last role *Opt-Tech* really shines; it interfaces with far more languages than any other sort program, including Computer Control Systems' *AutoSort* and Microsoft's program for COBOL users, *Sort.* At last count *Opt-Tech* supported 30 languages, including IBM BASIC (interpreted and compiled), Better BASIC, Microsoft QuickBASIC, True BASIC, CBASIC86, Lattice C, Mark Williams C, Microsoft C, five versions of COBOL, four versions of FORTRAN, three versions of Pascal, and *dBASE III.*

File handling is another *Opt-Tech* forte. The number of files that can be concatenated on input is unlimited, the maximum number of records that can be sorted is limited only by disk space, and the maximum record length is more than 5000 characters. *Opt-Tech* is designed to use all available memory up to 640K; when a file won't fit completely into memory, the program bites off 400K and 500K chunks for fast processing.

For example, *Opt-Tech* whipped through a file of 1000 80-character records in 24 seconds on a 512K dual-floppy PC, in 11 seconds on a molasses-slow hard disk XT, and in a mere 5 seconds on a 640K, 6-MHz AT. On the same AT, *Opt-Tech* sorted a 4MB file of 50,000 records in 5 minutes, 8 seconds. (All times include reading from disk, sorting, and writing the file back to disk.)

Opt-Tech gives you every feature you could ever want in a sort program. There are options to include and omit records, bypass header records, create an output file of record addresses, limit the number of records, and build new output records from fields on the input record. The 100-page manual is clearly organized and has at least one working example for each language and option.

With its wide variety of features and compatibilities, *Opt-Tech Sort* is a remarkable sort program, the only one you'll ever need to buy. At $149, that's just as well. *–Donald B. Trivette*

Glyphix

Font creation program

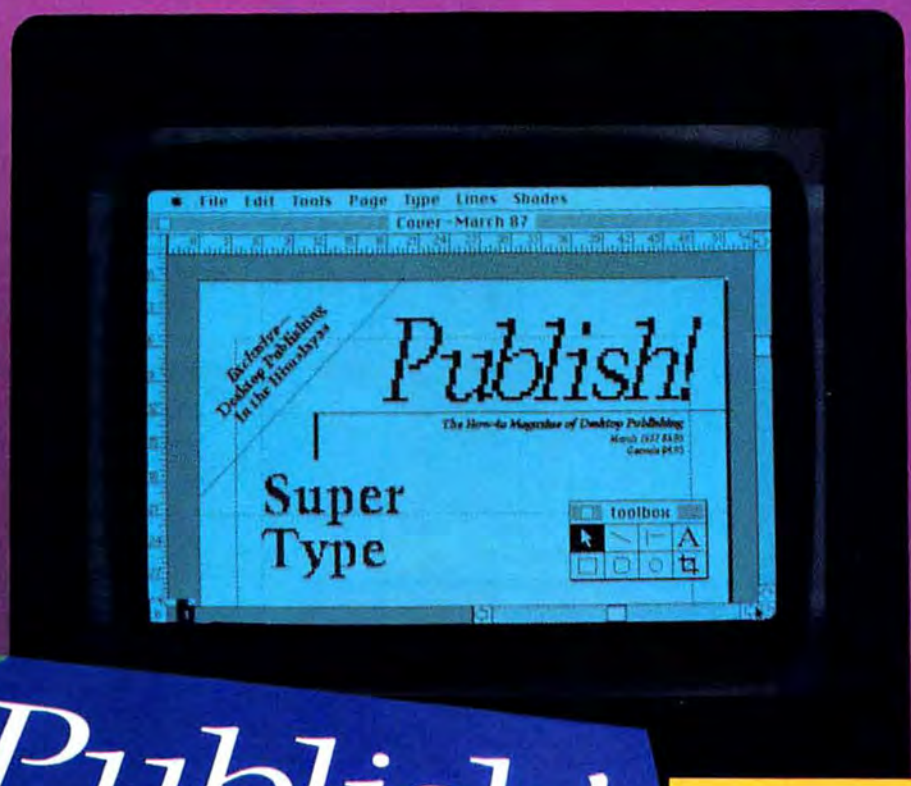
Pros: *Generates type of any size up to 60 points; provides instant test print*

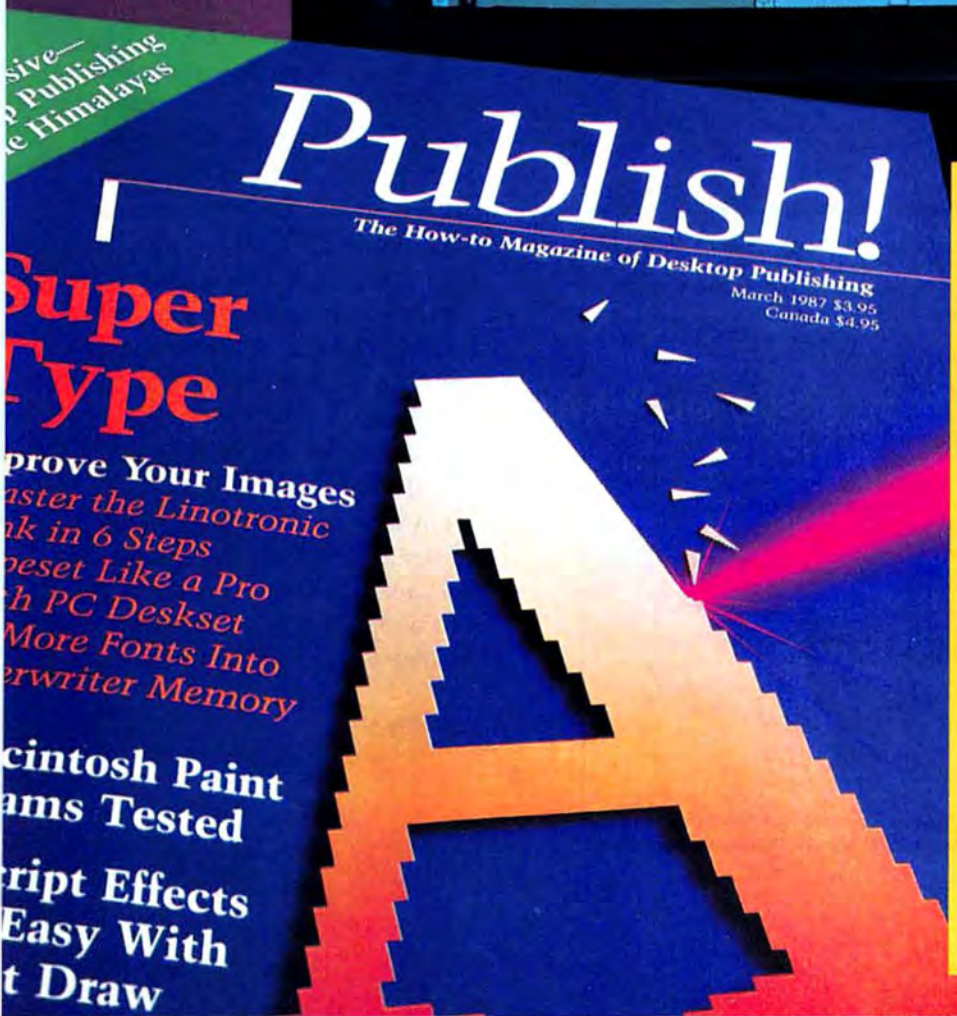
Cons: *Unsuited for producing small type*

Version 1.0
SWFTE Int'l
P.O. Box 219
Rockland, DE 19732
302/658-1123

(continues)

WHAT YOU SEE IS WHAT YOU GET





Subscribe Now and Save 40%

Become a Charter Publish! Subscriber and Here's What You'll Get—

***Reviews**—The largest selection of software and hardware product reviews available in any desktop publishing magazine.*

***Product News**—Information on the latest technology for all your desktop publishing applications. Hundreds of new product listings.*

***Solutions**—Step-by-step instructions that find answers to all your publishing needs.*

***Applications**—Tips on the fundamentals of graphic design and publishing basics.*

***Design Features**—Well known designers provide creative ideas and concepts for page makeovers.*

All this and more is yours in Publish! every month when you subscribe today at the Special Low Charter Subscription Rate.

Canon introduces MORE.
More easy-to-use features.
More advanced technology.
More productivity.

LBP-8II

Canon
LASER BEAM PRINTER

Canon U.S.A., Inc., Printer Division
One Canon Plaza, Lake Success, NY 11042

©1987 Canon U.S.A., Inc.

Get more info. Go to Ad index.

COPY II® PC OPTION BOARD

AN ALMOST FOOLPROOF WAY TO MAKE ARCHIVAL BACKUPS OF PROTECTED SOFTWARE!

The Copy II PC Option Board is an easy-to-use add-in board that will give your PC the same disk duplication technology used by most disk duplication firms (who put the copy protection on software in the first place).

DUPLICATES NEARLY ALL PROTECTED DISKETTES.

The Option Board can easily backup almost all protected diskettes for the IBM PC, including ones software-only backup programs can't touch. It even includes a track editor that will allow the more technically inclined to look at protection schemes and edit any data on a diskette.

The Option Board uses a half-size slot in an IBM PC, XT or AT, Heath/Zenith 150, 151, 158, Compaq Deskpro. Requires: 1 360KB drive, 256K memory. Extra $15 cable required for Compaq Portable, HP Vectra and Tandy 1000.

Call 503/244-5782, M—F, 8—5 (West Coast time) with your VISA in hand. Or send a check for $95.00 U.S. plus $3 s/h, $15 overseas. Please specify your computer brand when ordering so we can send you the correct cable.

$95.00

Central Point Software, Inc.
9700 S.W. Capitol Hwy., #100
Portland, OR 97219

Central Point Software INCORPORATED

Backup utilities also available for the Macintosh, Apple II, Commodore 64/128 and Atari ST.

Get more info. Go to Ad Index.

List price: with one typeface $49.95, with four typefaces $99.95; each additional typeface $24.95
Requirements: 64K, DOS 2.00 or later version
Not copy protected

Five minutes and 50 bucks—that's what you'll have to invest to create and test a font using *Glyphix*, a new font generator for the HP LaserJet Plus and Series II.

Glyphix fills a large-size gap in the LaserJet downloadable-font world. Because the LaserJet Plus couldn't produce type beyond 30 points, no one bothered to develop larger fonts. The LaserJet Series II broke the 30-point barrier, and with *Glyphix*, anyone with a Series II can print headlines and titles that command attention.

In the past, creating a font for the LaserJet meant hours of painstaking dot-by-dot work with a font-editing program. You drew the characters using an on-screen grid where each cell represented a single dot in the laser printer's 300-by-300 matrix. The font companies ignored the far more flexible technique of generating font bit maps from outlines, much in the manner of the PostScript page description language built into the Apple LaserWriter.

The creators of *Glyphix* rightly felt the grid method was insane and decided to borrow some of the PostScript magic. Instead of prolonged eyestrain, *Glyphix*

(continues)

gives you master typeface outlines that you can quickly manipulate to get exactly the results you want.

The program works on any computer with at least 256K of RAM. No installation is required; just type GLYPHIX from the DOS prompt, and the program's control screen pops into view.

Glyphix works like a police artist: It shows you a sketch, and you supply the details. First, you select a typeface to use as a template. A Helvetica-style typeface comes with the program, and three additional styles (similar to Times Roman, Century Schoolbook, and Optima) are available at $24.95 each. *Glyphix* then modifies the typeface according to your wishes. A menu on the right side of the screen lists the available parameters: orientation, size, expansion (for creating extra-wide or compressed type), weight, fill pattern, and degree of slant.

The most crucial parameter is obviously size, which can climb to 60 points. Next comes the expansion ratio, which lets you compress each character in the font to as little as one-quarter the normal horizontal space or expand it to four times normal. Weight control ranges from −5 (for very light type) to 9 (for very heavy type). The default is 0, which produces normal type.

Using the fill pattern option, you can put a decorative spin on workaday typefaces like Helvetica. *Glyphix*'s fill patterns include

(continues)

Canon introduces LESS.
Less hassle.
Less maintenance.
Less bulk on your desk.
Best of all, less cost.

LBP-8II
Canon
LASER BEAM PRINTER
Printouts that stand out.
Enjoy easy extended payments with the Canon Credit Card. Ask for details at participating Canon dealers and retailers. Available only in U.S.
For more information, call 1-800-453-3307. In Utah, 1-800-662-2500.
Get more info. Go to Ad index.

Attention all FX80, FX100, JX, RX, & MX owners:
You already own half of a great printer
Now Only $79.95

Now for $79.95 you can own the rest. You see, today's new dot matrix printers offer a lot more.
Like an NLQ mode that makes their letters print almost as sharp as a daisy wheel. And mode switching at the touch of a button in over 160 styles. But now, a Dots-Perfect upgrade kit will make your printer work like the new models in minutes— at a fraction of their cost.
And FX, JX and MX models will print the IBM character set, too.
So, call now and use your Visa, MasterCard, or AmerEx. Don't replace your printer, upgrade it!
1-800-368-7737
(Anywhere in the United States or Canada)
Sample of letter with Dots-Perfect
Dots-Perfect™
Dresselhaus
Sample of letter without Dots-Perfect

8560 Vineyard Ave., Ste. 405, Rancho Cucamonga, CA 91730
(714) 945-5600
IBM is a registered trademark of International Business Machines Corp.
Epson is a registered trademark of Epson America, Inc.
An upgrade kit for EPSON FX, JX, RX, & MX printers
Get more info. Go to Ad index.

Available on 3½" Disks
Certified to run on all models of IBM Personal System/2™

Peachtree Complete Accounting for Just $199

Everyone's Asking How Can We Do It?

When you reduce the price of an 8-package accounting system from $4,800 (or $600 a module) to $199 for the complete set, people are bound to ask questions. Here are some of the most popular ones we're hearing at Peachtree:

Q. How can we afford to sell Peachtree Complete at such a low price?

A. We've reduced our costs without reducing product features. Peachtree Complete has been repackaged into one set that includes more thorough and better organized user instructions. We've also streamlined order processing and reduced overhead. It is faster and easier to buy our product.

Peachtree has long been the first name in accounting software, so we've had time to completely amortize our original development costs plus make over 100 major additions. These enhancements include multi-company capability, menu driven installation and removal of copy protection. Consequently, you're getting a proven product at a better price.

We also "unbundled" support (so you only pay for what you need when calling our toll-free technical support hotline) and established a network of local dealers to serve as Independent Peachtree Support Centers.

Q. What does Peachtree Complete include?

A. 1. Eight Integrated Software Modules:

- General Ledger
- Accounts Receivable
- Sales Invoicing
- Accounts Payable
- Inventory Control
- Fixed Assets
- Job Cost
- Payroll

2. An Installation Guide to lead you step by step through our simple installation procedure.
3. An Accounting Primer, written for Peachtree users by an industry expert, to explain accounting concepts.
4. Tutorials on each module with sample data to make learning easier.
5. A complete Reference Library with detailed instructions in plain English on all software functions.

Q. Is Peachtree Complete really the same product that used to sell for $600 per module?

A. Peachtree Complete is basically the same accounting system that both Peachtree and IBM sold for about $5,000 but with substantial improvements in function and presentation.

With more than 150,000 users to its credit, Peachtree Complete has been the PC World Class Winner in its category for two of the last three years.

Q. What's the difference between Peachtree Complete and the $69.95 systems?

A. Peachtree's system is called Complete because it contains the eight most needed accounting packages (including payroll) and all reference materials for one price. Remember, it was designed as a $4,800 accounting software system.

The $69.95 systems, on the other hand, are incomplete. They were designed to sell for $69.95 and require the purchase of additional modules to be comparable—payroll, $49.95 more; tutorials, $19.95 each; etc. Everything is a la carte.

Q. How soon will I outgrow the system?

A. Peachtree Complete handles revenues up to $21,000,000, so only the largest companies will outgrow the system. The ability to process data for an unlimited number of companies is one of the system's biggest selling points.

An optional multi-user module soon to be available allows Peachtree Complete to be installed in a Local Area Network. And Peachtree Data Query, for just $199, lets you quickly transfer your accounting data to many popular spreadsheets and databases, as well as produce custom reports.

Q. What if I'm not satisfied with Peachtree Complete?

A. When you purchase Peachtree Complete directly from Peachtree Software, you're protected with a 30-Day Money Back Guarantee (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded.*

InfoWorld Report Card

"Superb value, easy to use, good manuals...We rate Peachtree's Complete Business Accounting System an excellent value."

—Richard Morochove, *InfoWorld* Review Board.

New!

Forms Direct from Peachtree

Enjoy the convenience and economy of buying your accounting forms direct from Peachtree Software. Guaranteed compatibility. **Call 1-800-553-6485** to order forms.

Compare Feature for Feature:

General Ledger
- Predefined and 25,000 user-defined Chart of Accounts
- Repeating journal entries
- Control report audit trail

Accounts Receivable/Invoicing
- Open item or balance forward customers
- Up to 12,000 customers
- Simultaneous updating of Inventory and A/R data files at time of invoice entry

Accounts Payable
- Selection of invoices for payment based on user-defined discount & due dates
- Up to 14,000 vendors
- Cash requirements forecasting by due date
- Checks printed with detailed stub listing invoices paid

Inventory
- Supports average, last purchase and standard costing methods
- Up to 21,000 inventory items
- Automatic pricing with 3 levels for each item

Fixed Assets
- 5 property and 8 asset classification categories
- 5 different methods of figuring depreciation

Job Cost
- Tracks cost and profitability on a job-by-job basis
- Compares estimated costs with actual costs for specific tasks

Payroll
- Built-in current year federal, state, city and county tax tables for all 50 states.
- Automatic federal, state, city and county withholding calculations
- Supports hourly, salaried, commission or draw-against-commission pay types
- Processes up to 3,900 employees
- Updates published regularly by Peachtree Software

Requires MS-DOS/PC-DOS version 2.0 or higher with 128K of RAM. For use with the IBM® PC, PC XT, PC AT and compatibles, and Personal System/2. IBM is a registered trademark and Personal System/2 is a trademark of International Business Machines.
*A $20 restocking fee will apply if disk bag is opened.

Call Now to Order or for a Dealer Near You

1-800-247-3224

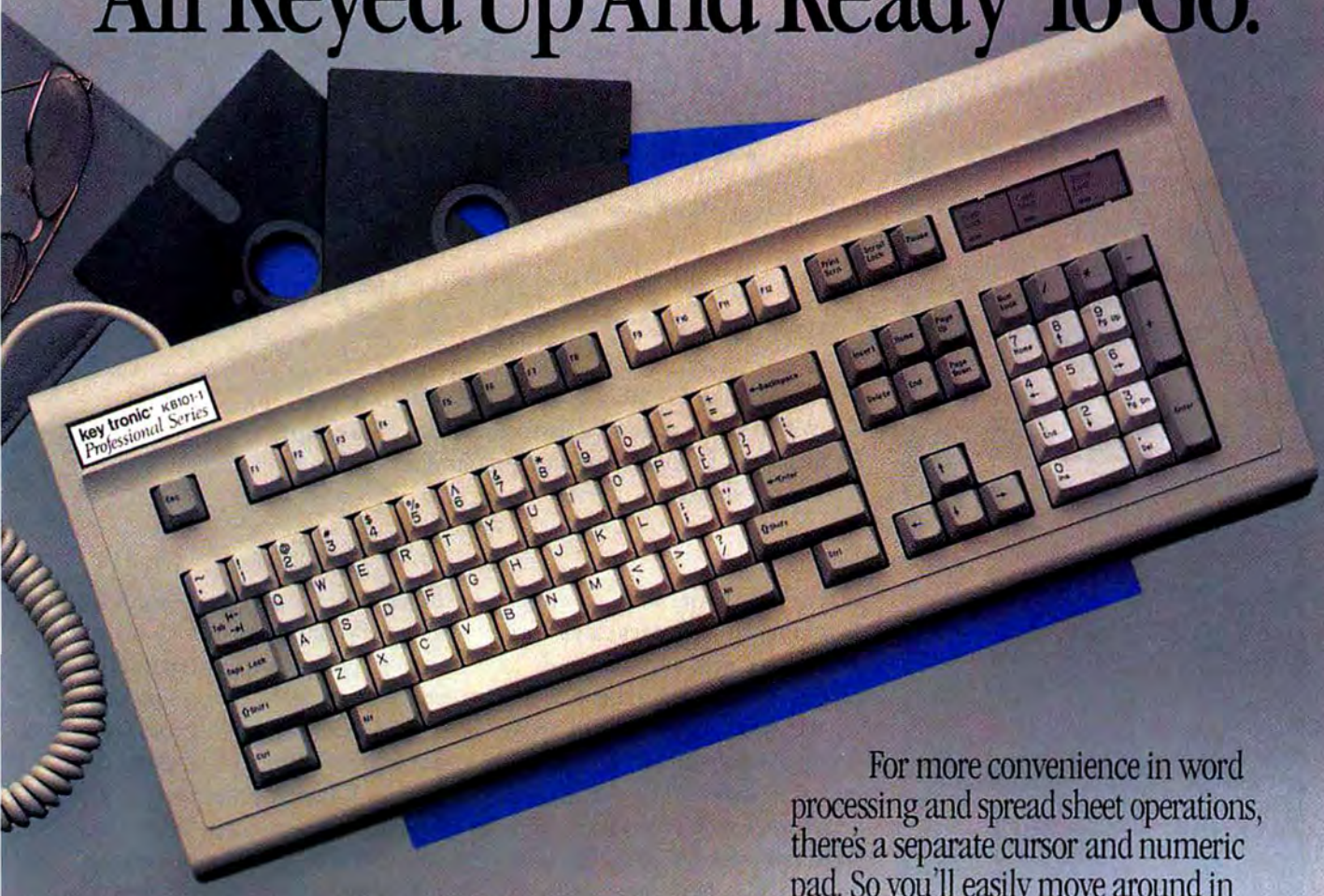
In Georgia, call 1-404-564-5800

To Order By Mail Send $199 plus $12.50 Shipping to:

Peachtree Software

4355 Shackleford Road, Dept. PCW-09, Norcross, GA 30093

Introducing The Key Tronic 101. All Keyed Up And Ready To Go.



Now there's a 101 style keyboard that's so reliable we back it with a three-year warranty. The KB 101™ has the enhancements you want *and* the quality that has made Key Tronic the world's leading manufacturer of keyboards. Best of all, it's immediately available through your favorite dealer for less than $160.

The KB 101 works with standard and enhanced PCs, XTs, ATs and most compatibles. That's why it's the perfect choice for organizations who want to standardize on one board.

For more convenience in word processing and spread sheet operations, there's a separate cursor and numeric pad. So you'll easily move around in your document and enter figures with new speed and accuracy.

Backed by a three-year warranty

See your Key Tronic dealer today. Or, for the source in your area, call 1-800-262-6006 between 7:00 AM and 3:00 PM Pacific daylight time. In Washington state, call (509) 927-5515.

key tronic

The Responsive Input Company

P. O. Box 14687, Spokane, WA 99214, USA
TWX 510 773 1885

Get more info. Go to Ad index.

Now
CopyWrite
backs up copy-protected software
and ...
runs it from a hard drive

Get the protection of CopyWrite, the utility that backs-up hundreds of copy-protected business and educational programs, plus the convenience of ZeroDisk, the program that runs most leading titles from a hard drive; all for the regular CopyWrite price of $50.00 U.S.

For credit card orders; call
(416) 961-8243
or return coupon below

Trade-in older versions of CopyWrite & ZeroDisk for $18.00 U.S., by returning the original diskette to Quaid Software Limited.

System requirements are an IBM PC, XT or AT, 128k or more of memory and at least 1 diskette drive.
CopyWrite is not for use in producing copies for sale or trade.

CopyWrite $50.00 U.S. $ _____
Revision $18.00 U.S. $ _____ *
* Revision orders must be accompanied by the original CopyWrite or ZeroDisk diskette)
☐ Check ☐ Money Order
☐ AMEX ☐ VISA ☐ MASTERCARD
Card No _____
Expiry Date _____
Name _____
Company _____
Address _____
City _____
State _____ Zip _____
Signature _____

45 Charles Street East
Third Floor, Dept. 223
Toronto, Ontario M4Y 1S2
(416) 961-8243
Quaid Software Limited

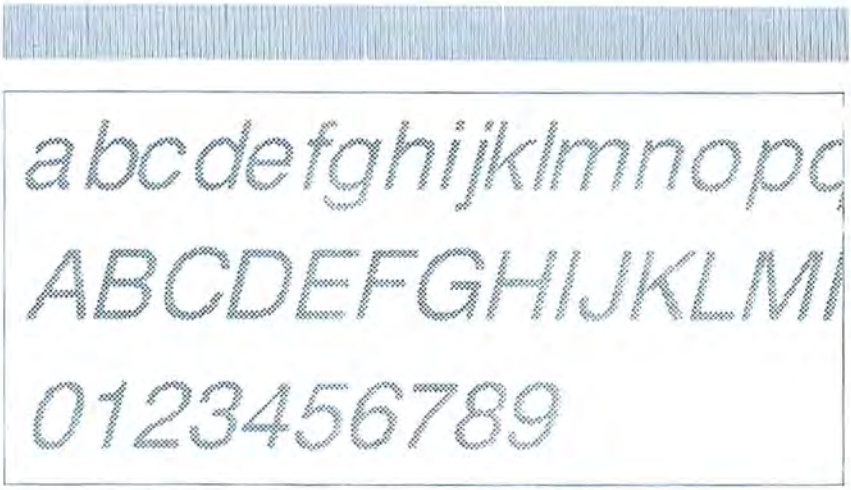


Figure 3: With Glyphix as the fairy godmother, a Helvetica Cinderella is transformed into a 36-point beauty with stylish cross-hatching and a ravishing 15-degree slant.

black; five shades of gray; cross-hatching; tiny squares; and horizontal, vertical, and diagonal stripes. Finally, the slant parameter lets you specify a tilt of up to 25 degrees, an effect typographers call obliquing.

Glyphix won't let you preview a finished font on screen, but you can quickly check your design by selecting the Test Print option. In less than a minute, *Glyphix* builds the entire character set for the font and prints out a sample (see Figure 3). If you like what you see, choosing Soft Font File saves the file to disk for future use; picking Download File immediately sends it to the laser printer. It's that simple.

Like any piece of software, *Glyphix* has its drawbacks. It isn't recommended for producing type as small as 10 or 12 points. At these sizes, you'll notice tiny gaps in thin strokes and slight jaggies along curves. The problem is more severe for serif typefaces like Times Roman, less so for sans serif faces like Helvetica. Another snag is that word processing programs generally can't recognize unfamiliar fonts such as those created by *Glyphix* unless you embed special LaserJet escape codes in your document. But new desktop publishing software can overcome this problem. For example, utilities supplied with *Ventura Publisher* allow you to build a new printer driver capable of recognizing any *Glyphix* font, add it to the proper menu, and use it when setting text. I generated a new font, tested it with *Glyphix*, downloaded it to my hard disk, built a new *Ventura* font width table, reformatted a document to contain

(continues)

Disk Optimizer™ puts the zip back into your hard disk.

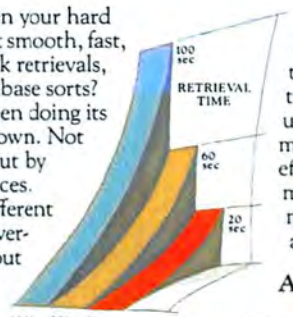
Your hard disk will run faster when it's not chasing around after files.

Remember the old days when your hard drive was new? Remember that smooth, fast, slick performance? Those quick retrievals, rapid saves, lightning-like database sorts?

Well ever since, DOS has been doing its best to slow your hard drive down. Not by slowing down the motor, but by breaking your files up into pieces. Storing different chunks in different places. Data files, programs, overlays and batches that started out in one seamless piece are now scattered all over.

Loading is slower. Sorting is slower. Retrieving, backing-up. Everything takes longer because your disk has to work harder.

Problem is, it's something that happens so gradually you may not notice the difference. At least, not until you see the dramatic improvement after using Disk Optimizer.



The more fragmented your files get, the longer they take to retrieve.

File fragmentation—It's a problem you can see.

Watch your hard drive the next time it reads or writes a file. Each "blip" of the LED means the drive-head is moving to another place on the disk—either to pick up or lay down another chunk of data.

And the truth is, head movement takes time. Far more time than actual reading and writing. What's worse, all this head movement causes extra wear and tear that can shorten the life of your drive.

Disk Optimizer—Tunes up your disk by cleaning up your files.

Disk Optimizer works by finding all the scattered pieces of your files and putting them back together where they belong. Next time your drive reads it, there's just one place to look.

And the results are often dramatic. Reading and writing times may be cut by as much as two thirds. Database sorts that used to take hundreds of head moves now proceed quickly and efficiently. And since head movement is now at an absolute minimum, your disk drive will lead a longer, more productive life.

Analyze, scrutinize, optimize.

Before you optimize, you'll probably want to analyze. So Disk Optimizer shows you, in percentages, how much fragmentation has taken place—on the entire disk, in individual directories, or for groups of files you specify using global or wildcard names.

Plus, there's built-in data security that lets you assign passwords to as many files or file groups as you want.

And the File Peeker gives you an inside look at the structure of files. It's a great way for non-programmers to learn more about computers, and a powerful tool for professionals who want to analyze the contents of their disks.

Get your hard disk back in shape—with new improved Version 2.0

Hard to believe, but new Disk Optimizer Version 2.0 is even better than before. Not only will it optimize your disks in far less time than it used to, but it actually speeds up retrievals even more by letting you give priority treatment to your most used files, like programs and batches.

When you think about it, it's simple. The longer you own your hard drive, the more you come to depend on it. But the longer you wait to get Disk Optimizer, the less performance you'll get.

Use it just once and discover what thousands of satisfied PC users already know—$59.95 is a small price to pay to restore the speed and performance you count on.

Buy Disk Optimizer at better computer dealers everywhere, or order today by calling SoftLogic Solutions at 800-272-9900 (603-627-9900 in NH).

Disk Optimizer $59.95

Here's what people are saying about Disk Optimizer.

"I feel this is essential software for anyone with a hard drive."
-D. Sorenson, TEXACO, California

"I find Disk Optimizer excellent. Disk access–even at 4.77MHz–is much faster. And loading 100+ Fontasy fonts now takes seconds."
-Elizabeth Joan Doyle, Indiana

"Disk Optimizer...(has) found a permanent place on my software shelf."
-Stephen R. Davis, PC MAGAZINE

SoftLogic Solutions, Inc.
One Perimeter Road
Manchester, NH 03103
800-272-9900
(603-627-9900 in NH)

SOFTLOGIC SOLUTIONS

Call today: 800-272-9900

Get more info. Go to Ad Index.

the new font in a headline, and printed the results—all in less than 10 minutes.

Of course, many LaserJet users are content to use the internal, cartridge, and disk fonts provided by Hewlett-Packard. But once people get a taste of laser-based typography, their appetite for fonts tends to grow. It's not every day that you need a font for a 48-point chapter title or type with racy diagonal stripes. But when that day comes, nothing else will do—and *Glyphix* can produce the font you want. *—Ted Nace*

Ted Nace is the coauthor of LaserJet Unlimited, Series II Edition *(Peachpit Press, Berkeley, 1987) and author of* Ventura Tips and Tricks *(Peachpit Press, 1987). Michael Covington is a researcher with the Advanced Computational Methods Center at the University of Georgia in Athens, Georgia. Melody Covington is a freelance artist/writer and former newspaper art director. Dennis Dykstra is a professor at Northern Arizona University in Flagstaff who also does freelance writing and commercial software development. Donald B. Trivette is a freelance writer and consultant in Wrightsville Beach, North Carolina.*

PC TOOLS™

NEW! Version 3

PC Magazine names PC Tools their Editor's Choice, "There's no reason to look beyond PC Tools..."

PC Tools puts together all the popular features of the Norton Utilities* with a powerful DOS interface and makes them resident like Sidekick*. Lets you execute virtually any DOS command even when you're using another program!

With PC Tools, you can

- **UNDELETE** an accidentally erased file.
- **FORMAT** a disk.
- **COPY** files.
- **MOVE** files and reorganize subdirectories with ease.
- **LOOK** at (and even edit) a file.
- **FIND** searches a file or disk for a string of bytes or text.
- **PRINT** a file (as text or hex and ASCII).

And much more – all without ever leaving your spreadsheet or database manager or word processor!

Now includes the best features of the MACE™ utilities & FastBack™!

- **UNFORMAT** a hard disk.
- **COMPRESS** a hard disk for improved performance.
- **BACKUP** and **RESTORE** a hard disk *FAST.*

System Requirements: IBM PC, PS/2 or compatible, 256K, uses only 64K in resident mode. Supports floppy disks, hard disks and 3½" disks (including 1.44 meg diskettes), as well as Lotus/Intel expanded memory. PC Tools includes both a 3.5" & 5.25" disk for your convenience!

To Order: Call 503/244-5782, 8-5 (West Coast time), M-F, with your VISA MasterCard in hand. Or send a check, include $3 s/h, $8 overseas.

$39.95

Central Point Software INCORPORATED
9700 SW Capitol Hwy. #100
Portland, OR 97219

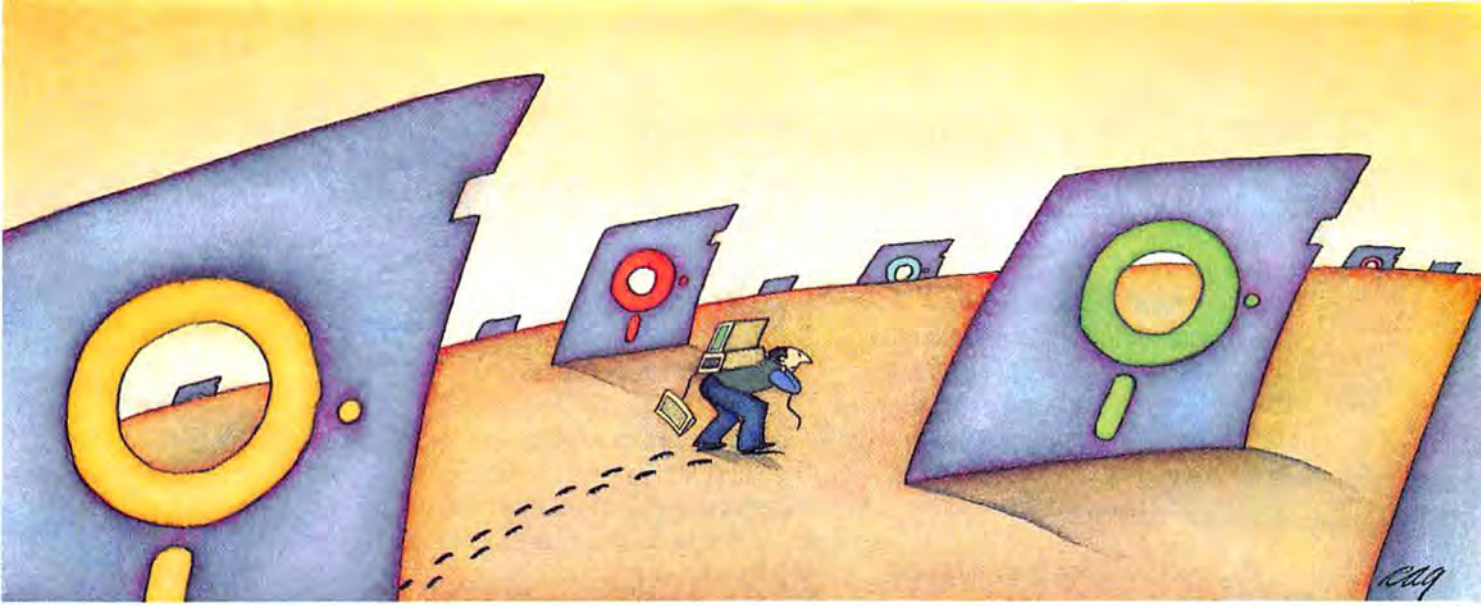
We also have backup utilities for the IBM, Macintosh, Apple //, Commodore 64/128 and Atari ST.

*FastBack, Mace, Norton Utilities and Sidekick are registered trademarks of Fifth Generation Systems, Paul Mace Software, Peter Norton and Borland International, respectively

Get more info. Go to Ad index.

Get In on the PC Market Action

Your *PC World* Action Ad takes you to the heart of the IBM PC marketplace. These ⅓-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).



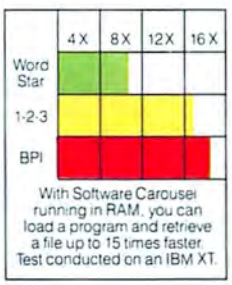
PROBLEM: There's just no easy way to move from one software program to another.

THE SOFTLOGIC SOLUTION: Software Carousel™

Now you can keep up to 10 programs loaded and ready to run.

Hard to believe, but some people are happy with just one kind of PC software. Well, this is not a product for them.

But if you're someone who depends on many packages, all the time—someone who'd use several programs at once if you could, well now you can. With Software Carousel.



With Software Carousel running in RAM, you can load a program and retrieve a file up to 15 times faster. Test conducted on an IBM XT.

Why call it "Software Carousel"?

In some ways, Software Carousel works like the slide projector you're used to. You load a handful of pictures, view one at a time, then quickly switch to another. A simple idea, with powerful possibilities for computing.

Here's how it works. When you start Software Carousel, just tell it how much memory you have, load your software and go to work.

Need to crunch numbers? Switch to your spreadsheet. Need your word processor? Don't bother saving your spreadsheet file. Just whip over to your document and do your work. Snap back to your spreadsheet, and it's just like you left it.

With up to ten different programs at your fingertips, you'll have instant access to your database, communications, spelling checker, spreadsheet, word processor, RAM resident utilities, languages, anything you like.

Reach deep into expanded memory.

This could be the best reason ever for owning an expanded memory card, like the Intel Above Board, AST RAMpage, or any card compatible with the L/I/M Extended Memory Standard.

Software Carousel puts programs into this "high-end" memory for temporary storage when they're not in use. And switches them back out when you want them. It's fast, efficient, and easy.

If you want, Software Carousel will even use your hard drive for swapping. Just allocate a portion for storage, and go to work.

Sidekick, Superkey and Ready. All at the same time.

You know what happens if you try loading two or more RAM resident utilities at once. You get crashed keyboards, frozen screens, all kinds of interference between programs fighting for control.

With Software Carousel, you can have as many accessories and utilities on-tap as you want. Just load different ones in different Carousel partitions. Since they can't see each other, they can't fight.

The easy way to maximize PC power.

With all this power, you might think Software Carousel is complicated and difficult to use. Not so. Particularly when you compare it to other programs like Windows and TopView.

Set it up once and Software Carousel remembers forever. Better still, Carousel will look for the programs you use most often and optimize them for quickest access.

The way we see it, there are certain things you have a right to expect from your computer. Access to your software is one of them. At just $59.95* a copy, Software Carousel is the best way to get it.

See Software Carousel at better computer dealers everywhere. Or order today by calling 800-272-9900 (603-627-9900 in NH), or mail the coupon below. If you find this product does not meet our advertised claims within 30 days of purchase we will arrange for a prompt refund.

Software Carousel $59.95*

YES! Please send me _____ copies of Software Carousel at just $59.95* each (not copy protected).

Name_____

Company_____

Address_____

City_____ State/Zip_____

Check Enclosed ☐ VISA ☐ MC ☐ AMEX ☐

Card #_____ Exp. Date_____

Signature_____

SoftLogic Solutions, Inc.
One Perimeter Road
Manchester, NH 03103
800-272-9900
(603-627-9900 in NH)

SOFTLOGIC SOLUTIONS

Call today: 800-272-9900

8

*plus $5.00 shipping and handling.

Get more info. Go to Ad index.

What can you expect from the new LaserJet Series II Printer?

we never stop asking "What if..."

Everything.

Because the LaserJet Series II Printer from Hewlett-Packard is the product of experience.

It's a second generation printer from the company with the world's largest installed base of laser printers.

Whatever your company's needs, the LaserJet Series II will deliver the performance you expect, at up to 8 pages/minute.

Take a simple memo like the Soup letter we created with Microsoft Word. As you can see, you can print in a variety of formats and type styles with our wide selection of LaserJet fonts.

Or you can create a sophisticated combination of text and graphics. With additional plug-in memory, you can also produce full-page 300 dpi graphics, like our Nuts form shown below. To do this, we used HP's new ScanJet desktop scanner, Microsoft Windows and Pagemaker® from Aldus.

With support by more than 500 of the most popular software packages, the LaserJet Series II Printer can produce whatever type of business document you need. And LaserJet Series II works with all popular PCs.

In fact, only the price is unexpected —starting as low as $2,595.*

For the authorized dealer nearest you, call us at 1 800 367-4772, Ext. 900A.

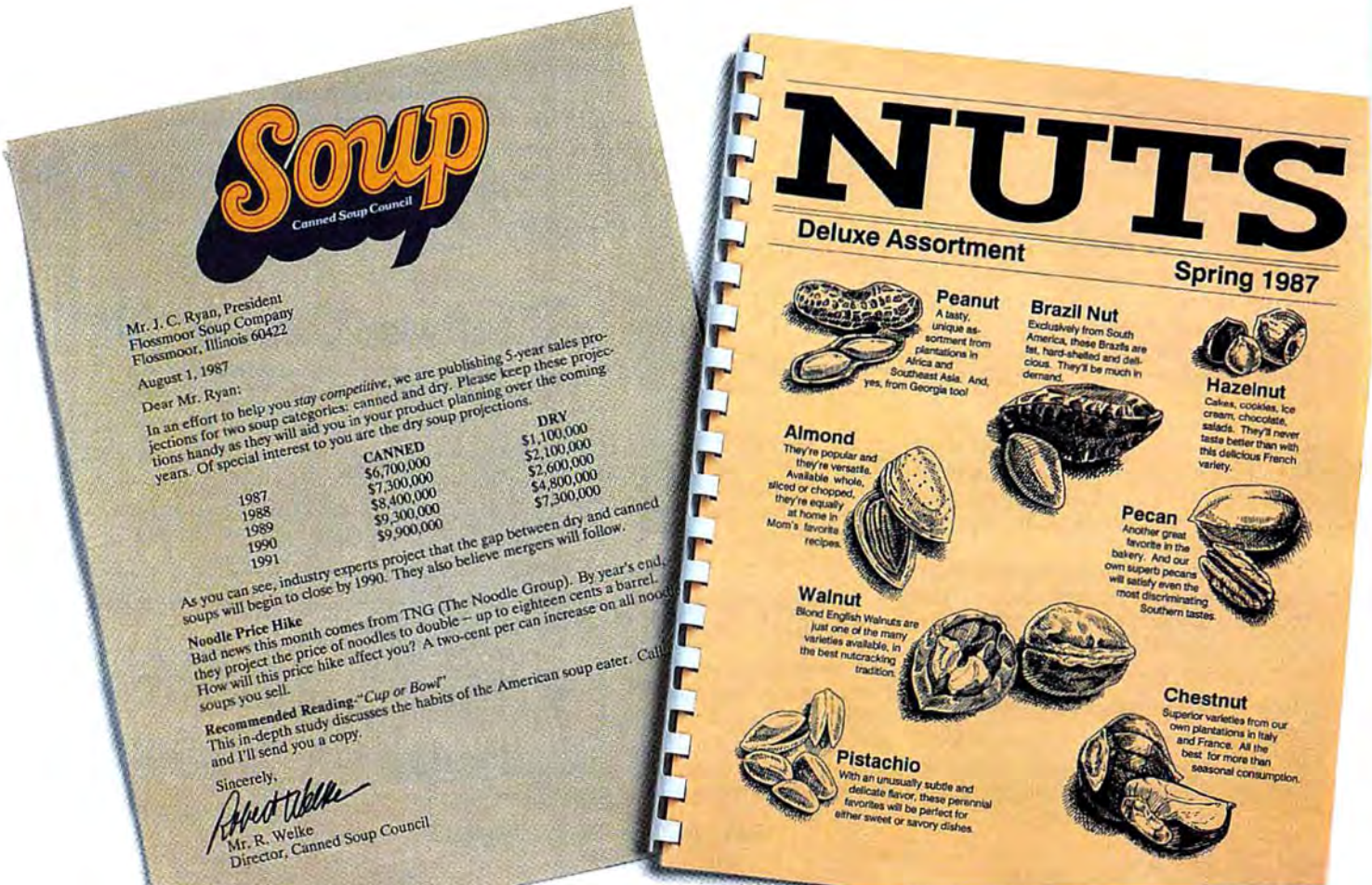
HEWLETT PACKARD

Business Computing Systems

MicroSoft is a registered trademark of MicroSoft Corp. Pagemaker is a U.S. registered trademark of Aldus Corporation.

*Suggested U.S. list price. © 1987 Hewlett-Packard Co. PE12701

Get more info. Go to Ad index.



From the Hardware Shelf

PC World offers first impressions of recent hardware releases

A price-shattering laptop, a space-conscious laser printer, a low-profile AT compatible, a data-saving tape drive, and a plastic peripheral serve up this month's hardware repast.

Edited by Charles Bermant

Datavue Spark

Laptop computer

Pros: *Low price, fast processing speed, expandability*
Cons: *Mediocre display*

Datavue Corp.
One Meca Way
Norcross, GA 30093
404/564-5555

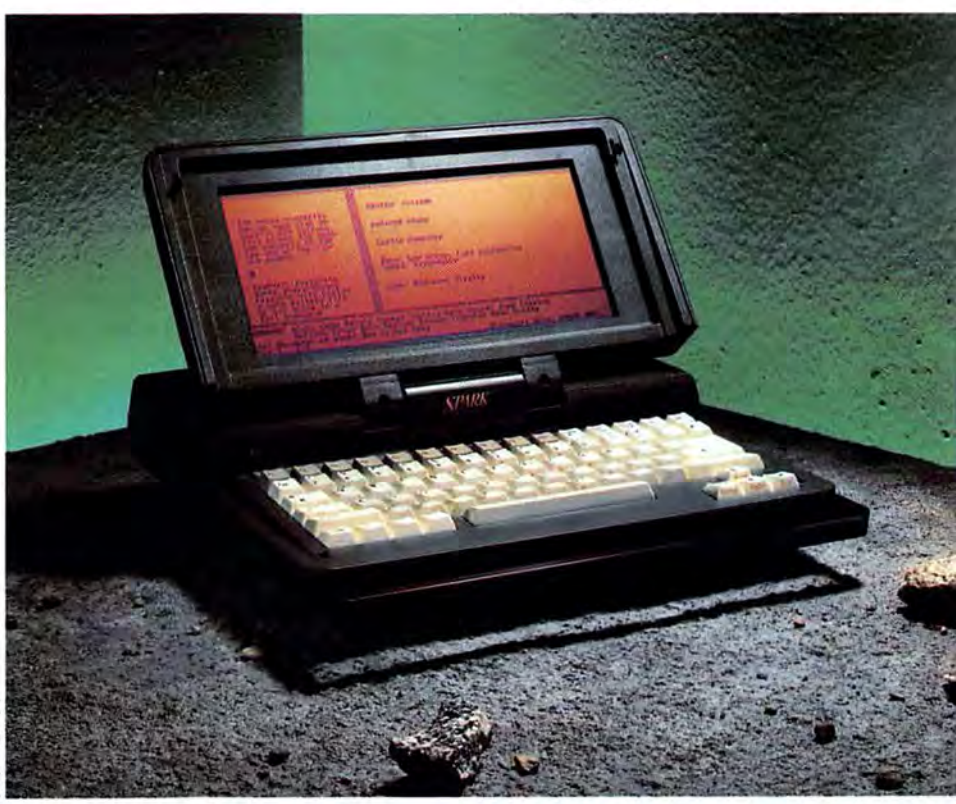
List price: with 384K and one 3 1/2-inch floppy drive $995, with 640K $1125; electroluminescent screen $125; second 3 1/2-inch floppy disk drive $200; external 5 1/4-inch floppy disk drive $210; 300/1200-bps modem $325; 256K memory board $130

Unless you spend half your working life in hotels and airplanes, it's tough to justify the expense of a laptop. Even NEC's high-performance "bargain" MultiSpeed goes for a cool $2000—enough to raise a bookkeeper's eyebrow.

For half the price of a MultiSpeed, Datavue offers the swift, compact Spark. Like the MultiSpeed, the Spark uses an 80-by-25-character Supertwist LCD screen and a NEC microprocessor with a top speed of 9.24 MHz—just a shade slower than the MultiSpeed's 9.54-MHz CPU. But because the Spark uses a V20 microprocessor instead of the MultiSpeed's V30 (which is roughly equivalent to using an 8088 instead of an 8086), you'll find the Spark 15 to 20 percent slower for processing-intensive operations.

(continues)

The base model Spark costs $995 but runs about $600 more with added disk drives and a modem.



John Greenleigh

Measuring 13 inches deep by 12 inches wide and weighing 9 to 11 pounds (depending on the options), the Spark's bulk is average for a laptop. The machine comes with 384K of RAM and one 3½-inch floppy disk drive, but you can upgrade to 640K and two drives for $130 and $200, respectively.

The Spark has a switchable clock, and the machine always starts up at the slower speed, forcing you to use a keyboard command to shift into high gear. Other keyboard commands (all of which begin with <Ctrl>-<LeftShift>) show the battery level, control the sound volume, change the screen contrast, and reassign gray values for the Spark's CGA-compatible display.

The best thing you can say about the Spark's Supertwist screen is that it's readable. Because the screen isn't backlit, you may have to spend some time finding the right balance of illumination and angle. Even under optimum conditions, using this screen for an extended period would be a hardship.

The keyboard fares considerably better. It's compact without being confining and has a comfortable, responsive feel. You access the numeric keypad by pressing the <Fn> key; the function keys line the top of the keyboard.

At the rear of the Spark, you'll find a standard array of connectors, including one serial, one parallel, one RGB, and one composite video port, as well as a connector for an external 5¼-inch floppy disk drive (which sells for $210—about half the price of similar drives from other manufacturers). A rear-mounted reset button is also provided, and the machine emits a steady beep if you close it while the power is on.

The Spark currently lacks a hard disk option, which places it squarely at the low end of the laptop market. However, forgoing these power-hungry features results in a long battery life—six hours on a full charge.

With the Spark, you can pay homage to the bottom line without subjecting yourself to sluggish kneetop models (like the Tandy Model 100) with tiny screens and no PC compatibility. If you don't have to spend hours staring at the Spark's lackluster screen—if you write memos rather than novels, or plan weekly expenses rather than yearly budgets—the Spark can plug a gap in your computing routine. —*C. B.*

John Greenleigh

One of the smallest and lightest laser printers available, the new Ricoh can save both your desk and your back.

PC Laser 6000

Laser printer

Pros: *Low price, optional HP LaserJet Plus emulation, automatic envelope feeding, compact size, light weight*

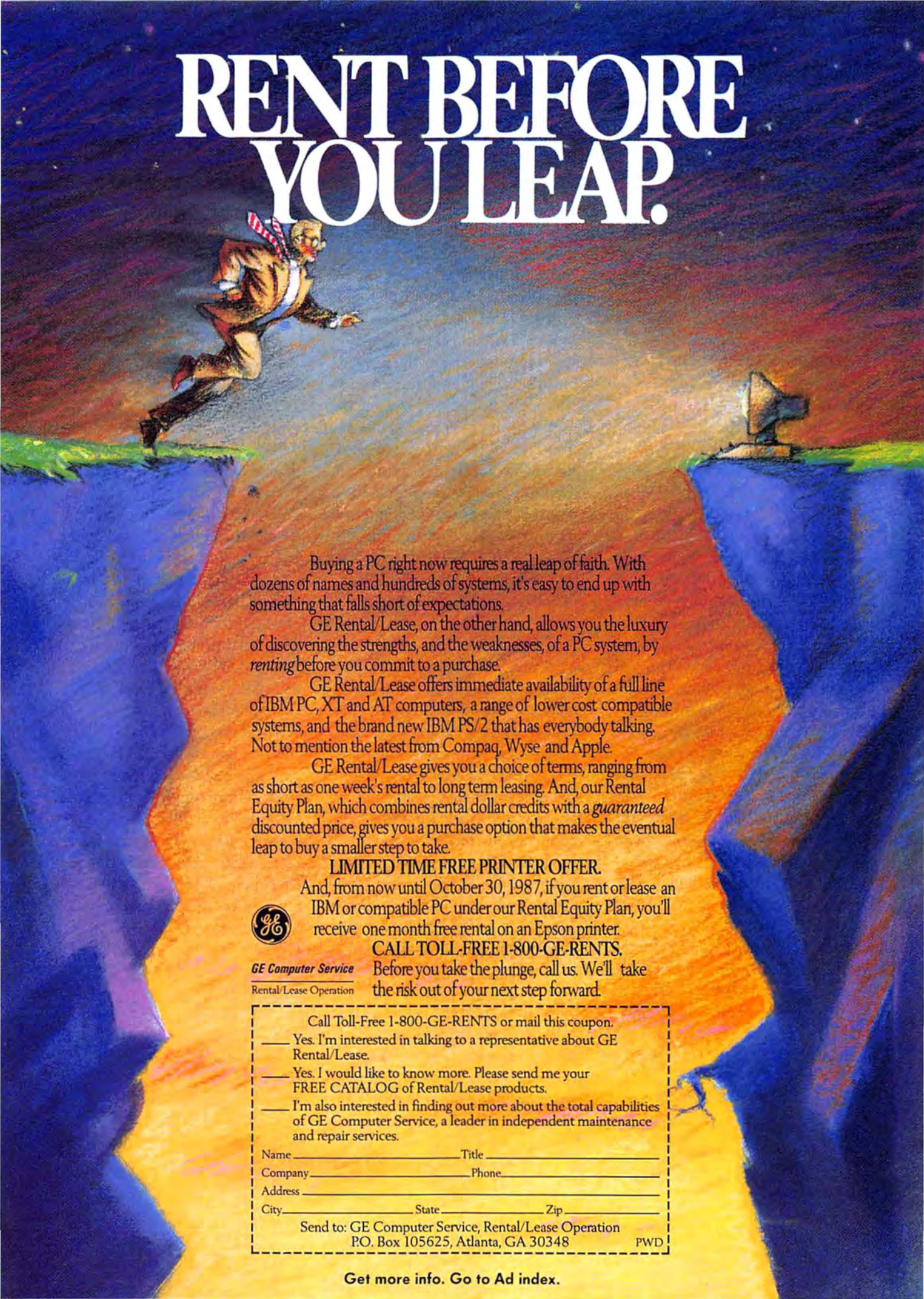
Cons: *Average print speed, no upgrade to page description language*

Ricoh Corp.
5 Dedrick Pl.
West Caldwell, NJ 07006
201/882-2000

List price: with 1MB RAM $2395, each additional 512K $249; HP LaserJet Plus, IBM Proprinter, or Epson FX-80 emulation $199; auxiliary input tray $495; font cartridges $200 to $300 each;

(continues)

RENT BEFORE YOU LEAP.



Buying a PC right now requires a real leap of faith. With dozens of names and hundreds of systems, it's easy to end up with something that falls short of expectations.

GE Rental/Lease, on the other hand, allows you the luxury of discovering the strengths, and the weaknesses, of a PC system, by *renting* before you commit to a purchase.

GE Rental/Lease offers immediate availability of a full line of IBM PC, XT and AT computers, a range of lower cost compatible systems, and the brand new IBM PS/2 that has everybody talking. Not to mention the latest from Compaq, Wyse and Apple.

GE Rental/Lease gives you a choice of terms, ranging from as short as one week's rental to long term leasing. And, our Rental Equity Plan, which combines rental dollar credits with a *guaranteed* discounted price, gives you a purchase option that makes the eventual leap to buy a smaller step to take.

LIMITED TIME FREE PRINTER OFFER.

And, from now until October 30, 1987, if you rent or lease an IBM or compatible PC under our Rental Equity Plan, you'll receive one month free rental on an Epson printer.

CALL TOLL-FREE 1-800-GE-RENTS.

Before you take the plunge, call us. We'll take the risk out of your next step forward.

GE Computer Service
Rental/Lease Operation

Call Toll-Free 1-800-GE-RENTS or mail this coupon.

____ Yes. I'm interested in talking to a representative about GE Rental/Lease.

____ Yes. I would like to know more. Please send me your FREE CATALOG of Rental/Lease products.

____ I'm also interested in finding out more about the total capabilities of GE Computer Service, a leader in independent maintenance and repair services.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Send to: GE Computer Service, Rental/Lease Operation
P.O. Box 105625, Atlanta, GA 30348 PWD

Get more info. Go to Ad index.

toner cartridge $29; cleaning magazine $99; OPC magazine $199

Laser printers are getting smaller, smarter, and easier to use. Typical of the new breed is the Ricoh PC Laser 6000, a compact, lightweight machine that's capable of more than just conserving desk space.

Although the Ricoh's 6-page-per-minute output is a bit slow by today's standards, it's still adequate for normal office use. Moreover, you get twice the RAM of Hewlett-Packard's LaserJet Series II for $100 less. Like the Series II, the Ricoh has a control panel that enables you to easily select fonts and control character pitch.

The Ricoh console panel is similar to the Series II panel, although the latter is more intuitive. For instance, both machines quickly supply current settings and available fonts, but the Ricoh doesn't number the fonts. Since you must select fonts by number, this lapse is inconvenient. Furthermore, HP allows you to select downloaded fonts from the panel, while the Ricoh provides access only to internal and cartridge fonts.

The 37.5-pound, 16-by-25-inch 6000 offers LaserJet Plus emulation as a $199 option. An integrated circuit board about the size of a credit card slides into an external slot below the font cartridge, making the 6000 instantly compatible with the hundreds of software applications, downloadable fonts, and drivers written for the LaserJet family. Emulation cards are available at the same price for the IBM Proprinter and Epson FX-80.

Such flexibility opens up a wealth of options for the printer, but it's too bad Ricoh charges extra for the privilege. The company does toss in one free impersonation: The 6000 closely emulates the Diablo 630 impact printer and even uses a superset of the 630 control codes for its own internal instruction set. This aptitude allows the 6000 to use drivers and software written for the 630, a benefit to Diablo owners upgrading to laserland.

The printer's input and output trays hold 150 sheets of 20-pound paper, and an optional auxiliary holds another 400 sheets. Besides issuing pages in the correct order, the printer can automatically feed transparencies, laser labels, and envelopes (the 6000 is one of the few printers of any kind that can automatically feed envelopes).

The 6000's controller can rotate a font for landscape or portrait printing, so each font effectively serves as two. The controller permits printing in both modes on the same page, a trick few laser printers can manage. You can print up to 32 fonts per page. Finally, the controller allows up to 99 downloaded design overlays (standard text, forms, and graphics), depending on available memory.

Contrast quality of text and images is acceptable for the most part, although on scrutiny some internal fonts exhibit traces of "the jaggies" (jagged edges on the curves of letters that reveal the composite dots).

The 6000 comes with 1MB of RAM, expandable to 2MB. The standard 1MB can accommodate a bit-mapped 300-dpi image covering 50 to 70 percent of a page, with RAM left over for downloaded fonts or overlays. By comparison, the Series II accommodates as much as 4MB. And despite the 6000's talented controller, there's no built-in page description language and no video controller for linking up with, say, a PostScript expansion board. Given that products like *PageMaker* don't have Ricoh drivers, the 6000's optional LaserJet Plus emulation saves the day.

If you don't need Diablo 630 emulation but want LaserJet compatibility and are interested in serious desktop publishing, you may be better off with a LaserJet Series II than a Ricoh. The Series II costs more when configured with the equivalent of the Ricoh's RAM, but it offers the eventual option of a PostScript upgrade. *–Michael Gardner*

(continues)

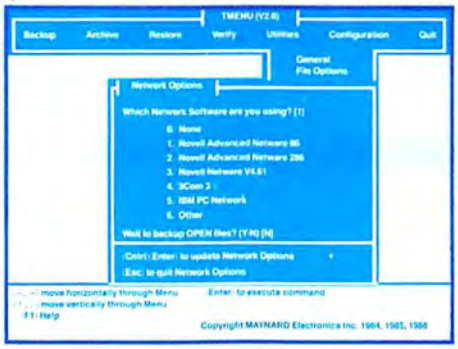
Interoffice Memo.

A single MaynStream™ backs up *all* the PCs in your office, file by file!

Announcing: Software Version 2.0!

Protecting Files: Top Priority.

Hard drive users know tape backup is indispensable, but equipping each of your PCs with its own backup is costly. That's why we developed the MaynStream, our lightning-quick, *file-by-file* tape backup system. Just snap the MaynStream onto any PC equipped with a low-cost MaynStream controller. Simple menus guide you through backup in seconds and restoring data is just as easy. So when your hard drive forgets to treat your files like your business depends on them, the MaynStream remembers.



Backup That Won't Back Down.

The MaynStream makes customized backup a reality, giving you unprecedented control over one of your computer's most important functions. Options include **Networking,** which is designed to work with all popular LANs including Novell, 3COM, and IBM's PCNet.* The MaynStream will not only back up a network while the network is up and running, but will actually back up open files automatically once they're closed! *No other system currently on the market can do this!* The MaynStream's other features include **Automatic Save; File & Directory Marking** for backing up select files, directories, and subdirectories; **Archive; Verify;** and **Backup Macros** for unprecedented convenience.

Other Powerful Systems for the PC.

MaynStream internal, 20 and 60MB. | MaynStream 60Q internal, 60MB. | MaynStream portable, 20 and 60MB. | MaynStream 60Q portable, 60MB. | MaynStream Plus,* hard drive and tape. | Transport™ 20MB portable hard drive.

All Maynard systems are backed by our 1-year warranty.

Sold at the finest computer stores. Contact your local dealer or write to us today for product information.

Maynard Electronics

Shaping tomorrow's technology.

Get more info. Go to Ad index. 460 E. Semoran Blvd., Casselberry, FL 32707 305/331-6402

*IBM PC and PCNet are trademarks of International Business Machines. 3COM Ether Series is a trademark of 3COM Corporation. Novell is a trademark of Novell, Inc.

A Midrange Performer

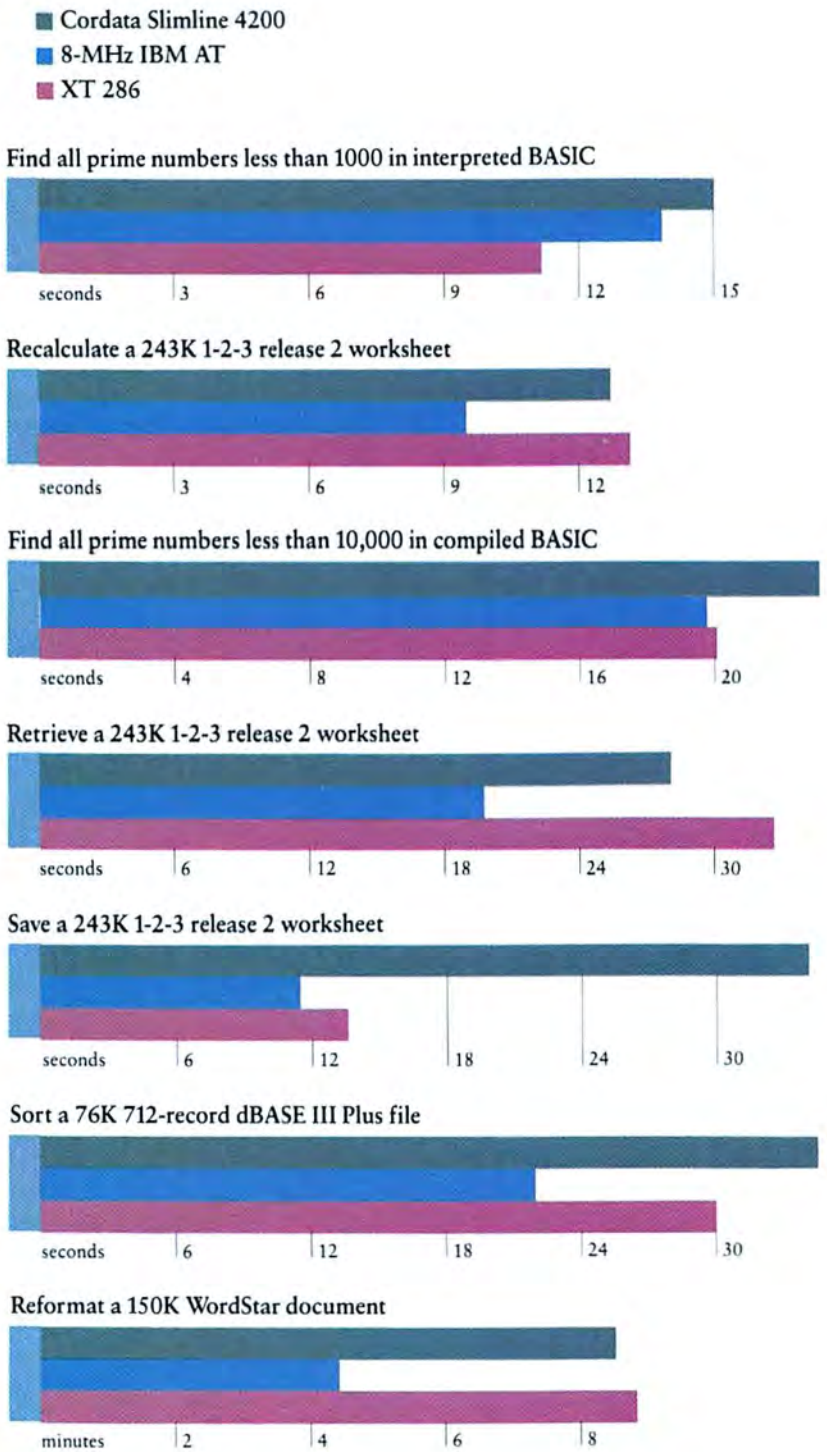


Figure 1: Cordata's new 80286 machine performs better than IBM's XT 286, but the original AT leaves it in the dust. Times shown in minutes:seconds.

Slimline 4200

PC AT compatible computer

Pros: *Low price, small footprint*
Cons: *Slow hard disk, limited expandability*

Cordata
2001 Corporate Center Dr.
Newbury Park, CA 91320
805/375-1500

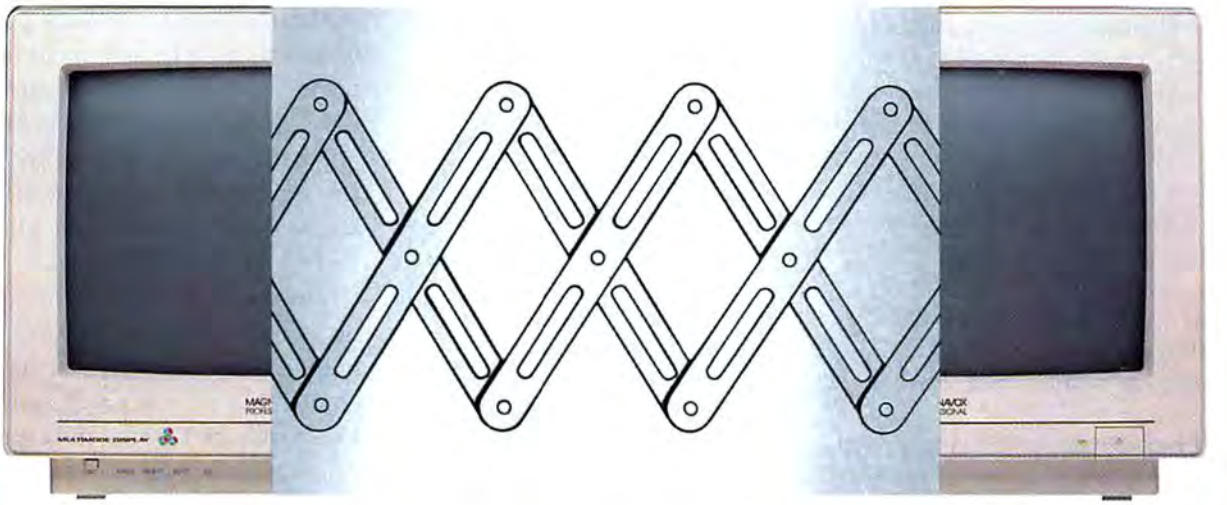
List price: with 360K floppy drive $1495, with two drives $1595, with one floppy drive and a 20MB hard disk $1995

The Slimline 4200 is a competitively positioned AT compatible that bundles most generic AT features into a nice, neat, small package. But the unit is destined for obsolescence. With only two available expansion slots and an odd patchwork of factory-installed storage devices, this is a machine you are likely to outgrow as soon as the next generation comes along.

The least expensive 4200 configuration is a $1495 single 360K 5¼-inch floppy drive unit. Two drives will run you $1595, and one floppy drive with a 20MB hard disk retails for $1995. The video adapter and monitor are extra. (Cordata offers a monochrome monitor/graphics board package for $368.)

(continues)

Expanding your display horizons has never been easier.



The Magnavox Professional Color Display System

Multimode Color Display

Now you can own a single color display that will function with virtually *any* graphics board, in any computer now on the market, automatically. The Magnavox 8CM873 Multimode Display.

The Multimode is a new breed of color display that can adapt itself to a wide range of video signal types providing you maximum flexibility for future expansion. (The Multimode supports vertical resolution up to 580 lines [34kHz] and accepts your system's digital [TTL] or analog video outputs.)

So whether your into CGA, EGA, ATT, or PCG we're sure you'll have the same opinion of the Multimode. TNT.

Multires Display Card

The Multimode Display is only as good as the video adaptor that drives it. And we have one of the best. The 8AV480 Multires expanded function EGA Display Card for IBM PC/XT and AT computers and compatibles.

The Multires Display Card is part of a new generation of video controllers which employ customized integrated circuits to pack maximum firepower in minimum space. And with a minimum of parts producing a minimum of life-sapping heat.

The System — With the Multires Display Card and our Multimode monitor you can now get full EGA performance plus 640 × 480 (and 752 × 410) 16/64 color graphics for the price some people charge for the graphics card alone. Plus you get complete backwards compatibility with virtually all software written for the PC/XT and AT.

It's a dynamite combination.

Maximum flexibility. Single sourced.

Nobody puts it together like MAGNAVOX.

For more information, contact: Magnavox Computer Products, P.O. Box 14810, Knoxville, TN 37914-1810

©1986 N.A.P. Consumer Electronics Corp. A North American Philips Company

The Desktop Publishing Conference

A Seybold Seminar and Exposition

"The event of the year." You heard about last year's Seybold Desktop Publishing Conference. More than 100 new products were introduced, including Ventura Publisher and Aldus PC PageMaker. Steve Jobs declared that Hewlett-Packard was "brain damaged" for selecting the DDL page description language. IBM revealed its desktop publishing strategy. Users blasted vendors for not offering support. Everyone agreed they had not seen so much enthusiasm and excitement in years.

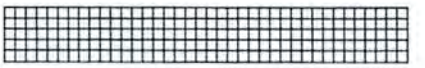
The 1987 Conference will be even better: a lot of new players in the market; a raft of exciting new products; serious work being done by serious users.

The seminar will explore the key issues in this rapidly changing field. Presentations by industry leaders and pioneering users are followed up with tough questions from the Seybold staff and no-holds-barred discussion.
Wed. - Fri., Sept. 9 - 11, 1987. $595.

The exposition will fill the 75,000 sq. ft Convention Center and include virtually every vendor from IBM, Apple, Xerox, Hewlett-Packard, Aldus et al. to dozens of innovative new entrants from all over the world. This is the event that will once again define an industry.
Thurs. - Sat., Sept. 10 - 12, 1987. $25.
Free to seminar participants.

For registration information, contact:

Seybold Seminars
6922 Wildlife Road
Malibu, CA 90265
(213) 457-5850



The 4200 relies on an 8-MHz Intel 80286 chip, and its maximum 640K of RAM is built into the motherboard. The back panel holds one parallel and one serial port. The machine also features a clock/calendar with battery backup, a 130-watt power supply, a slot for an 80287 math coprocessor, and fully documented MS-DOS 3.20 and GW BASIC.

The system is 18.25 inches wide by 16 inches deep by 5 inches high–shorter than the average AT compatible. Cordata achieved the low profile by turning the expansion bus on its side. Consequently, the machine has only four 16-bit expansion slots, two of which are used by the video and hard disk controller boards. Cordata notes that the system can hold 15MB of RAM, but this is a facile claim given the unit's two free slots and the state of contemporary EMS boards.

The system has room for two half-height storage devices. While the machine supports high-density and 3½-inch floppies, the factory model has 360K floppies. The Seagate-manufactured hard disk clocks in at an unimpressive 68 milliseconds. So here's an 80286-based machine with XT floppies, AT-compatible slots, and a hard disk that falls somewhere between.

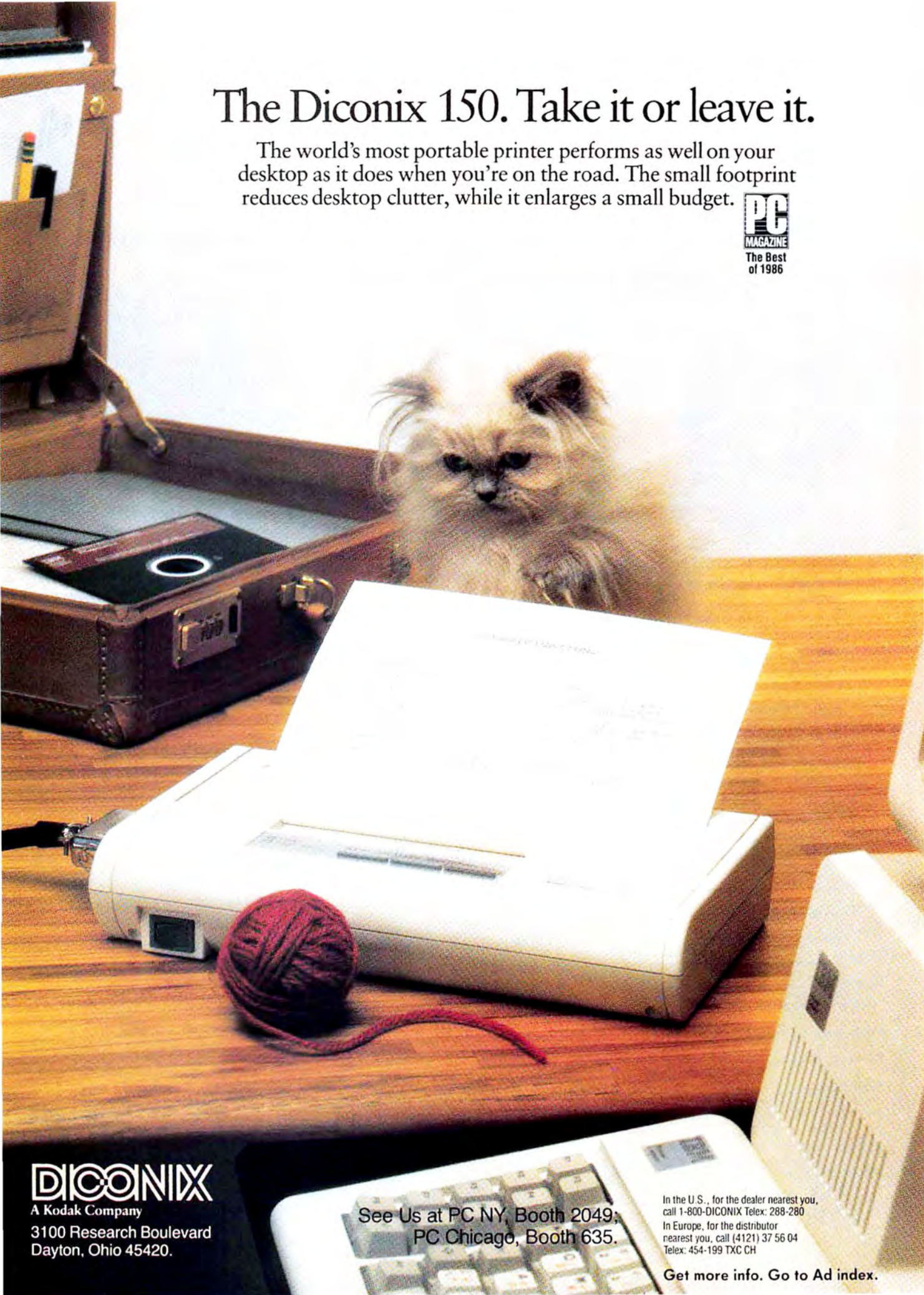
The keyboard imitates the original PC AT layout, with LED indicators and ten function keys

(continues)

The Diconix 150. Take it or leave it.

The world's most portable printer performs as well on your desktop as it does when you're on the road. The small footprint reduces desktop clutter, while it enlarges a small budget.

PC MAGAZINE
The Best of 1986



DICONIX
A Kodak Company
3100 Research Boulevard
Dayton, Ohio 45420.

See Us at PC NY, Booth 2049;
PC Chicago, Booth 635.

In the U.S., for the dealer nearest you, call 1-800-DICONIX Telex: 288-280
In Europe, for the distributor nearest you, call (4121) 37 56 04
Telex: 454-199 TXC CH

Get more info. Go to Ad index.

CHECK IT OUT!
SAMPLE DISK

We'll send you a sample issue of **I.B. MAGAZETTE** at 60% off the regular price. You can try our disk magazine with NO OBLIGATION.

You'll get a great selection of new programs for home, business, education and recreation for less than 50¢ each.

Find out why **I.B. MAGAZETTE**, the *original* magazine on disk for the IBM-PC and compatibles, is still #1, while imitators have come and gone.

Just fill in the form below and send it with your $5.00 payment to:

I.B. MAGAZETTE, Dept. 5
425 Edwards, Suite 1306
Shreveport, LA 71101-3125

Name _____
Address _____
City _____
State _____ Zip _____
Phone _____
Type of Computer _____
Enclosed: ☐ Check ☐ MC/VISA
#_____Exp. _____
Signature _____

For immediate service:
Call 1-800-622-4070
Have your credit card ready.

IBM is a Trademark of International Business Machines Incorporated.

LET US PUBLISH YOUR PROGRAMS

positioned on the left side. While the rest of the system seems to be well constructed, the keyboard has a cheesy, plastic feel. Cordata, of all companies, should know that supplying a mail-order-quality keyboard is no way to knock off the PC AT.

The Slimline 4200 has a sturdy metal case, and the unit's front and back panels are made of tough plastic. Getting the cover off is tough, too—you must remove six screws to get at the 4200's innards.

The rounded power switch is right up on the front panel next to the hard disk—a blessing for those of us who've strained an arm reaching for the PC's power switch. Cordata also supplies a reset button for restarting, for those occasions when some nasty piece of software freezes up the system. Unfortunately, the button is located on the system's back panel.

Predictably, the machine fell behind the 8-MHz AT in the disk-intensive *dBASE III Plus* test (see Figure 1). Compatibility, however, is no problem: The machine worked well with *dBASE III Plus*, *Flight Simulator*, *WordPerfect*, *1-2-3*, and all other software thrown at it.

The Slimline 4200 performs adequately and is a good choice for space-conscious users, but it suffers from technological schizophrenia. The machine can't decide whether it is an AT, an XT, or something in between and gives the impression that Cordata just packaged the near-obsolete parts it had lying around. —*Eric Ludd*

Maynstream 60

Tape drive

Pros: *Speed, good file selection and exclusion capabilities, portability*

Cons: *Marginal status information, RAM-hungry software*

Maynard Electronics
460 E. Semoran Blvd.
Casselberry, FL 32707
315/331-6402

Requirements: 512K, DOS 2.00 or later version

List price: (for PC, PC XT, PC AT) 60MB internal $1195, 60MB external $1595, 125MB internal $1895, 125MB external $2195; (for PS/2) 60MB internal $1295, 60MB external $1695, 125MB internal $1995, 125MB external $2295

Last summer *PC World* tested four tape backup units and tagged Maynard Electronics' Maynstream 20 as the best backup system based on a combination of speed, convenience, and value (see "Protection Money," *PCW*, August 1986). One year later, the new Maynstream 60 performs just as quickly and effectively, sweetening the deal with extensive LAN support and the first controller card that supports IBM's PS/2 Models 50, 60, and 80.

Although the Maynstream's 6½-by-15-by-4-inch shape isn't exactly svelte, its convenient handle, shirt-pocket-size cassette tapes, and LAN support make it a natural for departmental backup

(continues)

How to see VGA for what it really is.

Take this little test. Look at the screen and notice the sharpness of the characters. And the brightness of the colors.

And the name of the standard. VEGA Deluxe.™

It's a 640 x 480 high resolution graphics standard that IBM thought so highly of they built it into their own new Personal System/2 computers.

But if you've already got a PC or compatible and a MultiSync monitor, then all you need is the $495 VEGA Deluxe card.

The VEGA Deluxe is a standard that runs every piece of software written for CGA, MDA, Hercules and EGA. And one that, with a free software upgrade, will run future programs written for IBM's VGA. With 16 colors from a palette of 64.

Oh sure, the VEGA Deluxe uses advanced surface mount technology. And comes with a two year warranty. And has been the recipient of numerous awards including Editor's Choice from PC Magazine and the Ultimate Machine from PC Tech Journal.

So head down to your nearest Video Seven dealer and see for yourself what high resolution really looks like. Or contact Video Seven.

The VEGA Deluxe. It'll open your eyes.

Video Seven Inc., 46335 Landing Parkway, Fremont, CA 94538, 1-800-238-0101 (in California, 1-800-962-5700).

VIDEO SEVEN

We make a clear difference.

Registered trademarks: Video Seven, Video Seven Inc.; IBM, International Business Machines Corp. Trademarks: MultiSync, NEC Home Electronics (USA) Inc.; VEGA Deluxe, Video Seven Inc. Video Seven reserves the right to change specifications without notice.

Get more info. Go to Ad Index.

DBASE USERS!

STOP CODING

100% CLIPPER
100% FOXBASE+
COMPATIBLE

with

QUICKCODE PLUS

Let's face it. Coding is a waste of time. Why should *you* have to work hard just to get dBASE to do what you want? Let QUICKCODE PLUS automatically write all your dBASE programs for you. Its built-in Form Editor and 1-2-3 style commands are a breeze to use. And it can write programs like an *expert*-to read and update *dozens* of databases; 11 pages and 500 fields per form; Protected Fields; and *hundreds* of other state-of-the-art features!

REPORT LIMIT

95!

NOW 100% CLIPPER COMPATIBLE

with

QUICKREPORT

Not getting enough mileage out of your dBASE reports? Is REPORT FORM too weak and programming to slow? Then it's time to switch to something a lot stronger...QUICKREPORT, the dBASE Report Writer you've always wanted. Design reports in seconds simply by drawing them on the screen. Put text and data anywhere, define computed fields, totals, averages, etc. You can even link together 6 databases and use powerful features like file chaining and transaction processing. Sort, group, and total on up to 16 fields. Use fancy printer features like BOLD, italics, etc. This is the Report Writer that PC Magazine called "elegant."

FOX & GELLER

Fox & Geller
604 Market Street
Elmwood Park, NJ 07407
(201) 794-8883 Telex: 311256

QUICKCODE PLUS and QUICKREPORT are trademarks of Fox & Geller, dBASE III PLUS is a trademark of Ashton-Tate, 1-2-3 is a registered trademark of Lotus Development Corp

Get more info. Go to Ad index.

John Greenleigh

The Maynstream 60 tape backup unit has added extensive LAN support and works with PS/2 Models 50, 60, and 80.

duties. Slip the controller into your PC and the board into one of the new PS/2 machines, and the Maynstream not only safeguards the corporate coffers, it also provides a means of exchanging data between the old-time PC and its new PS/2 cousin.

The Maynstream boasts high compatibility marks, supporting computers from IBM to Zenith and LANs such as Novell's *Advanced Netware/86* and */286*, 3Com's *3+Share*, and IBM's *PC Network*. Maynard also boosted the total number of assignable Novell network drives from 8 to 26. Most important, the tape drive is speedy: In *PC World* tests it performed a file-by-file backup of a 20MB disk (with 1031 files in 39 directories) in 5½ minutes—less time than many systems require for the typically quicker image backup.

Installation of the Maynstream 60 is painless. Once the board and cables are in place, the menu-driven software automatically creates a subdirectory, copies the programs, and modifies your CONFIG.SYS file. Like most systems, the Maynstream employs DMA (direct memory access) channel 1 to swap data; however, you can use channels 2 or 3 to avert a potential hardware conflict—say a spat between an internal modem and Maynard's controller card over the COM2 port. If you're unsure about handling such technical minutiae, enter a value of 0. The Maynstream will become a data valet, automatically polling the DMA channels for you and rerouting the data flow if conflicts arise.

(continues)

frustrated	aggravated	sick
impatient	confused	troubled
upset	perturbed	tired
tedious	overwhelmed	miffed
dizzy	defeated	agitated
perplexed	stupid	wrecked
crazy	annoyed	moronic
dumb	irate	pained
outraged	foiled	thwarted

Don't hold back now. How do you really feel about working with columns?

Columns. The black hole of word processing technology.

Try to move a column with your present word processor. Good luck. Try to add or delete a column. Sorry.

Lotus Manuscript™ can change how you feel about working with columns. Really. Because Lotus Manuscript thinks vertically as well as horizontally.

Consider this. On ordinary word processors, when you create a table, or put any information in columns, you work horizontally, using tabs to create a vertical effect.

Inserting a column with your present word processor would be a true test of patience, right?

It's simple with Manuscript, because Manuscript thinks vertically as well as horizontally.

With our sophisticated table editor, you can actually create each column independent of one another. You can change information, even delete, move or insert columns, without the usual litany of expletives deleted.

And it's not just limited to columns you create yourself. Take tables from Lotus® 1-2-3® or Symphony,® for instance. When you import that tabular information into Lotus Manuscript, it recognizes it as columns, so you can change, delete, move, insert or format this material as well. You can even dress up your tables with a variety of boxes and borders.

As you can see, Lotus Manuscript is not just another word processor. It's a complete document creation system, with more impressive features than we could ever go into here.

Lotus Manuscript is designed to work on most IBM® PCs and compatibles.* Its familiar 1-2-3 interface makes it easy to use. And our Manuscript evaluation kit makes it easy to try. For $10.00, you'll get a presentation disk, working software, and a tutorial manual. To get your evaluation kit, call 1-800-345-1043, ask for lot PS-1450. Or, for more information, see your Authorized Lotus Dealer, or write Lotus Development Corp., 90 Annex, Atlanta, GA 30390-03070.

Lotus Manuscript™

© 1987 Lotus Development Corporation. Lotus, 1-2-3, and Symphony are registered trademarks and Lotus Manuscript is a trademark of Lotus Development Corporation. IBM is a registered trademark of International Business Machines. *Manuscript and Manuscript Evaluation Kit require 512K and a hard disk.

PC Magazine Editors' Choice

Laptop & IBM PS/2 Users:

The solution to bridge the gap between your 5¼ & 3½ inch drives.
"It's a steal. It allows you to use your favorite DOS shell for selective file transfer and it even lets you use your PC's peripherals from your laptop . . . In short: An exceptionally fast and functional transfer utility . . . The Brooklyn Bridge is the perfect solution for people who use a laptop almost exclusively as a portable machine that travels from PC to PC. It's terrific!" — Howard Marks, PC Magazine, July 1987*

Rated as one of the best of the best utilities by John Dvorak.
"This is one of those rare programs that you enjoy the minute you take it out of the box, especially when you discover that a cable is included . . . Excellent product." — PC Magazine, June 23, 1987*

THE BROOKLYN BRIDGE

End users are "sold on Brooklyn Bridge . . .
Dvorak is certainly correct in describing White Crane Systems' Brooklyn Bridge as 'Fabulous' . . . and I love it." — G. Schochet, Letter to the Editor, PC Magazine, May 12, 1987*

WHITE CRANE SYSTEMS
404-394-3119
Suite 151
6889 Peachtree Ind. Boulevard
Norcross, Georgia
30092

PS/2 users: The Brooklyn Bridge allows data transfer and drive access in either direction so you may also transfer your data back to your 5¼ inch PC.

Priced at $129.95, call White Crane Systems to order or for more information.

*Reprinted from PC Magazine, copyright 1987 Ziff Communications Company

WHITE CRANE

Get more info. Go to Ad Index.

SOLID MODELING ON A PC FOR $349

ModelMATE is a true solid modeling software package with the power of the "big guys" at a fraction of the cost. By providing a low cost, high quality package, we plan to make 3D modeling capabilities available to all serious users — not just a privileged few.

If you are an engineer, designer, draftsman, architect, or just interested in 3D, ModelMATE is for you. It has the power you need, at a price you can afford.

ModelMATE's powerful solid modeling technique (B-rep) places it a class above point-line (wireframe) CAD software. This capability is further enhanced by the following features . . .

- 3D Cursor
- Extrusions
- Construction Planes
- Surfaces of Revolution
- Multiple Display Windows
- 3D Splines
- Automatic Sectioning
- Object Duplication & Scaling
- Interference Checking
- 6 Standard Views & Isometric Perspective
- Light Source Rendering
- Unlimited User-Definable Views
- Hidden Line Removal
- Floating Point Accuracy

Created and Rendered Using ModelMATE

An optional print package is available for $49.
A package for transferring ModelMATE models to DXF, IGES, and other popular CAD files is also available for $49.
System Requirements: IBM PC/XT/AT, 512K RAM, & one floppy.
Graphics Card: Hercules, CGA, EGA, PGC, and others.
Recommended: Math co-processor, 640K RAM, mouse or digitizer.

Control Automation, Inc.
P. O. Box 160100, Altamonte Springs, FL 32716-0100
For immediate information, call (305) 682-7077
IBM PC/XT/AT are registered trademarks of IBM Corp.

Get more info. Go to Ad Index.

The Maynstream 60 performs almost any backup-and-restore operation without hassle. Its elegant file inclusion and exclusion system enables you to back up and restore any combination of disks, drives, subdirectories, and files—including non-DOS partitions.

In addition to entering DOS-level commands, beginners can quickly perform full backups by typing SAVE, or they can turn to the *1-2-3*-style menu system for context-sensitive help. Department heads will appreciate the Autoback feature, which permits them to prearrange up to eight unattended backups per week. If you shut off the computer before automatic backup is completed, the software will remind you of that fact when you turn the system back on.

If you perform the same kinds of backups regularly, the parameters can be saved in script files for future use. The Maynstream protects you from directory-scanning tedium by automatically displaying the script file names under the backup menu option. Backups can be restricted to modified files or to files from specified time periods.

The Maynstream's provisions for safe and accurate hard disk maintenance are also extensive. Before performing backups, you can label the data set using up to 60 characters and decide whether to add to or overwrite any existing data sets. Maynard also prevents the sinking feeling that occurs when an 'end of tape' message pops up in midbackup; rather

(continues)

Finally. A Portable Designed To Break The Mold, Instead Of Your Back.

Portable computers fit a predictable pattern. The more powerful they are, the less portable they are.

With one magnificently small exception. The T3100/20.

It's the best shape power has ever been in. A smaller, slimmer profile that's tailored to you, instead of the other way around.

Yet inside this sleek 15-pound package are 640KB of RAM and a built-in 20MB hard disk. All driven by an 80286 microprocessor, the same CPU that sparks the IBM® PC AT.®

Its gas plasma screen is so bright, it looks like a full-size CRT display. Which, by the way, you can easily plug into the T3100/20's standard RGB color port.

MS-DOS® 3.2 is standard. So are parallel, serial and 5¼"external drive ports. And a soft carrying case.

With every T3100/20, we'll include free copies of Lotus® *Symphony*® * and Lotus *Metro*,® two of the world's most popular programs, for the world's most popular portable computer.

You can also add a 1200 bps Hayes®-compatible modem, a five-slot IBM-compatible expansion chassis, 2 megabytes of extended memory, and a numeric keypad.

The T3100/20 is backed by Exceptional Care,** our promise that if we have to fix your computer, we'll fix you up with another one while you wait.

All of which leads one to a small dilemma. How to regard a machine that changes forever the way the world thinks about portable performance.

You could think of it as a desktop on a crash diet. Or the muscle of an AT without the bulk. Or simply as *PC World* put it: "A small miracle."

Call 1-800-457-7777 for the Toshiba computer and printer dealer nearest you. He can show you how to enjoy all the advantages of power.

With none of the burdens.

IBM & PC AT are registered trademarks of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft Corp. Lotus, Symphony and Metro are registered trademarks of Lotus Development Corp. Hayes is a registered trademark of Hayes Corp. *Limited time offer. **No-cost enrollment required. See your dealer for details.

In Touch with Tomorrow

TOSHIBA

Toshiba America, Inc., Information Systems Division

CAT IMAGE SCANNER

$295

Turn your Printer into a SCANNER
... Perfect for Desktop Publishing ...

- For IBM PC//XT/AT and Compatibles
- Used with most Epson-compatible printers
- Interfaces with existing parallel printer port

Scanned Picture

Features....

- resolution 300 dpi
- adjustable light/dark contrast control
- dual scan modes: halftone & line-art
- used with paint programs for image editing
- loads images directly into desktop publishers
- auto-positioning to feed images into documents
- operates with CGA, EGA & Hercules graphics

Name: _____ Phone: ( ) _____
Address: _____
State _____ Zip _____
☐ Send me more informaion on CAT Image Scanner
☐ Send me a CAT Image Scanner for $295 + $5(s/h) + .0725 tax for TX residents
☐ check enclosed ☐ visa ☐ MC Acct#: _____
Exp.Date: _____ Signature: _____

Call **(214) 631-6688** for order or information
Computer Aided Technology, Inc.
7411 Hines Pl., Suite 212, Dallas, TX 75235

Get more info. Go to Ad Index.

than screeching to a halt, it demurely asks you to insert a second tape.

The Maynstream checks data integrity by performing standard read-after-write verification during backups. A separate Verify option, similar to DOS's COMPARE, scans the disk and tape for comparison after the backup is finished.

For such an accommodating system, the Maynstream's meager on-screen status information is disappointing. Only during image backups does it provide a running account of elapsed and remaining backup time. With file-by-file operations, all you see is a flock of file names and subdirectories flying by. After the operation concludes, the system notes the total number of files and directories backed up but does not provide a total megabyte figure.

That omission aside, the Maynard Maynstream 60 offers flexibility and speed. The drive comes with password protection, an excellent archiving feature, and a well-organized manual with clear, step-by-step instructions. The system carries a respectable MTBF (mean time between failure) rating of 30,000 hours, a one-year warranty (five years on the controller), and toll-free technical support. Although the Maynstream's $1595 retail price isn't rock-bottom, when you consider that the unit can serve an entire department, it's a tough package to beat. *–Art Wilcox*

(continues)

AutoSketch™

A Resource to Draw Upon

To get any job done, you need the right tools. Ideally, they should be extensions of your talents, freeing you to do what you do best. And speed, precision, flexibility, and consistency are always top priorities, no matter what the job. If communicating with drawings is part of your job, AutoSketch should be one of your resources.

AutoSketch from Autodesk, the developers of AutoCAD,® is the precision drawing tool for professional use. It's fast, powerful, and simple to learn. The price is right, too.

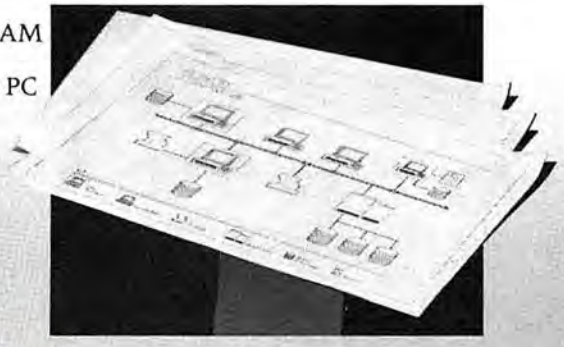
With AutoSketch and your personal computer, you'll enter the world of computer-aided drawing with ease. You may never have designed with a PC before, and you may think it's bound to be complicated and time-consuming. Surprise! With AutoSketch, you'll probably be up and running in about an hour.

Despite its ease of use, AutoSketch is a full-function, object-oriented CAD program. Pull-down menus and dialog boxes help you each step of the way. With a click of the mouse, you can draw, then copy, mirror, or move objects, even create symbol libraries. AutoSketch automatically updates measurements whenever you stretch, scale, or rotate dimensioned objects. It even keeps track of everything you do, so that you can delete and restore parts of your drawing as easily as you change your mind, using successive undo or redo commands.

We know you'll be impressed with the professional results. So will your clients and colleagues.

AutoSketch runs on the IBM PC/XT/AT and compatible systems with a minimum of 512K RAM and either color or monochrome display. The standard version is yours for just $79.95. If your PC has an 8087 or 80287 math coprocessor, this version operates about three times faster. The speed-enhanced version for $99.95, requiring the coprocessor, is three times faster still.

Call 800-445-5415 for the name of the AutoSketch Dealer nearest you or more information on supported peripherals. To order direct with a credit card, call **800-772-9200, ext. 346.**



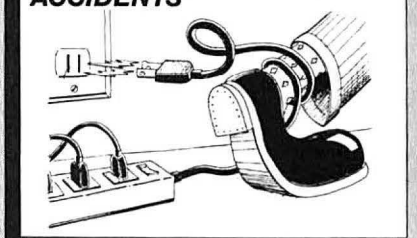
Get more info. Go to Ad index.

FRUSTRATION INSURANCE

NOW Non-Copy Protected!

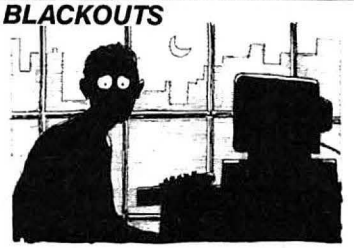
For Only $99.95 **BOOKMARK™** Protects You From:

ACCIDENTS



BOOKMARK protects you against loss of work and time due to unexpected incidents.

BLACKOUTS



Work in progress, up to the previous BOOKMARK placement, is safe!

SYSTEM CRASH

System crashes used to mean complete loss of data in memory, but not any more.

FROZEN KEYBOARD

When the keyboard freezes up you've got to reboot—and you can't even save first. But with BOOKMARK, work is already saved.

BOOKMARK™

Memory-resident utility software that automatically saves work in progress to the hard disk at user-definable intervals.

See us at

P.C. EXPO
Jacob K. Javits Convention Center, New York, New York
Sept. 1-3, 1987

The 10th NORTHEAST COMPUTER FAIRE
The World Trade Center
Exhibition Center, Commonwealth Pier Five
Boston, MA Oct. 15-17, 1987 - Booth No. 436

The 14th International
INFORMATION MANAGEMENT EXPOSITION & CONFERENCE
Jacob K. Javits Convention Center, New York, New York
Sept. 29-Oct. 2, 1987 - Booth No. 249

P.C. EXPO
McCormick Place North
Chicago, IL Oct. 13-15, 1987

To Order Call Toll *FREE* **800-544-MARK** In California Call Toll Free **800-543-MARK** or call for the dealer or distributor nearest you.

Requirements:
IBM PC/XT/AT or 100% Compatible • 256k to 640k • IBM DOS 2.1 or Higher. 1 Floppy Drive • Hard Disk Drive (10 Megabytes Minimum) • Video Display Adapter IBM (Monochrome, Color, Enhanced Color) Hercules, AST (BOOKMARK occupies an equivalent space on hard disk as in system RAM plus video RAM)

INTELLISOFT™
INTERNATIONAL
51 Digital Drive • P.O. Box 5055 • Novato, California 94948
(415) 883-1188 • Telex 470766 • Fax (415) 883-2646

BOOKMARK® is a trademark of INTELLISOFT International. Copyright © 1986, 1987 by INTELLISOFT International. All rights reserved. Patent Pending. Other brand and product names are trademarks of their respective holders.

NEW!
IBM Personal System/2 and Mac Plus Versions Now Featuring:

- Increased compatibility including IBM DOS 3.3 and plug-in hard disk cards
- New UNDO function key
- Audible indication option of BOOKMARK save
- Keyboard input now appears simultaneously during BOOKMARK save
- Advanced user mode

Coming Soon!

BOOKMARK add-on utility for extended and expanded RAM applications.

BOOKMARK for Novell Network workstations

YES! Please send ___ BOOKMARK(s) at $99.95 each to:

SHIPPING AND BILLING ADDRESS

Name _____ Co. _____
Street # _____ State _____
City _____
Zip _____ Phone (_____)

PAYMENT METHOD
☐ Money Order ☐ Visa
☐ MasterCard ☐ Amer. Exp.
/ / /
Account Number
Expiration Date
Signature

FORMAT (check one)
☐ 3½" ☐ 5¼" ☐ Mac Plus

ORDER INFORMATION
Please send ___ BOOKMARK(S) at $99.95 each (total) _____
Sales Tax $6.00 (Calif. Residents Only) _____
Shipping & Handling ($5.00 per unit) _____
TOTAL _____

Get more info. Go to Ad Index.

Laser Stacker

Laser printer paper recollator

Pros: *Ergonomic design*
Cons: *Does not work with all paper stock*

Bairnware Industries
23 Braddock Way
Asheville, NC 28801
704/252-4491

List price: $29.95

The Laser Stacker is a peripheral that strives to compensate for a design deficiency in laser printers equipped with the Canon LPB-CX engine, such as the HP LaserJet, the Apple LaserWriter, and the QMS KISS. With these printers, documents emerge face up and must be reordered.

Laser Stacker solves the problem–sort of. Molded from a single piece of plastic bent into a modified *V*, it fits underneath the printer and replaces the paper tray. As paper comes out of the printer, each sheet is flipped over face down, so documents stack in the right order.

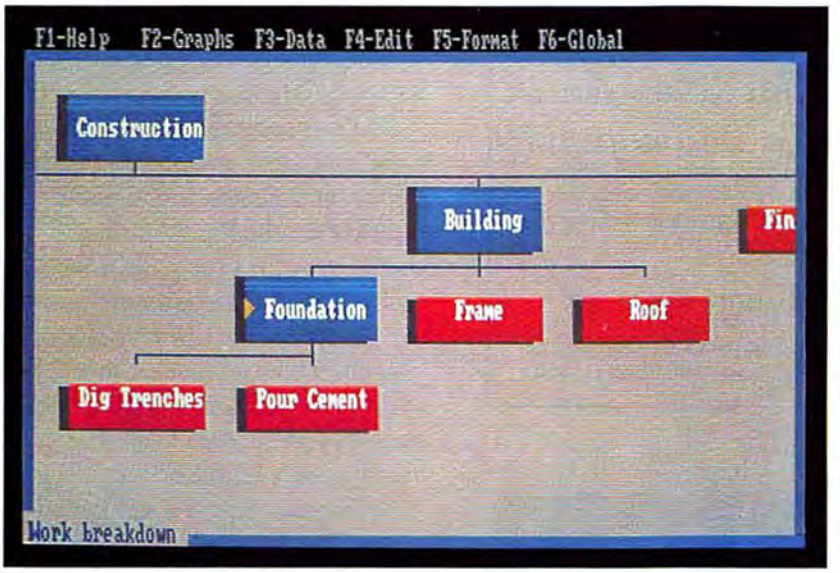
At least that's the theory. I tried Laser Stacker with two paper types: everyday, lightweight office copier stock for rough drafts and my "Sunday best" cotton rag stock that I use for correspondence. It didn't work with either one.

Because of the heat that a laser printer uses to fuse toner onto paper, sheets tend to curl temporarily as they emerge. Inevitably, one sheet comes out before the

(continues)

Is this the new look of project management?

Plan on it.



Our interactive Work Breakdown Structure is a more intuitive way to start planning.

We redesigned HTPM for a faster, easier approach to project management.

Even though Harvard Total Project Manager was the category leader, we knew we could make it better.

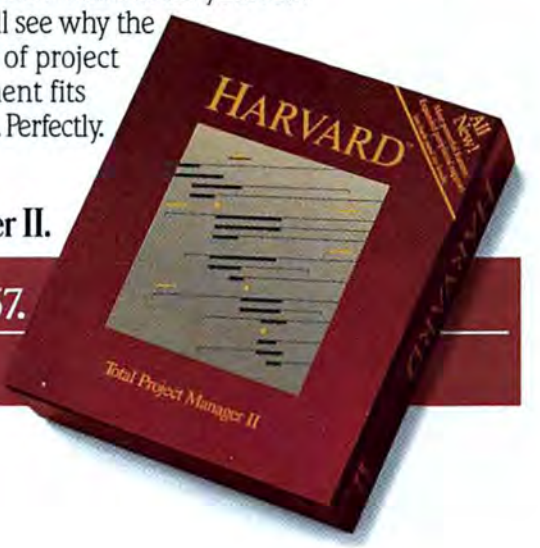
So we listened to project managers, added innovations, and created Harvard Total Project Manager II. The result is a redesigned project management tool that's dramatically easier to use, with more features and increased capability.

You'll see the difference right away. It starts with a more intuitive, easily accessible user interface. Then HTPM II's unique Work Breakdown Structure gives you the opportunity to plan your project completely on-screen. You also have the choice of other interactive planning formats: PERT charts, GANTT charts and Task Lists. Only HTPM II offers all four alternatives, letting you plan the way that works best for you.

HTPM II's other sophisticated features help you automatically track resources across multiple projects, add project data more efficiently, and keep everyone on the project up to speed with comprehensive presentation quality reporting.

We can't tell you everything about HTPM II here. We can invite you to call for our free trial disk, and find it all out for yourself.

You'll see why the new look of project management fits your style. Perfectly.



Graduate to Harvard Total Project Manager II.

For a free trial disk call 1-408-848-4391. Oper. #57.

For upgrade information call 1-800-255-5550.

Runs on IBM XT with hard drive and MS DOS compatibles. © Software Publishing Corporation, P.O. Box 7210, Mountain View, CA 94039-7210.

Still Searching?

MAC Version now available

What does the Bible say? And where?

We offer an integrated family of software products that allow you to search the Bible as never before.

With "THE WORD Processor" software (which includes the complete text of the KJV or NIV Bible) you can create indexes on key words, phrases, even concepts, as well as search, display or print, for just $199.95. Greek and Hebrew Transliterator products which include Strong's Concordance are also available. Or choose from a host of other exciting Biblical software products available in varying price ranges.

So if you're still searching, give us a call. We're anxious to show you how your PC can help you access your Bible as never before.

Include $3.00 for postage and handling. For Apple, IBM PC, Commodore 64, TRS80, MacIntosh, CPM 2.2, MS-DOS.

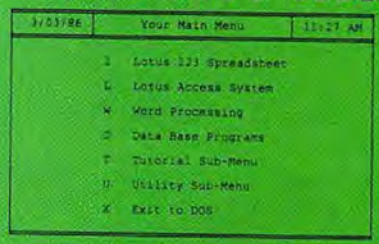
BIBLE RESEARCH SYSTEMS

2013 Wells Branch Parkway, Suite 304
Austin, Texas 78728 **(512) 251-7541**

Get more info. Go to Ad Index.

Menu System

Ver. 3.11 with NEW Editor



$49.95
PS/2, XT, AT & COMPATIBLES

Site Licensed By:
Polaroid, RCA, Allied/Bendix, C.A.R.E and Security Pacific.

"Of the menu utilities we have tried, our favorite is the Menu System by Cottage Industries."

—Keith Thompson, *Business Systems Product Update*

Allows you to create an unlimited number of menus, each with up to 19 selections. Runs any DOS command or application. Written in C. Fast. Color or B/W. Not copy protected. Non-resident. Requires a hard disk and DOS 2.0+. Site licensing. Multi-user versions. Master-Card/Visa/PO. Quantity Discounts.

Cottage Industries, Inc.
P.O. Box 176, 407 Gordon
Liberty, Missouri 64068
Telephone (816) 792-2400

Upgrade $10.00

IBM XT & AT are trademarks of International Business Machines Corp. DOS is a trademark of Microsoft Inc. Lotus 123 is a trademark of Lotus Development Corp.

previous one has a chance to uncurl. The sheets collide in the Laser Stacker, scrambling the page order.

The Laser Stacker's user manual acknowledges that problem and maintains it can be alleviated by turning the paper upside down when loading it into the printer. In my case, however, that solution proved fruitless. After some trial and error, I found a medium-weight stock that popped out without curling.

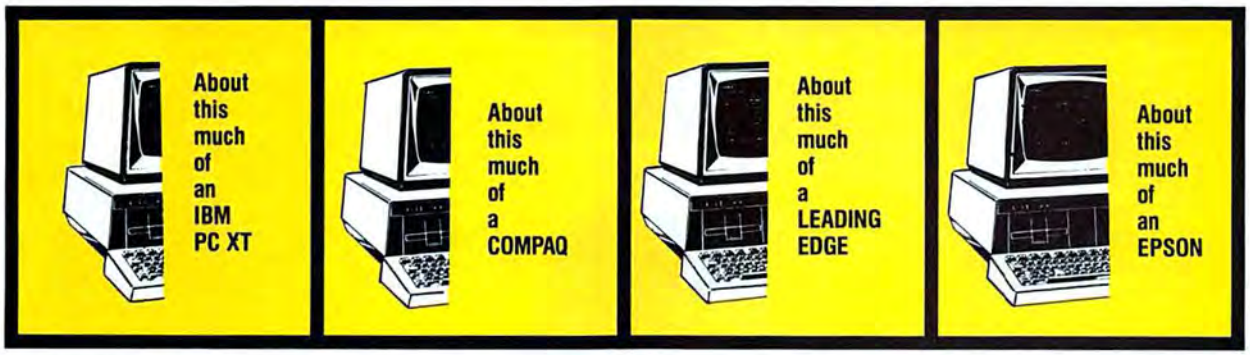
The company offers a money-back guarantee, so you can try the device for yourself. If you find the right paper, the Laser Stacker should provide a permanent, low-cost solution to an irritating problem. If not, you might consider keeping the Laser Stacker around as an easel for computer manuals, since its wide lip can keep the bulkiest tome in place.

Otherwise, there's a simpler solution. Raise the printer about two inches with books or blocks. Then place the lid of a large box underneath the output slot so that the top edge of each emerging sheet catches on the lid and flips over.

The document is then in the correct order, there's no limit to the number of sheets—and the price can't be beat. —*Ted Nace*

Michael Gardner is an author and a software developer in Orinda, California. Eric Ludd is a New York-based writer. Art Wilcox and Ted Nace are Contributing Editors for PC World.

How much computer will $699* buy?



With the AMSTRAD PC1512, everything is included.

At last! A powerful IBM-compatible personal computer with the popular "MOUSE" and software, all at an affordable price. No add-ons needed, just plug it in and go!

Here's what you get:

Monochrome monitor, paper white with 16 gray levels – 360kb double sided floppy disk drive – 512k memory – 8086 processor (8mhz) – "mouse" – PC compatible keyboard – Joystick port – Parallel and Serial ports – 3 full sized PC compatible expansion slots – Complete user instructions.

"FREE" Software ($500 retail value)

Microsoft MSDOS V3.2 operating system, Digital Research DOS PLUS operating system, Digital Research "GEM Desktop," "GEM Paint," "GEM Doodle," Locomotive Software "Basic 2" and very detailed, clearly presented user manual.

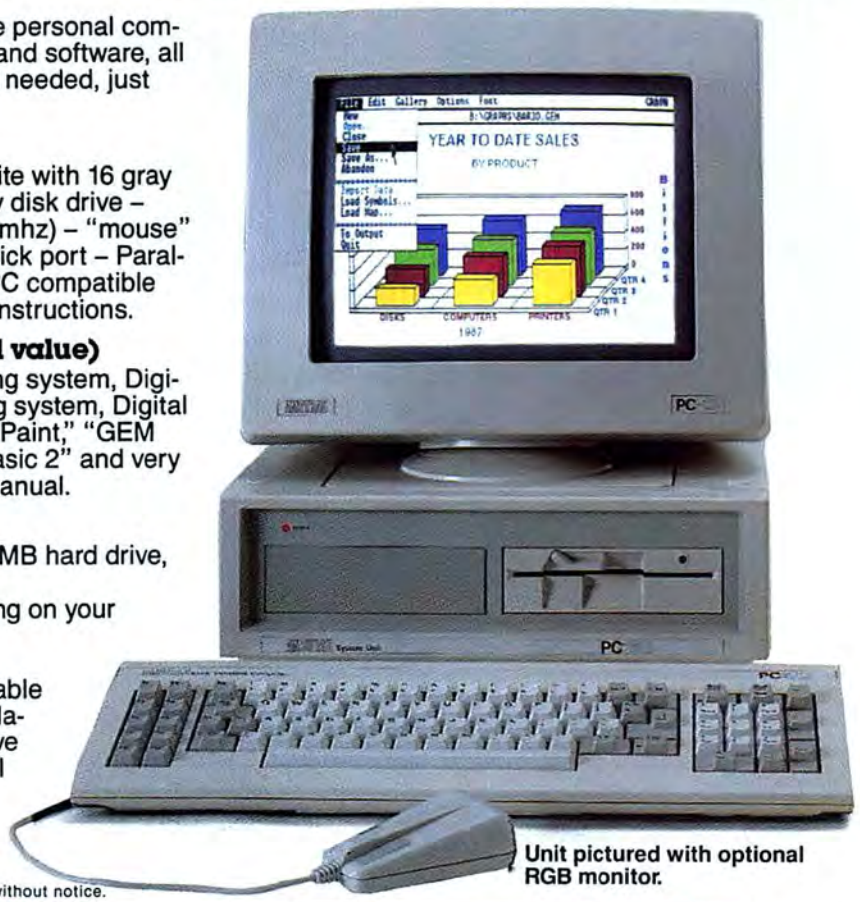
Optional Features

Second Floppy disk drive or 20 MB hard drive, RGB Color Monitor, 16 colors.

It's never been easier to get going on your own personal computer. It's what you've been waiting for.

The AMSTRAD PC1512 is available now at better Computer Dealers Nationwide. If your dealer doesn't have them yet, write or call and we'll tell you where you can buy one.

*At participating dealers



Unit pictured with optional RGB monitor.

IBM, Compaq, Leading Edge, Epson, Amstrad and Microsoft MS-DOS are registered trademarks of International Business Machines Corp., Compaq Computer Corp., Leading Edge Products, Epson America Inc., Amstrad plc and Microsoft Corp., respectively.

*Prices and specifications are subject to change without notice.

The complete AMSTRAD PC1512.

Sole U.S. Agent, Vidco, Inc.
1915 Harrison Rd.
Longview, Texas 75604
214-297-4898

AMSTRAD

only you can save unprotected software.

Unprotected software is not freeware

Recently, many leading software firms have removed copy protection from their software. They have taken this action for one reason—you, the user, have requested it. You say that unprotected software is less trouble to use, and that it generally simplifies the use of your PC. Many software firms responded and have given you what you requested.

Now the software industry requests something of you. ***Please do not illegally duplicate unprotected software.*** Unprotected software enjoys the same legal protection as protected software. It is not a violation of federal copyright laws to make a back-up copy, but making or distributing additional copies for any other reason is against the law.

Only you can stop software piracy.

Remember, many people worked hard to produce every program you use: designers, programmers, distributors, and retailers, not to mention all the people who support users. They have a right to be compensated for their efforts through legitimate software sales. By removing copy protection from their software, publishers are relying upon your good faith—and your trust. They assume that you want the industry to continue developing even better and more innovative software. Please do not abuse the trust the industry has placed in you. Do not make unauthorized copies of software.

SPA Software Publishers Association
1101 Connecticut Avenue NW
Suite 901
Washington, D.C. 20036

1-800-241-0286

PC MART
Personal Computer Centers

OVER 3 MILLION DOLLARS IN INVENTORY AND THOUSANDS OF DIFFERENT PRODUCTS IN STOCK. CALL FOR OUR FREE CATALOG.

1485 Northeast Expressway, N.E.
Atlanta, GA 30329

AST PREMIUM 286 MODEL 140
40 MB fast-access, 1 MB ram, zero wait states, 10 MHz, AST 3G EGA card, bundled with new color monitor complete system
$3289

SYSTEMS

- **Hundreds of portables and laptops**—Call for the model that suits your needs.
- **DATAVUE SPECIAL**—two drives with 640 K . . . . . **CALL**
- **TOSHIBA 3100/1100 PLUS** with super-twist screen and new 1200 . . . . . **in stock and ready to ship!**
- **IBM PS/2 MODEL 30/50/80**, new low pricing from $1499 . . . . . **CALL!**
- **ARC/XT—640K**, 1 floppy w/20 MB, complete with new Mitsubishi color monitor . . . . . **From $1299 while they last!**
- **AST PREMIUM 286 MODEL 80** . . **$1595** ...mix and match your favorite monitor and card (shipping included)

PRINTERS/ PLOTTERS

- **BROTHER HR-40**—built in cut sheet feed, true letter quality with tractor . . . . . **low price!**
- **BROTHER M1409/M1509/ M1709**—9 pin dot 180-240 CPS in data processing mode. From $349 . . . . . **CALL!**
- **AST/QUADRAM** laser printers . . . . . **from $2999**
- **CALCOMP and HEWLETT PACKARD PLOTTERS** . . . . **call for complete CAD systems!**
- **HOUSTON INSTRUMENTS DMP-52 MP** (14 pen/22 IPS/ 21.5" x 34" plot) **$4175**
- **OKI LASER PRINTER** . . **$1895** Delivered, complete!

BROTHER HL-8 LASER PRINTER
300x300 DPI, 8 PPM, 1 MB resident memory, HP-laserjet plus emulation...
LOWEST PRICE GUARANTEED!

MITSUBISHI DIAMOND SCAN—
VGA, EGA, CGA, & PGA compatible with VCR input and 800x560 resolution including 131 mm dot pitch. Crystal clear clarity on an unmatched palette of colors
NOW **$549**

MONITORS

- **MITSUBISHI 1410**—EGA 640x350 resolution **$429**
- **NEC MULTISYNC XL** and **PLUS** . . . . . **now available!**
- **PGS LM 300**—a true WYSIWYG monitor . . . . . **CALL!**
- **MITSUBISHI 1409** color monitor **$349**
- **SAMSUNG TRUE MONOCHROME** (720x350 res) **$89**
- **AMDEK 410A/W/G** **$179**
- **PGS MAX-15** . . . . . **NEW!**
- New line of monitors in stock, call for our unadvertised special.

SOFTWARE

- ASHTON TATE D'BASE III PLUS . . . $396
- ASHTON TATE RAPIDFILE . . . CALL!
- ASHTON TATE MULTIMATE II . . . $349
- BORLAND EUREKA . . . $59
- BORLAND REFLEX . . . $79
- BORLAND TURBOBASK . . . $69
- BORLAND TURBO C . . . $69
- COMPUTER ASSOCIATES A/P, G/L, A/R, & PAYROLL . . . IN STOCK
- GENERAL CADD . . . $69
- LOTUS 123 . . . $339
- LOTUS EXPRESS . . . $89
- LOTUS HAL . . . $119
- LOTUS METRO . . . $75
- MICROSTUFF MARK IV . . . NEW!
- PFS PROFESSIONAL WRITE/PLAN . . . CALL!
- XEROX VENTURA DESKTOP PUBLISHING . . . LATEST VERSION
- MATH CADD . . . $199
- GRAPH IN THE BOX . . . $69
- FASTBACK . . . $109
- MACE UTILITIES . . . $69
- WORDPERFECT EXECUTIVE . . . $139
- SILK . . . $99

BOARDS

- INTEL INBOARD 386—turn your AT into a 386 . . . CALL!
- QUADRAM HPG—high resolution video . . . NEW!
- AVATAR MODEM . . . IN STOCK
- QUADRAM EGA PROSYNC—with free Opti Mouse . . . $349
- INTEL—above board/AT w/512K RAM . . . $399
- PARADISE AutoSwitch EGA 480 . . . $369
- PARADISE Basic EGA . . . $179
- AST SIXPACK PREMIUM w/256K . . . $199
- ALL HAYES MODEMS . . . LOW, LOW PRICES!

DRIVES

- MICROPOLIS 40 MEG hard disc w/controller . . . $829
- MICROPOLIS 70 MEG hard disc . . . CALL TODAY!
- SEAGATE (ST-4038) 30 MEG hard disc w/controller . . . $789
- SEAGATE (ST-4051) 40 MEG voice coil . . . IN STOCK!
- SEAGATE (ST-225) 20 MEG hard disk w/controller . . . $389
- PRIAM 40 & 60 MEG hard discs . . . NEW LOW PRICE
- IRWIN 10 to 60 MB tape drives . . . from $199
- FILECARD 30 MEG hard card . . . $595

HIGHEST SELECTION OF HIGH CAPACITY HARD DISCS AT LOWEST PRICES!

MISC

- ALL PRINTER CABLES WITH PRINTER PURCHASE . . . $10
- MAXELL HIGH DENSITY DISKETTES . . . $29
- ALL DOS (latest versions) . . . from $39
- PRINTER STANDS SM/LG . . . $35/$45
- POLAROID PALETTE & PALETTE PLUS . . . $1395
- KEYTRONICS 515/AT&T . . . $169
- CARRYING CASES (portables or printers) . . . from $69

COMPAQ
AUTHORIZED DEALER

CALL FOR OUR FREE CATALOG!
Compaq products available in retail stores only
VISIT OUR SHOWROOMS IN ATLANTA, CHARLOTTE, DURHAM, & RALEIGH

INFORMATION
1-404-634-5995

PC MART™
Personal Computer Centers

Get more info. Go to Ad index.

FREE

Unbelievable, but true! Unlimited Processing, Inc. will give you **TOP DRAWER** - the $149.00 File Manager that is SECOND TO NONE! It's FREE, when you order the Demo/Tutorial of *TEAM-UP*.

We could spend millions in advertising dollars telling you about the many features of *TEAM-UP* that make Personal Computers truly useful for you and your business. But—**SEEING IS BELIEVING...**

Like *TEAM-UP*, **TOP DRAWER** is Unbelievably Uncomplicated on any computer, yet true multi-user on LANS—that's because we wrote the book on distributed processing. That's what *TEAM-UP* is all about (Distributed Database Management).

- **TOP DRAWER is like *TEAM-UP* in many ways:**

- 4 billion records per file.
- 100 indexes per file.
- 1000 fields per file.
- Advanced Q-B-E retrieval and selection process that provides SUB-second ACCESS.
- "Draw the Record" creation.
- The ultimate in multi-user LAN capabilities! And much more!

TOP DRAWER runs on any PC/XT/ AT/386/ or PC/Token Ring or compatible LAN.

*dBase is a registered tm of Ashton-Tate.

The UnBELIEVABLE TEAM-UP UnCOMPLICATED yet UnLIMITED

TEAM-UP is not just another dBase* or "R-clone"
It is the **UnDBMS!**
You must see it to believe it!!
The Demo/Tutorial shows it all for $19.95

Almost FREE

To receive TOP DRAWER FREE
ORDER YOUR DEMO TODAY!
CALL 1-800-443-0100 Ext. 131w

Send me a TEAM-UP demo/tutorial and a free TOP DRAWER file manager. I've enclosed $19.95 for the demo and $2.95 for shipping and handling.

NAME: _____

COMPANY: _____ TITLE: _____

ADDRESS: _____

PHONE #: _____ IBM Compatible

☐ CHECK ☐ MASTERCARD ☐ VISA

ACCOUNT # _____ EXP. DATE _____

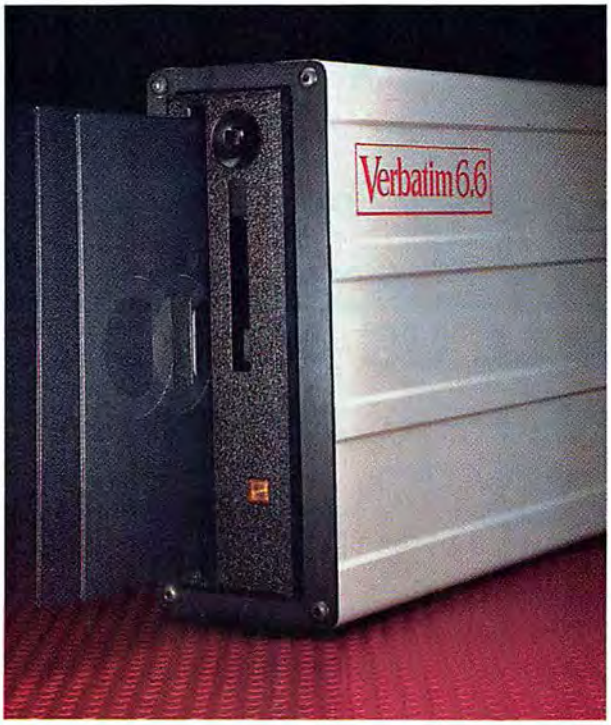
SIGNATURE _____

For additional information about TEAM-UP call 904-731-8330 or write to Unlimited Processing. Dealer inquiries welcome.

UNLIMITED PROCESSING, INCORPORATED

8382 Baymeadows Road, Suite 8 • Jacksonville, Florida 32216
904-731-8330

Get more info. Go to Ad index.



Verbatim 6.6 MB subsystems: high capacity with the convenience and security of removable floppies.

You'll appreciate the advantages of Verbatim 6.6 MB subsystems from Kodak.

You get 5.57 MB of formatted capacity and all the benefits of removable floppies. Store unlimited amounts of data. Easily transport files. Secure important information. And back up your hard disk quickly and reliably.

No need to throw away existing disks. This subsystem can read disks with 48, 96, and 192 tpi. Available to fit inside or alongside your IBM PS/2 model 30 *or* IBM PC/XT/AT *and compatibles. Everything you need for fast, easy installation comes with the package. And you're protected by a one-year warranty.*

Ask your computer dealer about this new Verbatim subsystem and media. Or call 1-800-44KODAK, ext. 990.

Free Back-It *software for hard-disk backup with purchase, while supplies last.*

6.6 MB OF ADDED STORAGE FROM KODAK

The new vision of Kodak

Kodak

©Eastman Kodak Company, 1987

FOR THE BEST BUYS, CALL US ANYTIME.

Software

Word Processing/ Desktop Publishing

Fancy Font	$ 139
Microsoft Word 3.1	$ 209
Multimate Advantage-II	$ 259
Lotus Manuscript	$ 359
Office Writer /Speller	$ 249
Pagemaker	$ 499
PFS: Prof Write	$ 119
Ventura Publisher	$ 519
Volkswriter 3	$ 145
Word Perfect 4.2	$ 195
Word Perfect Server	$ 309
Word Perfect Station	$ 75
Wordstar Pro 4.0	$ 249
Wordstar 2000+	$ 289
Xywrite III	$ 199
Xywrite III+	$ 249

Database Systems

Clipper	$ 389
DBase III Plus	$ 399
DBase III Lan Pak	$ 599
Foxbase +	$ 229
Paradox 2	$ 429
PFS: Prof File	$ 145
Q&A	$ 219
R Base System V	$ 449
RapidFile	$ 239
Reflex	$ 89

Spreadsheets/ Integrated Packages

Enable 2.0	$ 389
Framework II	$ 399
Javelin +	$ Call
Lotus 1-2-3	$ 309
Lotus Hal	$ 109
Multiplan	$ 125
Smart System	$ 429
SuperCalc 4	$ 279
Symphony	$ 449

Communications

Carbon Copy +	$ 119
Crosstalk XVI	$ 99
Crosstalk Mark IV	$ 129
Relay Gold	$ 159
Smarterm (Persoft)	$ Call
Smartcom II	$ 99

Statistics

SPSS/PC +	$ 699
Statgraphics	$ 419
Systat	$ 439

Graphics

Chartmaster	$ 209
Diagraph	$ 279
Diagram Master	$ 189
Freelance Plus	$ 349
Graphwriter Combo	$ 349
Harvard Presentation Graphics	$ 249
MapMaster	$ 219
MS Chart	$ 189
PC Paintbrush Plus	$ 109
Picture Perfect	$ 209
Prodesign II	$ 159
Publishers Paintbrush	$ 219
Signmaster	$ 139

Desktop Environments

Lotus Metro	$ 65
MS Windows	$ 65
Sidekick	$ 59

Project Management

Harvard Total Project Manager II	$ 369
Microsoft Project	$ 249
Superproject Plus	$ 299
Timeline 2.0	$ 259

Languages/Utilities

Fastback	$ 89
Lattice C	$ 219
Norton Advanced	$ 89
Microsoft C	$ 279
Mace Utilities	$ 65
MS Fortran 4.0	$ 279
Quick Basic	$ 69
Turbo Basic	$ 59
Turbo C	$ 59
Turbo Pascal	$ 69

Productivity Tools

VP Expert	$ 59
Eureka	$ 69
Sideways	$ 39

Accounting

BPI	$ 179
Great Plains	$ 499
Easy Business	$ 359

QUALIFIED INSTALLERS AVAILABLE

Hardware*

Computers

AST Premium 286	$ Call
Wyse 286 PC	$ Call
Panasonic Business Partner	$ Call
Toshiba 3100/1100 +	$ Call

Multifunction Boards

AST Advantage (128K)	$ 319
AST Advantage Premium	$ 419
AST 6 Pak Plus (64K)	$ 119
AST I/O Mini II	$ 119
AST Premium (256K)	$ 219
AST Rampage PC	$ 279
AST Rampage 286	$ 399
Inboard 386AT	$1350
Intel AboveBoard	$ Call
Orchid Jet 386	$ 949
PC Turbo 286 (1MB)	$ 749
PC Tiny Turbo 286	$ 449
QuadBoard (0K)	$ 109

Display Boards

ATI EGA Wonder +	$ 239
Hercules Graphics Card Plus	$ 189
Hercules Color Card	$ 159
Hercules In-Color Card	$ 309
NEC GB1	$ 359
Paradise Auto Switch EGA 480	$ 399
Quad EGA Prosync	$ 339
Quadram EGA +	$ 289
Tseng EVA 480	$ 389

Modems

Hayes 1200	$ 299
Hayes 1200B	$ 299
Hayes 2400	$ 499
Hayes 2400B	$ 449
Migent Pocket	$ 159
US Robotics 1200	$ 139
US Robotics 1200B	$ 109
US Robotics 2400B	$ 189
Ventel 2400	$ 409
Ventel 2400B	$ 409
Watson	$ 339

Emulation Boards

AST 5211-11 +	$ 629
Irma/2	$ 725

Monitors

Amdek 310A	$ 149
Amdek 410A	$ 169
Amdek 1280	$ 779
NEC MultiSync	$ 579
Princeton HX-12	$ 439
Princeton MAX-12E	$ 149

Printers/Plotters

Epson EX-1000	$ 549
Epson FX-86E	$ 359
Epson FX-286E	$ 499
Epson LQ-1000	$ 569
HP 7475A	$1499
HP Laserjet II	$1825
NEC 3550	$ 789
Okidata 192 +	$ 379
Okidata 193 +	$ 549
Okidata 292	$ 539
Okidata 293	$ 689
Toshiba P321	$ 549
Toshiba P341 E	$ 769
Toshiba P351 Model 2	$ 999

Mass Storage/Backup

IOmega 20 + 20 W/intfc	$1949
Irwin Tape Drives	$ Call
Plus HardCard 20MB	$ 675
Plus HardCard 40	$ 949
Priam 42MB AT	$ 799
Priam 60MB AT	$ 899
Seagate ST 225 W/int	$ 329
Seagate ST238 W/int	$ 389
Tallgrass	$ Call
Tecmar QT60 Int	$ 899

Networks

ArcNet	$ CALL
Novell	$ CALL

Input Devices

Keytronics 5151	$ 169
Keytronics 101	$ 119
Microsoft Mouse	$ 129
PC Mouse/Dr Halo II	$ 109

Accessories

Curtis Ruby	$ 59
DataShield S-100	$ 69
Logical Connection	$ 329
Masterpiece Plus	$ 129
Microfazer II	$ 269
80287 Math Chip	$ 189

3.5 INCH SOFTWARE NOW IN STOCK CALL!!

24 Hours A Day, 7 Days A Week

1-800-221-1260

Customer Service Hours: 9 AM—5 PM, Mon.—Fri.

In New York State call (718) 438-6057

FREE SHIPPING

on all orders over $1,000.00, credit card orders and prepaid orders.

MasterCard VISA

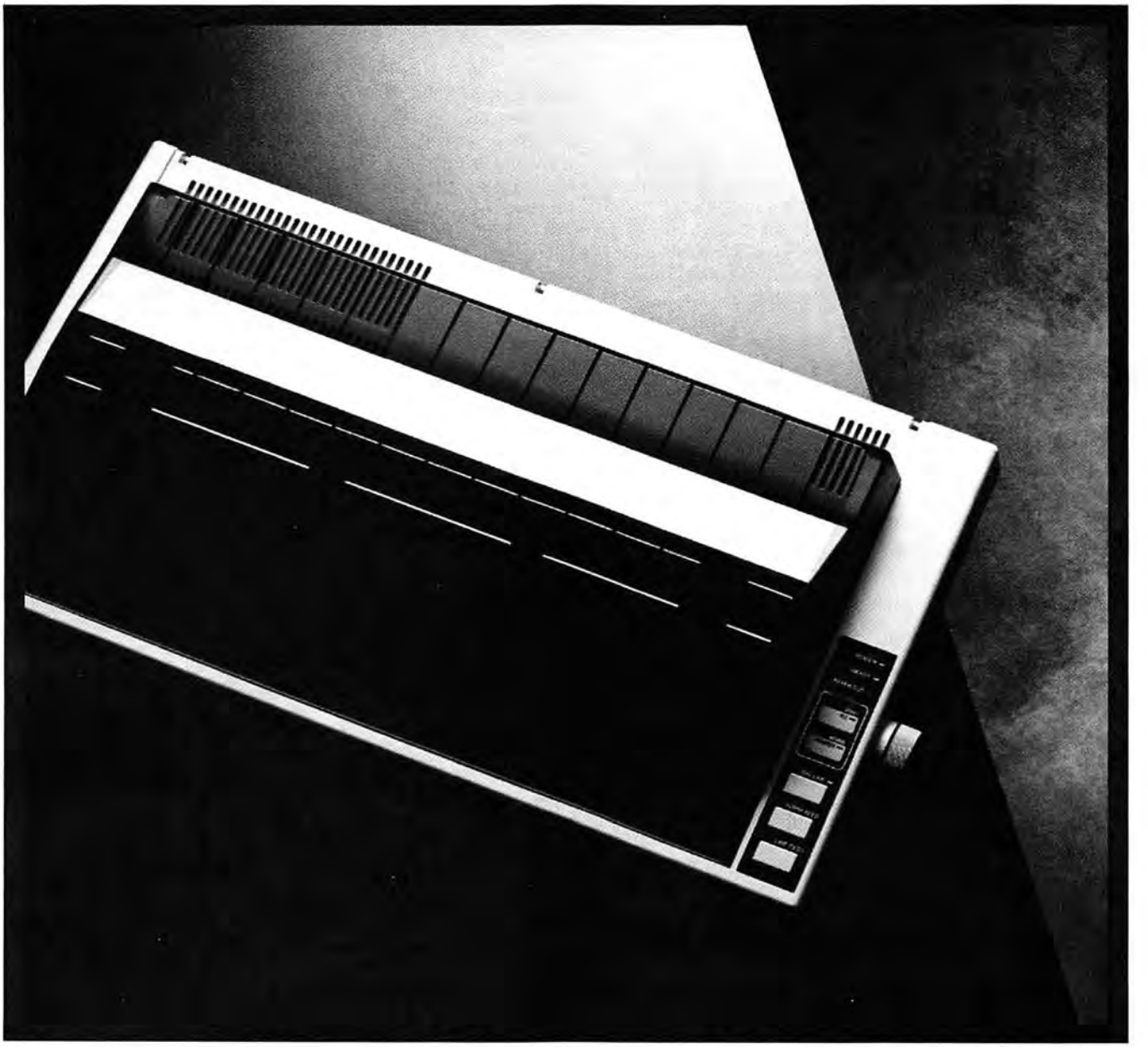
PAUL

Softline

P.O. Box 300729,
Brooklyn, NY 11230
TELEX: 627-30170 or 910-240-3918
FAX: 718-972-8346

Our Policy:

- All returns require prior authorization • Visa or Mastercharge—add 3% • Cash, M.O. or bank check only—add $5.00 per order • Prepaid personal or company check—allow two weeks to clear
- Shipping via UPS surface—add $3.00 per item, UPS Blue—add $8.00 per item • Call for shipping costs. • Prices subject to change; call for latest prices.



Epson® Printer, 1987.

Representing a line of computers and printers that are the benchmark of reliable performance. In fact, **Epson printers have been in business longer than most printer companies.** Today, in every type and size of business, you'll find Epson printers of every size and type. From high speed, high quality dot matrix, to an astonishing, and affordable laser printer.

Epson. The most famous name in printers, twenty years running.

EPSON

WHEN YOU'VE GOT AN EPSON, YOU'VE GOT A LOT OF COMPANY.™

Epson is a registered trademark of Seiko Epson Corporation. Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. **(800) 421-5426.**

ABILITY PLUS

GENERAL FEATURES
- 6 Modules for One Price
- Both 5.25″ and 3.5″ Media Included
- Vertical or Horizontal Windows
- Perform DOS Functions from Main Menu
- System-Wide User Macros

INTEGRATION
- Two or More Applications Working at One Time
- Real-Time Links; Changes made in one Application are Reflected in All Other Applications
- Include "Live" Spreadsheet, Calculated Fields and Graph in Document

WORDPROCESSOR
- Spelling Checker
- What You See Is What You Get Formatting
- Mail Merge (On-Screen Preview)
- 7 Type Styles (On-Screen)
- Fields Perform All Built-in Math Functions

SPREADSHEET
- 9999 Rows x 702 Columns
- Global and Local Formats
- 46 Built-in Functions
- Sort on Row or Column
- Link Multiple Spreadsheets and other applications
- Sideways Printing 10, 12, 15-17 CPI
- Vertical & Horizontal Windows
- Spreadsheet Macros

Why Ability Plus should be your first choice.

Fact is, only Ability Plus™ gives you so much choice.

Start with the five most often-used business applications—wordprocessing, spreadsheet, graphics, database, and telecommunications. All packaged in one convenient program.

What's more, everything's surprisingly easy to use.

The applications are practically intuitive. And they all work the same way. Once you've learned one, you know how to use all five. A level of mastery that takes only a couple of days.

Now here's the really ingenious part. Ability Plus ties them all together. So if you make a change to data in one application, that change is instantly reflected in any other application where that data appears.

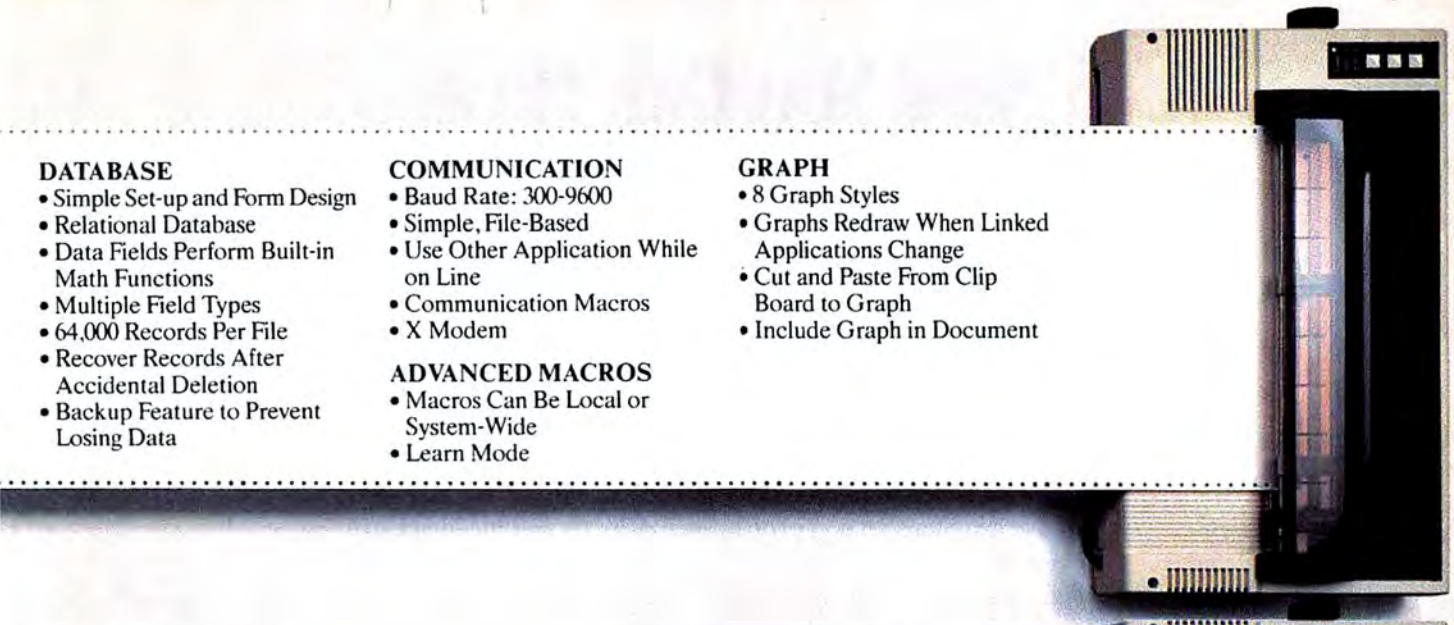
Impressive capabilities, yes. But the power and ease of Ability Plus let you accomplish something equally impressive:

DATABASE
- Simple Set-up and Form Design
- Relational Database
- Data Fields Perform Built-in Math Functions
- Multiple Field Types
- 64,000 Records Per File
- Recover Records After Accidental Deletion
- Backup Feature to Prevent Losing Data

COMMUNICATION
- Baud Rate: 300-9600
- Simple, File-Based
- Use Other Application While on Line
- Communication Macros
- X Modem

ADVANCED MACROS
- Macros Can Be Local or System-Wide
- Learn Mode

GRAPH
- 8 Graph Styles
- Graphs Redraw When Linked Applications Change
- Cut and Paste From Clip Board to Graph
- Include Graph in Document



FIRST CHOICE

GENERAL FEATURES
- 4 Modules for One Price

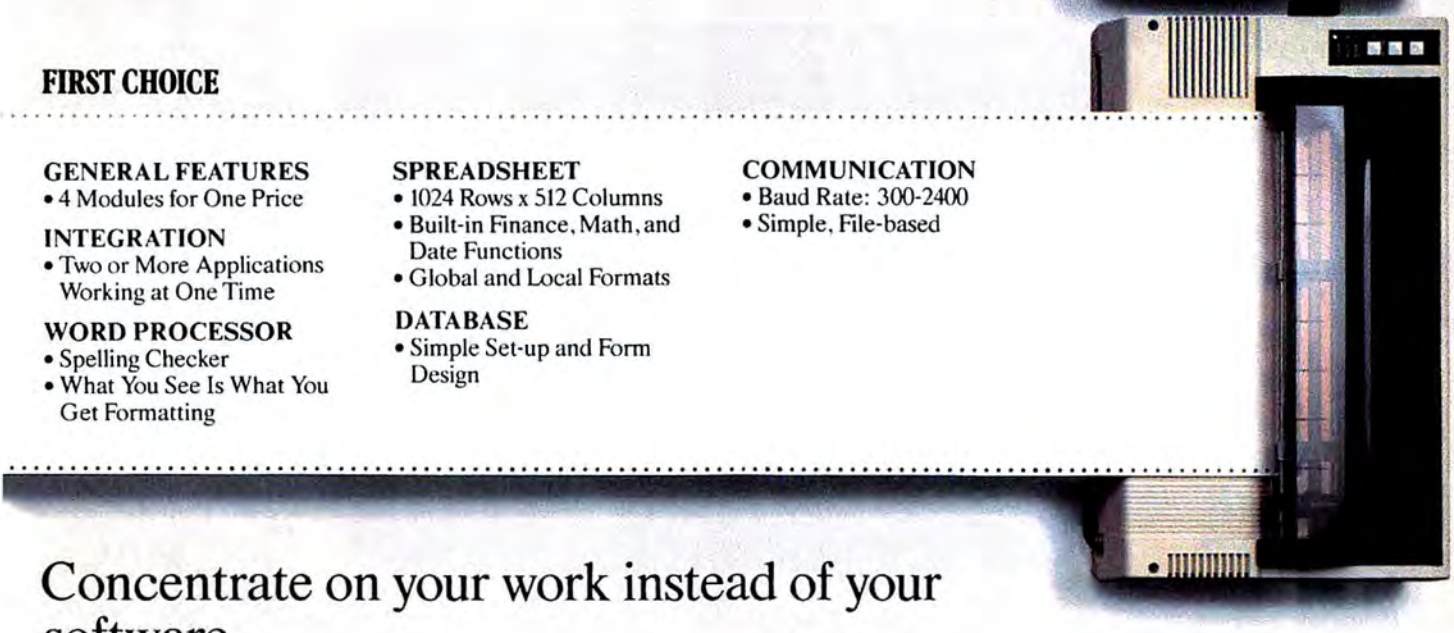
INTEGRATION
- Two or More Applications Working at One Time

WORD PROCESSOR
- Spelling Checker
- What You See Is What You Get Formatting

SPREADSHEET
- 1024 Rows x 512 Columns
- Built-in Finance, Math, and Date Functions
- Global and Local Formats

DATABASE
- Simple Set-up and Form Design

COMMUNICATION
- Baud Rate: 300-2400
- Simple, File-based



Concentrate on your work instead of your software.

Which means Ability Plus begins to pay for itself immediately. And continues to pay off for a long, long time, thanks to our long list of features.

Want to find out more about our choice software? Just call 1-800-644-3448. Or return the coupon.

Ability Plus. Its features make it your first choice. What it will do for your organization makes it your best choice.

Ability Plus
Business software for everybody in your business.

Ability Plus is a trademark of Migent, Inc.

Yes! I'd like more information about Ability Plus.

Name

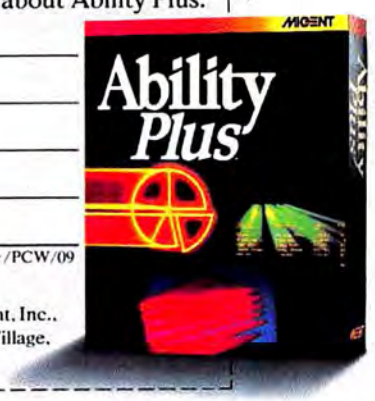
Title

Company

Address

City/State/Zip A+/PCW/09

MIGENT Send to: Migent, Inc., 865 Tahoe Blvd., Call Box 6, Incline Village, Nevada 89450-6062, Attn: Alexis



Now You Can Have The Same Information Professionals Use!

"Telescan Analyzer... is easy to use and inexpensive."

Fortune Magazine
1987 Investors Guide

Chosen by *Wall Street Computer Review* as one of "The two most popular programs among professional analysts and independent investors..."

June 1986

STOCK OVERVALUED

THESE GRAPHS RETRIEVED IN ABOUT 30 SECONDS!

ON-LINE COST LESS THAN 15¢

BUY AND SELL WITH INSIDERS

UP TO 14 YEARS DATA

STOCK UNDERVALUED

ALL THE TECHNICAL & FUNDAMENTAL INDICATORS

GET LATEST NEWS ON COMPANY!

There is simply no other stock evaluation service on the market like Telescan Analyzer and Database.

Our service gives you full information on over 8,000 stocks and 2,000 mutual funds, ALL the technical and fundamental indicators, industry group analysis, insider trading, inflation adjustment, and a comprehensive news service. Plus, fast retrieval, ease of use, outstanding color graphics, and much, much more!

Once you experience Telescan, we KNOW you will never use any other stock evaluation service. That's why we can offer our complete package for only $49.95, plus $5.00 shipping and handling. (Compare that with prices of other financial databases!) There is nothing else to buy to use the Telescan Database–and our on-line charges are among the lowest in the industry!

For a limited time new subscribers will receive **two hours of free on-line usage** (non-prime time, or one hour prime time)*. And Telescan always offers a 30-day money-back guarantee!

See what all the excitement is about–order your Telescan Analyzer TODAY toll-free.

Telescan
ANALYZER

1-800-752-7001, Ext. 903
(In Texas: 1-800-442-4799, Ext. 903)
American Express®, VISA® and MasterCard® accepted.

System requirements: *IBM PC/AT/XT Portable or 100% compatibles; IBM Monochrome or Color Graphics Adaptor Board or Hercules Monochrome Graphics Card; 1200/2400 Hayes Smartmodem or compatible modem; Double-sided Disk Drive; 256K Memory; MS DOS 2.1 or higher. Please specify if you have: IBM PCjr; IBM Enhanced Graphics Adaptor (or compatible); AT&T 6300; or IBM 3270.*

**To be used within 30-days after you purchase the program.*

Get more info. Go to Ad index.

It's not if you'll lose data.

It's when.

Head crashes. Software glitches. Operator errors.

These are the grim realities of computer life in the 80's. To protect yourself from the inevitable data losses, get an ArchiveXL.

The ArchiveXL is a simple, low-cost tape backup system specially designed for the IBM PC, XT, AT and compatibles. When data is lost, just insert your backup data cartridge in the tape drive and stream the data back onto your hard disk. Data salvation is just a few keystrokes and just minutes away. All this protection takes up precious little space—even as little as a 3.5 inch floppy disk drive. And the ArchiveXL system is complete with everything you need for maximum data protection—including Archive's QICstream™ utility software.

A final thought, the ArchiveXL is based on QIC-40, the tape interchange standard for data compatibility. That's a big Archive extra.

Face reality, you need tape backup. Find out today how little a lot of personal data protection costs. For the Archive dealer nearest you, call toll-free 1-(800) 237-4929.

Sure, I want to know more about the ArchiveXL.
Please send me an ArchiveXL information kit ASAP.

NAME _____

COMPANY _____

STREET _____

CITY _____

STATE _____ ZIP _____

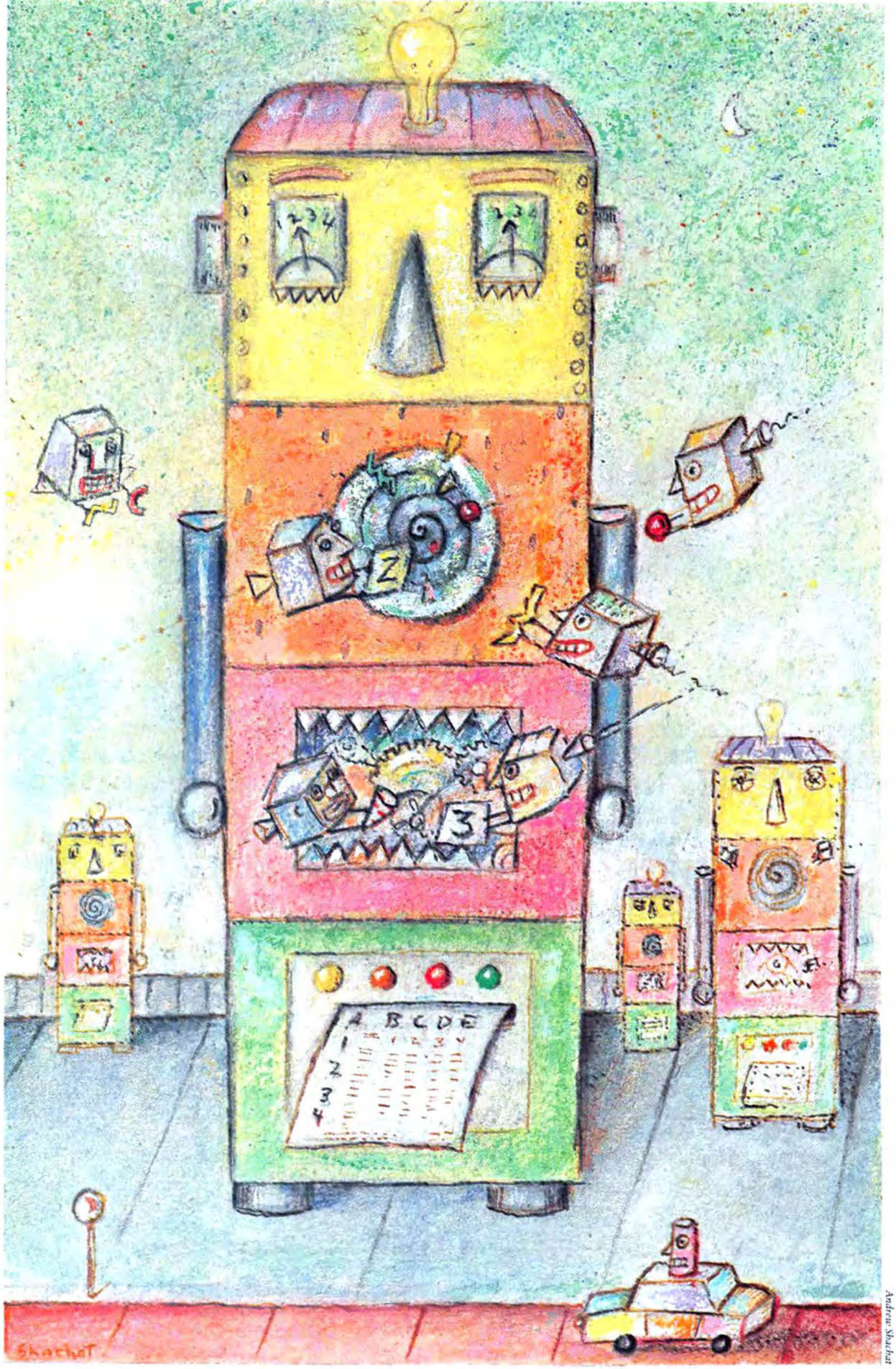
PHONE ( ) _____

Mail to: Archive Corporation
1650 Sunflower Ave.
Costa Mesa, CA 92626

ARCHIVE
CORPORATION

©1987 Archive Corporation. Archive XL is a trademark of Archive Corporation. IBM is a trademark of International Business Machines.

Get more info. Go to Ad index.



Andrew Shachat

Worksheets by Design

Need to set up a worksheet but don't know where to start? This beginner's guide provides tips for creating a worksheet that's manageable, accurate, and easy to expand.

William Urschel

Every good story–be it a novel, play, movie, or joke–has a basic design called dramatic structure. Any story worth telling sets up the characters, introduces complications, works toward resolution, and arrives at a denouement.

A well-designed worksheet does exactly the same thing. Whether it's a simple affair that calculates an IRA or a magnum opus that computes a corporation's net worth, a properly constructed worksheet should set up the basic assumptions, introduce data, work out the results, and end with a summary.

Structure does more than simply impose order; it helps us understand and explain complex situations. Think of the New York City telephone directory, arranged alphabetically. That's order. Now imagine the same directory arranged by ethnic origin, income level, or occupation. Suddenly you know a great deal more about New York. That's structure.

Good worksheet structure conveys a sense of flow or progression. For example, when you get to the profit line in a worksheet, you should be able to answer these questions: What are the basic assumptions? Where did the data come from? And what circumstances affected the results? Answer those questions, in that order, and you will convey (and understand) the dynamics of any financial model you create with a spreadsheet program. Change the order, omit an element, or try to combine one part with another, and the worksheet becomes a convoluted mess.

To avoid chaos, build worksheets using a vertical, four-block structure: Assumptions, Input, Calculation, and Bottom Line. Figure 1 provides a blueprint of a worksheet that projects costs and returns for Sisquoc Data, a small company that sells accounting software at retail prices via direct mail (and other venues) and at wholesale prices to dealers. Figure 2 shows the worksheet writ large according to the principles of good worksheet design. (For hands-on tips on creating worksheets, see the sidebar "Nitty-Gritty Setup.")

The Assumptions Block

Assumptions are the constants in a worksheet–in this example, the list price of the product, the wholesale price per unit, and the materials costs and shipping costs. It's important that all constants be grouped together. If you embed constants at random when setting up a worksheet, anyone else looking at the worksheet won't know what or where the constants are (and you may not either, six months down the road).

Think of the Assumptions block at the top of the worksheet as a control panel. You can change the assumptions to test various "what if" conditions, such as a decrease in the price of raw materials or an increase in the cost of labor. Twist or push one figure here, and the whole worksheet changes.

The Input Block

The Input block is where you enter the bulky data the worksheet will digest. In Figure 2 this block contains the up-front costs of the business: Fixed Costs such as salaries and rent, and four kinds of Advertising Costs–direct mail, card decks, display ads, and dealers. (Card decks are decks of postcards with an ad on one side and the business's mailing address on the other. Dealer costs include mailing-list rentals, the cost of attending trade shows, and the cost of placing ads in trade magazines.) Calculations performed subsequently in the Calculation and Bottom Line blocks will draw on figures here and in the Assumptions block.

A word of caution: In larger worksheets, the Input block can easily bloat. Fixed costs don't present any problems–the numbers are based on solid historical information, and the data is entered directly into this area of the worksheet. But variable information, such as projected advertising costs, is another story. This data must come from somewhere (unless you're just making a wild guess), and that source must be detailed on the worksheet. Even in this relatively simple example, showing the cost calculations for four different advertising categories would clutter up the Input block, making it harder to set up, difficult to change, and almost impossible for anyone else to understand.

The solution is to use "satellite" worksheets–separate worksheets (or discrete sections within a worksheet) that pass results to the main worksheet. This example has four satellites; each calculates the costs of (and unit sales generated by) a particular advertising scheme, then forwards the results to the main worksheet's Input and Calculation blocks. The satellites are kept in separate files so the main worksheet remains uncluttered. As Figure 2 shows, satellites use the same block structure as the main worksheet.

A complete separation of the four satellites makes practical sense, since each uses a different process to arrive at estimated costs. For the purposes of this example, just one satellite, the direct mail campaign, is illustrated in Figure 2. (To see how this satellite connects with the Input section, note that total costs data is neatly funneled into row 29 of the Input section.) Farming out calculations to satellite worksheets reaps an extra harvest: The main worksheet remains small and is more speedily recalculated.

It's best to segregate macros in the nether regions of the worksheet so they run properly and are not accidentally overwritten by data or corrupted by sorting rows or shuffling columns.

One final note on the satellite system: Using a "file combine" procedure, macros can automate the updating process. One keystroke can fetch the costs and results from named ranges in all the satellites and recalculate the main worksheet. Because many spreadsheet programs execute macros line by line until an empty line appears, it's best to segregate macros in the nether regions of the worksheet so they run properly and are not accidentally overwritten by data or corrupted by sorting rows or shuffling columns.

Building a Worksheet Block by Block

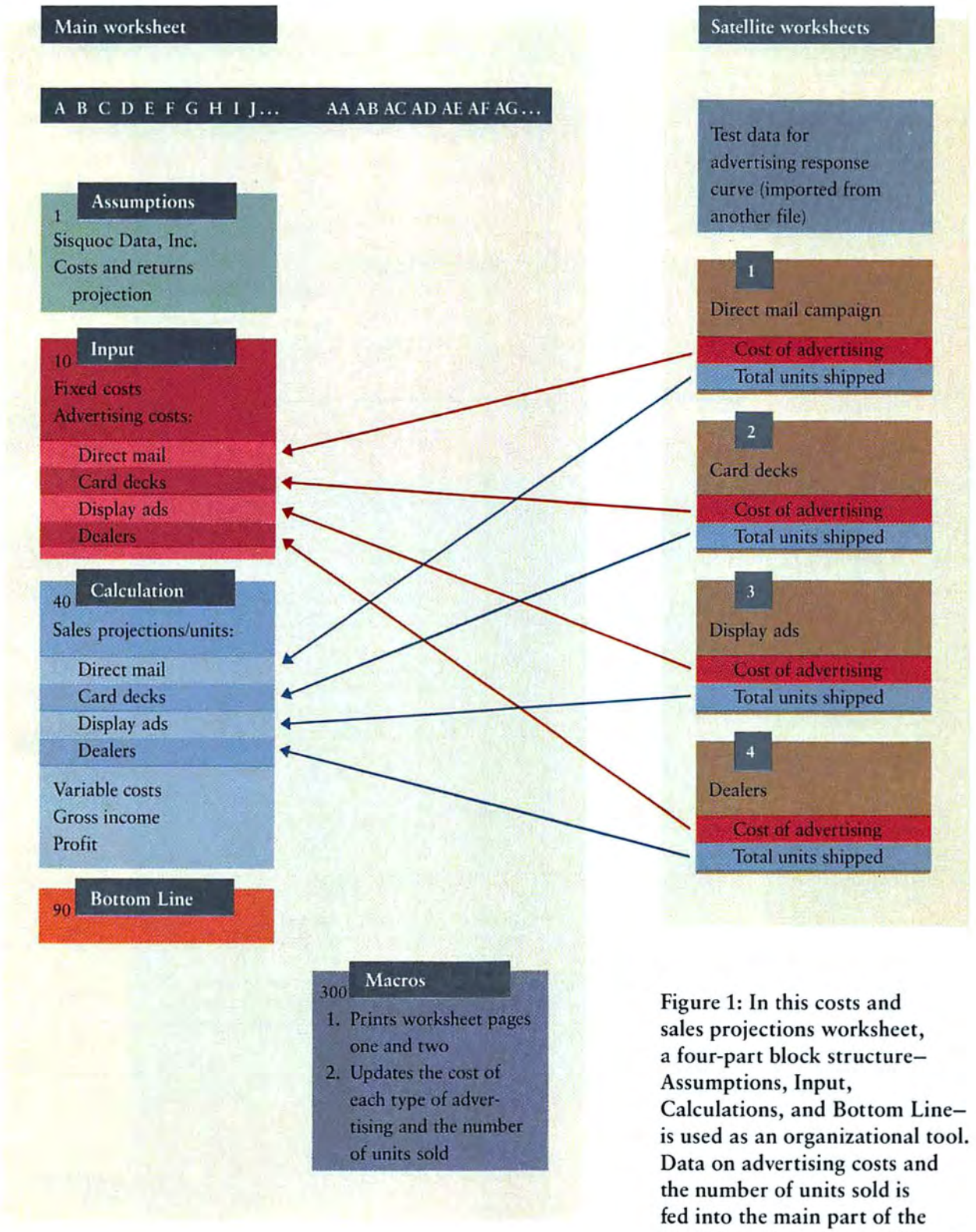


Figure 1: In this costs and sales projections worksheet, a four-part block structure–Assumptions, Input, Calculations, and Bottom Line–is used as an organizational tool. Data on advertising costs and the number of units sold is fed into the main part of the worksheet from four satellites to help keep the central activity uncluttered.

Main worksheet

	A	B	C	D	E	F	G	H	I	J
1										
2					Sisquoc Data, Inc.					
3					Costs and returns projection					
4	Assumptions									
5	List price per unit		$595		Shipping per retail unit		$7			
6	Wholesale price per unit		$350		Shipping per wholesale unit		$2			
7	Unit materials cost		$15							
8										
9										
10	**Fixed Costs**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
11										
12	President		5,000	5,000	5,000	5,000	5,250	5,250	5,250	5,250
13	Sales manager		4,000	4,000	4,200	4,200	4,200	4,200	4,200	4,200
14	Programmer 1		4,000	4,000	4,000	4,000	4,000	4,100	4,100	4,100
15	Programmer 2		3,500	3,500	3,600	3,600	3,600	3,600	3,600	3,600
16	Production manager		3,000	3,000	3,000	3,000	3,000	3,200	3,200	3,200
17	Rent/utilities/insurance		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
18	Legal/accounting fees		550	550	550	550	550	550	550	550
19	Office furnishings		375	375	375	375	375	375	375	375
20	Supplies/misc. printing		625	625	625	625	625	625	625	625
21	Mailer artwork & typesetting		1,200	200	0	0	0	1200	200	0
22										
23	Total fixed costs		$25,750	$24,750	$24,850	$24,850	$25,100	$26,600	$25,600	$25,400
24	Cumulative fixed costs		$25,750	$50,500	$75,350	$100,200	$125,300	$151,900	$177,500	$202,900
25										
26										
27	**Advertising Costs**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
28										
29	Direct mail		3,200	6,400	9,600	12,800	16,000	16,000	16,000	16,000
30	Card decks		0	210	150	150	150	150	150	150
31	Display ads		7,250	7,250	7,250	7,250	7,250	7,250	7,250	7,250
32	Dealers		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
33										
34	Total advertising costs		$11,700	$15,110	$18,250	$21,450	$24,650	$24,650	$24,650	$24,650
35										
36										
37										
38										
39										
40	**Sales Projections/Units**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
41										
42	Direct mail		0	136	281	429	579	729	743	748
43	Card decks		0	210	150	150	150	150	150	150
44	Display ads		0	75	110	115	115	115	115	115
45										
46	Retail subtotal		0	421	541	694	844	994	1008	1013
47										
48	Dealers		0	123	132	154	168	172	172	172
49										
50	Wholesale subtotal		0	123	132	154	168	172	172	172
51										
52	Total unit sales		0	544	673	848	1012	1166	1180	1185
53										
54										
55	**Variable Costs**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
56										
57	Package/printing/disks		0	8,160	10,095	12,720	15,180	17,490	17,700	17,775
58	Retail shipping		0	2,947	3,787	4,858	5,908	6,958	7,506	7,091
59	Wholesale shipping		0	246	264	308	336	344	344	344
60										
61	Total variable costs		$0	$11,353	$14,146	$17,886	$21,421	$24,792	$25,100	$25,210
62										
63										
64										
65	**Gross Income**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
66										
67	Direct mail		0	80,920	167,195	255,255	344,505	433,755	442,085	445,060
68	Card decks		0	124,950	89,250	89,250	89,250	89,250	89,250	89,250
69	Display ads		0	44,625	65,450	68,425	68,425	68,425	68,425	68,425
70	Dealers		0	43,050	46,200	53,900	58,800	60,200	60,200	60,200
71										
72	Total gross income		$0	$293,545	$368,095	$466,830	$560,980	$651,630	$659,960	$662,935
73										
74										
75	**Profit**		Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88
76										
77	Total gross income		0	293,545	368,095	466,830	560,980	651,630	659,960	662,935
78	Advertising costs		(11,700)	(15,110)	(18,250)	(21,450)	(24,650)	(24,650)	(24,650)	(24,650)
79	Variable costs		0	(11,353)	(14,146)	(17,886)	(21,421)	(24,792)	(25,100)	(25,210)
80	Fixed costs		(25,750)	(24,750)	(24,850)	(24,850)	(25,100)	(26,600)	(25,600)	(25,400)
81										
82	Total net profit		($37,450)	$242,332	$310,849	$402,644	$489,806	$575,588	$584,610	$587,675
83										
84	Cumulative net profit		($37,450)	$204,882	$515,731	$918,375	$1,408,181	$1,983,769	$2,568,379	$3,156,054
85										
86										
87										
88										
89										
90	**The Bottom Line - (Sep 87 - Apr 88)**									
91										
92										
93	Overall					Performance ratios				
94			Copies sold	Gross value						
95							Cost	Sales	Ratio	
96	Retail copies		5,515	3,281,425						
97	Wholesale copies		1,093	382,550		Direct	96,000	2,168,775	23	
98						Card decks	1,110	660,450	595	
99	Total		6,608	3,663,975		Display ads	58,000	452,200	8	
100						Dealers	10,000	382,550	38	
101	All costs			(507,921)						
102										
103	Total net profit			$3,156,054						

Assumptions block

Input block

Calculation block

Bottom Line block

Satellite worksheet #1

	A	B	C	D	E	F	G	H	I	
1				Direct Mail Campaign						
2				Historical data and future schedule						
3	Assumptions									
4										
5										
6	Response curve			Costs						Assumptions
7		Estimated	Historical							
8	00 - 30 Days	1.36%	1.31%	Printing per piece		00.120				
9	30 - 60 Days	0.09%	0.08%	Postage per piece		00.125				
10	60 - 90 Days	0.03%	0.03%	List rental per 1000		75.000				
11	Over 90 Days	0.02%	0.02%							
12										
13	Total response	1.50%	1.44%							
14										
15	Mailings	Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88	Input block #1
16										
17	Total pieces	10,000	20,000	30,000	40,000	50,000	50,000	50,000	50,000	
18	Average cost/piece	0.320	0.320	0.320	0.320	0.320	0.320	0.320	0.320	
19										
20	Total costs	3,200	6,400	9,600	12,800	16,000	16,000	16,000	16,000	Calculation block #1
21										
22	Sales Projections	Sep 87	Oct 87	Nov 87	Dec 87	Jan 88	Feb 88	Mar 88	Apr 88	Input block #2
23										
24	00 - 30 Days	0	136	272	408	544	680	680	680	
25	30 - 60 Days	0	0	9	18	27	36	45	45	
26	60 - 90 Days	0	0	0	3	6	9	12	15	
27	Over 90 Days	0	0	0	0	2	4	6	8	
28										
29	Total sales in units	0	136	281	429	579	729	743	748	Calculation block #2

Figure 2: Both the main worksheet (left) and the satellite worksheet (above) use a blocklike structure for clarity. With the help of a macro, the satellite's total costs and total sales rows (shaded in red and blue, respectively) are automatically fed into the main worksheet.

The Calculation Block

This block provides details about Sisquoc Data on a month-by-month basis but doesn't provide insight into the big picture–a job reserved for the Bottom Line block just below it. The Calculation block is almost entirely mechanical; you don't enter any data manually, but let simple formulas here gather data from various sources and crunch away. In fact, once the model is debugged and proven, many spreadsheet jockeys will protect the range of cells containing the Calculation block.

Starting at row 42, projected sales figures for each advertising strategy are pulled in from the four satellites and added up; note that the dealers line is segregated from the retail subtotals for the sake of readability.

Variable Costs (rows 57 through 61) are calculated by formulas that multiply the constants in the Assumptions block (materials costs and shipping costs) by the total unit sales (row 52). A common design error would include the Variable Costs in the Profit section of the worksheet without showing how they were derived. The end result would be the same, but the supporting logic would be lost.

The Gross Income section generally mimics the structure of the Variable Costs section. Formulas here simply multiply constants in the Assumptions block (in this case, list price and wholesale price per unit) by the number of units sold. For example, direct mail income for October 1987 (cell D67) is the result of multiplying the list price per unit ($595, in cell C5) by projected units sold via direct mail (136, in cell D42). Formulas tucked into row 72 add up the numbers in rows 67 through 70.

The Profit section works much the same way. Total net profit is merely the gross income minus fixed, advertising, and variable costs. Cumulative net profit represents the company's expected cash flow–a useful line to graph.

Nitty-Gritty Setup

Figure 2 provides an example of a well-designed worksheet; here are some tips for setting up your own.

Position Main Sections According to Logical Structure

After determining what your worksheet will accomplish–organizing personal finances, setting up an inventory control system, or creating a business budget–follow the pattern laid out in Figure 1 and block out the worksheet's main sections from top to bottom.

Cast the worksheet's general shape by entering labels for each block, from section titles (such as Assumptions) to the line item labels (such as office furnishings). For convenience' sake, anchor the different blocks in the worksheet to easy-to-remember rows such as A10, A40, and A90. Don't put blocks side by side, because if you later insert rows in one block, you'll encroach on its neighbor. And as noted in the article, create distant satellites that feed data and results into the main part of the worksheet.

Test Logic With Sample Data

Once you've finished blocking out the worksheet, typing in the labels, and specifying range names, enter the formulas. Then, enter some simple test data and run it through the worksheet so you can flag any errors in logic or typing. Plug in large round numbers such as 100,000, and make sure they percolate all the way to the bottom line. Then enter the real data.

Use Range Names to Minimize Reference Errors

Although the worksheet's formulas and macros can reference specific cells or labels, using range names simplifies matters. Range names can be applied to a cell, a row, or an entire block in the worksheet. They minimize typing errors when creating formulas and macros, and most spreadsheet programs include a show function that lists all range names with their beginning and ending cells. Ranges should always be assigned to cells or rows that are used in calculations. For example, the list price per unit ($595) in the Sisquoc worksheet is named Fullprice and used by the direct mail, card decks, and display ads rows in the Gross Income section to calculate dollar sales.

Use Global Formats

Next, format the worksheet globally for the type of data most of the cells will hold–percentages, currency, numbers with decimal places. The worksheet in Figure 2 was formatted globally for numbers with no decimal places; later, individual cells and ranges were formatted independently. For example, some costs and totals ranges were formatted to hold figures with parentheses and dollar signs, respectively, to set off these ranges from the others. Other global commands

can then be used to adjust column width and specify whether labels are flush left, flush right, or centered.

Protect Macros From Potential Corruption

Macros should always be below and off to the side of the worksheet's main activities; in Figure 1, for example, macros are fastened at row AA300. After ensuring that everything is drum-tight, use the spreadsheet's cell-protect or read-only feature to protect macros and other areas where data should not be entered.

Document, Document, Document!

Finally, make some room for documentation at the beginning of the worksheet. Just as an article summary helps to guide readers, worksheet documentation helps subsequent users find the information they need. A "table of contents" that lists the main blocks of the worksheet along with range names is a handy guide; it also makes sense to note macro key combinations and describe what each macro does. *–W. U.*

The Bottom Line Block

The Bottom Line is the report card that delivers, in one pithy group of figures, Sisquoc Data's grades for the semester. In this example, the block identifies how many copies of software were sold and their gross value–in other words, how much revenue was collected. To clarify the effectiveness of Sisquoc Data's advertising, a sales/cost ratio section spells out how well each advertising scheme generated sales.

Form and Content, Hand in Hand

If you set up a worksheet with the block model in mind, each step in the worksheet will be visible and will support the one that follows it. In the case of Sisquoc Data, the four big blocks are made up of smaller, structurally similar blocks, which makes it easier to root out errors in procedures or logic and reduces the number of convoluted calculations. When the formulas that run the worksheet perform simple, straightforward tasks–adding up a column of numbers or taking a value from one cell and multiplying it by another–you're on the right track.

This modular structure even makes it easier to print selected sections of the worksheet. Want to look at just the Fixed Costs section, the dealers costs line, or the cumulative net profit? No problem; mark it and print it out.

Good structure really pays off when you have to modify the worksheet, because it's easier to recognize logically discrete elements, add new blocks, reorder blocks, and orbit new satellites. The worksheet will also make more sense from the start–both to you and to anyone looking over your shoulder–leaving you free to concentrate on the how and why of the bottom line.

William Urschel is president of Arc Tangent, maker of ArcList, *a professional mailing-list-management program.*

Laser-Perfect

WordPerfect 4.1 and the LaserJet Plus went through some rocky times together. WordPerfect 4.2 makes a cozier match.

Ralph Blodgett

At first glance *WordPerfect* and the Hewlett-Packard LaserJet Plus seem like the perfect marriage. *WordPerfect* is one of the most comprehensive word processing programs on the market, and the LaserJet Plus can produce a wide range of handsome hard copy with its versatile soft fonts. Linking the Plus with *WordPerfect 4.1*, however, made for a stormy relationship, complicated by entanglements with BASIC and *WordPerfect*'s DOWNLOAD.BAT utility (see "WordPerfect Meets LaserJet Plus," *PCW*, February 1987).

WordPerfect has improved its support for the LaserJet Plus with new printer drivers and printer commands in version 4.2. Now you can create a simple document file that downloads soft fonts into the LaserJet Plus, 500 Plus, and Series II printers and then use *WordPerfect* macros to mix and match fonts for more professional-looking hard copy.

WordPerfect 4.2 makes producing attractive documents with the LaserJet Plus a three-step process: installing the appropriate *WordPerfect* printer drivers for soft fonts, creating a font-load file to download soft fonts into the LaserJet Plus's RAM, and recording macros to change fonts within a document. For the purpose of this article, it's assumed you have *WordPerfect 4.2*, the Hewlett-Packard LaserJet Plus, and the AC TmsRmn and Helv Soft Fonts, which are HP's implementation of the popular Times Roman and Helvetica typefaces.

Soft Fonts on a Platter

If you haven't introduced *WordPerfect 4.2* to your HP LaserJet Plus, you'll need to install the proper printer driver. Load *WordPerfect 4.2* and press **< Shift > - < F7 >** to display the Print menu. Type **4** (for Printer Control) and **3** (for Select Printers). *WordPerfect* supports up to six different printers at a time, and all six work with LaserJet Plus soft fonts. You select the printer you want for soft fonts via cursor keys; for this practice session, choose 'Printer 3'.

Each *WordPerfect* printer driver defines eight fonts–a fraction of the fonts available on the soft font disks but more than adequate for most business documents. There are ways to define other printer drivers with *WordPerfect*'s printer program or HP's *PCLPAK;* however, such methods are not for the beginner (see "From Soft Fonts to Hard Copy," *PCW*, July 1986).

After you've selected a printer, press **< PgDn >** to begin the installation process. At this point, the program prompts you to insert one of the two *WordPerfect 4.2* printer disks in drive A: (or drive B:, if you have two disk drives). The Printer 1 disk should contain the LaserJet Plus printer drivers. Press **< PgDn >** until you find '114 LaserJet+, 500+ Soft AC: Helv P', the listing for the HP

John Hersey

Helvetica AC soft font. Type **114** at the 'Using Definition' prompt, and press **< Enter >** to install it.

WordPerfect then asks you for printer setup information. If the LaserJet Plus is connected to a parallel port, press <Enter> twice to accept the default LPT1 setting. For the serial port, choose the COM1 setting and use the default settings: 9600 baud, no parity, 1 stop bit, and 8 character bits.

The final question in the series asks whether the paper feed is continuous, hand-fed, or sheet-fed. Although the LaserJet and the LaserJet Plus are sheet-fed printers, the printer drivers were written for continuous-feed paper and must be so identified at this point.

You've now installed your first soft font driver. Repeat this procedure for all the drivers that match your soft fonts. For example, *WordPerfect* 4.2 supports two different combinations of the HP AC soft fonts. Press **< F7 >** twice to exit the Select Printer menu.

Keeping the soft fonts in a hard disk file avoids tedious disk swapping and reduces the time it takes to download them. In *WordPerfect,* create a directory called C:\FONTS by pressing **< F5 >** (for List Files) and then =. You'll see 'New Directory =' displayed at the lower left corner of the screen. Type **C:\FONTS** and press **< Enter >** twice.

Now you can copy the font files from the HP soft font disks into the C:\FONTS directory. Place the first soft font disk in drive A:. Press **< F5 >** (for List Files), type **A:**, and press **< Enter >**. You'll see the files displayed on screen. Mark them with * and press **8** to copy them into C:\FONTS, or exit *WordPerfect* and copy them with the DOS command COPY A:*.* C:\FONTS. Do this for all four soft font disks.

A Fonts and Drivers Scorecard

After storing the soft fonts on the hard disk, you're ready to prepare a file that downloads the fonts into the LaserJet Plus. You'll need lists of both the installed *WordPerfect* printer drivers and the soft fonts in the C:\FONTS directory. Press **< Shift > - < F7 >** (for the Print menu), **4** (for Printer Control), and **2** (for Display Printers and Fonts). If all six printers have

```
1:  Standard Printer                Continuous

        1 ASCII/Line Ptr            2 ASCII/Line Ptr
        3 ASCII/Line Ptr            4 ASCII/Line Ptr
        5 ASCII/Line Ptr            6 ASCII/Line Ptr
        7 ASCII/Line Ptr            8 IBM Graphics

2:  DOS Text Printer                HandFed

        1 Standard ASCII            2 Standard ASCII
        3 Standard ASCII            4 Standard ASCII
        5 Standard ASCII            6 Standard ASCII
        7 Standard ASCII            8 Standard ASCII

3:  LaserJt+,500+ Soft AC: Helv PContinuous

        1 HP AD Helv10R             2 HP AD Helv10I
        3 HP AD Helv6R              4 HP AD Helv8R
        5 HP AD Helv8I              6 HP AD Helv12R
        7 HP AD Helv18B             8 HP AD Helv30B



Press any key to continue

4:  LaserJt+,500+ Soft AC: Tms P Continuous

        1 HP AD TmsRmn10R           2 HP AD TmsRmn10I
        3 HP AD TmsRmn6R            4 HP AD TmsRmn8R
        5 HP AD TmsRmn8I            6 HP AD TmsRmn12R
        7 HP AD TmsRmn18B           8 HP AD TmsRmn30B

5:  LaserJt+,500+ Soft AA: Helv LContinuous

        1 HP Soft Helv10N           2 HP Soft Helv10I
        3 HP Soft Helv10B           4 HP Soft Helv8N
        5 HP Soft Helv12N           6 HP Soft Helv12I
        7 HP Soft Helv12B           8 HP Soft Helv18B

6:  Epson LQ-1500 (1.x ROM)         Continuous

        1 Dot Matrix 1/60           2 LQ 800/1500
        3 LQ 800/1500               4 LQ 800/1500
        5 LQ 800/1500               6 LQ 800/1500
        7 LQ 800/1500 S/s           8 Standard ASCII



Press any key to continue
```

Figure 1: A list of WordPerfect printer drivers helps you keep track of the soft fonts while you create the font-load file.

installed fonts, *WordPerfect* will display the names of three printers (the other three will be listed later).

Turn on the LaserJet Plus and print this screen by pressing **< PrtSc >**. If no paper appears, push the on-line switch to turn off the light, and press formfeed to eject the printed screen. Push the on-line switch to reconnect the printer. Once you've printed the information for printers 1 through 3, press any key to display printers 4 through 6. Repeat the process for these printer drivers.

Now print out a list of the C:\FONTS file. Press **< F5 >** for List Files, type **C:\FONTS < Enter >**, and press **< Shift > - < F7 >** to print them. Exit the List Files menu by pressing **< Enter >**.

Preparing the Font-Load File

With the list of *WordPerfect* printer drivers and the HP soft font files in hand, you're ready to create the font-load file. It will contain the *WordPerfect* printer commands that download the soft fonts into the LaserJet Plus.

The printer drivers list will show eight Helvetica fonts from the AC soft font disk for Printer 3: 6-, 8-, 10-, and 12-point roman; 8- and 10-point italic; and 18- and 30-point bold (see Figure 1). On the C:\FONTS directory printout, circle the files that match the Printer 3 printer driver list. Number them on the printout to match the Printer 3 driver sequence.

WordPerfect 4.2 uses a special printer command to load HP soft fonts. With a clear screen in front

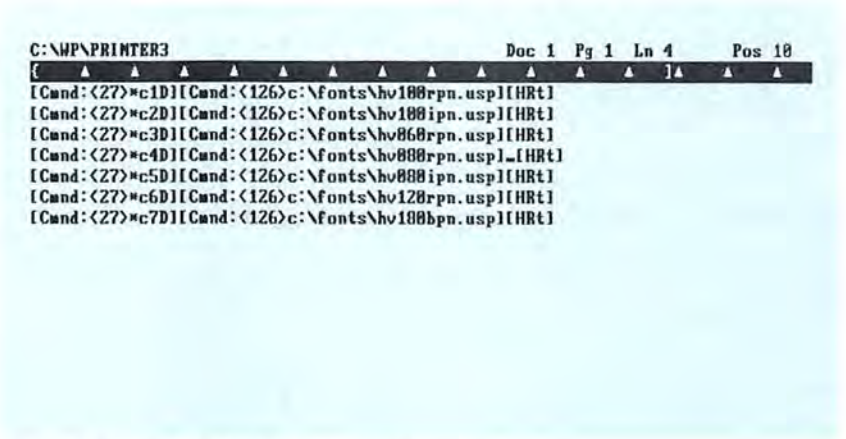
of you, press **< Ctrl > - < F8 >** to display the Print Format menu, and choose Option A to insert a printer command. Type **< 27 > *c1D** and press **< Enter >**. (You need to type the angle brackets surrounding '27', unlike with keys such as <Enter>.) This *WordPerfect* printer command retrieves a soft font file from the C:\FONTS directory and loads it into the printer's memory.

Next, select Option A, press **< Shift > - < F10 >** (for Retrieve Files), and enter the drive and path to the directory containing the fonts, followed by the file name of the HP soft font that matches the first font listed under Printer 3 (for example, C:\FONTS\HV100RPN.USP). At the end of each line, press **< Enter >** twice. *WordPerfect* printer commands are format codes, which remain hidden on screen. To check your progress, use the Reveal Codes command by pressing **< Alt > - < F3 >**.

You must create eight command lines—one for each soft font. Use the numbered *WordPerfect* drivers printout as your guide, and insert the font number into the printer command code (<27>*c1D) that matches the printer driver sequence. The '1' after the 'c' indicates the font number, so you need to use 2 for the second line, 3 for the third line, and so on.

Of course, if you aren't using the AC soft fonts, the font codes following C:\FONTS\ will differ from the example. When you've finished, the Reveal Codes command will display eight command lines (see Screen 1).

Once you've finished all eight lines and ensured that the soft font file names match the



Screen 1: WordPerfect's Reveal Codes feature displays the font-load commands and enables you to double-check the Hewlett-Packard soft font file names.

C:\FONTS printout, it's important to press **< Enter >** one last time. Press **< F10 >** to save the font-load file on the *WordPerfect* default drive. To check which drive is the default, press **< F5 >** (for List Files); this will display the current drive at the lower left corner of the screen. Call the file PRINTER3 (or another name if you're using a printer different from the example).

Verifying the Download

The PRINTER3 file now contains all the commands necessary to load eight AC soft fonts into the LaserJet Plus. Adding a few lines of text to the file will help verify that the file has loaded properly and that the fonts are indeed the ones you want to use in your document.

For the heading use Font 7, which is 18-point Helvetica. Press **< Ctrl > - < F8 >** (for Print Format), select **1** (for Pitch and Font), and type **13*** (for Pitch) and **7** (for Font). This is a good all-around pitch setting that works for many HP LaserJet fonts. Press **0** to exit that menu. Center the heading by pressing **< Shift > - < F6 >** and type **Soft Font Test.** Press **< Enter >** twice.

Now add a line of text to illustrate each font. Press **< Ctrl > - < F8 >** (for Print Format), select **1**, press **< Enter >** (to accept the 13* pitch of the previous font), and type **1** to indicate the font number. Press **0** to exit the font menu. Now type **This is font number 1.** Press **< Enter >** twice to double-space. Repeat these steps for the remaining seven fonts. Be sure to change font number 1 to 2, and so on.

Remember that the printer commands and font changes occupy the top third of your display but do not appear on screen unless you use the Reveal Codes command <Alt>-<F3>. All

you'll see is eight lines of copy and a headline. Press **< F7 >** to exit. Type **Y** (for Yes) to save the document and replace the previous version.

You can now load eight soft fonts into your LaserJet Plus simply by retrieving the PRINTER3 file, selecting printer number 3, and printing the file. On a clear screen, press **< F5 >** to list files. Enter the font-load file name (C:PRINTER3, in the example). Highlight the file with **< Cursor-Down >**, and select **1** from the file menu to retrieve it.

Next, press **< Shift > - < F7 >** and **4** to display the Print Options menu. Then press **113** to select Printer 3. Press **< Enter >** twice and **< Shift > - < F7 >** for the Print menu. Press **1** to begin printing. After 1 or 2 minutes (depending upon the size of the eight soft font files), the LaserJet Plus will print the Soft Font Test document.

Macro Magic

WordPerfect macros can make downloading soft fonts even faster. After you complete the next step, four keystrokes will download the AC soft font file.

You can invoke *WordPerfect* macros in two ways. One method uses <Alt> with a letter key. The other enlists the Macro command, <Alt>-<F10>, and a two- to eight-letter macro name. The <Alt>-*key* approach is fast, requiring just two keystrokes, but the number of macros you can create is limited to 26. The macro name method requires a few more keystrokes but allows unlimited *WordPerfect* macros. Since you may eventually use a large number of soft fonts, use name macros to mix and match individual fonts.

To create a macro for the font-load file, clear the *WordPerfect* screen and press **< Ctrl > - < F10 >** (for Macro Definition). At the prompt, type Printer3, or P3 if you want to minimize keystrokes. Press **< Enter >**, and 'Macro Def:' will flash in the lower left corner of the screen. *WordPerfect* is now ready to record keystrokes as part of a macro labeled P1.

Press **< Shift > - < F7 >** (for the print menu), **4** (for Printer Control), and **1** (for Select Print Options). Press **1** again to select the printer number, and type the number of the printer that's defined for the soft fonts (**3**, in this example). Then press **0** twice to exit the menus. Next, press **< F5 >** (for List Files) and type **C:PRINTER3**, the font-load file.

If you saved PRINTER3 in a directory other than the default, the entire path to the file must be identified. *WordPerfect* will display a list of files. Use the cursor keys to highlight PRINTER3, and select **4** (for Print) from the menu at the bottom of the screen. Press **0** to exit, and the macro is complete. All you need to do is press **< Ctrl > - < F10 >** to save it.

Now whenever you press <Alt>-<F10>, type P3, and press <Enter>, *WordPerfect* will download eight AC soft fonts to the LaserJet Plus. When all the fonts are loaded, the printer will eject a sample page with a line printed in each of the eight fonts.

Fonts à la Macro

With *WordPerfect* macros, you can combine individual soft fonts once they're loaded into the LaserJet Plus. Before you start, however, recheck which drive or directory is the default. The macros will end up in that drive; so make sure it's the one you use most often, or later on you might wonder what happened to them.

To create the first font macro, press **< Ctrl > - < F10 >**, label the macro **F1** for Font 1, and press **< Enter >**. From this point on, every keystroke becomes part of the F1 macro. Press **< Ctrl > - < F8 >**, type **1**, then **13*** for pitch. Press **< Enter >** and type **1 < Enter >** to select the first soft font. Then press **0** to exit the Print Format menu and **< Ctrl > - < F10 >** to end the macro. Repeat this procedure for the other seven fonts, changing only the font numbers.

Don't worry about changing margins to match the pitch. Unlike version 4.1, *WordPerfect 4.2* takes care of that for you. When you center words at the top of a document using 18- or 30-point Helvetica, for example, *WordPerfect* centers them between the margins.

WordPerfect has improved its support for the LaserJet Plus with new printer drivers and printer commands in version 4.2.

Creating a Sample Document

Assuming all the individual font macros are labeled F1 through F8, you can now mix the fonts in a document like the business memo in Figure 2. On a clear screen, set the margins for the memo by pressing **< Shift > - < F8 >** (for Line Format), **3** (for Margins), **12 < Enter >**, and **95 < Enter >**. This creates margins of 1 inch on either side of the paper.

Now enter the memo copy itself. Press **< Shift > - < F6 >** to center the title, then use the Font 7 macro (**< Alt > - < F10 > F7 < Enter >**). Type the words **Interoffice Memo** and press **< Enter >** twice to double-space. Change to Font 2 with the F2 macro (**< Alt > - < F10 > F2 < Enter >**) and type **DATE:**. Since the body text will be in Font 6 (Helvetica 12 point), change to this font with the F6 macro (**< Alt > - < F10 > F6 < Enter >**), add two spaces, and press **< Enter >**. Type in the date.

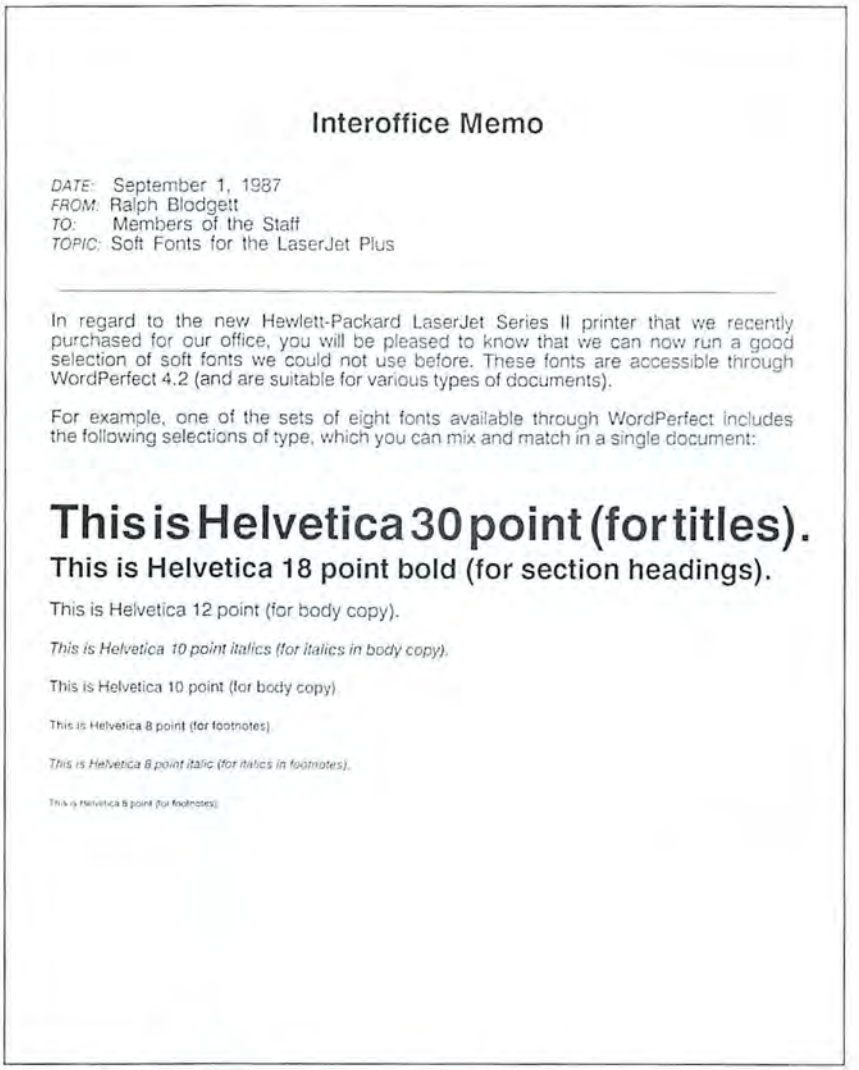
At the F in 'FROM:', switch back to Font 2. After the colon in 'FROM:', change back to Font 6 and type in the text. Repeat this sequence for the lines beginning with 'TO:' and 'TOPIC:', respectively.

Now separate the heading from the body text with a horizontal bold line in 18-point Helvetica. Change to Font 7 with the F7 macro (**< Alt > - < F10 > F7 < Enter >**), and press the underline key. Change back to Font 6, and type in the body text.

For the first sentence, change to Font 8 (30-point Helvetica bold) and type **This is Helvetica 30 point (for titles).** Use the appropriate fonts for each of Figure 2's sentences.

Finally, to check your work, press **< Alt > - < F3 >**; *WordPerfect* will display margin settings and all the codes. To print the memo, press **< Shift > - < F7 >** and type **1**.

It takes a little time to set up *WordPerfect*'s font-load files, but the result is quick and easy access to the LaserJet Plus's soft fonts. Making these powerful tools work together harmoniously will improve the appearance of your documents, lending new force to your printed words.



Interoffice Memo

DATE: September 1, 1987
FROM: Ralph Blodgett
TO: Members of the Staff
TOPIC: Soft Fonts for the LaserJet Plus

In regard to the new Hewlett-Packard LaserJet Series II printer that we recently purchased for our office, you will be pleased to know that we can now run a good selection of soft fonts we could not use before. These fonts are accessible through WordPerfect 4.2 (and are suitable for various types of documents).

For example, one of the sets of eight fonts available through WordPerfect includes the following selections of type, which you can mix and match in a single document:

This is Helvetica 30 point (for titles).

This is Helvetica 18 point bold (for section headings).

This is Helvetica 12 point (for body copy).

This is Helvetica 10 point italics (for italics in body copy).

This is Helvetica 10 point (for body copy)

This is Helvetica 8 point (for footnotes).

This is Helvetica 8 point italic (for italics in footnotes).

This is Helvetica 8 point (for footnotes).

Figure 2: WordPerfect macros are a quick and easy way to mix Hewlett-Packard soft fonts and produce attractive documents with the LaserJet Plus.

Ralph Blodgett is a magazine editor and freelance writer from Maryland.

DOS Amigos

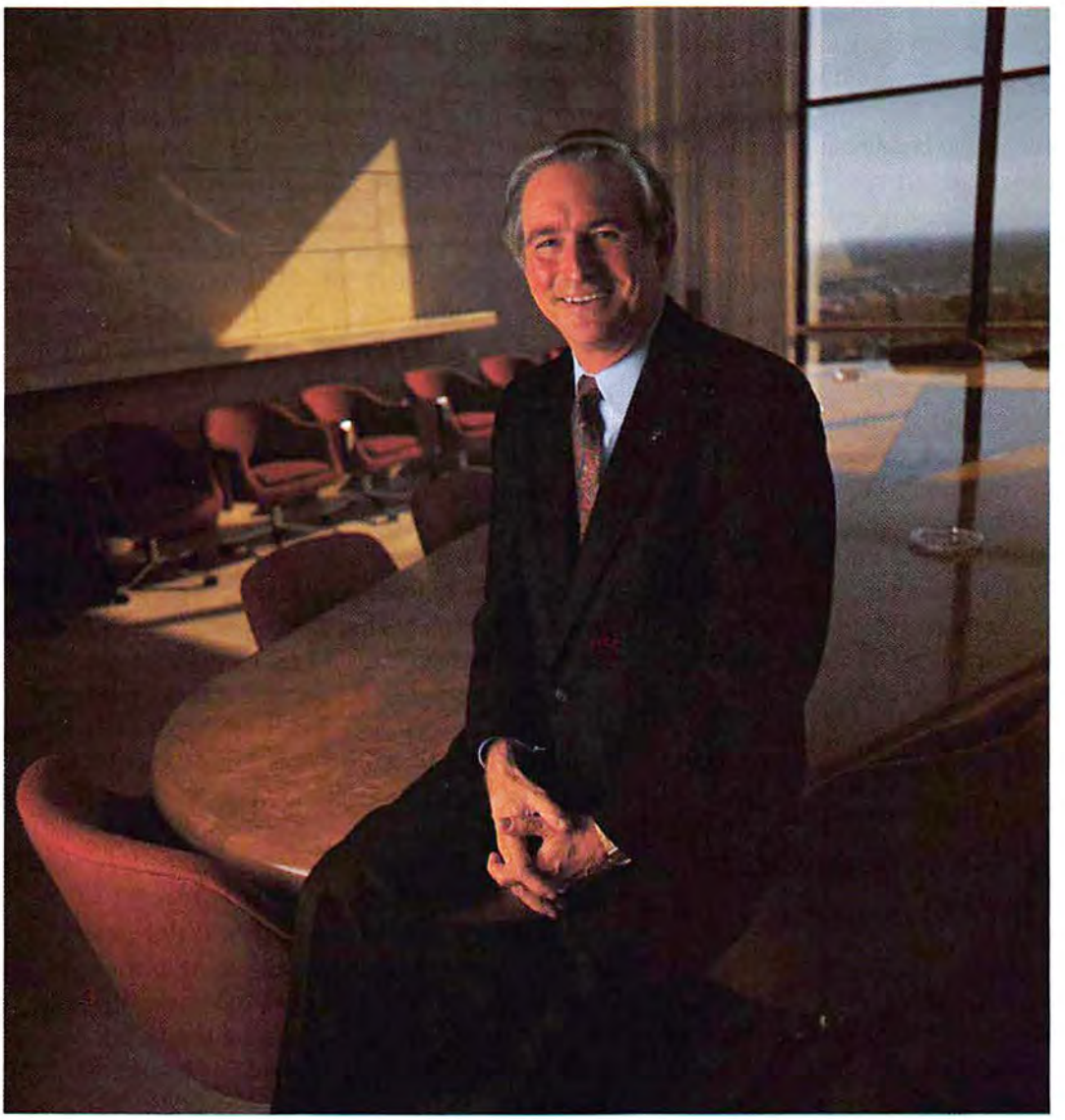
Photographs by Steven Pumphrey

Deep in the heart of Texas, Compaq's Rod Canion and Tandy's John Roach reflect on the PS/2 family and cogitate on the impending generation gap in personal computing.

Edited by

Ken Greenberg

Compaq's Canion: A vote for coexisting standards



Tandy's Roach: A reproach for IBM's "neglect"

If everything is indeed bigger in Texas, it should come as no surprise that IBM's PS/2 launch made an especially big noise in Fort Worth and Houston, the respective home bases of Tandy Corporation and Compaq Computer. In dropping the PC in favor of the PS/2, Big Blue may also have dropped the standard that both firms live by.

Although separated by style and philosophy, Tandy and Compaq represent two sides of the same coin. Competitors at opposite ends of the price spectrum, they're united in defending a standard that IBM godfathered—and that they maintain it has now forsaken.

Still, even in a PS/2 world, these seem like the best of times for both firms. By dint of product quality, BMW-like panache, and unwavering fidelity to industry norms, Compaq ranks just behind Big Blue on corporate "approved vendor" lists. The company has climbed to notch 409 on the Fortune hit parade, and its 80286 and 80386 systems are reportedly selling faster than assembly lines can slap them together.

Although a Johnny-come-lately to the DOS realm, Tandy has become a principal bulwark of the PC standard. Credit the company's success in part to its owning both the distribution channel and the plants that make everything from processors to plastic bezels. Tandy's strategy is to pursue the unpursued—those businesses with revenues of less than $500 million—while attempting to pry Fortune 1000 firms away from vendors offering pricier systems.

The only problem is the standard—or, rather, standards. Nature may abhor a vacuum, but not as much as computer users abhor marketplace confusion. After all, buyers usually respond to mixed signals by keeping their billfolds closed. Figuring out who holds the deed to the industry standard isn't an esoteric exercise: The DOS world's number two and three vendors are literally banking on the continued health of a standard that now resides in the public domain.

'IBM certainly isn't taking the position of abandoning the standard, but actions speak more clearly than words.'

PC World's Southwest Editor Ken Greenberg recently interviewed Tandy chairman John Roach and Compaq president Rod Canion on the prospect of a schism in the personal computer business. An edited transcript of those conversations follows.

Compaq: No Changing of the Guard

PCW: I'd like to begin by quoting from David Bunnell's June PC World *column. David said this about IBM's Personal Systems: "Big Blue is not the party pooper it was made out to be. In fact, it's become the life of the party because it's managed to push the PC standard without abandoning it." How does that strike you?*

Canion: I disagree. IBM certainly isn't taking the position of abandoning the standard, but actions speak more clearly than words. From the user's perspective, the new products have completely broken with the existing standard.

PCW: That may be true in a hardware sense, but if you can run existing software...

Canion: You *can't* run a lot of the popular software directly on the newer products. You must get a new version from the software vendor. That's CP/M compatibility—all you need is the program on a different disk format. That kind of incompatibility permeates the machine from a user's point of view. IBM could have beefed up its systems without rendering all existing peripherals obsolete. What it chose to do would have been justified only if it delivered truly useful functionality that could not have been done in a compatible way.

PCW: What do you suppose was IBM's thinking behind PS/2 development?

Canion: IBM has said that it really wants greater control of what goes out to its customer base, especially large accounts. IBM actually made changes [to the hardware] in order to make it absolutely clear that change had come—and that IBM was controlling it.

PCW: Yet IBM's customer base in many ways parallels yours.

Canion: Absolutely. But the mainframe segment is clearly of greatest importance to IBM. With the new products, IBM is trying to emphasize those features that offer the greatest advantages to large companies, not small ones.

PCW: Were you expecting the new systems to reflect a closed architecture?

Canion: No. I just couldn't believe that IBM was going to break away from the standard. When it finally announced the PS/2 machines, I was relieved. I think [the PS/2 line is] the weakest move IBM could

have made. The PC was successful only because IBM considered it so unimportant that the company pushed it off onto a separate business unit. But now, IBM can't let [personal computing] be on its own, so top management is put on it, and lo and behold–

'A lot of big companies are saying that IBM can't do whatever it wants and are taking control of their [computing] situation. IBM may have come up against a force that is more powerful than it is.'

3½-inch floppies. It's new technology, and sure, it causes a problem–but IBM's been doing that for 30 years in the mainframe business, and people follow along.

PCW: From what you've been able to discern, how are users responding?

Canion: The trend we're seeing is one of cautious evaluation.

PCW: Would you go so far as to say that there's some confusion?

Canion: Yes, but it's a different kind of confusion. What strikes me is how this process contrasts with the PCII rumors two years ago. Just rumors of a PCII really did slow down the entire industry.

PCW: Historically, when confusion exists, people don't buy.

Canion: Right. They take the safe path, which in the past has been whatever IBM said was the safe path. Today, it's very different, which demonstrates a change in the degree of buyer understanding. We've all received an education about the standard and IBM's role in it. Compaq wasn't alone in insisting that the standard belongs to users. A lot of big companies are saying that IBM can't do whatever it wants and are taking control of their [computing] situation. IBM may have come up against a force that is more powerful than it is.

A Matter of Momentum

PCW: In any case, this is clearly a strategic product line for IBM, and that means IBM will marshal the expenditures and the energy to make it fly.

Canion: Agreed, but so was the PC. It's not a matter of IBM playing around before and now getting serious. Once IBM decided that PCs were going to be a big part of its business, the company could have designed a compatible 386 machine–one I think would have been much more successful. That's not to say these machines won't sell; the issue boils down to how many and how soon. It's a matter of momentum. Even though IBM did spend millions of dollars this quarter [on PS/2 promotion], the absence of that momentum has got to be a telling signal.

PCW: How much is Compaq hurt by the fact that three key products–the Model 80, OS/2, and OS/2 Extended Edition–have not yet seen the light of day?

Canion: It does have an effect, but the fact is that people haven't stopped buying ATs and industry-standard 286 machines. Demand for the Deskpro 286 is just skyrocketing. And we're coming up on the second generation of our 386. All of this tells you that a mass switchover hasn't occurred at all.

PCW: In a way, Compaq is a company built on the industry standard. You've long been insistent that Compaq would go wherever the industry went.

Canion: Absolutely.

PCW: How long before others in the industry indicate what that direction is–not just the Far Eastern clone makers, but companies like AST, Quadram,

and the like? Might we anticipate coexistence for an indefinite period–and, if so, how will that affect buying decisions?

Canion: Coexistence is almost the only plausible scenario. There's just no chance that the PS/2 line will take over and people will stop buying the current standard. What it really boils down to is which piece of this market will be the largest in what period of time. That will determine in the long term which standard prevails.

PCW: There's a special dynamic here that everyone has to face–the mass market.

Canion: Right, many millions of units and tens of billions of dollars invested. If there's one underlying reason for Compaq's success, it's that companies fail to appreciate the power of the standard.

PCW: Could you substitute the word user *for* standard *in that sentence?*

Canion: The user has changed because of the standard.

The Shock of the New

PCW: It seems as though a bit of psychological warfare is being waged here as well. In a sense, you've been put in the position of defending old technology.

Canion: It's true that in pitting IBM's new offerings against older products, consumers tend to feel they have to go with the new. Three years ago, certainly, that was the level at which the battle was being waged. But the good news is that users have grown up. The standard can continue to accept new technology–that's the point we're now making with the 386.

PCW: You've publicly likened the PS/2 introduction to the old Coke/new Coke predicament. If you follow that analogy a bit further, IBM should reawaken at least the AT line.

Canion: I think that's the most likely alternative. Assuming you buy my scenario that users won't move quickly to the new products, IBM may lose market share if it can't continue to supply ATs and XTs alike.

PCW: Let's assume that a PS/2-compatible industry emerges with some force. Are patents an issue with the Micro Channel? If so, what might that mean to users, should Compaq one day want to offer Micro Channel capability?

Canion: Certainly IBM is making noise about patents. Let's assume the bus is patented. If so, you can deal with it in several ways. One is licensing. Through that mechanism, the patent at least is available. You can design around patents, once you understand exactly what is patented. You can also imagine making something that performs the same basic functions but isn't totally compatible and keeps clear of any patent. You can count on seeing Micro Channel alternatives from third parties, whether they're needed or not.

> *'What it really boils down to is which piece of this market will be the largest in what period of time. That will determine in the long term which standard prevails.'*

PCW: When users require a 32-bit bus for something other than memory, Compaq will have to make a choice. At this juncture, where might you go?

Canion: Our first choice is to take the easy path by following what users say they want. But you won't see Micro Channel capability from Compaq unless there's a clear need.

PCW: You've said that for most business users DOS 3.00 and its extensions will provide all the capabilities they'll ever need. Is that the kind of statement that can come back to haunt you?

Canion: First, you have to recognize that OS/2 is not a step forward from DOS–they're two very separate things. OS/2 addresses the 286's protected mode. There's nothing inevitable about millions of satisfied DOS users all going over to OS/2. You may never need a minicomputer operating system on a PC.

PCW: Yet Compaq's primary systems are vehicles for OS/2, so isn't there some peril in IBM's holding OS/2 back? It's still a fact that DOS will never do for the 286 what OS/2 will do.

Canion: I'm not going to fight the acceptance of OS/2. We'll be selling it–and selling more 286 machines. Clearly, OS/2 is good for the industry. But IBM didn't explain it, and that's not good for the industry. If people expect to switch to OS/2 next year, they'll be disappointed. Trade-offs must be made if you want snazzy new OS/2 applications. It's a big step into a brave new world.

PCW: Might OS/2 Extended in fact require IBM hardware?

Canion: IBM hinted that OS/2 Extended will work only on PS/2 machines, but I'm skeptical. It'll be based on a Microsoft product but have added value. Those additional features are separate from making OS/2 Extended depend on PS/2 hardware–and unable to run on ATs. But I think IBM is going to try [to restrict the product]–and that will make users even madder.

I probably seem overconfident to people who haven't watched Compaq for a while. We respect IBM greatly. It would be foolish to say the battle is over. Of course, we're going to watch IBM carefully and follow the PS/2 line very closely, but our current path looks pretty clear.

Tandy: Driving Through Holes in the Standard

PCW: Given the apparent fissures in the DOS world these days, would you agree that this is a confusing time for users?

Roach: Not really. For the foreseeable future, DOS is *the* single-user operating system. People will begin to make the transition to OS/2 over time, but DOS will persist because most people just don't have the horsepower to run OS/2.

PCW: Has IBM abandoned the standard it launched back in 1981?

Roach: The standard has nothing to do with hardware; it has to do with software compatibility. As I see it, OS/2 is essentially hardware independent, and *Microsoft Windows*–or the OS/2 Presentation Manager–is absolutely hardware independent. That means we're not a hardware-compatible industry but a software-compatible industry. Taken together,

> *'If you get right down to it, the Model 30 is the biggest orphan ever to hit the market. It may be the PCII–maybe IBM owned all the parts and finally decided to do something with them.'*

OS/2, *Windows*, and DOS have done more to clarify the course of the industry and to permit variations in hardware than anything [any one vendor] could possibly do.

PCW: With IBM's Micro Channel and its support for yet another graphics standard, is the PS/2 line evidence that at least some in the industry are pitching technology that users don't necessarily need?

Roach: I'm not sure if I'd put it that way, but there has been a lack of focus on being truly user-friendly. The world doesn't necessarily need millions of spreadsheets or word processors. As an industry, what we don't have is anything that my wife likes–or that most people can use without a big investment and formal instruction on how to use the thing.

PCW: That implies that vendors ought to be looking to the low end. Still, with the Model 30, IBM seems to be declaring that it's not going to play commodity pricing with anybody.

Roach: I don't know what the Model 30 is. [Unlike the other PS/2 models], the Model 30 doesn't have a bridge to OS/2. If you get right down to it, the Model 30 is the biggest orphan ever to hit the market. It may be the PCII–maybe IBM owned all the parts and finally decided to do something with them. Why would you buy a Model 30? It's not priced right, it's not positioned right, and its performance is unspectacular.

PCW: It seems to confirm that IBM is addressing a constituency that Tandy isn't.

Roach: It's unquestionably a different constituency, but I can't dream of anyone wanting the thing. You can use your 8-bit cards, but that's it, end of list. This dog isn't going to hunt. If it hunts, I don't understand the business.

Two Cheers for Small Business

PCW: The product might make sense if you subscribe to the theory that IBM splits its customer base into expendables and nonexpendables. By that analysis, you're nonexpendable if you have a big IBM machine somewhere in the organization.

Roach: I haven't heard that theory, but I could go along with it. The PS/2 line lets IBM retreat into its traditional customer base. [Outside of that base] most users didn't have in mind spending $3500-plus for a computer in the first place.

PCW: So your sense is that IBM has written off the small business market?

Roach: They've written off the market under $1500, and with that orphan they've put out there they may have written off the entire market under $3500. The PS/2 line leaves a hole in the industry so big you could drive a truck through it–as long as that truck has Tandy's name on it. Literally millions of businesses of all sizes–but particularly small businesses–schools, home businesses, and home users have been neglected.

PCW: Certainly Tandy isn't ceding the Fortune 500 to anyone. What kind of outreach does the company have into the large corporate market?

Roach: Unlike most of our competitors, our primary target is not the Fortune 500. Not that it's a secondary target, but it's just that we have a lot of other targets that are absolutely as important to us. Are we selling to more large accounts today than we were a year ago? Yes. Have Fortune 500 companies focused on value? Not to the extent they should have, and we will continue to try to develop them. While IBM would like to dominate that market, if we could get a few percentage points out of that [share] and add that to the rest of the markets we address, we'll have a very, very big business.

'When you get beyond all the superficial stuff, you have to conclude that the new IBM line is software compatible with the old IBM line. IBM's added features it hopes will give it a marketing advantage with its larger customers.'

PCW: Even though you've said the standard is independent of hardware, the PS/2 family features two major hardware deviations from the PC and AT classes of machines–the 3½-inch floppy disk drive and a new bus. How important is the Micro Channel? It's already being reverse engineered...

Roach: It depends on who you talk to. What are you going to use the Micro Channel for? To add memory? Have you ever known any computer manufacturer that lacked a way of adding memory? In that sense, the Micro Channel doesn't make a difference–everybody has memory extension capability. As far as the application software is concerned, it's channel independent. What other boards can I put in there? Probably some special communications board, right?

PCW: The expectation is that OS/2 Extended will require it...

Roach: What are you going to talk to? I'll be surprised if there aren't communications boards available to talk to that same device from an AT or

an XT bus. Right now, you can get every kind of communications board anybody ever dreamed of.

And OS/2 Extended? When you follow the thread all the way through, what IBM has done is clear. IBM's own technical document calls OS/2 Extended [*quoting*] "a comprehensive multiapplication operating system for the XT 286, the AT, and the PS/2 line." That's what it says: OS/2 Extended will run on an AT. And this is independent of whether or not IBM has shafted customers again by introducing an incompatible disk format, or whether it has prevented them from using existing boards or monitors or from buying anything but fixed-configuration machines.

When you get beyond all that superficial stuff, you have to conclude that the new IBM line is software compatible with the old IBM line. IBM's added features it hopes will give it a marketing advantage with its larger customers. We're not talking about standards—we're talking about bells and whistles that give IBM a marketing advantage. And that means all manufacturers now have the opportunity to provide the best features and performance they can within the software compatibility standard. I rest my case.

A Clone of One's Own

PCW: Even so, what will stop companies from doing what they have done in the past—jump on the IBM bandwagon simply because it's IBM's?

Roach: Just look at the list of bandwagon-jumpers: Columbia, Corona, Eagle, Seequa. There's a real difference there. Clones per se have not necessarily been the big winners. It's a matter of what the customer gets. We're certainly going to look at anything we think is worthwhile. We might clone a specific feature because it's a good idea, just as we would accept a good idea from anybody in the industry. While many software developers will be writing for OS/2—they have to, they don't have any options—my guess is that their applications will be smart enough to operate under *Windows*, which is inherently hardware independent.

PCW: So it's not completely out of the question that we might see a Model 50 compatible wearing the Tandy logo within a year or so?

Roach: I don't know. We haven't made any decision on that. While certain features will be cloned and while we may eventually support IBM's graphics convention or a better one, this isn't a situation that necessarily calls for a clone.

> *'We can put in place a machine that is so much better than the Model 50 it's not even funny.'*

The beauty of the Model 50 is that you can't install any 8-bit cards. You aren't able to use existing monitors. You must have 3½-inch floppies because that's the only way it comes. When I talk about our not offering a Model 50, I'm not saying that Tandy is going to abdicate that part of the market; I say it because we can put a machine in its place that is so much better than the Model 50 it's not even funny. And I'm not saying that we would never sell a machine with a 3½-inch drive—but I will guarantee that with our machine you'll be able to have any size drive you want. We aren't going to dictate to our customers what they have to do.

PCW: With IBM having declared its intentions, what market is apt to offer the greatest growth for Tandy and the industry?

Roach: There isn't just one, of course. Nobody has ever really made a home computer. One of these days, we're going to be smart enough to build one.

The Knowledge Engineers

Eric Bender

In developing an expert system, be prepared for the experts to contradict themselves, advise Gold Hill's Sajnicole Joni and Gerald Barber.

Seth Resnick

Launching expert systems into the business mainstream can require skills from areas as disparate as software design and anthropology. Increasingly, the biggest obstacle is debriefing the human expert.

When retiring experts walk out the door for the last time, a fortune's worth of undocumented experience may leave with them. Thanks to a new breed of PC software tools, however, a company can capture those intangible assets before they slip away forever. A firm can also tap the wisdom of experts with long careers still ahead, spreading their knowledge throughout the organization and freeing them from mundane tasks.

Software that successfully mimics aspects of human problem solving has been trickling out of the blue-sky artificial intelligence labs and into commercial use during the past decade (see "Experts on Call," *PCW*, September 1985). Known popularly as expert systems, the programs might be described more suitably as *knowledge-based* or *advisory*.

In the past year commercial knowledge-based systems have steadily infiltrated the offices and factories around us. Increasingly, these systems are available for PCs—a trend that will only accelerate as 80386-based machines proliferate. Now the challenge of building an expert system becomes how to capture the knowledge and experience of human experts, who are often elusive or expensive, or both.

Acquiring Knowledge

Among early commercial users, the Big Eight accounting firm Coopers & Lybrand tapped the expertise of dozens of its senior partners for *ExperTax*, an in-depth tax adviser that runs on the AT. "The beauty of the system is that you don't have to know taxes to use it," says one employee. *ExperTax* can also dispatch updates quickly and unerringly through hundreds of Coopers & Lybrand offices.

Many other firms are creating somewhat less ambitious knowledge-based systems, narrowing the focus to matters such as technical-support phone calls. And while small businesses are unlikely to devise seminal expert systems any time soon, Harvey Newquist, editor of *AI Trends*, a newsletter published in Scottsdale, Arizona, suggests boom times are ahead. By the end of 1987, Newquist predicts, "we'll probably start to see prepackaged systems—advisory systems to perform inventory control, to create billing cycles, or to design manufacturing schedules."

Building moderately complex advisory systems is still likely to require considerable programming prowess, and familiarity with AI languages like LISP and Prolog will come in handy (see "A Prolog to the Future," *PCW*, December 1986). But rapidly evolving software tools are freeing developers to focus on picking the expert's brain. "The hard part of writing an expert system is knowledge engineering—finding out what the [given discipline's] rules are," says Eugene Wang, marketing vice president at Gold Hill Computers in Cambridge, Massachusetts.

"Knowledge acquisition is going to be the major bottleneck," agrees Leslie Porter of Index Systems, a management consulting firm also based in Cambridge. "People who have the ability to extract that knowledge are rare." And not surprisingly, a tension exists between expert and engineer,

reflecting a clash between the expert's vernacular and the engineer's methodology.

"What we see is literally a whole new profession opening up," declares Karl Wiig, a principal with Coopers & Lybrand who is responsible for AI practice. "Five years ago I never would have believed I'd say that."

Other observers, however, downplay the call for a new breed of professional. "Developing an expert system is like developing any other computer system—almost," maintains Earl Sacerdoti, vice president for strategic projects at Teknowledge in Palo Alto, California. "We have a knowledge engineer, whom the rest of the world would call a systems analyst—and he sits down with the expert, whom the rest of the world would call a representative of the user community."

Covering the Knowledge Bases

At the lowest level, nontechnical PC users are employing inexpensive and reasonably powerful expert system *shells*. Such shells are simply high-level tools that provide a framework for assembling knowledge-based systems without the need to delve deeply into the vagaries of LISP or other AI languages.

These products are likely to earn their keep by solving small but nagging problems like how best to ship a package. A few shell-based systems easily subdue what appear to be daunting jobs and offer solid payoffs, available today.

But the true potential of expert system technology is demonstrated most impressively by the high-end systems built by teams of professionals—like those at Arthur D. Little's Artificial Intelligence Applications Center, where some staffers gather nuggets of information while others write software.

A classic advisory system begins with a business problem that an expert can solve in a single phone conversation. Teknowledge's Sacerdoti expands the list of criteria: Can the knowledge base (the information gathered) be encoded? Do your sources perform better than average, even if they're not world-class experts? Can the knowledge engineer translate the expert's sensory cues? (As Sacerdoti puts it, "The human expert can hear that the machine sounds funny or can smell the burning lubricant.") And, of course, does the problem have a solution?

"You're looking for a problem with a specific solution that the expert can articulate," says Sajnicole Joni, director of consulting at Gold Hill. "You can write a great expert system to support a sports training system, but it won't teach you to hit a tennis ball like Martina Navratilova."

Scoping It Out

Like any software project, a fair-size knowledge-based system is built on estimates of goals, time, costs, appropriate hardware, and impact on work habits. With this breed of software, it's particularly important that these estimates not be chiseled in stone.

> *'As part of integrating knowledge, expert systems identify holes where not only the computer but the organization lacks information.'*

Expert systems can be split into two components: the knowledge base, which holds rules and related information; and the *inference engine*, which provides the problem-solving mechanism (which in turn holds the underlying control structures). Control structures, in turn, can be either rule-based or frame-based.

Almost all PC systems are rule-based, linking a series of IF... THEN rules with *forward-chaining* or *backward-chaining* architectures. Forward chaining starts with a premise and chugs through the rules and the relevant information to find solutions; backward chaining starts with a hypothetical solution and then tries to justify that solution. Forward-chaining seems the more natural method of the two: You enter a mass of data and rules and see what happens. Backward chaining is less intuitive but often more efficient.

Frame-based systems are inherently more complicated. These systems rely on convoluted dependencies and generally run on specialized LISP machines or superminicomputers.

In grappling with these technical issues, programmers work with diverse tools, including languages such as LISP, Prolog, and C, and shells such as Teknowledge's M.1 and Gold Hill's GoldWorks. Figure 1 shows a sample scheme for developing a prototype knowledge-based system.

A Qualifying System

Gold Hill's Joni describes the design for a system that qualifies sales leads. The process begins with the acquisition of data on methods the sales force is currently using. "You get all the salespeople to write down what they do," she says. Then she selects roughly 20 representative scenarios of how the salespeople perform in the field.

She next analyzes that data and the process of obtaining it. "What's the salesperson's thinking process? You look for critical variables that allow the salesperson to make decisions very quickly."

Although users often want to solve an array of problems, it's crucial that each system be confined to a single problem, such as targeting potential customers above a specified income level.

From there, Joni assembles the pieces of information that make up the knowledge base and then determines how to string the pieces together. A flexible, modular approach is essential to easily accommodate new categories of

Iteration Plus Interaction Equals Knowledge-Based Systems

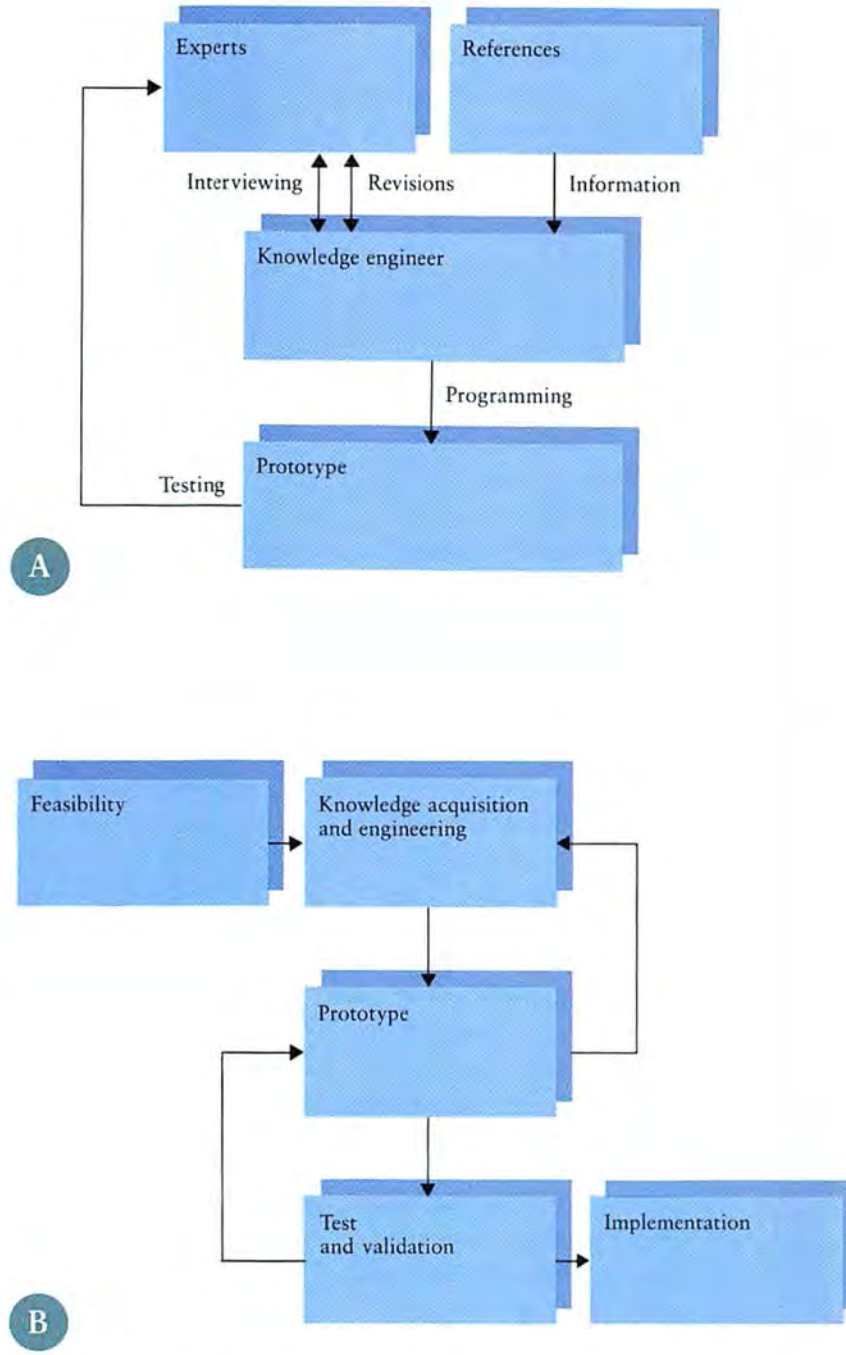


Figure 1: Developing a prototype knowledge-based system, knowledge engineers go through an iterative process (A). The overall development cycle for a knowledge-based system (B).

Source: DM Data

Elicit Work

As a knowledge-acquisition interview rolls along, things are not proceeding smoothly. Increasingly irritated by the knowledge engineer's queries, the manufacturing expert throws up his hands and fumes, "OK, do it your way!"

According to knowledge engineers Helen Ojha and Susan Stafford, the scene is a textbook example of an approach to avoid.

"Over the years experts develop what appear to be odd ways of doing things," says Ojha, a former political scientist who worked at Arthur D. Little before joining Coopers & Lybrand. She describes knowledge engineers as "visitors to a culture they have not grown up in." At work, they're much like anthropologists, who are trained to be keen observers of things they don't fully understand.

Experts, she says, tend to generalize about experiences from fragments of actual events. "Our job can be to translate that knowledge into something that's more usable." Experts are often visual or kinesthetic, not verbal, and thus can't easily express what they know. A meteorologist who was superb at predicting the volatile weather at the Kennedy Space Center "would use his body to mime the evolution of clouds," she recalls. "We spend a lot of time thinking about the cognitive style of the expert," adds Stafford, a onetime philosophy professor.

David Mitzendorf/Arthur D. Little, Inc.

Helen Ojha and Susan Stafford, knowledge-elicitation specialists at Arthur D. Little, ponder the results of an interview.

The two engineers classify four types of experts. First is the professional practitioner, who's very procedural "and can give an apparently coherent verbal rendering of how it is," according to Ojha. "He or she has all the patina of logic." Doctors tend to fit that mold.

Next is the "practical knowledge worker," whom Ohja describes as one who cares more about the content of a problem than its structure. These experts are generally most articulate "if they have all of their artifacts with them," Stafford says.

The third type is a "performer, a primitive actor," says Ojha. "These experts tend to be people-oriented, and are exquisitely good" at relating to individuals. They spend much of their time

preparing themselves to respond to a situation. Here you're apt to find stock-market traders, the folks who make all that noise on the exchange floor.

Fourth is the "communicating negotiator," Ojha says. "These people dance their way around things. They like to engage you in dialogue." The classic example is the sales professional.

Initially, experts cast a jaundiced eye on the knowledge engineering team. For one thing, says Ojha, "a lot of experts don't believe in their own expertise. They believe that, yes, they do a good job—but if a computer system used their methods, it would be flawed."

Based on their own experience, the knowledge engineering duo emphasizes that familiarity with experts breeds anything but contempt. "The more you look at this stuff, the greater your respect for what those people do," Stafford marvels. —*E. B.*

information. The system should be capable of incorporating details that are not necessarily part of any decision-making process. "Salespeople may want to include the customer's hobby or favorite drink," she explains. And the system should accommodate exceptions.

Next come architectural questions, addressing whether forward-chaining or backward-chaining controls are most appropriate for a given task. After the first attempt at a rule architecture, it's time to write the rules themselves. Joni then throws everything into a software prototype, tries it out, patches it here and there, and begins a long trial-and-error period with the experts: "You have to be prepared to hear your experts say, 'That's not how I do it.'"

As the knowledge engineers build systems, they must often sidestep company politics, turf battles, conflicts over information that employees want to keep to themselves, and similar traps. Gold Hill R&D vice president Gerald Barber emphasizes that the engineer must always keep the final user in mind.

Expert Advice (and Consent)

Teknowledge, one of the more successful suppliers of knowledge-based system tools, adheres to a methodology closer to conventional software design than that followed at some expert system houses.

Although developing knowledge-based systems is an iterative process, Teknowledge's Earl Sacerdoti stresses the importance of identifying problems as far in advance as possible. "We try to map out the universe and the kinds of subproblems that will come up," he says. With this controlled approach, "the surprises tend to be conventional—things like choice of interface.

"In terms of pulling knowledge from people, we've adopted a few principles from clinical psychology," he says. "But that's not a critical issue. People succeed with wildly different efforts." Teknowledge advises against including the expert in the development team or pitting expert against expert in "knowledge games," although both approaches have paid off for other developers.

The key, Sacerdoti says, is to pair a cooperative expert with a knowledge engineer "who can operate in an egoless fashion and let the expert be the 'owner' of the system, and who can ask questions and listen to the answers." It's just as necessary that the knowledge engineer gain the expert's trust. "They will be dealing with each other in fairly intimate detail," says Harvey Newquist. Intimacy can, however, produce sparks.

"A crucial step in building a system is learning the expert's language," according to Susan Stafford, a Coopers & Lybrand staffer who specializes in debriefing experts (see the sidebar "Elicit Work"). "Often, the first thing you hear is not what the experts actually said, and the first thing they say is often not what they meant."

All of this suggests that a hacker with a little spare time is not necessarily the best candidate to plumb for expertise. Someone with a less technical background is often better suited; those with

Teknowledge's Earl Sacerdoti promotes expert system shells as "mainstream" tools.

Ed Kashi

strong communications skills—like teachers and journalists—seem to be particularly effective. Arthur D. Little's AI group includes computer scientists, anthropologists, linguists, philosophers, sociologists, and psychologists. However, others insist there's no need to raid the social sciences. Existing personnel can carry out most of the work on a corporate project, according to Index Systems' Thomas Davenport, who doubts that many company payrolls include linguists or philosophers.

Meanwhile, software gurus continue trying to build automated knowledge acquisition tools that can lighten the system development burden, particularly for maintenance tasks. William Brodie of Brodie Associates in Boston says that in some cases those tools can carry on moderately sophisticated interviews and can even "detect and tactfully pose likely exceptions to general rules the human expert provides."

Experts in the Field

Expert systems that reach the field are often greeted with skepticism. Doubt issues in equal measure from those who think the software will never work or never earn its keep and those convinced it will simply demonstrate the lack of genuine expertise in the world. Even the foremost advocates of expert systems acknowledge a need to accept limitations: "An expert system, like an expert, does not guarantee the optimum result and does not guarantee correctness," says Index's Leslie Porter.

In addition, expert systems demand more fine-tuning than do most classes of software. That's because of the volume of information, its often rapid obsolescence, the inherent conflicts among experts, and the tendency of the rules themselves to change with new information. "There's a horrendous problem in maintaining knowledge bases," says David Pensak, a technical support professional at DuPont corporate headquarters in Wilmington, Delaware. "We're back to a form of knowledge representation that's at least as archaic as punch cards."

But Earl Sacerdoti insists that system upkeep is not overwhelming if the proper knowledge is available: "We have fielded many systems that are maintained by a fraction of one individual's time."

Within medium-to-large companies, information systems groups typically act as custodians for knowledge-based systems. Opinions vary on how well these groups handle the onslaught of computer-based advice. Many have actively pushed such technology as automated spreadsheets, but others "have enough problems with the COBOL side of the house without dealing with these Star Wars applications," notes Index's Porter.

What changes people's minds are the payoffs—not only in day-to-day operations but in the wealth of detail that knowledge-based systems can generate about

how work gets done within an organization. "As part of integrating knowledge, these systems identify gaps where not only the computer but the organization lacks information," says Sacerdoti.

And the systems also pay off in personal satisfaction. Sacerdoti recounts the story of one industrial plant where an expert system was being tested with a thorny diagnostic problem. "The expert was showing me around, and a technician came up and told him, 'That was a tough problem—the repair manual was wrong and you were right!' The expert loved it."

Eric Bender is PC World*'s East Coast Editor.*

A Sampling of PC Expert System Shells

GoldWorks
Gold Hill Computers, Inc.
163 Harvard St.
Cambridge, MA 02139
617/492-2071
List price: $5000
Requirements: AT or compatible, 5MB extended memory, DOS 2.00 or later version
Not copy protected

Exsys version 3.2
Exsys, Inc.
P.O. Box 75158, Contract Station 14
Albuquerque, NM 87194
505/836-6676
List price: $395; $600 one-time fee for developer's run-time license includes non-copy-protected version
Requirements: 320K for development version, 256K for run-time version, DOS 2.00 or later version
Copy protected

First Class
Programs in Motion, Inc.
10 Sycamore Rd.
Wayland, MA 01778
617/653-5093
List price: $495, demo disk $20
Requirements: 256K, DOS 2.00 or later version
Not copy protected

Guru version 1.0
Micro Data Base Systems
P.O. Box 248
Lafayette, IN 47902
317/463-2581
List price: $6500, run-time copies $400 each
Requirements: 640K, 5MB hard disk drive, DOS 2.00 or later version
Not copy protected

KDS2, KDS3
KDS Corp.
934 Hunter Rd.
Wilmette, IL 60091
312/251-2621
List price: KDS2 $970, KDS3 $1495
Requirements: 512K, numeric coprocessor (Intel 8087 or 80287), DOS 2.00 or later version, hard disk recommended
Not copy protected

M.1 version 2.1
Teknowledge, Inc.
1850 Embarcadero Rd.
P.O. Box 10119
Palo Alto, CA 94303
415/424-0500
List price: $5000 (includes first 90 days' maintenance), run-time price based on quantity purchased, software maintenance contract $1000 per year
Requirements: 512K, DOS 2.00 or later version, color monitor recommended
Not copy protected

Personal Consultant Easy version 1.0
Texas Instruments
P.O. Box 80963
Dallas, TX 75380-9063
800/527-3500
List price: $495, applicable toward purchase of Personal Consultant Plus within six months of purchase
Requirements: 512K, two disk drives, DOS 2.00 or later version
Not copy protected

Personal Consultant Plus version 2.01
Texas Instruments
List price: $2950; demo disk $25; single run-time disk $95, 20 run-time disks $950
Requirements: AT or compatible with 640K and 10MB hard disk, DOS 2.00 or later version
Not copy protected

Wordprocessing

□ **3½″ format available from us. Specify when ordering.**
◙ **package includes both 5¼″ and 3½″ disks.**
Ⓡ **3½″ format available from manufacturer by request. Call us for details.**
CP—copy-protected; **NCP**—not copy-protected.

SOFTWARE

We only carry the latest versions of products. Version numbers in our ads are current at press time.

Alpha Software ... NCP
□Keyworks 3.0 *(macros)* . . . . . $59.
□Advanced Keyworks . . . . . 175.
□Alpha/three 1.0 *(dB3 file compatible)* . . . . 223.
American Small Business Computers
□ProDesign II 2.5 *(NCP, low price CAD)* . . . 169.
Ansa ... NCP
◙Paradox 2.0 *(easy-to-use database)* . . . . . 419.
Application Techniques ... NCP
ⓇPizazz 2.0 *(see what your printer is missing)* 45.
Ashton-Tate ... NCP
□dBase III Plus 1.1 *(the standard)* . . . . . 399.
□Framework II 1.1 *(integrated excellence)* 399.
□Rapid File 1.0 . . . . . 269.
□MultiMate Advantage II 1.0 . . . . . 299.
Bible Research ... NCP
THE WORD 3.1 *(KJV, Bible on Disk)* . . . . . 159.
THE WORD 3.1 *(NIV, Bible on Disk)* . . . . . 159.
Borland International ... NCP
□Numerical Methods Toolbox 1.0 . . . . . 59.
□Turbo Lightning 1.0 *(speller, thesaurus)* . . . 59.
□Eureka 1.0 . . . . . 99.
□Turbo C 1.0 . . . . . 59.
□Turbo BASIC 1.0 . . . . . 59.
□Turbo Pascal 3.0 w/BCD & 8087 support . . 59.
□Turbo Pascal w/Turbo Tutor . . . . . 75.
□Turbo Prolog 1.1 . . . . . 59.
□Turbo Prolog Toolbox 1.0 . . . . . 59.
□Turbo Jumbo Pack . . . . . 169.
□Sidekick 1.5 . . . . . 51.
□Reflex 1.1 . . . . . 87.
□Superkey 1.1 . . . . . 59.
Breakthrough ... NCP
Timeline 2.0 *(project management)* . . . . . 259.
Broderbund ... CP
Print Shop *(banners, signs, etc.)* . . . . . 35.
Print Shop Companion *(tools for Print Shop)* 33.
Graphics Library 1 or 2 *(for Print Shop)* . . . 22.
Computer Associates ... NCP
ⓇSpreadsheet Auditor 3.0 *(check your work)* 89.
◙SuperCalc 4 1.1 *(includes Sideways)* . . . . 299.
Core International ... NCP
□Corefast 1.3 . . . . . 89.
Crosstalk Communications ... NCP
□Crosstalk XVI 3.61 . . . . . 95.
□Crosstalk MK.4 1.0 . . . . . 129.
Dac Software ... NCP
□Dac Easy Base 2.0 . . . . . 32.
□Dac Easy Payroll 2.0 . . . . . 32.

PC Connection Software Special
through September 30, 1987

MONOGRAM ... NCP
□Dollars & Sense 3.0

The only worry the average person has about money is that there is never enough. Dollars & Sense will allow you to watch your income, expenses, credit card(s), and cash flow, so you can keep better track of what's yours to begin with. Plus, through September 30, with each Dollars & Sense you buy from PC Connection, Monogram will send you absolutely FREE the book *Using Dollars & Sense*, from Que Publishing ($17.95 value)!

- Supports up to 120 record-keeping categories and 12 checking accounts, and includes 3 sample account templates
- Constantly shows running balance in active account
- Supports automatic transactions
- Prints checks, reports, and graphs

For the IBM PC, XT, XT286 & AT . . . . $105.

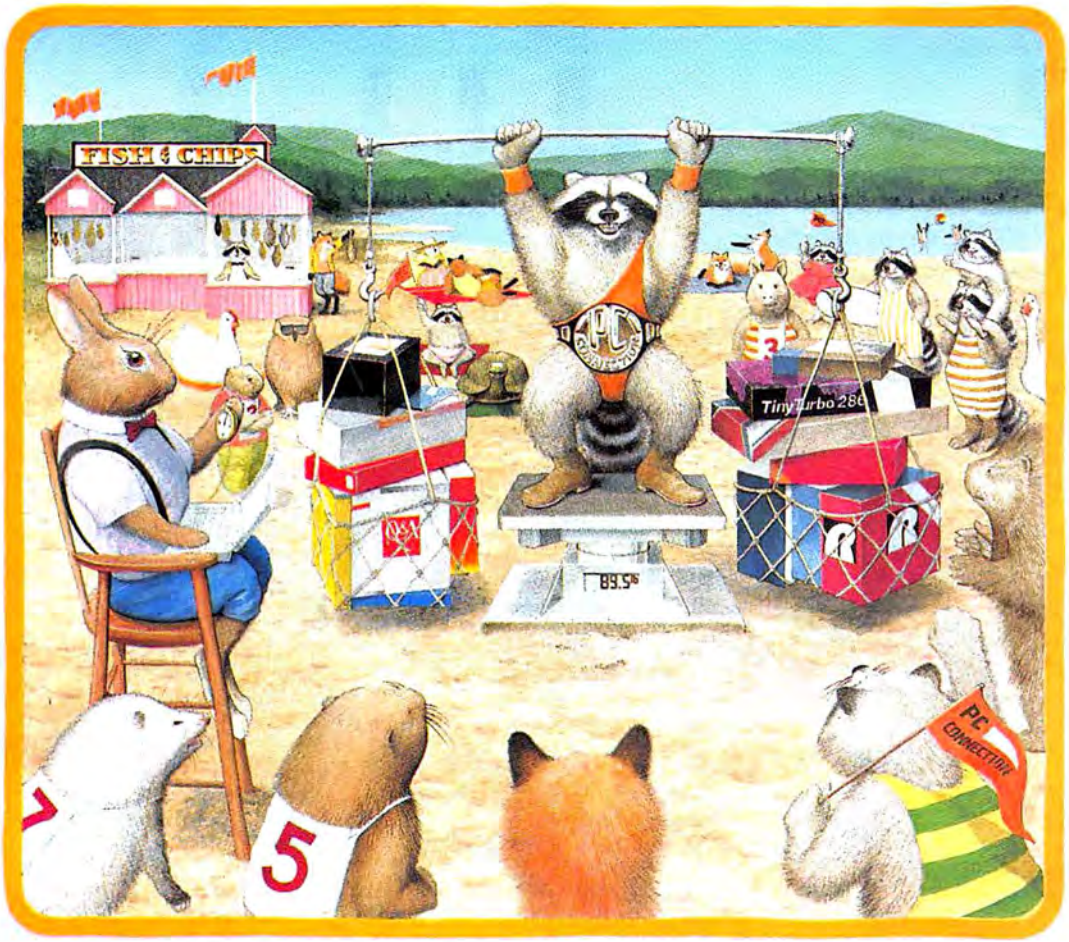
□Dac Easy Accounting 2.0 . . . . . 45.
Daybreak Technologies ... NCP
Silk 1.0 *(advanced features)* . . . . . 99.
Digital Research ... NCP
□Gem Draw Plus 2.0 . . . . . 189.
□Gem Desktop Publisher 1.0 . . . . . 259.
Executive Systems ... NCP
□XTREE 2.0 *(DOS shell)* . . . . . 31.
5th Generation ... NCP
□Fastback 5.14 *(hard disk backup)* . . . . . 89.
Funk Software ... NCP
Sideways 3.1 . . . . . 42.
□Noteworthy 1.0 . . . . . 49.
□Inword 1.0 . . . . . 59.
Generic Software ... NCP
□Generic CADD 3.0 *(full-featured)* . . . . . 69.
□Auto Dimensioning 3.0 . . . . . 35.
□Dot Plot 3.0 . . . . . 35.
Harvard Associates ... NCP
PC LOGO 2.0 . . . . . 89.
Hayes ... NCP
□Smartcom II 2.2 . . . . . 89.
Headlands Communications ... NCP
□PC TALK4 1.3 . . . . . 55.
Hilgraeve Software ... NCP
□HyperAccess 3.2 . . . . . 89.
Infocom ... NCP
Cornerstone 5.2 *(powerful database)* . . . . . 59.
Intersecting Concepts ... NCP
□Display Master 2.04 *(for EGA systems)* . . . . 39.
□Backup Master 2.1 . . . . . 59.

Javelin Software ... NCP
□Javelin 1.1 *(more than a spreadsheet)* . . . $ 69.
□Javelin Plus 1.0 . . . . . 159.
Lifetree ... NCP
□Volkswriter Deluxe Plus 1.0 *(an old favorite)* 69.
□Volkswriter 3 1.0 . . . . . 147.
Micro Education (MECA) ... CP
□Managing Your Money 3.0 . . . . . 115.
Micropro ... NCP
□Easy Extra 1.5 . . . . . 69.
□WordStar Professional Release 4.0 . . . . . 259.
□WordStar 2000 Plus Release 2 . . . . . 229.
Microrim ... NCP
□R:base System V 1.1 *(with Express)* . . . . . 429.
□R:base Graphics 1.0 . . . . . 159.
Microsoft ... NCP
□Windows 1.04 *(includes Write & Draw)* . . . . 65.
◙Chart 2.02 . . . . . 189.
◙Word 3.11 *(graphics based)* . . . . . 219.
◙Project 3.01 . . . . . 239.
LANGUAGES
□Quick Basic 3.0 *(newest version)* . . . . . 59.
ⓇMacro Assembler 4.0 . . . . . 97.
ⓇFORTRAN Compiler 4.0 . . . . . 289.
ⓇC Compiler 4.0 . . . . . 279.
Monogram ... NCP
□Dollars & Sense 3.0 . . . . . special
Nantucket Software ... NCP
□Clipper *(Autumn '86, dB3 Plus compiler)* 399.
Nolo Press ... NCP
ⓇWillWriter 1.0 . . . . . 35.
Paul Mace ... NCP
□H/Test-H/Format 1.0 *(hard-disk tools)* . . . . . 49.
□Mace Utilities 4.0 *(DOS utilities)* . . . . . 59.
Paperback Software ... CP
□VP-Planner 1.3 *(1-2-3 vers. 1A compatible)* 57.
□VP-Info 1.0 . . . . . 57.
□VP-Expert 1.0 *(expert system)* . . . . . 57.
□VP-Graphics 1.0 . . . . . 57.
Personics ... NCP
ⓇSmartNotes 2.0 *(Post-It-like notes)* . . . . . 49.
ⓇSeeMORE 1.0 . . . . . 49.
Quarterdeck ... NCP
□DESQView 2.0 *(operating environment)* . . . 79.
□Expanded Memory Manager 386 1.0 . . . . 39.
Simon & Schuster ... NCP
Webster's New World Writer 1.04 . . . . . 59.
Softlogic Solutions ... NCP
Double DOS 4.0 . . . . . 35.
Software Carousel 2.0 *(everything resident)* 35.
Disk Optimizer 2.01 . . . . . 35.
Software Publishing ... NCP
◙PFS:First Publisher . . . . . 59.
◙PFS:First Choice 1.0 *(nice program)* . . . . . 109.
◙PFS:Professional Write 1.0 . . . . . 119.
◙PFS:Professional File 1.0 . . . . . 149.
◙PFS:Professional Plan 1.0 . . . . . 149.
◙Harvard Total Project Manager 2.0 . . . . . 379.
Springboard ... CP
Newsroom *(make your own newspaper)* . . 35.
Newsroom•Pro *(NCP)* . . . . . 79.
Symantec ... NCP
□Q & A 2.0 *(database, word processor)* . . . 209.

For the IBM-PC (XT & AT) exclusively.

PC CONNECTION®

COPYRIGHT PC CONNECTION, INC. 1987. ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.



PC Pectorals.

The ripple effect.

In the heavyweight town of Marlow, NH (pop. 547) we've found it takes a big grin, true grit, and the occasional bulging bicep to outmuscle the competition. That's why we don't try to load you down with products that can't carry their weight.

We know that using a PC (XT or AT) can be a real burden when you don't have the right add-ons, software, or accessories. Fortunately, the strapping hunks and hunkettes on our sales force know the tricks and trickettes to keep the scales tipped in your favor.

Pumping ions.

Did you ever think about how many electrons go scrambling in different directions every time you touch your keyboard or mouse? And it gets even more complex when you start loading up your mischievous little micro with various doodads and doohickeys. Don't it?

Well, sweat thyself not. When those confusing instructions and error messages make you feel like some silicon strong man just kicked sand in your face, give our tech heavies a call. They know which keystrokes, cables, or configuration you need to give the old heave-ho to virtually any micro mayhem.

Keep your head above water!

As you can see, our muscular mascots tend to show off a bit when they hit the beach each summer. And so should you! With the PC Connection inflatable raft. From the company that always catches your drift. It's free to anyone who places an order of $500 or more between now and September 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.

Follow the straits and narrows in your very own PC Connection inflatable raft. Offer not available to net accounts. Limit one per customer.

For the IBM-PC (XT & AT) exclusively.

PC CONNECTION®

©COPYRIGHT PC CONNECTION, INC., 1987. THE RACCOON CHARACTER(S) IS A TRADEMARK OF PC CONNECTION, INC. PC CONNECTION IS A REGISTERED TRADEMARK OF PC CONNECTION, INC., MARLOW, NH.

wonders for write

Traveling Software ... NCP
⊙LAP-LINK 2.0 *(5¼" to 3½" and back)* . . $79.
True BASIC, Inc. ... NCP
□True BASIC 2.0 . . . . . 59.
®True BASIC Libraries . . . . . *each* 32.
Turner Hall ... NCP
®SQZ! 1.5 *(make 1-2-3 sheets smaller)* . . . . . 49.
®Note-It Plus *(notes on 1-2-3 sheets)* . . . . . 49.
®4Word 1.0 *(add word processing to 1-2-3)* 59.
®Cambridge Spreadsheet Analyst 2.02 . . . . 59.
Unison World ... NCP
Newsmaster 1.0 . . . . . 57.
WordPerfect Corp. ... NCP
⊙WordPerfect Executive 1.0 . . . . . 119.
□WordPerfect 4.2 *(one of the best)* . . . . . 199.
Xerox ... NCP
Ventura Publisher 1.1 . . . . . 549.

TRAINING

ATI ... CP
□How to use DOS, BASIC . . . . . *each* 33.
□How to use Lotus, dBase III Plus. . . . *each* 43.
Individual Software ... NCP
□The Instructor II *(with Smartguide)* . . . . . 26.
□Professor DOS. . . . . 33.
□Smartguide *(mem. resident DOS reference)* 15.
□Typing Instructor II . . . . . 26.
Microsoft ... NCP
□Learning DOS *(for any version)* . . . . . 33.
Simon & Schuster ... NCP
Typing Tutor IV . . . . . 33.

EDUCATIONAL

Barron's ... CP
Computer SAT . . . . . 35.
Designware ... CP *(requires CGA)*
Spellicopter *(ages 6 to 10)* . . . . . 22.
Stone & Associates ... CP *(reqs. CGA)*
My Letters,Numbers,Words *(ages 2 to 6)* . . 27.
Kids Stuff *(ages 2 to 6)* . . . . . 27.
True BASIC, Inc. ... NCP
®Calculus . . . . . 32.
®Trigonometry . . . . . 32.
®Algebra . . . . . 32.

RECREATIONAL

Accolade ... CP *(requires CGA)*
Mean 18 *(great golf game)* . . . . . 29.
Blue Chip ... CP
Millionaire II . . . . . 36.
Electronic Arts *(requires CGA)*
Starflight *(NCP)* . . . . . 32.
Chessmaster 2000 *(CP)* . . . . . 32.
Hayden Software ... CP
Sargon III *(Chess program)* . . . . . 32.
Infocom ... NCP
Bureaucracy Hollywood Hijinx
Enchanter Hitchhiker's Guide
Leather Goddesses of Phobos . . . . *each* 25.
Zork Trilogy . . . . . 49.

PC Connection Hardware Special
through September 30, 1987

CONTROL DATA CORP. ... 1 year
Wren II Series 40 Megabyte Hard Drive

Like the cold New England winters, this drive is rugged. The Wren II line is used by numerous OEMs to build complete systems around, and these are high-quality systems that use nothing but the best.

- CDC Model No. 94205-51, 5¼", half-height
- 28 ms average access time (30% faster than a stock AT hard drive)
- Includes Wrenpak II formatting and diagnostic software, which allows a full 40 megabyte usable partition, or partition the drive to suit your own individual needs
- PC/XT version includes Western Digital hard drive controller, AT version uses AT hard/floppy controller
- Also includes all necessary cables, mounting hardware, and instructions

For the IBM PC or XT
(includes controller) . . . . . $641.
For the IBM AT or XT286 . . . . . 569.

Microleague Sports ... CP
Microleague Baseball *(requires CGA)* . . . . 25.
Microprose ... CP
F-15 Srike Eagle *(requires CGA)* . . . . . 22.
Silent Service *(requires CGA)* . . . . . 22.
Microsoft ... CP
□Flight Simulator 2.13 *(reqs. graphics brd.)* 32.
Mindscape ... CP
Balance of Power *(reqs. graphics brd.)* . . . 30.
1Step Software ... CP *(requires CGA)*
Golf's Best *(Pinehurst or St. Andrew's)* . . . . 19.
Parlor Software ... CP
®Bridge Parlor *(best Bridge simulation)* . . . . 49.
Sierra On-Line ... CP
⊙Leisure Suit Larry *(requires CGA)* . . . . . 25.
⊙King's Quest III *(requires CGA)* . . . . . 33.
Simon & Schuster ... CP
Star Trek/Promethean Prophecy . . . . . 27.
Sphere, Inc. ... NCP
Orbiter *(Shuttle simulation, requires CGA)* 27.
Sublogic ... CP
Jet *(requires graphics board)* . . . . . 33.

1-800/243-8088

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

400W

XOR ... NCP
NFL Challenge. . . . . $79.

HARDWARE

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

AST Research ... 2 years
All boards listed (except Piggyback, I/O Mini 2 & Hot Shot) include a FREE copy of DESQView.
I/O Mini 2 C/S/P . . . . . 125.
SixPakPlus 384k C/S/P *(fully populated)* . . . 199.
SixPakPremium 256k C/S/P
(upgrades to 1 Mb or 2 Mb w/Piggyback) . . . call
Advantage Premium 512k S/P
(upgrades to 1 Mb or 2 Mb w/Piggyback) . . . call
RAMpage! 286 512k *(upgrades to 2Mb)* . . . call
Hot Shot 286 . . . . . call
AST Premium series boards and RAMpage! boards support EMS and fully support EEMS.
Amdek ... 2 years
Video 310A Amber monochrome monitor 139.
Video 410A Amber monochrome monitor 169.
Color 722 *(EGA compatible)* . . . . . 499.
Compucable ... lifetime
Smartmodem-to-AT cable *(9 feet)* . . . . . 19.
15-foot Parallel Printer cable . . . . . 27.
2-Position *(AB switch box, 2 yr. warranty)* . . . . 39.
3-Position *(ABC switch box, 2 yr. warranty)* . . 65.
Cuesta ... 1 year
Datasaver 400 Watt *(backup power unit)* . . . 499.
Curtis ... lifetime
ACCESSORIES
Printer Stand . . . . . 18.
Universal System Stand . . . . . 25.
CABLES
Smartmodem-to-PC Cable *(9 feet)* . . . . . 17.
Printer-to-IBM cable *(9 feet)* . . . . . 17.
SURGE SUPPRESSORS
Safestrip *(6 outlets)* . . . . . 21.
Diamond *(6 outlets)* . . . . . 29.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* . . . 55.
Ruby-Plus *(w/FAX & modem protection)* . . . . 65.
DCA ... 1 year
Irma 2 *(3270 emulation board)* . . . . . 729.
Epson ... 1 year
EX-800 printer *(80 column, 300 cps)* . . . . . 367.
EX-1000 printer *(136 column, 300 cps)* . . . . 497.
FX-86e printer *(80 column, 200 cps)* . . . . . 307.
FX-286e *(136 column, 200 cps)* . . . . . 437.
LQ-800 printer *(80 column, 180 cps)* . . . . . 437.
LQ-1000 printer *(136 column, 180 cps)* . . . 549.
LQ-2500 printer*(136 column, 324 cps)* . . . . 837.
LX-800 printer *(80 column, 180 cps)* . . . . . 167.
Printer-to-IBM cable (6 feet) . . . . . 15.
Everex ... 1 year
Evercom II 1200 Internal Modem . . . . . 119.
Evercom II 2400 Internal Modem. . . . . 199.
5th Generation ... 6 months
Logical Connection 256k. . . . . 319.

For the IBM-PC (XT & AT) *Exclusively.*

PC CONNECTION®

rs & would-be's.

Hayes ... 2 years
Smartmodem 1200 ..... $299.
Smartmodem 1200B *(with Smartcom II)* ... 299.
Smartmodem 1200B *(no software)* ..... 265.
Smartmodem 2400 ..... 449.
Smartmodem 2400B *(with Smartcom II)* ... 449.
Hercules ... 2 years
Hercules Color Card *(CGA)* ..... 159.
Hercules Graphics Card Plus ..... 189.
Hercules Incolor Card *(includes RAMfont)* .. call
Intel ... 5 years
Above Board PC 64k *(upgrades to 2 Meg)* 239.
Above Board PS-PC 64k C/S/P ..... 259.
Inboard 386/AT *(requires cable inst. kit)*... 1299.
Inboard Cable Installation Kit ..... 139.
Aboveboard 286 512k
(for PC, XT, AT, XT286) ..... 349.
Aboveboard PS/286 512k S/P
(for PC, XT, AT, XT286) ..... 379.
8087 *(for IBM-PC & XT)* ..... 114.
80287 *(for IBM-PC AT & XT 286)* ..... 195.
80287-8 *(for 8 MHz AT compatibles)* ..... 249.
80387 ..... 499.
Kensington Microware ... 1 year
Masterpiece ..... 94.
Masterpiece Remote ..... 119.
Masterpiece Plus ..... 129.
Printer stand ..... 17.
key tronic ... 90 days
101 Keyboard *(enhanced layout, 3 yr. warranty)* 119.
5151 keyboard *(deluxe)* ..... 169.
Kraft ... 1 year
3 Button Joystick ..... 33.
Microsoft ... 1 year
PS/2 Mouse 6.1 *(with Show Partner)* ..... 119.
Bus Mouse 6.1 *(with Show Partner)* ..... 119.
Serial Mouse 6.1 *(with Show Partner)* ..... 129.
Mach 10 *(includes Windows and mouse)* ... 369.
Migent ... 1 year
Pocket Modem *(ext., 1200 baud, w/software)* 169.
Mouse Systems ... lifetime
PC Mouse *(with Pop-up Menu software)* .... 99.
Bus Mouse *(with Pop-up Menu software)* .. 109.
PC Paint Plus 2.0 ..... 57.
NEC ... 2 years
Multisync monitor *(EGA compatible)* ..... 547.
GB-1 *(supports 640 x 480 resolution)* ..... 319.
NSI Logic ... 3 years
Smart EGA Plus ..... 299.
Okidata ... 1 year
Laserline 6 ..... 1299.
Advanced Personality Module ..... 159.
Orchid Technologies ... 2 years
Tiny Turbo 286 ..... 379.
PC Turbo 286e w/1 Meg *(10 MHz)* ..... 729.
Jet 386 *(includes cable kit)* ..... 869.
RAMquest *(for PS/2 models 50/60 2 Meg)* 699.
Practical Peripherals ... 5 years
Microbuffer Mini *(parallel print buffer w/128k)* 79.
Microbuffer Inline *(par. print buffer w/256k)* 149.
Princeton Graphics ... 1 year
MAX-12E Amber monochrome monitor... 179.
HX-12E *(EGA compatible)* ..... 499.

Toshiba ... 1 year
P321 SL printer *(80 col., 216 cps, w/tractor)* $549.
P351 S/P printer Mod 2 *(136 col., 288 cps)* 939.
Tseng Labs ... 1 year
EVA 480 *(supports 640x480 res., includes Dr. Halo II & drivers for Autocad & Lotus 1-2-3)* 349.
Video 7 ... 2 years
VEGA Deluxe *(supports 640x480)* ..... 329.

DRIVES

Control Data Corp. ... 1 year
40 Meg (formatted capacity) Int. Hard Drive for IBM AT or XT ..... special
70 Meg (formatted capacity) Int. Hard Drive for IBM AT *(w/Wren Manager II software, 28 ms)* 997.
IOMEGA ... 1 year
Bernoulli Box 20 Meg w/PC2 card ..... 1549.
10 Meg cartridge ..... 57.
Bernoulli Box 40 Meg w/PC2 card ..... call
20 Meg cartridge ..... 79.
PC2B (Bootable) Card ..... 229.
Mountain Computer ... 1 year
Drive Card 20 Meg *(80 ms)* ..... 479.
Drive Card 30 Meg *(78 ms)* ..... 569.
Dual 20 Meg Internal Bernoulli 5¼"
(includes PC2B card) ..... 1949.
5¼" Cartridge ..... 75.
40 Meg Internal Tape Backup *(for XT or AT)* 379.
Seagate ... 1 year
FREE PCTV® Hard Drive Installation Tape with the purchase of either of the following Seagate drives for the IBM PC (not for AT). Specify Beta or VHS.
20 Meg Internal Hard Drive *(w/Western Digital controller and cables, 65 ms)* ..... 329.
30 Meg Internal Hard Drive *(w/Adaptec RLL controller and cables, 65 ms)* ..... 349.
AT 30 Meg Internal Hard Drive *(w/cables & instructions, 39 ms)* ..... 589.
TEAC ... 1 year
PC, XT 360k Drive *(5¼" half-height)* ..... 109.
Toshiba ... 1 year
PC, XT 360k Drive *(5¼" half-height)* ..... 109.
AT 360k Drive *(5¼" half-height)* ..... 117.
3½" Internal ND-354-A Disk Drive *(720k)* 135.
Miniscribe Corp. ... 1 year
ScribeCard 20 Meg *(68 ms)* ..... 459.
ScribeCard 30 Meg *(68 ms)* ..... 479.

MEMORY

64k Upgrade Set *(150 ns, set of 9)* ..... call
256k Upgrade Set *(150 ns, set of 9)* ..... call
256k Upgrade Set *(120 ns, set of 9)* ..... call

DISKS

All disks have a lifetime warranty.
DS/DD Disks for the PC & XT (40 TPI).
Fuji MD2D *(10 disks per box)* ..... 12.
Verbatim Datalife *(10 disks per box)* ..... 15.
Maxell MD-2 *(10 disks per box)* ..... 15.
DS/High Density Disks for the AT (96 TPI).
Fuji *(10 disks per box)* ..... 24.
Verbatim *(10 disks per box)* ..... 27.
Maxell *(10 disks per box)* ..... 27.
3½" Double-sided Diskettes *(720k)*
Sony *(10 disks per box)* ..... 21.
Maxell *(10 disks per box)* ..... 23.
3½" High-Density Diskettes *(1.44 Meg)*
Maxell *(10 disks per box)* ..... 59.
Fuji *(10 disks per box)* ..... 55.

MISCELLANEOUS

CompuServe
CompuServe Information Service ..... 24.
Grolier's OnLine Encyclopedia ..... 32.
Dow Jones
Membership Kit ..... 24.
PC Connection
Computer Toolkit ..... 22.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders usually shipped 1st Class Mail.
- 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 through Friday 9:00 to 5:30.

SHIPPING

Note: Accounts on net terms pay actual shipping.
Continental US:
- For monitors, printers, and hard drives, add 2% for UPS ground. Call for UPS 2nd-Day & Next-Day-Air.
- For computers, pay actual charges. Call for UPS 2nd-Day & Next-Day-Air.
- For all other items, add $2 per order to cover UPS Shipping. For such items, we 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 hard 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.

1-800/243-8088

MEMBER DIRECT MARKETING ASSOCIATION

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

400W

For the IBM-PC (XT & AT) *Exclusively.*

PC CONNECTION®

*DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION. SOME ITEMS HAVE MANUFACTURERS WARRANTIES UP TO FIVE YEARS.

NewViews Breaks the Rules

Q.W. Page's fresh, all-in-one accounting program is a supple, powerful system for reporting and analyzing financial data. But be prepared for some serious mental retooling.

Charles E. Rundgren and Marlene Nesary

What do you get when you cross a spreadsheet with an audit trail? One is an open-ended tool for financial analysis, while the other is a rigid sequence of accounting detail. Can they merge into a workable hybrid? Q.W. Page says they can and offers *NewViews* as proof.

Introduced at last fall's COMDEX, *NewViews* created something of a minor sensation at that jaded soiree. A disk-based system with expanded memory support, the program is trim (256K) yet powerful. Attractively priced at $695, *NewViews* performs consolidations, maintains accounts receivable and payable, and handles inventory and after-the-fact payroll functions. Furthermore, *NewViews* eschews batch processing for interactive, "live" updating of financial data. If you need to gauge the immediate impact of a significant transaction on your bottom line, you can do it on the spot.

But what really turned heads was *NewViews*' dynamic analysis and reporting system. By linking formerly isolated ledgers into a single interactive stew of financial data, *NewViews* keeps reports current. Add the program's innovative view commands, and you can sort, select, compare, rearrange, and expand your set of books almost infinitely.

However, *NewViews*' approach prompted questions from the ranks of professional accountants. Should an accounting system require–or encourage–this much imagination? Does the lack of batch processing (and hence, the absence of an edit list) encourage bad bookkeeping habits? Aren't the traditional modular formats with their built-in audit trails safer? Given its clumsy handling of such common procedures as invoice and check printing, is *NewViews* secure and simple enough for everyday use? And if the purpose is financial analysis, why not use a separate program that requires less setup and maintenance–like a spreadsheet?

Designed by former accounting consultants, *NewViews*' flexibility may beguile small businesses that would do better with a simpler solution to their accounting needs. However, if you're an accounting expert frustrated by tedious transfers from rigid accounting systems to more flexible spreadsheets (see "From Ledger to Spreadsheet" in this issue for a discussion of one such process), *NewViews* alone may be enough of an analytical impresario to meet your needs.

Scott Baldwin

The Analytical Payoff

Most accounting software uses stand-alone modules to mimic a manual system's physically separate ledgers. Although data can often be funneled automatically to a general ledger module or a report writer, it is essentially locked on an unerasable electronic journal page.

NewViews forgoes modules and journals. Instead, it links every account in the system to a printable on-screen report–treating both transaction ledgers and sophisticated reports as documents. Nested like a set of Chinese lacquered dolls, these financial documents allow you to examine data according to level of detail.

Depending on whether you choose the report level or the account level, you can filter financial data in a number of ways using *NewViews'* /Document Views command set. The most potent and pliant of these is the Analysis view. Available only for report documents, the Analysis view looks and acts like a spreadsheet with its row-and-column format and its ability to calculate ratios, percentages, and variances for any set of time periods or accounts in your system.

Suppose you want to show fluctuations in marketing expense over a two-year period. First, enter into the Analysis view's empty rows all the accounts you want to link to this expense (salaries, sales commissions, advertising, trade shows, and so on). You determine the time period and type of calculation for each column; thus you can select 1986 selling expenses for column one and 1985 selling expenses for column two. *NewViews* automatically pulls this information from its history file. Then, when you select both 1986 and 1985 data and the variance option,

With NewViews, *you must specify all the links between different types of accounts and between accounts and reports. A traditional accounting package builds these links into its modular structure.*

NewViews will compute the variance in column three. If you so request, *NewViews* will present a simple bar graph of the data in the remaining three columns.

You can use the Analysis view to speculate about the future as well as to analyze the past. For instance, you can increase the marketing expense accounts by 12 percent to see how such a move would affect the income statement. You can refine further by selecting only open, closed, debit, credit, budgeted, or actual items for an Analysis view, producing a dazzling array of reports from the same document (see Screen 1).

Other views are less dramatic but still practical and well designed. The crucial Setup view, for example, controls report creation and structure. If you want to add expenses related to a new sales office to your marketing expenses, you use the Setup view to add the information. Subsequent Analysis views of the marketing expense report will reflect any transaction activity tied to that new office.

The Notes view is available for both report and account documents and, like *Note-It,* provides a virtually unlimited tablet for ancillary information such as sales contacts, addresses, names, special terms, and so on. The History view can find and display up to ten years' worth of transaction data for each account. All transactions are entered in the tabular Ledger view.

Item views–Debit, Credit, Open, and Closed–work like filters to sort accounts and transactions. However, the same item selected for different documents produces different results. The Debit view of a customer account, for example, displays invoices and finance charges, while the Debit view of a cash-in-bank report shows all cash receipts.

Producing hundreds of reports from just a few basic documents and commands, *NewViews'* views are a dazzling addition to accounting practice. Unfortunately, new concepts, new vocabulary, and cumbersome handling of many everyday accounting tasks make it hard to set up *NewViews* and tap its impressive analytic powers.

Screen 1: At work on an accounts receivable inquiry, this Analysis view shows the percent of total sales each account has generated, presenting the information as number and in a simple bar graph.

Analysis: Accounts Receivable — 25 Feb 87

Accounts Receivable	(1)	(2)	(3)
Period 1: Begin	00 000 00	00 000 00	00 000 00
Period 1: End	31 Jan 87	31 Jan 87	31 Jan 87
Period 1: Type	A	A	A
(less) Period 2: Begin	00 000 00	00 000 00	00 000 00
(less) Period 2: End	00 000 00	00 000 00	00 000 00
(less) Period 2: Type			
Ratios: % of Account		TOTAR	
Graphs: # of Columns,Scale	0 0	0 0	1 1000
Description	1-31-87	1-31-87	1-31-87
A-Vidd Electronics Corp.	1,782.28	10.27	▪▪
Abacus Microcomputer Company	3,855.00	22.22	▪▪▪▪▪
Articulate Computer, Inc.	0.00	0.00	
Computer Baron	0.00	0.00	
New Wave Computing	6,815.00	39.28	▪▪▪▪▪▪▪▪
Raintree Computer Systems	4,898.72	28.23	▪▪▪▪▪▪
TOTAL ACCOUNTS RECEIVABLE	17,351.00	100.00	▪▪▪▪▪▪▪▪

Getting There

In a sense, *NewViews* isn't an accounting package. Rather, it is a free-form environment that provides the tools for building a responsive and up-to-date custom accounting system. But here's the rub: You must specify all the links between different types of accounts and between accounts and reports. A traditional accounting package builds these links into its modular structure. So roll up your sleeves; with *NewViews*, setup isn't just a job–it's a thorny chore with weighty consequences.

NewViews' freewheeling, do-it-yourself approach extends even to the simplest part of setup. You must manually create the appropriate subdirectories and then copy the program, help, selected printer driver, and *NewViews* Procedures files onto a hard disk.

Once you've informed *NewViews* of when the fiscal year ends, you must create reports and then enter the account information that feeds into them. You'll undoubtedly need to set up reports for an income statement, a balance sheet, and accounts payable and receivable.

To create these reports, you enter a unique name and description for each one on *NewViews*' opening screen (called the Home document). Then, using *NewViews*' pulldown menus, you expand each report into a full document in the Setup view (see Figure 1).

Tabular in format like all *NewViews* documents, the Setup view holds account names and other identifying information; it controls the most crucial links in a *NewViews* set of books. You begin by typing in a list of related accounts (all your payable vendors, for instance). Here you can use unique names or numbers for identification. There's space for a brief description and a field for the normal balance of the account–debit or credit. If you stop here, no links are made; account activity won't update any summary reports. To make *NewViews* come alive, you use the Setup view's two Total To columns.

NewViews distinguishes two types of accounts –posting and total, or control, accounts. Transaction data can be entered only on a posting account, such as rent or payroll. Control accounts, like accounts receivable and accounts payable, appear on summary reports such as the balance sheet and are fed by the posting accounts.

Filling in the first Total To column with the name of another account links the two in a posting-controlling relationship: Changes in the line item account automatically update the Total To account. The second Total To column is used if you keep separate sets of books for several departments and then consolidate them.

If you leave both Total To columns blank or put a *T* in either Total To field, *NewViews* assumes that this is a control account and will not allow you to post transactions to it. Although you can't change the credit/debit field once you've entered an account in the Setup view, you can change the Total To fields at any time–an option that allows your books to reflect growth and change in your business.

As with any accounting system, the final step in setting up *NewViews* is recording beginning balances and–if you have the data and the time–summary information for the periods prior to automating the system. For this you need to record a distribution–

Executive Summary

NewViews

Accounting software

An all-in-one accounting package with real-time transaction processing, *NewViews* excels at providing dynamic views of financial data through on-screen and printed reports. Despite this innovation, serious problems limit the program's usefulness: A unique design and odd vocabulary complicate setup, and awkward handling of basic tasks such as invoice and statement printing compromises day-to-day usage. Not for the accounting (or computer) novice, *NewViews* creates a fertile environment for consultants.

Installation and setup	*Poor*
Transaction processing	*Fair*
Data protection	*Fair*
Reporting and analysis	*Excellent*
Overall value	*Fair*

> NewViews *makes it all too easy to dispense with an alarming number of traditional accounting safeguards.*

essentially, make a journal entry with multiple debit and/or credit amounts. With *NewViews*, you handle distributions with a separate document.

By examining the Total To columns in the Setup view, you can debug links in your books–or at least see how financial data is rippling through the system. You can also use the <F1> key to get on-line help. But don't look to the manual for assistance. There's no glossary to explain key *NewViews* terms, and setup issues aren't discussed until Chapter 15–and then only briefly.

New accounting concepts and a dense, poorly organized manual make setting up a *NewViews* system no trivial pursuit. Q.W. Page may think its product is intuitive enough for the novice to crack open and use, but it takes a pro with accounting *and* computer skills to make this custom baby hum.

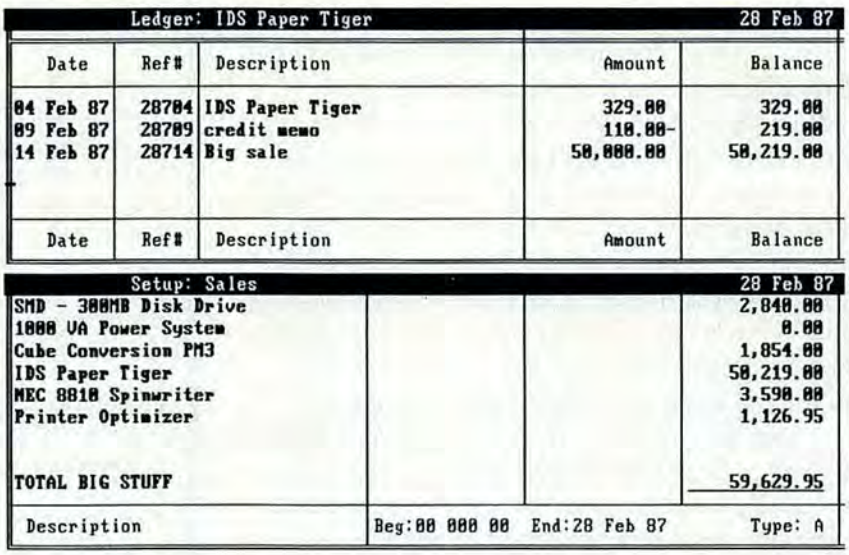
Look and Feel

The Home document is the first thing to greet the *NewViews* user. The current date and document title (in this case Home) are listed at the top of the screen. A *1-2-3*-like command line gives entrée to Document, Edit, Go, Block, Print, Cursor, and Window pulldown menus. To access commands, you can use a slash (/) key, *WordStar*-like <Ctrl>-*key* combinations, or <Alt>-*key* combinations, or you can simply pop open the menus with a mouse.

Like many programs striving to be graphically chic, *NewViews* uses zooming and windows. You zoom from level to level in the *NewViews* hierarchy with /Expand and /Contract commands. And with *NewViews*' double windows, as you post transactions to a document in one window, you can watch the linked total account in another window change accordingly (see Screen 2).

All *NewViews* documents and views can be displayed on screen, sent to a disk file, or printed. You can set columns and margins, request a pause after every page, specify whether you want headers and footers to show up on all pages of a report, and so on. You can even cut and paste pieces of different documents together in one report or print a portion of a document. *NewViews* supports seven common printers, including the HP LaserJet.

Screen 2: As you work in the upper window–the IDS Paper Tiger ledger–your entries update the Paper Tiger control account shown in the lower window.



Ledger: IDS Paper Tiger — 28 Feb 87

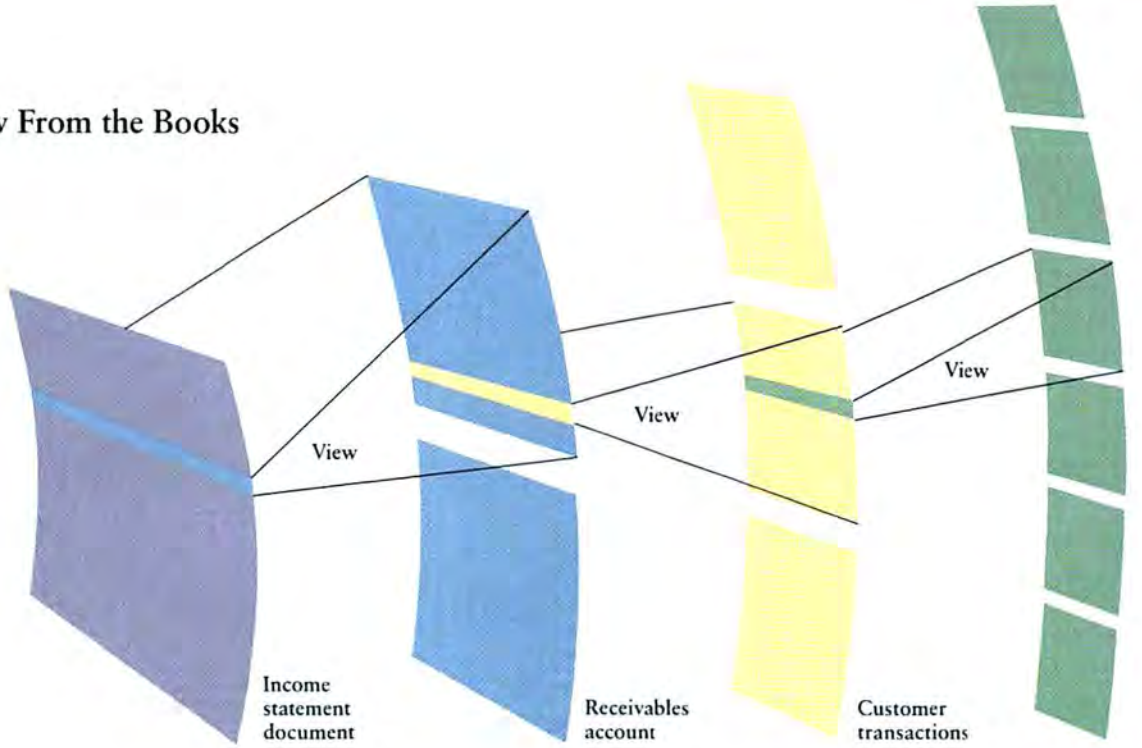
Date	Ref#	Description	Amount	Balance
04 Feb 87	28704	IDS Paper Tiger	329.00	329.00
09 Feb 87	28709	credit memo	110.00-	219.00
14 Feb 87	28714	Big sale	50,000.00	50,219.00

Date	Ref#	Description	Amount	Balance

Setup: Sales — 28 Feb 87

SMD - 300MB Disk Drive			2,840.00
1000 VA Power System			0.00
Cube Conversion PM3			1,854.00
IDS Paper Tiger			50,219.00
NEC 8810 Spinwriter			3,590.00
Printer Optimizer			1,126.95
TOTAL BIG STUFF			59,629.95
Description	Beg:00 000 00	End:28 Feb 87	Type: A

View From the Books



Day-to-Day Procedures

Given *NewViews*' penchant for integration, its clumsy handling of day-to-day procedures comes as a painful surprise. Instead of using commands or menu options to print checks, statements, or invoices, you must import individual routines for each and then access the procedure via a submenu from the /Go command.

In addition to form-printing routines, *NewViews* curiously relegates to its Procedures file other key management functions, such as purging and closing transactions; sorting reports by account name; deleting, counting, and copying blocks of ledger items; and assigning procedures to function keys. A Jig option opens a blank document for creating custom procedures. By using the <Shift> and <Alt> keys, you can assign to most of *NewViews*' separate procedures a unique function key combination.

This odd partitioning of basic tasks needlessly complicates even simple operations. Suppose you want to send out a set of customer statements. You must first import the Procedures document and expand it to list importable routines. Then you have to page down until you find Prtstmts, highlight the item, and press the <PgDn> key. From there, you move to the Procedures line of the Home document,

Use Document views to:

Design reports in Setup view

Analyze data in Analysis view

Record nonfinancial information in Notes view

Use Account views to:

Record transactions in Ledger view

Review account history in History view

Record nonfinancial information in Notes view

Examine detail of:

Open items in Open view

Closed items in Closed view

Debit items in Debit view

Credit items in Credit view

Income Statement	Beg: 01 Feb 87 End: 28 Feb 87	Type: A	C	U	Name	3	Total to	Total to	T	Report
REVENUES										IS
Sales--big ticket		56,051.95	3		3000	C	Sales		T	IS
Sales--little stuff		1,550.00	3		3100	C	Sales			IS
		---------	3	S						IS
Total sales		57,601.95	3		Sales	C	Netsales		T	IS
										IS
Sales returns and allowances		0.00	3		3900	D	Netsales			IS
		---------	3	S						IS
Net sales		57,601.95	3		Netsales	C	Gprofit		T	IS
										IS
Cost of sales		38,550.00	3		4000	D	Gprofit			IS
		---------	3	S						IS
Gross profit		19,051.95	3		Gprofit	C	IBIT		T	IS
		---------	3	S						IS
										IS
EXPENSES										IS
Salaries and wages		7,500.00	3		6000	D	Exp			IS
Payroll taxes		730.00	3		6100	D	Exp			IS
Rent		2,250.00	3		6200	D	Exp			IS
Repairs and maintenance		175.00	3		6300	D	Exp			IS
Telephone		325.00	3		6400	D	Exp			IS
Insurance		1,000.00	3		6500	D	Exp			IS
Depreciation		450.00	3		6600	D	Exp			IS
Miscellaneous		75.00	3		6900	D	Exp			IS
		---------	3	S						IS
Total expenses		12,505.00	3		Exp	D	IBIT		T	IS
		---------	3	S						IS
Income before income taxes		6,546.95	3		IBIT	C	Net		T	IS
		---------	3	S						IS
Income taxes										IS
Federal		1,950.00	3		9000	D	Tax			IS
State		600.00	3		9500	D	Tax			IS
		---------	3	S						IS
Total income taxes		2,550.00	3		Tax	D	Net		T	IS
		---------	3	S						IS
Net income		3,996.95	3		Net	C	295		T	IS
		=========	3	D						IS

Figure 1: The Setup view for an income statement report shows amounts for the period as well as the normal balance and Total To relationships.

expanding that to the chart of procedures where Prtstmts should be waiting. Expand Prtstmts, open up the Notes view, and specify a path and one of the two forms *NewViews* supplies. Now you must "parse" the form to make sure data fits properly. From now on, using the /Go menu, you can actually print customer statements. Not a simple matter–especially for the computer-shy.

Although *NewViews* allows you to assign function keys to procedures and to import a block of related procedures under one name, such customization is a hassle to undo or change. In *NewViews,* it's more trouble to do a simple thing–like adding sales tax to an invoice–than it is to do a sophisticated thing–like designing a new report.

Flexibility Versus Accountability

NewViews makes it all too easy to dispense with an alarming number of traditional accounting safeguards. Since the program updates related reports and accounts as soon as you record a transaction, you don't gather entries together in batches, run an edit list, make needed corrections, and then finally post the transactions. With *NewViews,* the trial balance *is* the final balance. Furthermore, you can predate or postdate transactions, and edit and delete during the same session without accumulating a record of the details–thereby violating the old rule of "writing in ink" to show *all* activity.

The only auditing function you can't escape is an automatic recorder that notes how many edit, delete, and purge operations have occurred. But the entire audit trail consists only of the number of operations performed–no details about dates, accounts affected, or types of operations. You know that something was done, but without tediously reconstructing the process, you don't know what. Even if you opt for a detailed audit trail, what you get is so badly organized you can barely read it (see Figure 2).

NewViews does offer a standard list of security and validation features. You can set three levels of

password protection, designating certain functions (such as audit trail options) and specific reports or fields as off-limits. *NewViews* will also check for existing accounts during data entry and make sure that you're referencing a posting (not a control) account. An error message pops up if you post incorrectly, and the system won't accept the entry.

Final Considerations

You must pay for a call to Toronto to get it, but Q.W. Page offers free customer support for *NewViews*. Not surprisingly, most customer questions involve system setup and use of procedures. Q.W. Page also reports complaints about slow screen refresh when more than one window is open. The company promises a 25 percent improvement in screen updating with its new version–which is due out by press time.

Page also promises to scale down the bulky manual for the new release. A better service to the customer would be a complete rewrite: The manual is badly organized, contains an incomplete index, and–inexcusable for a program that introduces so many new terms and concepts–lacks a glossary.

NewViews is a tough call in terms of value. Setup is complicated and requires advanced accounting and computer skills. Furthermore, since *NewViews* gives you just enough rope to hang yourself, you should plan your audit strategy with extra care. The bottom line: Are the freedom to customize and the analytical dazzle worth the hassle and risk?

The answer? For a small business wanting a bread-and-butter accounting package that will keep track of the books, write checks, bill customers, and be simple and safe enough for anyone to operate–probably not. For a larger company glad to forgo batch processing, or one that relies on departmental accounting–maybe so.

It may well be that an aftermarket of specialized consultants will develop for *NewViews*, similar to that spawned by *1-2-3* and *dBASE*. For, despite its obvious drawbacks, *NewViews* is unmistakably an innovation in automated accounting.

```
0000000000 A D GJ                    Jun 30,86       0 SUMMARY CHANGE FY86
0.00
0000000001 A D GJ                    000 00,00       0
0.00
0000000002 A D GJ          A-VIDD    Jun 30,85       0 BEGINNING BALANCES
1,000.00
0000000003 A C A-VIDD                10 Oct 86  108601
0.00
           A C A-VIDD                10 Oct 86  108601 invoice # 10861
0.00
0000000004 A C A-VIDD                10 Oct 86  108601 invoice # 10861
0.00
           A C A-VIDD                10 Oct 86  108601 invoice # 10861
738.00
             A             PRINT OP                    2 Printer Optimizers
738.00
0000000005 A C A-VIDD                10 Oct 86  108601 invoice # 10861
738.00
           A C A-VIDD                10 Oct 86  108601 invoice # 10861
782.28
             A             225                         Sales Tax
44.28
0000000006 A C RAIN          GJ      30 Jun 85       0 BEGINNING BALANCES
2,500.00
           A C RAIN          GJ      30 Jun 86       0 BEGINNING BALANCES
2,500.00
0000000007 A C RAIN          GJ      30 Jun 86       0 BEGINNING BALANCES
2,500.00
           A C RAIN          GJ      22 Jan 87       0 BEGINNING BALANCES
2,500.00
0000000008 A C RAIN                  10 Oct 86  108602 invoice
2,028.84
           A C RAIN                  02 Feb 87   28701 invoice
2,028.84
             C             PRINT OP                    Printer Optimizer
369.00
             C             CUBE PM3                    Cube Conversion PM3
1,545.00
             C             225                         Sales Tax
114.84
```

Figure 2: Unlike the rest of its reports, NewViews' presentation of crucial audit detail is needlessly scrambled.

Charles E. Rundgren is a CPA and consultant in the Orange County, California, office of Deloitte Haskins & Sells, a Big Eight accounting firm. Marlene Nesary is an Assistant Editor for PC World.

NewViews Accounting Software
Q.W. Page Associates, Inc.
One St. Clair Ave. W, 8th floor
Toronto, Ontario
M4V 2Z5 Canada
416/923-4567
List price: $695 (U.S. dollars)
Not copy protected
Requirements: 256K, hard disk, DOS 2.00 or later version

Letters From Cell A17

Three add-in word processors let monkish 1-2-3 number crunchers write epistles without ever leaving their cells.

Charles Seiter

Even people who spend their days inside *1-2-3* worksheets occasionally step out into the sunlight, if only to write letters and reports with a decent word processor. Thanks to a new breed of text editor that can nestle within the *1-2-3* release 2 environment, they no longer need to leave the bottom line to get the *Word*.

4Word, *InWord*, and *Write-in* are inexpensive add-in word processors that load into memory with *1-2-3*, pop up with the press of an <Alt>-*function key* combination, and offer many of the text-handling features found in stand-alone word processing programs. Unlike add-ons, which are typically RAM-resident programs that work with any version of *1-2-3*, add-ins use special entry points in release 2 or 2.01 (see "Routines for Rent" in this issue). As a result, these add-ins can form "live" links between the numbers in a worksheet and the corresponding data in a report that they have created. When you change the numbers in the worksheet, the numbers in the document change as well.

Add-ins are perfect for *1-2-3* users whose word processing needs fall somewhere between *SmartNotes* and *WordPerfect*. They can't match stand-alone word processors' indexers, spelling checkers, and page-layout features, but are more than adequate for creating and mail merging the memos, letters, and short reports that make up most business writing. And *1-2-3* veterans will find these add-ins easy to learn because they mimic much of *1-2-3*'s interface.

Turner Hall's *4Word*, the first word processing add-in to come to market, is RAM-thrifty and adept at handling worksheets packed with long text labels. Funk Software's *InWord* is a master of printed output. *Write-in*, developed by Lotus alumni at Blossom Software, leads the pack when it comes to easy installation and use, fealty to *1-2-3*'s look and feel, and the ability to merge text and charts.

Common Ground

4Word, *InWord*, and *Write-in* aren't three peas in a pod, but they do share many traits. The programs aren't copy protected, don't take up much space–*1-2-3* plus any of these add-ins fits in 384K or less of RAM–and are integrated into *1-2-3* via a special Add-In Manager provided by Lotus. In practice, the programs feel

David Bishop

much like the familiar RAM-resident text editors they are designed to replace, and you can flip between text and worksheet with a single keystroke.

Manipulating and formatting text are much the same from add-in to add-in (see Table 1). All reform paragraphs automatically and let you center text, set and save tabs, insert headers and footers, and so on. The way they attack such tasks differs, and each program performs at least one text-handling trick its rivals don't. For example, *4Word* displays double-spacing on screen, *InWord* lets you change print pitch within a document, and *Write-in* can restore deleted text.

Entering and editing text will seem cramped if you're used to *WordStar* or *WordPerfect*, but *1-2-3* users will feel right at home. To set a block of text in boldface, for example, you anchor the start of the block, highlight the text using the cursor keys, and select the attribute from the command line. Because add-ins live within *1-2-3*'s character-based world, don't expect *Microsoft Word*-like on-screen formatting; however, individual colors identify bold, italic, and underlined text.

Cementing hot links between a worksheet and a document is roughly the same process with any of these add-ins. With *InWord*, for example, you open a document, choose the Worksheet Link command, and select Cell or Table, which transports you to the *1-2-3* worksheet. Highlight the desired cell or range and press <Enter>; back in the document, place the cursor where the worksheet data should appear and press <Enter> again. The numbers are automatically inserted, and a live link is formed. If you need to quickly see the forest instead of the trees, commands in both *InWord* and *Write-in* will mask the data and show only the cell coordinates of the linked worksheet data (see Screen 1). Note that data links go only from worksheet to add-in document, thereby preventing you from accidentally scrambling data in the source worksheet.

These add-ins make merging worksheet data with form letters a seamless affair. You write the letter, retrieve the worksheet holding the names and addresses to be merged, link the variable name and address fields to specific worksheet cells, issue the merge command, and print. *Write-in*'s documentation explains the process so concisely that you can be churning out form letters in a quarter of an hour. Although generating "personalized" documents is a snap, leave mailing labels to another program; these sophisticates print them one across.

Write-in From the Start

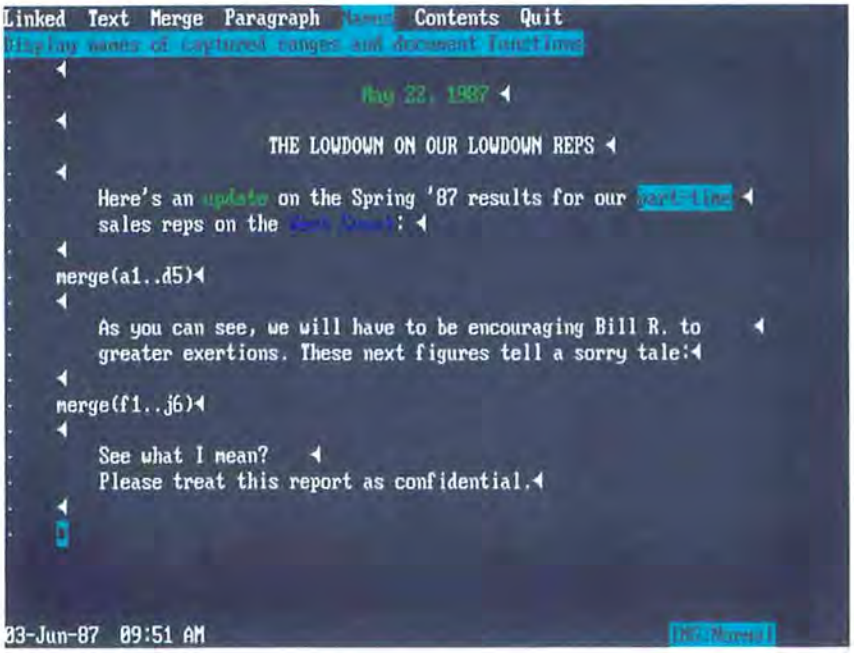
You can tell *Write-in* is a classy product from the moment you begin installation. Instead of copying files manually or enduring a menu-driven interrogation, you can install the program on a hard disk automatically by typing a single line. You specify the target drive, the name of the *1-2-3* driver set (such as 123.SET), and your choice of an <Alt>-*function key* combination (<F7>, <F8>, or <F9>) to invoke the add-in. If you're stuck with a dual-floppy system, *Write-in* makes the best of a bad situation, creating a "resource" disk by copying the necessary program and help files to a blank disk in drive B:.

To invoke *Write-in*, press your chosen <Alt>-*function key* combination when *1-2-3* is in Ready mode. *Write-in* initially displays a blank page. At the top is a panel that notes current file name, cursor position, and character and paragraph style; just below is a ruler. At the bottom of the screen lies a status line noting date, time, and insert mode.

As in *1-2-3*, you display *Write-in*'s command line by typing a slash (/) and tap virtually all program functions by either pointing to or typing the first letter of the command. *Write-in* uses a few function keys (<F1> is Help, for example), but you could run the program for days without ever touching them.

Start rattling away at the keyboard, and you'll discover that word wrap and paragraph reform are automatic. Text is displayed single-spaced but can be printed out single-, double-, or triple-spaced. To insert a page break, position the cursor and select /Insert New Page. To delete text, press <F2> to anchor the cursor; then highlight the region and press <Del>. The excised text is stored in *Write-in*'s Clipboard and can be pasted elsewhere in the same document or in a different one. The Clipboard can hold the last ten deletions, up to 6000 characters.

If you're at home on *1-2-3*'s ranges, moseying around a *Write-in* document will be old hat. For example, pressing <Home> shoots the cursor to the top left of the document, <End><Home> to the bottom, and so on, as in



Screen 1: If you want to quickly check the links created between a document and a worksheet, Write-in's /Capture Names command will display them without cramming the screen with linked tables, ranges, merge fields, 1-2-3 graphs, and other riffraff. To see the tables, choose Contents from the same menu.

1-2-3. For more precise navigation, *Write-in*'s search and replace function accepts the ? wild card and can search for as many as three markers. You can cancel any command–and eventually exit *Write-in* and return to the worksheet–by pressing <Esc>.

You display Write-in's *command line by typing a slash and tap virtually all program functions by either pointing to or typing the first letter of the command.*

Of course, manipulating and shaping text is what it's all about, and *Write-in* is no slouch. If the labels in your old worksheets resemble one-line novels, take heart. *Write-in* can encircle a range of Proustian labels and automatically format them into a single trim paragraph. Better still, by filling out an on-screen form you can develop paragraph style sheets (for tabs, indents, justification, spacing) and assign them to any block of text. Position the cursor anywhere within the paragraph, select /Options Paragraph, highlight the style you want, and select Use. Styles can be saved with a document or in expandable libraries.

Unlike *InWord* and *4Word*, which rely on *1-2-3*'s macro facility to automate operations, *Write-in* comes with its own macro processor, an automatic learn mode, and 14 ready-to-use macros that select italics, center text, format tables, and so on. A *Write-in* macro can contain as many as 80 keystrokes and be applied to any document. Up to 49 macros can be saved in a macro library; the number of libraries is limited only by disk space.

Like *InWord*, *Write-in* stores documents as separate text files and, unlike *1-2-3*, loads only what it needs to work on, conserving precious RAM. This design also enables *Write-in* and *InWord* to link a single document to a number of worksheets.

Words and Pictures–and Data

In addition to *Write-in*'s other talents, it's the only add-in reviewed here that integrates text and *1-2-3* charts in a document. The program accommodates as many as ten graphs on a single page, arranging them in neat two-across rows.

To combine a graph with a *Write-in* document, position the cursor in the document, select the /Insert Graph command, supply the graph's file name, note the desired dimensions in inches and columns, and indicate where the graph should appear on the page

Executive Summary

4Word

Add-in word processor

The first kid on the block missed the bus. *4Word*'s document preview and printing functions are limited, and text is stored as part of a worksheet, a setup requiring careful navigation. A few well-turned macros can overcome some of the program's text-handling limitations.

Block mark, move, and delete	*Excellent*
Search and replace	*Good*
Printer control	*Good*
File management	*Fair*
Mail merge	*Good*
Overall value	*Good*

InWord

Add-in word processor

InWord is competent at word processing and mail merging, but its greatest strength is printing the documents it creates–it supplies its own optimized drivers so you needn't reinstall the add-in to change printers.

Block mark, move, and delete	*Excellent*
Search and replace	*Good*
Printer control	*Excellent*
File management	*Excellent*
Mail merge	*Good*
Overall value	*Good*

(left or right, centered, or by starting column number). *Write-in* inserts a tag line marker in the document to indicate your choices. If you include multiple graphs, *Write-in* automatically scales them to fit, although if you try to squeeze in too many, *Write-in* may print some on the next page. Bear in mind that the integration isn't complete. Unlike in *Symphony*, graphs must be updated separately because they aren't linked live to the worksheets.

Unfortunately, the only way to see both text and graphs together is to exit *Write-in* and *1-2-3* and invoke the PrintGraph module. To save time, you can get a rough idea of the layout via *Write-in*'s preview function. It displays blank boxes where the graphs will be printed, along with page breaks, headers and footers, etc.

Words With Wings

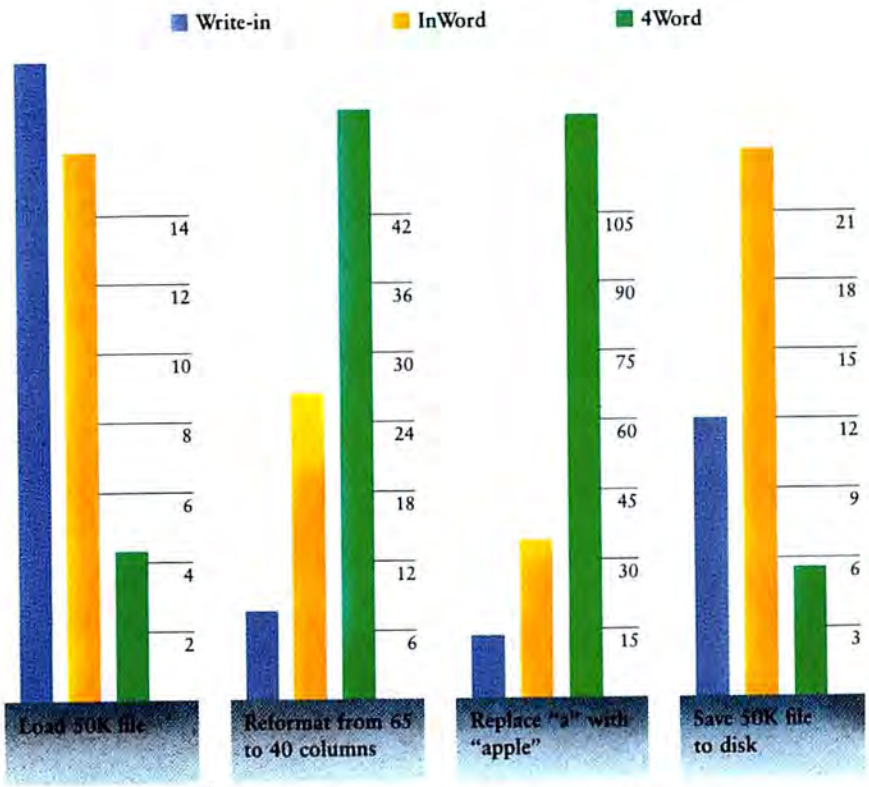


Figure 1: 4Word is relatively young, but age is already creeping up on it. In speed tests, the pioneer add-in lags behind its newer competitors, InWord and Write-in. Tests were run with a 50K file in an 8-MHz IBM AT; times are in seconds.

InWord—Prince of Prints

InWord is head and shoulders above the crowd when it comes to printing documents, but as an everyday word processor, it takes a back seat to *Write-in*. Like *Write-in*, *InWord* stores documents in separate files, and it handles text entry and formatting in the same way *Write-in* does. It also uses a similar virtual memory scheme to save RAM. Once *InWord* is invoked, you can create a document buffer as small as 16K; when it fills up, the program dumps the spillover to disk.

As with *Write-in*, *InWord*'s opening screen is essentially a blank page. You enter, delete, set text, and move around the page as you would in a worksheet (see Screen 2). *1-2-3* veterans will be up and running with *InWord* in no time.

Still, the program deviates from the *1-2-3* credo in surprising ways. For example, <F10> summons the program's command line, and text editing functions such as Word Right are assigned to function keys. Although this arrangement may save a keystroke or two, it also forces you to learn another set of function key assignments.

InWord doesn't offer a library of style sheets à la *Write-in*, much less its own macro processor. However, you can mold a paragraph or an entire document to your liking using the Format commands, which will store and attach the formats you create.

Of the three add-ins, *InWord* best simulates what a printed document will look like. With the

preview function, formatting symbols are stripped from the document, page breaks are displayed, each line is numbered, and you can scroll through the document one line or screen at a time.

InWord really shines at print time—not surprising, given the program's *Sideways* lineage. Unlike *4Word,* which leaves the entire job to *1-2-3*, or *Write-in,* which relies on *1-2-3*'s printer drivers, *InWord* has optimized drivers for many popular printers and puts some distinctive features at your disposal. For example, if you select a printing pitch your printer doesn't support, *InWord* automatically substitutes the closest match.

InWord also irons out a particularly nasty wrinkle in the add-in environment. When you change a printer driver with *1-2-3*'s Install utility, you must also reinstall the add-in from scratch. This is a real nuisance for anyone who upgrades to a new printer or runs off report drafts on a dot matrix printer and then turns to the array of internal, cartridge, and downloadable laser printer fonts. *InWord* neatly sidesteps the problem by calling its own drivers from within the program; *1-2-3* is never roused.

4Word, First and Last

Turner Hall's *4Word* was the first *1-2-3* add-in released, but being first to the dance doesn't necessarily make you the belle of the ball. *4Word* is a fascinating mix of good ideas and bad choices, a lean entry compared with *Write-in.*

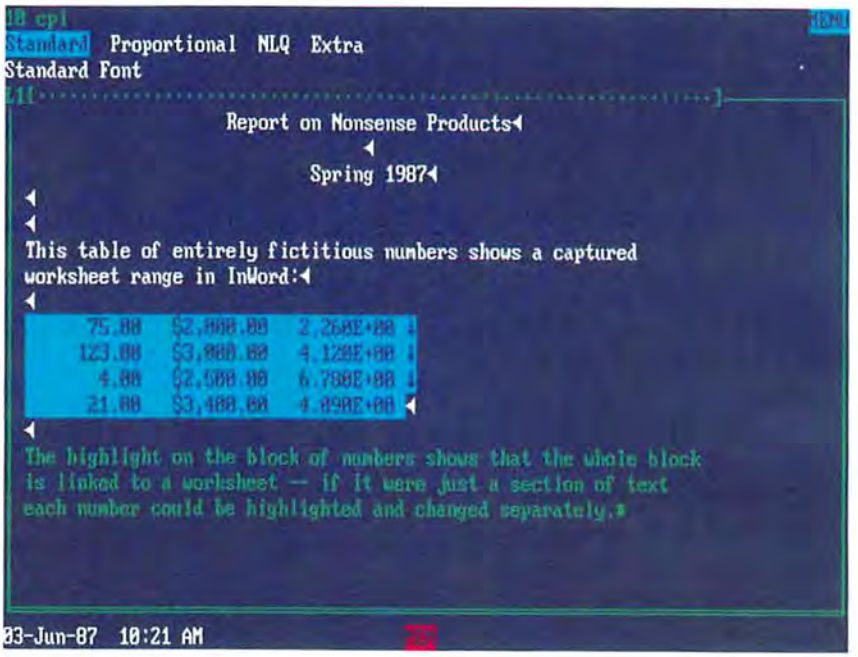
Turner Hall clearly designed *4Word* for those who mainly use *1-2-3* but still need to create notes, short reports, and tables. The program requires only 50K of RAM,

Table 1: Small but powerful, 4Word, InWord, and Write-in have features normally found in stand-alone word processors.

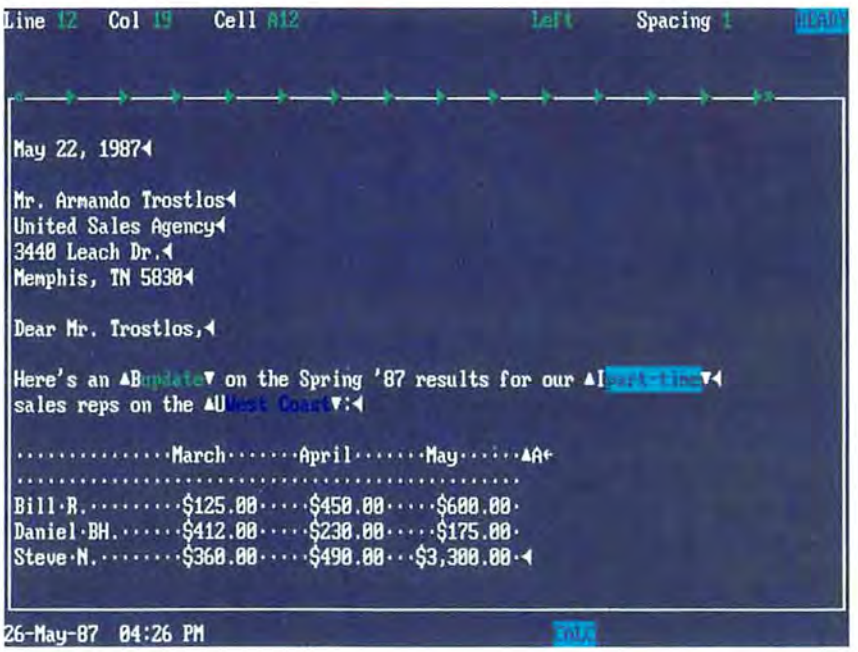
	Write-in	InWord	4Word
Formatting and Editing			
Maximum line width (columns)	78	156	240
Tabs	▬	▬	▬
Decimal tabs			
Saves margins and tabs	▬	▬	▬
Automatic page breaks	▬	▬	▬
Automatic text reformat	▬	▬	▬
Restores deleted text	▬		
Centers text	▬	▬	▬
Displays page breaks	▬	▬	▬
Displays headers, footers	▬		▬
Displays double-spacing			▬
Keystroke macros	▬		▬
Hides numbers/display links	▬	▬	
Printing			
Bold, underline, subscripts, and superscripts	▬	▬	▬
Pitch change within document		▬	
Prints file to disk	▬	▬	▬
Form letters/merge	▬	▬	▬
Miscellaneous			
Imports/exports ASCII files	▬	▬	▬
Subdirectory support	▬	▬	▬
Deletes files	▬	▬	▬
Renames files			
Copies files			

considerably less than either *Write-in* or *InWord*, and it creates and stores documents within *1-2-3* worksheets. Each line of a *4Word* document remains in a *1-2-3* cell as a left-aligned long label. (Not surprisingly, *4Word* can easily format left-aligned labels created with *1-2-3*.) Text is entered in what *4Word* calls its Restrict range, a kind of adjustable window into the worksheet that helps keep text and numbers from clashing. The Restrict range default is a worksheet column starting at A1 but can be reset as you copy tables and cells from the worksheet. With *4Word*, only the data in that column appears in the text area. To see the original numbers, you must scroll right, into *1-2-3*'s part of the worksheet.

Because text and worksheet sit side by side, *4Word* users must take care to set the Restrict range before they start writing, since otherwise they will play havoc



Screen 2: The small vertical arrows are InWord's tag for a linked spreadsheet block. When you move the cursor through this area, the whole block is highlighted to warn you against trying to change the numbers. The text area looks much the same as Write-in's.



Screen 3: 4Word's document area is carved out of the worksheet itself, and text is entered as left-aligned labels starting in A1. The numbers shown here are linked to figures elsewhere in the worksheet. Unlike the other two programs, 4Word adds control characters to formatted text.

with formulas and ranges when they insert and delete lines of text.

4Word's coziness with *1-2-3* presents other problems. Instead of the simulated page displayed by *Write-in* or *InWord,* a new *4Word* document is just a blank section of the worksheet, complete with rows and columns, with the active column indicated by *1-2-3*'s cursor. To get your bearings when flipping between *4Word* and a worksheet, you may have to check *4Word*'s rather meager ruler line at the top of the screen.

Despite its quirks, *4Word* is a member in good standing of the add-in club. It supports word wrap, automatic paragraph reform, and search and replace, and it lets you navigate the screen and the document with a mix of familiar *1-2-3* commands and specialized function keys. Like *InWord, 4Word* relies on *1-2-3* for its macros.

4Word also assigns colors to bold, italicized, and underlined text but one-ups its peers by adding formatting codes such as B, I, and U (see Screen 3). Although this clutters the screen, it makes it easy to remember what each color stands for. Note that *4Word* won't let you nest formatting commands–you can't have a word in both boldface and italics.

Parallel Performance, Unparalleled Convenience

These three add-ins tend to move at about the same pace, but they don't usually affect the speed of *1-2-3*'s operations (see Figure 1). *1-2-3* can slow down when it is set to automatically update numbers in a *4Word* document. Fortunately, you can toggle automatic updating off. Because they store documents in separate text files, *Write-in* and *InWord* update figures only when they are invoked.

Overall, these programs are as alike and unalike as Dumas's Three Musketeers. They all wear the royal *1-2-3* livery, perform their text-handling duties faithfully, and are ready for wordplay at the drop of an <Alt> key. But *Write-in* offers easy installation, a macro generator, macro and style libraries, and complete loyalty to the *1-2-3* slash. And in an age when a report without a graph is like a sword without a pommel, *Write-in*'s ability to merge graphics and text gives it a decisive edge over its fellows.

Charles Seiter is a Northern California writer and consultant on scientific programming and computer languages.

4Word
Turner Hall Publishing
10201 Torre Ave.
Cupertino, CA 95014
408/253-9600
List price: $99.95
Requirements: 320K, two disk drives, DOS 2.00 or later version
Not copy protected

InWord
Funk Software
222 Third St.
Cambridge, MA 02142
617/497-6339
List price: $99.95
Requirements: 384K, two disk drives, DOS 2.00 or later version
Not copy protected

Write-in
Blossom Software Corp.
One Kendall Sq. #2200
Cambridge, MA 02139
617/577-8879
List price: $99.95
Requirements: 384K, two disk drives, DOS 2.00 or later version
Not copy protected

Executive Summary

Write-in

Add-in word processor

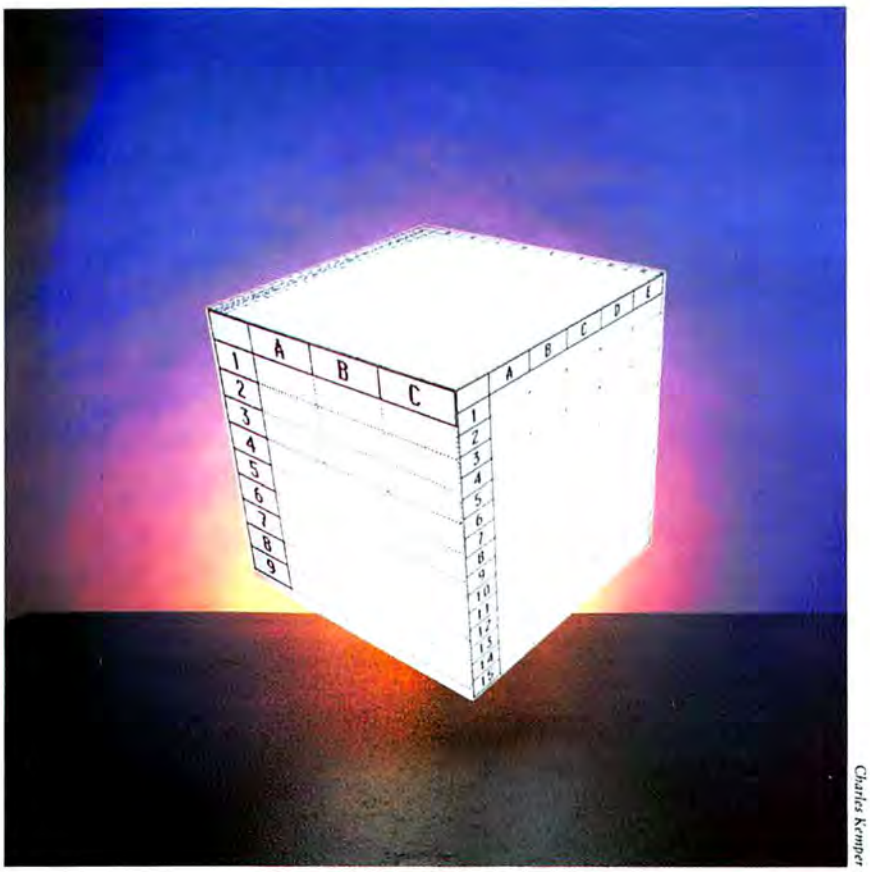
Write-in is a complete package for managing *1-2-3*-based documents. The best of the add-ins reviewed, *Write-in* is the easiest to install, has the best formatting, and is the only one that can merge text with graphics.

Block mark, move, and delete	*Excellent*
Search and replace	*Good*
Printer control	*Good*
File management	*Excellent*
Mail merge	*Excellent*
Overall value	*Excellent*

Dimensional Fortitude

If you need to orchestrate order among organizational entities, the multidimensional spreadsheets Boeing Calc and MVP may help you conduct your business more effectively.

Ralph Soucie



Charles Kemper

For the software vendor whose product catches on in the marketplace, success is often bittersweet. The more popular the program, the more likely users are to stretch it beyond its limits. For years *1-2-3* devotees have been a generally contented lot, but some now relish the chance to push the envelope a bit further.

Consolidating *1-2-3* worksheets is at best a dreary process. That common complaint has inspired a raft of multidimensional alternatives. But the term *three-dimensional spreadsheet* doesn't fully capture the richness of the emerging genre.

Terminology aside, *Boeing Calc 3.00E* from Boeing Computer Services and *MVP Spreadsheet Plus* from Bell Atlantic are powerful, if challenging, products. Each highlights a different approach to multidimensional financial modeling. *Boeing Calc* is functional but a bit bland. *MVP* is flashier but more demanding; it's a smart spreadsheet, affording users an unprecedented degree of control over a staggering array of variables.

Both should find a place in the market, but for different kinds of applications. *Boeing Calc* takes off

when summarizing historical (particularly accounting) data; *MVP* is a hit at developing budgets and projecting cash requirements. Both unquestionably target the power user elite, but their appeal extends well beyond the Fortune 1000. Small businesses are legitimate candidates, especially if they anticipate rapid growth. CPAs and management consultants are also likely to find spreadsheet sustenance here. But whatever the size of the balance sheet, previous spreadsheet experience is a must (see "Escape From the Second Dimension," *PCW*, November 1985).

Jet-Propelled Calculations

One of the earliest commercial three-dimensional products, *Boeing Calc* is a bona fide spreadsheet package, adding a third dimension—a page—to the usual rows and columns. Aside from that departure, the program is strikingly similar to *1-2-3*. It reads and writes release 1A and 2 files without modification, and macro-free *1-2-3* templates should operate without a hitch. *Boeing Calc* can also read and write DIF and ASCII files. Imported .WKS and .WK1 files retain formulas, functions, and column widths. *Boeing Calc* exports its three-dimensional files to *1-2-3* by stacking pages vertically within one file. The Import and Export commands aren't utility programs but separate menu options for both *1-2-3* releases and for *Symphony*.

Data interchange with *1-2-3* is no trivial matter. *Boeing Calc* is often best used in tandem with *1-2-3*. Since *1-2-3* is generally faster than *Boeing Calc*, users may want to do the bulk of their updating in separate *1-2-3* files, turning to *Boeing Calc* for periodic consolidation.

Boeing Calc's menu structure is like that of a certain old friend, from the slash key to single-letter command invocation. Refinements are minor: Insert and Delete have been bumped from the main menu to the Workpad submenu to make room for new commands. The System submenu contains the equivalent of the File List and Delete commands, along with an exit to DOS. To invoke macros, you select Environment. You can justify labels with right and left angle brackets. Although you can underline labels on screen, underlining can't be printed. In general, printing in *Boeing Calc* is just as laborious as it is in *1-2-3*.

Boeing Calc offers the full range of release 2 operators, including string functions. Boeing has crafted one handy improvement: You can omit the leading @ symbol when entering a function. Data management, however, is negligible: *Boeing Calc* is limited to Data Locate (a spartan version of *1-2-3*'s Data Query) and Data Sort (which apes its *1-2-3* counterpart). Data Fill, Extract, and Table are not available, although you can hasten data transfers with the Data Trade command.

Boeing recently exhibited the good sense to team up with 3-D Graphics, the firm behind *Perspective II*, a three-dimensional graphics package. Marketed as *Boeing Graph*, the program serves as *Boeing Calc*'s show-and-tell.

No Workpad Is an Island

Your Workpad or Mine? *Boeing Calc* models reside on *workpads*. A workpad can extend to 16,000 rows, 16,000 columns, and 16,000 pages. To move the cursor through the pages of the workpad, you use <F4> to toggle into pad mode. <PgUp> and <PgDn> then move you through the pages. Press <F4> again, and you are back in page mode, where <PgUp> and <PgDn> scroll through the current work area as they do in *1-2-3* (see Figure 1). The 3-D form necessitates certain navigation aids, among them cursor Quickstop—a nifty option under the Environment command that immediately halts scrolling when you release the cursor key.

The program manages the third dimension in a straightforward manner. Each page is numbered, and the page number precedes the column-row cell addressing scheme (see Screen 1). Accordingly, cell C6 of page 3 is labeled 3C6. As in *1-2-3*, cell references can be absolute, relative, or mixed. You can assign nine-character passwords to workpads, or change them with the Password command.

All pages in a *Boeing Calc* workpad need not be identical in design. Dissimilar pages can be linked by cell references within the same workpad. You could, for example, create a financial statement on the first page of a workpad. It might contain cell references to totals on separate pages for Sales, Cost of Goods Sold, Depreciation, General and Administrative Expenses, Income Taxes, and Other Income and Expenses.

Old hands at *1-2-3* will notice immediately that *Boeing Calc* isn't quite as quick as the Lotus standard. Calling up the main menu sends the program to disk, resulting in a perceptible delay. In addition, executing even simple commands often requires more keystrokes than equivalent operations in *1-2-3*. The program can take advantage of a numeric coprocessor, but the speed gain, as Boeing acknowledges, is negligible.

The program is sluggish despite its intelligent use of memory. Like *1-2-3* release 2, *Boeing Calc* uses the sparse-matrix approach to memory management, which generally reduces a model's RAM requirements. *Boeing Calc* likewise employs virtual memory, enabling files to spill over to disk once you've hurdled the 640K barrier. Theoretically, *Boeing Calc* file size tops out at 32MB. The exigencies of monster file management have produced some time-saving options: a Range Recalculate command that limits recalculation to a specified range, and a similar command that enables you to save selectively (and thereby spin off "what ifs" without overhauling an entire file).

Interestingly, Boeing chose not to support expanded memory, convinced that any benefit would

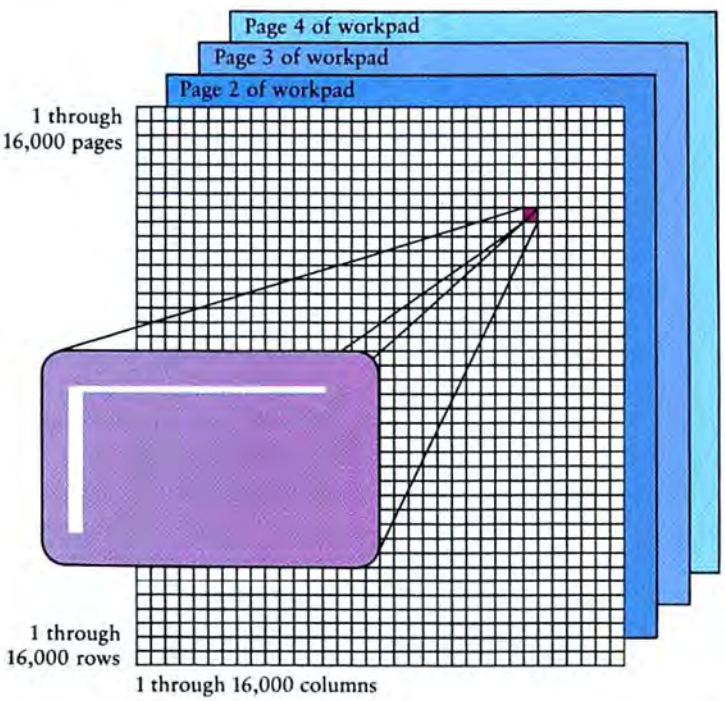


Figure 1: Just as the PC display serves as a small window on an outsize conventional spreadsheet, the Boeing Calc display opens a movable window into the workpad—one you can use to peer into the identical range on any of the program's 16,000 pages.

be largely offset by the heavy processing load of memory paging. The program will of course use an expanded memory board as a RAM disk.

A 1-2-3 Add-On?

Although *Boeing Calc* can serve as a *1-2-3* accessory—albeit a hefty one—there is new turf here for *1-2-3* defectors. In cell or range copy operations, for instance, you can selectively copy such cell information as formulas, values, or formatting.

Why limit the cell information copied? To optimize program response for very large files. When the source and target ranges are formatted identically, copying the format information is superfluous, and copying only formulas means faster execution. The larger the range copied, of course, the greater the gain. Unfortunately, you'll need to expend some of that saved time on extra keystrokes.

A few quirks mar *Boeing Calc,* including a <Tab> key inexplicably disabled in edit mode, limiting you to the right and left cursor keys. The program also lacks an on-screen indicator for <NumLock> status. And the DOS access feature, although functional, is unsightly: Any DOS command exceeding 20 characters is accepted but not displayed.

Macros on the Fly

Boeing Calc's macro facility operates quite differently from *1-2-3*'s, although the program retains *1-2-3* macro syntax. *Boeing Calc* stores macros outside workpads in separate ASCII files. Macros can be created with EDLIN or a word processor, but *Boeing Calc*'s learn mode, which records keystrokes, is generally more convenient.

Although storing macros in separate files is advantageous in a work group environment, it tends to make macro usage cumbersome at best. Instead of an <Alt>-*key* combination, you must execute the macro command (four keystrokes) and enter a file name (two to nine keystrokes). In addition, macros that pause for input require you to hit <F7> after the entry—a feature that can wreck data-entry macros. *Boeing Calc* does include a special macro file that executes on start-up and can be used to tailor the program to specific tasks.

The *Boeing Calc* manual is comprehensive and well designed, although *1-2-3* users may prefer to leave it on the shelf. A volume delineating the differences between the two products would be slim indeed. The program also provides useful, if somewhat sparse, help screens; you can access the help system via its own horizontal command line. *Boeing Calc*'s self-running tutorial is fine for spreadsheet novices, but *1-2-3* veterans may find it a bit condescending.

Boeing offers a local area network version of *Boeing Calc*—dubbed 3.01M—which is not evaluated here. Security features enable the LAN administrator to limit data access at the cell level on a need-to-know basis. Data files can be exclusive (single-user access), shared (multiple-user access), or checkout (which locks certain users out of a specific range). Security below the file level is in fact range protection, not true record-locking. Version 3.01M runs on IBM Token-Ring, Novell, and NETBIOS-compatible networks.

A Two-Party Line

The spreadsheet moniker notwithstanding, Bell Atlantic's program departs dramatically from the generic spreadsheet form.

1A1 :

ANGER, DENIAL & GRIEF
ALLOCATION OF PROFIT SHARING PLAN CONTRIBUTION

NAME	TOTAL COMP	ELIGIBLE COMP	EXCESS COMP	ALLOCATION-- BASED ON: EXCESS COMP	TOTAL COMP	TOTAL ALLOCATION
ANGER	83,768.98	83,768.98	41,768.98	2,923.83	4,876.76	7,800.59
BELL	29,250.00	29,250.00	0.00	0.00	1,782.84	1,782.84
CARLSON	30,184.00	30,184.00	0.00	0.00	1,757.22	1,757.22
DENIAL	70,950.00	70,950.00	28,950.00	2,026.51	4,130.48	6,156.99
ENGLE	21,738.07	21,738.07	0.00	0.00	1,265.52	1,265.52
GILLIS	23,149.62	23,149.62	0.00	0.00	1,347.78	1,347.78
GRIEF	72,280.00	72,280.00	30,280.00	2,119.60	4,207.91	6,327.51
HARRIS	21,966.42	21,966.42	0.00	0.00	1,278.81	1,278.81
JACKSON	17,814.00	17,814.00	0.00	0.00	1,037.07	1,037.07
JONES	20,385.49	20,385.49	0.00	0.00	1,186.78	1,186.78
MILTON	41,437.98	41,437.98	0.00	0.00	2,412.39	2,412.39
ORR	34,148.00	34,148.00	0.00	0.00	1,987.99	1,987.99

SCRATCH.PAD Use: BCALC.PRO Cursor: Page [1A1 to 1G37]

Screen 1: In the Boeing Calc workpad, the page number serves as the prefix in the address of cell 1A1.

In *MVP*, the mathematical relationships between data items reside in special model files, while data is stored in separate data files; each carries either a .MOD or a .DAT file extension.

MVP is not the only spreadsheet you'll ever need, and Bell Atlantic isn't promoting it as such. The package isn't crammed with file management or graphics capabilities, and it isn't multiuser. It is, in skilled hands, an ambitious financial management tool. While Bell Atlantic recommends an AT-class machine, the program virtually requires a numeric coprocessor—it is listless without it.

MVP supports neither expanded nor virtual memory. In a PC with 640K, *MVP* models are limited to about 300K, enough for only 30,000 cells. Fortunately, however, *MVP* data and model files are extremely compact; the program wisely discourages the creation of large files, in part by making movement between files so easy. Still, care is necessary to keep models tight and nomenclature consistent—and to prevent users from corrupting each other's data.

Although *MVP* displays models in a row/column/page format similar to that of *Boeing Calc*, the models are not limited to three dimensions. *MVP* attacks multidimensional problems with a vengeance; in the process, however, it yields ground to the more intricate financial functions of both *Boeing Calc* and *1-2-3*.

Basic Cell Geography

The starting point in understanding *MVP* is its cell referencing scheme. Cell addressing is name- rather than location-oriented. Consider a three-dimensional *Boeing Calc* model with single-word line, column, and page headers. In an *MVP* model, these headers are collectively termed *element names*.

If each element name is unique within the model, a given cell can be identified by its three intersecting names—one from each dimension. However, Bell Atlantic had to figure a way to keep track of duplicate element names—Total, for instance, which commonly appears in more than one dimension of a model.

MVP permits a character category extension of one, two, or three characters (not to be confused with a file name extension), which is associated with each dimension of the model (see Screen 2). In this example, each element name has a one-letter extension: *w* for worker level, *p* for product line, and so on. Thus, Total.w and Total.p are unique element names. All element names within a dimension share the same extension. Each axis in *MVP* can hold up to 20 dimensions, so models can grow to staggering complexity.

Because all cell references are name based, it's easy for users to track assumptions—and just as easy for *MVP* model files to share data. As long as element names are consistent, WEEKLY.DAT can effortlessly import updated sales data from DAILY.DAT. Outside the program, sharing is a stickier matter. *MVP*'s import facility for *1-2-3* is something of a kludge; the program reads release 1A files only, and then just data, not formulas. Importing requires that you tinker with *1-2-3* row labels so they match *MVP* element names.

```
Datafile: C:\MVP\force2   Model: FORCE
global:  Annual.m 1990.y  through:  NorthDiv.o
                Computer.p   Stereo.p       TV.p    Total.p
Mgmt.w
   Headcount.v       89.00       88.00     101.00     278.00
   Rate.v          3134.83     3136.36    2831.68    3025.18
   Salary.v         279000      276000     286000     841000
Nonmgmt.w
   Headcount.v      302.00      300.00     340.00     942.00
   Rate.v          1900.66     1916.67    1852.94    1888.54
   Salary.v         574000      575000     630000    1779000
Total.w
   Headcount.v      391.00      388.00     441.00    1220.00
   Rate.v          2181.59     2193.30    2077.10    2147.54
   Salary.v         853000      851000     916000    2620000

Work          1.pag 2.row 1.col     (ready)          cnls  31 JAN 1987    5 34 pm
Axis  Balance  Copy  Delete  Export  Find  Global  Import  Jump  Lock / UnLock
Model  Print / (Alt-P)  Read  Save  Window  Zoom  (Alt-H)elp  (Alt-Q)uit to exit
force2:
```

Screen 2: This MVP model occupies four dimensions. The three dimensions visible on this screen are employee class, product line, and the rate/salary computation. The amounts shown are divisional totals. The individual stores within the division (not shown) compose the fourth dimension.

Most Valuable Model

MVP models begin as script files created with a text editor or word processor. Bell Atlantic recommends *WordPerfect; Microsoft Word* also works, although less elegantly. Scripts are simply ASCII files that a program called the *MVP* Compiler turns into working model files (see Figure 2). The Compiler is available separately; *MVP* sans Compiler is basically a run-time version of the program.

The process of creating and compiling a script may initially intimidate some *1-2-3* users. The Compiler is finicky about syntax—a semicolon in the wrong place will keep the script from compiling. Nonetheless, adding a dimension to a model is a relatively simple process. The Compiler assists with error-checking routines to help detect and fix bugs.

```
Rem      Force Model
{template}
    {across}
    Computer.p Stereo.p TV.p Total.p;
    {endacross}

    {down}
    Mgmt.w Nonmgmt.w Total.w
    Headcount.v Rate.v Salary.v;
    {enddown}

    {through}
    NorthDiv.o StoreA.o StoreB.o StoreC.o;
    {endthrough}

    {global}
    Annual.m 1990.y;
    {endglobal}

{endtemplate}

{formats}

    {global}
    10.2 scale 1 priority 1;
    {endglobal}

    {across}
    {endacross}

    {down}
    10.0 scale 1 priority 2 Salary.v;
    {enddown}

    {through}
    {endthrough}

{endformats}

{rules}

    Rem      Across Rules
    Total.p = Computer.p + Stereo.p + TV.p except Rate.v;

    Rem      Down Rules
    Total.w = Mgmt.w + Nonmgmt.w except Rate.v;
    Rate.v = Salary.v/Headcount.v;

    Rem      Through Rules
    NorthDiv.o = StoreA.o + StoreB.o + StoreC.o except Rate.v;

{endrules}
```

Figure 2: The Force model script consists of a template section that supplies the model structure and a rules section of algebraic expressions that serve as cell formulas. The 'except Rate.v' phrases are necessary because the rate amounts are average annual salaries and shouldn't be added across product lines and stores.

Executive Summary

Boeing Calc

Three-dimensional spreadsheet

Boeing Calc is a three-dimensional spreadsheet that enjoys a healthy relationship with *1-2-3* via a familiar interface and a ready acceptance of worksheet data. Although not particularly quick on the draw, *Boeing Calc* is a snap to learn and excels at aggregating historical data. Its selective recalculation and intuitive cell addressing are offset by the absence of graphics and file management facilities.

Capacity	*Excellent*
Speed/performance	*Fair*
Data analysis	*Excellent*
1-2-3 compatibility	*Good*
Programmability	*Good*
Overall value	*Good*

Although the *MVP* Compiler evinces impressive power, cell formulas can't be changed on the fly. That restriction would diminish the program's "what if" capability were it not for other program facilities that enable you to override cell formulas temporarily.

MVP's reliance on element names may seem to chain users to an interminable parade of keystrokes, but that is not the case. The naming scheme can actually save time by enabling you to enter data into several cells at once. With one command, you can also change amounts in a cell or a range by a given percentage or amount.

Like its spreadsheet brethren, *MVP* lets you navigate models via the cursor keys. Commands and data are entered into an input line at the bottom of the initial *MVP* screen. Cells accept numeric input only, and any alphanumeric input is assumed to be a command. The *prompt block* immediately above the input line is the equivalent of *1-2-3*'s main menu. Unlike *1-2-3* and *Boeing Calc, MVP* lacks submenus, although additional prompts do supplement the main menu.

Back to the Solution

MVP permits you to enter data into any cell, even one that results from a computation. Although Total.p in Screen 2, for instance, is obviously the sum of the three products, you can enter values directly into any of the Total.p cells without disturbing the formula. (This works because you're changing only data–model logic is sacrosanct until you revise and recompile the script.)

You can then enter a desired "pattern," or ratio, for the three products, even though the new entries don't add up to the previous Total.p value. You can lock this value for Total.p and have *MVP* compute the product amounts needed to provide the total according to the pattern you entered. This is called *backsolving.*

Backsolving is a particularly powerful tool for medium-to-large organizations engaged in budgeting. In the real world, limited resources often demand that initial budget proposals be scaled back. Backsolving is the program's way of allocating pro forma reductions among departments, divisions, regions, and product lines.

MVP's Balance command makes backsolving work. Balance puts the entire sequence of cell recalculation under the user's control. Mindful of the unstructured nature of recalculation, Balance includes an elaborate rule-checking procedure to detect internal conflicts. Often, a model must be balanced several times before it comes out right. To make sure it does, *MVP* includes a Balance Test command.

As you might expect, balancing requires a little patience. Performing routine recalculation (balancing a model "forward," in *MVP* parlance), *MVP* was four to five times slower than *Boeing Calc.* Interestingly, converting a *1-2-3* file to *Boeing Calc* doubled the file size, but an *MVP* data file was just 15 percent larger than its *Boeing Calc* counterpart. With data and model logic combined, the *MVP* file required less than one-third the disk space of the same *Boeing Calc* model.

MVP's array of sophisticated mathematical functions is lean compared to those offered by *1-2-3* and *Boeing Calc.* Absent are financial functions like @PMT and @PV, depreciation, and trigonometric functions; Bell Atlantic determined that such functions would have added overwhelming complexity to Balance. This tradeoff may deter some users, especially those who'd like to add compound-interest computations to their models.

The program's Axis command, which rotates the axes of the spreadsheet cube, can shed new

Executive Summary

MVP Spreadsheet Plus

Three-dimensional spreadsheet

A multidimensional management tool especially useful for budgeting, *MVP Spreadsheet Plus* boasts a novel design that separates model logic from model data. The program features a separate Compiler and a "backsolving" capability to handle bottom-line adjustments. *MVP*'s cell-naming scheme and transcript facility provide a clear audit trail, but the program is encumbered by an unorthodox interface, a fairly steep learning curve, and the omission of certain financial functions.

Capacity	*Good*
Speed/performance	*Fair*
Data analysis	*Excellent*
1-2-3 compatibility	*Fair*
Programmability	*Excellent*
Overall value	*Good*

light on data. Rather than displaying each product in a column and each store on a page, for example, you can assign stores to columns and products to pages. Axis views cannot be saved and do not alter the model as stored in memory—only the way it is displayed or printed.

Dial M for Miscellaneous

MVP offers a macro capability (including a learn mode), but that won't necessarily simplify the program. Macros can be nested, and they support IF . . . THEN branching logic. They efficiently generate menus and prompts, and, via string matching, check entries for validity. Bell Atlantic is wooing third-party developers with a macro library and specs for building retroactive macros.

The *MVP* Undo function can roll the action back as many steps as you like. At any time, you can review a transcript file containing a running history of all keystrokes in the current session.

MVP takes an intriguing approach to windowing. Program windows are akin to microscopes, enabling you to monitor certain critical cells. You can specify up to 15 one-cell windows in any model, and all will remain on screen as you scroll through the file. You can name these windows if the names don't conflict with cell labels.

MVP print specifications reside outside the model in a file that can be attached permanently to a model file or called when printing a particular model. You can display and edit specification files within *MVP*. Although initial print file setup takes some doing, its ready availability beats the *Boeing Calc* (or Lotus) regimen hands down.

In its first crack at the software market, Bell Atlantic has come up with solid documentation, effectively addressing the fundamentals of this unconventional product. *MVP* lacks a tutorial, but sample models are helpful and thoroughly explained in the manual. On-line help is satisfactory.

The Purchase Dimension

If you're uncertain about the ultimate value of three-dimensional modeling, *Boeing Calc* is a safe choice. It's a frankly prosaic program, but installing it in your office will keep learning time to an absolute minimum and provide *1-2-3* users with by far the easiest migration path. Moreover, *Boeing Calc*'s receptivity to Lotus worksheet files ensures easy access to data from accounting programs (which often export to .WK1 and .WKS files) and mainframe applications. If pulled into service for consolidations and perhaps networking, *Boeing Calc* should deliver ambitious number-crunching.

MVP packs the potential to develop a loyal following. Sophisticated and feature-rich, it outclasses *Boeing Calc* as a decision support tool. It provides tighter organizational control over model design, which—due to its cell-naming scheme—is virtually self-documenting. *MVP*'s backsolving, true multidimensional quality, name-oriented model design, and ability to mix and match model and data files are all formidable features.

In this case, the price of power is an initially uncomfortable user interface. Although Fortune 1000 users may be equipped to scale the program's learning curve, others should take a hard look at the program. *MVP*'s relationship with *1-2-3* is far from intimate, and the omission of compound-interest financial functions looms as a significant drawback.

In a nutshell, then, *Boeing Calc* is today's product, and *MVP* tomorrow's. Both programs have a place in the fourth dimension. ●

Ralph Soucie is a CPA with McCallister & Co., P.C., in Portland, Oregon.

Boeing Calc 3.00E
Boeing Computer Services
Software and Education Products Group
P.O. Box 24346, Mail Stop 7W-02
Seattle, WA 98124-0346
800/551-0800
List price: $399
Requirements: 640K, hard disk drive, DOS 2.00 or later version
Not copy protected

MVP Spreadsheet Plus
Bell Atlantic
13100 Columbia Pike, Rm. D.2.0
Silver Spring, MD 20904
301/236-6294
List price: with Model Compiler $495, Model Compiler alone $195
Requirements: 640K, hard disk drive, word processor, DOS 2.00 or later version; numeric coprocessor recommended
Not copy protected

Magical Multiscan Tour

Why buy a new monitor every time you upgrade to a new video controller? With a multiscan monitor, you may never have to go monitor shopping again.

Patrick McDonnell

TJ Byers

There comes a time when a monochrome monitor just isn't enough. The boss wants you to produce charts, charts, charts—or you need a snazzy graphics adapter and monitor for desktop publishing. If nothing else, soothing colors may make long hours in front of the tube more bearable.

But venturing into the maelstrom of graphics standards takes some pluck and not a little cash. Since the birth of the PC, IBM has introduced three different color graphics boards (the Color/Graphics Adapter [CGA], the Enhanced Graphics Adapter [EGA], and the Professional Graphics Adapter [PGA]); two new PS/2 controllers (the Multi-Color Graphics Array [MCGA] and the Video Graphics Array [VGA]); a high-resolution Micro Channel adapter; and as many monitors. Unfortunately, every controller has been inextricably tied to new monitors. Moving up meant paying through the nose—twice.

No longer. Multiscan monitors can work with almost any video controller on the market in almost any mode—and accommodate new graphics standards as they arrive. Whether your eyes rely on a knockoff Hercules Graphics Card (HGC), a Tecmar Graphics Master, or a VGA-driven PS/2, a multiscan may be all the monitor you'll ever need.

NEC to the Rescue

When NEC introduced the multiscan concept two years ago with the MultiSync, it didn't expect to revolutionize the market. The company was simply looking for a piece of the action as the CGA standard gave way to the EGA. NEC rightly figured that a

display that could work with both boards might make some money.

The company was prescient in its timing. Thousands of users weary of their enslavement to shifting standards found emancipation in the MultiSync. The MultiSync's compatibility with both present and future graphics standards sealed its success.

Like all good ideas, the MultiSync was soon cloned. From the current crop of multiscan monitors, *PC World* culled the most notable contenders for the MultiSync crown. Each of the monitors examined here–the Sony Multiscan, the JVC GD-H3214, the Taxan Super Vision 770, the Magnavox Multimode, the Thomson Ultra Scan, and the Nanao 8060S –adds its own spin to NEC's original notion.

Given the multiscan monitors' similar pricing ($895 to $995) and performance, picking the right one can be tricky. Key purchase criteria–color reproduction, focus, and contrast–are in the eye of the beholder. But before you buy any multiscan, consider the characteristics that could affect its ability to accommodate new standards (such as scan capture range and maximum possible resolution) and embrace current ones (such as compatibility with current video adapters).

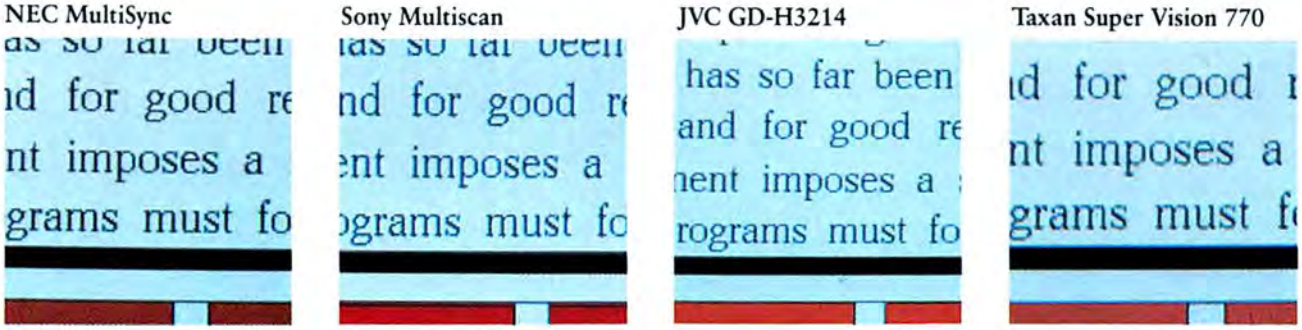
Scan Elan

A multiscan monitor and a conventional color monitor are essentially identical. Both have the same CRT and use the same electronics to drive the CRT, and both can display text and graphics. But a traditional monitor's scan rate–the speed at which the CRT's electron gun paints an image on the screen–is fixed to coincide with the video controller it is paired with.

A multiscan monitor isn't so fussy; additional circuitry in the unit automatically senses and matches the scan rate of the attached controller. Plug a multiscan monitor into an EGA, for example, and it adjusts its scan rate to mimic an Enhanced Color Display. Switch to a VGA controller, and the monitor cranks up its scan rate to reproduce 640-by-480 graphics.

The breadth of scan frequencies a multiscan monitor can encompass is called the capture range. The horizontal capture range, which is expressed in kHz, denotes the speed at which the electron beam sweeps across the face of the CRT. The higher the frequency, the faster the beam travels across the screen, and the better the horizontal resolution. The vertical capture range indicates how many scan lines the monitor is capable of displaying. As a rule, the higher the vertical scan frequency, the more lines per screen, and the greater the vertical resolution.

A quick look at Table 1 reveals that the horizontal capture range varies little from monitor to monitor. But the vertical capture range is a different story. The broader the range and the higher the upper



frequency, the more video controllers a monitor can use. The current champ in this category is the Sony Multiscan; the NEC MultiSync is dead last. All the reviewed monitors can be driven by most contemporary video boards. But remember: As new standards push resolutions higher, multiscan monitors with limited capture ranges may be left out in the cold.

Executive Summary

NEC MultiSync

Multiscan monitor

The MultiSync is known for its crisp resolution, vibrant colors, and rugged construction. But colors fade quickly to a muddy hue as the brightness is decreased. The unit does not support MDA or HGC video controllers.

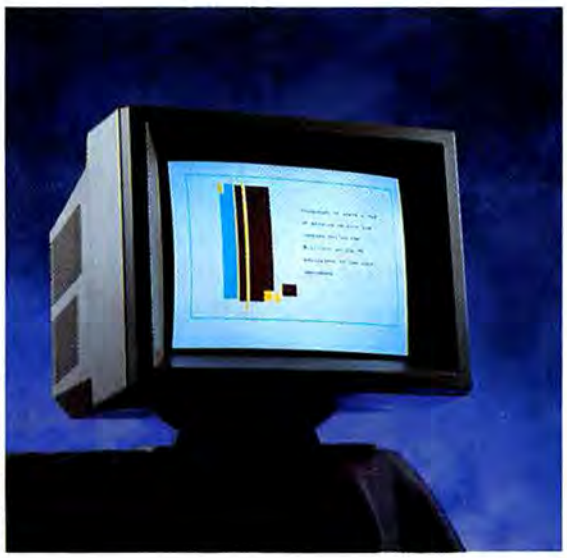
Image resolution	*Excellent*
Color quality	*Excellent*
Accessibility of controls	*Poor*
Support for existing controllers	*Good*
Overall value	*Good*

Manual Transmission

Monitor manufacturers would have you believe that you can connect their multiscan to any video controller and enter graphics heaven. It isn't quite that simple.

Different video controllers (and different modes) arrange pixels in entirely different ways. For example, with an EGA-equipped system connected to a multiscan, if you exit *WordPerfect* (80-by-25 character mode) and then load *Microsoft Windows* (640-by-350 graphics mode), the next image may be too tall, too squat, or simply off center. This problem, known as overscanning, can be corrected in several ways.

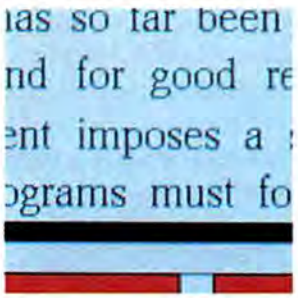
NEC and Nanao offer the simplest but most limited solution: a switch that selects two and four preset screen widths, respectively. For those who want total control, the JVC and Taxan monitors provide a separate set of screwdriver-adjustable horizontal and vertical size and position controls (16 in all) for the MDA (Monochrome Display Adapter), CGA, EGA, and above-EGA modes. Multiscan monitors from Sony, Thomson, and Magnavox offer the most ele-



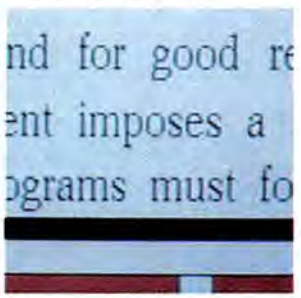
Photographs by Stan Musilek

When NEC introduced the multiscan concept two years ago with the MultiSync monitor, it sought to take advantage of evolving video standards.

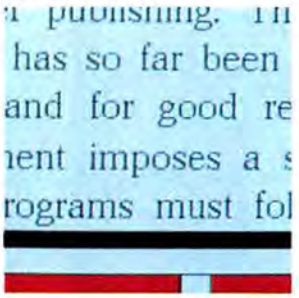
Magnavox Multimode



Thomson Ultra Scan



Nanao 8060S



Magnified portions of each of the six multiscan screens, using the NEC MultiSync–the monitor that popularized the multiscan concept–as a benchmark. Ventura Publisher provided the graphics-mode text for the display.

gant solution: They automatically adjust the screen's dimensions and placement when changing modes.

Text Case

Although most people buy color monitors to display graphics, more than 90 percent of the work done on PCs involves text. The Sony Multiscan, the JVC GD-H3214, the Magnavox Multimode, and the Thomson Ultra Scan can all mimic the crisp green-on-black output of the IBM Monochrome Display. The Nanao 8060S's text display is adequate, although monochrome options are restricted to amber or white text on a black background.

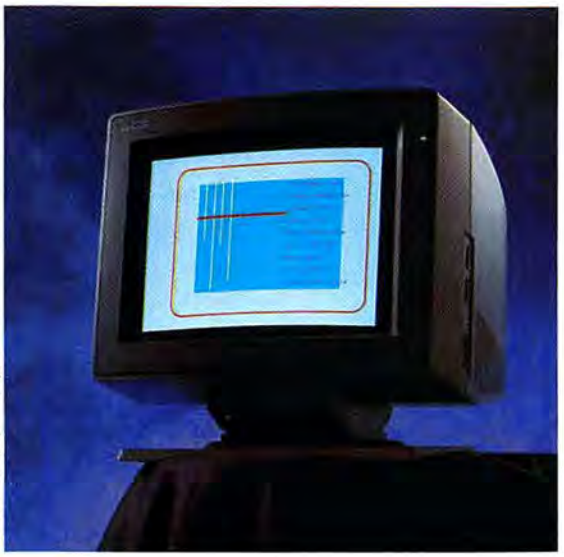
Unfortunately, the NEC MultiSync and the Taxan Super Vision 770 don't support either the MDA or the HGC, both famous for their sharp text output. NEC claims that the flicker caused by the low scan rate of those two monochrome adapters is unacceptable–although the company admits the MultiSync can be driven by either board using a modified cable connector. You'll find the resulting text quality on a par with that of the multiscan monitors that support these adapters.

Unique to the MultiSync are rear-mounted switches that activate one of eight colors–red, green, blue, yellow, cyan, magenta, black, or white–for text produced with any graphics adapter. The switches can override an application's default color selection, giving MultiSync users the widest selection of text colors among the monitors reviewed here.

Beauty Contest

Added value is the name of the game in any clone war, and the multiscan market is no exception. But except in their vertical capture range, the differences between these multiscan monitors are surprisingly minimal. The decision to follow the multiscan route, then, may be easier than deciding which monitor to buy.

NEC MultiSync. This is the multiscan monitor by which all others are judged–and for good reason. The ruggedly built MultiSync produces sharply resolved text and graphics and vibrant colors. When the monitor displays green text on a red background, you won't find colors running together or characters tinged with another hue.



Photographs by Stan Musilek

The Sony Multiscan's use of the patented Trinitron cathode-ray tube results in a virtually flat, glare-free, and sharper image than conventional screens.

Ease of use, however, is another matter. When you shift from one mode to another, you must constantly fiddle with the MultiSync's controls to center and size the image. Another complaint: Colors quickly fade to a muddy hue as the brightness is turned down. Controls for brightness, contrast, and horizontal and vertical size and position are located in a tiny compartment on top of the monitor—tidy, but inconvenient unless you have gorilla-length arms. Perched atop a tilt-and-swivel stand, the monitor is housed in a deep bezel that helps reduce glare.

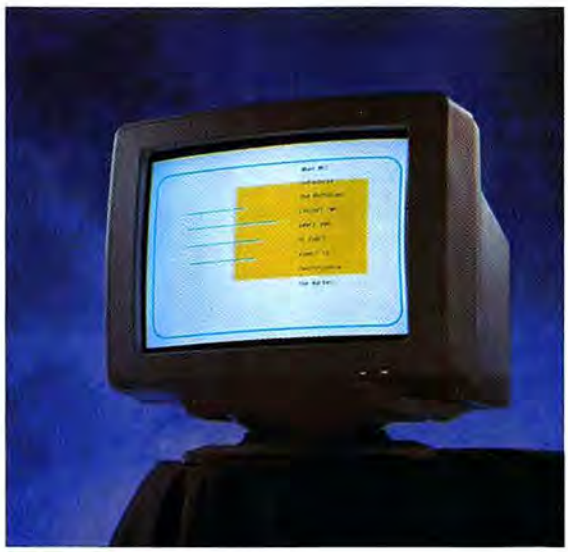
Sony Multiscan. The glare-free, swivel-mounted Multiscan is built around the patented and justly praised Trinitron CRT. Unlike conventional CRTs, which use tightly packed triads of round red, blue, and green dots, the Trinitron relies on thin rectangular stripes of each color. The result is a high-contrast image that few competing multiscans can match.

The Trinitron projection method nonetheless has its shortcomings. Although graphics resolution is superior, colors are a little less vivid than those produced by other multiscans in this roundup. Worse still, tiny vertical striations appear in single-color images—an effect that's especially pronounced with text.

A full complement of screen-size and screen-placement controls is located at the rear of the monitor beneath a removable cover—but given the alacrity with which the Sony adjusts to different modes, you'll seldom use them.

JVC GD-H3214. This sleek multiscan monitor comes in an ergonomically styled cabinet

The JVC GD-H3214's recessed screen gives a sleek appearance to the unit but increases glare.



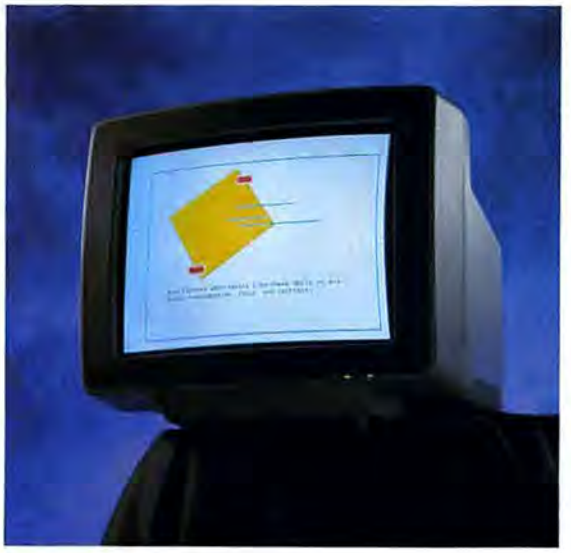
Executive Summary

JVC GD-H3214

Multiscan monitor

This sleek monitor is an ergonomic delight, but its screen is not sufficiently recessed to cut glare. EGA color graphics display is the monitor's forte. The unit produces a sharp white, but images tend to blur.

Image resolution	*Excellent*
Color quality	*Excellent*
Accessibility of controls	*Good*
Support for existing controllers	*Good*
Overall value	*Excellent*



The Taxan Super Vision 770 exhibits none of the focus problems of the JVC monitor, although its range of brightness and contrast control is limited.

mounted on a tilt-and-swivel base. The screen is recessed in a very shallow bezel, making glare the number one problem. In EGA color graphics modes the JVC GD-H3214 matches the MultiSync's bold colors and sharp resolution. The monitor can also produce a truer white than the MultiSync if you increase the brightness, but this tactic blurs the images.

Size and position controls at the back of the unit are typically set once. For fine adjustments, a set of brightness, contrast, and horizontal and vertical position controls are within easy reach on the right side of the monitor.

Taxan Super Vision 770. The Super Vision is nearly identical to the JVC GD-H3214, and for good reason–it's made by JVC to Taxan's specifications. However, the Taxan monitor is mounted on four plastic legs instead of a swivel.

Overall color quality is on a par with the JVC's, although graphics resolution is not nearly as impressive. The limited range of the Taxan brightness and contrast controls also does not permit the whiter than white produced by its kissin' cousin. On the other hand, images usually remain focused.

Magnavox Multimode. Magnavox, creator of the Quasar TV, enters the multiscan market with a generally unexciting entry. The Multimode's colors are flatter than the others. However, focus is consistent over the entire range of brightness and contrast adjustment, and the monitor excels with the PS/2's VGA controller.

Brightness, contrast, and horizontal position controls are conveniently located at the front of the swivel-based monitor, just beneath the bezel's bottom ledge. But controls for vertical hold, size, and position are rear mounted, and adjusting them requires a screwdriver. Unfortunately, the screen often rolls uncontrollably following a video mode change. Once you stop this rollercoaster, however, the Multimode properly

Executive Summary

Taxan Super Vision 770

Multiscan monitor

Made by JVC, the Super Vision 770 has limited brightness and contrast control, but the unit doesn't suffer from the JVC's occasional focus problems. The monitor does not support the MDA, HGC, or VGA video controllers, although VGA support will be added.

Image resolution	*Excellent*
Color quality	*Excellent*
Accessibility of controls	*Good*
Support for existing controllers	*Fair*
Overall value	*Good*

Sony Multiscan

Multiscan monitor

This glare-free multiscan displays clean, high-contrast images. Graphics resolution is superior, but colors seem less vivid than those produced by other reviewed monitors.

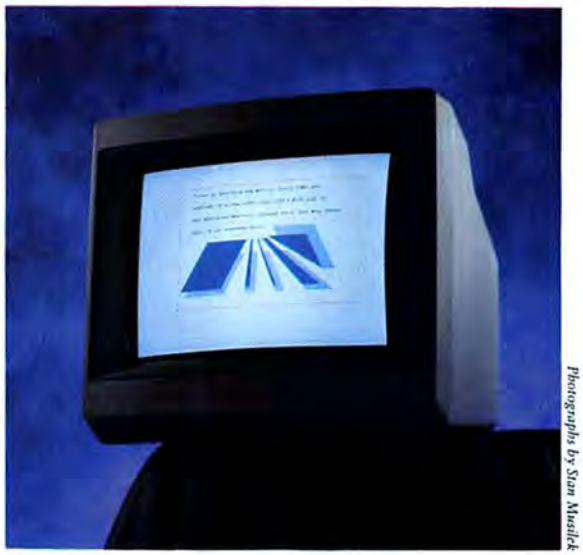
Image resolution	*Excellent*
Color quality	*Good*
Accessibility of controls	*Good*
Support for existing controllers	*Excellent*
Overall value	*Excellent*

adjusts screen dimensions and placement. Magnavox offers an amplifier and a speaker option for the unit that can be used with a VCR for video presentations.

Thomson Ultra Scan. This well-conceived multiscan monitor boasts excellent color rendition and the usual tilt-and-swivel stand. Although its colors are not as bold as those displayed by the MultiSync, they are richer in tone and not as muddy.

Brightness and contrast controls are right up front; screen size and placement controls are hidden in the back. But the Ultra Scan's adeptness at juggling modes makes control placement academic. Adjust them once, and chances are you won't touch them again.

As a bonus, the Ultra Scan can also display standard NTSC (U.S.) or PAL (European) television signals, with dynamite results. By simply patching a VCR to the unit's RCA video jack, you can watch the soaps in the most brilliant colors you've ever seen. Audio outputs are lacking, so you must turn to an external amplifier and speaker to enjoy the experience fully.



The Thomson Ultra Scan boasts excellent color rendition and can be patched to a standard VCR; you can watch the soaps in the most brilliant color imaginable.

Photographs by Stan Musilek

With the Magnavox Multimode display, focus is never a problem, and the screen retains its resolution over the entire range of controls adjustment.

Executive Summary

Magnavox Multimode

Multiscan monitor

Screen colors may seem flat, but focus and resolution are never a problem, and the unit handles mode changes with ease. This unit offers the best VGA resolution of those tested.

Image resolution	*Good*
Color quality	*Good*
Accessibility of controls	*Fair*
Support for existing controllers	*Excellent*
Overall value	*Good*

Nanao 8060S. Although most multiscan monitors are cut from similar cloth, not all quality control programs are created equal. Nanao's otherwise competent 14-inch monitor showed considerable color separation at the edges of the screen. The reason? Sloppy calibration of the CRT by one of Nanao's many suppliers. Why Nanao let this CRT pass inspection is a mystery; you might reasonably conclude that the company is not as attentive as other major multiscan vendors.

Color display is acceptable, but images are often slightly out of focus. Still, the range of the unit's contrast and brightness controls is impressive. By manipulating two dials, you can actually change deep orange to pale rose. Another dial displays text in color, amber, or white on black. Switching between color graphics and text modes, however, often requires a contrast and/or brightness adjustment.

The Best and the Brightest

It's hard to go wrong with almost any multiscan monitor reviewed here. But the choice is not just a subjective one. You can fine-tune your purchase decision if you know what video controller you'll be using.

If all you ever expect to use is an EGA-style video board that generates no more than 480 lines (such as the Quadram Pro-Sync and the VEGA Deluxe), the choice is clearly between the NEC MultiSync and the JVC GD-H3214, which excel in all of the EGA's graphics modes. If, on the other hand, you want to experiment with exotic video modes as they become available, then the Sony Multiscan is the monitor to choose because of its extended capture range. If the VGA is your cup of tea, the Magnavox Multimode is the appropriate mate (see the sidebar "Making the VGA Connection"). While not top dog in any category, the Thomson Ultra Scan is a capable performer that can fill most any role.

The Nanao 8060S is the only monitor with a 14-inch screen; all the others measure 13 inches. The monitor reviewed suffered from color separation, prompting questions about quality control.

Executive Summary

Thomson Ultra Scan

Multiscan monitor

This multiscan monitor can cover all the bases. Color rendition is sharp, and clarity is maintained at all brightness levels.

Image resolution	*Excellent*
Color quality	*Excellent*
Accessibility of controls	*Good*
Support for existing controllers	*Excellent*
Overall value	*Excellent*

Nanao 8060S

Multiscan monitor.

This 14-inch monitor won't set pulses racing. Color and resolution are merely adequate, and the unit suffers from noticeable color separation at the edges of the screen. The range of contrast and brightness, however, is considerable.

Image resolution	*Poor*
Color quality	*Good*
Accessibility of controls	*Excellent*
Support for existing controllers	*Excellent*
Overall value	*Fair*

Making the VGA Connection

Unlike the tunes of Gershwin, Kern, and Berlin, standards in the PC market are as fleeting as snowflakes on a hot griddle. But IBM's new analog VGA controller doesn't faze most of the reviewed multiscan monitors.

Previous IBM video controllers have relied on digital means to display colors. The digital method, called TTL video interface, assigns a whole number to each available color. As a result, a TTL controller can't dance a "half" step to create a different shade.

With analog controllers like the VGA, colors are represented by a voltage level that is converted by a monitor into a color intensity. For example, to produce a lighter shade of pink, an application need only lower the voltage level of the red driver. Although all the reviewed multiscan monitors can operate in analog mode, hooking them up to the MCGA or the VGA is difficult because of the PS/2's new 15-pin connector.

The two wallflowers at this dance are the JVC GD-H3214 and the Taxan Super Vision 770; their analog connectors' lack of a vertical sync signal line causes the screen to roll uncontrollably when tied to the VGA. Both companies promise a hardware fix, but the cure won't help the older multiscan units.

The rest of the assembled multiscans can be driven by the VGA courtesy of a modified cable, and with surprising results. The Nanao 8060S, which doesn't compare favorably with its multiscan peers, displays a superior VGA screen. The Sony Multiscan likewise does very well in the VGA's text and graphics modes.

Not surprisingly, the Magnavox Multimode and the Thomson Ultra Scan (which are specifically designed to work with VCRs and other analog devices) are the most responsive to the powers of the VGA. Images on the NEC MultiSync, on the other hand, tend to disappear behind a soft white veil. You can also expect to keep your fingers anchored to the vertical hold, because jumping from the VGA's 720-by-400 text mode to 640-by-480 graphics mode sends the MultiSync's screen reeling.

In general, the multiscan monitors do a better job with the VGA than do IBM's monitors for the PS/2 line. However, most current multiscans cannot automatically readjust screen height when shifting from the VGA's text mode to graphics mode. But considering the price of IBM's VGA monitors and the advantages of a multiscan monitor, the latter is a far better investment for PS/2 users. *–TJB*

Table 1: Although the reviewed multiscan monitors are similar, the bigger the capture range and the higher the vertical frequency, the more video controllers a monitor can work with.

Product	List price	Screen size (inches)	Horizontal capture range (kHz)	Vertical capture range (Hz)	Resolution (pixels)	Inputs: TTL	Inputs: Analog	Inputs: Composite	Video modes: MDA	Video modes: HGC	Video modes: CGA	Video modes: EGA	Video modes: PGA	Video modes: VGA	Video modes: AT&T
NEC MultiSync	$899	13	15.5 to 35	56 to 62	800 by 560	■	■				■	■	■	■	
Sony Multiscan	$945	13	15 to 34	50 to 100	900 by 560	■	■		■	■	■	■	■	■	■
JVC GD-H3214	$895	13	15 to 34	50 to 90	800 by 600	■	■		■	■	■	■	■	*	
Taxan Super Vision 770	$995	13	15 to 34	50 to 90	800 by 600	■	■				■	■	■	*	
Magnavox Multimode	$899	13	15 to 34	52 to 78	926 by 580	■	■		■	■	■	■	■	■	■
Thomson Ultra Scan	$895	13	15.65 to 35	45 to 75	800 by 560	■	■	■	■	■	■	■	■	■	■
Nanao 8060S	$919	14	15.75 to 35	50 to 80	820 by 620	■	■		■	■	■	■	■	■	■

* The manufacturer claims that recently released units can be directly connected and driven by the VGA.

At $900 or more, a multiscan monitor may seem a pricey investment. But for those extra dollars, you can bet that your monitor won't become obsolete the next time the graphics ante is raised.

TJ Byers is a Contributing Editor for PC World *and the author of* Inside the IBM AT *(McGraw-Hill, New York, 1986).*

8060S
Nanao USA Corp.
23510 Telo Ave. #5
Torrance, CA 90505
213/325-5202
List price: $919

GD-H3214
JVC Information Product Company of America
Division JVC Corp.
Western Regional Sales
1011 W. Artesia Blvd.
Compton, CA 90220
213/537-6020
List price: $895

Multimode
Magnavox
North American Philips Consumer Electronics
P.O. Box 555
Jefferson City, TN 37760
615/475-3801
List price: $899

Multiscan
Sony Corporation of America
9 W. 57th St.
New York, NY 10019
212/371-5800
List price: $945

MultiSync
NEC Home Electronics
1255 Michael Dr.
Wood Dale, IL 60191
312/860-9500
List price: $899

Super Vision 770
Taxan USA Corp.
18005 Cortney Ct.
City of Industry, CA 91748
818/810-1291
List price: $995

Ultra Scan
USA Thomson Consumer Products Corp.
5731 W. Slauson Ave. #111
Culver City, CA 90230
800/325-0464; 213/568-1002
List price: $895

Cache on Demand?

Does caching software crack the whip on sluggish, disk-intensive applications? Yes–and no.

Robert Pizzo

Evelyn Morrison

Arctic dogsledders know that if "Mush!" doesn't inspire their huskies to hustle, other persuasions are close at hand. After a long day of sorting data bases or pushing graphics around in a *Ventura* document, you too may feel like barking orders at your PC–or taking sterner measures.

But cracking the whip can be an expensive proposition. Capable turbo boards start at $600; swifter hard disks cost even more. And neither may remedy your application's paw-dragging performance. Because if you use data managers, word processors, desktop publishing programs, and other applications that spend most of their time looking for data or overlay files on disk, the real bottleneck isn't your system's microprocessor or hard disk–it's the disk controller.

One solution is moving everything you need–data, programs, fonts, and so on–to a RAM disk, which turns a block of memory into the swift electronic equivalent of a disk drive. But a RAM disk speeds access only to programs and data specifically copied therein. And like a magnetic disk, a RAM disk holds only so much information; purging it means exiting the current application and laboriously copying and deleting files.

Promises, Promises

A better solution, or so its proponents claim, is a disk cache, which essentially acts like an intelligent RAM-disk-cum-virtual-memory system. Any frequently requested item–be it a data base file, spelling checker dictionary, or *WordStar* overlay–is automatically pulled off the disk and into a section of memory (the cache), where it can be accessed more quickly. A control program keeps an eye on the process, automatically tracking the disk sectors in the cache, purging unneeded data, and bringing requested information into the fold. In general, the big-

ger the cache, the faster the applications will work, because files don't have to be read piecemeal into the cache.

For years, multimegabyte cache systems have boosted the performance of hard disk drives serving mainframes and local area networks. ITT popularized the notion in the PC realm with its Xtra XP, an 80286-based XT compatible that runs certain applications quadruple-speed when its cache software is active. The inclusion of caching software with IBM's PS/2 line and Compaq's Deskpro 386 has given the technique added allure.

Vendors pushing the new wave of inexpensive PC caching programs reviewed here–*Flash, Lightning, PolyBoost, Quickcache, Super PC-Kwik,* and *Vcache*–naturally play up the theoretical benefits of their wares, promoting them as all-purpose accelerators good for almost any application and system. "Why waste time! Accelerate with Vcache," commands Golden Bow Systems. "Most programs that frequently access the disk are made instantly up to 2 to 4 times faster," claims the maker of *Lightning.* But in fact, speed improvements vary wildly by application and system. Caching utilities won't necessarily save you money, either–the best cache is a big cache, and that means spending at least $300 for a 1MB expanded memory board.

Cache on the Run

PC World put the claims for the disk caching programs to several weeks of intensive testing. In the first round, test programs written in Pascal performed thousands of sequential and random disk reads and writes on a 640K dual-floppy PC, an XT, and an AT, with 128K and 300K caches set up in conventional memory. In the next round, a variety of real-world tasks–such as reformatting a *WordStar* document, sorting a *dBASE III Plus* data base, and retrieving and saving a *1-2-3* worksheet–were run with the same system configurations.

The results were mixed, to say the least. In some cases, the caching utilities didn't enhance performance at all. In others, a utility that hastened a program on the AT didn't on the XT. Worse still, some applications were actually slowed by a cache.

This outcome isn't surprising. Most PC applications, *1-2-3* and *Microsoft Word* included, soak up 256K of RAM. Disk-oriented applications such as *R:base System V, Ventura Publisher,* and *dBASE III Plus,* which stand to benefit most from disk caching, need as much as 512K. That doesn't leave much elbowroom for a cache.

Taking a cue from traditional caching systems, we also performed a set of benchmarks with a 1MB cache in expanded and then extended memory on a 512K, 8-MHz AT equipped with an Intel AboveBoard. The disk-intensive tests included assembling a 240K report with *Clipper,* reindexing and browsing through a 225K *dBASE III Plus* file, and checking the spelling in a 96K *Word* document.

Although no caching utility took the loving cup, the tests demonstrate that a 1MB cache consistently hikes performance for all tested applications, sometimes by as much as 60 percent (see Figure 1). Performance gains on a dual-floppy PC compatible with a 128K conventional memory cache can be similarly impressive, if unpredictable (see Figure 2).

The Fully Powered Cache

So how do you pick the right caching product? Assuming you have a spare megabyte or so of RAM, choose the caching utility that can be customized for the kinds of applications you use (see Table 1). Also, consider whether the cache program has keyboard- and display-speedup utilities, since they can effectively rev up an application's performance.

The caching utilities reviewed here aren't aimed at the *pfs* crowd. Although installation is as simple as copying a few files, proper cache management means rolling up your sleeves and getting your hands dirty. A cache is not fully automatic, and you can't change settings on the fly from a handy pop-up menu. Customizing the cache involves delving into the manual to learn what the options are, then venturing down to the DOS level to issue the necessary commands and parameters. If the utility can be suitably sculpted for your application, however, the minor inconveniences may be worth the trouble. And fortunately, in tests with a smattering of memory-resident programs–*SideKick*, *Turbo Lightning*, and *Keyworks*–none of the caching utilities missed a step.

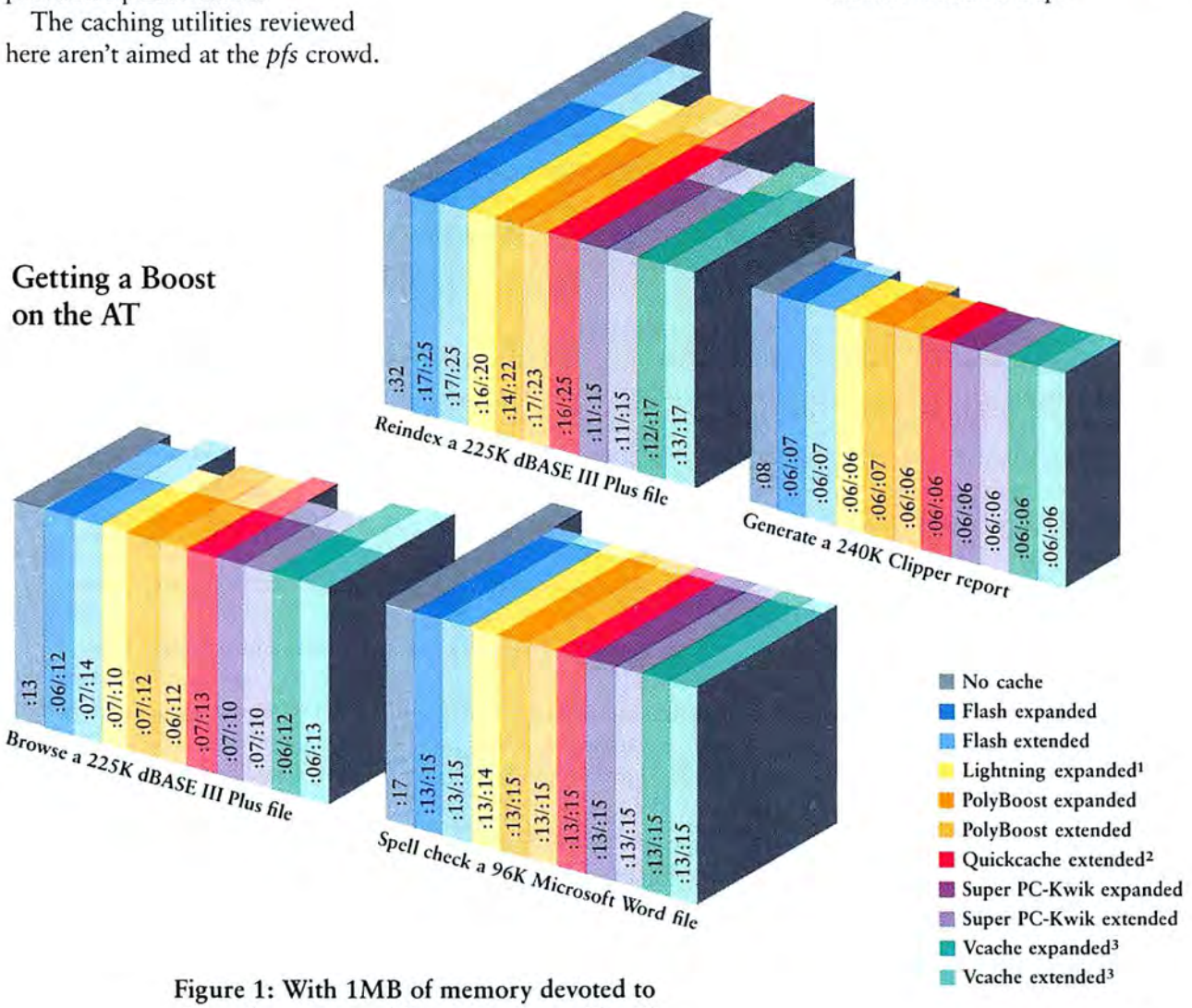


Figure 1: With 1MB of memory devoted to the cache, most caching programs achieved notable improvements. Performance increases were most significant after the first access because the requisite data was already in the cache.

Tests were performed by The Lambda Group on an 8-MHz AT with 512K, a 20MB hard disk, and a 1MB Intel AboveBoard. BUFFERS = 2 except where the manufacturer recommended another setting. When two times are given, the faster is subsequent access and the slower is first access. Times are shown in seconds.

Flash. Software Masters' *Flash* is probably the most malleable caching package of the lot. With its "high-priority" feature, you can permanently store a specific file, program, or set of overlays in the cache, speeding access markedly. If you often use a data manager such as *dBASE III Plus*, you can improve performance with an option that delays writing records to disk during a specified time period. By the same token, you can hotfoot operations by directing *Flash* to scoop up all the data in any track currently being read. *Flash* even includes a function that straps an afterburner to the cursor.

The range of controls is impressive: You can set cache size from 5K to 3MB, cache more than one drive at a time, change the drive being cached, empty a cache, and write-protect selected drives. If you remove the cache, you can instruct *Flash* to note which files it worked with last. Reactivate *Flash*, and it automatically pours the files back into the revived cache.

Flash's detailed, 105-page user manual is head and shoulders above most of the competition's and includes a list of error messages, a glossary, and a lucid quick-reference guide–but no index. Like most of the reviewed caching utilities, *Flash* provides a performance report noting how many requests for disk access the cache handled during the current session.

Lightning. This is a solid if uninspired product from Personal Computer Support Group. Cache size is limited to 1.8MB, and the $49.95 version is copy protected–a restriction that belies any ease of use the company might claim. The unprotected version is available for $89.95.

Lightning can't take advantage of extended memory, which may understandably irk those using 80286- and 80386-based machines equipped with 1MB (640K conventional, 384K extended) of RAM. Still, *Lightning* is the only reviewed package that works with versions of DOS prior to 2.00. As with *Flash*, you can write-protect drives, turn caching on or off for specific drives, and remove the cache from memory. *Lightning*'s terse documentation focuses on installation, but given the program's limited scope, you can probably get by.

PolyBoost. Like *Flash*, *PolyBoost* from Polytron aims to please. The package includes six different caching utilities for all possible combinations of floppy and hard disk drives with conventional, expanded, and extended memory. Based on the benchmarks in Figure 2, the approach apparently works. Unfortunately, you must set up a separate cache for each drive. The company claims this arrangement optimizes performance, but it certainly isn't convenient.

PolyBoost's developers throw in a couple of capable utilities. One speeds screen repainting and suppresses flicker produced by the CGA, in the manner of *Flickerfree*. Another enables you to capture, view, edit, and replay previously issued DOS commands; it also expands the PC's 16-character

Executive Summary

Flash

Disk caching utility

Flash has scads of options: Specific overlays can be kept in a cache, multiple drives can be cached, drives can be write-protected, and more.

Installation and setup	*Excellent*
Customization	*Excellent*
Documentation	*Excellent*
Overall value	*Excellent*

Lightning

Disk caching utility

Lightning is a solid workaday product and the only utility to support DOS 1.00 and 1.10–but it doesn't work with the AT's extended memory, and documentation is terse.

Installation and setup	*Excellent*
Customization	*Good*
Documentation	*Fair*
Overall value	*Good*

PolyBoost

Disk caching utility

PolyBoost offers cache programs attuned to likely disk and memory configurations, along with utilities that speed up text display and keyboard operations.

Installation and setup	*Excellent*
Customization	*Good*
Documentation	*Excellent*
Overall value	*Good*

type-ahead keyboard buffer to 128 characters.

The tin in the silver lining? The only way to remove a *PolyBoost* cache is by restarting or turning off the system. But *PolyBoost*'s indexed user manual is on a par with *Flash*'s, and it takes special pains to show users how to install the cache for various disk and memory configurations.

Quickcache. Unlike its peers, *Quickcache* by Micro Systems Developers is a device driver and must be referenced with a DEVICE = statement in the system's CONFIG.SYS file. Caching a specific drive, changing cache size, and so on, require tinkering with the DEVICE statement and then restarting the system to put the new settings into effect. Deactivating and activating the cache is an even bigger pain, since you must continually delete and recreate the necessary DEVICE statement.

Quickcache offers few frills, and the 11-page typewritten user manual omits technical details and application-specific tips. For example, the manual says, "*Quickcache* will automatically use AboveBoard memory if it exists"—but doesn't explain how to set up the cache in expanded memory. In our tests, *Quickcache* worked fine in extended memory but didn't work in expanded memory. Repeated calls to Micro Systems Developers' support line to clarify this point were not returned.

Super PC-Kwik. Multisoft claims that in addition to speeding file access, *Super PC-Kwik* significantly accelerates disk writing. This is no idle boast: *Super PC-Kwik* beat all contestants in a *dBASE III Plus* file-reindexing test, a task that requires considerable disk writing. To further speed applications, *Super PC-Kwik* provides a track-read feature. The program also works with the Bernoulli Box, a trait it shares with *Quickcache* and *Vcache.*

Along with excellent coverage of *Super PC-Kwik*'s few options, the user manual describes disk caching theory and includes several pages of tips and tricks.

Vcache. What distinguishes Golden Bow Systems' *Vcache* from the disk caching throng is its ability to create caches as big as 8MB. The package comes with separate caching programs for conventional, expanded, and extended memory, and a utility that speeds up screen display.

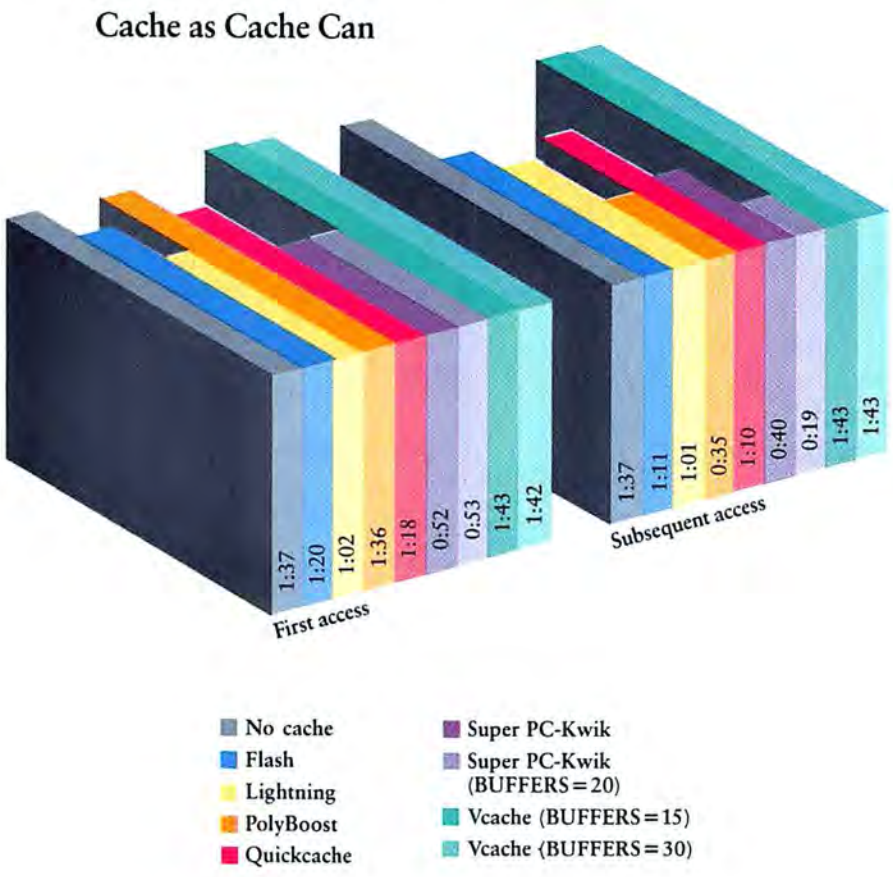


Figure 2: Using a 128K conventional memory cache on a dual-floppy PC compatible, most caching programs improved dBASE III Plus's browsing speed.

Tests were performed by The Lambda Group on a 640K 8088 Wyse PC + operating at 9.5 MHz using a 225K dBASE III Plus file with a 28K index file. BUFFERS = 2 except where a program performed better at another setting.

Table 1: With cache programs, versatility is the key.

Feature	Flash 5.0	Lightning 4.5	PolyBoost 1.7	Quickcache 2.1	Super PC-Kwik 1.5	Vcache 2.01
Minimum cache size	5K	20K	5K	1K	32K	64K
Maximum cache size	3MB	1.8MB	2MB	2MB	1MB	8MB
Caches floppy disks	◆	◆	◆	◆	◆	
Caches Bernoulli Box				*	◆	◆
Creates multiple separate caches			◆			◆
Uses expanded memory	◆	◆	◆		◆	◆
Uses extended memory	◆		◆	◆	◆	◆
Caches user-specified drives	◆	◆	◆	◆	◆	
Track read option	◆				◆	
Write-protects selected drives	◆	◆				
User can unload cache from memory at DOS prompt	◆	◆			◆	◆
Provides performance report	◆	◆		◆	◆	◆
Other utilities included:						
keyboard speedup	◆		◆			◆
display speedup			◆			
floppy disk speedup						◆

* Only in the Bernoulli Box's bootable configuration

Vcache won't cache floppy disk drives, although it comes with a utility that accelerates sequential data transfers (such as copying files) from floppy disk to floppy disk. But that isn't the same thing as caching, and in tests on a dual-floppy PC compatible, the utility actually slowed down *dBASE III Plus*'s browse function.

Vcache's 14-page user manual is so cursory that it neglects to mention the floppy disk and screen programs. Make sure you read the Typeme file on any *Vcache* disk before using the utility. Note, too, that *Vcache* is also sold as part of the *Mace Utilities*.

Hard-Won Conclusions

These caching utilities clearly can accelerate disk-intensive applications, but across-the-board performance gains aren't guaranteed. Many variables enter into the equation—the amount of disk activity an application typically performs, the size of the cache, the size of the cached file, and whether the cache resides in conventional, extended, or expanded memory.

But caching utilities do shine under certain circumstances. Floppy-based applications can take wing—if there's enough memory to go around. (Just remember that a 640K XT set up with a 384K cache can't load *1-2-3*, much less a worksheet.) Pop in an AboveBoard with a megabyte or more of RAM, and you'll definitely see improvements on any system.

On the basis of general performance and versatility, *Flash*, *Lightning*, *PolyBoost*, and *Super*

Executive Summary

Quickcache

Disk caching utility

Quickcache works as a device driver, needlessly complicating cache management and customization. The utility doesn't work with expanded memory, and documentation is mum on important details.

Installation and setup	*Fair*
Customization	*Poor*
Documentation	*Poor*
Overall value	*Fair*

Super PC-Kwik

Disk caching utility

This utility offers fewer customizing options but is generally faster than its rivals, thanks in part to a proprietary disk-writing routine.

Installation and setup	*Excellent*
Customization	*Good*
Documentation	*Good*
Overall value	*Excellent*

Vcache

Disk caching utility

Vcache's main claim to fame is its ability to cache up to 8MB of data. However, *Vcache* can't cache floppy disk drives.

Installation and setup	*Excellent*
Customization	*Good*
Documentation	*Fair*
Overall value	*Good*

PC-Kwik merit consideration. But before you commit yourself to any caching program, test it under normal working conditions. Rent the software, or order it from a company that offers a 30-day money-back guarantee. Call the company whose software you are trying and quiz the technical staff for tips on customizing the utility for the applications you use. If your applications still won't mush, there are other ways to crack the whip.

Evelyn Morrison is a programmer in New York City who writes frequently about computers.

Flash version 5.0
Software Masters
6352 N. Guilford Ave.
Indianapolis, IN 46220
317/253-8088
List price: $69.95
Requirements: 256K, DOS 2.00 or later version
Not copy protected

Lightning version 4.5
Personal Computer Support Group
11035 Harry Hines Blvd. #207
Dallas, TX 75229
214/351-0564
List price: copy protected $49.95, not copy protected $89.95
Requirements: 128K, any version of DOS

PolyBoost version 1.7
Polytron Corp.
1815 N.W. 169th Pl. #2110
Beaverton, OR 97006
503/645-1150
List price: $79.95
Requirements: 256K (320K recommended), DOS 2.00 or later version
Not copy protected

Quickcache version 2.1
Micro Systems Developers, Inc.
214½ W. Main St.
St. Charles, IL 60174
312/377-5151
List price: $49.95
Requirements: 128K, DOS 2.00 or later version
Not copy protected

Super PC-Kwik version 1.5
Multisoft Corp.
18220 S.W. Monte Verdi Blvd.
Beaverton, OR 97007
503/642-7108
List price: $79.95
Requirements: 128K, DOS 2.00 or later version
Not copy protected

Vcache version 2.01
Golden Bow Systems
2870 Fifth Ave. #102
San Diego, CA 92103
619/298-9349
List price: $49.95
Requirements: 256K, DOS 2.00 or later version
Not copy protected

Recent PC announcements have left Compaq in an enviable position.

Compaq still

In the midst of the clamor surrounding the new IBM® PS/2 personal computers, one thing is perfectly clear to people who really know PC's. COMPAQ® personal computers still work better. They enhance your productivity *within* the industry standard, and give you maximum performance from the world's largest library of business software.

different storage devices on all COMPAQ desktops.

Examine compatibility. We let you use all the industry-standard software and expansion boards that you already own.

Demand for the 12-MHz COMPAQ DESKPRO 286 has nearly doubled since the PS/2 introduction.

The 12-MHz COMPAQ PORTABLE III is the smallest, most powerful full-function portable there is.

Still the performance leader

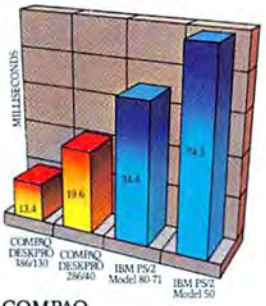
COMPAQ personal computers prove superior in overall performance.

Take speed. The COMPAQ DESKPRO 286® runs your software up to 20% faster than its PS/2™ counterpart. And, the COMPAQ DESKPRO 386™ sets all records for speed in advanced-technology, industry-standard personal computers.

Consider flexibility. Compaq offers 5¼" diskette drives, and allows you to add 3½" drives. In fact, you can add up to four

Look at expandability. Our industry-standard slots enable you to add many extra functions. So you can configure your system exactly the way you want it.

Finally, compare portability. You can't. The 12-MHz 80286-based COMPAQ PORTABLE III™ is the undisputed leader. It offers the performance of a desktop without any of the compromises you'll find in other portables.



COMPAQ fixed disk drives can access data up to 2½ times faster than PS/2 drives.

Compaq applies innovative technology within the industry standard, *without* sacrificing compatibility.

Earn higher returns on your investment

American business has $80 billion invested in

It still simply works better.

IBM, OS/2 and PS/2 are trademarks of International Business Machines Corporation. MS OS/2 is a product of Microsoft Corporation.
©1987 Compaq Computer Corporation. All rights reserved.

works better.

The COMPAQ DESKPRO 386 sets the standard for high-performance, advanced-technology desktop computing.

the current PC standard, including 72 million software and hardware products, and hundreds of millions of hours in training.

Compaq designs its computers to protect your investment. And because they do more, they also maximize it.

Two-way compatibility

Compaq has become famous for its legendary compatibility and connectivity. Our personal computers will run thousands of programs, without modification, far faster than other computers. And they work with all the other compatible computers in your office, without time-consuming diskette conversions.

As for the future, all 80286- and 80386-powered COMPAQ personal computers will run the new MS OS/2 operating system, allowing you to directly access up to 16 megabytes of memory. And they'll run all the applications developed for OS/2™. Again, much faster.

We don't burn bridges, we build them

At Compaq, advances are measured by our ability to push technology forward, without leaving you behind.

The new MS OS/2 operating system will run on all 80286- and 80386-based COMPAQ personal computers.

COMPAQ computers let you incorporate developing technology, and take advantage of the latest technology in a way that's fully compatible with the hardware, software and add-ons you already own. So Compaq protects your investment.

These are all reasons why recent surveys show COMPAQ owners are the most satisfied personal computer users.

Call 1-800-231-0900, operator 39, for information and the location of your nearest Authorized COMPAQ Computer Dealer. In Canada, call 416-449-8741.

COMPAQ®

Routines for Rent

Steve Lyons

Looking forward to the oomph promised by OS/2-based software, but tired of the wait? Application program interfaces enable old DOS applications to be souped up with features and power typical of the new software generation.

Bob Keller

Microsoft's OS/2 is coming. The IBM Presentation Manager is coming. Big new applications that will take advantage of multitasking and larger memory addressing capability are on the horizon. Clearly, microcomputer software is about to cross a generational boundary.

But the old order isn't fading away. DOS 2.*xx* and 3.*xx* applications are alive and well and running on 10 million machines. Microsoft vice president of systems Steve Ballmer reports that his company will continue to support and enhance DOS 3.*xx* for the foreseeable future.

So application software vendors face an interesting challenge. They must prepare to design the OS/2 programs that will take us into the era of multitasking work-group computing, but they can't ignore the single-tasking, mostly stand-alone world of DOS 3.*xx*. After all, the future will be financed by today's sales, so vendors need to keep extending, enhancing, and otherwise spiffing up the current product line even as they explore the new frontiers of OS/2.

The Trend Toward Softer Software

The maturing DOS 3.*xx* marketplace is replete with applications in nearly all major categories—and staying competitive isn't easy. Some vendors have tried to keep up by going after specific kinds of users, either with vertical market products or generic offerings jazzed up with job-specific features. For example, *WordPerfect 4.2*'s line-numbering capability was added primarily for the benefit of the legal community.

Other vendors have discovered an even more effective way to broaden their products' marketing reach while at the same time responding to the increasingly specialized needs of individuals. By adding application program interfaces (APIs) to generic products—spreadsheets, data base managers, and integrated programs—publishers have been able to extend those products' life spans, reach new classes of users, and still achieve a level of power usually found only in narrowly targeted applications. In fact, the addition of APIs to established applications has become one of the major software trends of 1987.

The Year of the API

What exactly is an API? Essentially, it's a set of programming links in an off-the-shelf application that enables a commercial or in-house corporate developer to attach add-in programs that supplement the original (for an example, see the sidebar "API: More Power to You"). The API's set of routines defines the way an add-in program ties into the host.

An application's API also provides services to an add-in program in the same way that DOS lends a hand to applications. For example, DOS writes files to disk, captures keyboard input, and displays output, relieving application developers of the need to duplicate that code in their programs. This capability transforms DOS from a simple set of file management utilities into an environment in which all manner of application wildlife can flourish and interact.

Similarly, an API can channel some of an application's basic routines to the add-in. The latter might be a homegrown, special-purpose program designed for use only within a given company; a program tailored by a consultant or value-added reseller (VAR) for a particular class of users; or a general-purpose commercial product.

In all cases, the product with the API becomes a host, or environment, for new applications–something akin to system software. The add-in code actually becomes part of the API-equipped application.

Thus, APIs provide developers with numerous benefits. One advantage is the ability to call routines and functions already resident in the host application, saving both memory overhead and disk storage space. That capability leverages the programmer's resources, freeing him or her from the drudgery of duplicating the application's standard routines and allowing more time to focus on code that will increase the add-in's functionality.

APIs may also prove to be the solution to the increasing number of conflicts among TSR programs over access to memory and keystrokes.

In the same way, the add-in publisher gains a certain amount of sales and marketing leverage by riding the bandwagon of the better-known and usually well-established host application. And the established vendor won't complain if someone wants to add value that will extend the life of its best-seller.

Finally, the customers of both companies benefit because the host application and add-in are closely tied. The user doesn't need to learn new commands or deal with a foreign interface, which reduces training time and the cost of software support.

Although a relatively new phenomenon, APIs are beginning to fall into three major types. Some are retrofitted to long-standing popular applications like Lotus's *1-2-3* or Ashton-Tate's *Framework II*. Some are added to the cores of background utilities like Borland's *SideKick Plus*, generally known as TSR (terminate and stay resident) programs. Others are laid down in the foundations of the new and more powerful generation of 80386-based applications like Migent's 32-bit data base engine, *Emerald Bay*.

Lotus Leads the Way

The first and best-known example of this new software genre came from Lotus last December. *Lotus Developer Tools* facilitates the creation of add-in programs for *1-2-3* release 2 and *Symphony 1.1*, as well as custom @ functions for *1-2-3*. Originally designed for third-party commercial software houses, VARs, and consultants, *Lotus Developer Tools* also has been taken up by the in-house programming teams of large corporations. The earliest commercial add-ins have primarily been word processors–*4Word* (Turner-Hall Publishing), *Write-in* (Blossom Software), *Plus-Words* (Amazon Systems), and *InWord* (Funk Software) (see "Letters From Cell A17" in this issue).

Lotus offers versions for both C and assembly language, each with separate disks for *1-2-3* and *Symphony*. Included are sample add-in programs, files of useful macros and *equates* (predefined constants that make programs more readable and easier to modify), a library of procedures for linking up with the host environment, and a program *skeleton* that a developer can use to build add-in programs. The skeleton ensures that the developer will follow the format that *1-2-3* or *Symphony* requires.

A Framework Stretcher From Ashton-Tate

Lotus wasn't alone in the API market for long. Ashton-Tate brought out the *Framework II Developer's Toolkit* in February. The product extends the integrated package's built-in programming language, FRED, by allowing developers to attach their own assembly or C routines.

Ashton-Tate spokesman David McLoughlin reports that this "low-level" programming interface existed in FRED from the beginning but was undocumented. Ashton-Tate's own developers used it to create, among other things, *Framework II*'s routines for importing and exporting files between *Framework II* and other programs. But it wasn't until Ashton-Tate began getting calls from corporate developers trying

to make FRED do things not in the documentation that the company decided to bring its API out of the closet.

The *Framework II Developer's Toolkit* lets users speed up FRED applications, access devices that are not otherwise supported by *Framework II* (bar-code readers, for example), create new file import/export subroutines, and even attach full-blown non-*Framework II* applications. A developer who creates a project management system in C could, with the help of the *Developer's Toolkit,* achieve seamless integration of that system with *Framework II*'s spreadsheet and telecommunications modules.

Operating Systems for Pop-Ups

APIs may also prove to be the solution to the increasing number of conflicts among TSR programs over access to memory and keystrokes. Many of these programs–mostly desktop accessories–are incompatible with one another. And now that users are loading more and more TSRs into memory, "RAMcram"–bumping up against the current 640K RAM barrier–is becoming a problem. An API can provide a single interface to sort out the conflicts.

Lotus's *Metro* desktop organizer is one of the programs that will let developers write to its API, although the necessary developer tool kit won't be available until sometime in the fourth quarter of 1987. One of *Metro*'s advantages is that it's already centrally managed. Its array of accessories–phone book, notepad, calculator, timer, and appointment calendar, to name just a few–are linked to a TSR *kernel.* This nucleus provides the keyboard, screen, menu, and memory services used by the various accessories. Thus, it lets users pass information between accessories or between accessories and other applications. It's also possible to design macros that perform complex sequences with or without user input and with or without conditional branching (see "Metro Traffic Control," *PCW,* June 1987).

The kernel in *Metro*'s current version has slots for 46 accessories, but the program itself uses only 12. Lotus's *Express,* a desktop accessory designed to send and receive MCI Mail in background mode, takes up three of those slots, but there is still plenty of room for other programs (see "Shortcut to Data Sharing," *PCW,* July 1987). The forthcoming *Metro* developer tool kit will include a sample accessory and a set of C programming functions for creating accessories. "Developers will get everything that Lotus used to build the *Metro* accessories," promises product marketing manager Chris Noble.

Borland Follows Suit

Also scheduled for fall release is Borland International's *SideKick Plus,* which will resemble *Metro* in several important respects, although it may include more ambitious developer services. In fact, Borland is billing *SideKick Plus* as an operating system for TSRs. Developers who write their TSRs to the *SideKick Plus* API not only will enjoy freedom from RAMcram but also will obtain access to *SideKick Plus*'s native accessories and a passel of new kernel services.

Those native accessories will be much-expanded versions of the original *SideKick* modules. For example, *SideKick Plus* will feature greatly enhanced notepad functionality. Full outline capability is being added to the notepads so that comments can be attached to individual items in various accessory data files–the phone book, the appointment scheduler, or perhaps one of the accessories written for the *SideKick Plus* API. The kernel will offer such amenities as virtual memory management (swapping to expanded memory, extended memory, or hard disk), a custom menu system with hot keys for quick context switching, and window management with zoom capability.

The ability to call routines and functions resident in the host application frees the programmer from the drudgery of duplicating the application's standard routines.

API: More Power to You

How can APIs make a difference? By radically boosting the power of DOS applications. For example, a Toronto-based software firm named Alacritous has used the low-level application programming interface supplied in the *Framework II Developer's Toolkit* to build *Alacrity,* an expert system that may be the world's largest *Framework II* application.

Alacrity is a 12MB program that ties into *Framework II*'s API, enabling accountants, consultants, high-tech marketers, planners, financial analysts, credit officers, and others to develop and evaluate strategic business plans. Chairman Alistair Davidson claims that *Alacrity* offers functionality comparable to that of LISP systems running on dedicated artificial intelligence hardware. The program, whose name means *cheerful eagerness,* has "just the sort of qualities you want in a good assistant," says Davidson.

The system was written in *Framework*'s built-in programming language, FRED, augmented by a 3000-rule, forward-chaining expert system written in C. FRED processing loads user input into 11 *Framework II* spreadsheets, whose data is then funneled into the expert system. When necessary, *Alacrity* asks additional questions and then generates a 15-page report. The text of this report is fed back into *Framework II* word processing frames, where it can be further manipulated, read, and printed.

Alacrity started out as a 350-rule system entirely within *Framework* that took 15 minutes to run. But by assigning the expert functions to a separate program and bringing the resulting data back through the API, Alacritous has been able to expand

On the Surface of Emerald Bay

Yet another kind of API-optimized application is exemplified by the data base *engine* being developed for Migent by C. Wayne Ratliff (coauthor of *dBASE II* and its progeny). This product, code-named *Emerald Bay,* will sit on top of the operating system and connect to what Migent is calling *surfaces.* Surfaces present a familiar interface to the user but rely on the engine's routines to accomplish tasks. Such surfaces include *Emerald Bay*'s own data base administration and multiuser services as well as new products from developers, explains Migent CEO Carl Gritzmaker. Migent is soliciting products that will closely resemble many of today's popular applications but take advantage of *Emerald Bay*'s more powerful engine.

Naturally, Migent-developed surfaces–its *Enrich* application generator and its integrated *Ability* and *Ability Plus* programs–will be the first to run atop *Emerald Bay.* Other surfaces forthcoming from Migent include a report writer and a SQL (structured query language) module.

A Bridge to the Future

API-equipped applications of today are a step toward the OS/2-based programs of tomorrow. Like those to be developed under OS/2, they are bigger, fuller, and more efficient than current DOS applications. While they don't enjoy the time- and memory-

the system's rules to 3000 and cut processing time to 7 minutes.

"The tool kit has enabled us to build much larger, faster, and more complex models," concludes Davidson. *–B. K.*

Alacrity
Alacritous, Inc.
35 Church St. #301
Toronto, Ontario
M5E 1T3 Canada
416/362-5099
List price: $3750 (includes Framework II with FRED)
Requirements: 640K, 20MB hard disk, DOS 2.00 or later version, 8086-based processor, EMS or EEMS memory extension board recommended
Copy protected

Framework II Developer's Toolkit
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA 90502-1319
213/329-8000
List price: $149.95
Requirements: 512K (includes 320K for Framework II), two disk drives (hard disk recommended), DOS 2.00 or later version
Not copy protected

Lotus Developer Tools
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
800/345-1043, 617/577-8500
List price: $150
Requirements: 40K, two disk drives, DOS 2.00 or later version, 1-2-3 release 2 or later version or Symphony 1.0 or later version; Microsoft 8086/8088 Macro Assembler 3.0 or later version recommended
Not copy protected

saving benefits of memory-managed concurrency that OS/2 software will bring, they do gain some leverage by being able to communicate with each other in a tightly integrated fashion, even sharing common routines.

In that sense, the new application-specific APIs–as well as those in the *Windows* and *Desqview* operating environments–will provide developers with a direct bridge to the OS/2 generation. In fact, Borland's Philippe Kahn has predicted that modules written for the *SideKick Plus* API won't have to be changed significantly when the OS/2 version of *SideKick Plus* arrives. Microsoft's Bill Gates has been saying for years that *Windows* will be equally capable. It's only reasonable to assume that Lotus, Ashton-Tate, and other competitors will toe the same mark.

With this technology, even future applications under DOS 3.*xx* will be more open-ended, with plenty of room to turn into flexible, expandable engines. After all, users don't want to walk away from their considerable investments in products, data files, and training any more than vendors want to walk away from their installed base of users. With any luck, neither group will have to break with the past until both are ready.

Bob Keller is a freelance technology writer in Los Angeles.

From Ledger to Spreadsheet

Douglas Fraser

Moving data from an accounting package to a spreadsheet can be a dark, lonely job. With Computer Associates' EasyBusiness Systems, 1-2-3, and a third-party utility called DOS Exports, you can smooth the transition.

Charles E. Rundgren

Once you've played with a spreadsheet, there's no going back. Even though you depend on an accounting system's careful layering of financial detail to handle everyday chores, spreadsheet flexibility is too attractive to pass up at planning time. Yet having the best of both worlds isn't easy: Either you reenter the numbers or you grapple with data transfer.

The most common solution involves a translation utility. Usually, this is purchased separately; functions for customizing reports may sweeten the pot. Typically, such utilities cost about half as much as an individual accounting module and include several translation options: DIF, *1-2-3*, *dBASE*, and ASCII formats are the most common. Peachtree sells a $199 report and translation utility that retrieves data from the company's popular accounting modules. Dac Software offers *RePort Writer* for $39.95.

Among accounting packages, Computer Associates' *EasyBusiness Systems* shines as an adaptable, medium-priced package with superior reporting features. However, unlike recent programs such as *NewViews* (see "NewViews Breaks the Rules" in this issue), *EasyBusiness Systems* suffers from a shortage of spreadsheetlike analytical features.

To enhance the usefulness of this stalwart program, you can link the *EasyBusiness Systems* modules and Lotus's *1-2-3* release 1A using a third-party utility called *DOS Exports* from L&L Services.

DOS Exports costs $195 per *EasyBusiness* module or $495 for use with all five core accounting programs–*General Ledger, Accounts Payable, Accounts Receivable, Order Entry,* and *Inventory Control.* With *DOS Exports,* you can choose conversion to a number of data formats, including DIF, SYLK, *dBASE II* and *III, SuperCalc 3* and *4,* and *1-2-3* release 1A.

DOS Exports' file conversion routines output files only in *1-2-3* release 1A (.WKS) format. This shouldn't be a problem, because release 2 will read any release 1A file, convert it, and save it as release 2. However, in the unlikely event that you want to move release 2 (.WK1) files back into an *EasyBusiness Systems* package without first converting them back to .WKS format, L&L Services warns that your system may crash.

Easy to install and completely menu-driven, *DOS Exports* operates within *EasyBusiness,* extracts whatever range of items you specify, and can pull data from item profile or transaction files. Thus, you can move any part of your inventory records from *EasyBusiness* into a *1-2-3* worksheet.

Process Overview

Suppose you run a company called AWR, Incorporated, which sells a variety of sweets. You want to examine the cookie line–ten items–to see which sell best. Since no *EasyBusiness Inventory Control* package shows percentage of total sales for individual items, you'll have to transfer the raw data into *1-2-3* to get what you want.

Preparing the report entails three main steps. First, you create a *1-2-3* template and an empty "holding tank" worksheet to receive the raw data. Second, you use *DOS Exports* to select, extract, and

	A	B	C	D	E	F	G	H	I	J
1				UNITS			$			
2										
3			CURRENT		LAST	CURRENT		LAST		CURRENT
4	ITEM #	ITEM DESCRIPTION	MONTH	YTD	YEAR	MONTH	YTD	YEAR		MONTH
5										
6										
7	0064430	Fruit Oat Crunchies	300	3000	12000	750.00	7500.00	30000.00		24.2%
8	0064470	Chocolate Shortbread	80	380	920	800.00	3800.00	9200.00		6.5%
9	0064000	Country Biscuits	100	200	2000	1500.00	3000.00	30000.00		8.1%
10	0064400	Hazelnut Crunchies	80	800	1600	200.00	2000.00	4000.00		6.5%
11	0064340	Fruit Shrewsbury	175	875	2100	245.00	1225.00	2940.00		14.1%
12	0063500	Amaretto Pine Nuts	60	280	68000	255.00	1190.00	2890.00		4.8%
13	0063510	Chocolate Wafers	220	1100	2640	220.00	1100.00	2640.00		17.8%
14	0064330	Sultana Crunch	140	720	1720	196.00	1008.00	2408.00		11.3%
15	0065100	Yorkshire Bran Cake	24	100	240	216.00	900.00	2160.00		1.9%
16	0064510	Almond Wafers	60	260	620	90.00	390.00	930.00		4.8%
17										
18										
19										
20										
21										
22										
23										
24		TOTAL	1,239	7,715	91,840	4,472.00	22,113.00	87,168.00		
25										
26										
27										
28										
29										
30	\A	{GOTO}a7~/fcceICEXPORT~/dsg								

Figure 1: With inventory data in place and percentage of unit and dollar sales calculated, the 1-2-3 template becomes a valuable report.

convert the inventory data. Finally, you copy the exported data from the holding tank worksheet into the template you created and sort the data for presentation.

You'll need to consider the size of your inventory data files and build the template accordingly. Basically, *EasyBusiness Systems' Inventory Control* module recognizes up to 36 fields. Think of the fields as potential columns, but expand the number of columns in the template to allow for the several composite fields in *EasyBusiness* and your *1-2-3* calculations. *1-2-3* rows are essentially the number of inventory items you have, plus a few extra rows for headings and column totals. *1-2-3* permits 255 columns and 2048 rows.

Remember, though, that the more data categories and subtotals you have, the more difficult it is to ensure that everything ends up in the right place in the worksheet. *DOS Exports,* for example, places all records for a particular field in the same worksheet column; it won't separate inventory items by type.

Therefore, if you have more than one category of inventory item, you can either perform an extra sort on the data once it is within the *1-2-3* template, or–more simply–work with one kind of inventory item at a time.

Lotus 1-2-3 Setup

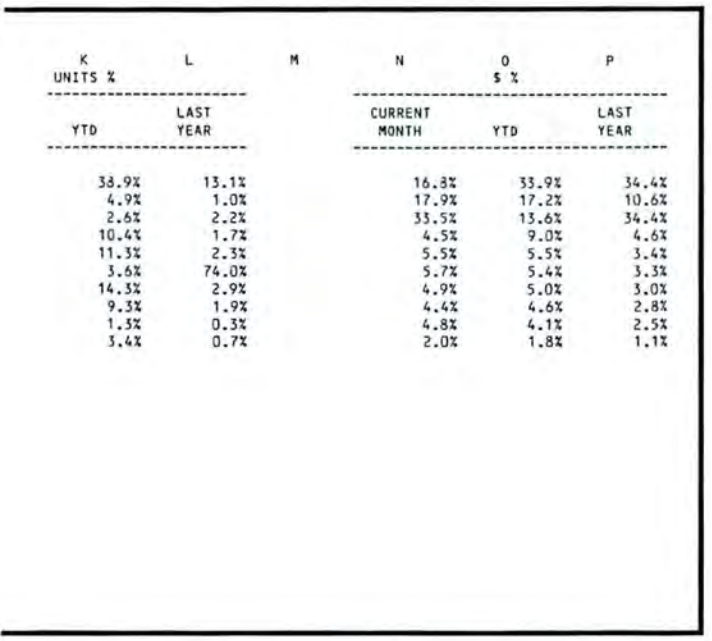
Before you can export data from your accounting package, you must have an existing worksheet named and waiting in the *EasyBusiness Systems* data file directory. In fact, you should have two worksheets: One is the report template itself; the other is an empty worksheet–necessary because dumping the data directly into the template erases all column headings and cell formulas.

To create the empty worksheet, simply issue the */Worksheet Erase Yes* command and save it in the *EasyBusiness Systems* data file directory with the file name ICEXPORT. This establishes a *1-2-3* worksheet file with the name ICEXPORT.WKS.

Next, create the report template shown in Figure 1. Of course, it has to be large enough to hold all the data you export. It is best to make it somewhat larger than needed so you can export additional data in the future without redesigning the template.

You'll export the data from two individual fields in the inventory master file–item number and item description–and from two composite fields holding transaction history for unit and dollar sales. Since the composite fields hold figures for the current month, the year to date, and the previous year, they will be broken out into separate *1-2-3* columns–for a total of eight data columns.

You must know the length of character fields for your exported items to specify column width for the template. The default column width in a blank worksheet is 9 characters. If you change the default



K	L	M	N	O	P
UNITS %			$ %		
YTD	LAST YEAR		CURRENT MONTH	YTD	LAST YEAR
38.9%	13.1%		16.8%	33.9%	34.4%
4.9%	1.0%		17.9%	17.2%	10.6%
2.6%	2.2%		33.5%	13.6%	34.4%
10.4%	1.7%		4.5%	9.0%	4.6%
11.3%	2.3%		5.5%	5.5%	3.4%
3.6%	74.0%		5.7%	5.4%	3.3%
14.3%	2.9%		4.9%	5.0%	3.0%
9.3%	1.9%		4.4%	4.6%	2.8%
1.3%	0.3%		4.8%	4.1%	2.5%
3.4%	0.7%		2.0%	1.8%	1.1%

to 12 characters, it will accommodate all field selections in this example except one. Set the default at 12 with */Worksheet Global Column-Width*, type **12**, and press **< Enter >**.

Since the second field in the example is item description and can hold up to 25 characters, set the width of column B to 25. Place the cell pointer in column B, issue */Worksheet Column-Width Set*, type **25**, and press **< Enter >**.

Now you're ready to assign column headings. Note that Figure 1 reflects a finished worksheet that includes the separator columns you'll add after the totaling rows are established. Therefore, some of the column labels may not match Figure 1 until all steps have been carried out.

All the column headings are centered labels, so issue the command */Worksheet Global Label-Prefix Center*. Now perform the following instructions to set up the worksheet's headings quickly. Go to cell D1, type **UNITS**, press **< Enter >**, press **< CursorRight >** three times to go to cell G1, type **^$**, and press **< Enter >**. Press **< F5 >** (the [GOTO] key) and type **C2 < Enter >** to go to cell C2, type \-, and press **< Enter >** to fill the cell with dashes. Issue */Copy* and type **< Enter >**. **< CursorRight > < CursorRight > < Enter >** (don't forget the period that anchors the cursor, and don't touch the <Space> bar).

Now issue */Copy* again, press **< Enter >**, and type **A5.E5 < Enter >**. Go to the appropriate cells and enter the labels for A4 through E4, E3, and C3 as shown in Figure 1.

Issue */Copy* and type **C2.E5 < Enter > F2 < Enter >**. Issue */Copy* again and type **C1.H5 < Enter > I1 < Enter >**. *1-2-3* reproduces the column headings beginning at column I. Now add percent signs to the titles in J1 and M1: Press **< F5 >** and type **J1 < Enter >** to place the pointer on J1; then press **< F2 >** followed by **< Space > %** and **< Enter >**. Follow the same procedure for M1.

Next, you need to create formulas to total the unit and dollar sales amounts in columns C through H and the percentages in columns I through N. To know where to place the total, you must know how many inventory items you will export. Since you're working with 10 items, you need at least 10 rows between the column headings and the total cell. You should also skip a row for readability; since the last column heading was in row 5, start in row 7. It's a good idea to give yourself room for growth (say, 5 items' worth), so add 5 spare rows. Thus, the total cannot be above row 22 (row 7 plus 10 current inventory items plus room for 5 more).

Press **< F5 >** and type **C22 < Enter >** to place the pointer on cell C22; then type \- **< Enter >**. Leaving C23 blank for readability, move the pointer down two rows to cell C24. Type in the formula **@SUM(C7.C21)** and press **< Enter >**. Move the pointer down to cell C25 and place repeating equal signs (to produce a double underline) beneath the total in the cell by typing \= and pressing **< Enter >**.

The next step is to copy the repeating dashes, total formula, and repeating equal signs from the cells in column C to those in columns D through N. Place the pointer on cell C22, issue */Copy*, type **< End > < CursorDown > < CursorDown >**, highlighting cells C22 through C25, and press **< Enter >**. Then type **D22.N22** and press **< Enter >**.

To format the unit totals for current month, YTD, and last year, issue the command */Range Format* and type **,0 < Enter > C24.E24 < Enter >**. The values will be displayed with commas between thousands and no decimal places. Formatting the three periods' total dollar sales to display commas and two decimal places is quite similar: Issue */Range Format* and type **,2 < Enter > F24.H24 < Enter >**.

In cell B24, type **'TOTAL** and press **< Enter >** to label row 24. Then press **< F5 >** and type **I1 < Enter >** to place the pointer in column I, and issue the command */Worksheet Insert Column* and press **< Enter >**

to insert a blank column between the exported data and the percentage computation ranges. Issue */File Save* and type **INVENTRY < Enter >** to save your work thus far.

All the values under the headings UNITS % and $ % need to be displayed as percentages with one decimal place. Issue the command */Range Format Percent* and type **1 < Enter > J7.024 < Enter >** .

The unit percentage of a given inventory item for any period is the ratio of the total number of those items (for example, 300 Fruit Oat Crunchies in the current month) divided by the total number of all inventory items (line 24) sold during the period (in this case, 1239). Likewise, the dollar percentage of a given inventory item for any period is the ratio of the total dollar income of those items divided by the total dollar income of all inventory items sold during the period. Go to cell J7 (**< F5 > J7 < Enter >**) and type **+ C7/C$24 < Enter >** . (Ignore the 'ERR'; it appears because there isn't a value in C7 yet.) Copy this formula to the rest of units percent and dollar percent ranges by issuing */Copy* and typing **< Enter > J7.O16 < Enter >** . The dollar sign in this simple ratio formula denotes an absolute reference to row 24—*1-2-3* does not adjust that row reference when you copy the formula to other rows, as it does for relative references (those not preceded by the dollar sign).

Now you're ready to insert a blank space at column M to separate the unit and dollar percentage computations. Move the pointer right to column M and issue the command */Worksheet Insert Column* followed by **< Enter >** . You now have two blank columns, and your column headings should match those in Figure 1. Finally, you need to set the parameters that will sort the data in order of dollar sales. Issue the command */Data Sort Data-Range* and type **A7.H21 < Enter >** to identify the data range you want to sort. Select *Primary-Key* to set the field on which to sort. It makes sense to sort the data in order of year-to-date sales, so type **G7** and press **< Enter >** . When queried whether to sort in ascending or descending order, type **d < Enter >** to accept the response of descending. Then select *Quit*.

Save the template with */File Save* **< Enter >** *Replace /Quit Yes*. This completes the design of the *1-2-3* template.

Doing the DOS Export

DOS Exports comes on two or three disks, depending on how many modules you'll export data from. Two hold program files, and the other contains exchange formats for *SuperCalc 4, 1-2-3, dBASE III,* and so on. Running *DOS Exports* on a floppy system may be possible but is not recommended because of all the disk switching it entails.

Change to the root directory and install *DOS Exports* by placing the system disks in the floppy drive and typing **A:INSTALL EU C:**—assuming your hard disk drive is the C: drive. Then do the same with the Exchange Formats disk.

To access *DOS Exports*, first start *EasyBusiness Systems* by typing **START IC C:**. At the Systems Functions menu, select **4** to change the Application Selector, type in **EU**, and press **< Enter >** . Now press **1** to select the first menu option, Proceed to Initialization; you should find yourself at the EasyUpgrades System menu.

DOS Exports is completely menu-driven. From each menu, you press <Esc> to signal that you are done selecting from the available menu options. Pressing <Enter> advances you to the next menu. When you arrive at the EasyUpgrades Master menu, select **4** to call up *Inventory Control.*

The EBS I/C EasyUpgrades menu is next. From here, select *DOS Exports* by typing **2.** The next menu lists the files you can export from the *Inventory Control* module. These include the item master, purchase order, receipts, and shipments files. Press **1** to select the I/C Item Master File. This file contains data for each inventory item.

The I/C Item Master File Field Selection menu lists 36 fields you can export. You will select two fields—Item Number and Item Description—and two composite fields containing a total of six sets of figures—PTD, YTD, LY Units, and PTD, YTD, LY Amt. The default option is Y, meaning yes, export the data. Therefore, you must change the option to N for the 32 data fields you do *not* want to export.

Unfortunately, *DOS Exports* does not record this change when you exit the program. So you have to go through all 36 data fields each time you export data from the item master file. A system for recording the last sequence would be a welcome addition.

Press **< Esc > < Enter >** to go to the next menu, the I/C Export Menu—Part II. Here you indicate the range of inventory items to export. For this example, type **0063500 < Enter >** and **0065100** to specify the range

of inventory part numbers. (You would press <Enter> twice if you wanted to export the data for all inventory items.) Press **< Esc >** **< Enter >** to go to the next menu.

The I/C Export Menu–Part III, provides a default file name: C:ICEXPORT.AWR. Since you're moving the data into an existing, empty *1-2-3* worksheet file, change the file name extension by pressing **< CursorRight >** until the pointer is under the A in the .AWR extension. Then type **WKS** over the extension and press **< Enter >** twice.

You'll be prompted for the format code and given space for three characters. Type **123** and press **< Enter >**. To actually export the data, simply press **< Enter >** when prompted to 'empty'. A status box at the bottom of the screen flashes the number of records processed and their names. Processing speed for this operation depends on the number of items and how much information you've asked for on each. To exit *DOS Exports*, simply press **< Esc >** until you've backed out to the *EasyBusiness* logo screen, which you can leave by pressing **< Enter >**.

Sort and Report

Go back into *1-2-3*, issue */File Directory*, type in the name of the drive and directory where you keep your *EasyBusiness Systems* data files, and press **< Enter >**. ICEXPORT.WKS now contains the exported data. INVENTRY.WKS contains the report template. Combining these two and sorting the data will produce the desired report.

First, retrieve the template by selecting */File Retrieve Inventry*, and press **< Enter >**. Place the pointer on cell A7 to indicate the beginning of the actual item list. To bring the data from ICEXPORT to the template, issue */File Combine Copy Entire-File Icexport* and press **< Enter >**; this tells *1-2-3* to copy the exported file into the template. The data then pours into cells A7 through H16, and the percentage calculations are made.

Finally, sort the data by selecting */Data Sort Go*. The data is now arranged from the inventory item with the greatest dollar amount of year-to-date sales to the item with the lowest amount. Issue **Quit** to exit from the data sort submenu.

Exporting data involves little effort once you design the template. Of course, you can reduce this effort even further by designing a *1-2-3* macro to combine the files and sort the data. For example, in cell B30 type **{GOTO}A7 ~/fccelCEXPORT ~/dsg < Enter >**. Then, in cell A30, type **'\A < Enter >** to name the macro. With the pointer on cell A30, issue */Range Name Labels Right* and press **< Enter >**. Invoke the macro by pressing **< Alt > -A**. Presto! You combine the files and sort the data with one keystroke.

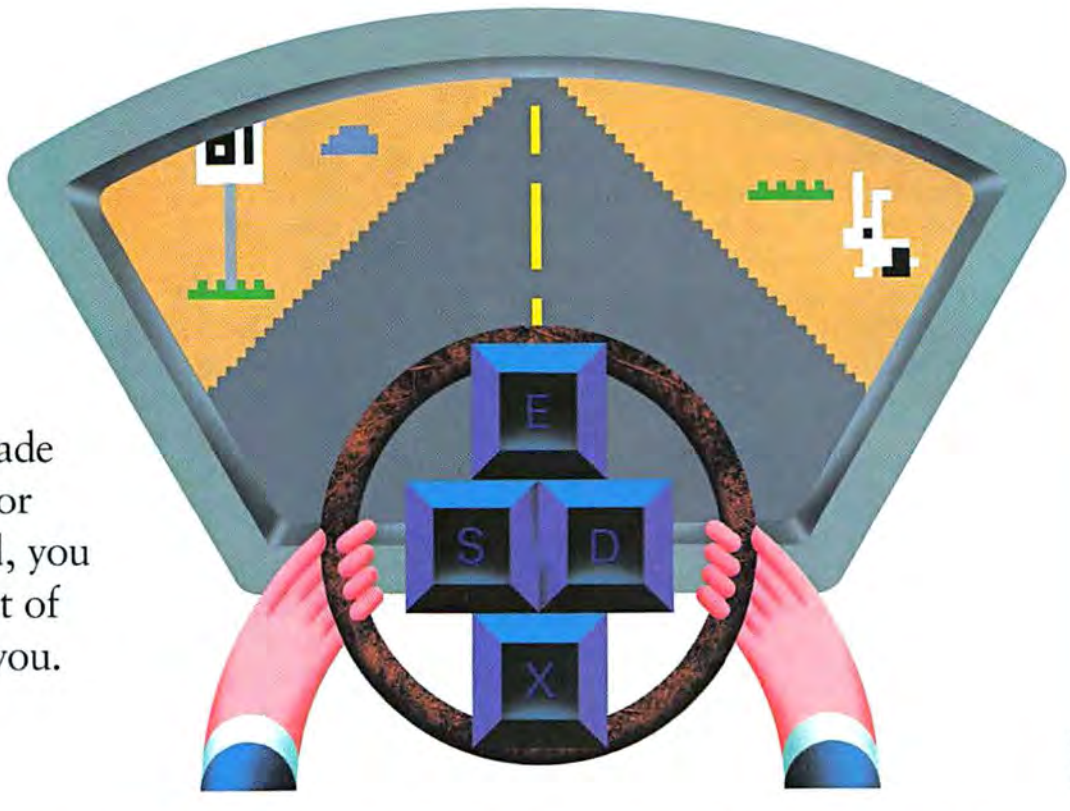
Now that the template is created, you can reuse it any time you want to examine a group of inventory items for their sales performance. And you've achieved the best of both worlds by accumulating reliable accounting data and analyzing it for a particular purpose–not a bad deal for $195 and an hour's effort.

Charles E. Rundgren is a CPA and consultant in the Orange County, California, office of Deloitte Haskins & Sells, a Big Eight accounting firm.

EasyBusiness Inventory Control and Analysis 4.1A
Computer Associates Int'l
Micro Products Division
2195 Fortune Dr.
San Jose, CA 95131
408/942-1727
List price: $595
Requirements: 128K, hard disk recommended

EasyUpgrades DOS Exports 4.01
L&L Services, Inc.
882-D N. Route 73
P.O. Box 346
Marlton, NJ 08053
609/983-4477
List price: $195 per module, $495 for set of five
Requirements: hard disk recommended

Up From WordStar



José Cruz

When you upgrade to WordPerfect or Microsoft Word, you can take the best of WordStar with you.

George Beinhorn

All trades have their time-tested tools, and hammers and chisels the world over look much the same because of centuries of consensus. But the craft of processing words is in its infancy, its tool box filled with instruments we are still struggling to master, much less carry from job to job.

If you honed your skills on *WordStar* but recently moved–or were pushed–to *WordPerfect* or *Microsoft Word,* you may feel lost in an unfamiliar environment.

Take heart. By using a macro program such as *SuperKey, ProKey, SmartKey,* or *Keyworks* to reshape the new word processor, you can import many of the efficient editing conventions you learned in *WordStar.*

Circumstances Beyond Our Control Keys

There are plenty of good reasons for moving up in the word processing world. *Word* and *WordPerfect* offer document-oriented formatting, windows, built-in macro processors, laser printer support, and more. MicroPro is trying to reclaim the once-faithful with *WordStar 4.0* (see "Teaching WordStar New Tricks," *PCW,* May 1987), but for the many users who have moved on, it may be too late.

For all their talents, though, neither *WordPerfect* nor *Word* matches *WordStar* for sheer speed in entering and editing text. MicroPro chose *WordStar*'s decidedly non-mnemonic <Ctrl>-*key* commands and famed cursor-control diamond (E, S, D, X) because they were efficient. *WordStar*'s scheme is so sensible

that a number of highly successful programs have adopted it–among them *Framework, Turbo Pascal, SideKick,* and *PC-Write. WordStar* users can edit text–moving the cursor a word in either direction, deleting a word or a line–without their hands ever leaving the keyboard's home row. By contrast, even small edits in *Word* or *WordPerfect* call for an expedition.

In *WordPerfect* you must move your hand to the cursor keypad; press a cursor key, <Backspace>, or the <PgUp> or <PgDn> key (alone or in combination with <Ctrl>); then find your way back to the keyboard's home row. *Word*'s mouse support makes major document overhaul impressively easy, but for those hundreds of little everyday edits, you're at a disadvantage–unless you do it *WordStar*'s way.

Retooling the Modern Word Processor

The macros provided here are limited to text editing and cursor movement; they don't change menu selections, for example (see Figure 1). Nor are they a Lazarus-like resurrection of *WordStar* in all its faded glory. There are no two-character commands like *WordStar*'s <Ctrl>-QR. Moreover, *Word, WordPerfect,* and macro processors have their own quirks and limitations, and accommodating them sometimes involves compromise.

Besides, a wholesale key swap can be counterproductive. It's wise to leave unaltered those keys that don't have direct editing duties. In *WordPerfect*, for example, <Ctrl>-J means "carriage return plus line feed," and <Ctrl>-I is a handy duplicate of the <Tab> key.

Although many new *Word* users think the program is heavily mouse-biased, it has more than 120 keyboard commands, not counting menu commands accessed with <Esc>. Even rookies soon realize that the mouse and the keyboard have their own domains: The mouse is best for quickly scrolling through text, highlighting and moving a number of blocks, and opening windows; keyboard commands are much more efficient for sentence, line, and paragraph edits. As it turns out, *Word* uses only a few <Ctrl>-*key* combinations–a situation that begs for a set of *WordStar*-style <Ctrl>-*key* macros. However, you won't find *WordStar*-style cursor keys much help while you navigate *Word*'s command menus, since *Word* uses <Tab>, <Space>, and <Backspace> for menu command selections.

Because *WordPerfect* has its own macro generator, you might be tempted to clone a set of *WordStar*-style editing keys within the main program. But *WordPerfect* can create only named macros (such as MovBlock) or macros invoked with an <Alt>-*key* combination, which requires an awkward stretch of the pinkie. You should really turn to a commercial macro program with the power to do the job right.

Macro See, Macro Do

There are two ways to create macros. You can invoke a macro processor's record mode, select key assignments, and start typing. Or you can take the approach suggested here: Direct the macro processor to read an ASCII file holding the macros you want to use.

If you honed your skills on WordStar *but recently moved–or were pushed–to* WordPerfect *or* Microsoft Word, *you may feel lost in an unfamiliar environment.*

Find the macro listing that corresponds to the word processor and macro generator pair you use (see the sidebars "SuperKey Macros" and "ProKey Macros"). With your word processor, open a document, and type in the listing. If you are a *SmartKey* or *Keyworks* user, enter the *ProKey* listings, then convert them with the utilities supplied with your macro program. Since all the *SuperKey* macros start with '<BEGDEF><Ctrl', you can save typing time by creating a *SuperKey* macro that enters this phrase for you.

When you finish entering the listing, save it as an ASCII file. With *WordPerfect*, use the Text In/Out function (<Ctrl>-<F5> 1 *file name* <Enter>). Within *Word*, press <Esc> Transfer Save, enter a file name at the prompt, press <Tab> and <Space> to select 'no' in the 'formatted:' field, then press <Enter> to complete the process. To minimize confusion, call the *SuperKey* macros for *WordPerfect* WPERKEYS.MAC and call the macros for *Word* WORDKEYS.MAC. Then save the file to the disk or directory where the macro processor looks for its macro files.

Figure 1: A garland of WordStar commands for Microsoft Word and WordPerfect. Enter and run the appropriate macro listing, and the following <Ctrl>-key assignments will take effect.

Ctrl-D	Moves cursor right one character
Ctrl-S	Moves cursor left one character
Ctrl-E	Moves cursor up one line
Ctrl-X	Moves cursor down one line
Ctrl-F	Moves cursor right one word
Ctrl-A	Moves cursor left one word
Ctrl-K	Moves cursor to beginning of line
Ctrl-O	Moves cursor to end of line
Ctrl-T	Deletes word to right of cursor
Ctrl-L	Deletes word to left of cursor (not a WordStar command)
Ctrl-Q	Deletes to end of line
Ctrl-Y	Deletes line
Ctrl-G	Deletes character at cursor
Ctrl-H	Deletes character to left of cursor
Ctrl-C	Scrolls down one screen
Ctrl-R	Scrolls up one screen

Customizing Caveats

Before you start transforming your word processor, consider its design and its inherent differences from *WordStar*. Because of the way *Word* moves the cursor, for example, the new commands <Ctrl>-F (move right one word) and <Ctrl>-A (move left one word) will politely stop at punctuation marks that *WordStar* ignores; you have to tap the keys more often to keep the cursor moving. And when you assign *Word*'s <F7> <Del> command sequence (delete left word) to the new (non-*WordStar*) <Ctrl>-L macro, remember to use it carefully. <Ctrl>-L deletes both spaces and punctuation marks, which can leave the cursor in the middle of what used to be two words; press <Ctrl>-L again and you'll zap both words.

Remember, too, the macro that moves the cursor one word at a time also instructs *Word* to highlight each word before moving on. The result is that the cursor bumps along like a caterpillar with a wooden leg–a sensation *WordStar* purists may find hard to get used to.

Macro Limits

Like most macro programs, *SuperKey* and *ProKey* can't accommodate *WordStar*'s two-character <Ctrl>-*key* commands, so you must boil down the pair to a single, easily remembered letter. For example, *WordStar*'s very useful <Ctrl>-QY could become <Ctrl>-Q.

Keyworks version 3.0, however, breaks this convention and allows

SuperKey Macros for Word and WordPerfect

Create the following macros as ASCII files. To make them distinctive, call the *WordPerfect* macro listing WPERKEYS-.MAC (see Listing A), and the *Word* macros WORDKEYS.MAC (see Listing B).

To load the macros automatically whenever you run the word processor, enter one of the following lines in the batch file that loads your word processor: **KEY WPERKEYS.MAC/ML** or **KEY WORDKEYS.MAC/ML**

Select *SuperKey*'s Show Titles screen by typing <Alt>-/ C W to display macros in memory. –*G. B.*

```
<BEGDEF><CtrlD><TITLE>Cursor rgt 1 char<TITLE><Rgt><ENDDEF>
<BEGDEF><CtrlS><TITLE>Cursor lft 1 char<TITLE><Lft><ENDDEF>
<BEGDEF><CtrlE><TITLE>Cursor up 1 ln<TITLE><Up><ENDDEF>
<BEGDEF><CtrlX><TITLE>Cursor dn 1 ln<TITLE><Dn><ENDDEF>
<BEGDEF><CtrlF><TITLE>Cursor rgt 1 wd<TITLE><F8><F8><Lft><Rgt><ENDDEF>
<BEGDEF><CtrlA><TITLE>Cursor lgt 1 wd<TITLE><F7><Lft><Rgt><ENDDEF>
<BEGDEF><CtrlK><TITLE>Lft end of ln<TITLE><Home><ENDDEF>
<BEGDEF><CtrlO><TITLE>Rgt end of ln<TITLE><End><ENDDEF>
<BEGDEF><CtrlT><TITLE>Delete wd rgt<TITLE><F8><Del><ENDDEF>
<BEGDEF><CtrlL><TITLE>Delete wd lft<TITLE><F7><Del><ENDDEF>
<BEGDEF><CtrlQ><TITLE>Delete ln rgt<TITLE><F6><End><Del><ENDDEF>
<BEGDEF><CtrlY><TITLE>Delete ln<TITLE><ShftF9><Del><ENDDEF>
<BEGDEF><CtrlG><TITLE>Delete char<TITLE><Del><ENDDEF>
<BEGDEF><CtrlH><TITLE>Delete char lft<TITLE><Lft><Del><ENDDEF>
<BEGDEF><CtrlC><TITLE>Screen dn<TITLE><PgDn><ENDDEF>
<BEGDEF><CtrlR><TITLE>Screen up<TITLE><PgUp><ENDDEF>
```

Listing A: SuperKey macros for WordPerfect (WPERKEYS.MAC)

```
<BEGDEF><CtrlD><TITLE>Cursor rgt 1 char<TITLE><Rgt><ENDDEF>
<BEGDEF><CtrlS><TITLE>Cursor lft 1 char<TITLE><Lft><ENDDEF>
<BEGDEF><CtrlE><TITLE>Cursor up 1 ln<TITLE><Up><ENDDEF>
<BEGDEF><CtrlX><TITLE>Cursor dn 1 ln<TITLE><Dn><ENDDEF>
<BEGDEF><CtrlF><TITLE>Cursor rgt 1 wd<TITLE><CtrlRgt><ENDDEF>
<BEGDEF><CtrlA><TITLE>Cursor lft 1 wd<TITLE><CtrlLft><ENDDEF>
<BEGDEF><CtrlK><TITLE>Lft end of ln<TITLE><Home><Lft><ENDDEF>
<BEGDEF><CtrlO><TITLE>Rgt end of ln<TITLE><Home><Rgt><ENDDEF>
<BEGDEF><CtrlT><TITLE>Delete wd rgt<TITLE><CtrlBks><ENDDEF>
<BEGDEF><CtrlL><TITLE>Delete wd lft<TITLE><CtrlLft><CtrlBks><ENDDEF>
<BEGDEF><CtrlQ><TITLE>Delete ln rgt<TITLE><CtrlEnd><ENDDEF>
<BEGDEF><CtrlY><TITLE>Delete ln<TITLE><Home><Lft><CtrlEnd><ENDDEF>
<BEGDEF><CtrlG><TITLE>Delete char<TITLE><Del><ENDDEF>
<BEGDEF><CtrlH><TITLE>Delete char lft<TITLE><Lft><Del><ENDDEF>
<BEGDEF><CtrlC><TITLE>Screen dn<TITLE><Pls><ENDDEF>
<BEGDEF><CtrlR><TITLE>Screen up<TITLE><Min><ENDDEF>
```

Listing B: SuperKey macros for Microsoft Word (WORDKEYS.MAC)

ProKey Macros for Word and WordPerfect

Type these macros with a word processor and save them in an ASCII file called WPERKEYS.PRO for *WordPerfect* or WORDKEYS.PRO for *Word* (see Listing C). To load the macros automatically, enter the following lines in the batch file that loads your word processor:

PKLOAD < Enter >
PROKEY PERWKEYS.PRO/R

(or **PKLOAD < Enter >**
PROKEY WORDKEYS.PRO/R)

To list the macros in memory, call up *ProKey*'s Dictionary by typing <Alt>-/ L. *ProKey* will display the Dictionary screen at start-up if you change the batch file command line to:

PROKEY < Enter >
WPERKEYS.PRO/R/[Alt/][L]

(or **PROKEY < Enter >**
WORDKEYS.PRO/R/[Alt/][L])

To use these macros with *Keyworks* or *SmartKey*, type the appropriate *ProKey* listing with your word processing program and save it as an ASCII file (WPERKEYS.PRO or WORDKEYS.PRO).

```
*Cursor right 1 character
<BEGDEF><CtrlD><Rgt><ENDDEF>
*Cursor left 1 character
<BEGDEF><CtrlS><Lft><ENDDEF>
*Cursor up 1 line
<BEGDEF><CtrlE><Up><ENDDEF>
*Cursor down 1 line
<BEGDEF><CtrlX><Dn><ENDDEF>
*Cursor right 1 word
<BEGDEF><CtrlF><CtrlRgt><ENDDEF>
*Cursor left 1 word
<BEGDEF><CtrlA><CtrlLft><ENDDEF>
*Left end of line
<BEGDEF><CtrlK><Home><Lft><ENDDEF>
*Right end of line
<BEGDEF><CtrlO><Home><Rgt><ENDDEF>
*Delete word right
<BEGDEF><CtrlT><CtrlBks><ENDDEF>
*Delete word left
<BEGDEF><CtrlL><CtrlLft><CtrlBks><ENDDEF>
*Delete line  right
<BEGDEF><CtrlQ><CtrlEnd><ENDDEF>
*Delete line
<BEGDEF><CtrlY><Home><Lft><CtrlEnd><ENDDEF>
*Delete character
<BEGDEF><CtrlG><Del><ENDDEF>
*Delete character left
<BEGDEF><CtrlH><Lft><Del><ENDDEF>
*Screen down
<BEGDEF><CtrlC><K+><ENDDEF>
*Screen up
<BEGDEF><CtrlR><K-><ENDDEF>
```

Listing C: ProKey macros for WordPerfect (WPERKEYS.PRO) and Word (WORDKEYS.PRO)

If you use *Keyworks*, convert the *ProKey* macro listings with the PK2KW utility supplied on the *Keyworks* program disk. PK2KW.COM isn't included with *Keyworks Advanced*, but Alpha Software will send it to registered owners on request.

To convert the *ProKey* listing to *SmartKey*'s .DTX format, use the PK2SK utility supplied on the *SmartKey* program disk. You can then auto-load the macro file by adding the following command to the batch file that loads your word processor: **SMARTKEY WPERKEYS.DTX** (or **SMARTKEY WORDKEYS.DTX**) –*G. B.*

you to create multikey "shorthand" macros that are executed when followed by a delimiter, such as a space, a comma, or the like. Thus you can name a macro QC and direct it to perform *WordPerfect*'s "move to end of file" sequence (<Home> <Home> <CursorDown>). But be careful when naming *Keyworks* shorthand macros. Although many of *WordStar*'s two-character commands read like Serbo-Croatian, some, such as KS (for save file and return), are also found in many common English words. It would be irksome to find yourself invoking a file-save every time you typed "wor*ks*," "truc*ks*," or "boo*ks*." (You probably never dreamed a letter pair like KX would be a blessing.)

ProKey also lets you use multicharacter macro names, but not as deftly as *Keyworks* does. To play back a graph-printing macro named Prgr, for example, you must press <Alt>-<comma> prgr <Enter> instead of just typing Prgr and a delimiter such as <Space>, as you would in *Keyworks*.

Keep in mind that a macro processor may affect screen display. For instance, running *SuperKey* with *Word* on an EGA-equipped color system may turn the screen reddish and scatter broken red lines at the top of the screen. The quickest way to banish these lines is to call up a *Word* help screen (<Alt>-H); the screen is redrawn and the unwanted visitors depart.

Finally, remember to keep macros in their place. If you switch between word processing programs, make sure you clear the macros out of memory before making the move. (In *SuperKey*, for example, choose Clear from the macro menu.) As noted earlier, give each set of macros a memorable file name so you don't load the wrong set by mistake.

Once customized with macros, Word *and* WordPerfect *are a delight, even to a surly ex-*WordStar *draftee.*

Direct Drive Word Processing

Once customized with macros, *Word* and *WordPerfect* are a delight, even to a surly ex-*WordStar* draftee. Fast editing with <Ctrl>-*key* commands gives the kind of feel that programmers call "direct drive," a hands-on sensation that makes software satisfying to use. By putting the macros to work, you win twice: Not only do *Word* and *WordPerfect* work more efficiently, but you gain the psychological boost of fitting the new tools to your hand.

George Beinhorn is a freelance editor and writer in North San Juan, California.

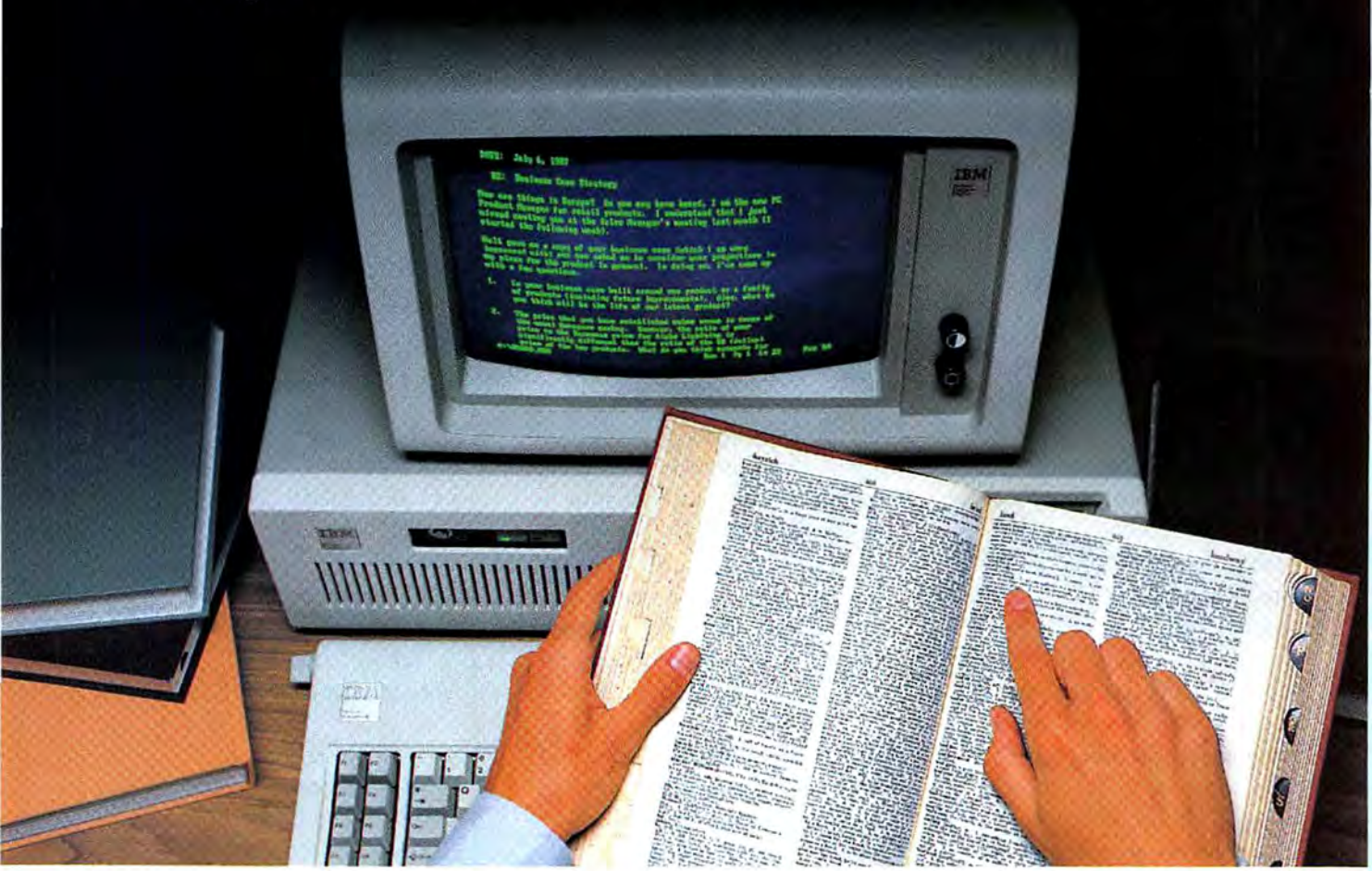
Keyworks version 3.0
Alpha Software Corp.
30 B St.
Burlington, MA 01803
617/229-2924
List price: $99
Requirements: 128K, DOS 2.00 or later version
Not copy protected

ProKey version 4.0
RoseSoft
P.O. Box 45880
Seattle, WA 98145
206/282-0454
List price: $129.95
Requirements: 96K, DOS 2.00 or later version
Not copy protected

SmartKey version 5.3
Software Research Technologies
2757 Wilshire Blvd. #211
Los Angeles, CA 90010
213/384-5430
List price: $59.95
Requirements: 96K, DOS 2.00 or later version
Not copy protected

SuperKey version 1.16a
Borland Int'l
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
408/438-8400
List price: $69.95
Requirements: 128K, DOS 2.00 or later version
Not copy protected

When you're at a loss for words, is your PC a dumb terminal?



Introducing abc•Word: a pop-up reference library for your word processor.

What happens when you're working fast and furious and you can't pinpoint the word you need? It's very likely that your PC gives you a blank stare and you walk fast—and furiously—to your bookshelf for a reference book. Then you waste time searching pages when you could be producing them.

With abc-Word™, you won't have to wear your fingers to the bone looking for words. abc-Word is a reference library software package for PCs that instantly calls up a dictionary, thesaurus, bilingual dictionaries, trade references or your own custom data base. And when you find the word you want, you can easily insert it into your document.

A true dictionary and thesaurus.

abc-Word's Proximity/Merriam-Webster Dictionary is a true dictionary, giving word definitions, usage notes, hyphenation points, abbreviations and parts of speech. And the Proximity/Merriam-Webster Thesaurus provides more than twice as many synonyms as most other electronic thesauruses.

Bilingual and specialized dictionaries.

You can add Collins' bilingual dictionaries that let you translate English words into French, German, Italian, Spanish or Portuguese. And you can even write your own reference works, so you can quickly look up customer lists, parts lists, or special terminology lists.

Ready Reference.

Finding the reference entry you want and inserting it into your document is as easy as lifting a finger. Once you find the right word, you can cut and paste it into your document in seconds. Clear, concise menus, detailed HELP screens and function keys prompted in every window keep you on course.

And abc-Word's pop-up windows with scrolling capabilities give you the flexibility of a book, with the speed and convenience of your word processor.

abc-Word works on any IBM/XT, AT or compatible computer with 512K memory and a hard disk. It's compatible with major software programs such as WordPerfect™, DisplayWrite™, MultiMate™ and WordStar™.

Give your PC a command of the language and put your reference books on the shelf. With the abc-Word reference library, it's finally possible to look it up without looking up. To start your own abc-Word reference library, contact your local software dealer or:

a.l.p. Systems
295 Chipeta Way
Salt Lake City, Utah 84108
1-800-354-5656
1-801-584-3000

Automated Language Processing Systems

Get more info. Go to Ad Index.

The Upgrade Path

Hands-on advice for upgrading PCs, compatibles, and peripherals

The XT more or less at Mach 10, slotless memory for the Equity I, a $195 almost-full-page monitor, and more

Robert Luhn

Fast-Track XT

After a breathless day of snail racing, running *Windows* on an XT is the most fun (legal or otherwise) a person can have. Of course, if you've got more pressing matters to attend to, you might sell that XT to raise cash for your favorite Central American cause or, better still, trade it in for an 80286-based system.

But for a measly $549 and a single full-length slot, you can add Microsoft's Mach 10 turbo board to your PC, XT, or Portable PC and glide through the most noxious computing tasks (see Table 1). You gain not only a 9.54/4.77-MHz 8086 microprocessor but also a mouse, a remote-control speed switch, a socket for a 10-MHz 8087, and *Microsoft Windows, Windows Paint,* and *Windows Write.* If you thought *Windows, PageMaker,* and other graphics-intensive programs were beyond your XT's reach, this PS/2-in-a-box will make you think again.

The Mach 10 installs like most other turbo boards. You pull out the system's 8088 and 8087 microprocessors, plug a special connector into the 8088's socket, and link the attached cable to the Mach 10 board sitting in a slot. Since Microsoft throws in a chip puller, all you need is a flat-blade

(continues)

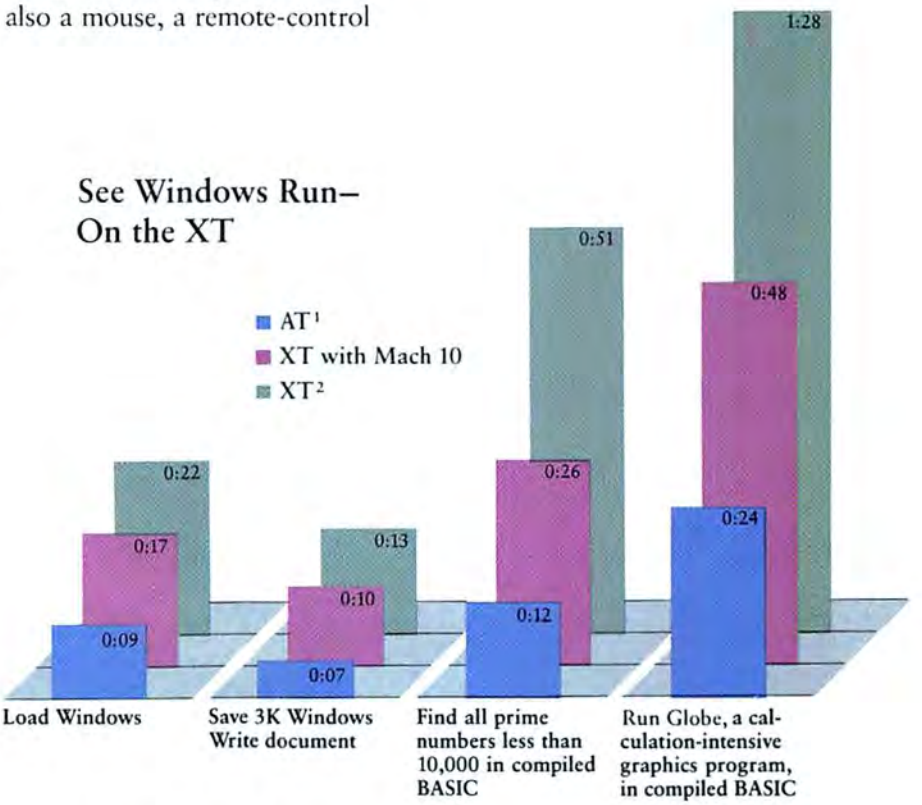


Figure 1: Drum your fingers no more! The Mach 10 can boost the XT's speed by nearly 50 percent. All times in minutes:seconds.

[1] Tests run on a 512K 8-MHz AT
[2] Tests run on a 640K IBM PC XT; Mach 10 run in 9.54-MHz turbo mode

The standard by which all other monitors are monitored.

MultiSync

So perfect a solution for business graphics it's become the best-selling color monitor.

Like most revolutionary products, the NEC MultiSync is based on a simple idea: Instead of one monitor for one board, why not have a single monitor compatible with all graphics boards. From CGA to PGC and beyond.

That simple idea has made MultiSync the world's best-selling color monitor and the undisputed industry standard.

MultiSync offers a maximum resolution of 800 x 560 for brilliant business graphics. And compatibility with old and new systems from PC/XT/AT to IBM PS/2 and Apple Mac II. It has a 14" diagonal screen, tilt/swivel base and 7-way text switch that lets you choose the color that's easiest on your eyes.

Best of all, it has one feature no one else can give you at any price: NEC. So why settle for monitors trying to equal the standard when you can have the one that created it. For literature or a dealer call 1-800-447-4700. For technical details call NEC Home Electronics (USA) Inc. 1-800-NEC-SOFT.

IBM, PC, XT and AT are registered trademarks of the International Business Machines Corporation.
Apple and Mac II are registered trademarks of Apple Computer, Inc.
NEC is a registered trademark of NEC Corporation.

C&C
Computers and Communications

NEC®

screwdriver for removing the XT's cover and installing the board.

Ground yourself properly and lay the Mach 10 on top of its antistatic bag. The Mach 10 is configured at the factory, but you will have to adjust jumpers if you want to add a 10-MHz 8087 to the board, initialize a built-in caching scheme, or use a mouse. Since a mouse is part of the deal, locate the A jumper block just a little above and to the left of the board's gold edge connector. The five pins on the block, labeled 2, 3, 4, 5, and 6 from left to right, allow you to assign an interrupt level to the mouse.

Flip to Appendix B on page 30 in the Mach 10 user manual and run your finger down the table that lists what pairs of pins *not* to cover based on the system configuration. Since the upgrade candidate in this example has a hard disk, a serial board, and an EGA, pins 5, 4, and 2 are off-limits. Slip the jumper off its current pins with your fingers and slide it down pair 3. If your system is so fully equipped that all pins are excluded (in other words, other devices have dibs on those interrupts), Microsoft suggests you put the jumper on pair 2. According to the company, the EGA assigned to this pin pair seldom requires the same interrupt the mouse uses.

Removing the XT's 8088 is a dicier proposition. Turn off the system, remove all external cables, and take off the hood. You'll find the 8088 cowering next to the power supply and keyboard connector at the back of the system. Remove any expansion boards that are in the way.

The Mach 10 is configured at the factory, but you will have to adjust jumpers if you want to add a 10-MHz 8087 to the board or initialize a built-in caching scheme.

Take the supplied chip puller and hook it around each end of the chip (*not* around the socket base). Rock the chip puller back and forth as you pull up; don't yank too briskly, or a broken 8088 may rocket past your ear. Keep two fingers on top of the chip as you pull and rock. Once the chip is free, put it in the protective foam that held the Mach 10.

If an 8087 is present, repeat this procedure. If the chip is obscured by the XT's stiff power cables, just mash them flush against the side of the power supply. Once the 8087 is removed and stowed away, you must set the XT's system switches to reflect its absence. Locate the DIP switch block just in front of the 8088 and 8087 sockets, and set switch 2 to the on position.

The next item of business is plugging the male end of the Mach 10 cable into the 8088 socket. With the ribbon cable extending to the left, carefully line up the pins in their appointed holes and press down evenly until the connector snaps into place. If the cable is a bit stiff, you can curl it, but don't twist or crease it.

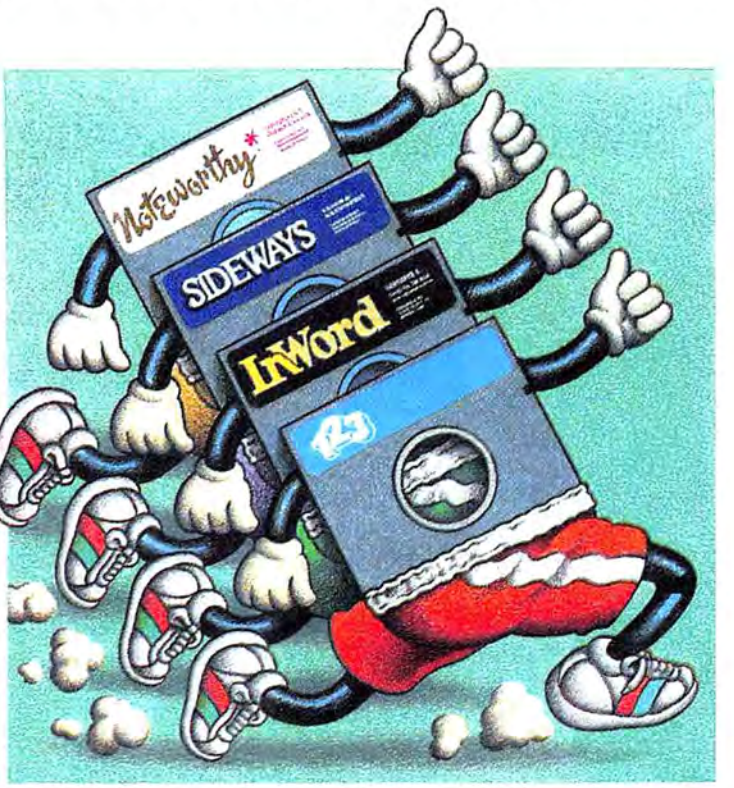
The user manual suggests that at this point you put the Mach 10 board in slot 3 so you can fold the cable out of the way. Unfortunately, this maneuver also requires you to relocate the floppy and hard disk controllers and feed their ribbon cables underneath the Mach 10. An alternate approach: Put the Mach 10 in slot 8 and let the ribbon cable drape across the other expansion boards in the system. Just make sure you don't snag the cable when you replace the XT's cover.

If you take the latter approach, rest the board on top of the slot, flip over the free end of the Mach 10 cable, and attach the beveled connector to the pins at the top of the board near the mounting bracket. Then push the board all the way into the slot. Attach the mouse and remote speed switch to the top and bottom ports, respectively, on the back of the Mach 10; then screw down the board's bracket and reassemble the system.

Installing the necessary mouse driver is a matter of copying a single file. If yours is a nonnetworked machine, you'll copy MOUSE.SYS to the hard disk's

(continues)

Funk's new 1-2-3 Performance Software



runs faster, runs easier, runs with 1-2-3.

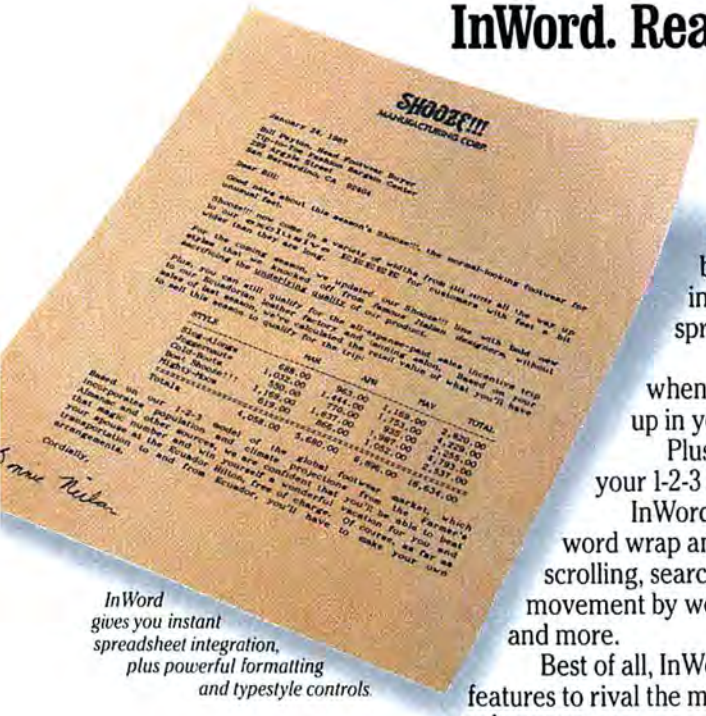
So why run around with anyone else?

It's no contest. Funk's 1-2-3® Performance Software helps improve your 1-2-3 productivity better than any other software you could possibly track down.

That's because each one is in perfect step with 1-2-3. With menus and commands like 1-2-3 itself. And with powerful functions and features that take up right where 1-2-3 leaves off.

So don't wait. Dash out to your favorite computer store and ask for them by name. Or order directly from Funk Software.

InWord. Real word processing that runs inside 1-2-3. No sweat.



InWord gives you instant spreadsheet integration, plus powerful formatting and typestyle controls.

Now this is what you call teamwork. 1-2-3 handles your numbers while InWord™ tackles your text.

InWord is the full-fledged, full-function word processor that runs right inside 1-2-3. So you can jump back and forth between your 1-2-3 worksheet and your InWord document instantly. Move some text into your spreadsheet. Move some spreadsheet into your text.

And create "live links" directly to data in your spreadsheet. So when you make a change on your spreadsheet, it automatically shows up in your document.

Plus, InWord zips right through mailmerge operations, straight from your 1-2-3 database. It's as easy as highlighting a range.

InWord keeps you moving at top speed, too. With features like automatic word wrap and paragraph reform, horizontal scrolling, search and replace, cut and paste, cursor movement by word, sentence or paragraph—and more.

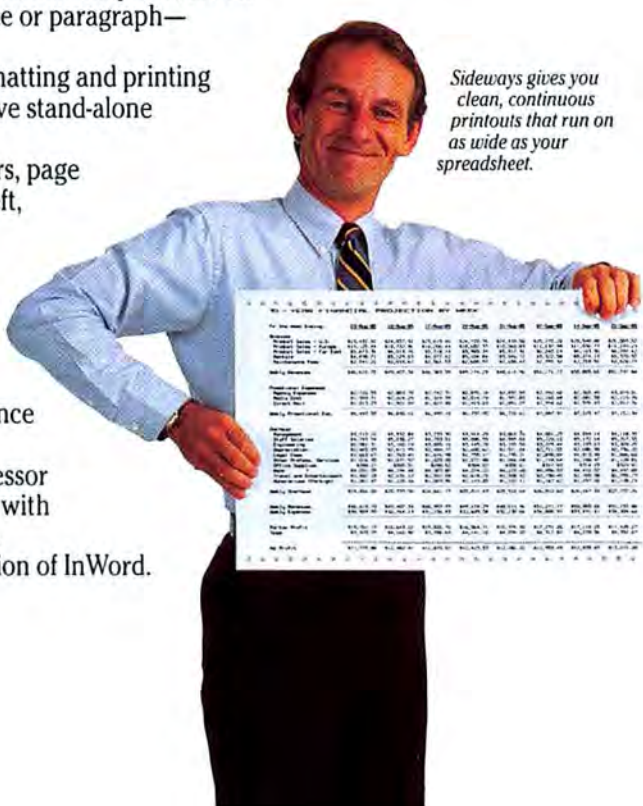
Best of all, InWord has formatting and printing features to rival the most expensive stand-alone word processors.

You can format your documents with headers, footers, page numbers, tab stops, indents, hanging indents, as well as left, right, center and full justification.

Plus, you can print with bold, underlined and italic text, and mix typefonts and pitch to your heart's content. And since InWord takes full advantage of all your printer's features, you'll be able to create professional printouts of both your text and spreadsheets, whether you have a 9-pin dot-matrix, or a high performance printer like the HP LaserJet.

So it's up to you. You can limp along with a word processor that wouldn't know a spreadsheet if it tripped over it—or with one that's weak on features and wobbly on performance.

Or go for the power, simplicity and full 1-2-3 integration of InWord. It's just $99.95. *(Requires 1-2-3 release 2)*



Sideways gives you clean, continuous printouts that run on as wide as your spreadsheet.

With Noteworthy, neither you nor others who use your spreadsheets need ever forget the true meaning of a cell.

Burdened with the details of your spreadsheets? Let Noteworthy jog your memory.

Stop running in circles trying to remember all the assumptions and relationships behind your 1-2-3 spreadsheet entries. Get Noteworthy.™ It never forgets.

Noteworthy is the professional annotation and documentation software made especially for 1-2-3. It's fast, convenient, and gives you a greater degree of integration with 1-2-3 than has ever been possible before.

Want to remember why you put what you put in a cell? Just hit the hot-key and up pops a blank note. Then type away using Noteworthy's powerful built-in editor.

Create single notes up to 8,000 characters long. Make as many notes as you need, in a window of any size you choose, positioned on the screen where you want. Copy text from your note to your spreadsheet. From your spreadsheet to your note. Or from one note to another.

Noteworthy even reminds you where you put your notes. Each time the cursor lands on an annotated cell, the note indicator lights up at the bottom of the screen.

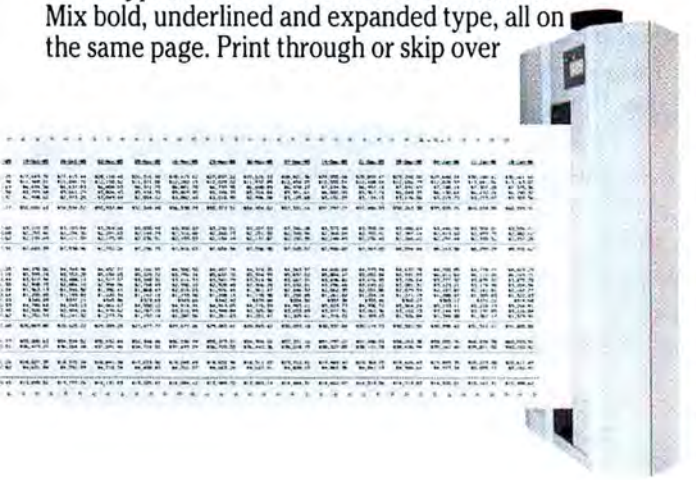
At just $79.95, Noteworthy is a giant step forward in spreadsheet management. *(Requires 1-2-3 release 2 or Symphony)*

Sideways. Making the world's favorite 1-2-3 printouts for four years running.

In the long run, there's no better way to get all the columns of your spreadsheet to print on one continuous page than with Sideways.® A fact that's helped make Sideways the most widely used printing utility of any kind in the history of personal computing.

Sideways turns text on its side as it prints. So no matter how many columns you put in your spreadsheet, you'll get a printout that goes the distance. Just highlight a range on your worksheet and go.

Plus, you'll be putting your best foot forward with printouts that really look great. Choose from nine different typefaces from "minuscule" to "mammoth". Mix bold, underlined and expanded type, all on the same page. Print through or skip over perforations. Add borders, change page size, adjust margins any way you like.



It's a fact. In the wide world of 1-2-3 spreadsheet printing, Sideways is number one. For just $69.95 a copy, why not get Sideways on your side? *(Works with all versions of 1-2-3 and Symphony, as well as other software)*

FUNK SOFT WARE

I want to run with the best!

Please rush me the following:

_____ copies of InWord at $99.95 each.
_____ copies of Noteworthy at $79.95 each.
_____ copies of Sideways at $69.95 each.

☐ My check is enclosed. Charge my ☐ Visa ☐ MasterCard

Account number _____ Exp. date _____

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

To order call 1-800-822-3865, Ext. 228
(617-497-6339, in MA)

Funk Software, 222 Third Street, Cambridge, MA 02142

© 1987 Funk Software. InWord and Noteworthy are trademarks of Funk Software. Sideways is a registered trademark of Funk Software.

root directory and add DEVICE=MOUSE.SYS to the system's CONFIG.SYS file. Restart the system, and you're ready to roll.

Keep in mind that the system always starts in normal (4.77-MHz) mode when the remote speed switch is attached. Once the system has plowed through internal diagnostics and loaded DOS, you can change speeds as you wish. However, since few programs have difficulty running at 9.54 MHz, you may want to forgo remote control and leave the speed toggle on the back of the board in the 9.54-MHz position.

Mach 10
Microsoft Corp.
16011 N.E. 36th Way
Box 97017
Redmond, WA 98073-9717
206/882-8080
List price: $399; with mouse and Windows $549
Requirements: PC, XT, or Portable PC

More Equity

Like the Little Tramp and the Kid, the clever PC and the little knockabout Epson printer seemed joined in permanent friendship. And for the first couple of reels, they were. But after years of capitalist camaraderie, Big Blue and Little Ep went their separate ways. IBM launched its own mildly popular printer line, while Epson sallied forth with the Equity I, a sturdy little PC work-alike for a then rock-bottom price of $1200 (give or take a yen). The Equity I came with dual-floppy disk drives, 256K of RAM, and built-in serial and parallel ports, all packed into a trim system unit complete with watt-saving CMOS circuitry.

CMOS machines like the Equity I have decided advantages: They use less power and are cooler, and can thus be smaller. Just remember to be careful about the internal devices you add. The Equity I is equipped with a 53-watt power supply, and Epson cautions users to upgrade their machines with either company-supplied CMOS products or energy-efficient third-party devices with modest power requirements.

However, you can throw such cautions to the wind if you want to boost the Equity I's memory contingent to 512K with an Essential Card from P.C. Computer Brokers. You install the 256K Essential Card by removing the Equity I's hood and slipping the 2-by-2-inch board into a special connector on the motherboard. No muss, no fuss, and you don't take up one of the Equity I's three slots.

Befitting its cut-rate origins, the Essential Card is packed in a Ziploc sandwich bag and accompanied by a single page of exceedingly terse installation instructions. Before you do anything else, pull out the Equity I operations guide and review the procedures for installing a memory board.

The process is pretty simple. Turn off the system, remove any connected cables, and unplug the unit from the wall socket. (The Equity I's power cable is not detachable.) Swing the unit around so the stern is facing you, and with a small flat-blade screwdriver in hand, remove the three screws securing the plastic backplane cover and pull it off. The metal backplane is now exposed.

The system's cover is held in place by four side screws—two on the port side hidden under raised plastic panels and two on the starboard, bare to the world. To remove the former, slip the screwdriver head into the slot near the bottom of either panel and twist; a tiny plastic cover will flip off, exposing a screw. Once all four screws are out, lift the cover off. (Start lifting at the backplane, since the cover is slotted into the front of the system unit.)

Ground yourself to discharge any static, and extract the Essential Card from its stylish bag. (Be careful to handle the board only by its nonconducting blue edges.) From the front of the Equity I, lower the Essential Card, with its RAM chips facing to the right, into the beveled female memory connector sitting between the floppy disk drives and the RAM

(continues)

Now make brilliant projections in minutes with PalettePlus.

Polaroid introduces an instant, high resolution PC presentation system for under $3,000.

Now you can get professional, full frame 35mm slides right off your PC.* And you can do it all in house, in color and in minutes.

As its name suggests, PalettePlus allows you to "paint" your slides any color you want for emphasis or impact. And you can preview the image in full color right on your PC screen before making the finished slide.

The PalettePlus system includes a high resolution computer image recorder, Polaroid 35mm Instant Slide System and print film camera – everything you need to make instant 35mm slides, prints and overheads right at your desk.

With new PalettePlus, you can now get the high resolution, without the high price. *PC Magazine* named it Editors' Choice saying, "PalettePlus rates as the most useful, affordable, and versatile..." film recording device on the market.

The entire PalettePlus system costs only $2,999;** and you can make brilliant slides with it for as little as 60¢ apiece. And PalettePlus comes with a 21-day satisfaction guarantee.

For more information and the name of the PalettePlus dealer nearest you call toll-free 800-343-5000, 8 a.m. to 8 p.m. Eastern Time.

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.

Name _____

Address _____

City _____

State _____ Zip _____

Telephone _____

PC make and model _____

*IBM or compatible PC equipped with an EGA or CGA board.
**Suggested list price.
"Polaroid" ® © 1987 Polaroid Corporation. PCW 9/1

Polaroid

Get more info. Go to Ad Index.

chips on the Equity I's motherboard. Then snap it into place.

Step back after you've popped the Essential Card in, and you'll notice that the board brushes up against a metal brace running through the system. To prevent the board from shorting out, place a sheet of laminated cardboard between the board and the brace. You can cut up a floppy disk sleeve or, better still, buy a swatch of nonconductive "fish paper" from the local electronics store. Don't use plastic or celluloid sheets–they not only pick up deadly static, they also melt.

When you're ready to close up the Equity I, step around to the back of the unit, angle the cover down a bit, and slide it toward the front of the system, making sure the runners catch the inside of the box. Screw the cover into place and reattach the necessary cables. To make the extra 256K of RAM feel at home, open the switch cover at the front of the Equity I and flip switch 4 to the off (down) position. Turn on the system, and when the message '512KB RAM Available' flashes on the screen, you know your job is done.

Essential Card
P.C. Computer Brokers
3879 E. 120th Ave.
Thornton, CO 80233
303/450-6727
List price: $99.95
Requirements: Equity I

More Than a Multiscan

Multiscan monitors like the NEC MultiSync and the Sony Multiscan are rightly hailed as jacks-of-all-video-trades (see "Magical Multiscan Tour" in this issue). Plug them into almost any adapter board, and they adroitly slip on a new set of electronic duds, assuming the role of the desired monitor. But none can play the part of a full-page monitor.

However, no technical stone goes unturned for long in the PC world. Take the Kicker from Aristocad. Plug this tiny daughterboard into an EGA-compatible video board driving a NEC MultiSync, Sony Multiscan, or Taxan 770 monitor, and *Ventura Publisher, AutoCad,* and GEM can call on four user-defined colors and resolutions as high as 800 by 600. Better yet, a Kicker-equipped system can double *Ventura Publisher*'s displayed page length (see Screen 1). Not bad for $195.

Plugging the Kicker into an EGA-compatible board (in this example a Video Seven VEGA Deluxe) is short work. But getting the various drivers straight (for the installed video controller, the application, and the Kicker) can be a nightmare. The documentation isn't much help, although the developers at Aristocad pledge to clarify the steps in upcoming releases.

To climb towards graphics nirvana, turn off your system, remove all external cables, pop the top, and pluck the video board from its slot. In most cases you simply push the Kicker's pins into the "feature adapter" connector at the top of the video board. However, the clock/calendar circuitry on VEGA Deluxe and Quadram QuadEGA Pro-Sync boards interferes with the Kicker's operations, so you must first reposition a jumper to set the stage.

Lay the VEGA Deluxe on a flat surface and locate the baby blue feature clock jumper block at the top of the board, just to the right of the feature connector. To disable the clock, pull the jumper off pins 2 and 3 and push it down on pins 1 and 2. Make sure the board is configured in what the VEGA Deluxe manual calls the ED (enhanced) mode. Switches 1 through 4 on the VEGA's mounting bracket should be set to off, on, on, off, respectively, and the metal toggle above them should be pushed to the left to specify Enhanced Color Display.

Take the Kicker out of its bag and turn it so the label "Aristocad Inc ©" is right side up. Since the Kicker is being configured to display *Ventura* in high-resolution (800-by-560) black and white, cover the two rightmost pins at the bottom of the Kicker board with the supplied jumper. Although the user manual is unclear on which setting to use, the 16-color setting (as opposed to monochrome and 4-color) is better for high-resolution black-and-white display.

(continues)

Why people love their Pro-Tech Computer Paper.

Who wouldn't love a computer paper specially designed for the printer they use?

The Pro-Tech family of specialty computer papers and film provides the consistency and reliability required for superior image quality and is specifically designed for dot matrix and daisywheel, ink jet, laser and thermal transfer printers as well as pen plotters. Pro-Tech enhances your printer's performance. And your image.

The complete line includes: Laser Papers for hi-speed and desktop laser printers (in white and colors, 25% cotton and other special finishes), Ink Jet Paper, Thermal Transfer Paper, Pen Plotter Paper, Printer Papers (in bond, 25% cotton and other special finishes) and Transparency Film. You'll love them.

Pro-Tech™

Because the right paper and film makes all the difference.™

Yours Free!

For free samples of the right paper for your printer, contact Pro-Tech today. Return this coupon to: Pro-Tech Sampler Kit, c/o James River Corporation, Groveton Division, Groveton, NH 03582 or call toll-free Mon-Fri 8:00-5:00 EST...

1-800-521-5035

In MA: 413-589-7592

Name _____

Title _____

Company _____ Phone _____

Address _____

City _____

State _____ Zip _____

My computer printer is a _____

(Manufacturer – Make – Model No.)

JAMES RIVER CORPORATION
GROVETON DIVISION
Groveton, NH 03582

PCD 9 87

© 1987 James River Corporation

Get more info. Go to Ad Index.

Line up the pins on the back of the Kicker board with the VEGA's feature adapter connector and press the little board in. Note that the Kicker will go only about two-thirds of the way into the connector. Return the VEGA Deluxe to its appointed slot and reassemble the system.

Unfortunately, the Kicker manual is also a little fuzzy on how to configure *Ventura* to take advantage of this setup. If *Ventura* is already installed for the EGA/Enhanced Color Display duo, you're set. If not, you must reinstall the program. This is a major pain with versions 1.0 and 1.01, but with the recently released 1.1, you merely slip the *Ventura* applications disk into drive A: and type VPPREP. The program asks 'Are you installing this version for the first time?' Answer no, insert the screen device driver disk, and select C (IBM Enhanced Card/Enhanced Display [640 x 350]) from the menu. Follow the prompts, swap a few more *Ventura* disks in and out of drive A:, and the program is sitting pretty.

Finally, put the supplied Kicker application driver disk in drive A: and enter the appropriate driver name for the installed version of *Ventura*. In sequence, the prompts ask which drive *Ventura* is on, the video driver to select (in this instance, B–16-color Kicker driver version 2.0), and the kind of mouse being used. Once you confirm the choices, the driver will be properly referenced in VP.BAT and copied to the *Ventura* directory.

Now run *Ventura,* and you'll be amazed. Text and graphics are sharply defined, and nearly 60 percent of a page is visible. If you're tired of hide-and-seek formatting and of constantly flipping from full page to reduced view and back, the Kicker will make your life easier and your eyes happier.

The Kicker
Aristocad, Inc.
333 Cobalt Way #107
Sunnyvale, CA 94086
408/245-2138
List price: $195

Upgrade Update

A reader from the far-off environs of Port St. Lucie, Florida, gratifyingly reports that until he read "Double Your Storage" (*The Upgrade Path, PCW,* May 1987), he wasn't able to format the disks in his internal 3½-inch drive B: for 720K. The magic fix–for DOS 3.00 and 3.10 users–was the undocumented DRIVPARM command, which is slipped into the system's CONFIG.SYS file.

Times and DOS change, though, and many readers with DOS 3.20 and 3.30 discovered that the DRIVPARM = /D:1/F:2 statement actually prevented them from formatting 3½-inch disks beyond 360K. The solution? Remove DRIVPARM from CONFIG.SYS (since DOS 3.20 and 3.30 allow 720K formatting) and replace it with DRIVER.SYS = /D:*n*/F:2, where *n* is the number assigned to the 3½-inch drive (C: is 2, D: is 3, and so on). The next time you start the system, the message 'external drive *n* is installed' should appear; to format a disk at 720K, merely type **FORMAT** *n:*.

From the Upgrade Bookshelf

Compleat Compaq Portable users should check out *Upgrading Your Compaq Plus or Portable* by R. H. Martin. This 60-page report is a handy compendium of everything you've ever wanted to know (and conceivably forget) about upgrading the Compaq Portable and the Portable Plus. The discussion ranges from adding a new power supply to buying the best hard disk card to ordering hardware and software by mail. The report can be obtained by sending $17.50 ($30.00 for those outside the U.S. and Canada) to R. H. Martin, Applied Foresight Inc., P.O. Box 20607, Bloomington, MN 55420.

Please forward submissions and queries to The Upgrade Path, PC World, *501 Second St., San Francisco, CA 94107 or electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. Articles submitted by mail should be accompanied by a self-addressed, stamped envelope and an ASCII file of the item.*

"Wait a second. You're saying I can create applications in 1-2-3®, hand them out to, say, 10 users...and they don't need 1-2-3 at their desks?"

I thought that was impossible... not to mention illegal."

"Now you want me to believe it costs under $100?"

It's true. There's finally a way to distribute executable spreadsheet applications—as many as you need, to anyone who needs them.

It's simple. It's secure. And at the low introductory price of only $99.95, it's incredibly inexpensive.

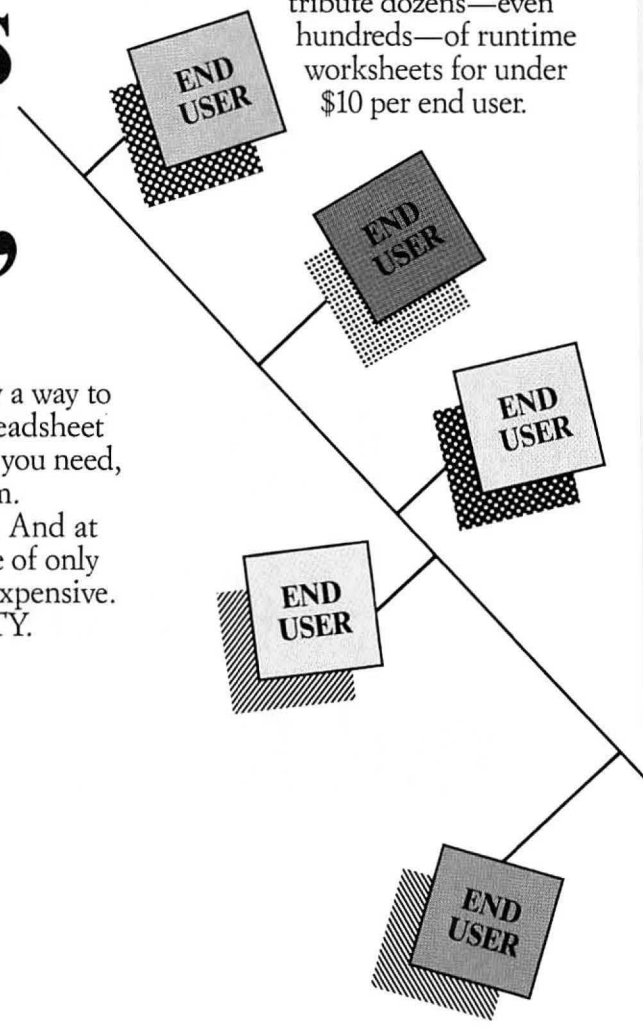
Introducing @LIBERTY.

Spreadsheets for everyone...at under $10 each.

@LIBERTY (pronounced "At Liberty") is the first-ever spreadsheet compiler. It works by separating the task of spreadsheet development from the task of spreadsheet usage. As a result, you can convert your spreadsheets into "runtime" versions. In English, this means you can create executable 1-2-3 files that run on IBM-compatible PCs—and your users won't need a copy of the original spreadsheet package.

@LIBERTY works with 1-2-3 and compatible spreadsheet programs. With it, up to 10 users can share your applications. And @LIBERTY is far more affordable than any site licensing plan available. You can add up to 15 more users for only $99.95—and you can keep adding as many as you need.

Imagine: You'll be able to distribute dozens—even hundreds—of runtime worksheets for under $10 per end user.



SOFTLOGIC SOLUTIONS

One Perimeter Road • Manchester, NH 03103

Your formulas are always safe, your work is always secure.

@LIBERTY makes sure your proprietary information and sensitive data (like salaries) are inaccessible to your users. That goes for the clerk who might hit a wrong button, and the power user who might try to pass the time by hacking away at your formulas.

The only thing anyone can do is input data exactly where you want. And you specify *where* by simply "unprotecting" cells in your original spreadsheet.

This way, no one can get at your formulas. No one can change your applications. And no one can destroy your hard work.

You get the big picture, without doing the little work.

Almost as important as your ability to safely distribute executable spreadsheets, is your ability to collect the files and export all of that data back into your "master" 1-2-3 program.

This entirely new, cost-efficient approach to data collection and spreadsheet consolidation allows you to get everyone you need involved in a project—and get your results in record time.

Perfect for heavy applications, macros, graphics...the works.

Even if your applications involve complex 1-2-3 macros, you can compile them into "runtime" versions with @LIBERTY. And on top of low cost and security, you'll receive some added benefits.

For instance, @LIBERTY puts more macro commands at your disposal to make applications easier to use. It allows you to hide your fixed data and macros. And it even lets your users specify worksheet color schemes, as well as use most graphs from the original spreadsheet program.

What's more, @LIBERTY works with spreadsheet sizes up to 64,000 cells. And its proprietary algorithm can recalculate much faster than 1-2-3. So your users will spend a lot less time waiting for large spreadsheets to recalculate—and a lot more time being productive.

Who can benefit from @LIBERTY... and how.

Corporate Users	Do everything from budgeting to cost-estimating to forecasting.
Insurance Companies	Send your agents spreadsheets for sales illustrations.
Auditing Firms	Have your clients input their own financial data, so you can economically (and safely) perform your audit.
CPAs and Tax Lawyers	Distribute your tax planning methods to clients.
Government Agencies	For internal auditing, inventory control—almost anything you'd use a traditional spreadsheet for.
VARs and Template Developers	Develop and market your business and technical solutions.

More than a high quality product...high quality service and support.

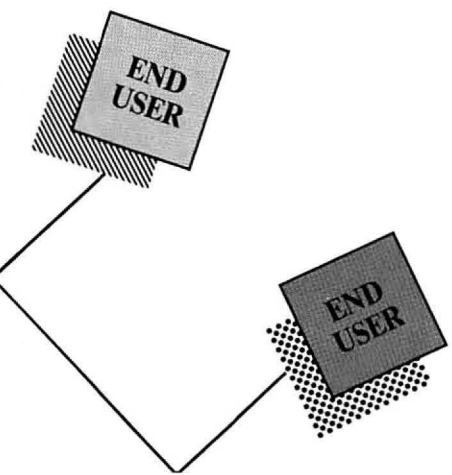
Since 1983, SoftLogic Solutions has shipped copies of proven PC software products to over 200,000 satisfied customers. We guarantee a product of only the highest quality and reliability. And we back @LIBERTY up with a Technical Assistance Hotline and a Customer Support Bulletin Board System. We even offer a 30 day return privilege. If @LIBERTY doesn't live up to our advertised claims, we'll gladly refund your purchase price.

"Talk about breakthrough. I can't believe I can get all this now... and at this price."

There's no doubt: @LIBERTY is truly one of the most useful software programs available. And at $99.95, it's an incredible value. However, this low introductory price won't last forever. So make sure you don't miss out. Contact your local computer dealer and order @LIBERTY today. Or call,

800-272-9900.

(In New Hampshire, 603-627-9900.) 8

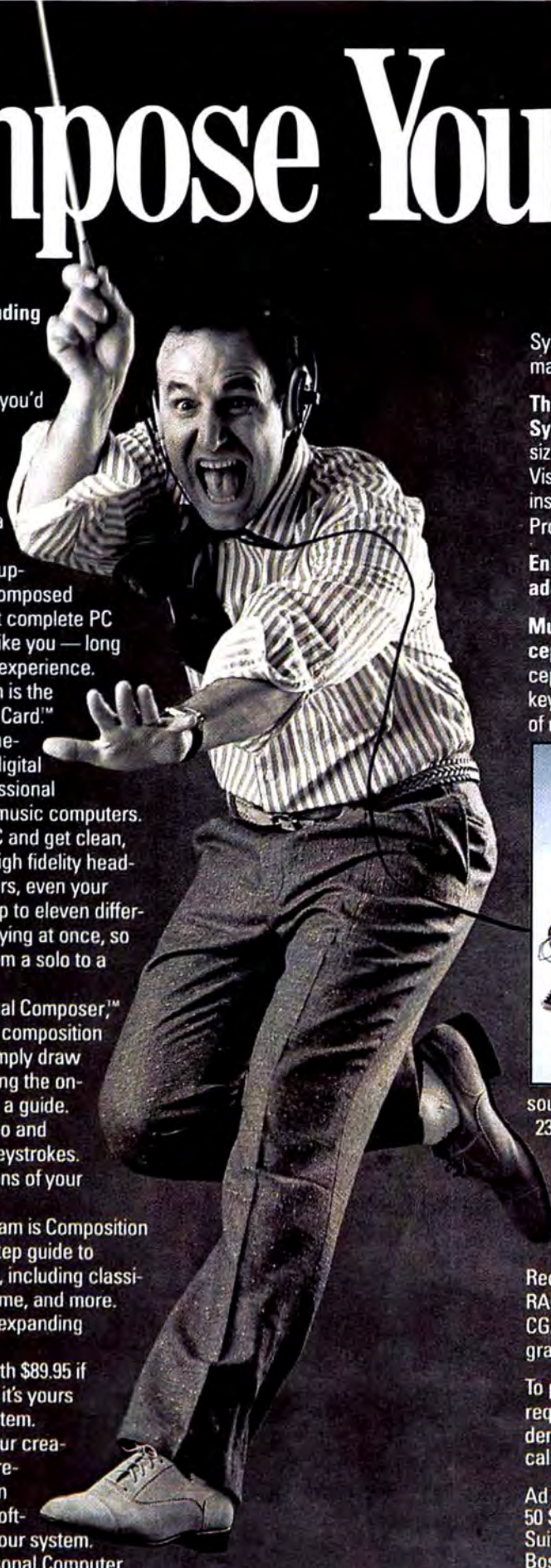


@LIBERTY

Get more info. Go to Ad Index.

1-2-3 is a registered trademark of Lotus Corporation.

Compose Yourself!



Now create superb sounding music on your IBM® PC. Ad Lib™ makes it easy.

Just when you thought you'd heard it all, along comes Ad Lib.

And with it comes rich, room-filling music like you've never heard from a PC before. With rumbling bass, crystal clear highs, up-front mid-range. All of it composed and performed on the first complete PC music system for people like you — long on desire, a little short on experience.

The heart of the system is the Ad Lib Music Synthesizer Card.™ An electronic sound synthesizer based on the same digital technology found in professional keyboards and the finest music computers.

Just plug it into your PC and get clean, powerful music through high fidelity headphones, bookshelf speakers, even your home stereo. It'll handle up to eleven different instrument sounds playing at once, so it's perfect for anything from a solo to a symphony.

There's also Ad Lib Visual Composer,™ about the most instinctive composition software ever devised. Simply draw lines to indicate notes, using the on-screen piano keyboard as a guide. Change instruments, tempo and volume with a couple of keystrokes. Cut, copy and paste portions of your music in a snap.

Included with the program is Composition Projects™ #1, a step-by-step guide to creating all kinds of music, including classical, jazz, bossa nova, ragtime, and more. Just the thing for an ever-expanding repertoire.

Visual Composer is worth $89.95 if purchased separately, but it's yours free when you buy the system.

Then play back all of your creations, as well as several pre-programmed selections, on the Juke Box™ playback software, also included with your system.

Look for the Ad Lib Personal Computer Music System™ at selected computer and music stores, or order direct from Ad Lib with your check, Visa or MasterCard.

The Ad Lib Personal Computer Music System. At last, you have what it takes to make great-sounding music.

The Ad Lib Personal Computer Music System. Includes the Ad Lib Music Synthesizer Card, Juke Box playback software, free Visual Composer software with 50 pre-set instrument sounds and Composition Projects #1 . . . . . $245.00

Enhance your system further with this additional Ad Lib software:

Music Championship™ #1 — Basic Concepts. Learn to identify basic musical concepts, including tempo, mode, rhythm and key. Perfect for all ages. The first in a series of music training programs combining synthesized music with exciting computer game competition $39.95

Instrument Maker™ software. Lets you create and save new instrument sounds for use with Visual Composer. Alter 23 sound characteristics like attack, sustain and decay. Modeled after professional music synthesizer software $49.95

Look for more Ad Lib music software titles coming soon.

Requires IBM PC, XT, AT or compatible, 256K RAM, DOS 2.0 or higher, CGA, EGA or monochrome graphics adaptor.

To place your order, or to request your free demonstration recording, call us toll-free today.

Ad Lib Inc.
50 Staniford Street
Suite 800
Boston, MA 02114

AdLib Personal Computer Music System 799

1-800-463-2686

Ad Lib, Composition Projects, Instrument Maker and Music Championship are trademarks of Ad Lib Inc. IBM is a registered trademark of International Business Machines Corporation.

Get more info. Go to Ad Index.

Consumer Watch

Advice and information for the computer consumer

This month: What to look for in a floppy disk drive, the scoop on buying cheap disks, and letters from readers about compatibility, printers, and hardware support

Anita Amirrezvani

A Driving Concern

Last spring I bought a $60 boom box–sight unseen–through the mail, confident that the product was worth the modest investment. And it was. Thanks to fierce competition, brand name commodity items like portable tape players, bicycles, and digital watches tend to be well built and competitively priced. The same goes for volume PC products such as floppy disk drives: What you get for the money is fairly consistent across the board.

On the street, a 5¼-inch 360K drive from well-known manufacturers such as Fujitsu, Tandon, Teac, or Toshiba sells for anywhere from $70 to $100; 3½-inch 720K drives and 5¼-inch 1.2MB drives run about $125. With prices so low, it's hard to get stung. Still, whether you're replacing a worn-out disk drive, purchasing drives for a no-name computer, or planning to add a second drive to a system, there are several considerations to keep in mind (see "A Floppy Disk Drive Buyer's Checklist").

Watch out for tricky pricing. When purchasing a 360K drive for an AT, you may be quoted a price that's $10 to $20 higher than for a PC drive. The difference may be entirely cosmetic; retailers sometimes charge a premium for drives with gray faceplates that are color-coordinated with the AT. "Generally speaking, you're paying $20 for a merchandising ploy," says Gerald Karl, product marketing manager for storage products at Fujitsu America. Karl warns consumers to check for differences in functionality or installation: "Ask whether the jumpers on the drive's printed circuit board are set up properly for an AT." And verify that the drive comes with the proper connectors and mounting brackets for the target system.

Bigger isn't always better. Forget about buying a 1.2MB drive if you have a PC, XT, or compatible. A 1.2MB drive requires a controller that fits into an 8/16-bit slot–which is found only on 286 and 386 machines. But you can always add a 720K 3½-inch floppy disk drive to cheaply expand a PC or XT's removable storage capacity. Upgrading is a simple job–just make certain the unit comes with mounting brackets that allow the drive to fit snugly in a 5¼-inch slot (see "Double Your Storage," *The Upgrade Path, PCW,* May 1987). Keep in mind that formatting 3½-inch disks at 720K requires DOS 3.20 or a later version. Note, too, that major manufacturers are expected to release 1.44MB 3½-inch drives compatible with the PS/2 line. These drives will also require DOS 3.20, according to Microsoft representative Marty Taucher.

Resist the urge to upgrade unnecessarily. Before purchasing the latest technological wonder, step back and consider whether what's new is what's best for your system. Adding a 3½-inch 720K drive will double a PC's floppy storage (from approximately 240 to 480 pages of double-spaced text), but bear in mind that 5¼-inch floppies are the standard medium for software distribution. They're cheaper, too.

(continues)

AS FAST AS

The Nanosecond

Think of a clock ticking. Tick...Tick...Tick ...One second apart. In a world full of seconds, things could get pretty tedious. So let's pick up the pace a bit, shall we?? To, uhh, nanoseconds, yeah — nanoseconds. In between seconds ticking off are little nanoseconds, also ticking off. One billion of them. Tickticktickticktick ticktickticktickticktickticktickticktick. Now that livens things up, doesn't it?? Suddenly, next to a nanosecond, a second is just about as exciting as watching the grass grow. So all you folks that think the speed of light is so blinding (at 186,000 miles per second) just aren't putting things into the proper perspective. Light really only travels 11.785 inches...in a nanosecond!! In a world full of nanoseconds, light's just a flash in the pan!!

But one company always moving ahead is The Fast Computer Co. No matter what you need for your computer, delivery is just one business day away, guaranteed. All our order-processing is completely on-line, so your order is picked, packed, and shipped fast. With ABSOLUTELY FREE GUARANTEED OVERNIGHT DELIVERY!! No longer shall you stare at the clock, tediously ticking off the seconds. In fact, if you don't receive your order within the promised next business day, we'll refund 5% of the purchase price. Moving across the globe in a few shakes of a nanosecond's tail, The Fast Computer Co. keeps PC software and hardware moving onwards towards it's destination...With FREE GUARANTEED OVERNIGHT DELIVERY. From The Fast Computer Co. Ticking off the nanoseconds as fast as you think.

FREE GUARANTEED

1-800-54THINK VISA MasterCard AMERICAN EXPRESS

YOU THINK

HARDWARE

LAPTOP COMPUTERS

TOSHIBA
T1100+ ..... CALL
T3100+ $3289

PRINTERS

EPSON
FX-86e $339
FX-286e $479
LQ 800 ..... $479
LQ 1000 ..... $679

NEC
P 660 ..... $479
P 760 ..... $659

OKIDATA
M182 ..... $265
M192 ..... $369
M293 ..... $735

TOSHIBA
P321SL $559
P/S 351 ..... $999

LASER PRINTERS

CANON
Laser Printer
LBP8A1 ..... $1899

HEWLETT PACKARD
Series 2 ..... $1949

MONITORS

AMDEK
Color 600-S $369
Color 722 ..... $475
Amber 310A $149
410A $159

NEC
Multi-sync color
w/swivel base $579

PRINCETON GRAPHICS
RGB HX-12 ..... $449
RGB HX12E $535
Amber Max 12 ..... $159
RGB SR-12 ..... $569

MULTI-FUNCTION BOARDS

AST RESEARCH
Six Pack Premium $199
Six Pack Plus (384K) $199
Rampage w/256K $275
Rampage 286
w/512K $429
Advantage (128K) $349

GRAPHIC BOARDS

HERCULES
Color Card $155
Graphics Card Plus $189
InColor $325

PARADISE SYSTEMS
Auto Switch EGA
Card $215

NEC
GBI-EGA $349

QUADRAM
EGA Plus Graphics $319
Pro Sync EGA $349

VIDEO 7
Vega (½ Card) $249
Vega Deluxe (½ Card) ... $349

MODEMS

HAYES
Smartmodem 1200 ..... $309
Smartmodem 1200B
w/Smartcom II $309
Smartmodem 2400 ..... $465
Smartmodem 2400B
w/Smartcom II $465

MOUSE INPUT DEVICES

IMSI
PC Mouse w/Dr.
Halo 2 ..... $119

MICROSOFT
Microsoft Mouse
(Serial) $129
Microsoft Mouse
(Buss) $119

SURGE PROTECTORS

KENSINGTON
MICROWARE
Masterpiece Plus $119

KEYBOARDS

KEYTRONIC
5151 (Deluxe) $169

MEMORY STORAGE

IOMEGA
Bernoulli Box
(10 + 10) $1449
Bernoulli Box
(20 + 20) $1899
Bernoulli 10 MB
Cartdg. Tr $169
Bernoulli 20 MB
Cartdg. Tr $255

HARD DISC DRIVES

PLUS
Hard Card 20 Mb $649

HARD DISC DRIVES

SEAGATE
20 Mb ½ Ht Int. $369
30 Mb ½ Ht Int. $469
20 Mb Full Ht (AT) $569
30 Mb Full Ht (AT) $609
40 Mb Full Ht (AT) $969

SOFTWARE

WORD PROCESSING

Display Write IV $325
Lotus Manuscript $349
Microsoft Word 3 ..... $229
Multimate $235
Multimate
Advantage II $279
PFS Professional Write ... $115
Volkswriter 3 ..... $145
Word Perfect $215
Wordstar Professional
Rel. 4 ..... $239
Wordstar 2000 Plus $219
XY Write III $245

WORD PROCESSING ADD-ONS

Print Shop $39
Punctuation & Style $89
Turbo Lightning $59
Word Perfect Library $65

DATABASE MGMT.

Cornerstone $65
d Base III Plus $409
d Base III Lan Pak $599
Foxbase Plus $245
PFS Professional File $145
Q & A $239
R: Base System V $359
Revelation $519

DATABASE MGMT. ADD-ONS

Clipper $399
R: Base Ext. Report
Writer $179
Genifer $215
Quick Report $145

INTEGRATED SPREADSHEETS

Ability Plus $149
Enable $365
Framework II $409
Lotus 1-2-3 ..... $315
Microsoft Multiplan $119
PFS First Choice $105
Symphony $459

SPREADSHEET ADD-ONS

HAL $109
Lotus Report Writer $79
Smart Notes $49
SQZ $59

DESKTOP PUBLISHING

Click Art Personal
Publisher $99
Harvard Pro Pub $445
Page Maker $499
Ventura $545

GRAPHICS

Energraphics (NEW) $309
Microsoft Chart $189

CAD/CAM

Generic CAD $69
ProDesign II $179

LANGUAGES

BASIC Compiler (MS) $255
C Compiler (MS) (4.0) ... $269
COBOL Compiler (MS) ... $425
FORTRAN Compiler
(MS) $269
Lattice C Compiler $239
Macro Assembler (MS) $95
Pascal Compiler (MS) $179
Quick BASIC (MS) $65
Turbo Pascal (plus BCD
& 8087) $65

PROJECT MANAGEMENT

Harvard Total 2 ..... $375
Microsoft Project $239
Super Project Plus $305
Timeline $235

FINANCIAL

Managing Your
Money $115
Dollars N' Sense $105

ACCOUNTING

BPI Entry $169
CA Accounting
Modules ..... CALL

MISC/UTILITIES

Copy II PC $39
Crosstalk XVI $99
Disk Optimizer $35
Fastback $89
Microsoft Windows $65
Norton Commander $45
Norton Utilities $55
Remote $149
Sidekick $55
Smart Com II $89
Superkey $45
Traveling Sidekick $45
XTREE $39

OVERNIGHT DELIVERY *

FROM THE FAST COMPUTER CO.

*Guaranteed overnight delivery on all orders placed by 2 PM E.S.T. Any order not received at delivery site on next business day will receive 5% off purchase. Never a surcharge for American Express, Visa or Mastercard. Credit cards are not charged until after your order has been shipped. No sales tax on orders shipped outside NY State. Please add 2% for insurance, and handling ($3.00 minimum). Defective merchandise can be returned for repair or exchange (please call for R.A. no.). Due to variety of products, we cannot guarantee compatibility. Prices & policies subject to change without notice.

AS FAST AS YOU THINK

1507 NEW YORK AVE., HUNTINGTON STATION, NY 11746

1-800-54THINK (84465)

Get more info. Go to Ad Index.

A Floppy Disk Drive Buyer's Checklist

This checklist can help you determine which floppy disk drive supplier offers the best combination of price and service.

_____ Cost

_____ Size (5¼- or 3½-inch)

_____ Capacity (360K, 720K, 1.2MB)

____yes ____no Half-height drive

____yes ____no Drive compatible with system

____yes ____no Drive compatible with current DOS version

____yes ____no Includes manual

____yes ____no Includes mounting kit with cables, connectors, brackets, and faceplates (if needed)

____yes ____no Toll-free technical support

Warranty

_____ Period (months)

____yes ____no Parts and labor

____yes ____no Shipping costs paid by company

____yes ____no Guaranteed turnaround time for repairs

_____ Length of turnaround time

____yes ____no Exchange or refund policy

Buying an AT with a 1.2MB floppy drive provides an even bigger storage boost and makes backing up data more convenient. However, a ComputerLand salesperson reports that many AT buyers trade in 1.2MB drives for 360K drives to ensure compatibility with other systems at home and at the office. Disk errors sometimes occur when you format a 360K disk in a 1.2MB drive and then try to read it in a 360K drive, according to Chris Tipton, customer service manager at Maynard Electronics in Casselberry, Florida. New technology is no panacea; it often pays to stick with proven products you're comfortable with.

Think small. If you're not queasy about forgoing the 5¼-inch standard, note that 3½-inch disks are rugged, slip into a shirt pocket, and are compatible with the PS/2's disk drive–the likely standard of the future. More and more programs are available in this smaller format, and products such as *Lap-Link* make copying programs and data from 5¼-inch drives relatively simple. If your system has one drive of each size, you can easily copy information from one to the other.

One drawback, however, is that the cost per byte stored is generally higher with 720K 3½-inch disks than with 360K and 1.2MB

(continues)

Introducing Logitech's Publishing Solution

LOGITECH MOUSE $179
with Publisher Software

Our Mouse and Publisher Software is the complete solution for people who want to produce great looking, attention getting documents without having to master a lot of complex commands and typographical jargon. It's easy to learn, fast to use, and it gets you the results you need right now.

Page Layout Made Easy
You don't have to be a graphic designer to get professional quality results. Create and edit text right on the page. We offer design templates, automatic layout in 1-4 columns, automatic flow of text around graphics, and vertical and horizontal rulers to guide you.

Typography Made Easy
Select from over 61 fonts representing 14 typefaces, in sizes suitable for headlines, subheads and text. We provide optimal line spacing automatically. You adjust for special effects.

Graphics Made Easy
Use our ClipArt or create your own using LOGIPAINT, PC Paintbrush or MS Windows Paint software. You can shrink or expand your graphic images to fit. You can also modify, rotate or copy them.

LogiTech News
SUMMER 1987 THE LOGITECH DEALER NEWSLETTER
INTRODUCING LOGITECH DEALER NEWS
LETTER FROM THE PRESIDENT
NEW PRODUCTS
PUBLISHER MOUSE INTRODUCED

Produced on a dot matrix printer. Laser printer support also included.

30 Day Money-Back Guarantee
3 Year Warranty

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 to produce great looking documents now!

LOGITECH Publisher Package **$179**
- ☐ w. Serial Mouse *and Plus Software*
- ☐ w. Bus Mouse *and Plus Software*

Add $6.50 for shipping and handling. California residents add applicable sales tax. Prices valid in U.S. only.

Total Enclosed $_____
☐ 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
Tel: 415-365-9852
In Europe:
LOGITECH SA, Switzerland
Tel: 41-21-879656 • Telex 458 217 Tech Ch
In Italy:
Algol-Logitech Spa 39-2-215-5622

Get more info. Go to Ad index.

Table 1: Kilobyte for kilobyte, most 5¼-inch disks are cheaper than 3½-inch disks.[1]

		List price per 10 double-sided, double-density							
		5¼-inch, 360K	Cost per kilobyte (in cents)	3½-inch, 720K	Cost per kilobyte (in cents)	5¼-inch, 1.2MB	Cost per kilobyte (in cents)	Clip	Warranty (minimum)
Polaroid	DataRescue	$30.00	8.3	$65.00	9.0	$60.00	5.0	60%	Covers data and disk; 20-year warranty
	Diskettes[2]	$30.00	8.3	$65.00	9.0	$60.00	5.0	40%	Disk only; 20-year warranty
Verbatim	DataLife	$25.50	7.1	$39.30	5.5	$41.80	3.5	60%	Disk only; purchaser's lifetime
	Bonus	$12.90	3.6	n/a	n/a	n/a	n/a	40%	Disk only; one year
Xidex	Dysan	$49.50	13.8	$69.50	9.7	$79.50	6.6	75%	Disk only; purchaser's lifetime
	Storage Master	$ 9.90	2.8	$44.90	6.2	$49.50	4.1	60%	Disk only; purchaser's lifetime
	Precision	$ 8.60	2.4	$26.80	3.7	$21.00	1.8	40%	Disk only; purchaser's lifetime
Blackship	premium	$ 6.90[3]	1.9	$13.50	1.9	$12.90	1.1	65%	Disk only; lifetime of company
	regular	$ 4.90	1.4	n/a	n/a	n/a	n/a	55%	Disk only; lifetime of company

[1]Mail-order prices are usually 30% to 50% lower, except for Blackship.
[2]This 40-clip disk is discounted more heavily than the DataRescue brand.
[3]67% clip

5¼-inch disks (see Table 1). But prices are declining rapidly, thanks to the success of the Macintosh and PC laptops and the emergence of the PS/2 line. "As volume increases, the price of 3½-inch disks will fall to today's levels for 5¼-inch media," says James Porter, president of Disk/Trend, a market research firm in Los Altos, California.

Will the disk fit? If you want to add a second floppy drive to a system that is already equipped with a floppy and a hard disk drive, make sure there's room. For example, the XT's two drive slots are typically filled with a full-height 360K floppy disk drive and a full-height 10MB hard disk. Adding a second floppy means yanking out the older floppy disk drive and replacing it with two half-heights or resorting to an external floppy drive, which runs about $25 more than the internal equivalent and requires cabling to connect to the computer. Generally, new half-height floppy drives are quieter, require less power, and, of course, take up less space than full-height devices.

Know thy vendor and dealer. As always, check the retail or mail-order outlet's reputation with

(continues)

Get Your Hands On More Solutions.

LOGITECH MOUSE $99
with Plus Software $119

PC MAGAZINE EDITOR'S CHOICE

Purchase our best selling LOGITECH Serial or Bus Mouse and Plus Package with CADD, Paint and Publisher software at very affordable prices. Each package is a complete solution that gets you the results you need right now.

CADD Solution $189

Our Mouse, Plus Software and LOGICADD (Generic CADD 3.0 plus DotPlot). Everything you need to turn your PC into a full featured CADD workstation. It's the complete solution for dimensioned line drawing and CADD.

Paint Solution $149

Our Mouse, Plus Software and LOGIPAINT (PC Paintbrush). With 11 type fonts and a 16 color palette, it's the paint set that's used by professional and beginning users alike. LOGIPAINT files move easily into both LOGICADD and Publisher documents.

Publishing Solution $179

Our Mouse, Plus Software and PUBLISHER Software (PFS: First Publisher). It's the complete package that makes it easy to produce high-impact, professional looking documents.

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 the LOGITECH Mouse solution!

LOGICADD Package **$189**
- ☐ w. Serial Mouse *and Plus Software*
- ☐ w. Bus Mouse *and Plus Software*

LOGIPAINT Package **$149**
- ☐ w. Serial Mouse *and Plus Software*
- ☐ w. Bus Mouse *and Plus Software*

PUBLISHER Package **$179**
- ☐ w. Serial Mouse *and Plus Software*
- ☐ w. Bus Mouse *and Plus Software*

Add $6.50 for shipping and handling. California residents add applicable sales tax. Prices valid in U.S. only.

Total Enclosed $_____

☐ VISA ☐ MasterCard ☐ Check Enclosed

Card Number _____ Expiration Date _____

Signature _____

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

LOGITECH

LOGITECH, Inc.
805 Veterans Blvd., Redwood City, CA 94063
Tel: 415-365-9852

In Europe:
LOGITECH SA, Switzerland
Tel: 41-21-879656 • Telex 458 217 Tech Ch

In Italy:
Algol-Logitech Spa 39-2-215-5622

Generic CADD is a trademark of Generic Software. PC Paintbrush is a trademark of ZSoft Corp. PFS: First Publisher is a trademark of Software Publishing Corp.

Get more info. Go to Ad index.

the local Better Business Bureau or call a user group for recommendations before buying. When you're ready to contact a dealer, ask the following questions to measure the company's concern for its customers: Is installation free? Is toll-free technical support available? Is documentation provided? What are the terms of the warranty? Are repairs performed by the dealer, or must the product be sent back to the factory? In case of problems, can you exchange the product or return it for a refund?

Floppy Shopping

Unlike drives, floppy disks run the gamut from pricey to downright cheap. Top-grade 5¼-inch, double-sided, double-density (360K) and high-density (1.2MB) disks from Polaroid, Verbatim, Xidex, and others list for about $25 to $80 per box of ten, though you can buy them at half price through discount dealers. No-name mail-order disks cost as little as $5 for a box of 360K disks, or $13 for a box of 720K or 1.2MB disks. The most important measure of disk endurance is the *clip* rate. A disk drive's read/write head records information on the floppy disk's iron oxide coating using an electronic signal; clip is the percentage of the original signal the disk retains. Cheap disks, such as Xidex's Precision brand, meet the minimum industry standard of 40 percent. Bruce Shapiro, founder of Blackship Trading, a distributor that sells millions of floppies annually, points out that the much-used phrase "meets or exceeds all standards" probably means the disks are 40 clip. With repeated use and over time, 40-clip disks will be less reliable than disks with a 60 or 70 clip–which accounts for the difference in price tags.

Before buying, ask these questions: Is installation free? Is toll-free technical support available? What are the terms of the warranty?

But clip rates are seldom advertised. Typical–and less important–selling points include how the disk jacket is sealed, the number of revolutions a disk can spin before wearing out, whether each disk is individually tested, whether the entire surface of the disk is checked for errors, and whether the liner inside the disk jacket combats static charges. In recent ads for its DataLife disks, for example, Verbatim claims that "New DataHold Protects When Static Strikes." But according to product manager Jeanne Wun, DataLife disks have always carried an antistatic liner.

Like a high clip level, a good warranty may justify a premium price. When you buy Polaroid DataRescue disks, for example, your data–not just the disk–is covered in case of disaster. "Send us the disk, and we'll do our best to get the data back to you–from cleaning the disk and putting it in a new jacket to reconstructing the data," says Larry Muzinich, Polaroid's western regional sales manager. If you send the disk via overnight mail to Polaroid's offices in Ohio, the company will return the favor–sending your restored disk back via an express mail service.

How much you should spend on disks depends on the tasks you typically perform. If you use word processing or data base software and often write data to disk, choose a better class of disk, especially if all your data is on floppies. And "if you pack a disk with data, you're more likely to have problems," says Blackship's Bruce Shapiro.

Out of fear of losing important data, many consumers pay too much for magnetic media. To get the most for your money, consider purchasing different disks for different purposes: Polaroid for data you can't afford to lose, a good all-purpose disk–say 60 clip–for everyday work, and perhaps a cheaper product for archiving old data or backing up program disks. No matter what you buy, you can expect approximately 1 disk in every 100 to be imperfect due to the

(continues)

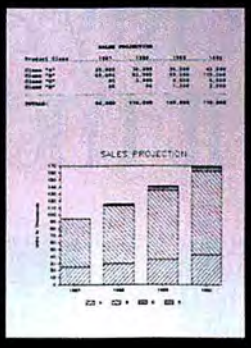
We arrange friendly mergers every day.

It doesn't take a Wall Street whiz to know what makes a successful merger. Or to need one.

Because if you run reports, spreadsheets, invoices...if you combine text and graphics...you need the kind of merger we deliver. Every day.

Our stock-in-trade is quality text with sharp graphics from 9-, 18- and 24-pin printers that are as friendly to you as they are to your budget. (And, not incidently, your system.)

Even *INFO WORLD* was impressed enough to write, "Instead of imitating its competition, Brother ...designed an unusual, ergonomic printer. The company took the little things into consideration that most manufacturers usually ignore."



Little things, indeed. Our innovative " Touch and Print" puts font and print functions right at your fingertips. "Paper Parking" switches from built-in tractor to the optional sheet feeder, and back... automatically.

While you'll find these features on many of our printers, you'll also find a printer with speeds up to 480 cps and 4-color printing. Another with heaps of typefaces. Still another that fits into a briefcase.

How we do it all is our trade secret. But you can arrange to see the results by calling for the name of the Brother dealer near you.

1-800-284-4357

Brother high performance printers.

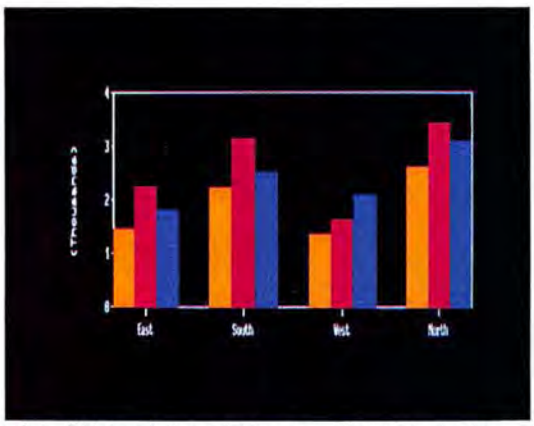
Get more info. Go to Ad index.

We're at your side.

Brother International Corp., Piscataway, NJ 08854
Brother Industries, Ltd., Nagoya, Japan

brother®

To get Lotus 1-2-3 to do all this more quickly and easily, we didn't make it more powerful.



Lotus HAL doesn't change 1-2-3 or the worksheet. It makes things easier. For instance, to graph sales by district from January to March just request **"graph Jan to Mar."**

You can spend a lot of time setting up your spreadsheet. Summing up sales figures is a good example. With Lotus HAL, just request **"total all rows"** *and 1-2-3 and Lotus HAL will create the formulas.*

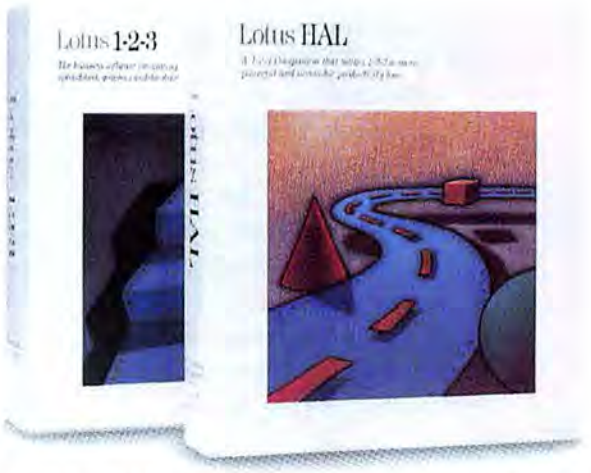
Say you want to extract just the information you want from a database. For example, you want to determine your top sales reps. Simply request **"who has sales ≥ 8000."**

You may find yourself in the position of figuring out how a spreadsheet was built. Well, with Lotus HAL, you simply request **"list the relations in the sheet."** *And away you go.*

Do you find it hard to sort things by district or sales or any other criteria? Just request **"sort by dist."**

To **create macros,** *well, you may not believe this. What you see here isn't a description of what's happening—it's the actual macro. See, we told you you wouldn't believe this.*

We made you more powerful.



How? With Lotus HAL™—a Companion product for 1-2-3® that helps you take shortcuts, undo mistakes, link spreadsheets, use your own words for commands and basically get more out of 1-2-3 than ever.

So much more, that Computerworld has named Lotus HAL "Product of the Year."

The screens on the left will give you an idea of how easy it is to get more out of 1-2-3. And these are only a few of the enhancements and new features Lotus HAL brings to 1-2-3.

Lotus HAL gives you the ability to perform 1-2-3 tasks using simple English phrases—called, logically enough, "requests." This has advantages for all kinds of 1-2-3 users: the newer users will find that difficult tasks are now simplified; the more experienced users will find that many time-consuming tasks can now be performed in a fraction of the time.

In addition to this powerful capability, Lotus HAL also allows you to test assumptions, correct mistakes and simply change your mind with ease. Because through a special capability called "undo," Lotus HAL lets you reverse your last command—even retrieving a file before saving your work.

Besides all this, Lotus HAL gives 1-2-3 a number of other useful and powerful new features—like spreadsheet auditing and the ability to link cells or ranges between worksheets.

One obvious benefit of all this is that you save time. This is what led Business Software to say, "...(Lotus) HAL gives users the ability to move through 1-2-3 at least twice as fast."

And what does that savings in time mean to a business person? It means you're more powerful, more productive, more effective than ever before.

Make yourself more powerful, and buy yourself Lotus HAL. You'll find it at your Authorized Lotus Dealer, for just $150.* Or, you can call us directly at 1-800-345-1043 and ask for Product PS-1377, or ask for PS-1385 to receive more information about Lotus HAL. See? Everything with Lotus HAL begins with a simple request.

Lotus HAL

Requirements: Lotus HAL is a memory-resident program that requires 1-2-3 Release 1A, Release 2, or Release 2.01 for personal computers from IBM,** COMPAQ and AT&T, plus 1-2-3 certified compatibles; two disk drives; DOS 2.0 to 3.1; 512K RAM. Please refer to your 1-2-3 package or 1-2-3 documentation for appropriate hardware configurations and DOS requirements or consult your dealer. **Lotus HAL does not operate with 1-2-3 for IBM PCjr., or IBM PC Convertible or Release 1A for the IBM 3270 PC. When you purchase Lotus HAL directly from Lotus, take your first 30 days to try it. If after 30 days, Lotus HAL does not perform as described and you've purchased it directly from Lotus, we'll gladly give you a full refund.

© 1987 Lotus Development Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Lotus HAL is a trademark of Lotus Development Corporation.
Lotus HAL is distinguished from HAL which is a trademark of Qantel for its Hotel And Leisure software.

*Suggested Retail Price (Plus Sales Tax)

vagaries of manufacturing. If the percentage is higher, send the disks back and demand a refund.

Shop Talk

Down and Out in Anacortes
In August 1986 I bought a Tandy 3000 computer for CAD work. I've suffered months of frustration, traveled several hundred miles to Tandy computer centers, and spent hundreds of dollars in consultant's fees trying to get the machine to work with *AutoYacht* [a yacht design package] and my Houston Instrument plotter. Manufacturers should not be allowed to say their machines are PC AT compatible unless they really are.

E. S. Brewer
Anacortes, Washington

Tandy responds: When Future Computing, a market research firm, tested the Tandy 3000, the company gave it its highest compatibility rating. Tandy's own tests of several popular computer-aided design packages–*AutoCAD, VersaCAD,* and *MGI/CAD*–show that they work as expected on the 3000. However, there are numerous ill-behaved software packages on the market today. Whenever a software developer violates standard DOS programming rules, there is a possibility that the software will not run on even the most compatible computers. While we regret the problems Mr. Brewer has experienced, they certainly aren't common among the hundreds of thousands of Radio Shack customers.

Ed Juge
Director, Market Planning

Editor's note: E. S. Brewer has managed to make the software and hardware work together. But his experiences serve as a warning: Don't buy a system before testing your applications on it–especially if they're finicky.

You're On
In response to a magazine ad offering free membership, I joined The Source. The only mention of any fee occurred in the footnote: "On-line rates as low as 10 cents/minute. $10 monthly minimum applies." A more detailed description of the monthly charges arrived with my membership verification form, which stated that "minimum charges will be applied to your account, regardless of usage, beginning the month after your ID and password are activated by STC [Source Telecomputing Corporation]."

I was surprised to learn that the charges applied even if I didn't go on line during a given month. I resolved to forget about using The Source and to not activate my password. Since then, I have learned that my ID and password were activated, and I was charged the minimum rate for three months. If I had been explicitly informed at the outset about the monthly minimum and automatic password activation, I never would have joined.

Alan Jeffery Roth
Reedsport, Oregon

The Source responds: By activating his account, we were able to give Mr. Roth an ID and password over the phone. The same process establishes a customer's billing record; that's why the $10 monthly minimum went into effect.

The terms we used to describe the monthly minimum are generally interpreted to mean that a minimum applies regardless of usage. However, since the procedures were not clear to Mr. Roth, we are reimbursing him for all charges–$30 for three months' minimum fees and $12.95 for the user manual.

Nancy Beckman
Manager, Corporate Communications

Don't buy a system before testing your applications on it–especially if they're finicky.

(continues)

BEDFORD STILL CAN'T MAKE COFFEE

But when it comes to accounting software for small business, we're ideal.

The entire program is contained in one file on one disk. Even the payroll formulas for 50 states are built in, (with no need for user maintained tables).

Bedford comes with two manuals. The User's Guide explains program operation in simple terms; the Accounting Manual serves as a layman's introduction to accounting.

Bedford even includes records of a sample company for ease of use, and learning the program.

As for making coffee...we're still working on it! But for now, some office procedures will still have to be done without the ease and efficiency of Bedford software.

" One of Bedford's biggest assets is its speed "
" we rate documentation as excellent "
" ...an excellent rating for ease of use "
" Installing...will take just a few minutes "
" ... a near perfect match for many small companies "
InfoWorld, April 6, 1987

$249
Complete

Call today!
(206) 883-0074

General Ledger
- financial statements are as current as last entry
- produces full audit trails
- entire fiscal year available for reports (any start or finish date)
- largest balance 20,000,000.
- closes books automatically at year end.

Payables/Receivables
- uses open invoice method
- automatically updates, inventory records and general ledger
- user can define aging periods
- prints invoices, statements and checks

Payroll
- both automatic and manual mode
- calculates all federal and state taxes
- uses built-in payroll formulas - no user maintained tables
- five income fields - two are user definable
- handles vacation pay and advances
- six extra deduction fields - three are user definable
- automatically maintains withholdings payable accounts
- automatically retains QTD and YTD employee information
- accumulates 940,941 and state taxes information
- accumulates W-2 data for each employee

Inventory
- handles state and local taxes
- posts from receivables and payables
- up to 999 items
- average weighted cost method
- handles adjustments and transfers
- prints invoices
- automatically flags reorder points

Jobcost
- distribute any revenue or expense to up to 999 projects or profit centers
- paycheck distribution includes the company's portion of FICA, SUTA and Disability Insurance
- produces summary and detail reports for any project or dept.

Program capacity
- Ledger accounts 500
- Journal entries . . . No Limit*
- Vendors 999
- Transactions . . . No Limit**
- Customers 999
- Transactions . . . No Limit**
- Employees 999
- Inventory Items 999
- Projects 999
- Limited by available disk capacity
** Limited by available RAM capacity

System Requirements
Hardware: Requires a minimum of 256K RAM with two disk drives. Program will support up to 640K RAM and a hard drive. Not copy protected.
Computer types: IBM PC and most compatibles using MS-DOS 2.0 or later.

Standard Features
- all modules are fully integrated
- all reports can be displayed or printed
- most reports can be exported to Lotus®, ASCII or DIF files.

® Indicates manufacturer's registered trademark.
™ Indicates manufacturer's trademark
©1986 Bedford Software Corporation.

bedford®

The accounting software for small business.

Dealer inquiries welcome: Bedford Software Corporation, 15008 NE 40 St., Redmond, WA. 98052. (206) 883-0074

Get more info. Go to Ad index.

How to replace your full 20 MB hard disk.

1. Buy new 40 MB hard disk.
2. Buy 58 floppy disks.
3. Format 58 floppy disks.
4. Download files to 58 floppy disks.
5. Buy 58 more floppy disks and back up originals.
6. Store in a safe place until Step 13.

   (If your PC has a tape backup system, substitute Steps 2A-5A. If not, go to Step 7.)

2A. Buy a blank data cartridge.

3A. Insert the cartridge in your PC's tape drive.

4A. Download files from hard disk into tape drive.

5A. Store data cartridge in safe place until Step 16A.

7. Dismantle and remove old hard disk.
8. Carefully note position of cables, mounting brackets, and setting of jumper pins.
9. Write down for safekeeping.
10. Install new hard disk.
11. Cross-check new hard disk manual for correct cable connections and jumper pin settings.
12. Run DOS debug program to do a low-level format.
13. Run DOS partitioning program.
14. Run DOS format program.
15. Load files from 58 floppy disks into new hard disk.
16. Store 58 used floppy disks in safe place until next memory upgrade.

16A. Download files from tape drive into new hard disk.

17. Store data cartridge in safe place until next memory upgrade.
18. Congratulate yourself on successfully filling up half of your new 40 MB drive with your old files.
19. Put ad in classifieds for old hard disk in perfect condition.

How to upgrade it.

1. Buy a 40 MB Hardcard.™ (Call (800) 826-8022 for nearest dealer.)
2. Slip it into a single 1" slot in your PC.
3. Run convenient installation program.
4. Congratulate yourself for adding 40 MB of new storage. And winding up with a total of 60 MB.

Plus™ Hardcard™

Plus Development Corp. is a subsidiary of Quantum Corp.

Plus and Hardcard are trademarks of Plus Development Corp. © 1987 Plus Development Corp.

Get more info. Go to Ad index.

A Matter of Form

I bought version 1.0 of BLOC Development's *FormTool* in 1985 and was very happy with it. Although the program didn't have a driver specifically for the IBM Proprinter, I was able to make the two work together.

When version 2.0 was announced, I decided to upgrade. Although the program had many new features, it still didn't support the Proprinter, and I couldn't make it work with the printer as I had with version 1.0. I wrote to BLOC Development three times asking for help but received no answer. I can't understand why the company wouldn't respond to a registered user.

Mark L. Newell
Portland, Oregon

BLOC Development responds:
We have been unable to verify the receipt of any correspondence from Mr. Newell. Fortunately, our latest release of *FormTool* (version 2.01) now supports the Proprinter. We have sent a copy to Mr. Newell to address his printing needs.

Tim McGuinness
Technical Manager

Moving Up or Down?

When my company purchased the first version of *Harvard Total Project Manager*, it worked fine on our IBM Color Jetprinter. Before upgrading to version 2 of the program, we called Software Publishing and were assured it would work with our present configuration. It didn't. Although we've called and written letters to the company, we haven't received any help.

George Duemeland
Bismarck, North Dakota

Software Publishing responds:
Due to space constraints, our advertising does not list supported printers, but we do provide a full list of the printers we support in all *Harvard Total Project Manager* brochures, fact sheets, trial disks, and upgrade information. In none of these items do we list the IBM Color Jetprinter as a supported printer for version 2.

Our product support staff tried several times to reach Mr. Duemeland but was unable to contact him. The poor experience Mr. Duemeland describes is not typical of our interaction with customers.

Bertram Rankin
Product Manager

Editor's note: According to Mr. Rankin, version 1.1 of Harvard Total Project Manager *supported the IBM Color Jetprinter; version 2 does not. "That's a decision we made after taking a look at printer market share," says Rankin. Mr. Duemeland's options? Either return to using version 1.1 (and send back version 2 for a refund) or buy a new printer.*

> *'Thanks to the efforts of AT&T, our PC 6300 has been brought up to standard and is performing without fault.'*

PC Plaudits

Editor's note: In June, Consumer Watch *included a letter from Stephen O. Davis, who had purchased an AT&T PC 6300 from Discount Micro Sales–now out of business–and subsequently discovered that the manufacturer's warranty was invalid because the PC was not a standard-issue AT&T machine. But AT&T has come through admirably. Writes Davis: "Thanks to the efforts of Mr. James Olson, AT&T's chairman of the board, and Mr. Jim Barham, area sales manager, the PC has been brought up to AT&T standards and is performing without fault."*

Got a gripe? Want to set the record straight? Write Consumer Watch, PC World, *501 Second St., San Francisco, CA 94107, or use MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. Include your name, city, state, and daytime telephone number with all correspondence. Letters may be edited for length and style. Due to volume, we cannot acknowledge every letter.*

Ever want to blow up your computer screen?

Now you can with Data Display.™

Your training and group presentations will never be the same. Simply place Data Display on any transmissive overhead projector, connect it to your computer's video port and turn it on.

Data Display projects crisp, larger than life, computer-generated images that allow for real-time manipulation of data—even in ordinary room lighting. And our true aspect ratio maintains the exact proportions as your monitor, so your pie chart doesn't turn into an egg chart.

We get along with everyone.
Because Data Display has built-in RGB and composite video ports (no adapter required!), it gets along with IBM's and compatibles, Apple II's and any software they run. We also give you our own Presentation Partner™ software to help you create dynamic presentations on IBM and compatibles. And at just 5 pounds you can take it everywhere.

The competition is heating up.
Heat from overhead projectors can cause "dark spots" on other projection panels and ruin display image. But cool-running Data Display uses a highly efficient fan and air flow system to guarantee consistent screen quality.

Place your chips on us.
Our state-of-the-art "chip on glass" technology actually bonds electrical circuitry to the Supertwist LCD panel for strength and reliability . . . replacing fragile, outdated printed circuit boards. That's why we give a full one year warranty and not the 90 day warranty you'll find elsewhere.

It's an open/shut case.
For its features, Data Display is the best value available. And when you purchase before September 1, 1987, you will receive a free carrying case valued at $69.95.

Data Display is available at computer stores everywhere. For the dealer located nearest you call . . . 1-800-582-2580. Within California, call 1-800-582-0852. Ask for Ext. 601.

COMPUTER ACCESSORIES CORPORATION

The Leader In Computer Components.

IBM and APPLE are registered trademarks of International Business Machines and Apple Computer Inc. respectively.

Get more info. Go to Ad index.

The difference is compatibility.

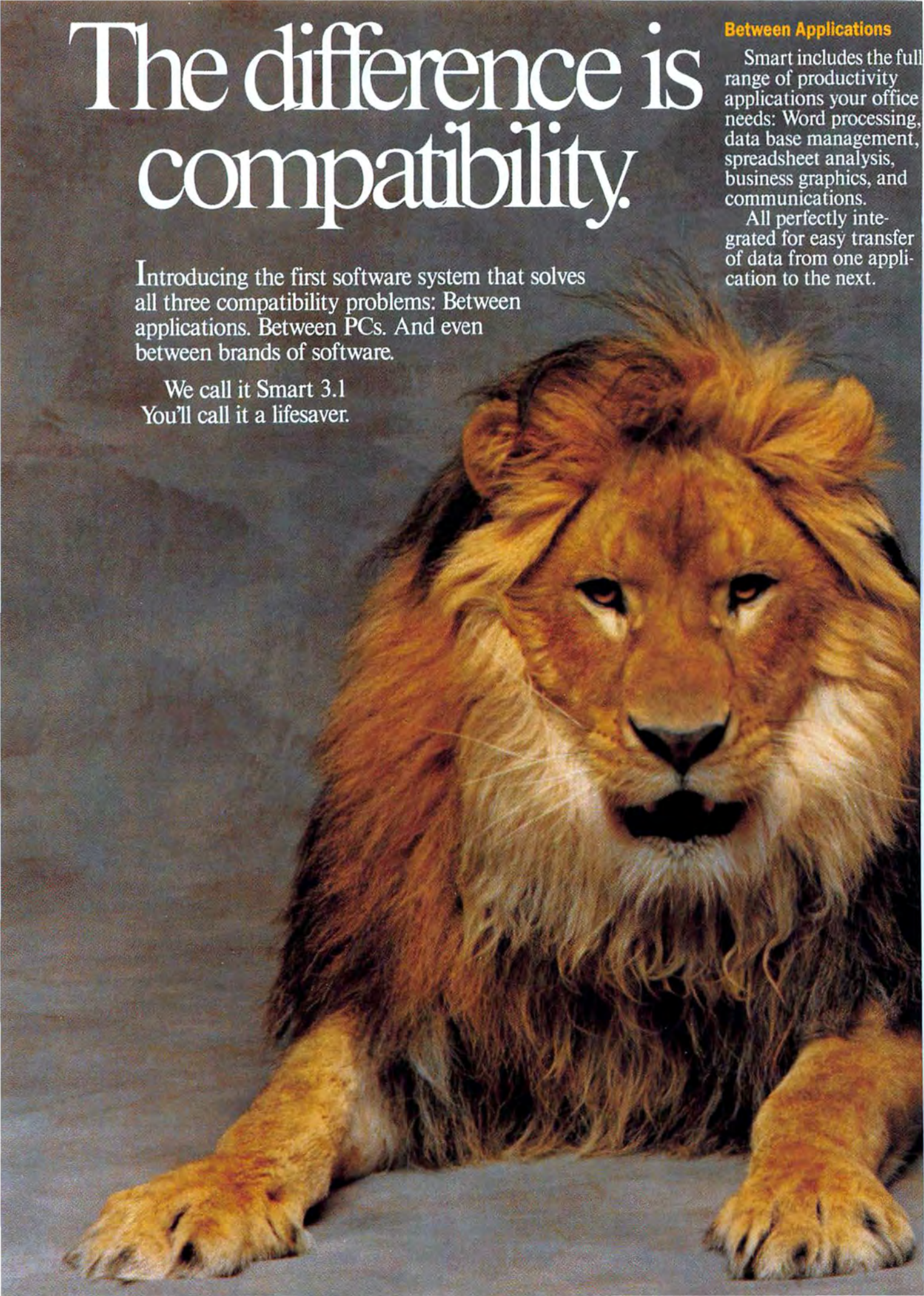
Introducing the first software system that solves all three compatibility problems: Between applications. Between PCs. And even between brands of software.

We call it Smart 3.1
You'll call it a lifesaver.

Between Applications

Smart includes the full range of productivity applications your office needs: Word processing, data base management, spreadsheet analysis, business graphics, and communications.

All perfectly integrated for easy transfer of data from one application to the next.



And only Smart lets you create custom programs that actually jump between applications. So, for instance, a single keystroke can transform a worksheet into a 3-D pie chart, paste the chart into a document, and send the document via modem to the home office.

Smart's "REMEMBER" command lets non-programmers create custom programs.

Smart's "SEND" command makes it easy to move data between applications.

Smart automatically protects your data in multiuser environments.

Between Workstations

Even if your PC isn't on a local area network (LAN) now, there's a good chance it will be soon.

And with Smart, you'll be ready.

Every Smart application includes a fully automatic File or Record-Locking scheme for shared data. So right out of the box, Smart can be used either on a single user PC or on a LAN workstation.

There are even versions of Smart for multiuser UNIX® systems.

Which, according to Information Week, makes Smart "the first to provide DOS-UNIX-LAN connectivity without sacrificing power and features."

Between software brands

Old software can be replaced, but old data can't. So you'll be pleased to learn that Smart is fully compatible with files already created with programs like Lotus 1-2-3 and dBase III Plus.

Smart also reads and writes ASCII, SYLK, DIF, and DCA.

Oh by the way, there's something else Smart is perfectly compatible with: You. Fact is, nearly every top computing magazine has praised Smart for its ease of use, on-line help, extensive tutorials, and clearly written manuals.

But why not see for yourself?

Just return the attached card, or call toll-free (800) 331-1763 (in Kansas, Alaska or Canada call (913) 492-3800) and we'll rush you a free Smart demo disk and information kit.

SmartWare®
from Innovative Software

© 1987, Innovative Software, Inc. SmartWare, Lotus 1-2-3, dBase, and Unix are registered marks of Innovative Software, Lotus Development, Ashton-Tate and AT&T respectively.

Turner Hall Publishing on Spreadsheet Productivity:

HOW TO FINISH FASTER, LEAVE WORK EARLIER, AND GET MORE TIME TO DRIVE.

You needed help with your work. That's why Lotus invented 1-2-3. And now that using spreadsheets just keeps you on par, it's time to take the next step in productivity. One that can reduce Lotus handicaps.

Drive ahead with 4WORD The Add-In Word Processor for 1-2-3. 4WORD (*by LeBlond Software*), means you'll never have to leave 1-2-3 to create presentation quality letters, memos, or reports. You get word processing complete with automatic word wrap, bold, underline, tabs, margins and more. At the shift of a key.

4WORD works just like Lotus. So you already know how to use it. Because it's instantly available and easy, you'll get writing work done while you're thinking about it. Instead of waiting until after you've finished your numbers. 4WORD even helps you create form letters, and mail-merge them with your spreadsheet's database. Complete with 1-2-3 ranges and numbers "hot-linked" inside so they change automatically as your spreadsheet changes. And, its documents are Symphony compatible because they're stored as part of the spreadsheet. Which also means you can count on your words being error-free using Spellin!, our optional spelling checker.

4WORD is the easy, elegant way to get words and numbers working together. For Only $99.95.

Turner Hall's Utility Library removes almost every Lotus handicap. Which means you'll get more Lotus done in less time without trouble. Note-It Plus, for example, helps you remember and document everything you've ever forgotten about spreadsheets. SQZ! reduces files by up to 95% for faster, safer backup and an almost immediate, tenfold increase in available disk space. Save time with single-key searching of every cell for 25 types of errors with The Cambridge Spreadsheet Analyst. And make spreadsheets (and yourself) look more professional with 4WORD and Spellin!. Buy any of these for under $100. Less than you'd pay for one night in an average business hotel.

Call now for more information or to order on our 30-day, no questions asked, money-back guarantee. Save today. Fore tomorrow.

(800) 556-1234 Ex. 525
(800) 441-2345 Ex. 525 in CA

The Lotus Utility Software Library from Turner Hall Publishing.

Write without leaving 1-2-3 with 4WORD The Add-In Word Processor.

Check 1-2-3 and Symphony's spelling with Spellin!

Save backup time, disk space, and communications cost with SQZ!, the 1-2-3 file squeezer.

Keep spreadsheets error-free with The Cambridge Spreadsheet Analyst.

Remember, document, and search for everything you've forgotten about spreadsheets with Note-It Plus.

Turner Hall Publishing

SYMANTEC

Turner Hall Publishing Division. 10201 Torre Avenue, Cupertino, CA 95014. (408) 253-9600. 4WORD The Add-In Word Processor, Spellin!, SQZ!, and The Cambridge Spreadsheet Analyst are trademarks, and Note-It is a registered Trademark of Turner Hall Publishing. Other brands and products are trademarks of their respective holders. Works with IBM PC, PS/2, and compatibles. (3½" diskette exchange available.) © 1987.

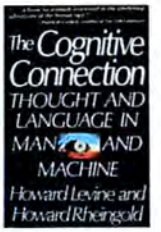
Get more info. Go to Ad Index.

Sourcebooks

Further explorations into personal computer technology

How languages shape the computer's future, troubleshooting and maintaining today's hardware, protecting against data vendettas, and a reader's digest of popular program manuals

Michael Harper and Marlene Nesary



The Language Machine

The Cognitive Connection: Thought and Language in Man and Machine
Howard Levine and Howard Rheingold
Prentice Hall Press, New York, 1987
276 pages
$19.95 hardcover

Computers are machines that follow instructions. And following instructions is a linguistic–rather than a physical–capability. So if you want to know which way the computer revolution is headed, pay attention to what's happening in the research of language–both natural and artificial.

That's what Howard Levine and Howard Rheingold have done in their fascinating new book, *The Cognitive Connection*. They mount an informed and sophisticated investigation of the relationship between natural languages and formal symbol systems and then show how the ornate cathedrals of actual programs are built from simple binary gates. They also abstract some general principles for computer languages, covering such topics as algorithms, data structures, and programming style.

Rheingold and Levine contrast the early, unfriendly, "industrial strength" languages such as FORTRAN and COBOL with the later, more accessible (but academic) BASIC. They discuss the evolution of LISP and Logo, the first artificial languages designed to handle symbolic data (such as names and objects rather than numbers), and they show how the modularity of Pascal helped programmers become more efficient.

But improved efficiency is only the tip of an iceberg with titanic implications for the software industry. Rheingold and Levine suggest that programmers as we know them will become obsolete, because newer languages–like Prolog, with its capacity for both inductive and deductive operations, and the Smalltalk environment, with its focus on data objects–capitalize on linguistic-intensive artificial intelligence (AI) technologies.

End users, the authors predict, will create their own programs by responding to prompts for information about relationships among "data objects" and about desired results. Driven by expert system interfaces, new programming engines will take user input, make all inferences, ask for more information as necessary, and supply the code.

You may dispute the authors' claim that AI will drive software development and believe instead the industry wag who charged that "if it works, it can't be AI." But if the authors' optimism is justified, then computers will soon emulate some of the reasoning powers human beings bring to

(continues)

"The PC's Limited 386[16] should top the list of anyone wanting today's utmost in performance and power."

—*PC Magazine*, August 1987

Impressing the folks at *PC Magazine* is no easy task.

So when they praised our 386[16] machine as "one of the fastest running desktop computers available today," it's safe to say they liked what they saw.

And what they saw was the industry's first true second-generation 386 machine; a computer that has a less cluttered motherboard that utilizes Very Large Scale Integration and speedy Static RAM.

The result is a 386 machine with zero wait states, that screams through compatible software, and that blows the doors off the competitor's 386 machine, in *PC Magazine's* words, "...at times crunching numbers 50 to 70 percent faster."

While *PC Magazine* gave us high marks for our power and performance, you'll give us equally high marks for our low price. We've eliminated the middlemen—and their 35-40% markups—and pass the savings that comes from buying direct from the manufacturer on to you.

But saving money is just the beginning. We back every machine with a one-year warranty and a 30-day no-questions-asked money back guarantee. And the low systems prices include the cost of your optional 12 month on-site service contract with Honeywell Bull.

To order your computers, call us at 1-800-426-5150. Talk to one of our sales representatives about which computers you want, give us your credit card or corporate purchase order number, and UPS will deliver your computers to your door.

So why just read about the fastest 386 machine when you can pick up the phone and order it. Just call us... 1-800-426-5150.

PC'S LIMITED 386[16]

MORE IMPRESSIVE COMPUTERS.

Standard chassis

The 386[16] Monochrome System

Includes the following standard features and options.

Intel 80386 running at 16 MHz
1024K of 0 Wait State Static RAM
1.2 Meg floppy drive
Combined floppy and hard disk Controller
101 key Keyboard
192 watt Power Supply
System Clock/Calendar/Configuration Data in CMOS RAM with battery backup
Hercules compatible Monochrome Graphics card
2 Serial and 1 Parallel port
High Resolution Monochrome Monitor
Smart Vu™ (Real Time Diagnostic Display)
12 month, on-site Honeywell Bull service contract

With a 40 Meg, 28 MS hard drive and standard chassis
$4,499
With a 70 Meg, 28 MS hard drive and standard chassis
$4,899
With a 150 Meg, 18 MS hard drive and standard chassis
$5,899

The 386[16] EGA Color System

The above system with the following substitutions.

EGA Video card
The EGA High Resolution Monitor

With a 40 Meg, 28 MS hard drive and standard chassis
$4,999
With a 70 Meg, 28 MS hard drive and standard chassis
$5,399
With a 150 Meg, 18 MS hard drive and standard chassis
$6,499

The 286[12] Monochrome System

Includes the following standard features and options.

Intel 80286 running at 6 and 12 MHz
1024K on board • 1.2 Meg floppy drive
Combined floppy and hard disk Controller
84 key Keyboard • 192 watt Power Supply
Clock/Calendar with battery backup
Hercules compatible Monochrome Graphics card
2 Serial and 2 Parallel ports
High Resolution Monochrome Monitor • Standard chassis
Smart Vu™ (Real Time Diagnostic Display)
12 month, on-site Honeywell Bull service contract

With a 40 Meg, 28 MS hard drive
$2,699
With a 70 Meg, 28 MS hard drive
$2,999

The 286[12] EGA Color System

The above system with the following substitutions.

EGA card • 2 Serial and 1 Parallel port
The EGA High Resolution Monitor

With a 40 Meg, 28 MS hard drive
$3,199
With a 70 Meg, 28 MS hard drive
$3,499

We have technical support people that you can talk to for free by calling 1-800-624-9896.

Our Total Satisfaction Guarantee works like this: Any item bought from us 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.

Our One Year Limited Warranty says we warrant each system we manufacture to be free from defects in materials and workmanship for one year following the date of shipment from PC's Limited. During the one year period, we will repair or replace, at our option, any defective products at no additional charge.

All systems prices include the features and options listed. Pricing and System Specifications are subject to change without notice. Please inquire for current details. © 1987 PC's Limited. Dell Computer Corporation.

AT VERY IMPRESSIVE PRICES.

The 286[8] Monochrome System

Includes the following standard features and options.
Intel 80286 running at 6 and 8 MHz
1024K on board • 1.2 Meg floppy drive
Combined floppy and hard disk Controller
84 key Keyboard • 192 watt Power Supply
Clock/Calendar with battery backup
Hercules compatible Monochrome Graphics card
2 Serial and 2 Parallel ports
High Resolution Monochrome Monitor
Smart Vu™ (Real Time Diagnostic Display)
12 month, on-site Honeywell Bull service contract
With a 20 Meg, 65 MS hard drive and
the space saving chassis
$1,799
With a 40 Meg, 40 MS hard drive and standard chassis
$2,149

The 286[8] EGA Color System

The above system with the following substitutions.
EGA card • 2 Serial & 1 Parallel port
EGA High Resolution Monitor
With one 20 Meg, 65 MS hard drive and the space
saving chassis
$2,299
With a 40 Meg, 40 MS hard drive and standard chassis
$2,649

Optional Honeywell Bull On-Site Service Contract provides for on-site service for parts and labor within the next business day if your system is located within 100 miles of Honeywell Bull's 185 service locations.

A system is defined as a CPU, monitor, video card and the disk drives indicated above. Your co-operation will be required in explaining the problem before a customer service engineer is dispatched.

Call or write PC's Limited for the complete terms of our Total Satisfaction Guarantee, our One Year Warranty and the Honeywell Bull Service Contract. PC's Limited, 1611 Headway Circle, Bldg. 3, Austin, Texas 78754.

The Turbo Monochrome System

Includes the following standard features and options.
Intel 16-bit 8088-2 running at 4.77 and 8 MHz
640K on board • 84 key Keyboard
130 watt Power Supply
Hercules compatible Graphics Adapter
High Resolution Monochrome Monitor
12 month, on-site Honeywell Bull service contract
With one 360K floppy drive
$799
With one 360K floppy and a 20 Meg, 65 MS hard drive
$1,199

The Turbo EGA Color System

The above system with the following substitutions.
EGA card
The EGA High Resolution Monitor
With one 360K floppy drive and a
20 Meg, 65 MS hard drive
$1,699
With one 360K floppy and a 40 Meg, 40 MS hard drive
$2,199

AT, Hercules, and Honeywell Bull are registered trademarks.

To order a PC's Limited computer call us at 1-800-426-5150. Extension 743. Our sales lines are open from 7 to 7 Monday through Friday and 9 until 2 on Saturday, Central Standard Time.

PC'S LIMITED™
Dell Computer Corporation

Get more info. Go to Ad Index.

language processing. Just how far this evolution will go is a matter for debate, but Rheingold and Levine present a tightly argued, well-documented case that can't be easily dismissed. It's not light reading, but this exciting crash course in the theoretical and practical limits of "computability" is well worth the effort.

Doctor Hardware

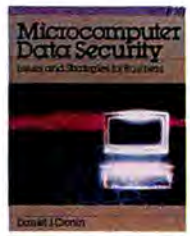
The Brady Guide to Microcomputer Troubleshooting and Maintenance
Henry F. Beechhold
Brady/Prentice Hall Press, New York, 1987
324 pages
$17.95 softcover

It's all very well to argue that the true computer is software, not hardware—except when your PC rolls over and plays dead. In such extremities, Henry Beechhold's book will be more to the point than any speculations about the shape of software to come. It may not solve all your problems, but you will come away with a clearer picture of available remedies.

Like all good advisers, Beechhold focuses on preventive measures. Much of his book is devoted to maintenance routines that reduce the chances of system failure. When disaster does strike, the simple diagnostic routines he includes can help a nontechnical reader locate and solve problems caused by loose cabling, defective disks or clocks, jammed paper, and so on. You can hone your troubleshooting skills even further by reading the chapters on how computers and peripherals work at the level of electrons and instructions sets.

Full of useful tips (for instance, don't expect integrated circuit pins to survive much banging around), Beechhold's *Guide* is clear and well organized—there's even a pullout troubleshooting roadmap at the back. The book also accommodates tinkerers with varying ambitions: One chapter explains how to read and use the schematic diagrams in a hardware manual; another covers the use of a logic probe and the rudiments of soldering.

Even if your system goes on purring contentedly, the chapter "Making Changes," in which Beechhold discusses choosing and installing upgrades such as expansion boards or a new power supply, may come in handy. A chapter devoted to technical references, a glossary of abbreviations and technical terms, suggestions for further reading, and a good index enhance the *Guide*'s usefulness. For those times when your system is acting up and you can't reach your resident technical wizard, reach for Beechhold instead—you'll find help.



Short-Circuiting Computer Crime

Microcomputer Data Security: Issues and Strategies for Business
Daniel J. Cronin
Brady/Prentice Hall Press, New York, 1986
281 pages
$18.95 softcover

Daniel J. Cronin is concerned with disaster. In fact, 4 of the 13 chapters in *Microcomputer Data Security: Issues and Strategies for Business* are devoted to precautions against theft, fire, flood, and crashes caused by power-line gremlins or the beasties that lurk in a poorly designed workstation environment.

But the heart of the book concerns computer disasters of another sort: deliberate, unauthorized access to (and interference with) software. Dispelling the myth of the budding young Einsteins as portrayed in news stories and movies such as *War Games*, Cronin insists that the typical computer criminal is a disgruntled employee bent on vengeance.

No matter how mundane the motives and players, however, the effects of computer crime are dramatic—so dramatic that many

(continues)

USE THE BRAINS YOUR IBM WASN'T BORN WITH.

Right at your fingertips in CompuServe's IBM® Forums.

Our IBM Forums involve thousands of users worldwide who will show you just how easy it is to get the most from your IBM and IBM compatibles.

The IBM New Users Forum lets you ask basic questions of PC experts. The IBM Junior Forum is perfect for PCjr® users. Trade tips with other IBM PC and AT users in the IBM Software Forum. Ask questions and get answers directly from the manufacturers in the PC Vendor Support Forum. And if you're looking for a PC Bulletin Board, visit the IBM Communications Forum. Or try the IBM Hardware Forum for discussions on hardware topics and product updates.

Easy access to free software, including free uploads.

You can easily download first-rate, non-commercial software and utility programs. Upload your own programs free of connect time charges. And take advantage of CompuServe's inexpensive weeknight and weekend rates, when forums are most active and standard online charges are just 10¢ a minute. You can go online in most areas with a local phone call. Plus, you'll receive a $25.00 Introductory Usage Credit when you purchase your CompuServe Subscription Kit.

Information you just can't find anywhere else.

Use the Forum Message Board to send and receive electronic messages. Join ongoing, real-time discussions in a Forum Conference. Communicate with industry experts, including the programmers who write your favorite programs. Search Forum Data Libraries for non-commercial software and shareware.

Enjoy other useful services too, like electronic editions of popular computer magazines.

All you need is your IBM computer or IBM compatible computer (or almost any other personal computer) and a modem.

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 and Canada, 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

Now Available!
The Best of IBMNET
Nearly 600 software file listings
Type GO ORDER or call CompuServe

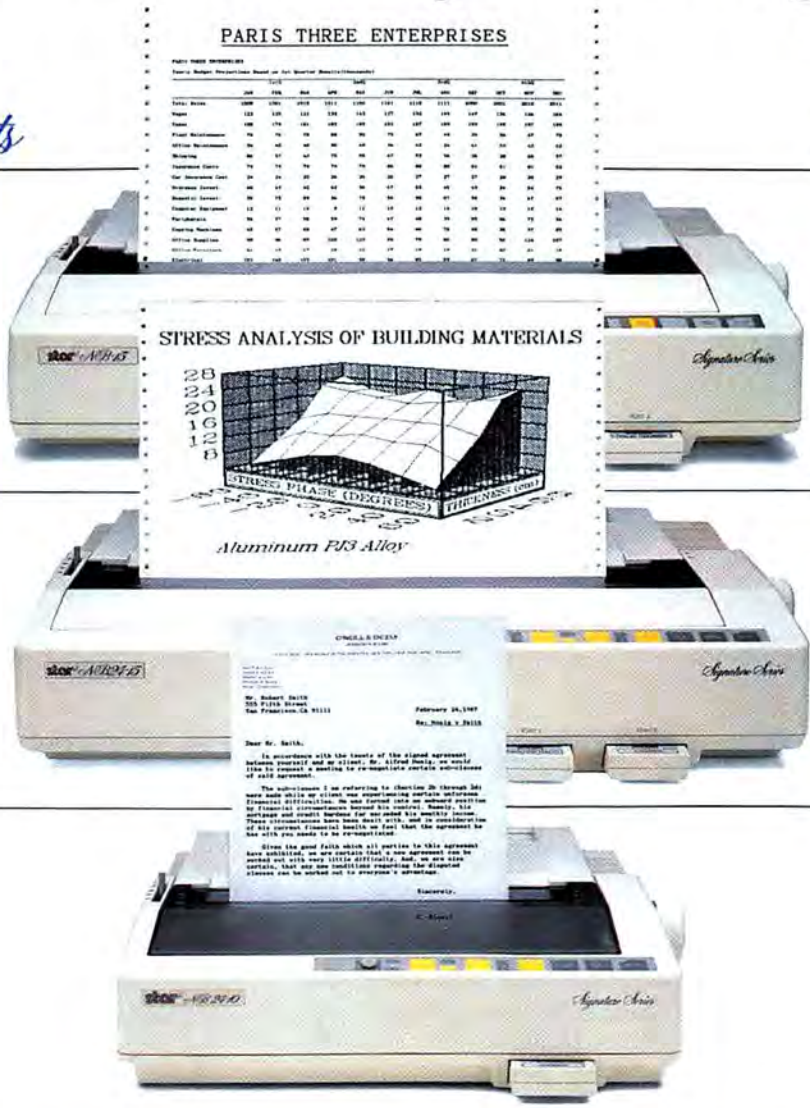
Get more info. Go to Ad Index.

Our Signature can do wonders for your image.

Spreadsheets *by Signature* *NB-15*

Graphics *by Signature* *NB24-15*

Text *by Signature* *NB24-10*



If you'd like a compelling reason to choose one of the 24-wire Star Signature Series Printers, here are three:

Spreadsheets, graphics, and text.

As one of the most advanced dot matrix printers on the market, the Signature Series brings new life to spreadsheets, graphics, and text—incredible clarity and resolution to every print-out.

Team your PC with our Signature—and know that the image you print will make you look your very best.

Quality. The Signature Series gives you impressive Letter Quality print-outs. And superior resolution graphics. That means convincing correspondence, great graphics, powerful presentations. ImagePower™ in every print-out.

Control. The advanced features of our easy-to-use front panel put complete control of important functions right at your fingertips.

Versatility. At a touch, choose from print pitch, paper length, form feed, and optional interchangeable fonts. And with a built-in buffer—expandable in our top model to 32K—you can work on one project, while printing another.

Speed. The Signature Series can produce drafts as fast as 300 characters per second. And superb true Letter Quality at up to 100 cps.

You can't beat the Signature Series from Star. Because when your print-outs look better, so do you.

For more information on how a new Signature can do wonders for your image, **call 1-800-447-4700.**

Star Signature Series™ by star micronics

THE IMAGEPOWER PRINTERS

Get more info. Go to Ad Index.

SEE US AT PC EXPO & THE INFO SHOW IN NEW YORK IN SEPTEMBER

On April 2, 1987 IBM and Quarterdeck announced the next generation in personal computing.

Introducing DESQview 2.0. Improving the past and ready for the future right now.

In one sweeping announcement from Miami Beach and New York City, IBM established new standards of performance for personal computers, with its new Personal System/2.™ Quarterdeck was there with IBM and simultaneously helped establish new standards for multi-tasking and multi-windowing.

We were there for them then. We're here for you now.

If you use two or more software programs, if you use a PC-compatible machine, if you own a new 80386 computer, if you've just bought one of the new Personal System/2 computers, or if you've tried Microsoft Windows and were disappointed but still need the power of graphics programs, DESQview 2.0 is the answer.

Consider this. InfoWorld voted DESQview's earlier version 1986 Product of the Year. SoftSector gave it the Editor's Choice Award. In PC Tech Journal's "System Builder Contest" at Comdex Fall it was voted best operating environment. And 450,000 dedicated users on four continents have voted yes with their dollars.

The new DESQview 2.0 is an order of magnitude better.

This unique software program enhances the power of your personal computer and makes it more convenient to use. It still gives your PC the power of many PCs. It still does windows. It still multi-tasks. It still breaks the DOS 640K barrier. It still transfers data. It still dials your phone. It still gives you menus for DOS. It still remembers your keystrokes (macros). It still runs your existing programs and your new programs soon to come. In fact now you can even run Windows-, GEM-, and Topview-specific programs too. And with 386 machines and our Expanded Memory Manager it still becomes a 386 control program, but now you can run text *and* CGA graphics programs in background.

The new DESQview 2.0.

For us it's the next logical step. For you it's windows of opportunity.

SYSTEM REQUIREMENTS
• IBM Personal Computer and 100% compatibles (with 8086, 8088, 80286 or 80386 processors) with monochrome or color display; IBM Personal System/2 • Memory: 640K recommended; for DESQview itself 0-145K • Expanded Memory (Optional): expanded memory boards compatible with the Intel AboveBoard; enhanced expanded memory boards compatible with the AST RAMpage • Disk: Two diskette drives or one diskette drive and a hard disk • Graphics Card (Optional): Hercules, IBM Color/Graphics (CGA), IBM Enhanced Graphics (EGA), IBM Personal System/2 Advanced Graphics (VGA) • Mouse (Optional): Mouse Systems, Microsoft and compatibles • Modem for Auto-Dialer (Optional): Hayes or Compatible • Operating System: PC-DOS 2.0–3.3; MS-DOS 2.0–3.2 • Software: Most PC-DOS and MS-DOS application programs; programs specific to TopView 1.1, GEM 1.1 and Microsoft Windows 1.03 • Media: DESQview 2.0 is available on either 5¼" or 3½" floppy diskettes

Rush me DESQview 2.0! Today!

No. of Copies	Media 3½"/5¼"	Product	Retail Price ea.	Total
		DESQview 2.0	$129.95	$
		Shipping & Handling USA	$ 5.00	
		Outside USA	$ 10.00	$
		Sales Tax (CA residents)	6.5%	$
			Amount Enclosed	$

Payment: ☐ Visa ☐ MC ☐ AMEX ☐ Check

Credit Card: Valid Since ____/____ Expiration ____/____

Card Number: | | | | | | | | | | | | | | | | |

Credit Card Name ____

Shipping Address ____

City ____ State ____ Zip ____ Telephone ____

Mail to: Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405
NOTE: If you own DESQview call us for a special upgrade offer, or send in your DESQview registration card and we'll send you upgrade information. PCW 9

DESQview™ Quarterdeck

SEE YOUR DEALER & ASK ABOUT OUR SPECIAL OFFER

Quarterdeck Office Systems • 150 Pico Boulevard, Santa Monica, CA 90405 • (213) 392-9851

DESQview is a trademark of Quarterdeck Office Systems. AboveBoard is a trademark of Intel Corporation. Hayes is a trademark of Hayes Microcomputer Products, Inc. IBM, PC, Personal System/2 and TopView are trademarks of International Business Machines Corporation. Microsoft Windows and MS are registered trademarks of Microsoft Corporation. Mouse Systems is a trademark of Metagraphics/Mouse Systems. RAMpage is a trademark of AST Research, Inc. GEM is a trademark of Digital Research. Hercules is a trademark of Hercules.

victims (especially large corporations) prefer to keep their vulnerability secret. In one study Cronin cites of 200 anonymous firms, about 60 admitted to having been stung, incurring losses as high as $15 million per strike.

What can you do to prevent PC sabotage? If someone wants to trash a machine, it's easy enough to pour a cup of coffee into the vents on a hard disk drive. But if your main concern is controlling access to sensitive information, then Cronin has plenty of helpful suggestions. His strategies include using the DOS directory and subdirectory structure for "hiding" important files and employing sophisticated encryption schemes.

Cronin explains the theory of encryption clearly and thoroughly and provides evaluations of hardware and software products that protect and encrypt data.

A specialist in microcomputer security, Cronin is quick to point out the weaknesses as well as the strengths of various products. He reviews the encryption capabilities of several software packages (*Security, Privacy Plus,* and *SuperKey*) that are inexpensive enough to consider even if the only data you want to protect is the phone numbers in your little black book. Cheapest of all is an encryption program written in Turbo Pascal—it's free, because Cronin gives the listing in an appendix to his candid, comprehensive, and immensely practical book.

Documentation Digest

Quick Start Guide for 12 Top PC Programs
John Rafferty and Sandra Jerome
En Route Books, 6408 W. College Dr., Phoenix, AZ 85033, 1986
217 pages
$19.95 softcover (available by mail for additional $4)

In the beginning software documentation didn't exist; or else programmers wrote it, so it might as well have not existed. While it's true that many software manuals are better written and organized than they used to be, it's still a reasonable bet that over the years, shoddy "helpware" has caused more gnashing of teeth than have recalcitrant disk drives, shimmying video displays, or uncommunicative motherboards.

The *Quick Start Guide for 12 Top PC Programs* is a good partial remedy for this situation. Chosen on the basis of sales figures, the 12 programs covered are *1-2-3, SuperCalc, Multiplan, pfs:plan, WordStar, WordPerfect, Microsoft Word, MultiMate, pfs:write, dBASE III, pfs:file,* and *Flight Simulator.* There's also a brief (ten-page) section on MS-DOS. For each program the authors present succinct, well-organized instructions for start-up and use of key features.

Unlike the questionable tutorials that so many manuals feature, these guides give you just what you need to do real, useful work in a very short time. After all, you didn't buy a spreadsheet to spend hours working painfully through the inventory of a mythical Mr. Jones's equally mythical nuts-and-bolts company. There are no hints or alternatives for the power user, however, and the *Guide* doesn't tell you how to handle crises like *WordStar* slapping you with a 'disk full' message in the middle of a crucial save. But Rafferty and Jerome will get you in and out of a program with a minimum of bother, and you'll have something to show for it.

Anyone who uses several programs regularly and doesn't want to carry a suitcase full of manuals on the road will find this a handy primer; so will the person familiar with basic computer operations who wants a clear overview of the main features of one of these programs. And if you're still shopping around for software, the *Guide* will give you a feel for the ease, power, and user-friendliness of several popular choices. *–M. H.*

Books in Brief

■■■■■

One of the most opaque of programs, Cosmo's *Revelation* is nonetheless an acknowledged data base powerhouse with special relevance for text-intensive chores. If you want to see the outlines more clearly, pick up Hal Chapel and Richard Clark's *Revelation Revealed.* Two consultants whose

(continues)

TOOLS FOR THE MOST DANGEROUS JOB IN BUSINESS.

The Project Planning and Presentation System that works the way you think.

Writing plans. The minute you present a project plan or proposal with objectives, schedules, and of course budgets, you set yourself up as the company spear catcher. Because you and your company are going to bet your mutual future on that plan. That's dangerous territory. But what if you could write and present a plan that's bulletproof from the beginning?

Outline-based planning. InstaPlan's "top-down" approach helps you think through plans and proposals. First, define broad objectives. Then, flesh out the details. Assign resources to activities on InstaPlan's unique spreadsheet. Finally, InstaPlan's database lets you select key activities for analysis and presentation.

A $99 powertool for:

- Consultants
- Marketers
- Entrepreneurs
- Engineers
- Product Managers
- Contractors
- Facilities Planners
- Account Executives
- Production Planners
- Researchers

"Selling" your plan. InstaPlan prints professional graphics on ordinary printers for overheads, proposals and handouts: Charts. Tables. Workflow diagrams. Expense graphs. Even Gantt and Time-phased PERT charts. So, you'll look as good as your plan.

Tracking performance. The InstaPlan progress tracking option is a $50 add-on module to InstaPlan.

Site licensing available

With it, you can compare progress and current activity against the plan. See time and budget changes for every step. Track shifts in cash flow and man-hours compared to plan.

"...InstaPlan is ideal for people like us who are too busy doing instead of planning..."

Esther Dyson
Release 1.0
March 24, 1987

"Redefines project management by combining thousand dollar performance with ease of use and superior output."

Tim Malagon
Project Information Services Corporation
San Clemente, CA

An air-tight guarantee. We guarantee that InstaPlan will help you develop and present clearer and more accurate plans. Or, return the complete package within 30 days and we'll cheerfully refund your money.

ORDER TODAY. $99.
NO RISK. TOLL FREE.

800-852-7526

"...InstaPlan...is a sexy, very interactive, very different approach to project management."

Stewart Alsop
PC Letter
© 1987 by PC Letter Associates

Recommended Configuration: IBM PC/XT/AT or compatible, 640K RAM, Hard Disk, or 512K, Dual Floppy required. **Printers Supported:** IBM Proprinter & Graphics Printer, Epson FX/MX/RX/LQ* Okidata Plug 'n Play 92/3, Microline 192/3, 292/3,* Toshiba 351,* and HP LaserJet Plus. *(72 x 120 dpi, B/W)

Not Copy Protected

The TOP 10 Reasons

Reason #1) REALLY Nice People! -- Well, yes the Qubie' staff are nice people, but they are also seasoned professionals. Our courteous Sales/Customer Service Department is staffed with people who can answer any question before you buy and take your order. Our top-notch Technical Support Department (working hours, **M - F 8am - 5pm PTZ, and Sat. 8 11am PTZ**) are as close as a phone call and can answer your questions after you buy. The staff of Qubie' knows it takes excellent service and tech-support to keep customers satisfied.

Reason #2) REALLY Good Products! -- Yes, Qubie' products are of the highest quality, but you don't have to take our word for it, our exclusive **30-Day No Risk Guarantee** speaks for itself -- if for any reason you are not completely satisfied with your purchase, you may return it within 30 days of purchase, for a complete refund, including the cost to send it back. Qubie' also offers a **one year warranty**, and **48-hour turnaround** and **Federal Express** on warranty repairs. The staff of Qubie' knows that customers want the best products at the lowest price.

Reason #3) Recommended By Several World Leaders -Well, perhaps not WORLD leaders, but Qubie' customers ARE leaders in the business community -corporations such as Exxon, General Motors, Rockwell and IBM, to name a few, buy peripheral equipment from Qubie' and have been for years; we've been pleasing PC owners since 1982.

So, please read on for reasons 4-10 and **DISCOVER** for yourself what others have known for so long -- Qubie' MEANS really nice people and really good products (at really low prices!)

Thank You

HARD SOLUTIONS

The PC20 is an internal hard disk subsystem mounted like your floppy that sells for an unbelievable **$309**! The PC20 drive boots directly from the hard disk and does not require software patches. Also included is software that truly enhances the use of your hard disk -- 1dir, the hard disk organizer that makes DOS a snap.

CLEAR SOLUTION

Choose from an array of display kits ranging from our Amber Monochrome Kits to our Enhanced Graphics Kits which feature a 640x350 resolution monitor, full 14" RGB picture with .31mm dot pitch and a tilt and swivel base. Included in our EGA Kit is our fully compatible 256K EGA card. In addition to 256K of memory and a parallel printer port, the board comes standard with 16 simultaneous colors displayed form a palette of 64 colors. The MONOKIT is only **$149**, the COLORKIT is **$399**, and the EGAKIT is **$579**.

TRUE PERFORMER

The Qubie' V20t System uses the super fast Nec V20 processor along with a dual speed 4.77MHz/8MHz system board to provide speed and performance up to three times that of the standard 4.77MHz, 8088 system. Standard features include "AT" style keyboard, multi I/O card with game adapter, 640RAM on motherboard, 360K floppy drive and controller, 8 additional expansion slots, serial port, and parallel port. A true performer for only **$499**.

To Buy From Qubie'

PLAY IT SAFE

Insure yourself against the unknown. Qubie's tape backup unit gives you 40 megabytes of formatted data per cartridge for the security you need. A high speed CMOS logic and switching motor drive circuits provide cool and low power consumption. Utilizes standard highest capacity/highest density DC-2000 mini data cartridge. Can be installed in your computers half height bay and uses existing floppy disk controller. Internal units are priced at **$349** and External units are **$399**.

COLD STORAGE

With the BT40, a 40 megabyte drive for your AT priced at **$469**, high reliability is assured through the use of LSI. The head positioning system employs a dedicated surface closed-loop servo and also a linear voice-coil actuator. The heads are automatically positioned and locked over the dedicated head shipping zone at power-down; average access time is 30 msec. We also offer BT70's and up starting at **$839**.

TALKS CHEAP

1200 baud Internal Modem for **$89** and External Modems for only **$99**! Both units are Hayes "AT" command set compatible, include a Modular Phone Cord, and PC-TALK III software. Both units are designed specifically for the IBM PC, PC XT, AT, and most compatibles. The internal modem occupies one full length slot. Our external standalone modem can be used with any computer which utilizes an RS-232C serial port.

TALKS CHEAP, VERSION II

2400 baud Internal and External Modems are an incredible **$189**. These state-of-the-art modems are CCITT V.22/V.22 bis, Bell 212A Compatible, and 2400/1200/600/300/110 bps. Both units are fully compatible with all Hayes software commands. The 2400I Internal Modem Card fits into any expansion slot, as it is a compact half-card modem. The 2400E External Modem offers the user asynchronous or synchronous communications.

QUBIE'

Department W
507 Calle San Pablo
Camarillo, California 93010

"Call Now For More Selections"

Inside California **805-987-9741**
Outside California **800-821-4479**

London (01) 223-4569 Sydney (02) 579-3322 Paris (01) 321-5316 Canada (403)434-9444
Hours: M-F 8am - 5pm PTZ Sat 8 -11am PTZ

Get more info. Go to Ad index.

business is development and training with *Revelation*, they provide a lucid conceptual overview in the first 60 pages, then move on to 250 pages describing program functions. Included are chapters on maximizing the benefits of R/LIST; using cross-references, text editors, and symbolic fields; employing R/BASIC programming techniques; and networking with *Revelation*. A separate section on commands, and appendices covering such topics as the data dictionary, the program debugger, and error messages complete the picture. Spend the $39.95 that *Revelation Revealed* costs, and you won't find yourself muttering (along with Bob Dylan), "Nothing is revealed." Paradigm Publishing, San Francisco, CA, 1986; 604 pages, softcover.

■■■■■

Managing Your Money With Managing Your Money isn't the tautology it sounds. It is, rather, the dream documentation that users of MECA's popular financial management package have always clamored for. Written by Jim Bartimo, a power user who is also a seasoned journalist, the book covers versions 2.0 and 3.0 of the software, includes a look at *Managing the Market* (MECA's software link with Dow Jones News/Retrieval), and takes a stab at the new tax laws. Bartimo organizes chapters according to *Managing Your Money*'s main menu options and finishes the book with four case studies: a single person on a budget, a two-income couple, a self-employed consultant, and a serious investor. Multiply your financial acumen with *Managing Your Money*²—it's well worth the $16.95 price tag. Microsoft Press, Redmond, WA, 1987; 314 pages, softcover.

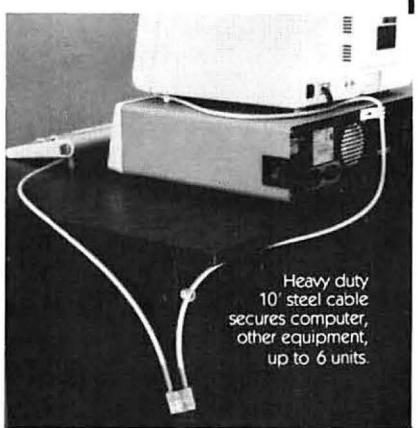
■■■■■

If Jeff Walden's review of *Q&A*, "Snappy Answers," in July's *PC World* piqued your interest in Symantec's fine file manager, have

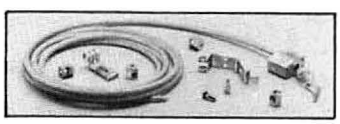
Prevent Computer Theft!

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.



Käblit works with: •Computers •Printers •Disk Drives •Typewriters •Stereos •Monitors •Lab Equip. •Televisions •Other



EXCLUSIVE! Proprietary components prevent removal of mounting screws. (Pat. Pend.)

$54.95 postage paid. Quantity pricing also avail. for schools, institutions, businesses, etc. Send P.O. Money back if returned in 30 days.

SECURE-IT Inc. 10 Center Square • E. Longmeadow, MA 01028
Phone orders 413-525-7039
Dealer Inquiries Invited

MasterCard VISA

Get more info. Go to Ad index.

THE EPSON® CONNECTION PCWD9

Orders processed same day! Full one year factory warranty!

MODEL	PRICE
LX800	$189
FX86e	$329
FX286e	$449
EX800	$399
EX1000	$519
LQ800	$469
LQ1000	$599
LQ2500	$950

Monitors Below Wholesale

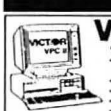
NEC Multisync EGA Monitor	$529
NEC Multisync Graphics Board GB-1	$329
ATI EGA WONDER Color Graphics Board	$299

Modems Below Wholesale

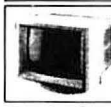
External 1200 - Hayes compat. w/software	$99
External 2400 - Hayes compat. w/software	$219
Hayes External 1200	$339
Hayes Internal 1200B	$279
Hayes External 2400	$529
Hayes Internal 2400B	$429

EPSON LQ1000 $599

- Outstanding 24-pin precision
- 180 cps draft speed
- Push button selection of print mode
- Built in 7K buffer, serial and parallel interface
- W-I-D-E carriage



VICTOR VPC II $795
"A Clear Cut Above"
- NEC V30 Processor - 2.3X IBM PC-XT speed!
- 640K bytes of RAM Memory
- MS-DOS 3.1, GWBASIC
- Monochrome graphics card
- Hi res monochrome monitor
- Full one year warranty



NEC $529
Multisync EGA Monitor

PC Pitstop

Call P.C. Pitstop toll free at:

1-800-852-2888

VISA

Send check, money order or P.O. to: **P.C. Pitstop,** 4517 W. Lake St., Mpls., MN 55416

MasterCard

Get more info. Go to Ad Index.

Join the decision makers who get scoops and early warnings from SUBROUTINES, *David Bunnell's Newsletter from Inside the Personal Computer Industry.* Belong to this select group and get critical information not available to outsiders. Be the one to know who's doing what long before others find out elsewhere.

Month after month, you get the how and why behind computer industry events: advance news, hot projects, stock analysis, product developments, interviews, trade show reports, market trends. All flavored with Bunnell's penetrating insight and wit. Subscribe to SUBROUTINES. Be in the know, produce results, and float on up.

Get your information from an inside source.

Subscribe now to SUBROUTINES. Get a FREE copy and special savings.

Call TOLL FREE
800-222-2990

Send me a free copy of SUBROUTINES. If I like it, I'll pay $24.95 for a 6-month trial subscription—a 75% savings over the $195 annual rate. If not, I'll write "cancel" on the bill, return it to you, and owe nothing.

Name _____

Company _____

Title _____

Address _____

City/State/Zip _____

Offer good in the U.S. only. Allow 6 to 8 weeks for shipment of your first issue.
Offer expires October 31, 1987.
SUBROUTINES, P.O. Box 10735, Palo Alto, CA 94303-9909. 55E7A

SCALA/Art Resource, NY.

a look at his book, *Getting the Most from Q&A*. Just published, it covers basic program operations including forms creation; search, sort, and indexing techniques; report generation; and all of *Q&A*'s extensive word processing functions. Sections on advanced techniques discuss the expanded macro features of version 2.0, *Q&A*'s surprisingly powerful command language, and the fascinating Intelligent Assistant. At $16.95, it's an excellent adjunct to the program and can help you milk the most from your system. Osborne/McGraw-Hill, Berkeley, CA, 1987; 402 pages, softcover.

■■■■■

As many a frustrated user will tell you, *Microsoft Word* is a stimulus overload. Chock-full of features and fitted with long command sequences whose shortcuts are far from apparent, it can make you yearn for the simple <Ctrl>-*key* combinations of the early *WordStar*. Now Nancy Andrews, a training and documentation consultant as well as a computer book author, offers help. Her new book, *Command Performance: Microsoft Word* provides an alphabetized listing of each *Word* version 3.1 command and feature. Each entry includes a description of the command and step-by-step directions for using it, at least one practical example, additional tips or cautions, and, usually, cross-references to related entries. A pullout chart of *Word*'s menu structure alone is almost worth the $19.95 admission. Microsoft Press, Redmond, WA, 1987; 309 pages, softcover. –*M. N.*

Michael Harper teaches English at Scripps College in Claremont, California. Marlene Nesary is an Assistant Editor for PC World.

Finally, the end of frustrating, inefficient, repetitive form word processing. Announcing BLANKITY BLANK.™

BLANKITY BLANK software works automatically and directly with your word processing program to eliminate frustrating, repetitive typing. Now you can greatly increase office productivity by letting **BLANKITY BLANK** fill in the blanks on all your standard forms and documents.

BLANKITY BLANK is a powerful software utility. It is an easy to learn, and use, menu-driven system designed for the IBM PC and compatibles. No document conversion is required. It also includes a math facility that calculates and inserts answers into your forms in numbers or words ("99" or "ninety-nine").

BLANKITY BLANK can give you truly automated word processing today for less than $100!

For more information or the dealer nearest you, call Softstream Technologies, Inc. today at 1-800-888-9292.

Blankity BLANK™!

A software product of
SOFTSTREAM™
TECHNOLOGIES INC

2740 HOLLYWOOD BLVD
HOLLYWOOD, FL 33020
305/920-9292
1/800/888-9292

© 1987 Softstream Technologies, Inc

BLANKITY BLANK requirements- Minimum 256K RAM on IBM PC or true compatible. IBM PC DOS (or true compatible) 2.0 or higher. Hard disk required or dual 3.5" floppy drives. Call 1-800-888-9292 to verify your word processing software's compatibility. IBM PC DOS is a registered trademark of International Business Machines Corporation. BLANKITY BLANK and Softstream Technologies are trademarks of Softstream Technologies, Inc.

SALES GENERATOR PLUS

A revolution in automating sales & marketing

SALES GENERATOR PLUS is so easy to use the beginner can amazingly have it running in minutes. The advanced user may be exploring new applications for this complete and powerful program several years from now. It features all the software tools necessary to conduct an effective sales campaign. Right at your fingertips without complicated commands, Sales Generator Plus can automate : Employment & Real Estate Agents • Service Organizations • Legal & Other professionals • Educational Institutions • Medical & Dental • Leasing • Insurance & other services • Consumer and Industrial Product Sales • And many many more.

FEATURES: Menu driven • record capacity limited only by disk space • support contract available • not copy protected • color and monochrome • works with any standard (ACSII) word processor or Sidekick • on demand a customer-by-customer communication history • automatic sales follow-up • telephone follow-up management • User definable reporting • Sales strategies can be defined by department head & follow the critical path of closing a sale • Intelligent record updating option • correspondence follow-up management • target customer selection report • sales performance reporting - daily, weekly, monthly, etc. by region, location, salesman, product or product group • customized on screen script • direct mail management • automatic mailing including conditional mail merging & nesting of data items, sentences and paragraphs • label and envelope printing • definable target market profiles • recognizes standard SIC codes etc. • significant dates • profile of target market and response profile each with 20 definable fields • up to 14 powerful selection criteria & data base ranges.

• appointment management & lists • automated telephone followup • import/export interfaces • selection of sort criteria • follow-up lists • name & address lists • phone lists • runs on any IBM PC or compatible • its versatility and features will amaze you.

Trademarks: IBM-International Business Machines; Sidekick - Borland International.

FOR IMMEDIATE SHIPMENT
In US and Canada

1-800-268-8588

In Hawaii & Alaska: 1-(416)-862-0017

ONLY $99.95 Shipping & Handling $5

SG+

SALES GENERATOR PLUS

Supersell Software Inc.
316 California Avenue, #990
Reno, Nevada,
89509

MASTERCARD
VISA
AMEX
DINERS CLUB

Get more info. Go to Ad index.

The more you depend on your PCs, the more you'll depend on Sorbus.®

You'll depend on Sorbus for lots of reasons. Like our service for more than 3,000 makes and models of computers and peripherals. Like our 230,000-part-number inventory that keeps the parts you need (more than 6.2 million, at last count) right where you need them. And like our flexible service options:

- ☐ Sorbus on-site service is so fast, a computer that fails at 8 A.M. is usually crunching numbers again by noon.
- ☐ You might choose on-site-deferred maintenance,* if you have extra PCs to substitute for those that are down.
- ☐ If you prefer to carry your PCs in or have us pick them up, you'll appreciate our 200 locations, nationwide.
- ☐ Not quite ready for a *full* service agreement? Our Parts Plus Program* establishes a fixed monthly charge for parts, leaving service hours as your only variable.
- ☐ Of course, we offer straight time-and-materials service, too.

We've earned our reputation at more than 70,000 sites, and readers of *Data Communications* have voted us the service company with the "Best Price/Performance Ratio" for nine consecutive years. *Datamation* and *Computer Decisions* readers have rated us the number one independent service company for 11 and 8 years in a row, respectively. Call Sorbus today. 1-800-FOR-INFO.

Sorbus®
A Bell Atlantic™ Company

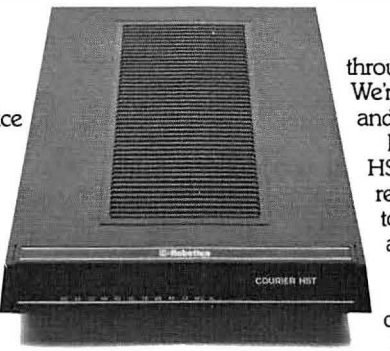
50 E. Swedesford Road
Frazer, PA 19355

Sorbus is a registered trademark of Sorbus Inc.
*Volume restrictions may apply.

Get more info. Go to Ad index.

Now go 17,400 bps in under $1000.

The new Courier HST modem.



PC Magazine calls USRobotics' Courier HST,™ "the top price-performance ratio at 9,600 bps." Now we've made it almost twice as fast without raising the price.

Our new full-duplex High Speed Technology dial-up modem with MNP™ Level 5 data compression is totally AT command set compatible, delivering data at up to 17,400 bps. And automatic fall-back/fall-forward always assures the fastest speed possible. Courier HST reduces phone line costs every time you use it.

When you buy an HST modem, you get USRobotics' more than 10 years of modem experience gained through sales of over half-a-million modems. We're an organization that will support you and grow with your needs.

PC Week says, "USRobotics' Courier HST produced the most impressive test results based on the modem's suitability to both file transfer and interactive applications."

Other modems talk about speed. Courier HST delivers. Get your hands on one... fast!

Free Warranty Extension! Buy an HST before December 31, 1987 and receive a 3-year warranty extension FREE. A $50 value.*

Call 1-800-DIAL-USR Ext. 30

In Illinois (312) 982-5001

US Robotics™

The Intelligent Choice in Data Communications.

8100 McCormick Blvd., Skokie, Illinois 60076.

MNP is the Microcom, Inc. trademark for Microcom Networking Protocol, a public domain error- control protocol.

9.87-24-NEW

*Total warranty including extension: 5 years.

M A I L

O R D E R

PC WORLD Computer Products Shopping Guide

Buy With Convenience

Buy With Confidence

800-

Dear *PC World* Reader:

Whether your business is in the Fortune 500 or the Fortune 14 Million, or you are a professional or consultant working out of a one-person office, you have no doubt found the need to purchase additional hardware, software, and peripherals for your computer systems. For businesspeople looking for efficiency, productivity gains, and timeliness, mail-order and direct-response advertisers in *PC World* offer you excellect opportunities for convenient shopping and cost savings.

A large number of *PC World*'s readers tell us they have purchased hardware or software through mail-order advertising. Their experiences have been overwhelmingly good. And that's why we have created this very special section in *PC World*. We want you to be able to buy conveniently from a group of mail-order firms that have agreed to this arrangement. Browse through the advertisements. Shop and compare—just as you would if you were on Main Street, USA. While you should not overlook other advertising in the pages of *PC World,* we hope this particular section will offer you a useful buying service.

You can buy from any of the mail-order advertisers with confidence. And, *PC World* is here to help in the unlikely event you have even minor problems. All you have to do is drop me a letter briefly explaining the situation. I will look into it immediately and respond as quickly as possible.

Happy Shopping.

Cordially,

James E. Martin
Vice President and Publisher
PCW Communications, Inc.

DON'T MAKE A 300 DOLLAR MISTAKE!
When you can get IBM-PC software for just $6.00

OVER 720 DISKS FULL OF IBM-PC COMPATIBLE PUBLIC DOMAIN AND USER SUPPORTED SOFTWARE.

APPLICATIONS

☐ **(2) FAMILY HISTORY** (#361,632) -- Family history, ancestor and descendant charts. Sample programs are included.

☐ **FORM LETTERS** (#388) -- Over 100 samples of the most commonly used business letters and applications. Modify!

☐ **(3) THE WORLD DIGITIZED** (#494-496) -- Locations of over 100,000 points of interest all over the world. A cartographers dream.

☐ **MSAV** (#503) MSAV is an unusual personal finance manger. After several interrogatives it predicts your future.

☐ **PC-TICKLE** (#576) -- Never miss an important appointment again. Controls calendar, checkbook, calories, and expenses.

☐ **(2) WORDWORKER** (#581,582) -- A concordance of the New Testament with word processor. Contains over 14,800 references.

☐ **GANTT/PAGEONE** (#593) -- Get your project on track with this super project manager to generate Gantt charts.

☐ **MAKE MY DAY** (#618) -- Time management system. Appointment calendar, expense log, and time log.

☐ **REAL ESTATE SYSTEMS** (#656) -- Helps professional Realtors keep track of listings, pending sales, and generates reports galore.

☐ **VIVANSOFT CHURCH CONTRIBUTIONS** (#659) --The real church administrator. Records contributions to a church in 20 different categories. Generates numerous reports of the same.

☐ **#668 WORLD** (#668) -- Statistics and Demographics for all of the nations of the world.

☐ **(3) FREEWAY PAYROLL SYSTEM** (#671-673) -- Freeway Payroll Program. So flexible you may have to let that extra bookeeper go and do it yourself.

☐ **(3) IN CONTROL** (#687-689) -- This comprehensive business system puts you in control of marketing, and sales information.

☐ **(3) FRONT OFFICE** (#697-699) -- A control system designed to manage direct sales prospecting, sales orders, and cost/profit anylisis.

COMMUNICATIONS

☐ **(4) RBBS** (#212,334,662,633) -- The most popular bulletin board system around. A super 4 Disk set to help you become a SYSOP and start a bulletin board.

☐ **QMODEM** (#310) -- Without a doubt the fastest and best communications software you can buy at any price.

☐ **FIDO NET** (#333) -- Bulletin Board System. Perhaps the easiest to run. Very popular.

☐ **PROCOMM** (#499) -- Communication software that makes a hackers dream come true. Fully Hayes compatible.

☐ **IDEAL TERMINAL** (#679) -- The "IT", emulates a VT-100 and VT-52. You may then connect a PC to a main frame. EPROM programmer, or an in-circuit emulator.

DATABASE PROGRAMS

☐ **PC FILE III** (#005) -- Perhaps the grand-daddy of user supported database programs from Jim Button.

☐ **CREATOR** (#339) -- Create, report, and sort makes this a super database management system.

☐ **DATABASE PUBLISHER** (#605) -- Publish list, church or lodge rolls, etc. in a handy booklet.

☐ **MUSIC LIBRARY SYSTEM** (#627) -- Music collectors use this program to retrieve by composer, score, etc.

☐ **(2) KWIKSTAT** (#654, 655) -- A graphics oriented for scientific analysis. Import various files for manipulation.

EDUCATIONAL

☐ **PC-PROFESSOR** (#105) -- Learn Basic the easy way. One of the best tutorials on BASIC.

☐ **PC-TUTORIAL** (#403) -- A first course in computer usage covering various aspects of MS-DOS. Good!

☐ **PC PROMPT** (#558) -- Fascinating on line memory resident DOS helper that also supports BASICA, EDLIN, DEBUG, and TURBO PASCAL.

☐ **BASIC GAMES & PROGRAMING INTRO** (#595) -- A concise tutorial on Basic together with a great set of games written in Basic that illustrate the principles.

☐ **(2) WALMYR PROGRAMS** (#648, 649) -- Programs to help computer class instructors get their students "off the ground" with micro computers.

☐ **HELPDOS** (#686) -- An educational program to help the novice remember DOS commands. Excellent!

FINANCIAL

☐ **PORTSWORTH PACKAGE** (#101) -- Ever popular package evaluates your ever changing stock portfolios.

☐ **PC-GENERAL LEDGER** (#237) -- Our customers rave about this exceptional accounting system. Used by some CPA's.

☐ **(3) ANALYTIC CALC** (#430-432) -- 3 disk set. Complete spreadsheet, database, graphics, word processor - fassst!

☐ **PC-PAYROLL** (#565) -- Handle all payroll problems with this complete menu-driven payroll system. Includes taxes, reports, forms, etc.

☐ **PC-STOCK** (#575) -- Tremendous stock evaluation and tracking system. Includes stock trend analysis program.

GAMES

☐ **TOP GAMES** (#274) -- The most requested arcade type games.

☐ **ARCADE GAMES** (#293) -- Another goodie bag of top Arcade games.

☐ **ASSORTED GAMES** (#457) -- Astro; ABM; Dig Dug; Movatorn; Supertrek.

☐ **PINBALL RALLY** (#557) -- You asked for it! Here are three pinball games that vary in complexity. PINBALL, RAIN, TWILZON2.

☐ **NEW YORK ADVENTURE** (#614) -- Written in BASIC, the object is to escape from a New York city Ghetto. Can you escape and survive?

☐ **HOTBOOT/INSULTS** (#619) -- A practical joke and insult generator that will make those folks at the office wonder about your clever PC.

☐ **BIBLEQ** (#628) -- A great trivia-type game with 1000 multiple-choice questions taken from The Book of books.

☐ **BUTTONWARE ADVENTURES** (#683) -- im Button shipwrecks you on a desert island without supplies. Next you go to South America collecting information for the U.S.

☐ **KIDGAMES** (#705) -- An aggregation of games gearec to the youngster 2-10 years of age.

GRAPHICS

☐ **(2) PC-KEY DRAW** (#344, 345) -- A small CAD that system has proven to be one of our most popular. Lots of demonstration files.

☐ **PRESENT VOL 5.1** (#471) -- Self contained presentation and slide show program.

☐ **HI-RES RAINBOW** (#652) -- A full featured PC-Paintbrush type program with all of the whistles and bells you get in "high priced" graphics programs.

☐ **DANCADD3D (2)** (#701, 702) -- Allows the composition of 3-D wire frame animation. Without a doubt there are no commercial programs available like this regardless of the price.

☐ **DANCADD3D DEMO (2)** (#703, 704) -- Goes with above. DANMOVIE animates the screen. Saves the screen at 4 million pixel resoLANGUAGES

LANGUAGES

☐ **CHASM** (#010) -- Its name is derived from "Cheap Assembler" but there is nothing "cheap" about this notable program and tutorial.

☐ **TURBO PASCAL UTILITIES** (#375) -- Utilities useful for both the user and Pascal programmers --printer and directory utilities.

☐ **P-BASIC** (#381) -- A BASICA interpreter work-a-like for clones, etc.

☐ **(2) C TUTOR** (#577, 578) -- A comprehensive programing course for learning how to program in C. Includes sample programs.

☐ **(2) PASCAL TUTOR** (#579, 580) -- Introductory course to the Pascal programing language. Good for Generic and Turbo Pascal.

☐ **POLYMATH** (#606) -- Similar to FORTH the Polymath language will allow you to build a powerful programing dictionary.

☐ **BLACKBEARD** (#611) -- A programers editor that makes those lines of code start to jump. Great for highly structured languages.

MATH AND STATISTICS

☐ **(2) SPPC SYSTEM & DEMO** (#232, 623) -- A fully interactive statistical package to conduct analysis on samples.

☐ **(2) SST** (#638, 639) -- SuperS Tat Share is a statistical program that analyzes the results of market surveys and poles.

MUSIC

☐ **PC-MUSICIAN** (#127) -- Compose music on your PC, save and play again.

☐ **PIANO MAN** (#279) -- Most popular program to play your computer like a keyboard.

PRINTER UTILITIES

☐ **BANNER** (#386) -- BANNER program makes long, larger-letter banners on your printer from console input. MS-FORTRAN source code.

☐ **PRINTER UTILITIES** (#411) -- Print your text SIDEWAYS. Also includes a Smorgasboard of utilities and tools.

☐ **IMAGEPRINT** (#517) -- Allows Epson/Compatible printers to do high quality symbols and graphic characters.

☐ **LIST** (#640) -- Permits formatting of documents for printing. Use headers, footers, and pagination.

SPREAD SHEET

☐ **PC-CALC** (#199) -- Fabulous 123 work-a-like from the author of PC-File.

☐ **TURBOCALC/ASEASYAS** (#651) -- Two exquisite spreadsheet programs. AsEasyAs is a 1-2-3 Work and look-a-like. Produces expert x-y graphs and bar charts.

TEXT PROCESSING TOOLS

☐ **PC OUTLINE** (#414) -- Create and collapse and outline. Great for plans, essays, etc.

☐ **THE TOOL WRITER'S TOOLKIT** (#667) -- 20 utility programs. Upper/Lower case conversion; encryption; many filters to process text.

UTILITIES

☐ **GINACO** (#066) -- Polished routines written in basic for any beginner or experts. We love it!

☐ **(2) ULTRA-UTILITIES** (#133, 245) -- Recover lost files, modify sectors, etc. Like Nortons. Maybe better.

☐ **TOP UTILITIES** (#273) -- All of the most requested utilities on one disk.

☐ **PC-DESKMATES** (#405) -- Better than Sidekick and all of the rest of the memory resident desktop utilities.

☐ **UNPROTECT** (#414) -- Various routines to disconnect 30 protection schemes. Info on how to run "key-disk" on a hard disk.

☐ **HARD DISK UTILITIES** (#478) -- Only the best utilities for your hard drive comprise this collection gleaned from over 25 disks.

☐ **STILL RIVER SHELL** (#481) -- An enhancement of the PC-DOS working environment. Faster and uses Key Commands.

☐ **DISK TOOL** (#598) -- A menu driven disk "zapper" that allows you to modify either ASCII or HEX.

☐ **AUTOMENU** (#608) -- Version 3.01. Access your programs with a unique menuing system that puts you back in control of things.

☐ **PACKDISK** (#610) -- Eliminate cluster fragmentation speedup and optimize your disk access time with this great utility.

☐ **HDMII** (#631) -- Hard Disk Menu System is a fantastic DOS shell which allows "Pro-Key" type batch commands.

☐ **MASTER-MENU** (#642) -- Allows one to access up to 12 applications on your hard disk. Makes PC/AT operation "user friendly".

WORD PROCESSING

☐ **(2) PC-WRITE** (#078) -- Our most popular full featured word processor that is actually faster than WordStar. Quicksoft has now added a new spell checker that is superb!!!

☐ **PC-TYPE (3)** (#455, 681-682) -- A full fledged word processor from none other than brother Jim Button. Includes a first rate spell checker, Mail merge, etc.

☐ **NEW YORK WORD** (#528, 529) -- Powerful word processor that creates keystroke macros, split screen eidting, mail merge and more. Watch out Micro-Soft!

☐ **CHI-WRITER** (#645) -- Word processor that includes many font styles PLUS . . . Scientific and Mathematical Smybols!

1-800-445-6172 ORDER LINE
OUTSIDE TEXAS

TOTAL # _____ x $6 = _____

DISK DIRECTORY (Explanation of all files & programs) x $6 = _____

OTHER _____ _____

SUBTOTAL _____

TEXAS RESIDENTS ADD 6 1/8% TAX _____

SHIPPING AND HANDLING (1 @ $1.00 and 50¢ for each additional disk) _____

No COD's or Purchase Orders • U.S. Funds Only
Foreign Orders add $5.00 to all Shipping/Handling
We Warranty All Disks Against Defects In Duplication

SHIP TO: _____

_____

_____

CHARGE MY:

☐ MASTERCARD ☐ VISA

CARD NO. _____

EXPIRATION DATE _____

SIGNATURE _____

LONE STAR SOFTWARE

2100 Hwy. 360, Suite 1204, Grand Prairie, Texas 75050, (214) 647-1010 ©1987 LONE STAR SOFTWARE, INC.

Get more info. Go to Ad Index.

Authorized **COMB** Liquidator

XEROX 6064 PERSONAL COMPUTER

XEROX... They Set The Standards!

For over 20 years Xerox has been the world leader in office products and copying equipment. They have set standards that others can only imitate. The Xerox 6064 Personal Computer was designed to meet the demands of business, professional, and personal computing today, and into the future! We are proud to offer this complete Xerox System at a remarkably **LOW price.** Compare for yourself ...then buy your Xerox 6064 from C.O.M.B.!

Get the Xerox Advantage! The Xerox PC offers you the advantage of running IBM™ compatible MS™-DOS, so you can run the hundreds of business and professional software programs available today! And the Xerox PC is easy to use! It's designed to get you up and running as quickly as possible with computer-aided instruction and superior documentation covering all aspects of personal computing.

Xerox...Service You Can Count On! If you're considering an IBM™-compatible, don't be misled by price alone! The system we are offering is a **complete** system...very easy to hook up and use...and very affordable. But more than that, each system we sell is backed by Xerox service and support. When you buy this system, your name and computer's serial number is automatically registered with Xerox. Should you need service or advice, a network of over 150 service centers stands ready to help you. Before you buy...compare! Xerox is your best value! Check all these features:

- IBM™-PC/XT Compatibility.
- 256KB Memory Features an 8MHz Intel 8086-2 Microprocessor for Faster Speed, Less Waiting Time.
- Two 5¼" Floppy Disk Drives, 360K Each.
- Seven Expansion Slots, Plus a Serial Port for Communications or Printer, and Parallel Printer Port.
- High-Resolution 640 x 400 Pixels Monochrome Monitor, with 12" Diagonal Non-Glare Screen, Swivel and Tilt Base.
- Standard 83-Key PC Keyboard with Mouse Interface (Mouse Not Included.)
- Comes with ScreenMate™, a User Friendly Guide to the Functions of the MS™-DOS Operating System. ScreenMate™ is Menu Driven...No Need to Remember Complicated Commands!

Lets You Select from a Menu and Provides Clear On-Line Instructions If You're Confused About Your Next Step.

Complete Tutorial Software and Manuals Included:

- "Getting Started" Booklet.
- Four Reference Guides.
- Four Software Programs: Two X-Cel™ Training Disks, Two Diagnostic Disks, GW™-BASIC Interpreter, and MS™-DOS/ScreenMate™ Operator's Guide.
- Twenty Blank Disks.

Over 150 Service Centers Nationally.

Manufacturer's Limited 90-Day Warranty on Parts/Labor.

List Price $2224.80

Priced At Only **$999**

Item H-2739-7129-232 Shipping, handling: $49.00 ea.

Memory Expansion Board for Xerox 6064 Personal Computer: Expands the memory to 640K.

List: $249.00

Priced At **$129**

Item H-2739-7128-978 Shipping, handling: $3.50 ea.

XEROX, ScreenMate™ and the identifying numbers herein are trademarks of Xerox Corporation. IBM™, IBM™ PC, and PC™-DOS are trademarks of International Business Machines Corporation. MS™-DOS is a trademark of Microsoft Corporation.

Toll-Free: 1-800-328-0609

Credit Card customers can order by phone, 24 hrs. a day, 7 days a week.

VISA MasterCard DISCOVER AMERICAN EXPRESS

SEND TO: **Item H-2739**
C.O.M.B. Direct Marketing Corp.
1405 Xenium Lane N/Minneapolis, MN 55441-4494

Send ___ **Xerox Personal Computer(s)** Item H-2739-7129-232 at $999 each, plus $49 each for ship, handling.

Send ___ **Xerox Memory Expansion(s)** Item H-2739-7128-978 at $129 each, plus $3.50 each for ship, handling.

(Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check.)

Charge: ☐ VISA® ☐ MasterCard® ☐ Discover℠ ☐ American Express®

Acct. No. _____ Exp. ___/___

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone (___) _____

Sign Here _____

Sales outside the 48 contiguous states are subject to special conditions. Please call or write to inquire.

COMB COMB COMB COMB COMB COMB COMB COMB

KENOSHA COMPUTER CENTER

SALES LINE **1-800-255-2989** OUTSIDE WISCONSIN

(in Wisconsin Call 414-697-9595)

PACKARD BELL TURBO XT

4.77 and 8 MHZ Switchable
640K Ram
1 Floppy Drive
20 MB Seagate Hard Disk
Parallel and Serial Ports
Clock
Monochrome Amber Monitor
AT Style Keyboard
135 W power supply
Combination Mono/Color Graphics Card
DOS 3.2 and Basic
1 Year Warranty

only...$1099

10 MHZ AT

10 MHZ
512K
1.2 Teac Floppy Drive
30 MB Seagate Hard Disk
Monochrome Graphics Card
Monochrome Monitor
AT Style Keyboard
192 W Power Supply
DOS and Basic
1 Year Warranty

only...$1829

IBM

Model 30 w/2 floppy drives	$1349
Model 30 w/20 MB	$1995
Model 50	$2995
Model 60	$4295

COMPAQ

Deskpro w/640K, 20MB	$1750
Deskpro w/640K, 30MB	$1795
286 Deskpro w/640K, 40MB	$3095
386 Deskpro Model 40	$4695
386 Deskpro Model 70	$5295
386 Deskpro Model 130	$6295
Portable II Model II	$2095
Portable II Model IV	$2995
Portable III, 20MB	$3995
Portable III, 40MB	$4650

HARD DISKS

SEAGATE

20MB w/contr ST225	$319
30MB w/contr ST238	$349
30MB for AT ST4038	$519
40MB for AT ST4051	$659
40MB for AT ST251	$489
80MB for AT ST4096	$869
Plus Hard Card	$659
Western Digital 20MB Card	$495

CHIPS

64K Ram Chips	9 for $10
256K Chips	each $3
8087-3	$109
8087-2	$149
80287	$159
80287-8MHZ	$269
80287-10MHZ	$319
80387	$599

GRAPHICS CARDS

Everex EGA Autoswitch	$139
Everex Edge	$219
Hercules Color Card	$145
Hercules Graphics Plus	$179
NEC GB-1	$339
Paradise Autoswitch 480	$339
Quadram EGA Plus	$299
Quadram ProSync	$349
STB EGA Plus	$259
Vega Deluxe	$349

MULTIFUNCTION CARDS

AST 6 Pack Plus 384K	$169
AST 6 Pack Premium 512K	$339
AST Advantage	$299
AST Advantage Premium 512K	$429
AST Rampage PC w/256K	$259
AST Rampage AT w/512K	$409
AST Flashpack	$289
AST 5251-11 Plus	$599
Everex Magicard II w/384K	$149
Intel Above Board PC	$249
Intel Above Board PC P/S	$279
Intel Above Board AT	$349
Intel Above Board AT P/S	$369
Irma Board	$695
Orchid Tiny Turbo	$349

MONITORS

AMDEK		PRINCETON	
310A	$139	MAX12	$159
410	$159	HX12	$415
600	$349	HX12E	$499
722	$459	SR12	$565
NEC Multisync			$549
Samsung Color			$279

MODEMS

Everex 1200/2400 Int.	$109/$199
Hayes 1200B Alone	$269
Hayes 1200B w/Software	$299
Hayes 2400	$469
Hayes 2400B	$469
US Robotics 2400	$189

PRINTERS

EPSON

LX 800	$179	LQ 1000	$519
FX 86E	$299	LQ 2500	$839
FX 286E	$415	EX 800	$359
LQ 800	$429	EX 1000	$489

OKIDATA

192 Plus	$339	292 Plus	$549
193 Plus	$509	293 Plus	$649
182	$229	294 Plus	$1095

NEC

P6	$439	P9XL	$1119
P7	$619	3550	$769
P5XL	$999	8850	$1095

HEWLETT-PACKARD

Laserjet II	$1795

SOFTWARE

D Base III Plus	$389
Framework	$399
IBM Displaywrite IV	$359
Lotus 123	$319
Managing Your Money	$115
Microsoft Word	$259
Multimate Adv. II	$269
R Base System V	$389
Symphony	$429
Ventura Desktop Publ.	$575
Word Perfect 4.2	$205

KENOSHA

KENOSHA COMPUTER CENTER
2133 91st St.
Kenosha, WI 53140

Sales outside Wisconsin 1-800-255-2989
Sales inside Wisconsin 414-697-9595
Shipping and technical assistance 414-697-9595

VISA MasterCard

Get more info. Go to Ad Index.

Prices and availability subject to change

EPSON® PRINTERS

LQ-2500 . . . . . $879
- 324 CPS-draft, 108 CPS-LQ
- 136 column • 24-pin

FX-286e $459
- 200 CPS-draft, 40 CPS-NLQ
- 136 column • 9-pin

EX-800 . . . . . $389
- 300 CPS-draft, 60 CPS-NLQ
- 80 column • 9-pin

FX-86e $319
- 200 CPS-draft, 40 CPS-NLQ
- 80 column • 9-pin

LQ-1000 . . . . . $639
- 180 CPS-draft, 60 CPS-LQ
- 136 column • 24-pin

LX-800 . . . . . $199
- 180 CPS-draft, 32 CPS-NLQ
- 80 column • 9-pin

EX-1000 . . . . . $519
- 300 CPS-draft, 60 CPS-NLQ
- 136 column • 9-pin

FREE! EPSON PRINTER STAND WITH EACH EPSON PRINTER PURCHASED FROM THIS AD!

NOW WITH HP EMULATION

GQ-3500 LASERPRINTER
- 7 internal fonts
- 640K memory
- Parallel interface **$1449**

SAMSUNG MONITORS

12" MONOCHROME
- Tilt'n swivel base
- 720 x 350
- Amber

$89 each, 1+

14" COLOR RGB
- Tilt'n swivel
- 16 color
- .41 dot pitch
- 640 x 200

$259 each, 1+

14" DUAL-FREQUENCY EGA MONITOR
- .31 dot pitch
- 16/64 colors
- 640 x 350

$379 each, 1+

★ SPECIAL ★
Samsung EGA monitor and EGA half card for the special price of $529, over a $100 savings This EGA board features mode & palette save, light pen interface and supports CGA, EGA, and MDA Hercules.

"desktalk" 2400/1200/300 BPS EXTERNAL MODEM

Includes Communication Software
- Fully Hayes compatible
- 5 year warranty
- With standard RS-232C cable

$199

100% SATISFACTION GUARANTEED

BOCA RESEARCH, INC.

BEST OPTION CARDS AVAILABLE

TOPHAT **$89.00**

BOCA RAM XT
with 0K **$195.00**

BOCA EGA
with 256K **$149.00**

BOCA RAM AT
with 0K **$225.00**

INCOMM

TURBO 2400 BAUD EXTERNAL MODEM

WITH COMMUNICATION SOFTWARE **$249**
- Hayes compatible
- Speed upgradeable

WITH MNP Level 4 Error Correction **$319**

Seagate ST-225

20 Meg Hard Drive with controller

WITH **PowerBase**

FULL FEATURE RELATIONAL DATABASE MANAGER

"Editor's Choice"—PC Magazine, June 1986
"Best Overall Rating 1984-85"—Software Digest

ENTIRE POWER PACKAGE **$319**

COSMO WORLD

ADEUS CP2000
DAISY WHEEL PRINTER

- Memory of 2KB
- Diablo 630 WP Sequence
- Parallel and serial ports
- Letter-quality daisy wheel printer
- Sheet and tractor feed available
- Fast and quiet (22 CPS at 58dB)

$169

hp COMPUTER PRODUCTS — HEWLETT PACKARD — VALUE-ADDED SYSTEM SUPPLIER

LASERJET SERIES II **$1729**

- 300 x 300 dpi
- 512K memory
- 16 character LCD control panel
- Prints 8 pages per minute
- Stores up to 32 fonts
- Manual feed for envelopes, heavier and odd size paper

★ CALL TOLL FREE ★ 7 TO 7 CENTRAL TIME ★ 10 TO 3 SATURDAYS ★

1-800-USA-FLEX

(1-800-872-3539)
TECHNICAL SERVICE (1-312-351-7172)

USA★FLEX
135 N. BRANDON DRIVE, GLENDALE HEIGHTS, IL 60139

**If you prefer sending in your order please call first for shipping/handling charges. All prices/specifications subject to change without notice. (c) USA★FLEX.

TERMS: Minimum order $100. Shipping/handling additional. Visa, MasterCard and Prepaid orders accepted. Corporations rated 3A2 or better and government accounts are accepted on a net 30 basis. C.O.D. orders add an additional $5.00 special handling charge. Checks must be imprinted with buyer's name and address. We ship to the 50 states. APO, FPO, AK, and HI orders add an additonal 5% to the total order amount to cover PAL and insurance. No sales tax outside of IL. All returns must have prior authorization from our Customer Service Department (1-312-351-9700). Unauthorized returns and refused shipments are subject to a 20% restocking charge.

Get more info. Go to Ad Index.

PC NETWORK

America's Favorite Business Software

for the IBM, PS/2 and compatibles

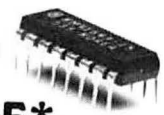
LOTUS 1-2-3 **$295.00*** | **DBASE III+** **$385.00*** | **WORD PERFECT** **$185.00***

(5.25" or 3.5" Formats Available)

Borland *Reflex*	**$80.00***
Borland *Turbo Prolog Toolbox*	**53.00***
Borland *SuperKey or Turbo Graphics Toolbox*	**38.00***
FGS *Fastback*	**82.00***
Lotus *HAL, Report Writer*	**91.75***
Microsoft *Quick Basic 3.0 or Windows*	**55.08***
Microsoft *Word 3.11*	**180.50***

Your #1 Source for Chips

64K IBM™ Memory Expansion Kit
150ns/Set of 9
$13.05*



256K *Dynamic Ram Chips*	**ea. $2.90***
128K *AT Mother Board Chips*	**ea. 3.90***
Intel *8087 5Mhz Co-Processor*	**105.00***
Intel *8087 8Mhz Co-Processor*	**155.00***
Intel *80287 8Mhz*	**235.00***
Intel *80287 10Mhz*	**299.75***

All Chips are Guaranteed for Life

TOLL FREE (800) 621-SAVE

(Orders-Membership and Advice!)
In Illinois call (312) 280-0002
Your Membership Validation Number W297
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. (CST) **8am-6pm**

PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610-9934
FOR CUSTOMER SERVICE AND ORDER STATUS
CALL: (312) 280-1567

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 receive "THE PRINTOUT", a special periodic update on merchandise at prices BELOW even those in my wholesale catalog and all the other exclusive, money-saving services available to Members. I am under no obligation to buy anything. My complete satisfaction is guaranteed.

297

Please (✓) all boxes that apply:

	1 Year	2 Year
•Basic Membership With Optional 14 Days Rental of	**$8** ☐	**$15** ☐
Business Software Rental Library	**$25** ☐ add'l. per year	
Games Software Rental Library	**$10** ☐ add'l. per year	
•Special V.I.P. Membership With Optional 30 Days Rental of BOTH BUSINESS AND GAME Software Rental Libraries	**$15** ☐	**$25** ☐
	$30 ☐ add'l. per year	

Account Number:

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Exp. Date: mon. _____ yr. _____

☐ Check or Money Order Enclosed for $ _____

Name _____

Address _____ Apt. No. _____

City _____ State _____ Zip _____

Telephone: ( ) _____

My Computer(s) is: ☐IBM ☐IBM XT ☐IBM AT
☐Apple II ☐Macintosh Other _____

Signature _____

(Signature required to validate membership)

Copyright 1986 PC NETWORK INC

MEMBERS PAY WHOLESALE AND GET 14-30 DAY

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

ANSA *Paradox 2.0 NEW*	**$384.00***
Borland *SideKick (UnProtected)*	**45.00***
Borland *Turbo Basic, Turbo "C"*	**54.00***
Breakthrough Software *Time Line 2.0*	**210.00***
Broderbund *ForComment-Single Author*	**103.25***
Central Point *Copy II PC*	**18.50***
Computer Associates *Supercalc IV or Super Project Plus*	**255.00***
DAC *Easy Accounting*	**38.00***
Delta *Direct Access*	**48.25***
Enertronics *Energraphics 2.01*	**275.00***
Executive Systems *XTREE*	**27.50***
Funk Software *Sideways*	**34.00***
Harvard *Presentation Graphics*	**209.00***
Harvard *Total Project Manager II*	**345.50***
Intuit *Quicken*	**30.00***
Lotus *Express, Metro*	**CALL**
Meca *Managing Your Money Ver. 3.0*	**99.95***
MicroPro *Wordstar Professional Release 4*	**220.00***
MicroRim *RBase 5000*	**235.00***
MicroRim *R:Base Graphics*	**175.00***
Microsoft *C Compiler*	**244.80***
Migent *Ability or InHouse Accountant*	**55.00***
Monogram *Dollars and Sense w/Forecast*	**95.00***
Multimate *Advantage II*	**225.00***
Multimate *Multimate Latest Version*	**199.00***
Nantucket *Clipper DBase III Compiler*	**377.85***
Norton *Commander*	**33.00***
Norton *Norton Utilities 4.0 (New Version)*	**45.00***
Paperback Software *VP Planner, VP Expert, VP Info*	**48.00***
Paul Mace *Mace Utilities 4.0*	**47.90***
Software Publishing *PFS: First Choice*	**95.00***
Software Publishing *PFS: Professional Write*	**103.49***
Symantec *Q&A Ver. 2.0*	**215.00***
Xerox *Ventura Desktop Publishing Vers. 1.1*	**560.00***

PC NETWORK–THE NATION'S LARGEST COMPUTER

PC MAGAZINE

"THE" PC+ is well built and has enough company support behind it to make it a very attractive alternative to higher priced competition."

"THE's bottom line? The PC+ is a highly compatible clone worthy of consideration..."

PC WORLD

"...the unit became the preferred computer in our office, which has several name brands as possible alternatives..."

Computer Dealer

THE™ PC

100% IBM Compatible
256K/w 360K Drive, Turbo Speed, AT Style Keyboard

$352.00*

Save on Famous Name Printers

EPSON FX-286E
132CPS/200CPS LQ
$420.00*

PRINTERS

Citizen *MSP-10 160CPS 80COL Fric + Trac*	**$259.00***
Citizen *MSP-15 160CPS/132COL Fric + Trac*	**360.00***
Citizen *Premiere-35 35CPS Daisywheel 15"*	**440.00***
Epson *EX-800 300/60CPS 132COL Par Ser*	**362.00***
Epson *EX-1000 300/60CPS 132COL Par Ser*	**489.00***
Epson *FX-86E 160/35CPS 10" Par*	**299.00***
Epson *FX-286E 200/40CPS NLQ*	**420.00***
Epson *LQ-800 180/60CPS 10" 24 Pin Par Ser*	**429.00***
Epson *LQ-1000 180/60CPS 15" Pin Par Ser*	**609.00***
Epson *LQ-2500 324/108CPS 24 Pin Par Ser*	**819.00***
Epson *LX-800 180/30CPS 8.5" Par w/Trac*	**164.00***

• 10 DAY HARDWARE RETURNS • CATALOG

(No Questions Asked, If You Don't Like It, Return It) (Thousands of Products Available)

PLUS 8% OR LESS SOFTWARE RENTALS†

GAMES & EDUCATIONAL SOFTWARE

Activision *Shanghai*	$22.20*
Broderbund *Ancient Art of War At Sea*	24.00*
Broderbund *The Print Shop*	30.00*
Broderbund *The Print Shop Library, Disk 1 or 2*	19.50*
Electronic Arts *The Chessmaster 2000*	26.97*
Electronic Arts *Starflight, World Tour Golf*	32.97*
Epyx *Graphics Scrapbook Chapter 1,2 or 3*	14.00*
Epyx *Destroyer*	22.00*
Epyx *Sub Battle Simulator*	21.25*
Davidson *Math Blaster or Word Attack*	26.00*
Infocom *Bureaucracy, Hollywood Hijinx*	22.00*
Infocom *Hitchhiker's Guide, Ballyhoo, Fooblitsky, or Trinity*	20.00*
Infocom *The Lurking Horror or Stationfall*	22.00*
Infocom *Zork Trilogy*	39.95*
Microprose *F-15 Strike Eagle, Silent Service or Solo Flight*	18.50*
Microsoft *Flight Simulator Vers. 2*	27.54*
Mindscape *Balance of Power or Crossword Magic*	27.00*
Mindscape *MasterType*	23.97*
Sierra On-Line *Black Cauldron*	21.25*
Sierra On-Line *King's Quest III, Space Quest*	26.50*
Simon & Schuster *Typing Tutor III*	28.25*
Spectrum Holobyte *GATO*	21.00*
Spinnaker *Typing Made Easy*	27.50*
Springboard *Certificate Maker, The Newsroom*	31.75*
Springboard *Newsroom Pro*	64.50*
Sublogic *Jet*	27.50*
Sublogic *Scenery Disks 1-7, Japan*	ea. 12.00*

TM – Registered Trademarks of Apple/AST/Compaq/Epson/Hayes/IBM/Microsoft/PC Network

*All Prices in This Ad are Wholesale – Members Pay 8% Over Wholesale Prices Plus Shipping. All Prices Reflect A 3% Cash Discount. All Items Subject to Availability – Prices Subject to Change Without Notice

†RENT BEFORE YOU BUY – Members are eligible to join the NETWORK's Business and Game Software Rental Libraries to evaluate products for a full 14 days (Regular Membership) or 30 days (VIP Membership) to see if they meet 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 1,000 available titles for IBM/Apple/Mac.

Most Software Available for NEW IBM PS/2 Systems. Call for Latest Pricing & Availability.

PC NETWORK

Big Values on Computer Monitors

MONITORS

Amdek *410 TTL 12" Amber, Green or White*	ea. $142.00*
Amdek *Color 600S 13" RGB Hi Res*	325.00*
Amdek *Color 722 Enhanced EGA Monitor*	425.00*
Amdek *Color 725 13" Ultra Hi Res*	479.00*
Amdek *Video 1280 15" White w/Graphics*	635.00*
Princeton *HX-12 Color RGB Monitor*	369.00*
Princeton *HX-12E Hi Res RGB/EGA Monitor*	445.00*
Princeton *Max-12E 12" Amber TTL*	138.00*
Sony *KV1311 13" Trinitron RGB w/TV Tuner*	415.00*
THE™ *12" Dual Frequency Amber Monitor*	85.00*
THE™ *12" Dual Frequency Green Monitor*	85.00*
THE™ *12" RGB w/Cable*	277.00*
THE™ *12" Enhanced Graphics*	375.00*

NEC Multisync Monitor

$530.00*

Your #1 Source for Add In Boards

THE™ Super EGA

$145.00*

100% EGA/MDA/CGA/HGC Compatible
VLSI Technology
640x528
w/Multisync

VIDEO BOARDS

ATI *EGA Wonder*	$237.00*
Hercules *Color Card w/Parallel Port*	135.00*
Hercules *Graphics Card Plus*	175.00*
Hercules *InColor Card*	319.25*
Quadram *Quad EGA+ Short Slot*	295.00*
THE™ Color Card *100% IBM Compatible*	60.00*
THE™ H720 *Mono Graphics w/Parallel Port 100% Hercules Compatible!*	69.00*
Video 7 *Vega Deluxe*	330.00*

MULTIFUNCTION CARDS

AST *Advantage for AT w/128K*	$325.00*
AST *Six Pak Plus w/64K*	139.00*
Orchid *Conquest w/0K, 1S, 1P, Clk*	195.00*
Orchid *Tiny Turbo 286*	345.00*
THE™ Multi I/O *I/O Plus Clone Ser/Par/Game/Clock*	60.00*
THE™ Multi 384 *w/0K Ser/Par/Game Clk/Cal*	67.00*
THE™ 2MB RAMCard *Lotus™/Intel™ Specs w/0K*	99.00*

PRODUCTS MAIL ORDER COMPANY

CALL FOR QUOTES ON PRODUCTS NOT LISTED

THE™ Best "AT" Clone in the Business

512K System Upgradeable to 1MB On Motherboard

NEW COMPACT SIZE

THE™ 286/12+ 512K Base System

6 or 12 Mhz Switchable with 101 Key "AT" Style Keybrd, Runs All Software Designed for the IBM™ PC/AT

Model I Base System w/1.2 Floppy Drive **$915.00***

Model II Model I w/42MB/40MS Drive **$1,395.00***

Both Systems Come w/ Combination HD/FD Controller

$690.00*

IBM™ PS/2 Model 30

CALL FOR PRICES

IBM™ AT BASE SYSTEM

256K/1 1.2MB Floppy Dr./Keyboard

$2,204.00*

IBM™ XT 286 System $2,100.00*

IBM™ AT 339 30MB HD $3,295.00*

$315.00*

THE™ 20MB Hard Disk Kit

THE™ 42MB 1/2 Ht. Hard Disk Kit w/Controller & Cables

100% IBM Compatible

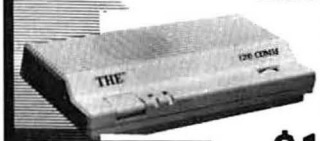
$449.00*

IOmega *Dual 20MB Bernoulli Box w/non-auto Cont*	$1,850.00*
IOmega *Dual 10MB Bernoulli Box w/non-auto Cont*	1,450.00*
PC Network *½ Ht 360K Floppy Drive*	75.00*
PC Network *10MB ½ Ht Hard Disk Kit*	237.00*
PC Network *30MB Capacity ½ Ht Hard Disk w/RLL Controller*	369.00*
PC Network *71MB FI Ht HD w/28MS Access Time/AT*	825.00*
PC Network *80MB/28MS Hard Drive for AT*	869.00*
TEAC *1.2MB Add On Floppy for the IBM AT*	110.00*
THE™ 20MB *HD/20MB Tape B/U Combo Kit*	699.00*
THE™ 20MB *Hard Disk Card*	375.00*
THE™ 30MB *RLL Hard Disk Card*	425.00*
THE™ 40MB *½ Ht Hard Drive 40MS for AT*	465.00*
THE™ 60MB *Tape BackUp*	675.00*

The Best Buy in Modems

100% Hayes Compatible

THE™ 1200 COMM



EXTERNAL **$109.00*** INTERNAL **$88.00***

(For the IBM™ and clones)

PC MAGAZINE *"...THE™ modems offer a lower-priced alternative to the Hayes products with no apparent sacrifice in quality."* May 12,1987

MODEMS

Anchor *Lightning-1 2400 Baud External*	$281.00*
Hayes *Smartmodem 2400 External*	425.00*
Hayes *Smartmodem 1200B w/Smartcom II VT-100 Emulator*	269.00*
Hayes *Smartmodem 2400B Internal*	425.00*
Migent *Pocket Modem*	179.00*
THE™ 2400 Comm *External 2400BPS*	220.00*
THE™ 2400 Comm *Internal 2400BPS*	197.00*
U.S. Robotics *Courier 2400BPS External*	345.00*
U.S. Robotics *Password 1200BPS External*	180.00*

BOX OF 50

DS/DD DISKETTES .44* ea.

5¼" BOX OF 10 **$7.95***

SONY 5¼" HD Box of 10 **$19.00***

SONY 3½" DS/HD Box of 10 for PS/2 **49.00***

• NEWSLETTERS • 24 HOUR BULLETIN BOARD • SOFTWARE RENTALS

(Catalog Price Updates and Reviews) (10,000 Free Programs to Download) (Over 1,000 Titles in our Library)

Get more info. Go to Ad index.

Arlington Computer Products gives you the best prices on IBM PCs...

IBM XT

CALL FOR CUSTOM CONFIGURATIONS

IBM AT 339 (8 MHZ)

1.2 Floppy, 512K,
30 MB Hard Disk
w/Monochrome Monitor ... ***$3650***
w/Color Monitor ***$3850***

IBM PERSONAL SYSTEM II

BRAND NEW AND IN STOCK — CALL NOW!

Model 30, 20 MB
w/Monochrome Monitor ... ***$1975***
Model 50,
w/Monochrome Monitor ... ***$2975***
Model 60,
w/Monochrome Monitor ... ***$4275***
w/Color Monitor add $250

...and COMPAQ too!

COMPAQ PORTABLE

2 Drives, 256K ***$1595***
1 Drive, 256K, 20 MB ***$1950***
1 Drive, 640K, 20 MB ***$2025***

COMPAQ DESK PRO

1 Drive, 640K, 20 MB
Green or Amber Monitor ***$1750***

COMPAQ 286

DESKTOP — 1 Drive
640K, 30 MB, Monitor ***$3075***

PORTABLE II MODEL IV —
1 Drive 640K, 20 MB ***$2975***

PORTABLE III —
1 Drive 640K, 20 MB ***$3950***
w/40 MB ***$4495***

COMPAQ 386

Model 40 ..... ***$4695***
Model 70 ..... ***$5295***
Model 130 ..... ***$6375***

DRIVES & TAPES

360K Floppy for PC $99
360K Floppy for AT $115
10 MB Tape Backup for XT $249
20 MB Tape Backup for XT $459
20 MB Tape Backup for AT $489
40 MB Tape Backup for AT
or Compaq 386 ..... $549

EVEREX

60 MB Internal Backup for AT $719
60 MB External Backup for AT $719

SEAGATE HARD DISKS

20 MB Kit for XT (Model 225) $319
30 MB Kit for XT (Model 238) $349
30 MB for AT (Model 4038) $519
40 MB for AT (Model 251) $489
40 MB for AT (Model 4051) w/software .. $659
80 MB for AT $869

IOMEGA

10 + 10 Bernoulli w/Controller $1489
20 + 20 Bernoulli w/Controller $1950
PLUS hard card $659

VIDEO BOARDS

Hercules Graphics Plus $179
Hercules Color Card $145
STB EGA Plus $259
Paradise Autoswitch 480 ..... $339
Quadram Prosync $349
Quad EGA $309
NEC GB1 ..... $339
Vega Deluxe $349
Everex EGA Autoswitch $139
Everex Edge $219
Hercules Compatible Graphics Card $85
Hercules Compatible Color Card $69

MONITORS

AMDEK		*PRINCETON*	
310A	$139	MAX12	$159
410	$159	HX12	$415
600	$349	HX12E	$499
722	$459	SR12	$565

NEC Multisync $549
THOMPSON Color $319
SAMSUNG Color $279

Arlington Computer Products, inc.
3025-E S. MALMO
ARLINGTON HEIGHTS, IL 60005

VISA MasterCard

FOR ORDERS & SYSTEMS QUOTES:

800-548-5105

CUSTOMER SERVICE AND IN ILLINOIS 312-228-6333
SHIPPING 312-228-6333
TECHNICAL ASSISTANCE 312-228-1470

Prices and Availability Subject To Change Without Notice

Bringing you the best in IBM compatible peripherals since 1984.

OUR EPSON PRINTER PRICES ARE SO GOOD WE NEED TO SHOW THEM OFF!

LX 800	*FX 286E*	*LQ 1000*	*EX 800*
$189	*$419*	*$529*	*$365*
FX 86E	*LQ 800*	*LQ 2500*	*EX 1000*
$299	*$429*	*$849*	*$489*

PRINTERS

EPSON

LX 800	$189	LQ 1000	$529
FX 86E	$299	LQ 2500	$849
FX 286E	$419	EX 800	$365
LQ 800	$429	EX 1000	$489

OKIDATA

192 Plus	$349
193 Plus	$525
292 w/Module	$549
293 w/Module	$649
Pacemark	$1749

TOSHIBA

321 S/L	$519
351 Model II	$899

NEC

P6	$445
3550	$769
P5XL	$999
P7	$619
P9XL	$1119
8850	$1095

IBM

Proprinter	$399
Proprinter XL	$549

HEWLETT-PACKARD

Laserjet II	$1795

SOFTWARE

Crosstalk	$109
D Base III Plus	$389
Framework	$399
IBM Displaywrite IV	$359
Lotus 123	$319
Managing Your Money	$115
Microsoft Word	$259
Multimate Adv. II	$269
Norton Utilities	$59
R Base System V	$389
Smartcom	$49
Symphony	$429
Ventura Desktop Publ.	$575
Volkswriter III	$145
Word Perfect 4.2	$205
Wordstar 2000+	$279

MODEMS

HAYES

1200	$299
1200 B Alone	$269
1200 B w/Software	$299
2400	$469
2400 B	$469
Everex 300/1200 w/Software	$109
Everex 2400 internal	$199

MULTIFUNCTION BOARDS

Everex Magicard 384K	$149
AST 6 Pack w/384K	$169
AST 6 Pack Premium w/512K	$339
AST Advantage	$299
AST Rampage PC w/256K	$259
AST Rampage AT w/512K	$409
Orchid Tiny Turbo	$349
Intel Above Board PC	$249
Intel Above Board PC P/S	$279
Intel Above Board AT	$349
Intel Above Board AT P/S	$369
Irma Board	$695
AST 5251-11	$529
AST 5251-11 Plus	$599

CHIPS

64K Ram Chips	9 for $11
256K Chips	each $2.95
8087-3	$109
8087-2	$149
80287	$159
80287-8MHZ	$259
80287-10MHZ	$309
80387	$599

★ ISSUE HIGHLIGHTS ★

AST RAMPAGE AT W/2 MEGABYTES	*NEC MULTISYNC MONITOR*	*MICROSOFT BUS MOUSE*	*MOUSE SYSTEMS MOUSE*	*EPSON PRINTER STAND W/PRINTER PURCHASE*
$539	*$549*	*$119*	*$106*	*$15*
EVEREX 300/1200 MODEM W/SOFTWARE	*SEAGATE 20MB HARD DISK KIT*	*MICROSOFT SERIAL MOUSE*	*135 WATT POWER SUPPLY*	*D BASE III*
$109	*$319*	*$129*	*$95*	*$389*

Arlington Computer Products, inc.
3025-E S. MALMO
ARLINGTON HEIGHTS, IL 60005

FOR ORDERS & SYSTEMS QUOTES:
800-548-5105
CUSTOMER SERVICE AND IN ILLINOIS 312-228-6333
SHIPPING 312-228-6333
TECHNICAL ASSISTANCE 312-228-1470

Prices and Availability Subject To Change Without Notice

707 WAYS TO SAVE MONEY ON COMPUTERS

COMPUTER PRODUCTS AT THE LOWEST PRICES

COMPUTERS

THE ALL NEW IBM PERSONAL SYSTEM 2

MODEL 30-002 (2 720K FLOPPIES)	$1,299.00
MODEL 30-021 (20MB HARD DRIVE)	$1,721.25

80286 SYSTEMS

MODEL 50-021 (20MB HARD DRIVE)	$2,696.25
MODEL 60-071 (70MB HARD DRIVE)	$4,721.25

IBM PERSONAL SYSTEM/2 DISPLAYS

MONOCHROME 8503	$199.00
COLOR-8512 (14")	$476.00
COLOR 8513 (12")	$548.00
COLOR 8514 (16")	$1,162.50

NEW PERSONAL SYSTEM 2 SOFTWARE

IBM DOS 3.3	$96.00

IBM XT™ SPECIALS

IBM XT W/256K 1 DRIVE	$899.25
IBM XT W/256K 2 DRIVES	$988.00
IBM XT W/256K 1 FLOPPY AND 20MEG	$1,238.99

IBM AT SPECIALS

IBM AT W/256K, 1.2MB FLOPPY	$2,349.00
IBM AT MODEL 339	$3,446.25
NEW IBM QUIETWRITER III PRINTER	$1,274.25

AT&T SPECIALS

AT&T 6300 W/640K, 1 360K FLOPPY SERIAL, PARALLEL, VIDEO BOARD AND DOS	$839.99
AT&T 6300 KEYBOARD	$109.00
AT&T MONOCHROME MONITOR W/SYSTEM	$199.00
AT&T COLOR MONITOR W/SYSTEM	$476.00

WYSE PC/AT AND 386 COMPUTERS

WYSE PC 1400 W/640K, 2 DRIVES 2 SERIAL PORTS, 1 PARALLEL PORT, AT STYLE KEYBOARD	$1,069.00
WYSE PC 286 AT COMPATIBLE 640K, 1.2MB FLOPPY, SERIAL AND PARALLEL PORTS, AT OR ENHANCED AT STYLE KEYBOARD	$1,399.50
WYSE 386, 1.2MB FLOPPY, 16MHz 0 WAIT STATE, 1MB RAM, HD/FD CONT. SER/PAR	$2,499.00
WYSE 386, AS ABOVE WITH 40MB HARD DRIVE	$3,350.00

***** LASER AND SSI SPECIALS *****

***** NEW *****

IBM XT COMPATIBLE LAPTOP W/512K, SERIAL, PARALLEL, EXPANDS TO 640K, 1 5-1/4" FLOPPY, RUNS @ 4.77 or 10 MHz, MONO/CGA/COMPOSITE ON BOARD	$499.00
IBM COMPATIBLE LAPTOP W/640K, 1 5-1/4" FLOPPY, W/EMS BOARD 0K, EXPANDS TO 1MB, EGA ON BOARD W/TTL MONO AND COMPOSITE COLOR, CLK/CAL, RUNS @ 4.77 or 10 MHz	$599.00
LASER 128, APPLE COMPATIBLE	$395.00
NATIONALLY RENOWNED LASER XT W/256K, 1 FLOPPY	$499.00
LASER XT W/640K, 2 FLOPPIES, MULTI I/O CARD, TTL MONOCHROME MONITOR MONOGRAPHICS BOARD, TURBO 8 MHz MOTHERBOARD	$879.00
SSI XT/8 TURBO, 256K, 1 DRIVE	$399.00
SSI AT 286-10, 512K, 1.2MB FLOPPY, HD/FD CONTROLLER, AT OR ENHANCED KEYBOARD, 8 EXPANSION SLOTS, 195 WATT POWER SUPPLY, FULL 1 YEAR WARRANTY	$1,119.00

TOSHIBA SPECIALS

TOSHIBA 1100 PLUS LAPTOP	$1,499.00
TOSHIBA 3100 LAPTOP	$2,875.00

COMPAQ™ SPECIALS

COMPAQ DESKPRO MODEL II 256K, 2 360K FLOPPIES	$1,299.00
COMPAQ "286" DESKPRO WITH 20MB HARD DRIVE	$2,699.30
COMPAQ "286" DESKPRO WITH 40MB HARD DRIVE	$2,950.00
COMPAQ "386" DESKPRO 40MB	$4,679.28
COMPAQ "386 DESKPRO 70MB	$5,254.00
COMPAQ "386" DESKPRO 130MB	$6,335.30
*** NEW COMPAQ PORTABLE III ***	IN STOCK

MONOCHROME MONITORS

SAMSUNG TTL MONITOR GREEN OR AMBER	$85.00
TAXAN 123 GREEN MONOCHROME	$105.50
TAXAN 124 AMBER MONOCHROME	$110.00
AMDEK 310A AMBER MONOCHROME	$135.99
AMDEK 410A AMBER MONOCHROME	$154.56
WYSE 530 GREEN OR AMBER	$175.36
IBM MONOCHROME MONITOR	$215.89
COMPAQ MONOCHROME MONITOR	$198.50
PGS MAX-12E AMBER	$144.00
WYSE 700 1280 X 800 RES. W/GRAPHICS CARD	$767.20

COLOR MONITORS

IBM COLOR DISPLAY	$515.30
TAXAN 720 COLOR MONITOR	$299.50
TAXAN 635	$397.50
TAXAN 650	$430.92
PGS HX-12E	$459.00
AMDEK COLOR 600	$349.00
AMDEK COLOR 722	$453.60
CTX 14" COLOR MONITOR 2 YEAR WARRANTY	$289.00

EGA MONITORS

COMPAQ EGA MONITOR	$589.30
COMBINATION SPECIAL CLASSIC TECHNOLOGY PGA MONITOR AND AUTOSWITCH BOARD—RUNS CGA, EGA AND PGA RESOLUTIONS	$728.00
SAMSUNG EGA MONITOR	$389.00
CTS EGA MONITOR	$365.99
NEW! TAXAN 760 EGA MONITOR	$499.00
TAXAN 660	$515.00
NEC MULTISYNC	$539.00

DISK DRIVES

20MB SEAGATE 1/2 HEIGHT W/CONT.	$329.00
30MB SEAGATE 1/2 HEIGHT W/RLL	$369.00
30MB SEAGATE FULL HEIGHT FOR AT	$533.99
40MB SEAGATE FULL HEIGHT FOR AT	$619.50
20MB MINISCRIBE HARD CARD	$439.00
30MB MINISCRIBE HARD CARD	$459.00
PLUS HARDCARD 20	CALL FOR PRICE
60MB PRIAM DRIVE FOR AT W/SOFTWARE	$839.00
SPECIAL! 80MB SEAGATE FOR AT W/ON-TRAC	$850.00
FUJITSU 360K 1/2 HGT. FLOPPY	$83.00
BERNOULLI BOX 10 + 10	$1,420.00
BERNOULLI BOX 20 + 20	$1,829.50
NON BOOTABLE CONTROLLER	$159.00
BOOTABLE CONTROLLER	209.00
IRWIN 10MB TAPE BACK-UP	$295.00
IRWIN 20MB AND 40MB INTERNAL TAPE BACK-UPS	IN STOCK
ARCHIVE 40MB TAPE BACK-UP UNIT FOR XT/AT	$339.00

CARDS

MULTI I/O	$69.99
MONOCHROME GRAPHICS W/PP	$69.85
ATD HERCULES COMPATIBLE W/PP	$99.79
TAXAN 535 MONOCHROME W/PP	$89.00
HERCULES GRAPHICS CARD PLUS	$179.00
IBM MONOCHROME W/PP	$197.00
COLOR GRAPHICS CARD	$69.00
COLOR GRAPHICS CARD W/PP	$89.00
HERCULES COLOR CARD W/PP	$149.00
NEW HERCULES INCOLOR CARD	IN STOCK
TAXAN 555 COLOR CARD W/PP	$189.50
GENOA SPECTRUM PLUS, 16 COLOR W/SERIAL, PARALLEL, CLOCK HERCULES COMPATIBLE	$239.75

EGA CARDS

***** SPECIAL *****

EGA, CGA, HERCULES MONOGRAPHICS	$139.00
TAXAN AUTOSWITCH EGA	CALL FOR PRICE
PARADISE AUTOSWITCH EGA	$339.00
QUADRAM EGA	$318.00
QUAD PROSYNC	$345.00
GENOA SUPER EGA CGA/EGA/HERC	$299.00
VIDED 7 VEGA DELUXE	$339.00
NEC GB-1 640 X 480 RES.	$339.00
FOR THE CAD USER PHOTON MEGA BY PCG 800 X 600	$568.88
ZUCKER MEMORY 576K	$59.00
ZUCKER MEMORY W/CLOCK	$99.89
AST 6 PAK W/64K, C/S/P EXPANDS TO 384K	$165.00
AST ADVANTAGE 128 FOR AT EXPANDS TO 3MEGS	$344.00
INTEL PC ABOVEBOARD W/64K	$245.00
INTEL PC ABOVEBOARD W/P/S	$275.60
INTEL AT ABOVEBOARD W/128K	$355.00
INTEL AT ABOVEBOARD W/P/S	$390.00
STB GRANDE BYTE	$199.00

MODEMS

MASTEC 1200 BAUD INTERNAL W/ SOFTWARE	$129.00
MASTEC 1200 BAUD EXTERNAL	$139.00
USR PASSWORD 1200 EXTERNAL	$209.00
USR MICROLINK 1200 HALF	$199.00
EVEREX 1200BAUD INTERNAL	CALL
EVEREX 1200BAUD EXTERNAL	CALL
NEW LOWER PRICING AVAILABLE	
HAYES SMARTMODEM 1200 EXTERNAL	$305.00
HAYES SM1200B W/SMARTCOM II	$305.00
HAYES SMARTMODEM 1200B W/HW INTERNAL – NO SOFTWARE	$279.25
HAYES SMARTMODEM 2400 EXTERNAL NO SOFTWARE	$439.50
HAYES SMARTMODEM 2400B W/SOFTWARE	$439.50
HAYES SMARTMODEM 2400B W/HW	$411.75
SMARTCOM II SOFTWARE ONLY	$80.99
EXTERNAL MODEM CABLES	$19.99
AST 5251-11 PLUS/5251-12	$638.05/507.99

PRINTERS

CITIZEN 120D, 80 COL, 120 CPS	$187.99
CITIZEN MSP10, 80 COL, 160 CPS	$270.00
SPECIAL OF THE MONTH	
CITIZEN MSP20, 80 COL, 200 CPS	$299.00
BROTHER M-1409, 110 COL, 180 CPS W/ PUSH TRACTOR	$339.00
BROTHER M-1509, 136 COL, 240 CPS W/ PUSH TRACTOR	$399.00
EPSON LX-800 W/TRACTOR FEED	$195.00
EPSON FX-86E	$329.75
EPSON FX-286E	$455.00
EPSON EX 800	$399.00
EPSON EX-1000	$525.96
EPSON LQ 800	$460.08
EPSON LQ 2500	$899.00
NEC P660 80 COL	$449.20
NEC COLOR P660	$539.50
NEC P760 136 COL/216 CPS	$615.00
NEC COLOR P760	$709.00
NEC P560 XL	$915.00
NEC P960 XL	$1,104.84
NEC 3550 SPINWRITER	$795.00
NEC 8850 SPINWRITER	$1,095.25
OKIDATA ML182 FOR IBM	$233.50
OKIDATA ML192 PLUS FOR IBM	$344.80
OKIDATA 193 PLUS FOR IBM	$515.50
OKIDATA ML292E	$424.00
OKIDATA ML293E	$547.00
INTERFACE MODULE FOR 292/293	$94.99

***** NEW *****

TOSHIBA P321 SL W/TRACTOR	$499.00
TOSHIBA P341E	$678.50
TOSHIBA P351 P/S MODEL II	$965.00
HP LASERJET SERIES II	$1,796.00
QUAD LASER LS1101	CALL NEW MODEL

DISKETTES

3-1/2" DS/DD FOR MACINTOSH	$18.25
5-1/4" DS/DD FOR XT	$12.45
5-1/4" DS/HD FOR AT	$21.99

CHIPS

4164 (64K) 9 CHIP SET	CALL FOR PRICE
128K PIGGY BACKS FOR AT	CALL FOR PRICE
NINE CHIP SET	CALL FOR PRICE
8087-2 (FOR COMPAQ DESKPRO)	$169.00
80287-6 (FOR AT & AT COMPATIBLES)	$179.20
80287-8	$255.00
80287-10	$335.00
41256 (256K) 9 CHIP SET	CALL FOR PRICE
COMPAQ 386 1MB UPGRADE	$349.00

MISC.

PARALLEL PRINTER CABLES	$15.00
10' PARALLEL PRINTER CABLES	$20.00
150 WATT POWER SUPPLY	$65.00
DS BACKUP PLUS	$49.95
4 - 6 OUTLET SURGE PROTECTORS	$15.00
PERMA POWER SURGE PROTECTORS	$39.50
QUADRAM MICROFAZER	$139.00
ENHANCED AT STYLE KEYBOARD	$75.00

ALL NOVELL NETWORKING ITEMS 25% OFF • ALL SOFTWARE MINIMUM 30% OFF • MOST ORDERS SHIPPED WITHIN 48 HOURS • WE HAVE THE LOWEST PRICE, CALL US BEFORE YOU BUY IT ANYWHERE ELSE • CORPORATE BIDS OR HIGH VOLUME BIDS WELCOME. CALL **(800) 426-2489,** AND ASK FOR AMY • **TECH HOT LINE (312) 537-3970** • TOLL FREE ORDER LINE **(800)/IBM-CITY**

WE HAVE ALL YOUR COMPUTER NEEDS AT THE BEST PRICE AND WE GUARANTEE IT!

Get more info.
Go to Ad Index.

CALL **1-800-IBM-CITY**

or in Illinois **312-537-3600**

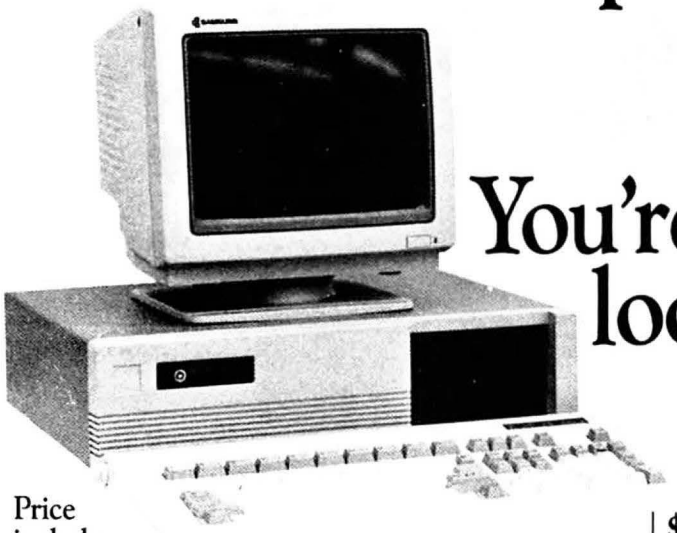
Add 3% Shipping & Handling. Orders under $200, please add $5 for handling. Prices reflect 3% cash discount. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. Returns are subject to a restocking charge. Prices are subject to change without notice.

VISA MasterCard Visa /Mastercard accepted

707 COMPUTER SALES

707 Dartmouth Drive
Buffalo Grove, IL 60089

If you're looking for the best price on an IBM compatible PC,



You're looking at them now.

Price includes monitors, drives, keyboard, – *everything.*

	$599 PC-XT Compatible Turbo System	$1,250 PC-AT Compatible Turbo System	$1,450 PC-AT Compatible Super Turbo
Intel processor:	8088	80286	80286
Speed:	8/10MHz	8/10MHz	10/12MHz
RAM on motherboard	256K	640K	1024K
Floppy drive:	360K	1.2MB	1.2MB
Power supply:	150W	200W	200W
Keyboard style:	PC-AT	AT Deluxe	AT Deluxe
Monitor:	12" high-resolution monochrome with swivel base		
Printer port:	Parallel		
Additional features:	Monochrome graphics card Full documentation; 10 Omni Disks preformatted for PC		
Installed options:			
640K RAM motherboard	$70		
Hard disks with controller:			
20MB (65MS)	$379	$379	$379
30MB (65MS)	$424	$424	$424
40MB (28MS)	$619	$619	$619

Also Peripherals:
MS DOS and GW BASIC: $75
Color 14" RGB monitor: $320
Color 14" EGA monitor: $399
360K drive with cables: $89
1.2MB drive with cables: $144
Epson LX 800 printer (80 column, 160 cps): $238
Epson FX 286E printer (136 column, 240 cps): $559
101 key keyboard $74
RS-232 serial card $36
Call for pricing on multi-function cards, expanded memory cards, modems, cables, etc.

30-day money-back guarantee

Get great savings, free delivery, our no-risk money-back guarantee, and toll-free telephone support. You must be satisfied. Each PC is complete, ready to use, and runs IBM compatible software.

Item | Qty | Unit cost | Total cost

_____ Master Card _____ Visa _____ Check
(Credit to qualified accounts)

Card # _____ Exp. _____

Name _____

Address _____

5% sales tax (Mass only) _____

TOTAL _____

Tel. (_____) _____

30-day money-back guarantee – Any item may be returned within 30 days of shipment for a full refund. Items must be returned in original packing, undamaged, shipped prepaid and insured, and bear our return authorization number.

One year limited warranty – Covers parts and labor. We will repair or replace, at our option, any product that fails due to defects in materials or workmanship within one year from date of shipment. Items must be returned prepaid, insured, and bear our return authorization number.

PRISM

Prism Technologies, Inc.
50 Howe Avenue, Millbury, MA 01527
(617) 865-0211
Fax: (617) 865-1853

Call toll-free (800) 648-7402
In Mass: (800) 562-9202

IBM*, PCXT*, PCAT* – International Business Machines Corporation.

COMPUTER DISCOUNT WAREHOUSE

AT&T

6300 w/640K 1 DRIVE $890.50
6300 w/640K 2 DRIVES $980.24
6300 w/640K 1 FLOPPY, 20 MEG $1190.22
6300 w/640K 1 FLOPPY, 30 MEG $1260.18

All AT&Ts include keyboard. Monitor and DOS additional.

WHY PAY RETAIL?
Nobody Sells For Less

CALL FOR LOWEST CUSTOM QUOTES

TOSHIBA

LAPTOP COMPUTERS
TOSHIBA 1100+
(PC Magazine Editor's Choice) ..$1529.10
TOSHIBA 3100 .....$2778.95

PRINTERS
TOSHIBA P321SL.....$499.85
TOSHIBA P341E.....$679.86
TOSHIBA P351 S/P Model 2 .....$979.99
TOSHIBA P351 Color Model 2 ....$1199.95

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

COMPUTERS

AST SPECIALS

AST Model 80/ 90 .....$1556.80/ 1947.20
AST Model 120/ 140 .....2328.48/ 2709.88
AST Model 170 .....3049.90

AT&T SPECIALS

AT&T 6300 w/640K 1 drive $890.50
AT&T 6300 w/640K 2 drives 980.24
AT&T 6300 w/640K 1 floppy, 20 Meg ..1190.22
AT&T 6300 w/640K 1 floppy, 30 Meg ...1260.18
All AT&Ts include keyboard.

Panasonic BUSINESS PARTNER SPECIALS

PANASONIC FX-600F1 .....$789.90
PANASONIC FX-600HD20 20 Meg 1219.75
PANASONIC FX-800F1 AT compatible....1499.60
PANASONIC FX-800HD30 30 Meg 2149.20

TOSHIBA SPECIALS

TOSHIBA 1100 Plus $1529.10
TOSHIBA 3100 .....2778.95
TOSHIBA 1000 .....NEW MODEL
TOSHIBA 1200 .....LOWEST PRICE

WYSE PC/AT SPECIALS

WYSE 2200-01 AT compatible 1349.77
WYSE 2200-20 AT compatible 1775.20
WYSE 2200-40 AT compatible 2269.40
WYSE 286 & 386 compatibles
Brand New Models.....CALL

THE ALL NEW IBM PERSONAL SYSTEM 2

PS II Model 30 .....CALL
PS II Model 30 w/hard drive .....FOR
PS II Model 50 .....BEST PRICE
PS II Model 60 .....& AVAILABILITY
IBM AT Model 339 .....3448.00

COMPAQ™ SPECIALS

COMPAQ portable w/256K 2 floppies ...SAVE
COMPAQ portable w/256K, 20 Meg..LOW PRICE
COMPAQ DeskPro w/128K 1 floppy ...$1299.96
COMPAQ DeskPro w/256K 2 floppies...1354.26
COMPAQ DeskPro w/640K 20 Meg hard drive 1699.96
COMPAQ DeskPro w/640K 30 Meg.....2189.50
COMPAQ Portable II Model II 1829.43
COMPAQ Portable II Model IV 2797.29
COMPAQ Portable III 20 Meg .....NEW MODEL
COMPAQ Portable III 40 Meg .....IN STOCK
COMPAQ "286" DeskPro, 256K 1 floppy ...SAVE
COMPAQ "286" DeskPro w/30 Meg .....CALL
COMPAQ "286" DeskPro w/40 Meg....2953.29
COMPAQ "386" DeskPro 40 Meg.....4679.28
COMPAQ "386" DeskPro 70 Meg 5255.28
COMPAQ "386" DeskPro 130 Meg 6247.82
Other Computers Available Upon Request

DRIVE CARDS

MINISCRIBE 30 Meg Flashcard $469.96
MOUNTAIN 20 Meg/ 30 Meg 519.50/ 589.50
PLUS DEVELOPMENT 20 Meg 649.40
PLUS DEVELOPMENT 40 Meg 878.80
WESTERN DIGITAL 20 Meg/30 Meg ..... CALL

PLOTTERS, DIGITIZERS & SCANNERS

HP7440A ..... HI TG-1811
HP7475A ..... HI TG-1017
HP SCANNER ..... HI TG-8011
HI DMP-42 ..... HI TG-8017
HI DMP-52 ..... HI TG-8024
HI DMP-52MP ..... HI TG-8036
HI DMP-56A ..... PGS LS-300
SUMMASKETCH, both 12x12 & 12x18
CALL FOR PRICE & AVAILABILITY

DRIVES FOR ATs & 286s

MINISCRIBE 40 Meg 28ms $627.40
MINISCRIBE 80 Meg 28ms 895.45
PRIAM 40 Meg hard disk 668.55
PRIAM 60 Meg hard disk 798.95
PRIAM 130 Meg hard disk 1989.40
SEAGATE 4038 30 Meg hard disk 534.80
SEAGATE 4051 40 Meg hard disk 599.98
SEAGATE 4096 80 Meg hard disk 895.59
360K floppy drive 110.12

PRINTERS

CITIZEN 1200 .....$184.55
CITIZEN MSP10 .....275.20
CITIZEN MSP15/ MSP20 .....384.60/ 334.92
DICONIX Printer by Kodak 329.17
CDW™ SUPER BUY—LIMITED QUANTITY
EPSON LX80 (Limit 5) 159.50
EPSON LX800 .....184.15
EPSON LQ800 ..... 437.40
EPSON LQ1000 ..... 625.32
EPSON FX86e 312.12
EPSON FX286e 429.40
EPSON EX800/ EX1000 .....374.76/ 499.99
EPSON LQ2500 .....875.88
IBM Pro Printer II 441.95
IBM Pro Printer X24 .....626.42
IBM Pro Printer XL24 .....822.42
IBM Quietwriter III 1346.82
NEC Color P6/ Color P7 .....539.74/ 709.12
NEC P6 80 col 449.22
NEC P7 136 col 216 cps 615.35
NEC P5XL 974.75
NEC P9XL 1068.70
NEC P2200 .....NEW MODEL
NEC LC850 .....IN STOCK
NEC 3550 Spinwriter 741.12
NEC 8850 Spinwriter 1097.79
OKI Okimate 20 .....122.74
OKI ML 182P/ ML 182S 234.50/ 276.10
OKI ML 192 Plus 339.50
OKI ML 193 Plus 519.40
OKI ML 292 Plus 424.44
OKI ML 293 Plus 547.55
PANASONIC 1080i 219.16
PANASONIC 1091i 284.80
PANASONIC 1092i 359.40
PANASONIC 1592 .....433.44
PANASONIC 1595 .....517.44
PANASONIC 3131 .....264.32
PANASONIC 3151 .....409.52
TOSHIBA P321SL 499.85
TOSHIBA P341E 679.86
TOSHIBA P341SL .....SAVE
TOSHIBA P351 S/P Model 2 .....979.99
TOSHIBA P351 Color Model 2 .....1199.95

LASER PRINTERS

AST Laser Printer $3245.40
CORONA Laser Printer 1699.85
H-P Laser Jet Model 2 ..... IN STOCK
H-P Laser Jet 500 Plus 3451.50
QUAD Laser LS1101 .....2999.90

FLOPPIES, DRIVES & TAPES

1/2 height floppy drive $99.00
MINISCRIBE 20 Meg 1/2 height w/ cont. 339.14
MINISCRIBE 30 Meg 1/2 height w/ RLL ...399.95
SEAGATE 20 Meg 1/2 height hard drive ...299.60
SEAGATE 30 Meg 1/2 height w/ RLL 399.72
SEAGATE 40 Meg 1/2 height 529.50
GENOA 20 Meg int. tape... GENOA ...574.85
GENOA 20 Meg ext. tape... IS NOW ...636.02
GENOA 60 Meg int. tape... NOVELL ...734.60
GENOA 60 Meg ext. tape... COMPATIBLE ...895.10
IOMEGA BERNOULLI 10+10 .....1424.28
IOMEGA BERNOULLI 20+20 ..... 1839.50
IRWIN 10 Meg tape backup 276.34
IRWIN 28 M /40 M Internal Tape...499.10/ 589.20
TALLGRASS 20 Meg Internal Tape 369.40
TALLGRASS 20 Meg External Tape 592.67

NOVELL NETWORKING

STARTER KITS

WESTERN DIGITAL 3 Node LAN kit w/Western Digital software $924.34
G-NET 86 w/Keycard 1593.90
ARCNET 86 Starter Kit 1811.25
ETHERNET 86 w/Keycard 2152.80
Kits include 2 Network Cards, Keycards, Software and Manuals. Call for pricing on 286 Starter Kits

INTERFACE CARDS

ARCNET PC100 LANBoard $372.27
ARCNET PC200 LANBoard 386.00
ETHERNET Interface Connector 479.19
ETHERNET Plus Board (for 286) 724.74
G-NET Interface Card w/cable 419.92

ACCESSORIES

ARCNET Passive Hub $85.00
ARCNET Active Hub 619.98
NOVELL 286 Software w/Keycard 1598.09
SFT Netware Level I 2246.66
Nondedicated Netware Software 286 w/Keycard 1598.96
All Sales People are Novell trained and authorized. Call CDW for all your Networking Hardware & Software. On-Site Installation Available—Call for Details

MONOCHROME MONITORS

AT&T Monochrome Monitor.....$185.40
AMDEK 310A/ 410A 139.99/ 154.95
AMDEK 1280 ..... 587.78
COMPAQ monochrome monitor 188.46
IBM monochrome monitor 219.84
IBM PS2 Mono Monitor .....IN STOCK
PGS MAX 12E amber color 144.40
PACKARD BELL Green or Amber 89.95
TAXAN 123 Green/ 124 Amber ...119.50/ 124.05

MONITOR INTERFACE CARDS

PACKARD BELL color card w/p .....$ 99.00
PACKARD BELL monographics card w/p.. 99.00
GENOA Spectrum (color monographic w/p)168.75
HERCULES color card w/p 144.16
HERCULES monographics plus w/p 179.84
HERCULES Incolor Board 324.00
STB CHAUFFEUR HT w/p 199.60
TAXAN MONOGRAPHIC w/p 99.00

COLOR GRAPHIC MONITORS

AT&T Color Monitor $495.10
AMDEK color 600S/ 722 .....349.24/ 444.49
IBM PS2 Color Monitor .....IN STOCK
IBM PS2 Enhanced Color Monitor .....SAVE
MAGNAVOX 14" RGB 640 x 200 .....289.00
PGS HX-12 Hi-Resolution RGB 412.32
TAXAN 635/ 650 .....397.90/ 469.90
TAXAN 720 ..... 379.00

EGA PRODUCTS

EGA MONITORS

COMPAQ enhanced graphics monitor....$584.14
IBM enhanced graphics monitor 579.41
NEC Multisync 564.76
NEC APC-IV Color Monitor 569.76
PGS HX-12E Hi-Resolution RGB 469.32
SONY MULTISCAN .....SAVE
TAXAN 760 New EGA Model 477.00
TAXAN 770U 539.40

EGA DISPLAY CARDS

ATI Wonder Card $249.75
GENOA Super EGA 640 x 480 ..... 262.85
GENOA Super EGA Hi-Res 800 x 600 ....319.40
IBM Enhanced Graphics Adapter 398.98
NEC GB-1 640x480 ..... 334.43
ORCHID EGA Card 329.94
PARADISE Auto Switch EGA 350 .....229.65
PARADISE Auto Switch EGA 480 .....314.33
QUADRAM EGA Card 319.10
QUADRAM Prosync 359.90
TAXAN Auto Switch EGA Card 299.99
VIDEO 7 Vega Deluxe 345.45

MODEMS, COMMUNICATIONS & EMULATIONS

AST 5251-11 Plus/ 5251-12 .....$639.04/ 508.60
EVEREX 1200B/ 2400B 109.90/ 199.50
HAYES Transet 1000, 128K 274.10
HAYES 1200/ 1200B 289.60/ 269.20
HAYES 2400 ..... 424.68
HAYES 2400B 379.65
HAYES V Series .....IN STOCK
IRMA 3278/79 Courier 695.17
US ROBOTICS 1200B HAYES compat. ... 108.45
US ROBOTICS 1200 External 129.10
US ROBOTICS 2400B 199.70
VEN-TEL 1200 Int. Half Card 194.50
VEN-TEL 1200 Plus 228.88
VEN-TEL 2400 Int. Half Card 299.10
VEN-TEL 2400 External 389.44
Smartcom/ Crosstalk 58.95/ 96.85

CHIPS

4164 (64K) 9 chip set $13.50
128K piggy backs 9 chip set 34.85
41256K (256K) 9 chip set 32.35
8087-2 (for COMPAQ DeskPro) 154.33
8087-3 (for PC/XT/COMPAQ Portable) ... 118.50
80287-6 (for AT and AT Compatible) 168.30
80287-8/ 80287-10 .....297.55/ 336.25
COMPAQ 386 1 Meg upgrade .....SAVE

MISC. & ACCESSORIES

A-B Switching Box (par. or serial) $39.95
BASF D/S, D/D 12.50
BASF Disks for AT (1.2 Meg) 26.14
DATASHIELD 6 Outlet Surge Suppressor ...27.85
DATASHIELD 500 Watt Batt. Backup 469.10
KENSINGTON Masterpiece 99.99
KENSINGTON Masterpiece Plus 118.40
KENSINGTON Masterpiece Remote 117.95
KEYTRONICS 101 .....SAVE
PERMA POWER 6 Outlet Surge Suppressor 29.40
QUADRAM Micro Fazers 140.40
Printer Cable (IBM to Centronics) 6 ft. 19.99
XT Power Supply 150 Watt 69.95

MICE

LOGITECH Logimouse Bus Version $109.06
LOGITECH Logimouse C7 .....89.95
MICROSOFT Mouse (Bus Version) 119.34
MICROSOFT Mouse (Serial Version) 131.26
MOUSE SYSTEMS (Serial Version) 108.55
MOUSE SYSTEMS (Bus Version) 116.77

MOST ORDERS SHIPPED WITHIN 48 HOURS.

Call CDW™ for custom quotes on products not listed.

If you find a better price call us before you buy.

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE™ NOW!

dBase III+ $399.00
Lotus 1-2-3 .....$305.00
Paradox $359.00
Ventura Software Version 1.1 ...$499.00
Word Perfect $199.99

On all hard drive orders and 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. Software, chips and other electronic components are not returnable. All pricing subject to change. TM - Registered trademarks of IBM and COMPAQ.

Canada and Outside Illinois

1-(800) 233-4426

In Illinois (312) 498-1426

FAX (312) 291-1737

MasterCard VISA AMERICAN EXPRESS Card

HIGH VOLUME BIDS INVITED
P.O. BOX 3048
Northbrook, IL 60065

CDW 987 PCW

When you join the Software of the Month Club...

ADULT
Gettysburg
This critically acclaimed strategy and battle tactic game challenges the mind with variable play levels. You become the decision-making difference in history.
—"best designed war game available"
Strategic Simulations **List $59.95**

ELEMENTARY
Creative Contraptions
Rube Goldberg would be proud of the zany mechanical contraptions used to encourage thinking skills and teach the simple physics of mechanical devices.
—"colorful, clever, and humorous"
Bantam
List $39.95

ELEMENTARY
Sticky Bear Math
Math practice becomes an exciting adventure for youngsters with this delightfully clever program from My Weekly Reader™.
—"stimulating and colorful"
List $39.95

COLLEGE-BOUND
Term Paper Writer
The program to organize and write research papers. Automatically creates outlines, footnotes, and bibliography. Adds an important layer of organization for young scholars.
—"the master key to writing effective papers"
Activision **List $59.95**

JR. HIGH
Rocky's Boots
Kids will play as they learn—exercising advanced thinking skills & creating graphic designs of electronic circuitry.
—"an ideal educational program for the home"
The Learning Co. **List $49.95**

PRESCHOOL
Fantastic Animals
Young children mix and match to build real and imaginary animals in different environments.
—"colorful and funny"
Bantam
List $39.95

COLLEGE-BOUND
SAT Success for Micros
A proven successful program that combines traditional review with computer-assisted instruction. Individualized study plans and the strategies for getting the right answers. With built-in diagnostic tests.
—"a necessary tool"
Peterson's Guides
List $79.95

ADULT
Moonmist
Become the lead character in this all-text interactive mystery & fiction game—based in Tresyllian Castle in Cornwall. Thrilling and challenging with multiple variations.
—"a great introduction to interactive fiction"
Infocom **List $39.95**

PRESCHOOL
Alphabet Circus
Fun and learning under the Big Top. Letter recognition, alphabetical order, text creation, & problem solving.
—"imaginative learning"
DLM **List $29.95**

JR. HIGH
Pinball Construction Set
The "original" computer construction game. Design and build your own pinball machine with special effects in sight and sound.
—"pinball wizardry"
Electronic Arts
List $14.95

Software The Easy Way

SATISFACTION GUARANTEED! Call Now. Phone in your order for fast service. **1-609-452-7333**

☐ **YES!** Only the BEST SELLING software from the BEST publishers!

We'd love to take advantage of your incredible offer. Please enroll us in the Software of the Month Club. As members we'll save 50% *or more* off list on quality software from the leading publishers. We agree to buy at least three more exciting programs during the next few months. If we're not satisfied, we can return this program without further obligation.

PLEASE RUSH _____ as our first program. Future selections will be in this age category.

Name _____ Address _____ Phone _____

City _____ State _____ Zip _____

Signature _____ Credit Card # _____ exp. date _____

Check one: ☐ Visa ☐ Mastercard

Or enclose your check or money order (no cash please) for $4.95 plus $1.50 shipping and handling. Sorry, no COD's.
NJ residents add 6% sales tax.

Return to: Software of the Month Club
300 Alexander Park
Princeton, NJ 08540

7 DW 95

Access MicroCenters, Inc

Mail Order Done Right!

ACCESS™ PC/10

ACCESS™ PC/10 100% IBM™ COMPATIBLE

MEMORY 256K RAM Standard Expandable to 640K on the Motherboard

SPEED 4.77 and 10 Mhz, Keyboard Selectable

POWER 150 Watt Power Supply

KEYBOARD 84 Key "AT" Style Keyboard

DISK DRIVE 1 360K 5 ¼" Diskette Drive with Controller

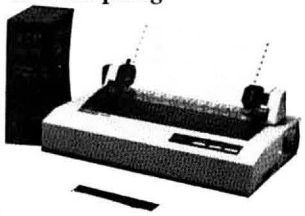
$389.00

CERTIFIED 100% IBM PC COMPATIBLE

ACCESS™ PC/10 STARTER SYSTEM

A $2,000 Computer Value...

A Complete System with Everything You Need to Start Computing



COMPUTER 256K w/4.77 and 10 Mhz Turbo Speed, Mono Graphics Adapter, 1 360K Floppy Drive, Printer Port

MONITOR High Res (1100 line) Amber TTL

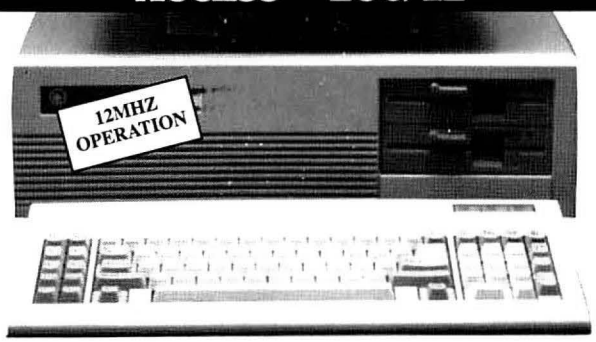
PRINTER Name Brand w/Graphics and NLQ Modes

SOFTWARE MS-DOS 3.2, GW Basic, Word Processor, Database, Spreadsheet & Communications

$889.00

PC/10 Starter System w/Color Monitor, Color Card $1,175.00

ACCESS™ 286/12



ACCESS™ 286/12 100% IBM™ "AT" COMPATIBLE

MEMORY 512K Standard Expandable to 1MB on the Motherboard

SPEED 6 or 12 Mhz, Keyboard or Toggle Switch Selectable

KEYBOARD 101 Key "AT" Style Keyboard

COMPATIBILITY Runs All the Software Designed for the IBM™ PC/AT

$699.00

CERTIFIED 100% IBM COMPATIBLE

ACCESS™ 286/12

Enhanced 512K SYSTEMS with Hard Disk and Floppy Storage Included

ACCESS™ 286/12 BASE SYSTEM w/1.2MB FLOPPY

STORAGE DRIVE 1.2MB Floppy Disk Drive

CONTROLLER Floppy and Hard Disk Combined

$959.00

ACCESS™ 286/12 BASE SYSTEM w/42MB DRIVE

STORAGE DRIVE 1.2MB Floppy Disk Drive and a 42MB Hard Disk Drive

CONTROLLER Floppy and Hard Disk Combined

$1495.00

Prices subject to change without notice. Products subject to availability. All product names are products of their manufacturers.

Hi Res COLOR

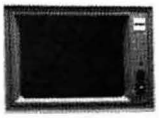
MAGNAVOX™ RGB
13" High res (800 x 560), RGB Monitor w/Cables

$297.00

ACCESS™ COLOR CARD
Features 320x200 color and 640x200 B&W
100% IBM™ compatible.
with printer port

$60.00

TTL MONITOR



ACCESS™ AMBER
High res TTL monochrome 1200 line res

$94.00

ACCESS™ HERCULES™ CLONE
80x25 COL capability, with parallel printer port and lightpen interface,
100% IBM™ and Hercules™ compatible.

$70.00

EGA™ MONITOR

14" Dual Frequency High res. EGA Monitor

$399.00

SUPER EGA

100% IBM™ compatible. 256K RAM VLSI Technology, 640x528, w/Multisync EGA/CGA/ HGC/MGA, Light Pen & Port

$155.00

EPSON™ PRINTERS

EX-800	*80 COL 300/60 CPS*	$405.00
EX-1000	*132 COL 300/60 CPS*	545.00
FX-86E	*160/35 CPS 10" Parallel*	335.00
FX-286E	*200/40 CPS 15" Parallel*	469.00
LX-800	*180/30 CPS w/Tractor*	164.00
LQ-800	*180 COL/ 60 CPS*	475.00
LQ-1000	*180 COL/ 60 CPS NLQ*	669.00
LQ-2500	*180 CPS/ 132 COL*	899.00

ACCESS™ "AT" STORAGE

SEAGATE™ 42MB HIGH PERFORMANCE "AT" HARD DRIVE

$499.00

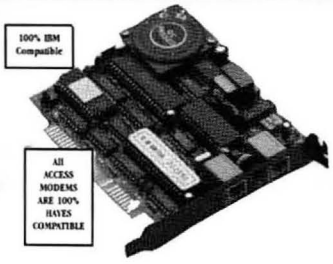
60MB TAPE BACK-UP
Streaming Tape for "AT" Drives

$699.00

71MB *28MS* HARD DISK
Internal Hard Drive

$875.00

ACCESS™ MODEMS

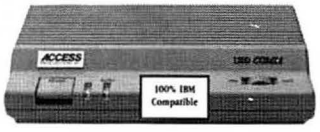


ACCESS 1200 BAUD INTERNAL
Auto answer, auto dial/re-dial, built-in speaker w/volume control, RS-232 serial port and Free software

$90.00

ACCESS 2400 BAUD INTERNAL

$209.00



ACCESS 1200 BAUD EXTERNAL
Self-testing 1200BPS w/auto answer, auto dial/re-dial, and built-in speaker w/volume control

$109.00

ACCESS™ PC EXPANSION BOARDS

ACCESS™ Multi I/O

Serial/Parallel/Game Ports Clock/Calendar Standard, Second Serial Port Optional

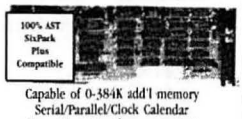
$60.00

ACCESS™ 2MB EMS

Lotus™/Intel™ specs, EMS Compatible, up to 2MB of RAM, software included w/0K

$99.00

ACCESS™ Multi 384



Capable of 0-384K add'l memory
Serial/Parallel/Clock Calendar
Game Port/ & software standard

$69.00

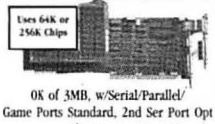
ACCESS™ "AT" EXPANSION BOARDS

ACCESS™ Multi I/O "AT"

Serial/Parallel/Game Ports Standard, Second Serial Port Optional

$69.00

ACCESS™ Multi 3MB "AT"



0K of 3MB, w/Serial/Parallel/ Game Ports Standard, 2nd Ser Port Opt

$119.00

Daughterboard for 3MB Capability **$29.00**

ACCESS™ STORAGE DEVICES

20MB HARD DISK KIT

20MB Half Height IBM™ compatible Disk Drive w/Controller Card, cables and manual

$335.00

20MB HARD DISK CARD

3.5" 20MB Hard Disk mounted on a Controller Card, installs in 1.5 slots

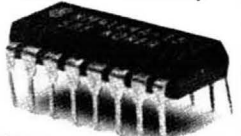
$389.00

30MB HARD DISK CARD

$455.00

ACCESS™ CHIPS

ACCESS™ Memory



64K Set of 9 Chips/150ns	$12.15
256K Set of 9 Chips 120-150ns	$33.75

ACCESS™ Math

Intel™ 8087-3 5Mhz	$119.00
Intel™ 8087-2 8Mhz	$159.00
Intel™ 80287	$215.00

ACCESS™ MEDIA

ACCESS™ Diskettes

5.25" DS/DD 360K For the IBM™ PC	.48 ea.	Box of 50
5.25" QD 1.2MB For the IBM™ AT	$8.75	Box of 10
3.5" 2MB For the IBM™ PS/2	$18.50	Box of 10
	$52.00	Box of 10

Our Policies and Procedures:

- **NO Freight Charge for UPS Ground!**
- **PO'S ACCEPTED from Fortune 1000 / Universities & Institutions**
- **NO Surcharges on Credit Card Use!**
- **TOLL FREE Customer Service!**
- **1 Year WARRANTY on All Hardware Products!**

Track Code #W293

1 (800) MICROS4

In Illinois Call (312) 787-0606 . 319 West Ontario Street, Chicago, Illinois 60610
Illinois, Wisconsin & Indiana, Corporate & Institutional Accounts Dial (312) 787-1227

Monday-Friday 9am-4pm (CST)

MasterCard

Access Micr Centers, Inc

Get more info. Go to Ad index.

QUICK SHIP

NITRO MICRO SM

STOP

Monitor Extra

- 4.77/8 MHz TURBO
- 256K RAM (up to 640K)
- 360K Disk Drive
- 150 Watt Power Supply
- Keyboard

NITRO PC $395

One Year Warranty

Monitor & Keyboard Extra

AT&T 6300

- 640K RAM
- 360K Disk Drive
- Video Controller
- Serial & Parallel ports

$799

TOSHIBA 1100 PLUS

- 640 RAM
- Dual 3.5" Drives

$1488

You Found Us
Absolutely the LOWEST Price
On Every Item Everyday

SEAGATE
20 MB with controller $339
30 MB with controller $399

Factory sealed direct to you

Monitor Extra

AST PREMIUM/286
$1389

ZENITH Z-181 LAPTOP

- 640K RAM
- Dual 3.5" 720K Drives

$1639

HEWLETT PACKARD LASERJET SERIES 2
$1688

PLUS 20MB HARDCARD $619

PLUS 40MB HARDCARD $835

COMPUTERS

AST PREMIUM/286 6/8/10 MHz

Model 80 *512K,1.2MB Drive*	$ 1389
Model 90 *1MB RAM,3G+EGA*	$ 1688
Model 120 *1MB,3G+20MB*	$ 1948
Model 140 *1MB,3G+40MB*	$ 2335
Model 170 *1MB,3G+70MB*	$ 2688
AST 14" Monochrome Monitor	$ 139
AST 14" Enhanced Color Monitor	$ 469
AT&T 6300 CPU *640K 1 Drive*	$ 799
AT&T 6300 CPU *640K 2 Drives*	$ 899
AT&T 6300 CPU *640K 20MB*	$ 1139
AT&T 6300 Keyboard	$ 109
AT&T Monochrome Monitor	$ 188
AT&T Color Monitor	$ 539
AT&T MS-DOS/Basic	$ 69
AT&T FAX 3510D	$ 1722
AT&T FAX 3530D	$ 2892
NITRO PC *256K 1 Drive 8MHz*	$ 395
TOSHIBA *1100 Plus*	$ 1488
TOSHIBA *3100*	$ 2788
PANASONIC *Bus. Part. 1 Drive*	$ 745
PANASONIC *Bus. Part. 2 Drives*	$ 849
PANASONIC *Bus. Part. 286 512K.*	$ 1379
PANASONIC *Sr. Partner 1 Drive*	$ 999
PANASONIC *Sr. Partner 20MB*	$ 1339
PANASONIC *Exec. Part. 1 Dr.*	$ 1329
PANASONIC *Exec. Part. 20MB*	$ 1689
ZENITH *181-93 Laptop*	$ 1639
ZENITH *183 10MB Laptop*	$ 2333
ZENITH *158 256K 1 Drive*	$ 1287
ZENITH *158 256K 20MB Harddisk*	$ 1626
LASER 128 *//C compatible*	$ 389
LASER 128 EX */C compatible*	$ 435
LASER XTE *10MHz PC/XT Comp.*	$ 589

SURGE PROTECTION

TRIPPLITE ISOBAR-4	$ 49
TRIPPLITE ISOBAR-8	$ 64
TRIPPLITE 450 WATT *Backup*	$ 389
TRIPPLITE 1000 WATT *Backup*	$ 798
CURTIS *Safe Surge Strip*	$ 22
KENSINGTON *Masterpiece*	$ 98
KENSINGTON *Masterpiece PLUS*	$ 129

Store Hours:

Monday-Friday	**9-9 EST**
Saturday	**12-5 EST**

RAM & I/O BOARDS

AST SIXPACK *64K*	$ 129
AST SIXPACK PREMIUM *512K*	$ 229
AST 5251-11 PLUS *Package*	$ 619
AST 5251-12 *Package*	$ 488
DCA IRMA	$ 688
INTEL PC *Above Board 64K*	$ 219
INTEL AT *Above Board 128K*	$ 335
INTEL *Inboard 386/AT*	$ 1189
MAYNARD *Surprise! Turbo Board*	$ 129
MAYNARD *Surprise! 286 Turbo*	$ 396
MICROSOFT *Mach 10 Package*	$ 338
NITRO *Parallel Adapter*	$ 24
NITRO *Serial Adapter*	$ 39
NITRO *Game Adapter*	$ 28
ORCHID *Tiny Turbo 286*	$ 364
UNIVATION *TurboCharger*	$ 379
UNIVATION *Dream Board 1MB*	$ 539

VIDEO ADAPTERS

AST 3G PLUS *Video Card*	$ 288
BOCA RESEARCH EGA	$ 155
HERCULES *Color Card*	$ 138
HERCULES *Monographics PLUS*	$ 177
NEC GB-1 EGA	$ 339
NITRO *Monographic Card*	$ 99
NITRO *CGA W/Parallel*	$ 74
ORCHID *Turbo EGA*	$ 566
PARADISE *Autoswitch EGA*	$ 358
PARADISE *Autoswitch 480*	$ 367
QUADRAM EGA + Video Card	$ 319
QUADRAM EGA PROSYNC	$ 338
TSENG LABS EVA *480 EGA*	$ 333

SOFTWARE

ALDUS *Pagemaker*	$ 439
XEROX *Ventura Publisher 1.1*	$ 498
MICROSOFT WORD *3.1*	$ 319
MICROSOFT WINDOWS	$ 65
PARADOX *by ANSA*	$ 379
FASTBACK *5th Generation*	$ 98
VP PLANNER *Paperback SW*	$ 58
VP INFO *Paperback SW*	$ 58
FIRST CHOICE SW *Publishing*	$ 118
WORD PERFECT *4.2*	$ 198
QUICKSILVER *Wordtech*	$ 318
QUICKSILVER *Network Module*	$ 72
WORDSTAR *Pro Rel. 4*	$ 248
PEACHTEXT *5000 Peachtree*	$ 129
KINGS QUEST I, II, OR III	$ 32
CLICKART PUBLISHER	$ 82
COPY II PC OPTION BOARD	$ 79

MONITORS

AMDEK *410G Green TTL Mono*	$ 149
AMDEK *410A Amber TTL Mono*	$ 149
AMDEK *600Color Display*	$ 388
AMDEK *722Enhanced Color*	$ 444
AMDEK *1280with video card*	$ 699
EPSON *Monochrome Green TTL*	$ 109
EPSON *HiRes RGB Color Display*	$ 379
NEC *MultiSync HiRes Monitor*	$ 535
PGS *Max 12EMonochrome*	$ 155
PGS *HX-12 Color Display*	$ 399
PGS *HX-12EHiRes Color*	$ 488
SONY *Multiscan CGA/EGA/PGA*	$ 644
SONY *Trinitron 13" Monitor/TV*	$ 477
SONY *Trinitron 25" Monitor/TV*	$ 1088
THOMSON 4120 *RGBColor*	$ 278
XEROX *Full Page System*	$ 969
ZENITH 1230 *Green composite*	$ 99
ZENITH 1220 *Amber composite*	$ 99

MODEMS

US ROBOTICS 1200 PC *Internal*	$ 96
US ROBOTICS 2400 PC *Internal*	$ 188
US ROBOTICS 1200 *External*	$ 115
HAYES 1200B *Internal*	$ 244
HAYES 1200Bw/*Smartcom II*	$ 277
HAYES 2400B *Internal*	$ 377
HAYES 2400Bw/*Smartcom II*	$ 399
HAYES *Smartmodem 300 Ext*	$ 136
HAYES *Smartmodem 1200 Ext*	$ 278
HAYES *Smartmodem 2400 Ext*	$ 399

SCANNERS

AST *TurboScan*	$ 1609
DEST *Scan Plus with interface*	$ 1879
PGS LS-300	$ 739
PGS LS-300 *with OCR*	$ 988
HEWLETT PACKARD ScanJet	$ 944
EPSON *Image Option EX Series*	$ 229

MOUSE

MICROSOFT *Bus@Paintbrush*	$ 118
MICROSOFT *Serial@Paintbrush*	$ 132
LOGITECH *Serial*	$ 92
LOGITECH@Generic Cadd	$ 138
MOUSE SYSTEMS@*Paint*	$ 112
AT&T MOUSE *for 6300*	$ 124

DRIVES

SEAGATE 20MB *Int w/controller*	$ 339
SEAGATE 30MB *Int w/controller*	$ 399
SEAGATE 20MB *Ext w/controller*	$ 458
SEAGATE 30MB *Ext w/controller*	$ 518
SEAGATE 40MB *Int for AT*	$ 652
IOMEGA 10+10	$ 1319
IOMEGA 20+20	$ 1699
IOMEGA 20+20w/*80MB Plus*	$ 3129
PRIAM 42.7MB *Internal*	$ 736
PRIAM 59.8MB *Internal*	$ 979
PRIAM 130MB *Internal*	$ 2344
CORE 56MB *Plus Series*	$ 1798
CORE 72MB *Plus Series*	$ 2177
MAYNARD 10MB ONBOARD	$ 439
MAYNARD 20MB ONBOARD	$ 561
MAYNARD 30MB ONBOARD	$ 833
PLUS 20MB HARDCARD	$ 619
PLUS 40MB HARDCARD	$ 835
IRWIN 110 10MB *Internal Tape*	$ 269
IRWIN 120 20MB *Internal Tape*	$ 419
IRWIN 145 40MB *Internal Tape*	$ 522
IRWIN 420 20MB *Internal Tape*	$ 487
IRWIN 445 40MB *Internal Tape*	$ 588
SYSGEN QIC-FILE 60MB *Internal*	$ 872
TECMAR QIC 60 *Internal Tape*	$ 1088

PRINTERS

AST TurboLaser	$ 3198
AST TurboLaser Plus	$ 4794
CITIZEN 120D	$ 189
CITIZEN MSP-10	$ 273
CITIZEN MSP-15	$ 369
CITIZEN MSP-20	$ 312
CITIZEN MSP-25	$ 458
CITIZEN *Premiere 35*	$ 455
DICONIX 150 *Ink Jet*	$ 318
EPSON LX-800	$ 175
EPSON FX-86E	$ 309
EPSON FX-286E	$ 428
EPSON LQ-800	$ 429
EPSON LQ-1000	$ 615
EPSON LQ-2500	$ 845
EPSON EX-800	$ 368
EPSON EX-1000	$ 489
EPSON GQ-3500 *LaserJet*	$ 1388
HEWLETT-PACKARD *LaserJet II*	$ 1688
HP Extra LaserJet II *Toner cart*	$ 88
HP ThinkJet	$ 338
HP QuietJet Plus	$ 544
HP 7475A *Plotter 6 Pen*	$ 1288
PANASONIC 1080 I	$ 169
PANASONIC 1091 I	$ 194
PANASONIC 1092 I	$ 309
PANASONIC 1592	$ 404
PANASONIC 1595	$ 436

Call for the Best Prices on Networks

PLEASE CALL FOR FREE CATALOG SUBSCRIPTION

NO SURCHARGE FOR CREDIT CARDS and we do not charge until we ship. All items subject to availability and price change. Add 2% for shipping and handling ($3 minimum).

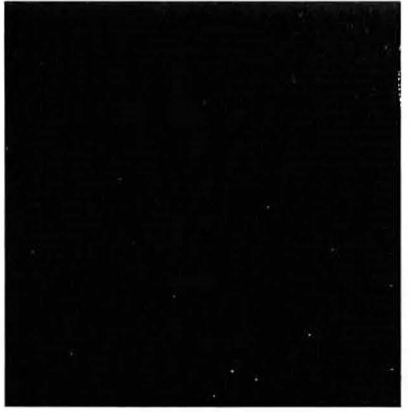
800-382-3888

VISA MasterCard

320 WEST MAIN STREET CARMEL, IN 46032

NITRO MICRO SM

Get more info. Go to Ad Index.



The Help Screen

PC World offers answers and advice at every level

Retrieve text patterns from files, speed type via Dvorak, control 3½-inch floppy drives, properly support PageMaker, whip files between PCs, and brighten SCREEN-.BAT's text

Karl Koessel

Verdi or Puccini and Not The 101 Strings

Q. *Someone told me that there is a PC utility that uses "pattern recognition" to search and retrieve text from any file or group of files on a hard disk. The program identifies exact matches as well as similar patterns. It sounds like a great idea because I often use a word processor to manually search file after file. Do you know if such a program exists?*

Tom Madigan
Brooklyn, Massachusetts

A. *Dragnet* from Access Softek will sift through all your files (or a designated subset) looking for a given word, phrase, or pattern. (A pattern is formed from keywords and the operators AND, OR, NAND, NOR, or NOT.) You tell *Dragnet* to extract the lines, sentences, or paragraphs that contain the word(s) or search pattern, and it places them into a new file. Each extract is prefixed by numbers indicating the page and line where it begins. You can even save your keywords and search patterns for later use.

Although *Dragnet* will run as a stand-alone program, it supports Microsoft's multitasking *Windows* environment, which gives it the ability to run in the background while you work with other *Windows* applications or conduct another *Dragnet* search. Note also that *Dragnet* requires a graphics adapter and that a 6-MHz or faster PC, XT, AT, or compatible is recommended.

Speed Typing, Dvorak Style

Q. *I've searched everywhere for a program that will rededicate my Qwerty keyboard to Dvorak and remain RAM resident until I restart my Wyse PC+. Does such an animal exist, or am I doomed to type slowly for the rest of my life?*

George P. Valentine
Pittsfield, Vermont

A. The keyboard macro utilities *ProKey, SmartKey,* and *SuperKey* all come with ready-made Dvorak layouts. You can also create a Dvorak layout with macro utilities, such as *Keyworks,* that don't come with their own. If you don't feel the need for a full-blown macro processor, the 2.2K *PCKey,* available from Freelance Communications, will rededicate your keyboard. And *Acutype* from Acu-Business Systems, a 1.5K memory-resident utility, enables you to toggle between Qwerty and Dvorak layouts and includes adhesive key tabs. The company also offers a combination disk and book tutorial.

The hardware route is an alternative for users whose systems have the standard keyboard connector port (unfortunately, the Wyse PC+'s keyboard uses an RJ-11 telephone-style connector). MaxiSwitch has a Dvorak keyboard that is switch-selectable for compatibility with the PC, XT, AT, and compatibles. KT Services (a wholly owned subsidiary of Key Tronic Corporation) offers the Dvorak Conversion Kit, which includes properly angled key tops, a key puller, and an EPROM chip that plugs into the company's Qwerty keyboards, transforming them to Dvorak.

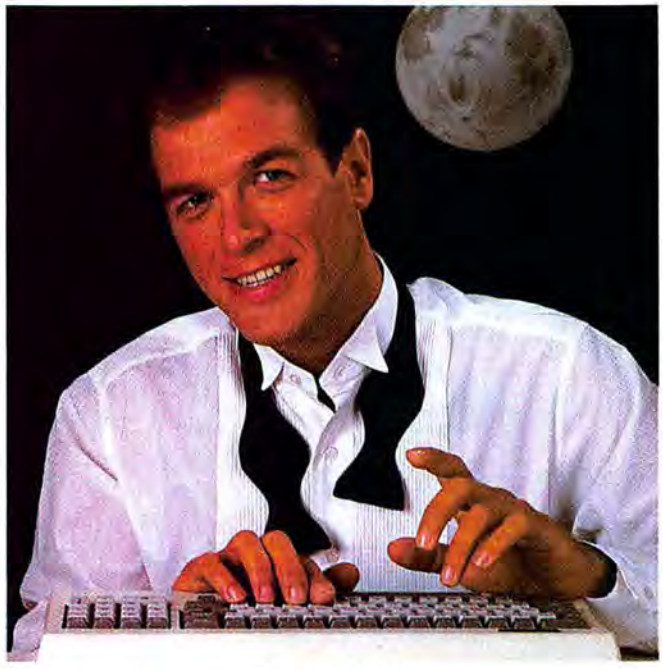
For more information about what's up in the Dvorak world, write or call Dvorak Int'l, P.O. Box 128, Brandon, Vermont 05733; 802/247-6020. This group has become the de facto Dvorak

(continues)

"Computing at night bit into my budget..."

$10.00+ per hour

"With GEnie™ I get more bytes online for less."



$5 per hour

Most online information networks can drain your resources faster than you can say *"Vampire."* Not with GEnie, the General Electric Network for Information Exchange. As part of the world's largest commercially available teleprocessing network of General Electric Information Services Company, GEnie won't bite into your budget.

Evenings, weekends, holidays. Just $5 per hour.

With GEnie, you can make friends, schedule meetings, gather facts and figures, set up travel reservations, get the news, be entertained, even shop for a fraction of what other information services charge.

And you get a lot more for your money.

With GEnie's IBM† ***RoundTable™ Special Interest Group*** you can discuss the latest in IBM PC products and accessories; download hundreds of public domain software programs, and participate in exciting and informative online conferences. And, uploads are FREE on GEnie!

There's more!

Meet friends old and new with GEnie's ***LiveWire™*** CB simulator or exchange messages with ***electronic mail*** service. Schedule a trip with the ***online travel service.*** Fun and learning for the whole family with ***Grolier's*** electronic encyclopedia.

Play multiplayer and classic games in GEnie's ***Game Room.*** Get the latest in domestic and international ***computing news.*** All this and there's more to come. New services are being added each and every month!

Only $18 to register! Save up to 60%!

Check out the chart. Compare the savings for yourself. You'll find GEnie delivers all of your favorite services for an incomparable price, at incomparable savings.

*Compare & Save**	Services						Pricing			
	Travel & Shopping	*SIGs/User Groups*	*CB & Mail*	*Financial Services*	*News*	*Games*	*Registration Fee*	*Monthly Minimum*	*Non-prime time rates*	
									300 baud	*1200 baud*
The Source	X	X	X	X	X	X	$49.95	$10.00	$8.40	$10.80
CompuServe	X	X	X	X	X	X	$39.95	none	$6.00	$12.50
GEnie†	**X**	**X**	**X**	**X**	**X**	**X**	**$18.00**	**none**	**$5.00**	**$5.00**

**Basic rates and services shown in effect 2/87. †Non-prime time applies Mon.–Fri., 6pm–8am local time, all day Sat., Sun., and nat'l holidays. Subject to service availability. Additional charges apply for 2400 baud and financial services.*

With services and savings like these, now you can get more bytes online without incurring blood-curdling costs. Get online with GEnie. Sign up today!

Sign up from your keyboard today. 4 Easy Steps:

1. Have your Visa, MasterCard or checking account number ready.
2. Set your modem for local echo (half duplex)—300 or 1200 baud.
3. Dial **1-800-638-8369.** When connected, enter HHH
4. At the U# = prompt enter **XJM11853,GEnie** then RETURN.

Need help or more information? No modem yet? We can help. Call **1-800-638-9636.**

GEnie™

Stay online longer, for less.

INFORMATION SERVICES

General Electric Information Services Company, USA

GEnie rates and services subject to change. Uploads are free during non-prime hours at 300 or 1200 baud. Third-party services offered on GEnie may include additional charges.

† IBM is a registered trademark of International Business Machines.

"At Mach 3 you don't have time for sightseeing." —Chuck Yeager

You are looking at a breakthrough in flight simulation. Not just a sleepy ride in a Cessna. Or a safe, pretty collection of scenery. But the kind of Mach-speed simulation that makes your palms sweat—and your inner-ear scream for mercy.

Chuck Yeager co-piloted the entire design. We gave him Mach-speed graphics drivers, state-of-the-art 3-D terrain modeling, and authentic aerodynamics. He added things only Chuck Yeager would think of, like seat-of-the-pants in-air flight instruction, formation flying and even test piloting of 14 different aircraft.

Now you can experience the fun and excitement of flying like never before. Streak along at Yeager's wing—flying formation through gates, slaloms and skyscrapers. Punch a hole in the sky and drive the SR-71 "Blackbird" at full thrust to the very edge of space. Climb into the P-51 "Mustang" and race wide-open, full throttle against six computer-controlled adversaries.

The action is so fast, even experienced pilots can "auger in." Which is why Yeager insisted on windscreen cursors that teach you in mid-flight: from flawless take-offs and flare landings to aileron rolls, Cuban 8's, even Hammerhead stalls.

Program Designer: Ned Lerner. Available for the IBM PC, XT, AT, the Tandy 1000 family of computers, and compatibles. Enhanced performance on the IBM AT, Ram disks, hard drives, and Tandy 3000. Enhanced color support available for Tandy computers and IBM EGA.

Windscreen cursors make learning faster, and a *lot* more fun.

Can you follow Yeager's lead through Dead Man's slalom?

Dig a hole and you'll face the wrath of the ultimate survivor himself.

You can even take on the challenges of a test pilot using Yeager's own evaluation charts. Strap yourself into the Bell X-1 and shatter the sound barrier. Check out Yeager's three supersonic X-jets and enter the "realm of the unknown." Push them too hard and you'll discover the gut-wrenching sensation of hurtling toward Earth at Mach 3.

As Yeager says, the real hero is the test pilot who somehow manages to survive. So climb into the cockpit with the greatest pilot in history—and put yourself to the test.

ELECTRONIC ARTS®

HOW TO ORDER: Visit your retailer or call 800-245-4525 for direct VISA or MasterCard orders (in CA call 800-562-1112). The direct price is $39.95 for the IBM version. To buy by mail, send a check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $3 for shipping and handling ($5 Canadian). Please allow 4 weeks for delivery. Screen shots represent IBM version, others may vary. IBM is a registered trademark of International Business Machines, Inc. Software © 1987 Ned Lerner. Package Design © Electronic Arts. All rights reserved. Electronic Arts, authorized user.

Get more info. Go to Ad index.

lobby, consulting with corporations and computer and keyboard manufacturers, as well as publishing *Dvorak News*, a quarterly newsletter.

You might also take a look at *Dvorak Developments*, another quarterly newsletter, and the book *The Dvorak Keyboard*, by R. C. Cassingham, both of which are published by Freelance Communications.

Controlling 3½-Inch Floppy Drives

Q. What are the requirements for replacing an IBM XT's full-height 5¼-inch floppy disk drive with a half-height 5¼-inch floppy drive and a 3½-inch floppy drive? Do I need a separate controller for the 3½-inch drive, is there a controller that can operate both types, or can I use the existing controller?

Laurence R. Poché
Belle Chasse, Louisiana

A. You can use the XT's existing controller for both types of drives (see "Double Your Storage" in *The Upgrade Path, PCW,* May 1987). However, your current version of DOS may not support the drive's 720K capability, yielding only 360K per floppy disk. Although "Double Your Storage" explains a few techniques to obtain 720K disks, the simplest way is to upgrade to DOS version 3.20 or later.

A Syncing Suspicion

Q. I need help writing a BASIC or C program to transfer files from one PC to another using the BSC [binary synchronous communications or bisync] protocol and IBM's asynchronous [serial] port. I want the program to transfer data, text, and compiled program files. I am not using a modem to connect the PCs.

Steven M. Carr
St. Augustine, Florida

Lap-Link is easy to use and can send files, directories, or the contents of entire disks at speeds of up to 115,200 bits per second.

A. I'm confused. The IBM serial port supports only asynchronous communications; BSC is supported by the IBM BSC Adapter, another beast entirely.

If you actually want to transfer files between PCs, why reinvent the wheel? *Lap-Link* from Traveling Software includes both a 5¼-inch disk and a 3½-inch disk and a null modem serial cable with 9- and 25-pin female D-shaped connectors at both ends. The program is easy to use and can send files, directories, or the contents of entire disks at speeds of up to 115,200 bits per second. It checks each block of data sent, retransmitting errant blocks automatically. Although designed for transmitting files between a desktop computer and a laptop computer, *Lap-Link* can send files between two desktops or two laptops.

Lap-Link is more than a simple file transfer utility. You can tell it to send only files that are different, or only those files that have been created or changed on, after, or before a specified date. You can look at text files on the screen and delete or rename them.

If you want to know the specifics of the two communications adapters, the *IBM Personal Computer Technical Reference, Options and Adapters, Volume 2* provides minimal information about the BSC Adapter's Intel 8251A Universal Synchronous/Asynchronous Receiver/Transmitter (USART), Intel 8255A-5 Programmable Peripheral Interface (PPI), and Intel 8253-5 Programmable Interval Timer, as well as the Asynchronous Communications Adapter's National Semiconductor 8250 Asynchronous Communications Element (or functional equivalent).

PageMaker Paradox

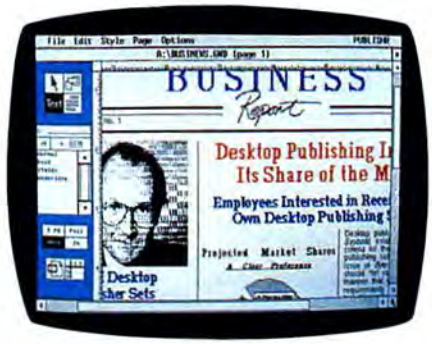
Q. While reading the June 1987 issue of PC World, *I noticed that information about the recommended system configuration for* PageMaker *varies.*

On page 201, the review "Publishing Meets Its PageMaker" states that "Only Joe Isuzu would claim that PageMaker *runs on an XT... The duo [of* Windows *plus* PageMaker*] requires at least an*

(continues)

A Work of Art Without the Work

GEM Desktop Publisher.™



Throw Away Your Scissors, Paste, White-Out, and Frustrations!

Today, GEM Desktop Publisher offers you the ability to combine text and graphics in your documents, giving you more control over your designs, deadlines, and costs. With GEM Desktop Publisher, you can create high-quality documents quickly and easily, at an affordable price.

THE COMPANY BUSINESS Report

May 1987

Volume 1, No. 1

Desktop Publishing Increases Its Share of the Market

Employees Interested in Receiving Their Own Desktop Publishing Software

Projected Market Shares
A Clear Preference

Alphatext Systems
Desktop Publishing Systems

Desktop publishing expert John W. Seybold, establishes some shopping criteria for the "godsend" desktop publishing software, from the May issue of *Byte*. He tells the system should "let you compose text in a manner that comes close to the requirements of typesetting." Including well-designed and proportionally spaced characters, multiple fonts, sizes, etc.

Seybold also believes that the system should allow you to perform the composition tasks "in a manner that is considerably less code-intensive than that which characterizes trade computer typesetting." This includes the feature of WYSIWYG which "lets you point to the effects desired rather than requiring that you describe them by some sort of command language". He feels that software programs that were "code-intensive" and required "considerable user experience" should not be included in the desktop publishing category.

GEM Desktop Publisher Sets Price/Performance Benchmark for Software Industry

Digital Research announces its high performance easy to use, full-function page composition software application - **GEM Desktop Publisher**. Introducing the true price/performer, available at the end of May, at a suggested retail price of $395.

"We're excited to provide an integrated team of products for personal publishing with the addition of **GEM Desktop Publisher** to our family of GEM applications," said Dick Williams, Chief Executive Officer of Digital Research. "Users now have a more complete and easier to use solution for combining text and graphics than ever before. But more important for the user is the outstanding price/performance offered by our product," continued Williams.

Flexibility is a key feature of this GEM-based software product. The user can define a location anywhere in a document and automatically place text or graphics at that location.

Continued on page 5

"As a product offering, it's the best thing that ever happened to personal computers," says desktop publishing expert, John W. Seybold, about desktop publishing, in the May issue of *Byte*.

Desktop publishing, the latest development in microcomputers, offers the user the ability to combine text and graphics to create professional quality brochures, newsletters, fliers, sales reports, marketing briefs, books, manuals, forms, and other publications on their own computer. And, as Stewart Alsop says in the February edition of *PC Magazine*, "Ever since Guttenberg, publishers have been looking for a better, cheaper, faster way to get words and pictures on paper."

Growth for PC Software Market
Software Revenues for U.S. Suppliers

Large scale
Medium scale
PC

50 40 30 20 10 0
BILLIONS

84 85 86 87 88 89 90

Try Your Creativity, Not Your Patience

GEM Desktop Publisher is easy to learn and easy to use. Its icons, drop-down menus, and mouse interface eliminate the need for you to memorize complicated commands. You simply point and click to become productive immediately! Since the turnaround time from concept to finished output is totally under your control, you can create professional-quality brochures, newsletters, fliers, sales reports, marketing briefs, books, manuals, forms, and other publications within time frames that meet your needs. It's like having a small print shop on your desk.

Price/Performance Benchmark

GEM Desktop Publisher is big on performance, yet small on price. At $395, it sets a new price/performance benchmark for the software industry. You get a lot for your money—features from WYSIWYG (what you see is what you get), to style sheets, help you create high-quality documents. And none of your existing software is obsolete with GEM Desktop Publisher. You can use word processing files and keyboard commands from popular word processors, such as Word Perfect®, MultiMate™, WordStar™, GEM Write™, and IBM® DisplayWrite™, as well as text in DCA and ASCII file formats. You can incorporate data created using other GEM applications, such as GEM Paint™, GEM Draw Plus™, GEM Graph™ and GEM WordChart™. GEM Desktop Publisher is completely useable with the hardware you have today and the hardware you plan to purchase tomorrow, including the IBM PC series, 100% compatibles, the IBM Personal System/2™ family of computers, and any Intel® -based microcomputer where GEM System Software is installed. A wide range of dot matrix, laser printers, and other devices are supported for output.

GEM Desktop Publisher Features

- WYSIWYG
- Total flexibility in inserting, deleting, rearranging and merging text and graphics
- Automatic reformatting documents
- Automatic text flow around graphics rectangles
- Style sheets
- Automatic scaling of graphics
- Multiple fonts in multiple sizes, many colors and many styles
- Import text and commands from your favorite word processor
- Page numbers, headers and footers
- Compatible with other GEM applications
- Compatible with many output devices

Ask your dealer for GEM Desktop Publisher, to create documents that you can be proud of, easily, quickly, and at an affordable price. For more written information, contact Digital Research Inc. at 1-800-443-4200.

DIGITAL RESEARCH®

GEM, GEM Desktop, GEM Desktop Publisher, GEM Draw Plus, GEM WordChart, GEM Graph and GEM Write are trademarks and Digital Research and the Digital Research logo are registered trademarks of Digital Research, Inc. IBM is a registered trademark and Personal System/2 is a trademark of International Business Machines Corp. Other product names are registered trademarks, tradenames, or tradenames of their respective owners.

Get more info. Go to Ad index.

PRICED TO SAVE YOU MONEY, SHIPPED FAST ANYWHERE.

BEST PRICES YET!

Lotus 123	Paradox	dBase III Plus	Rapid File	Multimate Advantage	Word Perfect 4.2
$195	**$195**	**$220**	**$299**	**$179**	**$142**

Software

Word Processing

FANCY FONT	$ 83
FINAL WORD II	$119
MICROSOFT WORD 3.0	$167
MULTIMATE	$149
MULTIMATE ADVANTAGE	$179
OFFICE WRITER/ SPELLER 5.0	$155
PFS: PROF WRITE	$ 96
SAMNA WORD IV	$226
THINK TANK	$ 65
TURBO LIGHTING	$ 42
VOLKSWRITER 3	$ 95
VOLKSWRITER SCIENTIFIC	$155
WORD PERFECT 4.2	$142
WORDSTAR 2000	$161
WORDSTAR 2000+	$187
WORDSTAR PRO	$155
XYWRITE III	$129

Database Systems

CLIPPER	$226
CONDOR III	$220
DBASE III PLUS	$220
FOXBASE +	$220
KMAN 2	$220
PARADOX	$195
PFS: PRO FILE	$ 96
Q&A	$148
QUICKCODE III	$103
QUICKREPORT	$103
QUICKSILVER	$223
R BASE SYSTEM V	$233
RAPIDFILE	$250
REFLEX	$ 57
REVELATION	$324

Spreadsheets/ Integrated Packages

ENABLE	$236
FRAMEWORK II	#239
JAVELIN	$300
LOTUS 1-2-3	$195
MULTIPLAN	$ 81
OPEN ACCESS II	$148
SMART SYSTEM	$285
SPREADSHEET AUDITOR	$ 64
SUPERCALC 4	$187
SYMPHONY	$291
TWIN	$ 51
VP PLANNER	$ 38

Graphics

CHARTMASTER	$135
CLICKART	$ 77
DIAGRAPH	$200
DIAGRAM MASTER	$122
ENERGRAPHICS 2.0	$194
FREELANCE PLUS	$233
GEM DRAW	$ 96
GRAPHWRITER COMBO	$200
HARVARD PRESENTATION GRAPHICS	$155
IN-A-VISION	$168
MAPMASTER	$142
MS CHART	$122
PC DCRAW	$135
PC PAINTBRUSH PLUS	$ 70
PICTURE PERFECT	$159
PRODESIGN II	$122
SIGNMASTER	$ 90
WINDOWS/DRAW	$ 77

Project Management

HARVARD TOTAL PROJECT MANAGER	$181
MICROSOFT PROJECT	$161
PROJECT SCHEDULER NETWORK	$220
SUPERPROJECT PLUS	$161
TIMELINE 2.0	$168

Communications/ Productivity Tools

CARBON COPY	$ 83
CROSSTALK XVI	$ 64
CROSSTALK MKIV	$ 90
PROKEY	$ 55
RELAY GOLD	$83
REMOTE	$ 70
SMARTERM	$ 80
SMARTCOM II	$64
SUPERKEY	$ 35

Statistics

SPSS/PC +	$454
STATGRAPHICS	$304
STATPAC GOLD-WALONICK	$259
SYSTAT	$304

Accounting

BBP	$200
GREAT PLAINS	$311
IUS EASYBUSINESS	$226
ONE WRITE PLUS	$103
OPEN SYSTEMS	$265
REAL WORLD	$259

Network Applications

CROSSTALK XVI	$272
DBASE III LAN PAK	$389
KMAN 2	$584
MULTIMATE	$415
MULTIMATE ADVANTAGE	$846
REVELATION	$647
WORD PERFECT SERVER	$200
WORD PERFECT STATION	$ 48

Languages/Utilities

COPYWRITE	$ 29
FASTBACK	$ 57
LATTICE C	$168
MICROSOFT C COMPILER	$187
MS BASIC COMPILER	$161
MS FORTRAN	$148
NORTON UTILITIES	$ 38
QUICK BASIC	$ 44
TURBO PASCAL	$ 44
TURBO PROLOG	$ 44
XENIX	$ 35
ZERO DISK	$ 45

Desktop Environments

GEM DESKTOP	$ 25
MS WINDOWS	$ 42
SIDEKICK	$ 38

Hardware

Mass Storage/Backup

IOMEGA 10+ 10 W/INTFC	$1299
IOMEGA 20+ 20 W/INTFC	$1689
IRWIN 120D 20MB TBU	$ 304
IRWIN 145AT 40MB TBU	$ 304
MOUNTAIN DRIVECARD 20MB	$ 467
PLUS HARDCARD 10MB	$369
PLUS HARDCARD 20MB	$454
PRIAM 42MB AT	$ 616
SEAGATE 20B W/INT	$ 259
SYSGEN SMART IMAGE 20MB (INT)	$ 406
TALLGRASS	$ 400
TECMAR QIC-60AT TBU (INT)	$ 779

Multifunction Boards

AST ADVANTAGE (128K)	$226
AST 6 PAK PLUS (64K)	$109
AST I/O MINI II	$109
AST PREMIUM PAK	$233
AST RAMPAGE PC	$181
AST RAMAGE AT	$285
INTEL ABOVEBOARD	$200
JRAM AT-3 (0K)	$239
JRAM 3 (0K)	$116
PC TURBO 286 (1 MB)	$579
PC TINY TURBO 286	$298
QUADBOARD (64K)	$ 90

Display Boards

HERCULES GRAPHICS CARD PLUS	$122
HERCULES COLOR CARD	$103
ORCHID TURBO EGA	$462
PARADISE AUTO SWITCH EGA	$239
PARADISE MODULAR GRAPHICS	$168
QUADRAM EGA +	$220
SIGMA COLOR 400	$291
STB EGA PLUS	$194
TECMAR EGA MASTER	$194
TSENG ULTRA PAK	$278
TSENG EVA 480	$304

Emulation Boards

AST 5211-11 +	$421
AST 5251-12	$324
AST BSC	$317
AST SNA	$389
FORTE	$389
IRMA	$471
SMART ALEX 5251	$454

Modems

AST REACH 1200	$233
HAYES 1200	$252
HAYES 1200B	$226
HAYES 2400	$376
HAYES 2400B	$356
TRANSNET 1000	$131
US ROBOTICS 1200B	$ 70
US ROBOTICS 2400B	$122
VENTEL 1200 HALF CARD	$239
VENTEL 1200 PLUS	$194
WATSON	$220

Monitors

AMDEX 310A	$103
AMDEX 600/722	$278
NEC MULTISYNC	$389
PRINCETON HX-12	$291
PRINCETON MAX-12E	$116
PRINCETON SR-12	$389
PRINCETON HX-12E	$350
PRINCETON HX-9	$343
TAXAN 122 AMBER	$103
TAXAN 630/640	$304

Networks

AST PC NET	$399
NOVELL	$389
ORCHID PC NET	$349

Printers/Plotters

EPSON EX-1000	$454
EPSON FX-85	$259
EPSON FX-286	$376
EPSON LQ-800	$382
EPSON LQ-1000	$499
HP 7475A	$974
NEC 2550	$579
OKIDATA 192 +	$252
OKIDATA 193	$369
OKIDATA 292	$350
OKIDATA 293	$350
TOSHIBA P321	$324
TOSHIBA P341	$499
TOSHIBA P351 MODEL 2	$779

Input Devices

KEYTRONICS 5151	$109
KEYTRONICS 5153	$194
MICROSOFT MOUSE	$ 83
PC MOUSE W PAINT +	$ 83

Accessories

CURTIS RUBY	$ 42
DATASHIELD S-100	$ 51
MICROFAZER II	$174
256K RAM SET	$ 25
8087 MATH CHIP	$ 77
80287 MATH CHIP	$122

NEC Multisync	Plus HardCard 20	Quadram EGA+	US Robotics 1200 B	US Robotics 2400B	IRMA Board
$389	**$454**	**$220**	**$70**	**$122**	**$471**

OUR COMPANY POLICY:

All orders must be prepaid. Company and Personal Checks Accepted. Allow 10 working days for checks to clear. No Sales Tax Added. Allow 10 days for refund on all returned items. All prices are Fixed. All Products have an unconditional Money back Guarantee upon return with receipt of purchase. Allow Four to Six Weeks for delivery.

FREE DELIVERY
PRICES ARE FIXED
TECHNICAL SUPPORT
(818) 336-8111
5% DISCOUNT FOR PURCHASES OVER $2,000.00
Make Checks Payable to:
Compusystems, Co.

COMPUSYSTEMS
279 South Beverly Drive
Suite 320
Beverly Hills, CA 90212-3898

Case History #47582

"With over a million lines of source code, MortgageFlex is probably the largest application ever written for a LAN," says Lester Dominick, the developer of this monster program for mortgage banking back office management. "We probably encountered just about every programming challenge imaginable, but DataFlex's powerful 4th generation programming language proved more than a match for every situation."

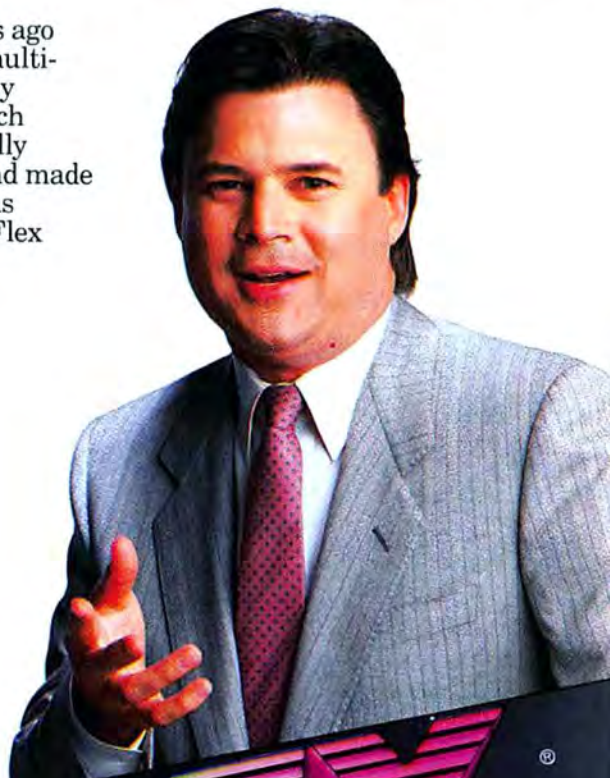
A Straightforward English-like Syntax

"MortgageFlex is very easy to maintain and, because of DataFlex's English-like structure, new programmers with minimum training find it easy to figure out what programmers before them have done. DataFlex macro commands also take much of the burden off the programmers by automatically taking care of the tedious chores of index manipulation, screen handling, cursor positioning and file management. We also like the way DataFlex uses indexes because it really lets the program take advantage of the capabilities of the system and run extremely fast."

Multi-user Capabilities for Today and Tomorrow

"We chose DataFlex 4½ years ago because of its outstanding multi-user capabilities and are very pleased with the way in which DataFlex has been continually adapted to new hardware and made even better as technology has improved. Not only do DataFlex programs run on more multi-user and LAN systems than any other DBMS product, but do so with absolutely no changes in the source code from system to system! I don't have to tell you what that means to a developer with a million and a quarter lines of programming."

Take the first step to more efficient program development today. Return the coupon below for your free DataFlex Demonstration Diskettes.



"100 data files, 4,500 fields and 1.2 million lines of source code. Just try that with anything but DataFlex!"

Lester Dominick
MortgageFlex Systems, Inc., Irvine, CA.

DATAFLEX®

FREE SELF-RUNNING DATAFLEX DEMO (PC-DOS/MS-DOS ONLY)

Find out more about DataFlex's ease of use and programming power. Mail this coupon today for your free self-running demonstration diskettes.

Name_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone ( )_____
How many computer systems are in use at your company? _____
Do you use a Local Area Network or Multi-User computer? _____
Will you be running the Demo off a hard disk? _____

Data Access Corporation, 14000 S.W. 119 Avenue, Miami, Florida 33186

PC World 9/87

Data Access Corporation
14000 S.W. 119 Avenue
Miami, Florida 33186
(305) 238-0012
TELEX: 469021 Data Access CI
FAX: (305) 238-0017

Get more info. Go to Ad Index.

80286-based hard disk computer." I assume that such a statement means that the same applies to XT compatibles. At the end of the article, on page 207, the published requirement of an "IBM AT or compatible 80286-machine" further intimates that I cannot run PageMaker *on my Sperry PC/HT.*

However, the requirements for PageMaker *at the end of* The Help Screen *on page 342 seem to indicate that an AT or 80286 machine is not necessary. Would you please clarify the requirements for* PageMaker?

Walter Derlukiewicz
Williamstown, New Jersey

A. We're sorry about the contradictory information. The requirements published in the review are technically incorrect; an 80286-based computer is *not* required to run *PageMaker*. But the enormous demands placed on a system running *Microsoft Windows* and *PageMaker* necessitate a fast processor (at least a 6-MHz 80286 or a 7-MHz 8088/8086) and a fast hard disk (40ms minimum average access time).

At the time the review was written, 7.16-MHz XT compatibles such as your 8088-2-based Sperry PC/HT (now the Unisys PC/HT) were not very common; the preferred processor and hard disk access speeds were generally available only from AT-class machines. Trying to run *PageMaker* under *Windows* with an old-style XT or compatible is like moving all of your household possessions from New Jersey to California in a compact car. It would take several trips, and larger furniture, such as couches and beds, would have to be disassembled for shipping. The same move could be accomplished more easily using a moving van (a fast XT compatible) and far more swiftly using air transportation (a fast AT).

The enormous demands placed on a system running Microsoft Windows *and* PageMaker *necessitate a fast processor and a fast hard disk.*

Screen Help

I have received several letters from readers having trouble with SCREEN.BAT from June's *Help Screen*. Let's examine the various problems and their solutions.

Users of DOS 2.00 and 2.10 find that without a PROMPT command previously in effect, SCREEN.BAT does set colors but produces the prompt 'prompt%'. The solution is to insert a PROMPT command just after the first SET command. For example, the command PROMPT NG yields a simple A> prompt, and the command PROMPT PG displays the default drive and path, followed by the greater-than symbol (for example, C:\DOS>).

DOS 3.00 users find that SCREEN.BAT does not work at all. Because that version has some serious bugs, SCREEN.BAT cannot be modified to work with it. However, there is a way to set the screen's colors without SCREEN-.BAT (although 3.00 users should upgrade their DOS), and I'll describe how in a moment.

Regardless of the DOS version, yellow characters and backgrounds appear brown on IBM monitors and their true compatibles. (Older 8-color monitors do display yellow.) Monitors with 16 colors, however, display yellow characters when brown characters are "highlighted." In fact, all the other character colors can be highlighted to produce light blue, light red, light green, and so on. (Light black is gray, and light white is bright white.) Backgrounds cannot be highlighted with ANSI.SYS commands.

The ability to highlight character colors was left out of SCREEN.BAT, so let's put it in. Insert the following lines after the command 'echo Changing colors...':

```
prompt $e[0m
if not %1! = =bright! goto continue
prompt $e[1m
shift
:continue
```

(continues)

AW . . .
WHAT THE HECK!

ProDesign II — Still $299!

ProDesign II — the Easy-to-Use CAD System. The CAD system that was introduced two years ago for the amazingly low price of $299. The CAD system that has undergone four major revisions with more than 400 enhancements. The CAD system that still costs only $299!

How do we do it? Our accountants said to raise the price to cover research and development costs. Our business advisors said to charge more for the additional features. Our competitors said it's impossible to stay in business selling a comprehensive CAD package such as ProDesign II for only $299.

And our customers said $299 is great. So, we said:

"Aw . . . What the Heck! $299 it is!"

Now, two years after its introduction, ProDesign II is one of the world's leading CAD packages. It has features previously found only on CAD systems costing thousands of dollars. For the single price of $299, you get these features and more:

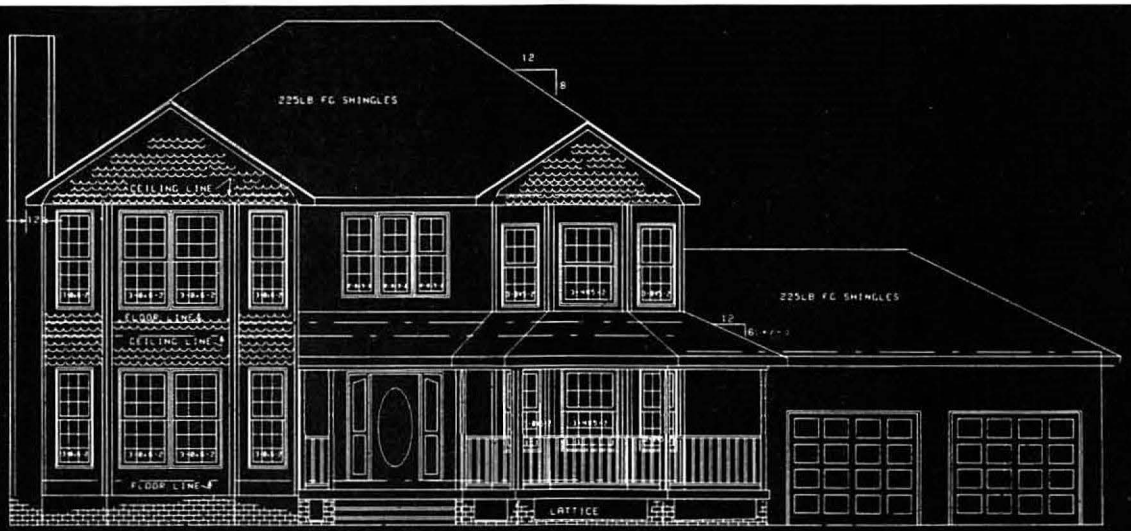
- Support for more than 180 printers (including color printers)
- Support for more than 80 plotters, with plotter optimization.
- Easy-to-Use single keystroke commands.
- On-screen menus accessible with a mouse.
- Comprehensive drawing commands, including the finest curve fitting in the industry.
- Editing features unsurpassed by ANY other CAD package.
- Extensive snap features, including snap to point, endpoint, midpoint, line, circle, ellipse, arc, intersection, and perpendicular.
- True Auto Dimensioning with several formats.
- Extensive Layering features.
- Full Macro capabilities.
- Specialized drawing aids, such as tangents to circles and ellipses, parallel lines, parallel curves, wide lines, and more.
- Complete hatching with up to 40 different patterns.
- Area and length calculation for line curves, circles, etc.
- Full Zoom, Pan, and Rotate capabilities.
- Capability to transfer drawings to and from other programs.
- Capability to Break/Trim Lines, Curves, Circles, Arcs, and Ellipses.
- Many more features — *All for only $299!*

Where do you get ProDesign II? See your local computer dealer, or contact:

American Small Business Computers, Inc.
118 South Mill Street
Pryor, OK 74361
(918) 825-4844
Telex 9102400302

Want more information? Call or write for a detailed brochure and a free demo disk!

PRODESIGN II STILL ONLY $299!



FRONT ELEVATION

1/4"=1'0"

Get more info. Go to Ad index.

MAN BUYS INBOARD 386; ENDS UP ON DESERT ISLAND.

When John Middleton's 1-2-3 applications got to be more than his IBM PC AT® could handle, he had two choices.

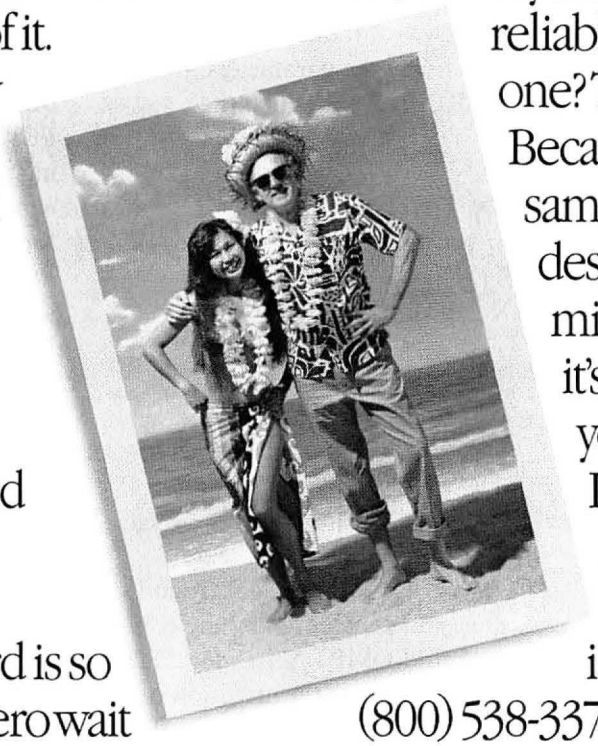
Spend $6000 for a new 386 system.

Or spend $2000 for an Intel® Inboard 386 system.

So he got the best of both worlds. With the Intel Inboard 386, he got the full power of a 386 system. Without compromising one bit on performance or compatibility. Then, with the leftover $4000, he spent two glorious weeks on the island of Bora Bora.

How can we give you so much for so much less? Simple. If you have an IBM PC AT or compatible, you already own ⅔ of a 386 system. And when you install an Inboard 386, you get the rest of it.

Besides price, how do they compare? According to a recent *Infoworld* product review, "Inboard has the best computing speed of all micro systems we have tested to date," including all other 386 systems.



The reason Inboard is so fast is because of its zero wait state cache and 32 bit memory.

And there's also a special socket for adding the 80387-16 math coprocessor giving you even greater performance.

Software compatibility is unsurpassed as well.

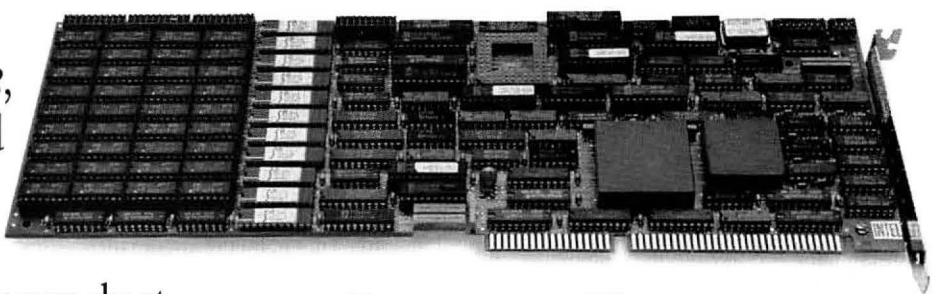
According to *PC Week*, "The Inboard 386 proved perfectly compatible with a standard IBM PC AT and every software product we tested." It's compatible with advanced software, too, including the new 386 control software for multitasking. And lots of developers are already using Inboard to create OS/2® applications.

But maybe the real question is can a $2000 system be more reliable than a $6000 one? The answer is yes. Because it's built by the same company that designed the 80386 microprocessor and it's backed by a five-year warranty.

If you still need more information on which system is best, call us at (800) 538-3373. Or contact your local dealer.

Then we suggest you find a nice quiet place, clear your mind of all distractions, and think it over.

Maybe a nice quiet place like Bora Bora.



intel®

©1987 Intel Corporation
Trademarks/owner: IBM PC AT, OS/2/International Business Machines Corporation; Intel/Intel Corporation.

Get more info. Go to Ad index.

Now, to brighten your choice of character color, use the syntax SCREEN BRIGHT *foreground-color background-color*. If you don't want the text color brightened, use SCREEN.BAT as described in June's issue; that is, don't type 'BRIGHT'.

You can put the appropriate PROMPT command in your AUTOEXEC.BAT file instead of a SCREEN.BAT command.

Most people want to have a specific combination of text and background colors set automatically when they turn on their PCs. Some have tried putting the command SCREEN BLACK CYAN into their AUTOEXEC.BAT files. If they didn't put it at the end, though, they learned that when one batch file calls another, the first does not resume when the second is done. Although this can be remedied by prefixing the SCREEN command with \COMMAND.COM /C, to do so in an AUTOEXEC.BAT file needlessly lengthens start-up time. Instead, take the straightforward approach: Put only the proper ANSI.SYS commands for the desired colors into a PROMPT command in AUTOEXEC.BAT.

Execute SCREEN.BAT with various color choices until you find the combination you like. Now take a close look at SCREEN.BAT. This batch file relies on DOS variables. The first, 'temp', holds the prompt command that is in effect when SCREEN.BAT is invoked. Then the DOS variables 'fgc' and 'bgc' are set by the parameters given to SCREEN.BAT. When the PROMPT command below the last 'if %2 = =...' is executed, DOS replaces '%fgc%' and '%bgc%' with the values of 'fgc' and 'bgc'. Thus, black text (fgc = 0) on a cyan background (bgc = 6) is achieved by the command PROMPT $e[30;46m. (The '$e[' summons the attention of ANSI.SYS.) Since you know which text and background colors you want, you can put the appropriate PROMPT command in your AUTOEXEC.BAT file instead of a SCREEN.BAT command. (Because ANSI.SYS commands do not take effect unless they are echoed to the screen, an ECHO ON command must be executed if the ANSI.SYS PROMPT command was issued while echo was off.)

Note that another PROMPT command reinstalls the original prompt. Since you're setting up the AUTOEXEC.BAT file, the prompt you want can be set with the same PROMPT command that sets your desired screen colors. For example, PROMPT $e[30;46m$P$G sets black text on a cyan background with a prompt that displays the default drive and path, followed by the greater-than symbol.

DEFKEYS Redefined

Senior Master Sergeant David "Mike" Blevins wrote to let me know that line 230 of DEFKEY.BAS (from "Thirty More Function Keys," *The Help Screen, PCW,* April 1987) lacks the shading meant to highlight the difference between that listing and the former DEFKEY.BAS of *.*, *PCW,* February 1986. The omission won't affect readers entering DEFKEY.BAS for the first time, but those modifying the original will find that the program does not function properly without the change to line 230.

Do you have any questions concerning the IBM PC or compatibles? Send them to The Help Screen, PC World, *501 Second St., San Francisco, CA 94107, or electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908.* ●

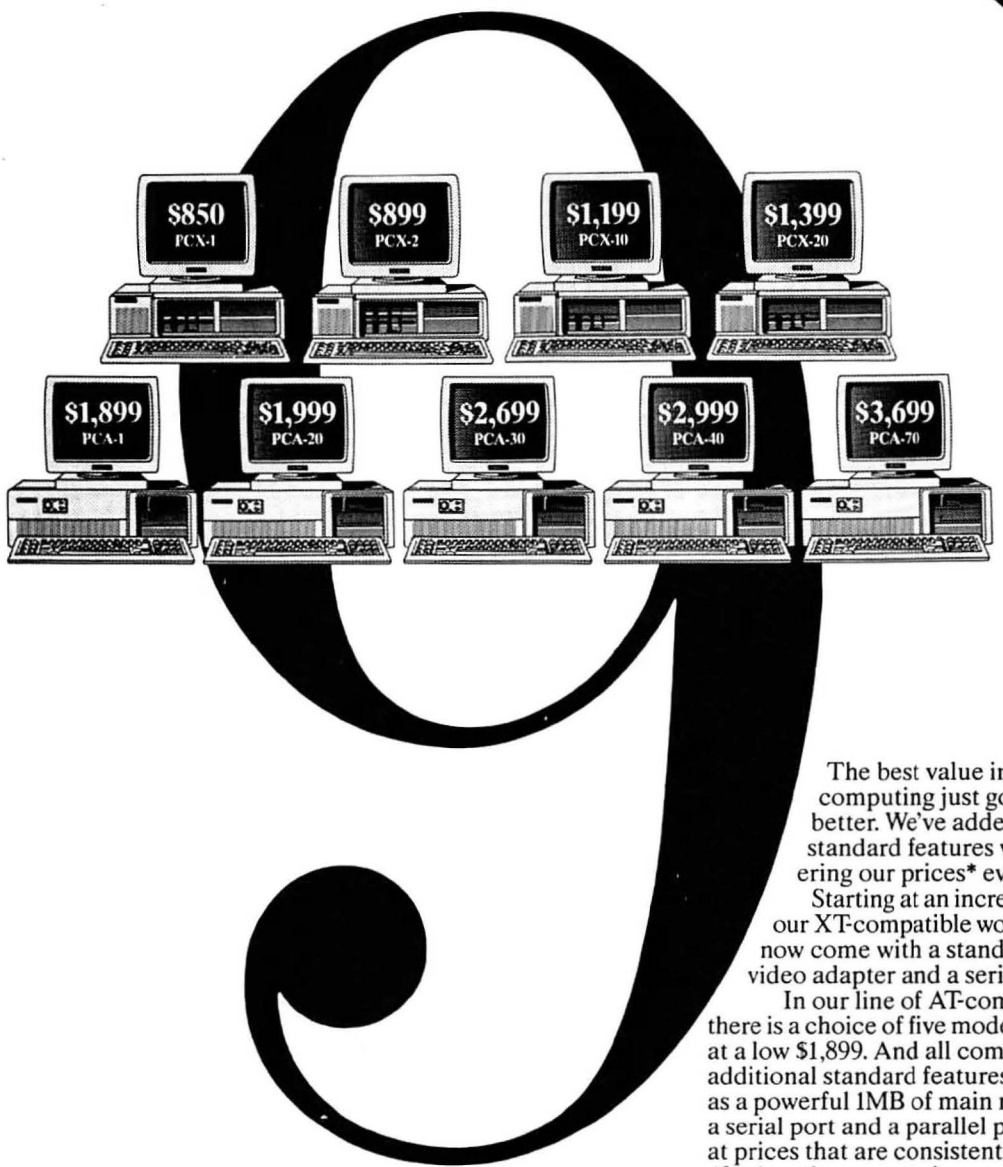
Acutype
Acu-Business Systems
819 W. Sixth St.
Winona, MN 55987
507/452-4887
List price: $24.95
Requirements: 1.5K, DOS 2.10 or later version
Not copy protected

Acutype Tutorial
Acu-Business Systems
List price: $19.95, if purchased with Acutype $15
Requirements: 256K, DOS 2.10 or later version
Not copy protected

(continues)

From 360K to 70MB, we've still got your number.

NOW, Even Lower Prices.



The best value in personal computing just got even better. We've added more standard features while lowering our prices* even further.

Starting at an incredible $850, our XT-compatible workstations now come with a standard dual video adapter and a serial port.

In our line of AT-compatibles there is a choice of five models, starting at a low $1,899. And all come with additional standard features such as a powerful 1MB of main memory, a serial port and a parallel port. And at prices that are consistently around 40% less than our major competitors.

But a low price doesn't mean you have to sacrifice quality. Tandon personal computers are brought to you by a trusted manufacturer who has been an industry leader for over a decade.

For the Tandon dealer nearest you call toll-free **1-800-556-1234 ext. 171.** In California call **1-800-441-2345 ext. 171.**

Tandon Personal computers. With selection and price, we've still got your number.

Tandon
Price. Selection. Quality.

Please send me your Tandon Fact Pac, a comprehensive set of literature and product reviews.

Name _____

Position _____

Company _____

Address _____

City/State _____

Telephone _____

Tandon Computer Corporation
405 Science Drive
Moorpark, CA 93021
805/378.6104

PCWD 9/7

*Manufacturers suggested retail price. Monitor not included.

Get more info. Go to Ad Index.

Dragnet
Access Softek
3204 Adeline St.
Berkeley, CA 94703
800/222-4020, 800/445-6466, 415/654-0116
List price: $145
Requirements: 256K, two disk drives, DOS 2.00 or later version, graphics board (recommended: 6-MHz or faster PC or compatible, 512K, hard disk, Microsoft Windows, mouse or other pointing device)
Not copy protected

Dvorak Conversion Kit
KT Services, Inc.
P.O. Box 14528
Spokane, WA 99214-0528
509/927-5395
List price: $33.50 (includes shipping and handling)
Requirements: Key Tronic KB-5150 or KB-5151 keyboard (specify PC, XT, or AT)

Dvorak Keytop Layout
MaxiSwitch
5436 W. Latham St.
Phoenix, AZ 85043
602/272-5645
List price: $175
Requirements: standard PC or AT keyboard connector port

Keyworks 3.0
Alpha Software Corp.
30 B St.
Burlington, MA 01803
800/451-1018, 617/229-2924
List price: $99
Requirements: 81K, DOS 2.00 or later version
Not copy protected

Lap-Link
Traveling Software, Inc.
19310 North Creek Pkwy.
Bothell, WA 98011-8006
206/483-8088
List price: $129.95
Requirements: two computers, each with 100K free, one serial port, DOS 2.00 or later version
Not copy protected

Microsoft Windows 1.04
Microsoft Corp.
16011 N.E. 36th Way
P.O. Box 97017
Redmond, WA 98073-9717
206/882-8080
List price: $99
Requirements: 512K, two disk drives, DOS 2.00 or later version, graphics board (recommended: hard disk, mouse or other pointing device)
Not copy protected

PageMaker version 1.0
Aldus Corp.
411 First Ave. S #200
Seattle, WA 98104
206/628-2375
List price: $695
Requirements: 512K, 20MB hard disk, DOS 3.00 or later version, graphics board, Windows 1.03 or later version, mouse or other pointing device (recommended: 6-MHz or faster PC or compatible; 640K; Hercules Graphics Adapter, EGA, their compatibles, or higher resolution Windows-compatible graphics board)
Not copy protected

PCKey
Freelance Communications
P.O. Box 1895
Upland, CA 91785
List price: $20
Requirements: 2.2K

Dvorak Developments
Freelance Communications
Cost: $12 per year

The Dvorak Keyboard
R. C. Cassingham
Freelance Communications
List price: $12.95 plus $1 for shipping (special discount price of $10, shipping included, if ordered before January 1, 1988)

ProKey 4.0
RoseSoft Inc.
4710 University Way NE #601
Seattle, WA 98105
206/524-2350
List price: $130
Requirements: 96K
Not copy protected

SmartKey 5.2
Software Research Technologies, Inc.
2130 S. Vermont Ave.
Los Angeles, CA 90007-1654
800/824-5537 outside California, 213/737-7663
List price: $69.95
Requirements: 33K
Not copy protected

SuperKey
Borland Int'l
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
408/438-8400
List price: $99.95
Requirements: 48K, DOS 2.00 or later version
Not copy protected

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 6 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.

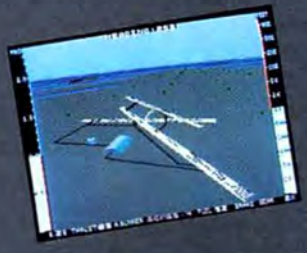
Seagate

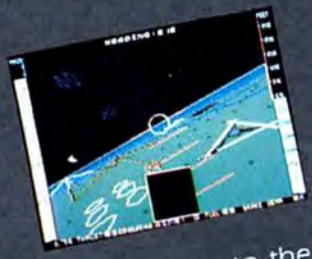
Get more info. Go to Ad index.

THE FLIGHT CHOICE!

Atari ST screens shown.
Other computer versions may vary.

From the sophisticated realism of Flight Simulator...





IBM PC screens

...to the thrills and excitement of Jet...

Atari ST screens

...to new Scenery Disk adventures... SubLOGIC. Make The Flight Choice.

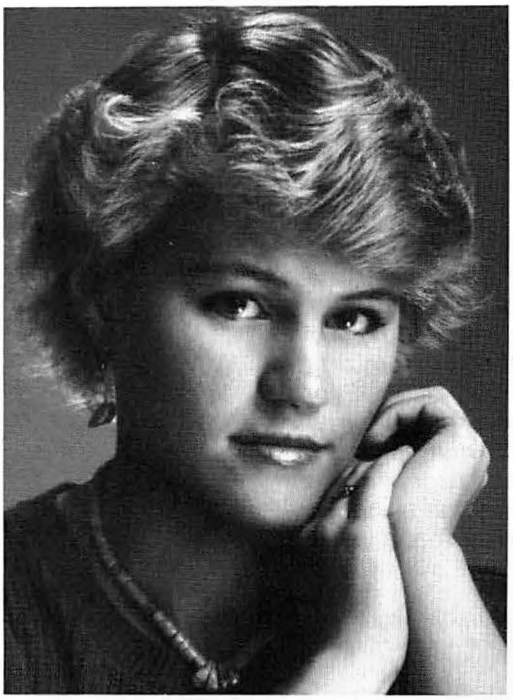
See Your Dealer. For additional product ordering information or the name of the dealer nearest you, call (800)637-4983.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995
ORDER LINE: (800) 637-4983
(except in Illinois)

Get more info. Go to Ad index.

Add the Reader,

ORIGINAL



DISPLAY

subtract the work.

Having an office system capable of reading text, graphics and photographs is no longer a luxury. It's a necessity.

The addition of the Reader to your present system will virtually eliminate the need to retype or recreate documents and images. The Reader can scan continuous tone images, such as photographs, by converting them to 128 shades of grey and transfer them to your system. Imagine multiplying your graphic scanning ability to a point where you can reproduce photos or graphics in vivid detail. The applications are countless. And with the Reader's 30 page capacity it can feed up to 4 pages of text a minute. Accurately and automatically.

Standard features allow you to read pages directly into word processing programs such as Wordstar® 2000, Multimate™, XyWrite™ III, Word Perfect™, DisplayWrite™ III and Microsoft® Word. Features for filing and editing are provided in an easy to use format. The Reader also offers a multitude of interfaces to the most popular page make-up and graphic editing programs available. Unique software architecture permits the addition of new typestyles and features to your system without the worry of hardware obsolescence or costly upgrading.

Consider the possibilities. Words and pictures reproduced into a polished, professional appearance you never dreamed affordable. So total up the time and effort you spend at your system, then add the Reader and subtract the work.

Yes, I am very interested in the IOC Reader. Please send me more information.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Mail to or call: Intelligent Optics Corporation
4 Heritage Park Road, Clinton, CT 06413 Telephone (203) 669-3650

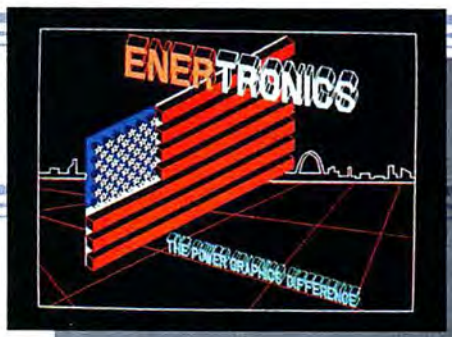
INTELLIGENT OPTICS CORPORATION

Names indicated by TM or ® are trademarks of their respective manufacturers.

Get more info. Go to Ad index.

EnerGraphics

"Software hit of '87"
—PC World

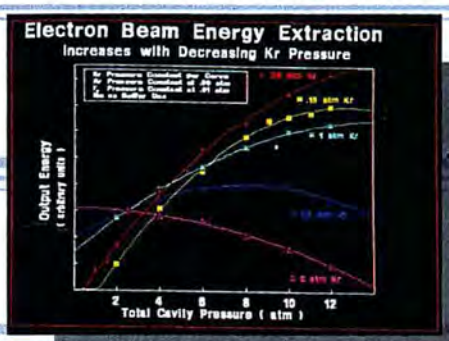


Chart

Create an endless array of 3-D business and scientific charts with ENERGRAPHICS 2.0. Use basic prompts and menus, and virtually unlimited customizing features, to design pie, bar, line, text and analytic charts. Capabilities include merging up to four charts on one page; adding floating text, lines and symbols; and entering data using the new Lotus 1-2-3™ Macro.

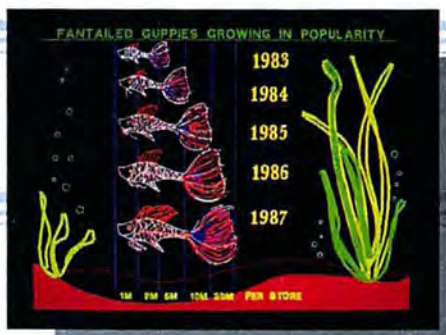
Draw

Imagine it and draw it with ENERGRAPHICS 2.0! Draw anything from flow charts and company logos, to 3-D maps and schematics. Creating is made even easier with access to over 1,000 pre-defined 2-D and 3-D symbols. Put your creativity to the test with special features to customize what you see on the screen.



Analyse

Examine what you create with ENERGRAPHICS 2.0. Analyze data using linear or polynomial regression analysis, and display it using log-log and semi-log scales and up to four Y scales at once. Or with one of the unique features of the program, input your own math equation to create the data you need.



Present

Make dazzling presentations with ENERGRAPHICS 2.0. Design slide presentations for on-screen viewing, or in conjunction with your printer, plotter or overhead projector.

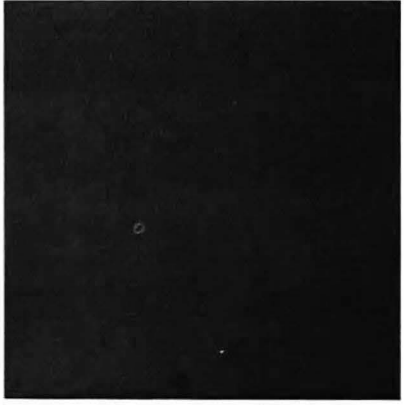
Design and create colorfully effective 3-D charts, merged charts and analytic graphics with ENERGRAPHICS 2.0. Call TODAY for more information at:

800-325-0174.

ENERTRONICS The Power Graphics Difference

Enertronics Research, Inc. • #5 Station Plaza • 1910 Pine Street • St. Louis, MO 63103 • (314) 421-2771

Get more info. Go to Ad Index.



Star-Dot-Star

A global exchange of personal computer discoveries

Turn out perfect directory printouts, make WordPerfect dBASE's editor, cope with PC schizophrenia, validate Pascal values, ease BASIC line drawing, automate the patching of programs, and put commas in your banners

Edited by Mike Cushman

WordPerfect Does Directories
You can quickly print directory listings, complete with page breaks, from within *WordPerfect*. To do so, use the program's List Files key, <F5>, to display the desired directory listing on the screen. Then press the Print key, <Shift>-<F7>.

The entire directory listing will be sent to the printer regardless of length. If the directory listing is longer than the default page length, *WordPerfect* will automatically insert page breaks where necessary.

Joyce Long
Columbia, South Carolina

A (Word)Perfect dBASE Editor
I use *WordPerfect*'s advanced editing features whenever possible. I also use a separate ASCII text editor to edit program source files such as .PRG command files in *dBASE III Plus*.

After struggling with the ASCII text editor to extensively edit very large command files, I decided that *WordPerfect* would be a far superior text editor, since it provides features such as search and replace, block commands, a spelling checker, directory listings, and the document summary feature found in version 4.2.

Enthusiastically, I tackled the *dBASE* reference manual for instructions on setting up *WordPerfect* as *dBASE*'s default text editor, which is called by typing Modify Command *filename* at *dBASE*'s dot prompt. The instructions say to put TEDIT = WP.EXE in the *dBASE* configuration file, CONFIG.DB [see reference manual, pages U1-19 through U1-21].

One small problem arises with this setup. Modify Command is capable of calling *WordPerfect* as the editor, but documents are saved with *WordPerfect*'s formatting codes intact. A *dBASE* command file cannot interpret these codes, and the program crashes. *WordPerfect* can retrieve and save ASCII text files but requires a number of keystrokes to do so. Further, Modify Command cannot perform such saves and retrieves.

Determined to circumvent this barrier, I devised a solution that lets me use *WordPerfect* without all the text-in and text-out keystrokes.

The solution is to ignore Modify Command and instead assign a *dBASE* function key to call *WordPerfect*, along with a *WordPerfect* macro that executes automatically when the word processor begins.

First, set up a function key (I use <F9>) by adding the line F9 = "!WP/M-START;" to CONFIG.DB (START is the name of my *WordPerfect* macro; any function key and macro name can be used).

Next, copy WP.EXE and SYS.FIL to the *dBASE* subdirectory. With WP/S, set *WordPerfect*'s default values to normal text editor values, such as left margin = 0, right margin = 150, top margin = 0, and page length = 108 lines (the maximum length that *WordPerfect* allows). To save disk space, do not copy the spelling checker into the *dBASE* directory. Instead, use WP/S to configure the copy of *WordPerfect* in the *dBASE* directory to find the spelling checker in the *WordPerfect* directory. Although it's possible to keep just one copy of *WordPerfect* on the hard disk and use a macro to change the default word processing values to the text editor values, I prefer having two

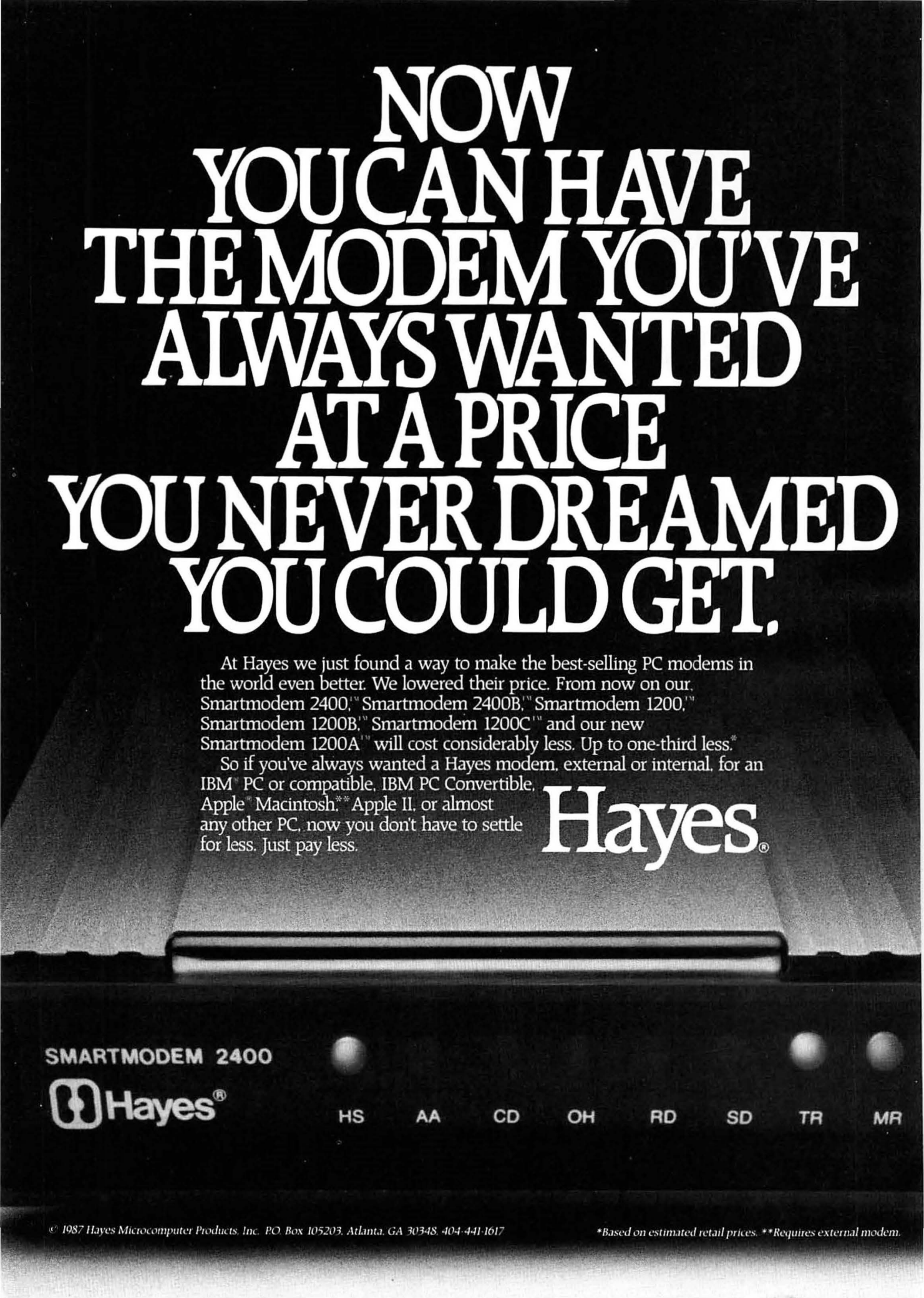
(continues)

NOW YOU CAN HAVE THE MODEM YOU'VE ALWAYS WANTED AT A PRICE YOU NEVER DREAMED YOU COULD GET.

At Hayes we just found a way to make the best-selling PC modems in the world even better. We lowered their price. From now on our Smartmodem 2400,™ Smartmodem 2400B,™ Smartmodem 1200,™ Smartmodem 1200B,™ Smartmodem 1200C™ and our new Smartmodem 1200A™ will cost considerably less. Up to one-third less.*

So if you've always wanted a Hayes modem, external or internal, for an IBM® PC or compatible, IBM PC Convertible, Apple® Macintosh,** Apple II, or almost any other PC, now you don't have to settle for less. Just pay less.

Hayes®



© 1987 Hayes Microcomputer Products, Inc. P.O. Box 105203, Atlanta, GA 30348. 404-441-1617

*Based on estimated retail prices. **Requires external modem.

CAD
FOR THE REAL WORLD.

John Gunyon, Architects

Summit Computer Systems, Inc.

Davis & Carter, P/C

CADVANCE™

When your creative juices are flowing…or your client is waiting…you need CAD software that's quick, easy and efficient. Something with real answers at a moment's notice. You need CADVANCE, the fastest-response design software in the PC market today.

CADVANCE is simple to learn. Commands and menus are written in *your* language. So you can quickly produce even the most detailed, full-color graphics.

SOLID VISION™

Want to design in 3-D? Try Solid Vision, featuring all the fast response of CADVANCE for three dimensional images. See shaded sections, hidden line views, or "walkaround" perspectives…with just the touch of a key.

CADVANCE and Solid Vision. High speed, high performance, compatible CAD software for your IBM PC system. Visit your local dealer for a demonstration or send for your free ISICAD kit.

To get your free ISICAD kit, drop your business card in the mail and we'll drop our CAD kit to you.
ISICAD, Inc. P.O. Box 61022
Anaheim, CA 92803-6122
(714) 821-2600

ISICAD
DESIGN SYSTEMS FOR THE REAL WORLD

Get more info. Go to Ad Index.

copies, one in the *WordPerfect* directory that I use for everyday documents and one in the *dBASE* directory, each with its appropriate default settings.

Last, set up two *WordPerfect* macros. I use START and <Alt>-S. START contains the text-in keystrokes, <Ctrl>-<F5> 2, which invoke the prompt that asks for the name of the ASCII file to be edited; <Alt>-S contains <Ctrl>-<F5> 1, the text-out command, which invokes the prompt requesting the name of the file to be saved in ASCII format.

Michael J. Piar
Columbus, Ohio

Editor's note: The WordPerfect Library *also includes a program editor, which saves and retrieves ASCII files with the normal <F7> key. The program editor incorporates most of* WordPerfect's *text editing features but not the spelling checker. It may be used as the* dBASE *default editor by placing TEDIT=PE.EXE in CONFIG.DB. You must also put PE.EXE and its related files in the* dBASE *subdirectory or reference the Library's subdirectory in the system's PATH.*

Plural PC Personalities

I have often wished for a quick and easy way to change the "personality" of my PC. For instance, general purpose office chores are best performed with several memory-resident utilities, such as *SuperKey* and *FANSI-Console,* in place and rarin' to go. But programming and debugging program code require a different set of device drivers and utilities. When the boss sits down and types WIN (to start *Microsoft Windows*), the building shakes if the full 640K is not available.

There are some excellent TSR managers, such as *Referee,* on the market, but a set of batch files will manage both CONFIG.SYS device drivers and memory-resident utilities quite handily.

The trick is to create a batch file for each personality (environment). These batch files will copy appropriately configured CONFIG.*xxx* and AUTOEXEC.*xxx* files over the existing CONFIG.SYS and AUTOEXEC.BAT and then restart the PC. For example, Listings 1 and 2 show two batch files. The only difference between the two is the file name extensions of the AUTOEXEC and CONFIG files that are copied when the respective batch file is executed. However, the .UTL files are configured to support a utility environment (with memory-resident programs) and the .WIN files to support a *Microsoft Windows* environment (no memory-resident programs, maximum memory).

```
COPY c:\dos\autoexec.utl c:\autoexec.bat
COPY c:\dos\config.utl c:\config.sys
WARMBOOT
```

```
COPY c:\dos\autoexec.win c:\autoexec.bat
COPY c:\dos\config.win c:\config.sys
WARMBOOT
```

Listings 1 and 2: UTILITY.BAT and WINDOWS.BAT illustrate simple batch files that restart the PC with AUTOEXEC.BAT and CONFIG.SYS files tailored to support a specific environment.

The batch file finally issues the command WARMBOOT, which restarts the PC with specific paths, default directory, default keyboard macros, and so forth set for the particular environment. [The directions for creating WARMBOOT can be found in "Pick a Partition" in last month's *Help Screen.*]

Jeff Slama
Joplin, Missouri

Get Real, Integer Validation

I developed two *Turbo Pascal* procedures, GetInt and GetReal, that ensure a valid user response to prompts for numeric entries. The sample program REALINT.PAS [Listing 3] illustrates the two procedures.

Variables in each procedure include X and Y, the screen locations for positioning the prompt; Low and Hi, the minimum and maximum limits for the input; Prompt, the inquiry prompt; and

(continues)

Now your office PC can do this job faster.

MicroFax™ by Datacopy lets PCs send documents worldwide.

In less than 60 seconds, you can send and receive documents anywhere in the world, without leaving your desk. MicroFax by Datacopy makes it happen.

MicroFax is the ultimate desktop communicator. A simple add-on board for PCs and their compatibles, it communicates with fax machines or PCs over ordinary voice-quality phone lines. Your computer can generate the documents. And your printer can do the printing.

What's more, you can keep working because MicroFax does not tie up computer time; it runs in the background. Even when you're not there, MicroFax can be programmed to send or receive 24-hours a day. You can deliver to 160 destinations at one time. And MicroFax maintains complete activity records.

MicroFax combines the virtues of a dedicated fax machine and a PC modem at a fraction of the cost. Better still, MicroFax is by Datacopy, who pioneered the technology.

So get your hands on one. And stop handing your documents to someone else.

For information call 800-821-2898.

DATACOPY

THE EYE OF THE COMPUTER™

Get more info. Go to Ad Index.

CompuCover®

COVER YOUR INVESTMENT

IBM PC, XT or AT	15.95
IBM ProPrinter	11.95
IBM ProPrinter XL	12.95
Corona PC400	17.95
Compaq 286 or Desk Pro	16.95

Custom combinations available for all IBM models
Citizen - Epson - Okidata - Panasonic
Over 3000 covers to choose from
You name it - We got it!
Anti-Static • Different Colors
Call For Free Catalog

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

Get more info. Go to Ad Index.

Tune-up your hard disk!

Vopt™ DISK ORGANIZER

FAST — EFFICIENT
Vopt organizes your hard disk into contiguous files for fast, efficient, time-saving use! Initial organization averages under 5 minutes; daily runs average under 1 minute!

CONVENIENT
Run it from your autoexec.bat file!

SAFE
Vopt's contiguous files are easier to recover if accidentally deleted! **Vopt**'s speed allows files to be moved one-at-a-time, rather than taking chances on disk reliability. Detects and maps bad sectors.

GOLDEN BOW SYSTEMS

$49.95
Add $3 for S&H
California Residents add 6% Sales Tax

2870 Fifth Avenue
Suite 201
San Diego, CA 92103
619/298-9349

Get more info. Go to Ad index.

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

Get more info. Go to Ad index.


```
program RealInt;  {Illustrates GetInt and GetReal procedures}

type Str45 = String[45];

var I:integer;
    R:real;

procedure GetInt(X,Y,Low,Hi:integer;Prompt:Str45;var I:integer);

var OK:boolean;
    Ans:String[6]; {integers in -32768 thru 32767, only 6 chars needed}
    Check:integer;

begin
  repeat
  begin
    GoToxy(X,Y);clreol;write(Legend);read(Ans);
    Val(Ans,I,Check); OK:=(Check = 0) AND (I <=Hi) AND (I >=Low);
    if not OK then
    begin
      GoToxy(X,Y);ClrEOL;write('** ERROR ** Press Any Key');
      repeat until KeyPressed;
    end;
  end;
  until OK;writeln;
end; {GetInt}

procedure GetReal(X,Y:integer;Low,Hi:real;Prompt:Str45;var R:real);

var OK:boolean;
    Ans:String[15];
    Check:integer;

begin
  repeat
  begin
    GoToxy(X,Y);clrEOL;write(Prompt);read(Ans);
    Val(Ans,R,Check); OK:=(Check = 0) AND (R <=Hi) AND (R >=Low);
    if not OK then
    begin
      GoToxy(X,Y);clrEOL;write('** ERROR ** Press Any Key');
      repeat until KeyPressed;
    end;
  end;
  until OK;writeln;
end;

{******** Sample Program **********}
BEGIN
  ClrScr;
  GetInt(3,4,0,50,'Enter an integer between 0 and 50: ',i);
  GetReal(3,6,-100.0,100.0,'Enter a number between -100.0 and +100.0: ',R);
  writeln;writeln('The first number was:',I:3);
  writeln;writeln('The second number was:',R:6:1);
END.
```

Listing 3: REALINT.PAS demonstrates GetInt and GetReal, two Turbo Pascal procedures that validate numeric input.

R or I, specifying whether the desired value is a real number or an integer. The procedures return the integer or the real value to the program.

If the user inputs an invalid entry—a number outside the acceptable range or one that contains improper characters—the screen displays an error message. The user must press a key to reset the prompt and enter a valid number before the program will continue.

Michael G. Weiss
Dallas, Texas

(continues)

SMALL STAKES

When it's a choice between affordability, capability and reliability, logic dictates the best deal – the ACER 910 personal computer

You're looking for a personal computer – one to cope with your ever increasing demands? Perhaps finding one to suit that tight budget is proving a problem?

Well, in terms of real value for money the ACER 910 personal computer is it – no other machine comes close.

Faster than you can say IBM

At 10MHz, the ACER 910 can run your programs 25% faster than the industry standard AT. This power can also be switched down to 6MHz via keyboard or software for the few applications that need to operate under 10 MHz.

From home computers to super-micros– we have the PC for you.

With its superior speed, and true-blue compatibility, the ACER 910 is a tireless thoroughbred when it comes to word processing, financial analysis and spreadsheets, CAD/CAM applications and communications.

Made with care

Designed for easy operation, the ACER 910 has LED indicators, keyboard connector, power on/off switch and reset button all located within reach on the front panel. For total system security, on the front panel, you'll also find a keylock which simultaneously locks powerswitch, keyboard, reset button and cabinet cover.

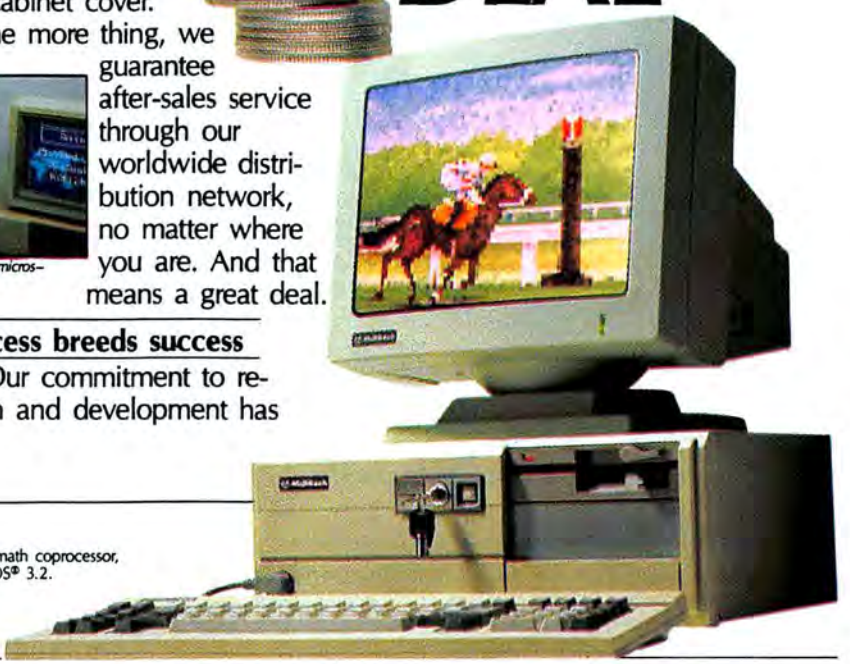
One more thing, we guarantee after-sales service through our worldwide distribution network, no matter where you are. And that means a great deal.

Success breeds success

Our commitment to research and development has enabled us to build better, more affordable machines. From home computers like the ACER 500 and the world's fastest 8088 PC – the ACER 710 to the revolutionary 80386-based ACER 1100.

So check out the ACER 910. You'd be surprised what big returns such small stakes bring.

BIG DEAL



Technical Specifications

ACER 910B CPU 80286, 6/10MHz, switchable. Socket for 80287 math coprocessor, RAM 512KB, expandable to 1MB. 1FDD, 1.2MB. Microsoft® MS-DOS® 3.2.
ACER 910E As 910B plus 1WDD, 40MB, 28ms.

Microsoft MS-DOS is a registered trademark of Microsoft Corporation
PC-AT is a registered trademark of International Business Machines Corporation

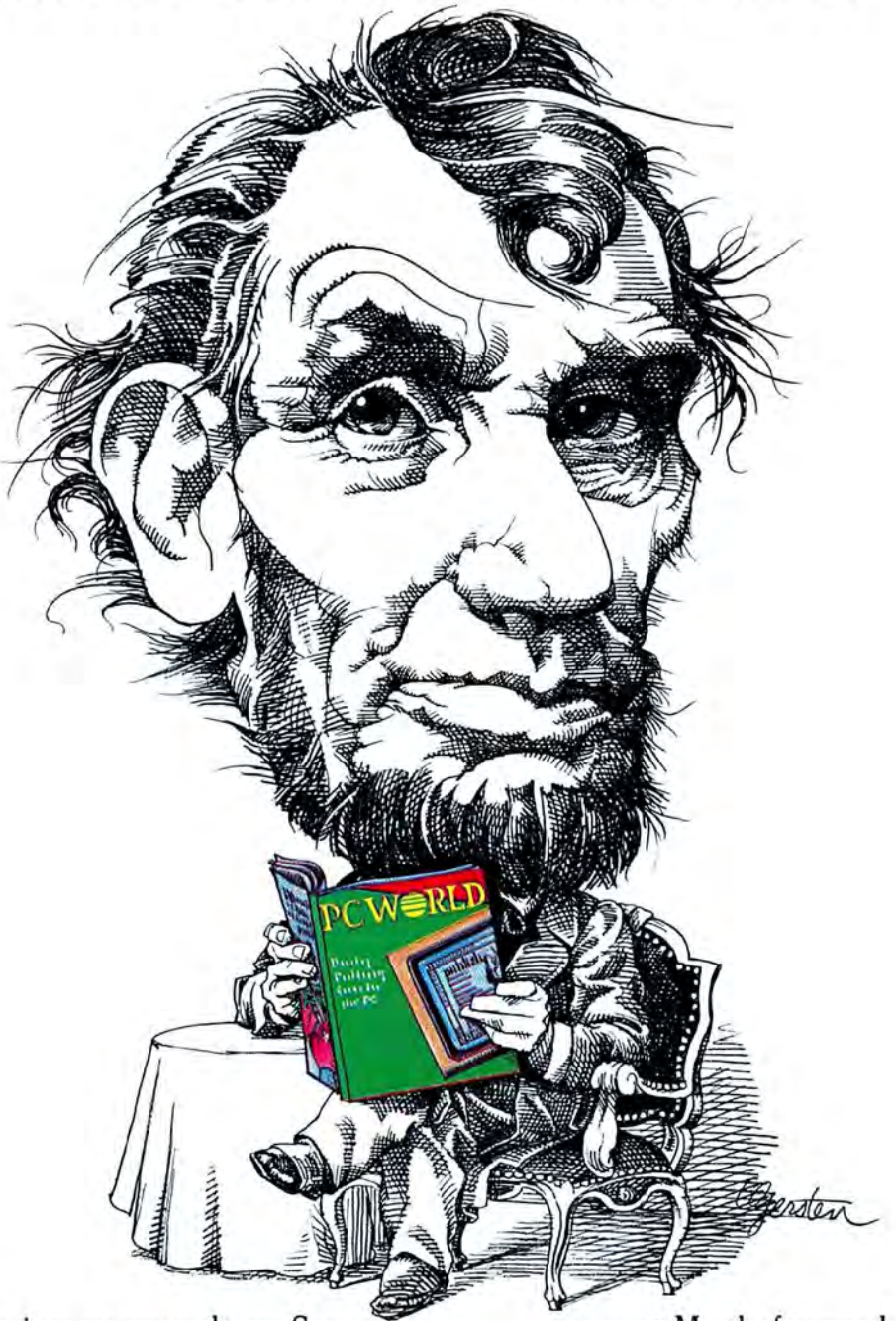
ACER
Silicon Valley • Dusseldorf • Tokyo • Taipei

Acer Technologies Corporation
401 Charcot Avenue, San Jose, CA 95131.
Tel: (408) 922-0333. Fax: (408) 922-0176.
Toll-free nos: (800) 782-1155 (CA only), (800) 538-1542.

Formerly Marketed by
Multitech Electronics Inc.

Info-01

Not all reviews are created equal.



Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. PC WORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want. Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices. PC WORLD, The Business Magazine of PC Products and Solutions.

PC WORLD GIVES YOU MORE.

SUBSCRIBE NOW!

PC WORLD

SAVE OVER 40% OFF THE ANNUAL COVER PRICE

Limited-time offer!
Take advantage of Special Savings
Call TOLL FREE 800/642-9606
Visa and MasterCard Accepted

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of PC WORLD for only $19.97. That's over 40% off the annual cover price of $35.40 and over 30% off the regular subscription rate of $29.90.

☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

PC WORLD

4B390

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of PC WORLD for only $19.97. That's over 40% off the annual cover price of $35.40 and over 30% off the regular subscription rate of $29.90.

☐ Payment enclosed ☐ Bill me later

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

PC WORLD

4B390

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

The most brilliant breakthrough in SQL technology since SQL.

XQL is a dramatic step forward in the history of SQL. It's the one unique SQL solution that helps programmers break through to even higher levels of productivity. Powerful yet easy to use, XQL minimizes your coding time and lets you focus on building better applications.

XQL extends the power of Btrieve, SoftCraft's high-performance file manager, by allowing access to multiple records at a time. It frees your application from physical file characteristics by providing true relational capabilities with data independence, data descriptions, data integrity and security.

XQL's three interface levels are a major advance in SQL technology. The first two levels, XQL primitives for maximum efficiency or full SQL statements for maximum convenience, are callable subroutines from BASIC, Pascal and C. The third level lets you enter SQL statements interactively without ever having to write a program.

XQL's extensive DBMS features let you access data by name. Field order is independent of physical location within the Btrieve record. Only records that pass your restrictions are returned—in the sort order you specify. Fields can be computed from other fields or constants. And you can manipulate composite records built from multiple, joined Btrieve files.

XQL offers all the performance and reliability you've come to expect from Btrieve, including LAN support, fault tolerance, comprehensive documentation and expert technical support for trouble-free software development.

Plus, you never pay royalties on your XQL applications.

Put the latest innovation in SQL technology to work for you. Contact SoftCraft.

SoftCraft
A NOVELL COMPANY
P.O. Box 9802, #917
Austin, Texas 78766
(512) 346-8380 Telex 358 200

XQL, $595; Btrieve, $245; multiuser Btrieve, $595. XQL requires Btrieve and PC-DOS or MS-DOS 2.X or 3.X. XQL is a trademark and Btrieve is a registered trademark of SoftCraft, Inc.

Get more info. Go to Ad Index.

"BOOST YOUR PRODUCTIVITY
WITH A BUNDLE OF
FAST, POWERFUL
SCREEN AND KEYBOARD UTILITIES!"
• Speed up your screen writing 2-6 times!
• Add zip to cursor keys 2-5 times!
• Get back up to 800 scrolled pages!
• Over 60 other useful options!
"The Best of the Best Utilities"
—PC Magazine Jun 23, 87 pg 281.
"Another of those unheralded gems I would not wish to live without"
—Computing Canada Feb 5, 87 pg 25.
FANSI-CONSOLE™
The Integrated Console Utility™
Only $75! (+ $4 s/h in 48 states)
400p Manual & 2 Copyable Disks
No Risk, 60 Day Money-Back Guarantee
CALL (313) 994-3259 TO ORDER
HERSEY MICRO CONSULTING, INC.
Box 8276, Ann Arbor, MI 48107
Circle ### On Reader Service Card
To Get FREE Brochure w/Reprints
Get more info. Go to Ad index.

ENHANCED
VT220 $150
Zstem by KEA SYSTEMS
The most complete VT220 emulation available for your PC/XT/AT or compatible.
• HIGH PERFORMANCE to 38.4K BAUD
• TRUE DOUBLE HIGH/DOUBLE WIDE
• TRUE 132 COLUMN MODE ON MOST EGA'S
• COLOR EXTENSIONS/DOWNLOADABLE FONTS
• SOFTKEY/MACROS, DOS ACCESS
• XMODEM/KERMIT FILE TRANSFERS
plus many more extensions!
ZSTEMpc™-VT220 Emulator $150.
with PowerStation™220 layout keyboard $289
EGAmate™ option for true EGA 132 column $39
ZSTEMpc™ - 4014 option $99
KEA Systems Ltd.
#412 - 2150 West Broadway
Vancouver, B.C. Canada V6K 4L9
Support (604) 732-7411
TELEX 04-352848 VCR FAX (604) 732-0715
Order Toll Free (800) 663-8702
30 day money back guarantee. MC/VISA/AMEX
Get more info. Go to Ad index.

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.
4561 S. Westmoreland Dallas, TX 75237
(214) 339-0753
Get more info. Go to Ad Index.

```
5000 SUB DRAWIT(ULROW, ULCOL, URROW, URCOL) STATIC
5010 'CORRECT FOR CALL ERRORS TO KEEP SUBPROG FROM CAUSING RUNTIME ERRORS
5020 IF LRROW<ULROW THEN SWAP LRROW,ULROW
5030 IF ULROW<1 THEN ULROW=1
5040 IF ULROW>24 THEN ULROW=24
5050 IF LRROW<1 THEN LRROW=1
5060 IF LRROW>24 THEN LRROW=24
5070 IF LRCOL<ULCOL THEN SWAP LRCOL,ULCOL
5080 IF ULCOL<1 THEN ULCOL=1
5090 IF ULCOL>79 THEN ULCOL=79
5100 IF LRCOL<1 THEN LRCOL=1
5110 IF LRCOL>79 THEN LRCOL=79
5120 IF ULROW=LRROW OR ULCOL=LRCOL THEN GOTO 5250
5130 LOCATE ULROW,ULCOL:PRINT CHR$(201);
5140 FOR I%=ULCOL+1 TO LRCOL:PRINT CHR$(205);:NEXT
5150 LOCATE ULROW,LRCOL:PRINT CHR$(187);
5160 FOR I%=ULROW+1 TO LRROW:LOCATE I%,LRCOL:PRINT CHR$(186);:NEXT
5170 LOCATE LRROW,LRCOL:PRINT CHR$(188);
5180 FOR I%=LRCOL-1 TO ULCOL+1 STEP -1
5190 LOCATE LRROW,I%:PRINT CHR$(205);:NEXT
5200 LOCATE LRROW,ULCOL:PRINT CHR$(200);
5210 FOR I%= LRROW-1 TO ULROW+1 STEP -1
5220 LOCATE I%,ULCOL:PRINT CHR$(186);:NEXT
5230 GOTO 5410
5240 ' ------------- DO THIS IF ROWS OR COLS ARE EQUAL -----------------
5250 IF ULROW=LRROW AND ULCOL<>LRCOL THEN GOTO 5370
5260 IF ULROW<>LRROW AND ULCOL=LRCOL THEN GOTO 5310
5270 LOCATE ULROW,ULCOL
5280 PRINT CHR$(206);:' --- DRAW CROSS FOR INTERSECTION OF 2 LINES -----
5290 GOTO 5410
5300 ' -------------------- DRAW VERTICAL LINE -------------------------
5310 LOCATE ULROW,ULCOL:PRINT CHR$(203);
5320 FOR I%=ULROW+1 TO LRROW
5330 LOCATE I%,ULCOL:PRINT CHR$(186);:NEXT
5340 LOCATE LRROW,LRCOL:PRINT CHR$(202);
5350 GOTO 5410
5360 ' ------------------ DRAW HORIZONTAL LINE -------------------------
5370 LOCATE ULROW,ULCOL:PRINT CHR$(204);
5380 FOR I%=ULCOL+1 TO LRCOL-1
5390 LOCATE ULROW,I%:PRINT CHR$(205);:NEXT
5400 PRINT CHR$(185);
5410 END SUB
```

Listing 4: DRAWIT.BAS is a QuickBASIC subprogram that draws lines and boxes on the screen. With minor modification, it can be used as an interpreted BASIC subroutine.

Your BASIC Line Generator

Routines that draw lines and boxes on the screen can save a lot of time, coding, and hassle in any language. The routine DRAWIT.BAS [Listing 4] is a tool for generating double lines in interpreted and compiled BASIC. It was originally written as a QuickBASIC subprogram and is an important part of my user library.

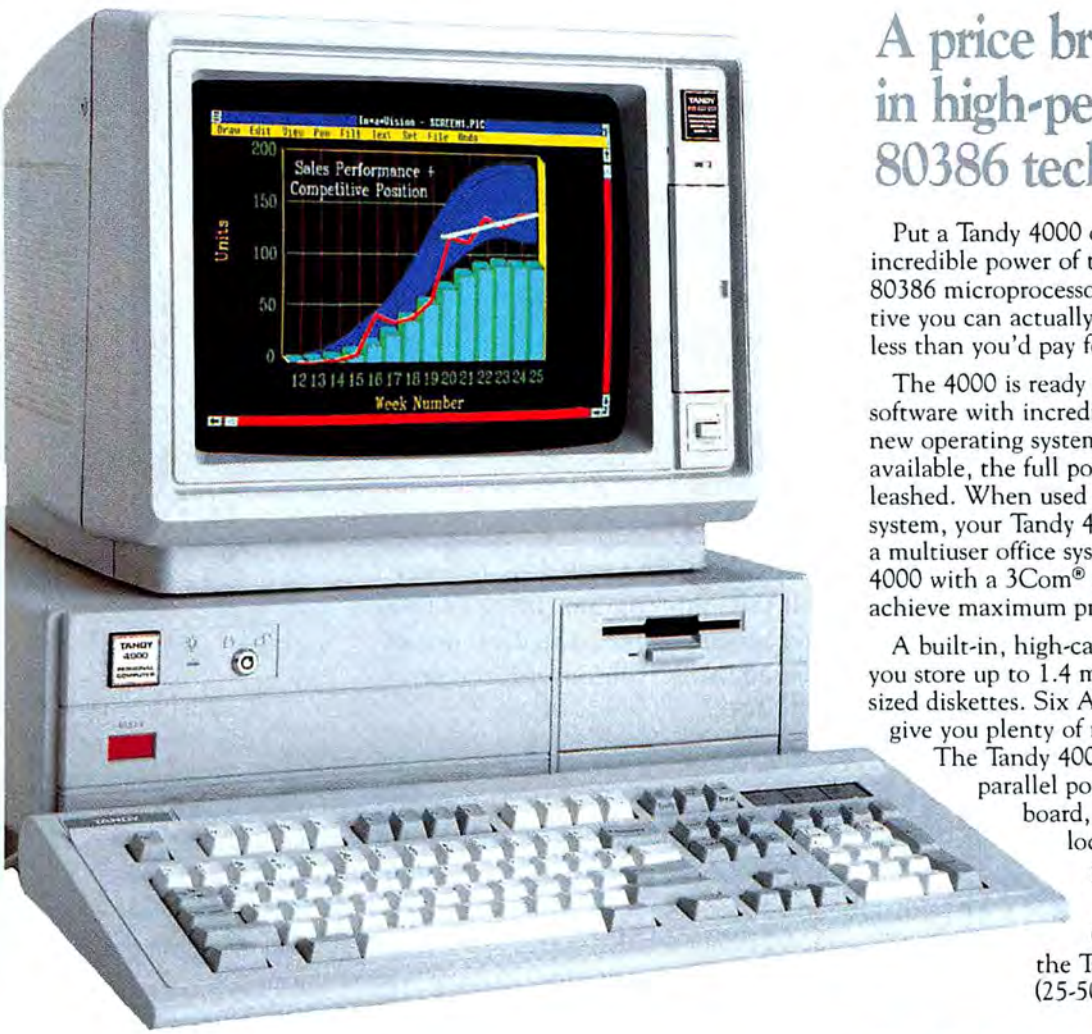
The short program DRAWDEMO.BAS [Listing 5] demonstrates how DRAWIT creates boxes, draws horizontal and vertical lines, and even "touches up" areas where two lines intersect. The user specifies the starting and ending locations, and DRAWIT creates the appropriate lines or boxes.

DRAWIT requires four variables—the row and column coordinates for two screen points. If the two points are in the same row or column, DRAWIT draws a horizontal or vertical line between them, putting the correct

(continues)

Tandy Computers: Because there is no better value.™

The New Tandy® 4000



A price breakthrough in high-performance 80386 technology.

Put a Tandy 4000 on your desk and unleash the incredible power of the 32-bit, 16-megaherz 80386 microprocessor. The 4000 is so cost effective you can actually configure a 386 system for less than you'd pay for a competitor's 286 model.

The 4000 is ready to run current PC and AT® software with incredible new speed. And when new operating systems such as OS/2™ become available, the full potential of 80386 can be unleashed. When used with the XENIX® operating system, your Tandy 4000 can become the heart of a multiuser office system. Or configure the Tandy 4000 with a 3Com® workgroup file server to achieve maximum productivity.

A built-in, high-capacity 3½" disk drive lets you store up to 1.4 million characters on pocket-sized diskettes. Six AT slots and two XT™ slots give you plenty of room for system expansion. The Tandy 4000 also comes with serial and parallel ports, a 101-key enhanced keyboard, and a keylock with chassis-lock mechanism for system protection.

Come into a Radio Shack Computer Center and see the Tandy 4000—only $2599. (25-5000)

Send me a new 1988 computer catalog.

Mail To: Radio Shack
Dept. 88-A-986
300 One Tandy Center
Fort Worth, TX 76102

Name _____
Company _____
Address _____
City _____ State _____
ZIP _____
Phone _____

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

Price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, display adapter and operating systems sold separately. AT/Reg. TM and XT/TM IBM. XENIX/Reg. TM and OS/2/TM Microsoft Corp. 3Com/Reg. TM 3Com Corp.

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)
QUANTITY ONE PRICES SHOWN for JULY 19, 1987

OUTSIDE OKLAHOMA: NO SALES TAX

640K MOTHERBD UPGRADE: Zenith 150, IBM PC/XT, Compaq Portable & Plus; Itp Vectra

DYNAMIC RAM			
1Mbit	1000Kx1	100 ns	$25.00
1Mbit	256Kx4	120 ns	32.00
51258	*256Kx1	100 ns	6.75
4464	64Kx4	150 ns	3.50
41256	256Kx1	80 ns	4.95
41256	256Kx1	100 ns	4.40
41256	256Kx1	120 ns	3.30
41256	256Kx1	150 ns	3.10
4164	64Kx1	150 ns	1.50
EPROM			
27512	64Kx8	200 ns	$11.25
27C256	32Kx8	250 ns	6.50
27256	32Kx8	250 ns	5.50
27128	16Kx8	250 ns	4.75
STATIC RAM			
43256L-12	32Kx8	120 ns	$12.75
6264LP-15	8Kx8	150 ns	3.30

* STATIC COLUMN DRAM FOR 386 COMPAQ

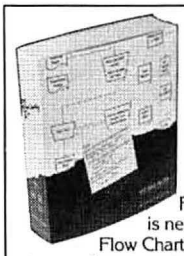
80387-16 $525.00
80287-8 $250.00
8087-2 $160.00

OPEN 6½ DAYS, 7:30 AM-10 PM: SHIP VIA FED-EX ON SAT.
SUNDAYS & HOLIDAYS: SHIPMENT OR DELIVERY VIA U.S. EXPRESS MAIL

SAT DELIVERY INCLUDED ON FED-EX ORDERS RECEIVED BY:
Th Std Air $4.1 lb
Fr P-1 $10.50 2 lbs

MasterCard VISA or UPS CASH COD
Factory New, Prime Parts
MICROPROCESSORS UNLIMITED, INC.
24,000 S. Peoria Ave.
BEGGS, OK 74421 (918) 267-4961
No minimum order. Please note that prices are subject to change. Shipping & insurance extra. & up to $1 for packing materials. Orders received by 9 PM CST can usually be delivered the next morning, via Federal Express Standard Air = $4.00, or guaranteed next day Priority One = $10.50* All parts guaranteed

Get more info. Go to Ad Index.



Flow Charting II+
The New Plus for Fast Flowcharting

FLOW CHARTING is new! It's now Flow Charting II+, with more speed + more functions + more printing options;

• 10 text fonts; 26 shapes; • Line mode can stop at a shape; • Backspace key can erase a line to its origin; • Free text entry anywhere, or select auto-centering; • Vertical or horizontal printing; one chart or multiple charts.

Used by Fairchild, Bechtel and more than 500 other major corporations. Edit quickly and accurately — even major edits — with Flow Charting II+, the Specialist.

See your retail store or call:

PATTON & PATTON
Software Corporation
800/672-3470, ext. 897 California
800/538-8157, ext. 897 National
408/629-5044 International)

Get more info. Go to Ad Index.

NOW, AN EASY WAY TO SHARE YOUR PRINTER!

Share any number of PC's and printers without cables, switches, or waiting.

Just plug PAMCO's Lil' Devil into the printer port of your PC. Works like a printer buffer and saves the data on a removable RAM cartridge. At your convenience, plug the RAM cartridge into another Lil' Devil attached to your shared printer. Easy!

Allows you to work anywhere. Frees your PC and Printer. Even a floppy disk can't do all that PAMCO's Lil' Devil can.

Comes complete with power supply, standard parallel printer port recepticle, standard parallel printer cable and plug, one RAM cartridge and instructions for only $149.95.

Call for more information **1-800-255-6265**
N.C. 704/529-1593

PAMCO 920 Blairhill Rd., Suite 101
Charlotte, NC 28217

Get more info. Go to Ad Index.

```
10 'DEMO OF DRAWIT SUBPROGRAM
20 'INVOKED AT RUNTIME BY CALLING QB WITH THE "/L" LIBRARY OPTION
30 'DRAWIT IS IN THE DRAWIT.EXE LIBRARY
40 'RUN QB AS FOLLOWS:
50 '                    QB DRAWDEMO /L DRAWIT.EXE
60 '
70 'THEN LOAD AND RUN THIS DEMO
80 'THE DRAWIT FUNCTION WILL BE AVAILABLE LIKE A BUILT-IN QB
90 'FUNCTION
100 ROW1=2
110 COL1=5
120 ROW2=20
130 COL2=75
140 CALL DRAWIT(ROW1,COL1,ROW2,COL2): ' DRAW BOX FROM ROW 2,COL 5 TO
150                                   ' ROW 20, COL 75
160 ROW1=6
170 COL1=5
180 ROW2=6
190 COL2=75
200 CALL DRAWIT(ROW1,COL1,ROW2,COL2): ' DRAW HORIZ LINE FROM ROW 6,
210                                   ' COL 5 TO COL 75
220 ROW1=2
230 COL1=40
240 ROW2=20
250 COL2=40
260 CALL DRAWIT(ROW1,COL1,ROW2,COL2): ' DRAW VERT LINE FROM ROW TO
270                                   ' ROW 20, COL 40
280 ROW1=6
290 COL1=40
300 ROW2=6
310 COL2=40
320 CALL DRAWIT(ROW1,COL1,ROW2,COL2): ' DRAW CROSS AT ROW 6, COL 40
330 END
```

Listing 5: DRAWDEMO.BAS demonstrates the QuickBASIC subprogram DRAWIT.BAS. With minor modification, it can demonstrate the interpreted BASIC subroutine version of DRAWIT.BAS.

T-shaped characters at each end. If the two screen points are the same, DRAWIT displays a cross at that point.

Pass illegal values to DRAWIT, and it uses the closest legal value. Therefore, calculated values can safely be passed to DRAWIT without fear of crashing a program.

Most of the line numbers used in DRAWIT are, of course, unnecessary for QuickBASIC, but by changing the first line to 5000 REM and the last line to 5410 RETURN, you can use the subprogram as an interpreted BASIC subroutine. Replacing DRAWDEMO's CALLs in lines 140, 200, 260, and 320 with ULROW = ROW1 :ULCOL = COL1 :LRROW = ROW2 :URCOL = COL2 :GOSUB 5000 will enable the program to demonstrate the interpreter subroutine.

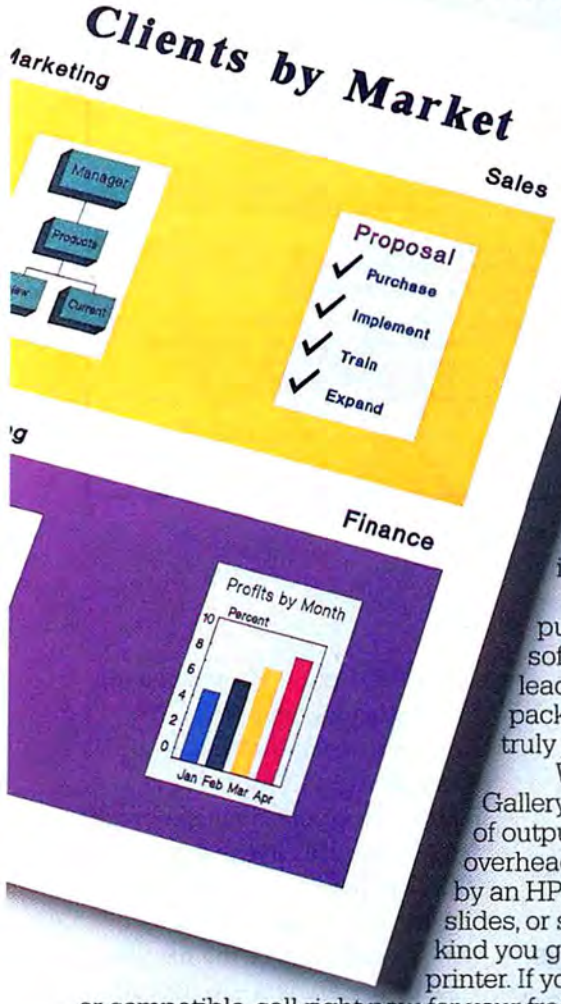
To compile with QuickBASIC, you can remove unwanted line numbers, leaving only necessary line numbers or labels in their place [shown shaded on Listing 4]. In any case, you'll need to create a library for the DRAWIT subprogram. Start QuickBASIC, type in DRAWDEMO.BAS, and save it. Do the same for DRAWIT.BAS,

(continues)

The Graphics Gallery makes winning presentations.

Here's graphic proof.

we never stop asking "What if..."



Seeing is believing. Which is why Hewlett-Packard invites you to call now for a free Graphics Gallery Sampler – an impressive collection of colorful business graphics produced by our powerful and flexible software.

We want you to see for yourself how The Graphics Gallery can give you an important winning edge. How it can increase the impact of every presentation and turn simple reports into persuasive documents. The Graphics Gallery can help you get the most out of *other* software, too.

Do you use 1-2-3® from Lotus®? The Graphics Gallery will easily transform those unimpressive Lotus graphs into persuasive, customized presentations enhanced with color, text, illustrations, and more.

Interested in desktop publishing? Our remarkable software works with the leading desktop publishing packages. And it creates truly *professional* results.

What's more, The Graphics Gallery gives you a flexible choice of output. Choose from colorful overhead transparencies produced by an HP plotter, professional 35mm slides, or sharp, printed output – the kind you get with the HP LaserJet printer. If you've got an IBM PC/XT/AT or compatible, call right now for your free Graphics Gallery Sampler and the name of your local Hewlett-Packard dealer.

We want to prove to you that seeing really is believing.

Call 1-800-367-4772, Dept. 710Q, right now and get a FREE Graphics Gallery Sampler from Hewlett-Packard

HEWLETT PACKARD

1-2-3® from Lotus® is a registered trademark of Lotus Development Corporation.

IS02713

©1987 Hewlett-Packard Co.

THE GRAPHICS GALLERY

Hewlett-Packard Company, Attn: Inquiries Dept.
1000 N.E. Circle Boulevard, Corvallis, OR 97330

☐ **Yes.** I'd like to see for myself how good The Graphics Gallery really is, so send me your free Graphics Gallery Sampler and the name of my local Hewlett-Packard dealer.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

710Q

PC SOFTWARE
Public Domain & User Supported

PC-Stock (Stock Trend Analysis)
DiskTool (Disk modification utility)
PC-Tickle (Desk calendar/reminder)
PC-Write 2.7 (Word processor with spell checker)
Imageprint (Better quality from Epson/Okidata printers)
Landing Party (Adventure with your favorite characters)
PC-Accounting (2 disks-single entry accounting)
Ham Radio #1(RTTY/CW/ASCII, Sat location, and more)
FT-ETC Genealogy(Produces several types of charts)
Symphony WKS #1(Bank, Insurance, & Medical Applic.)
123 Macros (A lot of 123 macros!)
PC-Prompt (Memory resident DOS help utility)
Mr Bill (2 disks-Professional Time Billing)
Label Master (Mail List Management System)
Misc. Games (Quarterback, Babies, Flightmare, Soviet & More!)

$6.00 Ea.

Try a Six-Pac

any six disks only $29.95
(all orders add $3.00 shipping & handling)
(credit card orders welcome, $10.00 min. please)
Call or write for FREE catalog

The above programs were written for the IBM-PC & PC-jr, will run on some compatibles. Be certain of compatibility before ordering.

Soft/Plus Research
759 S. State St., Ste. 109
Ukiah, CA 95482
(707) 462-3118
(800) 843-3882

Get more info. Go to Ad index.

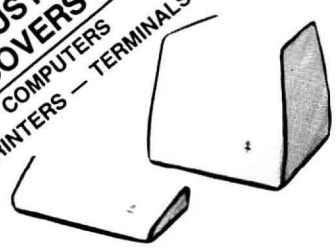
Name Brands * Low $$

Expansion Boards
AST Sixpackplus (384K) $209
Sixpack Premium (1MB) $289
Advantage (1.5MB)..$519..(3MB)..$929
Rampage (2MB) $439
Rampage AT (2MB) $599
Intel Above PC (2MB) $439
Above PC PS (2MB) $429
Above 286 (2MB) $509
Above PS 286 (2MB) $549
Quadboard (385K) $189
Graphics Cards
Hercules Mono... $199..Color... $159
Quad Prosync $349
ATI EGA Wonder $279
Hard Drives
Seagate 20, 30, 40, 80MB Kits..from. $349
Miniscribe 20, 30, 40MB Kits .... $call
Plus Hard card 20MB $659
Memory.. 64K, 256K ..... $call
Floppy Drives
Tandon TM102: $109 3.5": $139
Toshiba for PC, AT: $109 1.2MB: $139

Printers..Citizen, Panasonic, Toshiba, NEC
Monitors.. NEC, Amdek, Princeton Gr.
Modems.. Hayes, Everex
Tape Backup.. Maynard, Everex

VLM Computer Electronics
10 Park Place, Morristown, NJ 07960
(201) 267-3268 - Visa, MC, Check or COD

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

Get more info. Go to Ad index.

.

```
10 CLS: KEY OFF: DEF FNH$(X$)=RIGHT$("0"+HEX$(ASC(X$)),2)
20 DEF FNNOH(S$,H)=INSTR("0123456789ABCDEFabcdef",MID$(S$,H,1))=0
30 DEF FNHEX(X$)=VAL("&H"+X$): DELIM$="&h": DZ=LEN(DELIM$): NUL$=""
40 READ BF$: OPEN BF$ AS #1 LEN=1: FIELD #1,1 AS BX$: FZ#=LOF(1): EK=0
50 PRINT BF$;" has";FZ#;"total bytes.": GOSUB 130:  WHILE NOT REOF
60 FH$=NUL$: FOR I=1 TO LEN(SH$)/2: GET#1,A#+I: FH$=FH$+FNH$(BX$): NEXT I
70 IF SH$<>FH$ THEN EK=EK+1: GOSUB 290: GOSUB 130:  WEND
80 IF EK<>0 THEN PRINT EK;"Errors - File NOT Updated.";: END
90 RESTORE: READ BF$: GOSUB 130:          WHILE NOT REOF
100 FOR I=1 TO LEN(CH$)/2 STEP 2: LSET BX$=CHR$(FNHEX(MID$(CH$,I,2)))
110 PUT#1,A#+I: NEXT I
120 PRINT A#;SH$;" ---> ";CH$:GOSUB 130: WEND: PRINT "Update Complete.": END
130 READ A$: IF INSTR(A$,DELIM$+DELIM$)=1 THEN GOSUB 190 ELSE A#=VAL(A$)
140 IF A#<0 THEN REOF=-1: RETURN ELSE REOF=0: READ SA$,CF$
150 T#=FIX(A#): IF T#<>A# THEN A#=T#*512+(A#-T#)*1000
160 IF A#>FZ# THEN PRINT A#;" is beyond file size.": END
170 T$=SA$: GOSUB 200: SH$=T$: T$=CF$: GOSUB 200: CH$=T$
180 IF LEN(SH$)=LEN(CH$)THEN RETURN ELSE PRINT SA$;" ";CF$;" badlength": END
190 T$=A$: GOSUB 200: A#=FNHEX(T$)-256: RETURN
200 TR$=NUL$: TX$=NUL$: P=INSTR(T$,DELIM$): IF P=0 THEN P=1
210 IF P=1 AND MID$(T$,1+DZ,DZ)=DELIM$ THEN AH=-1 ELSE AH=0
220 T$=MID$(T$,P*ABS(NOT AH)+(1+2*DZ)*ABS(AH)): FOR I=1 TO LEN(T$)
230 IF AH THEN GOSUB 280: GOTO 270
240 IF MID$(T$,I,DZ)<>DELIM$ THEN TR$=TR$+FNH$(MID$(T$,I,1)): GOTO 270
250 I=I+DZ: IF FNNOH(T$,I) OR FNNOH(T$,I+1) THEN PRINT T$;" Bad hex": END
260 TR$=TR$+MID$(T$,I,2): I=I+1
270 NEXT: FOR I=1 TO P-1:TX$=TX$+FNH$(MID$(T$,I,1)):NEXT: T$=TX$+TR$: RETURN
280 IF FNNOH(T$,I)THEN PRINT T$;"BadHx":END ELSE TR$=TR$+MID$(T$,I,1):RETURN
290 PRINT SH$;" SearchItem at";A#:PRINT FH$;" FileItem doesn't match": RETURN

1000 DATA "A:TQB.EXE": ' Change QuickBASIC's default file extension to QUB.
1010 DATA 164770, ".bas",        ".qub"   :'begin addr, old=.bas, change=.qub
1020 DATA 321.404,"*.bas",       "*.qub"  :'Decimal pt splits sector & offset
1030 DATA 12264,  "B&hBAA&h53", "Q&hBAUB":'&h prefix for each hex digit pair
1040 DATA 174914, "&h&h424153", "QUB"    :'&h&h means all that follows is hex
1050 DATA 179114, ".BAS",        ".QUB"   :'
1060 DATA -99              :' PATCHBIN.BAS Patch binary file at byte addresses
```

Listing 6: PATCHBIN.BAS automates patching files. It is easier to use than DEBUG and will not modify incorrect versions of a file.

leaving it loaded. From the Run menu, select *Compile...*, set the Output Options for Obj (BRUN.LIB), and proceed with the compilation. Then quit QuickBASIC and type **BUILDLIB DRAWIT.OBJ, DRAWIT.EXE** to create the DRAWIT library. You can now run the demo by entering **QB DRAWDEMO /L DRAWIT.EXE.**

Stephen R. Berg
Kailua, Hawaii

Patch 'Em Up Easily

Using DEBUG to alter .COM or .EXE files can be an imposing and uncertain task for many users. To make patching easier for those unfamiliar with DEBUG, I created the BASIC program PATCHBIN.BAS [Listing 6], which automates patching files. PATCHBIN.BAS works similarly to X-MAKER2 [*.*'s program-making program]; that is, only the DATA lines are changed to patch different files.

For safety's sake, you should create a duplicate of the file you wish to modify and give it a different name before running PATCHBIN. The first DATA statement should contain the name of that duplicate file. Each succeeding DATA statement contains the byte address (relative to the start of the file) where a change begins, and a list of the expected current values and corresponding changes.

(continues)

WHEN EVALUATING A PERFORMANCE VEHICLE, PAY CLOSE ATTENTION TO THE GRILL.

The most recognizable grills in the world display a symbol which promises what's behind them: the ultimate in precision German engineering.

The one above, however, delivers more than promise in its grillwork: the Mannesmann Tally MT87 workstation printer.

The slot in our grill is a special media path for single sheets and envelopes. It's a path along which we clearly outperform the competition, including the IBM® ProPrinter.™

The reason? Fanfold paper in our tractor assembly automatically backs out when you load from the front, then repositions on completion. There's no manual maneuvering, no extra paper layer to blur printing. And no way the ProPrinter can compete.

That's equally true in the long run. You can expect over 5,000 hours of rock-solid performance from the MT87 before even minor servicing. That's a figure matched by its companion 132-column printer, the MT88, and two other members of our workstation printer family, the MT85 and 86.

So before you invest in a lesser printer of any kind, consider your alternative.

Call the number below for the name of the dealer nearest you. And see the workstation printer that delivers more flexibility than the ProPrinter.

MANNESMANN TALLY

1-800-843-1347 Ext. 19

In Washington state, call:
206-251-5524 Ext. 19

Get more info. Go to Ad index.

Please refer to ad code when calling.
PCW0800704

The last DATA statement contains a negative number, which means there are no more changes. The DATA statements also serve as documentation for a program's patch history.

PATCHBIN produces an updated disk file and displays messages showing the relative byte address in decimal and the original and new contents in hexadecimal. Any input error terminates the program and invokes an appropriate error message.

PATCHBIN verifies the current contents of all bytes to be changed before it updates the file. This cross-check guards against problems with partial updates, version differences, and keying errors. PATCHBIN cannot verify that the replacement data is correct; the user must ensure that those values have been correctly keyed into the DATA statements.

Hex notation can be eliminated because the values can be in decimal form. The byte address can also be in sector and offset form if you specify the offset as a 3-digit "fractional" value of the integer sector portion [see line 1020]. You can delineate hex-formatted contents by prefacing each hex digit pair with &h. Placing &h&h before a group of characters signifies that all subsequent characters are hex digit pairs. The &h&h convention is likewise permitted for the byte address, enabling DEBUG's offsets to be used easily.

To demonstrate the simplicity of the DATA statements, Listing 6 shows PATCHBIN with DATA statements for patching QuickBASIC so that the compiler uses a file name extension of .QUB instead of .BAS. The DATA statements in Listings 7 and 8 perform patches previously presented in *PC World*'s July 1986 *.* column.

Roger L. Anderson
Lake Villa, Illinois

```
1000 DATA "A:TCOMMAND.COM"      :'My patch library for command.com ver.3.10
1010 DATA &h&h263b,"&h19","&h2a"     :'CLS w/ANSI.SYS EGA *.* July 1986
1020 DATA &h&h1967,"&h01","&h00"     :'ECHO OFF default *.* July 1986
1030 DATA 18000, "Bad command or filename", "Bad DOS command/Disk name"
1040 DATA -99 : ' Stored as COMMCOM.PAT
```

Listing 7: COMMCOM.PAT contains the DATA lines that PATCHBIN.BAS needs to perform two July 1986 *.* patches to COMMAND.COM.

```
1000 DATA "A:ANSI43.SYS"  :'EGA patch *.* July 1986
1010 DATA &h&h29d, "&h&h7408" , "&h&h9090"
1020 DATA &h&h2a1, "&h&h7404" , "&h&h9090"
1030 DATA &h&h27c, "&h19", "&h2b"
1040 DATA &h&h283, "&h18", "&h2a"
1050 DATA &h&h50c, "&h19", "&h2b"
1060 DATA &h&h58f, "&h19", "&h2b"
1070 DATA -99 : 'Stored as ANSI.PAT
```

Listing 8: ANSI.PAT contains the DATA lines that PATCHBIN.BAS needs to perform a July 1986 *.* patch to ANSI.SYS.

Commas Come to BANNER.BAS

Even with Bob Thompson's correction ["BANNER.BAS Bug Corrected," *.*, *PCW*, May 1987] to the BANNER program ["Banner Performance," *.*, *PCW*, January 1987], the program does not accept commas, and that frustrates me.

The problem, I've determined, is the INPUT command in line 210. Changing it to LINE INPUT allows commas and still prints quick banners of up to 255 characters.

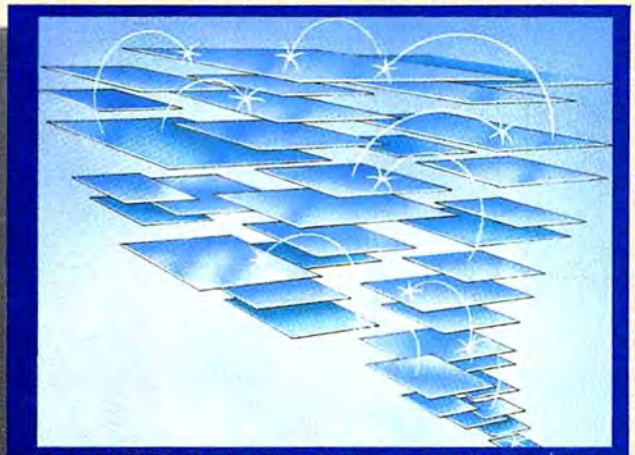
Rex W. Walker
Speedway, Indiana

*Join the *.* global exchange. We'll pay $25 to $200 for each item published. Send your personal computer discoveries to* Star-Dot-Star, PC World, *501 Second St., San Francisco, CA 94107, or electronically to MCI Mail PCWORLD/179-3813, 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 acknowledge any submitted materials. Accepted contributions will be acknowledged by payment.*

(Turn to page 354 for September's Softstrips)

Announcing the fastest most amazing way to deal with all your random information

TORNADO NOTES™



Up to 25,000 intelligent windows let you process information in an amazing new superfast way. For your IBM-PC.

"Excellent, Excellent, Excellent, Excellent"
Patrick Marshall,
PC World 7/87

Rave Reviews

"I heartily recommend it with no reservations"
Dr. Michael Ecker, *Computer Shopper 10/86*

"Product of the month" — "extremely useful"
Will Zachman, IDC, *Software News 7/86*

"fantastically wonderful"
Steve Gibson, *InfoWorld 12/1/86*

"simple ... superfast"
Diment, *New York Times 12/14/86*

Special Introductory Price $49.95
$3.50 Shipping

30-DAY MONEY-BACK GUARANTEE

New Concept

Until now, with or without a computer, there was just no good way to deal with all your notes, contacts, ideas, and other random information. Now there is a quick FREE-FORM way that is so flexible; so useful; and so fast, you will be amazed. It's called Tornado Notes. It's a memory-resident software package based on a totally new concept that is turning skeptics into fanatics. It not only lets you instantly enter, combine, and find any type of information - it helps you remember more, make better decisions, and get the most out of your computer. Whether you are a business executive, computer programmer, writer, or zoologist, Tornado Notes will significantly improve the way you work and think - or your money back. And it's fun too!

Friendly Power

Tornado Notes lets you do everything from managing a busy desk, to following up on sales leads, to planning a new invention. In up to 500 windows! You can even do simple wordprocessing. To start a new note all you do is press N (for Note)—no cumbersome file names—no extra keystrokes. It's quick and easy. And each note has its own window—so you can separate your information. When you need to find a note (or group of related notes), all you do is press G (for Get) with any word or phrase from any note—you'll see the search happen as you type! Or you can look through your notes with the arrow keys in windows that instantly pile up and lift away. These are just three of over 18 features that both beginners and experts are raving about. But don't let the easy commands fool you—Tornado Notes is a powerful productivity tool.

REAL Intelligence

We don't claim any outer-space "Artificial Intelligence". But, when Harry calls you on the phone...in two seconds flat, from 287 electronic notes, you'll get the 6 notes on Harry...before he even finishes his first sentence! That's just REAL intelligence.

Text Spreadsheet

Tornado Notes has NOTHING to do with programs that make outlines or "attach" notes. It's like a spreadsheet for text! And it's as far ahead of "resident notepads" as Lotus 1-2-3™ is from an ABACUS!

Serious Fun

Tornado Notes is fun to use. But most important, it becomes a focal point for whatever you do, with a surprisingly widespread effect on the way you work and think. User surveys show you may well use Tornado Notes more than any other software package! Order today.

SPECIFICATIONS

FEATURES: unlimited note size, scrolling within window, auto word wrap, cut & paste, time & date stamp, full printing, note forms, foreground data exchange, join & dup notes, import & export ASCII & Wordstar, mono or selectable color, definable Hot-key, non-resident option, LAN support, context help, supports extended ASCII, smart adjustable windows, parallel text processing, progressive resolution searching without keywords, and more. **COMPATIBILITY:** IBM-PC/XT/AT and compatibles, mono, CGA, text EGA, and Hercules graphics displays; 60K minimum RAM, 3.5" disk on request. **CAPACITY:** Up to 500 short notes per pile - 50 piles. **SPECIAL APPLICATIONS:** software development, "Tornado" expert systems, customer support terminals, message centers, information desks, electronic notebooks, etc.

☐ **YES,** send me ___ Tornado Notes at $49.95 each plus $3.50 shipping ($10 outside USA & Canada). NJ residents add $3.00 tax. No purchase orders. To order, mail coupon or call (800) 342-5930.

Payment: VISA MC Check

Credit Card Expiration _____

Card # _____

Not Copy Protected
30-Day Money-Back Guarantee

Name: _____

Address: _____

_____

City: _____

State: _____ Zip: _____

Telephone: _____

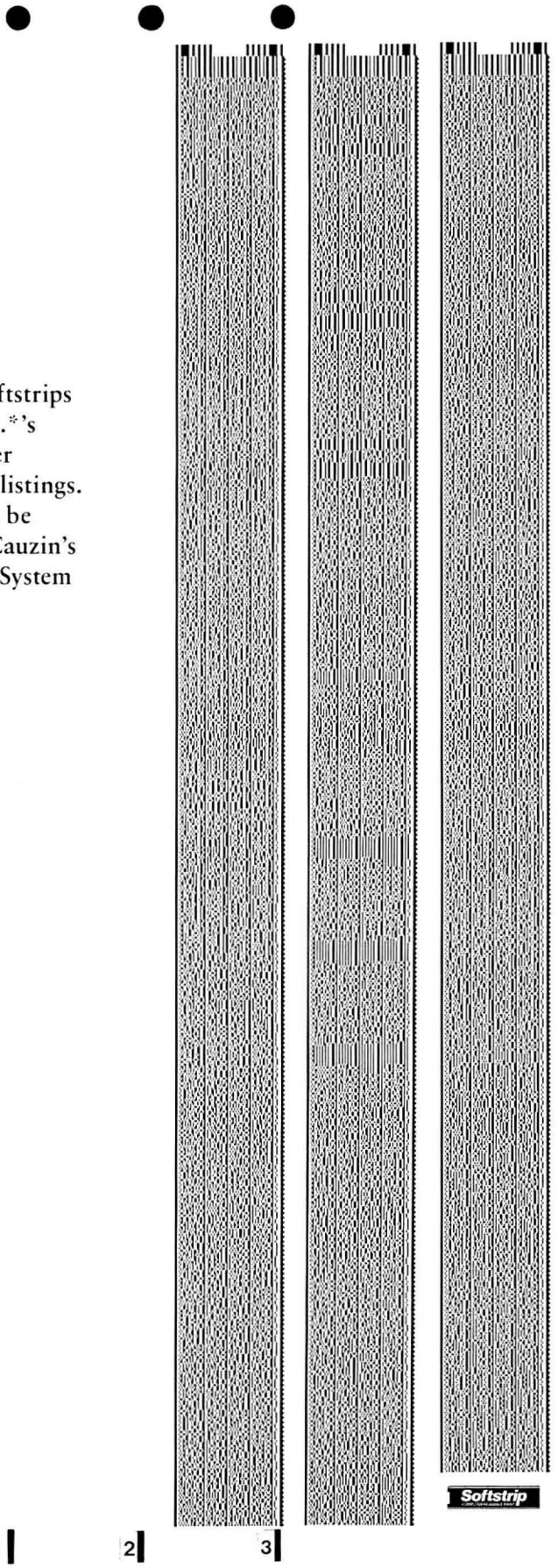
MICRO LOGIC CORP.
Dept T56, 100 2nd St., POB 174
Hackensack, New Jersey 07602

MICRO LOGIC CORP.
Dept T56, 100 2nd St., POB 174
Hackensack, New Jersey 07602

TO ORDER CALL: (800) 342-5930 VISA/MC ACCEPTED
Technical questions & NJ residents: (201) 342-6518
24 hour modem orders: (201) 342-8101
Dealer inquiries invited

© 1987 Micro Logic. European marketing by Atlantex Inc. (203) 655-6980. Trademarks: Lotus 1-2-3 — Lotus Development Corp; IBM-PC/XT/AT — IBM.

.



These Softstrips contain *.*'s September program listings. They can be read by Cauzin's Softstrip System Reader.

telemart

oing 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

FCC Approved
Non-Infringing Bios
All First Quality Materials
1 Year Limited Warranty
IBM Compatible

From As Low As

$346

Call For Details and Other System Configurations.

MIT SYSTEMS **Turbo PC/XT**

Up to 640K on Mother Board
Brand Name Floppy Drives,
135 Watt Power Supply, Slide Case,
AT Style Keyboard,
4-10 MH_z Clock Speed,
(Keyboard Selectable),
8 Expansion Slots

FREE AIR EXPRESS SHIPPING
You Pay the Ground
We Pay the Air

SOFTWARE

WORD PROCESSORS

Easy Extra	$ 79
Leading Edge Word Processor	25
Leading Edge W/P with Spell & Merg	59
Lightening	55
Microsoft Word 3.11	175
Multimate Advantage II	Call
PFS: Professional Write	89
Volkswriter 3	136
Volkswriter Deluxe Plus	59
Webster New World Writer	72
Webster Spell Checker	33
Webster Thesaurus	39
Word Perfect (Ver. 4.2)	195
Word Perfect Executive	103
Word Perfect Library	54
Wordstar 3.31	162
Wordstar Pro Pack 4.0	233
Wordstar 2000 Plus 2.0	209

ACCESSORIES

Copy II Option Board	$ 75
Masterpiece	84
Masterpiece Plus	97
Microsoft Mach 10 w/windows & Mice	335
MousePad by MouseTrac	9
Summasketch 12x12 Tablet	350

COMMUNICATIONS

CompuServe Starter Kit	$ 19
Crosstalk XVI	88
Microsoft Access	137
Mirror II	33
Remote	88
Smartcom II	79

ACCOUNTING

BPI - G/L, A/R, A/P, Payroll	$159 ea.
Computer Associates - G/L, A/R,A/P	379
DAC Easy Accounting	38
DAC Easy Payroll	28
One Write Plus	140
One Write A/P, A/R, Payroll	125
Open Systems-G/L,A/R,A/P,Payroll 3.0	409 ea.
Timeslips	55

MONEY MANAGEMENT

Tobias Managing Your Money	Call
Dollars & Sense w/Forcast	$ 92

GRAPHICS/MICE

Chartmaster	Call
Diagram Master	Call
Energraphics 2.0	$269
Generic CAD w/Dot Plot	75
Harvard Graphics	Call
IMSI Mouse w/Dr. Halo II	92
In-A-Vision	259
Logimouse	66
Logimouse w/paint	85
Map Master	Call
Microsoft Buss Mouse	103
Microsoft Chart	163
Microsoft Serial Mouse	115
News Room	31
News Room Professional	65
PC Buss Plus Mouse (New Ver.)	99
PC Mouse (New Ver.)	89
Printmaster	29
Print Shop	32
Signmaster	Call
Turbo Graphix Tool Box	38
Windows Draw!! w/clip art	163

LANGUAGES

Basic Compiler (Microsoft)	$219
C Compiler (Microsoft)	249
Cobol Compiler (Microsoft)	385
Fortran Compiler (Microsoft)	245
Lattice C Compiler	236
Macro Assembler (Microsoft)	83
Run C Interpreter	65
Ryan McFarlan Fortran	339
Ryan McFarlan Cobol	539
Pascal Compiler (Microsoft)	165
Quick Basic 3.0	55
Turbo Jumbo Pack (New Ver.)	159
Turbo Pascal w/8087 & BCD	55
Turbo DataBase Tool Box	38
Turbo Prolog	54

DESKTOP PUBLISHING

Harvard Professional Publisher	$329
Newmaster	48
Pagemaker	479
PFS: First Publisher	45
Ventura Publishing	475

UTILITIES

1 DIR Plus	$ 46
Carousel 2.0	29
Copy II PC	19
Copywrite	40
Cubit	25
Disk Optimizer 2.0	29
Double DOS 4.0	25
DS Back-Up Plus	25
Fastback	80
Homebase 2.5	40
Microsoft Windows	55
Norton Commander	36
Norton Utilities 4.0	48
Note It Plus	Call
PC Tools	19
Printworks	36
Prokey 4.0	69
Sidekick (Unprotected)	45
Sideways 3.1	37
Smart Notes	40
SQZ	45
Superkey	Call
Take Two	79
Unlock A, or B Plus	32
Unlock D Plus	43
XTree	27

TRAINING

Flight Simulator	$ 27
Let's C	38
Mastertype	23
Mind Prober	25
MS Learning DOS	27
PC Logo	69
Turbo Tutor	23
Typing Instructor	27
Typing Tutor III	27

INTEGRATIVE SOFTWARE

Ability	$ 55
Enable 2.0	Call
Framework II	395
PFS: First Choice	82
Smart Software System 3.1	409
Symphony	449

DATA BASE MANAGEMENT

Clipper	$ 375
Cornerstone	53
dBase III Plus	379
dBase III Lan	589
Extended Report Writer	Call
Eureka	55
FoxBase Plus	245
Genifer	188
Knowledgeman II Promo Pack	319
Nutshell	75
Paradox 2.0	Call
PFS: Professional File	112
Q & A	199
Quickcode Plus	138
QuickReport	138
Revelation	449
Revelation Burro Disk	249
R:Base Clout	Call
R:Base 5000 System V	Call
Reflex	79
VP Expert	47
VP Info	47

SPREADSHEETS

Cambridge Analyst	$ 59
4 Word	55
HAL	104
Lotus 1-2-3 Ver. 2.01	Call
Lotus Report Writer	67
Multiplan	108
Spreadsheet Auditor 3.0	82
Supercalc 4	Call
Twin Classic	35
VP Planner	47

PROJECT MANAGEMENT

Harvard Total Project Manager	$ 282
Microsoft Project	218
Super Project Plus	Call
Timeline 2.0	235

DISKETTES

Maxell M2S (Qty. 100)	$ 82.50
Sony MD-2 (Qty. 100)	80
Sony 3 1/2 S/S D/D (Qty. 100)	107.50

HARDWARE

PRINTERS

Alps	
All models	Call
Brother Printers	Call
Citizen Printers	Call
120D	159
Other models	Call
Diablo	
D-25	469
635	759
Diconics	
150	299
Epson Printers	Call
Hewlett-Packard	
Laser Jet Series II	1829
NEC	
P-6,P-7,P-9 Series	Call
3510, 3550	729
8810, 8850	1045
Okidata Printers	Call
Panasonic Printers	Call
1080I	155
Star Micronics	Call
Toshiba	
321/SI	Call
341E	669
351 Model II	1045

MODEMS

Hayes	
300	129
1200	285
1200B	249
2400B	389
Prometheus	
1200B	125
Other Models	Call
US Robotics	
Password 1200	149
Courier 2400	335
Microlink 2400	335

COMPUTERS

NEC	
Multispeed	Call
Panasonic	
Business Partner	$ 719
Sr. Partner	969
Exec. Partner Dual Drive	1429
Toshiba	
T-1100 Superwist	Call
T-3100	Call
Wyse	
286	1729

BOARDS

AST	
Six Pack Plus	$ 139
Other Models	Call
ATI	
EGA Wonder	245
Hercules	
Color Card	145
Graphics Card Plus	165
Graphics Card	175
Intel	
Above Board	210
PS/PC	239
Orchid	
EGA	565
Turbo EGA	449
Jet 386 Accelerator/AT	829
Tiny Turbo 286	399
Paradise	
5 Pack	99
Autoswitch 350	205
Autoswitch 480	279
Tecmar	
Graphics Master	409
Other Models	Call
Captain (No Memory)	109
Video-7	
Vega Deluxe	285

DISK DRIVES

Bernoulli Box	
10 Meg	$ 865
20 Meg	1199
40 Meg	1729
Segate 20 MG w/WD Controller	339

MONITORS

Amdek Monitors	Call
NEC	
Multisync	$ 549
Multisync Plus	Call
Other Models	Call
Princeton Graphics Monitors	Call

Canon PC-25 929

- **No Charge for VISA and Mastercard**
- You Pay the Ground Shipping - We Pay the Air
- Ground Shipping & Handling $6.00
- Free Air applies ONLY to orders up to 10 lbs & Over $50
- All product carries a manufacturer's warrantee. All Guarantee rebates, trial period priviledges & promotional programs are handled by the manufacture only
- No APO, FPO, or international orders please. **Mailing Address**
- **Call before submitting P.O.'s**
- Personal and Company Checks Will Delay Shipping 3 weeks. Order Lines Mon-Fri 7 a.m. - 6 p.m.
- Prices, Terms & Availability Subject to Change Without Notice. Saturday 9 a.m. - 1 p.m.
- Add 3% for C.O.D. Orders
- **We Do Not Guarantee Machine Compatibility**
- **All Sales Are Final**

2222 E. Indian School Rd. Phoenix, AZ 85016
Order Processing: (602) 224-9345
10 a.m. - 3 p.m. Mon.-Fri.

"The Breakthru 286 performed flawlessly with every application we handed it, including copy-protected programs and nine memory-resident utilities at once."
Stephen Manes, PC Magazine

"...the Breakthru 286 was the card of choice."
PC BusinesSoftwareview (Rated #1)

"...Breakthru 286 is a good value and a quality product backed by effective support."
Dan A. Griffin
The Newsletter of the AutoCAD User's Group

"The PCSG Breakthru 286 achieved the best performance results of the caching boards tested."
Ted Mirecki, PC Tech Journal (Rated #1)

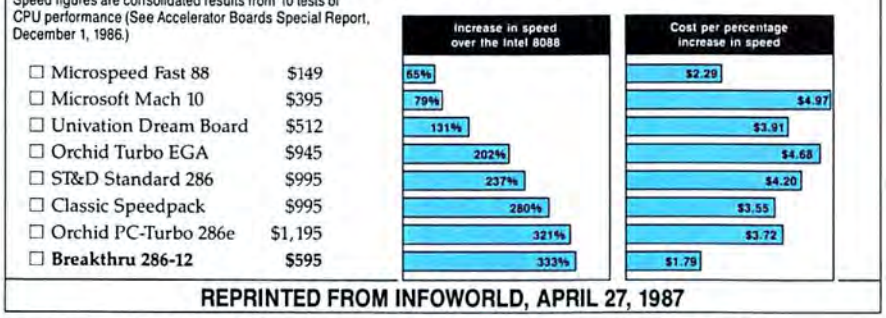
"The 12-MHz Breakthru 286-12 speedup board is the fastest of those tested, but not the most expensive. On a dollar per-horsepower basis, it could be called the cheapest boost available for an XT."
Mark Welch, InfoWorld (Rated #1)

Think You Need an AT?

Make Your IBM PC Faster Than an AT in Just 5 Minutes!

Accelerator Cards: Speed and Value

Speed figures are consolidated results from 10 tests of CPU performance (See Accelerator Boards Special Report, December 1, 1986.)



REPRINTED FROM INFOWORLD, APRIL 27, 1987

Breakthru 286-8MHz-$395
Breakthru 286-12MHz-$595

LIGHTNING™—FREE with Breakthru speedup hardware—$89.95 purchased separately

We are excited about our three speedup products. You probably know about our Lightning disk access speedup software that was awarded PC Magazine's Best of 1986 award (see box). After the smashing success of Lightning, in late '86, we guaranteed the Breakthru 286 board to be literally the most advanced, fastest, most feature-rich board available. The runaway success it has enjoyed truly proved that assertion. Now we go ourselves one better with the Breakthru 286-12. This new board has the clock speed cranked up from 8 to 12 MHz for speeds up to 10.2 times faster than an IBM PC. It is 50% faster than an 8MHz IBM AT, and up to a whopping 1,000% faster than a regular PC.

But, no speedup board cuts disk access time in half

LIGHTNING™

software can - $89.95 or FREE w/Breakthru

"Lightning is almost mandatory...." -
Steve Manes, PC Magazine
Best of 86 review

Loads with the DOS - always ready as a background program to accelerate disk access. You do nothing - everything is automatic. Programs that frequently access the disk (hard or floppy) are made instantly up to 2 to 4 times faster. Uses a principle greatly enhanced from mainframe technology called caching. Fully exploits Above Board memory.

LIGHTNING is the standard against which all our competition measures itself because we achieve universal compatibility with other software. Data is never lost. Order **LIGHTNING** separately or get it free with your Breakthru 286 board.

HERE'S WHY THESE TWO BOARDS ARE SO SPECIAL.

First, they install so easily. A half-slot card means you don't even have to give up a full slot. What's more, unlike competing products it works in the Compaq Portable and most clones. 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.

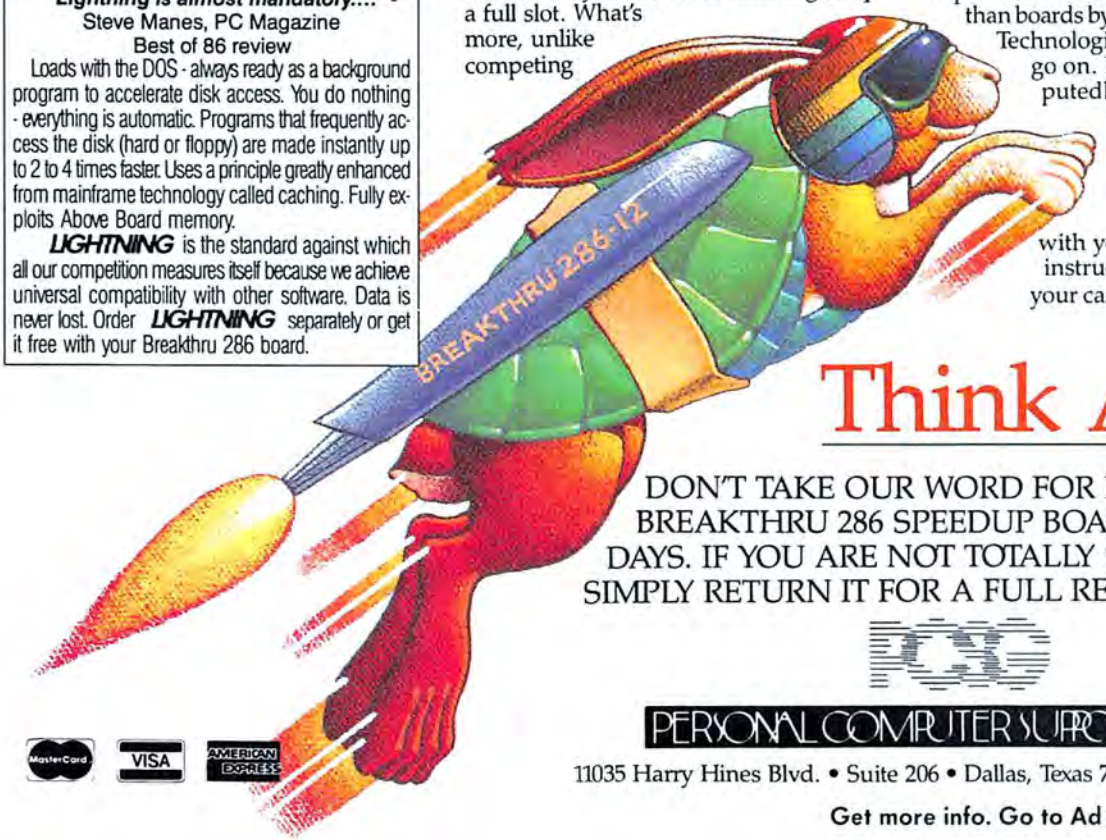
Second, they are advanced. The BREAKTHRU 286 replaces the CPU of the PC or XT with an 80286 microprocessor that is faster than the one found in the AT. Has a 80287 math coprocessor slot for numeric intensive applications. A 16K cache memory provides zero-wait-access to the most recently used code and data. Speed switching software allows you to drop back to a lower speed on the fly for timing sensitive applications.

Third, you have full compatibility. All existing system RAM, hardware, and peripheral cards can be used without software modification. Our boards operate with LAN and mainframe communication products and conform to the Expanded Memory Specification (EMS). Software compatibility is virtually universal.

Faster and smarter than an AT - PCSG guarantees it.

Fourth, these are the best. There are several other boards on the speedup market. We at PCSG have compared them all, but there simply is no comparison. Many cards offer only a marginal speedup in spite of their claims and others are just poorly engineered.

We are really excited about these products. PCSG makes the unabashed statement that the BREAKTHRU 286 card represents more advanced technology than boards by Orchid, Quadram, P.C. Technologies, Phoenix...we could go on. Breakthru 286 is undisputedly the turbo board with the biggest bang for the buck. And we include FREE the $89.95 acclaimed Lightning software. Call today with your credit card or COD instructions and we will ship your card the very next day.



Think Again.

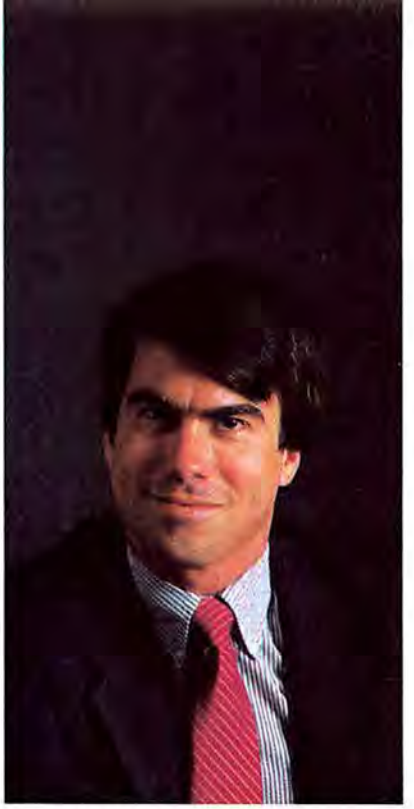
DON'T TAKE OUR WORD FOR IT. USE EITHER BREAKTHRU 286 SPEEDUP BOARD FOR 60 DAYS. IF YOU ARE NOT TOTALLY SATISFIED SIMPLY RETURN IT FOR A FULL REFUND.

MasterCard VISA AMERICAN EXPRESS

PCSG
PERSONAL COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. • Suite 206 • Dallas, Texas 75229 • **(214) 351-0564**

Get more info. Go to Ad index.



Kevin Strehlo

Telephone Power Line

Software for the new age of work-group computing is improving communication and getting things done.

At first, Nancy Welborne used her PC for little more than the writing that she did as a marketing consultant. Then she took a sales training course from Fernando Flores that revolutionized her business and her use of computers.

The course focused heavily on the role of communication in group productivity. The principles that Flores expounded seemed straightforward enough—guidelines that Welborne had always followed intuitively. Now, however, she saw them explicitly laid out as an organizational framework, giving her a way to redefine her clients' on-the-job interactions and improve their efficiency.

Welborne didn't notice at first, but gradually the focus of her business shifted. Six months after taking the course she was spending less time on marketing consultation and more time helping firms smooth communication among the members.

The first such firm was a restaurant run by three people who could never agree. Welborne quickly freed them from the too-many-chefs syndrome. Soon thereafter, she helped a $10 million company with a real problem: disagreements between the two top executives. "They were almost to the stage of fisticuffs," she recalls.

Welborne's approach followed the central theme of Flores' seminar: Good communication requires more care in listening than in speaking. Faulty interpretation can so muddy the waters that nothing gets done. She convinced her clients of the need to clarify requests, to make them concrete rather than vague and emotional. "It boils down to this: Were you really listening to them, and were they listening to you?"

In the meantime, Flores himself had put together a company called Action Technology in Emeryville, California, to capture his management theory in software. The result of that effort is *The Coordinator,* a program that makes

(continues)

The new standard for high performance STATISTICAL SOFTWARE

CSS

COMPLETE STATISTICAL SYSTEM WITH DATA BASE MANAGEMENT AND GRAPHICS

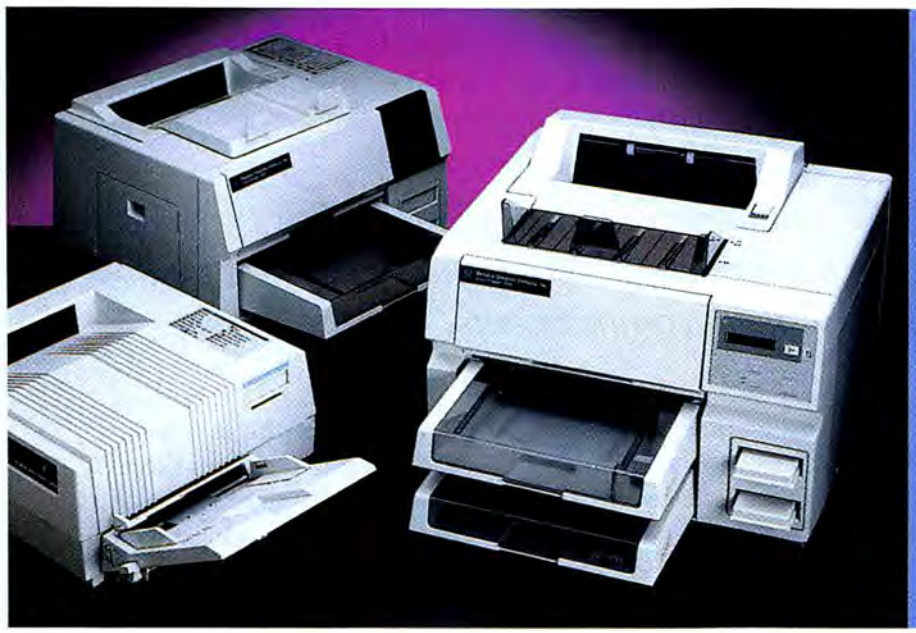
- CSS is currently the fastest statistical software available for IBM and compatible computers.
- CSS is the first statistical package to offer an advanced user interface that meets 1987 software quality standards.
- The CSS optimized user interface with super-fast hierarchical menus features elements of artificial intelligence; even complex analyses require only a few keystrokes (batch processing is also supported).
- All statistical procedures are integrated with fast data base management and instant (presentation quality) graphics.
- All CSS screen output is displayed via customized Scrollsheets™ (i.e., dynamic, user controlled, multi-layered tables with cells expandable into pop-up windows); all numbers in a Scrollsheet™ can be instantly converted into a variety of presentation quality graphs; contents of different Scrollsheets™ can be instantly aggregated, combined, compared, plotted, printed, or saved (Scrollsheet™ was first introduced in CSS and it is a registered trademark of StatSoft).
- The flexibility of the CSS input/output is practically unlimited: CSS offers an intelligent interface (read/write) to all common file formats (Lotus, dBIII+, DIF, SYLK,...) and can even access data directly from screens of incompatible programs.
- CSS data files can be as large as your operating system (DOS) allows.
- CSS precision exceeds the standards of all common precision benchmarks.
- CSS features comprehensive, state of the art implementations of: Basic statistics, Multi-way frequency tables, Nonparametric statistics, Exploratory data analysis with analytical graphs, Multiple regression methods, Time series analysis with modeling and forecasting (incl. full ARIMA), General ANOVA-/ANCOVA/MANOVA, Contrast analysis, Discriminant function analysis, Factor analysis/Principal components, Multidimensional scaling.
- Technical note: The CSS user interface and all I/O were written in Assembler and bypass DOS; graphics and data management were written in Assembler and C; the computational algorithms were written in Assembler and optimized Fortran.
- Price: $495 (plus $5.00 sh/h)

StatSoft

2832 East 10th Street, #4 • Tulsa, Oklahoma 74104 • (918) 583-4149

Get more info. Go to Ad index.

Long life and high speed run in our family.



Introducing the LaserImage 3000™ from PCPI. It gives you 15 page per minute speed, 20,000 pages per month capability and the industry's longest life cycle.

The LaserImage 3000 — the most productive laser printer available.

No other laser printer in its class can surpass the 3000's speed. But there is more to productivity than high speed. There's reliability. The LaserImage 3000 is built to last. You can expect a 1,500,000 page life cycle from it's advanced engine. Nationwide on-site service is also available.

Choose the PCPI laser printer that's right for you.

Whether you need the 6 page per minute speed and economy of the LaserImage 1000,™ the 8 page speed of the LaserImage 2000™ or the high speed of the LaserImage 3000,™ you are selecting a printer designed to give you dependability and long life. As with any close family, the LaserImage Series™ printers are fully compatible.

All members of the LaserImage family have a plotter and a graphics printer "built in."

The LaserImage family emulates LaserJet Plus, Diablo 630, IBM Proprinter, HP plotters and the Epson FX/80 — all standard. If your software works with these, it will work with any of the LaserImage Series printers.

Advanced graphic capabilities.

The LaserImage Series utilizes 100% of the page for graphics with sharp 300 dots per inch resolution. You can print in either the portrait or landscape format with PCPI's full bit map fonts and graphics.

Create the perfect image.

Choose your typeface from 31 standard near-typeset quality fonts, or select other optional typefaces from the PCPI font library.

Call PCPI toll free for the dealer nearest you.

Personal Computer Products, Inc.™

11590 West Bernardo Court
San Diego, CA 92127
(619) 485-8411; Telex: 499-2939
FAX: (619) 487-5809

Toll Free Information:
1-800-225-4098
In California:
1-800-262-0522

PCPI is a public company whose shares are traded on the NASDAQ exchange.

© 1987 Personal Computer Products, Inc. LaserImage, LaserImage Series, LaserImage 1000, 2000 and 3000 are trademarks of Personal Computer Products, Inc. IBM Proprinter is a registered trademark of International Business Machines Corporation. Epson FX/80 is a registered trademark of Epson America, Inc. HP and LaserJet Plus are registered trademarks of Hewlett-Packard Company. Diablo 630 is a registered trademark of Xerox Corporation.

Get more info. Go to Ad Index.

listening easier by providing a structured environment in which people clarify both what they ask of others and what others ask of them. The software also combines electronic mail and project management to produce a system best called "management by memo."

The Coordinator assumes that tasks get done because people communicate their commitments to completing them. A project is viewed as a conversation–an exchange of electronic memos in which commitments for action are made or possibilities discussed. Business problems arise when responsibilities are not made clear, so *The Coordinator* prompts workers to explicitly label memos that request or accept commitments.

The program not only spells out requests but also elicits appropriate responses: promises, counteroffers, or nonacceptances. If a request is accepted, an action item is automatically placed on the calendars of both parties. Alert dates and reporting dates are optional. Reminders pop up when appropriate.

Calendars and commitments can be searched by conversations, subconversations, participants, keywords, dates, or combinations of those factors. If someone joins a project or suddenly needs to know what has been going on, a single command can bring up the entire conversation. Naturally, people can be copied on conversations as they proceed.

But *The Coordinator*'s Conversation Manager does more than simply build a calendar; in project management fashion, it tracks the network of commitments made within a work group. Often, the chain of dependencies is many layers deep. If one commitment is not fulfilled on time, the whole network is recalculated accordingly, and those affected by the slippage are notified.

Some employees feared that The Coordinator *would document their failures to meet commitments.*

Welborne implemented *The Coordinator* at one small company, with dramatic results. Then, at a party, she met the vice president in charge of Frito Lay company logistics. The vice president was responsible for 1500 people nationwide, all of whom faced serious problems reaching one another.

"I told him that I could have everyone at Frito Lay working together in a far different way than they were and that I could save him a lot of money," Welborne recalls. "He was intrigued by the outrageousness of my claim."

She started at the top of Frito Lay with headquarter executives and moved down the chain of command, using a room full of PCs and phone lines in Action Technology's San Francisco offices as the communications hub. The system paid for itself in no time by eliminating phone tag and cutting communications costs among the 25 traffic centers, 4 warehouses, 4 zone offices, and 30 salespeople who eventually were linked over ordinary phone lines.

Then commitment tracking began. At first, some employees feared that *The Coordinator* would document their failures to meet commitments. But the chance to interface with executives soon outweighed those fears. Field employees no longer felt isolated. Once their PCs were linked, addressing a memo to any of their fellow workers was no more complex than typing out the person's code name.

Says Welborne, "One man who was stuck out in a little shack of an office in the middle of a potato field told me, 'You just don't know how this has saved my life.'"

Another participant who was being transferred worried that he would be left out while a computer was being requisitioned for him at the new site. He felt that he could no more function without *The Coordinator* than he could without a phone, so he broke with strict operating procedures and smuggled his old computer along.

(continues on page 366)

Order Status, Technical & Other Info. (602) 246-2222

Call for programs not listed

WAREHOUSE DATA PRODUCTS

SPECIAL
WORD PERFECT
$195

TOLL-FREE ORDER LINE 1-800-421-3135

FREE SOFTWARE!
Purchase over $100 and receive one of these disks absolutely FREE! Purchases over $250 get two free disks, over $400 get three, or get all four disks when your purchase is over $500! **1) MIXED BAG** —A great assortment of utilities and games all packed on one disk. **2) PC-WRITE** — Try this famous feature packed word processor. It's a winner! **3) FONT-SET** — Lets you set popular fonts like bold, underline, etc. on most late model printers from Citizen, Epson, NEC, Okidata, Panasonic, Star, Toshiba, etc. You can even use your printer like a typewriter! **4) ABC-LIST** — Great mailing list program! Sort on any field, do qualified searches, print reports and mailing labels, and more!

— SOFTWARE —

ACCOUNTING
BPI AP, AR, PR, GA ..... **$169 ea.**
Cyma ..... **Call**
Dac Easy Accounting **39**
Dollars & $ense **94**
Managing Your Money 3.0 ... **117**

COMMUNICATION PROGRAMS
Carbon Copy Plus **115**
Crosstalk **89**
Remote **89**
Smartcom II **83**

DATA BASE MANAGERS
Clipper **380**
Clout 2 ..... **Call**
Condor III **310**
Knowledgeman II ..... **Call**
Powerbase 2.2 ..... **169**
Q&A ..... **Call**
Quickcode **138**
Quicksilver **295**
Quickreport **138**
Revelation **469**
R: Base System V **425**

EDUCATIONAL
Flight Simulator **28**
Turbo Tutor II **25**
Typing Tutor III ..... **Call**

GRAPHICS
Chartmaster ..... **Call**
Energraphics 2.01 ..... **294**
In-A-Vision **275**
Microsoft Bus Mouse **106**
Microsoft Chart **164**
Microsoft Serial Mouse **119**
Newsroom **31**
OPTI Mouse W/DR Halo II **96**
Printshop **33**
Signmaster ..... **Call**

INTEGRATED
Ability **59**
Enable **355**
Smart Software ..... **Call**

LANGUAGES
Lattice C Compiler **$242**
Microsoft C Compiler **249**
Microsoft Fortran 4.0 ..... **255**
Microsoft Macro Assembler ... **84**
Microsoft Pascal Compiler ... **166**
Microsoft Quick Basic 3.0 ..... **55**
Ryan McFarlan Fortran **305**
Ryan McFarlan Cobol **479**
Turbo Basic **55**
Turbo C **55**
Turbo Pascal w/8087 + BCD... **55**

PROJECT MANAGER
Harvard Total Project II **326**
Microsoft Project **219**
Super Project Plus ..... **Call**
Timeline 2.0 ..... **242**

SPREADSHEET
Microsoft Multiplan **108**
Spreadsheet Auditor 3.0 ..... **82**
Supercalc 4 ..... **Call**
VP Planner **49**

UTILITIES
Copy II PC **19**
Copywrite **39**
Desqview 2.0 ..... **72**
Double Dos **30**
Fastback **85**
Graph in the Box **55**
Homebase **39**
Microsoft Windows **55**
Norton Utilities 3.1 ..... **48**
Prokey 4.0 ..... **70**
Q DOS **49**
Sidekick (unprotected) **55**
Sideways 3.1 ..... **39**

WORD-PROCESSING
Easy Extra **88**
Microsoft Word ..... **Call**
Multimate Advantage II ..... **Call**
Volkswriter 3 ..... **139**
Webster Spellcheck **37**
Word Perfect **195**
Wordstar **162**
Wordstar Propac **233**
Wordstar 2000+ **206**

— HARDWARE —

ACCESSORIES
Copy II PC Board **75**
150 watt power supply **69**
Mini Micro Parallel Print Buffer **69**
Masterpiece **88**
Masterpiece Plus **99**

BOARDS
AST Advantage Premium .... **Call**
AST Premium Sixpac ..... **Call**
AST Sixpac (384K) **229**
Hercules Color Card **145**
Hercules Graphics + ... **182**
Intel Above Boards ..... **Call**
J Laser (Tall Tree) ..... **Call**
J Ram 3 (Tall Tree) **169**
J Ram 3 AT (Tall Tree) **207**

COMPUTERS

AZ 386
80386-16 Micro Processor, 1 MB of Ram, Teac 1.2 MB disk drive, 220 watt power supply, 6 layer mother board, RT keyboard **$2995**

AZ TURBO XT
IBM Compatible Computer, 135 watt power supply, 1 brand name floppy disk, 1 parallel port, 1 serial port, 1 game port, PC keyboard, 640K Ram, 8 expansion slots, 8088-2 processor ... **$519.00**

AZ TURBO AT
IBM AT Compatible, 512K, 6 & 8 MHZ, keyboard, graphics card, 220 watt power supply, MS/DOS 3.2 GW Basic **$1025**

AST 286 PREMIUM COMPUTER
512K, expandable to 2MB on the system board, RT enhanced style keyboard, parallel, serial and clock, 1.2 MB floppy disk drive, 7 expansion slots, two 32 bit fastram slots, DOS 3.1 & Basic
1 year warranty ..... **Call**

EGA BOARDS
GBI Board ..... **Call**
Paradise Auto Switch 480 EGA Card **290**
Quad EGA Plus ..... **Call**
Vega Deluxe **299**

EGA MONITORS
AMDEK 722 ..... **455**
Casper EGA ..... **Call**
NEC Multisync **559**

HARD DRIVES
AZ 20 MB Hard Card **425**
AZ 30 MB Hard Card ..... **Call**
Filecard 20 MB **499**
Maynard 20 MB Hard Card ... **Call**
Plus Hardcard 20MB ..... **Call**
Seagate 20 MB Int. w/cont. ... **309**
Seagate 30 MB Int. w/cont. ... **349**
Seagate 30 AT Int. **515**

KEYBOARDS
Keytronics 5151 ..... **162**
Keytronics 5153 ..... **269**
RT Style Keyboard **89**

INCREDIBLE VALUES
Nationally advertised boards for IBM PC and most compatibles at give away prices.
Keyboards (similar to 5151) **$79**
Monochrome Board w/printer port (similar to Hercules Graphics) **$79**
Expansion Board 0 to 576K **$42**
Multifunction Board w/game port (similar to AST six pack) **$79**
Four Drive Floppy Controller **$39**
Color Card w/o printer port **$69**
Color card w/printer port **$79**

MODEMS
Everex 300/1200 ..... **89**
Hayes 1200 ..... **Call**
Hayes 1200B ..... **Call**
U.S. Robotics Courier 2400 ... **339**
U.S. Robotics Passwd. 1200 .. **180**

MONITORS
AMDEK 410 Amber **157**
AMDEK 600 ..... **339**
Magnovox Color RGB ..... **Call**
Princeton Max 12 ..... **138**
Samsung TTL Amber **72**
Samsung TTL Green **70**
Samsung Color w/tilt/turn .... **Call**

PRINTERS
CANON LASER
CITIZEN
MSP-10 ..... **249**
MSP-15 ..... **315**
MSP-20 ..... **285**
Premiere 35 Daisywheel **459**
EPSON - Call on all models
LASER IMAGE 2000 ..... **Call**
NEC
NEC P5XLP **959**
NEC P7 Parallel **619**
NEC 8850 ..... **1059**
NEC P6 Parallel **439**
NEC P960XL **1150**
NEC Laser ..... **Call**
OKIDATA - Call on all models
PANASONIC
1080-I **155**
1091-I **179**
1092-I **295**
1592 ..... **372**
KXP3151 ..... **368**
STAR MICRONICS
NP10 ..... **139**
NB24-10 ..... **437**
NX10 ..... **160**
NX15 ..... **306**
TOSHIBA - Call on all models

RAM
64K 150NS (set of 9) **16.50**
256K 150NS (set of 9) **33**
256K 120NS (set of 9) ..... **Call**

TERMS: Shipping on most software is $5.00. AZ orders +6.7% sales tax. Personal check/company check - allow fourteen (14) days to clear. We accept purchase orders from authorized institutions for 3.5% more than cash price. All returns are subject to our approval. There will be a 20% restock fee. Minimum phone order $50. All prices are subject to change. Due to copyright laws we cannot take back any open software.

No Charge for Master Card or Visa

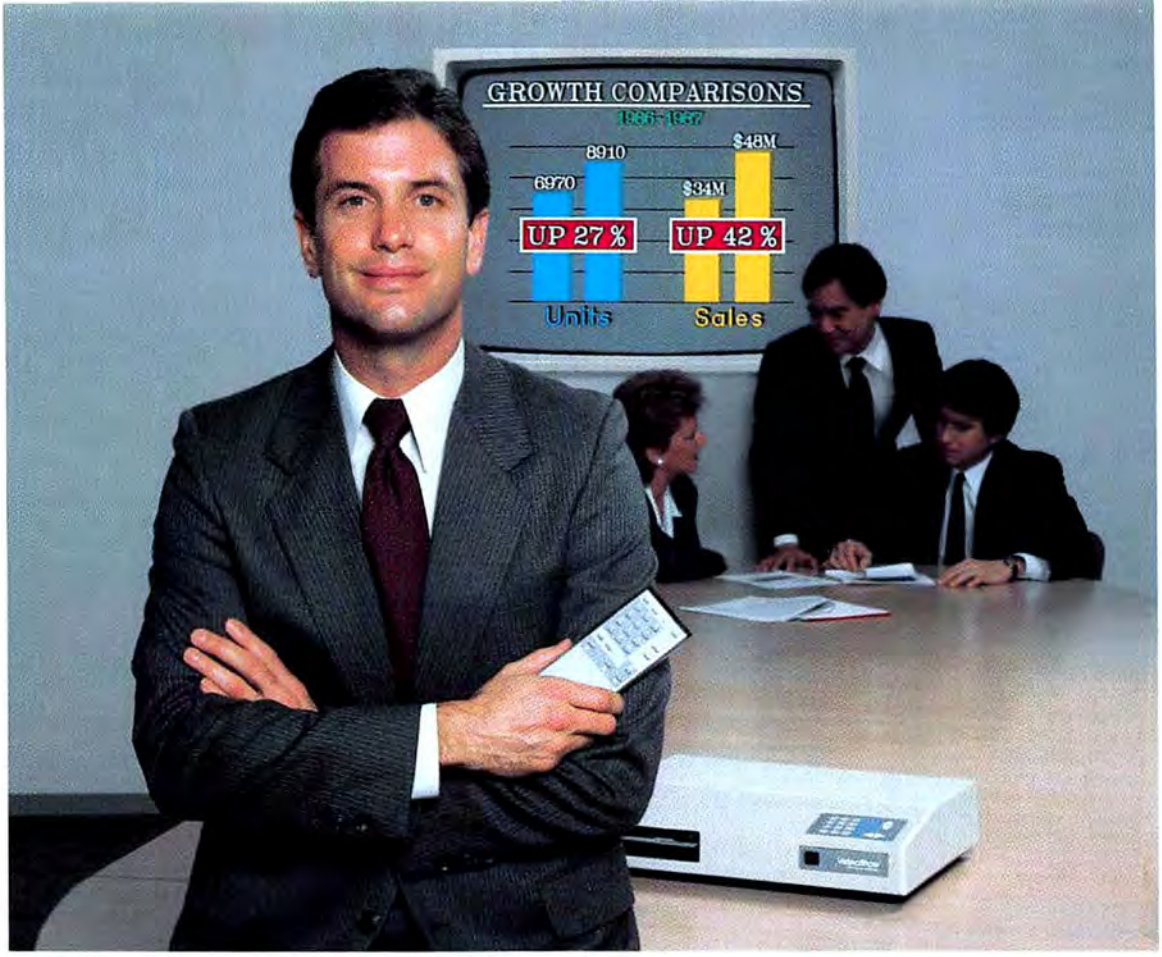
We do not guarantee compatibility

TOLL-FREE ORDER LINE 1-800-421-3135

WAREHOUSE DATA PRODUCTS

2701 West Glendale Ave. • Phoenix, AZ 85051

Phone Hours: Monday, Wednesday & Thursday 7 am-9 pm; Tuesday & Friday 7 am-5 pm; Saturday 9 am-5 pm. MST.



Thank You VideoShow

That's what business people around the world tell us every day about VideoShow™...the ultimate desktop presentation system.

"VideoShow saved us $75,000 in the first eight months we had it. VideoShow has become our standard for presentations corporate-wide!
The quality of our presentations has greatly improved since we started using VideoShow."
Robert Castellano,

Reader's Digest

"VideoShow is by far the most compelling and dynamic graphics system to come along in quite some time.
The advantage of VideoShow is that much of the work that was sent to outside slide services can now be done in-house at a fraction of the cost and at drastically reduced turnaround times."
Bill Morell,

Pfizer

"Our annual meeting was coming up in ten days and we had to prepare over 2000 high-quality images for a presentation to 500 people. We used VideoShow and the meeting was a success. We couldn't possibly have made and updated a presentation of that quality in such a short time using any other product."
Dawn Lepore,

Charles Schwab & Co.

Make your next presentation your best ever! Join 83 of the Fortune 100 and thousands of successful presenters worldwide. **Find out about VideoShow.** Call 1-800-556-1234, Ext. 533. In Calif., call 1-800-441-2345, Ext. 533.

VideoShow is a registered trademark of General Parametrics Corporation.

General Parametrics

The leader in desktop presentation products

Get more info. Go to Ad index.

$100 Trade-In for any A/B Switch Box (See Catalog Information below for details)

EasyPRINT—New *Easy* Solutions to Printer Sharing from $79.98 to $149.98 per PC.

Do you have two or more IBM or Compatible PCs, ATs, or Personal System/2 computers that need access to an expensive laser printer or plotter?

If so, then select the low-cost printer sharing solution that makes sense for you from our free *EasyPRINT*® Catalog.

The *EasyPRINT* catalog reviews five configurations ranging from 2 and 3 PC starter kits that let you share up to four printers, to 7 and 8 PC configurations sharing up to 32 printers. Using the chaining capability of our new advanced CrossPOINT™ switch, up to 25 PCs can share up to four printers.

And you can consult (toll-free) with our printer sharing experts before placing your order.

The CrossPOINT switch makes the printers in your office work together as an organized unit and offers dramatic economic benefits.

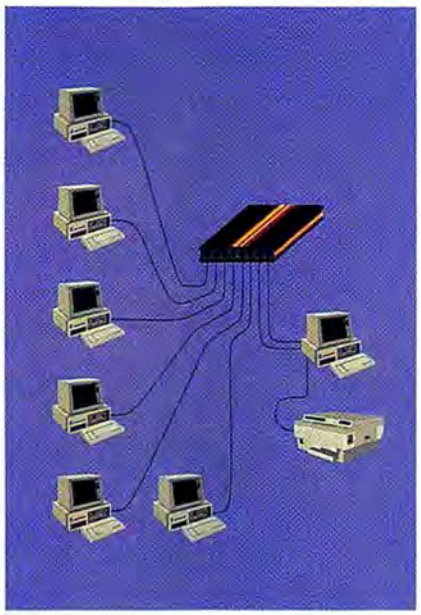
PC Magazine in 1985 profiled the ideal printer sharing system. We compared their wish-list against *EasyPRINT*, and here's how we stack up:

PC Magazine Profile	*EasyPRINT*
■ Hook up any number of PCs to a printer.	Yes
■ Support your choice of:	
Letter Quality	Yes
Dot Matrix	Yes
Laser	Yes
Plotter	Yes
■ Large segmented print buffer.	Yes
■ Accept all incoming print jobs no matter if the printer is busy.	Yes
■ Support mixed serial and parallel devices.	Yes
■ Any 3–4 users should be able to justify a joint purchase of all three printer types.	Yes

Highlights

- Expandable—from 2–25 PCs
- Supports serial and/or parallel printers in any combination
- Totally automatic
- Spooled printer services
- Cable lengths to 500 feet.
- Economical—configurations start at $79.98 per PC.

"Best bargain."
—PC Magazine, April 28, 1987



Windows is a registered trademark of Microsoft Corporation
PageMaker is a registered trademark of Aldus Corporation
Print-Q is a registered trademark of Software Directions, Inc.

Exclusive Capabilities

- Up to 25 PCs can be chained using the compact, advanced CrossPOINT switch.
- Modular telephone line cabling makes installation a "snap."
- Advanced Forms Support solves the paper changing problem on a shared printer. Now PC users can print regardless of the type of paper mounted on the printer.
- Three software packages, *EasyPRINT*, Print-Q® and a special version of *EasyLAN*,® are integrated with the CrossPOINT switch.
- *EasyPRINT* and DOS take 60K, leaving 580K for memory intensive desktop publishing programs such as Windows® and PageMaker.®

How To Order Your Free *EasyPRINT* Catalog

Call for our Free 12-page *EasyPRINT* Catalog Toll Free **800/835-1515** in U.S. or Canada, or **800/232-7729.**

Catalog contains **$100 Trade-in Coupon.** Send your coupon along with your old A/B switch box, and we'll give you *$100 off* on any *EasyPRINT* product that uses a CrossPOINT switch.

To Order by Phone Call in U.S. or Canada
(800) 835-1515
Or
(800) 232-7729
For Configuration Assistance & Technical Questions
Call (503) 485-4254 or (408) 738-8377

Place your Order Immediately
Dealer Inquiries Invited

Name _____
Address _____
_____
_____
City _____
State _____ Zip _____
Telephone (_____)
Payment: Visa, MasterCard, Check, COD, Bank Draft
Name on Credit Card _____
Cr. Card No. _____ Exp Date ___/___

For European Sales and Reseller Information Contact:
Trust International, Brussel/Bruxelles, Belgium
Tel: 02/660 89 24 Telex: 62 803 Telefax: 02/660 8868
Server Technology, Inc., 140 Kifer Ct.
Sunnyvale, CA 94086, Telex 5106003481

Order Form

Item	Description	Price	Qty	Amount
EP-200	*EasyPRINT* Starter Kit 2-PCs. With *EasyPRINT* software.	$ 159.95	___	$___
EP-300	*EasyPRINT* Starter Kit 3-PCs. With COM2 serial port and *EasyPRINT* software.	$ 349.95	___	$___
EP-700	*EasyPRINT* for 7-PCs. With CrossPOINT switch and *EasyPRINT* software.	$ 899.95	___	$___
EP-750	*EasyPRINT* for 7-PCs. With CrossPOINT Switch and Print-Q® software.	$ 999.95	___	$___
EP-800	*EasyPRINT* for 8-PCs. With CrossPOINT Switch and special *EasyLAN* software.	$1199.95	___	$___

California Residents add state tax $___
Shipping Charge $___
Total Order Amount $___

Get more info. Go to Ad index.

WHY PAY MORE?

YOUR MONEYSWORTH GUARANTEE

- ★ Credit cards not charged until after your order has been shipped
- ★ Orders shipped same day on all stocked products (on orders placed by 2pm EST)
- ★ All products guaranteed to be the latest versions available
- ★ Only factory sealed and fully warranteed products stocked
- ★ Never a surcharge for American Express, Visa or Mastercard

• No sales tax on orders shipped outside NY State • Please add 3% for insurance, shipping and handling ($3.00 minimum) (Some products may have a surcharge due to weight and size restrictions) • Defective merchandise can be returned for repair or exchange (please call for R.A. no.) • Due to variety of products, we cannot guarantee compatibility

GRAPHICS/CAD-CAM

Auto Sketch	$59
Chartmaster	189
Drafix Plus	185
Freelance Plus	299
Harvard Presentation	209
Microsoft Chart	165
ProDesign II	159

LANGUAGES

Microsoft C	$249
Microsoft Cobol	385
Microsoft Fortran	249
Microsoft Macro Assembler	85
Microsoft Quick Basic	55
Turbo Basic	55
Turbo C	55
Turbo Pascal	55

PROJECT MANAGEMENT

Harvard Total	$325
Microsoft Project	219
Super Project Plus	285
Time Line	209

FINANCIAL/ACCOUNTING

BPI Entry 1	$69
Computer Associates	**Call!**
Managing Your Money	105

UTILITIES

Carbon Copy Plus	$105
Crosstalk XVI	89
Disk Optimizer	29
Fast Back	85
Fixed Disk Organizer	45
Mace Utilities	49
Microsoft Windows	55
Norton Commander	35
Norton Utilities	45
Norton Util. Adv. Ed	75
PC DOS	**Low Price Call!**
Sidekick	45
Sideways	39
Smart Com II	79
Superkey	39

SPREADSHEET/INTEGRATED

Enable	$365
Framework 2	389
HAL	89
Lotus 1-2-3	305
Lotus Metro	55
Lotus Report Writer	65
Smart Integrated	399
Supercalc IV	269
Symphony	439

WE CARRY ALL AVAILABLE 3½" FORMATS.

DATABASE MGMT

Clipper	$349
dBase III Plus	389
Foxbase +	219
Genifer	189
PFS Professional File	129
Q & A	209
R:Base System V	339
Reflex	79

WORD PROCESSING

Display Write IV	$285
Harvard Pro Publisher	379
Lotus Manuscript	319
Microsoft Word 3	199
Multimate Advantage II	255
Page Maker	469
PFS Professional Write	105
Ventura Publisher	499
Word Perfect	189
Wordstar 2000 Plus	189
Wordstar Professional (Ver. 4)	225
XY Write III	199

LAPTOPS

Toshiba T1100 Plus	$1,485
Zenith Z181	1,519

SURGE PROTECTORS

KENSINGTON MICROWARE	
Masterpiece Plus	$89

BACK UP POWER SUPPLIES

DATASHIELD	
300 WT (XT)	$300
800 WT (AT)	389

MODEMS

HAYES	
Smartmodem 1200	$285
Smartmodem 1200B	285
Smartmodem 2400	429
Smartmodem 2400B	429
TOSHIBA	
1200B Laptop Modem	265
ZENITH	
Laptop Modem	255

GRAPHICS

ATI	
EGA Wonderboard	$259
HERCULES	
Color Card	145
Graphic Card Plus	175
In Color Card	295
NEC	
GB 1 (EGA)	315
PARADISE	
Auto Switch EGA	195
QUADRAM	
EGA Plus	279
Pro Sync EGA	299
VIDEO 7	
VEGA Deluxe	319

MULTI-FUNCTION BOARDS

AST	
Six Pack + 384K	$189
Six Pack Premium W/512k	169
Advantage 128K	325
Rampage 286 W/512K	399
Rampage W/256	265
CPI	
Half Pint I/O	69
INTEL	
Above Boards	**Low Price Call!**
Inboard 386's	**Low Price Call!**
Math Co-processors	**Call!**

MONITORS

AMDEK	
410 A	$139
Color 600-S	309
Color 722	415
NEC	
Multi-Sync	549
PRINCETON	
Amber Max-12	139
RGB HX-12	409
RGB HX-12E	495
RGB SR-12	535

PRINTERS

DICONIX	
Diconix 150	$305
EPSON	
FX 86 E	325
FX 286 E	439
EX 800	389
EX 1000	509
LQ 800	439
LQ 1000	619
LQ 2500	879
HEWLETT-PACKARD	
Series II	1,779
NEC	
P-660	429
P-760	629
OKIDATA	
M 192	345
M 193	515
M 293	669
TOSHIBA	
P 351	949
P 321 SL	509

MOUSE INPUT DEVICES

MICROSOFT	
Mouse (Serial)	$119
Mouse (Buss.)	105
IMSI	
PC Mouse	99
MOUNTAIN	
Hard Drive Card 30MB	545

HARD DISKS

PLUS	
Hard Card 20 Mb	$669
Hard Card 40 Mb	899

BACK UP STORAGE DEVICES

IOMEGA	
Bernoulli (10 + 10)	$1,349
Bernoulli (20 + 20)	1,759
Bernoulli 10 MG Cartridge Tri-Pak	149
Bernoulli 20 MG Cartridge Tri-Pak	225

All prices and policies subject to change without notice.

"Once they start to use it, some of them become absolutely fanatical," observes Welborne.

Welborne's own enthusiasm about *The Coordinator* is surpassed only by her enthusiasm for the theoretician behind it. She regularly attends retreats sponsored by Flores in San Francisco, concluding, "I believe that there's no end to what that man can teach me."

At 29, Fernando Flores was finance minister in Salvador Allende's government in Chile. When Allende was overthrown, Flores became a political prisoner. But his imprisonment soon became an international cause célèbre, leading to a campaign by Amnesty International that eventually won his release.

Emigrating to this country, Flores pursued his academic interest in phenomenology and the twentieth-century German philosopher Martin Heidegger. The University of California at Berkeley awarded him a Ph.D. for his theoretical work, which was partially founded on Heidegger's musings on language.

Flores built his theory on what he called a "speech move"—a combination of an assertion (it is true), a directive (do it!), a commissive (yes, I'll do it), an expressive (apology or praise), or a declarative (I need information). He began to teach speech-move management theory in and around Marin County, just north of San Francisco.

In the early 1980s, Flores recognized a kindred soul in Werner Erhard. The charismatic leader of the EST movement also had read Heidegger. In fact, Erhard's UNIX office system became the first test site for *The Coordinator*. Erhard liked what he saw so much that he invested in Action Technology and remains a silent partner today. Maybe it's the Erhard connection that has prompted occasional criticism of *The Coordinator*—one electronic-mail competitor calls it "fascist software." Maybe commitment tracking just sounds too much like George Orwell's *1984*, where a computerized Big Brother never sleeps.

Still, it's difficult to argue against the need to make people accountable for the promises that they make.

For many, though, the argument is irrelevant. David Lareau, who left a high-level position at Zaimosky Company in Baltimore, Maryland, to market *The Coordinator* after seeing what it accomplished, discounts the importance of its philosophical roots. Lareau allows that Flores' seminars taught him quite a bit about the craft of observing, but the classes were somewhat nebulous for his taste.

"Unfortunately, many of the people there are Fernando Flores followers," he observes. "It's a group-guru atmosphere."

Lareau is grateful to the Flores seminars, though, for introducing him to *The Coordinator*. Zaimosky, his former company, was looking for a way to share the expertise of the executive staff with those in charge of marketing. New managers coming up through the sales ranks lacked the experience to manage the department's complex operations. Yet people with operational backgrounds couldn't have generated the energy needed to keep sales pumped up.

Meanwhile, Zaimosky's top executives found themselves further and further removed from the real action by what Lareau likes to call "administrivia." They spent too much time redoing projects that fell through the cracks—reacting instead of looking forward—and they were becoming increasingly frustrated.

"We had great ideas," says Lareau, "companies that we wanted to buy, new markets that we wanted to attack, but nobody had the time. Every day was spent in crisis management."

At first, only the top executives used *The Coordinator*. Then others joined when they discovered how people on the system dispensed with administrivia. Each system user could handle 60 conversations in 45 minutes and eliminate many time-wasting status meetings. Work-group members kept up to date with copies of conversations containing explicit commitment memos that needed action.

"You're warned when commitments aren't being met, and by the time a situation reaches crisis

(continues)

SIGMAVGA BRIDGES THE GRAPHICS GENERATION GAP.

True VGA Graphics... Delivered.

Forget the promises or the confusion. Sigma Designs cuts through the smokescreen of competing claims with the definitive VGA solution, *including Mode 13.* Introducing SigmaVGA, the high resolution graphics display adaptor that provides 100% VGA BIOS-level compatibility for the PC, XT, AT and compatibles. SigmaVGA delivers the future generation of PS/2 graphics software without compromising your ability to run existing programs. And it's available right now!

More Graphics Flexibility Than Ever Before.

There's no need to sacrifice your existing hardware investment or access to popular graphics modes in exchange for VGA capability. With SigmaVGA, you can have it all:

More Colors—A demonstrated spectrum of 256 colors out of a palette of 256,000. *Now it's easier than ever before to represent complex information, execute designs or create intensely vivid presentations.*

More Displays and Emulations—SigmaVGA drives digital, analog and multisync monitors and provides EGA, CGA, MDA and Hercules Graphics emulations.

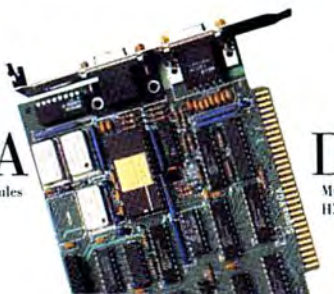
200,000+ EGA Boards Installed.

A proven leader in the field, Sigma Designs has been supplying advanced graphics hardware to major OEM customers. Now you can take advantage of this superior technology.

To find out more about SigmaVGA or other advanced Sigma Designs products, see your local dealer or call 415-770-0100.

SIGMA VGA
VGA Enhanced Display Modes · 320 x 200 x 256 Colors (Mode 13) Out of a palette of 256,000 colors · 640 x 480 x 16 Colors More resolution than ever before · 720 x 400 x 16 Colors or Gray Scales Easy reading 9 x 16 matrix in text mode
Emulation Modes EGA, CGA, MDA, Hercules
Monitors Supported · IBM PS/2 Monochrome Display 8503 · IBM PS/2 Color Display 8512, 8513 · NEC MultiSync (analog and digital modes) · Princeton HX12E · Compatible analog and digital monitors, both monochrome and color

Sigma Designs Inc.
46501 Landing Parkway
Fremont, CA 94538
Telex 171240
Fax 415-770-0100



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

IBM is a registered trademark of International Business Machines. Hercules Graphics is a trademark of Hercules Computer Technology, Inc.
MultiSync is a trademark of NEC Corporation.
HX12E is a trademark of Princeton Graphic Systems, Inc.

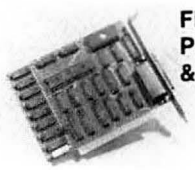
Get more info. Go to Ad Index.

FIND THE WIDEST RANGE OF DP WORKSTATIONS, ACCESSORIES & SUPPLIES IN THIS FREE GLOBAL GUIDE ...all at HUGE SAVINGS!

The GLOBAL GUIDE offers more variety than any office equipment, computer or software dealer; plus, toll-free order convenience. Use the Reader Service Number or dial 1-800-8-GLOBAL (That's 1-800-845-6225).

GLOBAL
COMPUTER SUPPLIES
45 South Service Road, Plainview, NY 11803

Get more info. Go to Ad Index.



FITS IBM PC, XT & AT

256K PRINTER BUFFER

- Includes Parallel Printer Port
- One Year Limited Warranty
- Software for multiple copies, pause . . . AND MORE

$180

TO ORDER CALL
800-826-1465
(602) 938-3165

Ditron
CORPORATION
4026 W. ST. JOHN
GLENDALE, AZ 85308
MC/VISA, COD ACCEPTED
IBM, PC, XT, AT a trademark of IBM CORP.

Get more info. Go to Ad Index.

GET OUT OF THE DARK.

Open your eyes and see just how many subjects are covered in the new edition of the Consumer Information Catalog. It's free just for the asking and so are nearly half of the 200 federal publications described inside. Booklets on subjects like financial and career planning; eating right, exercising, and staying healthy; housing and child care; federal benefit programs. Just about everything you would need to know. Write today. We'll send you the latest edition of the Consumer Information Catalog, which is updated and published quarterly. It'll be a great help, you'll see. Just write:

Consumer Information Center
Department TD
Pueblo, Colorado 81009

level, you already know all about it," Lareau says. "You've watched it develop and given it some thought. Thus, even decisions made in haste aren't hastily made."

When *The Coordinator* was first proposed, two members of Zaimosky's executive committee thought it the most harebrained scheme they had ever heard of. Outvoted, they boycotted the system. A month or two later, one of them began to realize that his peers on *The Coordinator* weren't always being surprised by the people who reported to them.

"Finally, this guy came into my office, shut the door, and asked me what I was doing Saturday morning," recalls Lareau. "He wanted me to come to work to show him how to use the system."

The other holdout still doesn't use *The Coordinator*–directly. "But his secretary uses it and speaks as him," Lareau says, chuckling. "She says that she saves two to two-and-a-half hours a day with the system, and things just don't fall through the cracks anymore."

The Coordinator exemplifies a broader trend away from the use of personal computers only as standalone tools for the individual. They're fast becoming links in a larger chain of users.

This shift from individual productivity to teamwork was inevitable. It's due in part to general corporate dissatisfaction with the rate of individual productivity improvement achieved with the PC (at least productivity measured in terms of accomplishing more–rather than better–work).

Even the disappearance of the Little Tramp from IBM's advertising signals this trend. The Tramp, IBM's Everyman, worked alone to overcome his daily business problems. Now he's been replaced in IBM's carefully packaged portraits of work-group computing by the team from "M.A.S.H."

This may not be the year of the network, but it's definitely the year of the work group. Consider that "M.A.S.H." episodes frequently detailed the triumphs and failures of a dedicated band of individuals struggling against often overwhelming odds to accomplish their goals. Likewise, today's work groups must band together to overcome the increasingly complex and demanding work environment.

They too often find themselves overwhelmed by administrivia or at odds with the larger corporate bureaucracies to which they belong. The hope, though, is that tools like *The Coordinator* will give us all the edge that we need to prevail.

Kevin Strehlo hunts for PC tales from an office on the outskirts of Silicon Valley.

SOFTWARE

SOFTWARE BEST SELLERS

D Base III+	$389.00
Lotus 123, latest version	$307.00
Lotus Manuscript	$337.00
R Base System V	$427.00
Word Perfect	$207.00
Multimate Adv	$299.95

PC COMPATIBLE SOFTWARE

AMERICAN SMALL BUSINESS
Prodesign II $169.00
ANSA
Paradox $359.00
ASHTON-TATE
D Base III+ $389.00
FrameWork II $389.00
Diagram Master $189.00
Chart Master $209.00
Map Master $219.00
Multimate Advantage $299.95
Multimate Advantage II ..... $CALL
Rapidfile $244.00
BOEING
Boeing Calc ..... $CALL
Boeing Graph ..... $CALL
BORLAND
Eureka $59.95
Reflex $84.95
Reflex Workshop $44.95
Sidekick(unprotected) $47.00
Sidekick/Traveling
Sidekick Bundle $74.95
Superkey $37.00
Travelling Sidekick $42.95
Turbo C ..... $CALL
Turbo Database Toolbox ..$42.95
Turbo Gameworks $39.00
Turbo Graphix Toolbox $31.00
Turbo Jumbo Pack $177.00
Turbo Lightning $54.95
Turbo Pascal $59.00
Turbo Pascal
Numerical Methods $59.00
Turbo Prolog ..... $CALL
Turbo Prolog Toolbox $57.95
Turbo Tutor $27.95
BRODERBUND
Graphics Library $25.95
Graphics Library Disks $24.95
Newsroom Pro $69.95
Print Shop $39.95
Print Shop Companion $32.00
Toy Shop $42.95
CENTRAL POINT SOFTWARE
COPY II PC $27.00
Option Board $79.95
PC Tools $27.00
DAC SOFTWARE
Dac Easy Accounting $54.95
Dac Easy Acct. Tutor $19.95
Dac Easy Payroll. $39.95
DAYBREAK
Silk ..... $CALL
ELECTRONIC ARTS
Call for price on all titles!
EPYX
Call for price on all titles!
FUNK
Sideways $37.95
GENERIC SOFTWARE
Generic Cadd $69.95
Generic Cadd w/Dot Plot ..$89.95
INFOCOM
call for price on all titles!
LIFETREE
Volks Writer $157.00
Words & Figure $137.00
LIVING VIDEOTEXT
Ready! $52.95
Think Tank $97.95
LOTUS
123 ..... $307.00
HAL ..... $CALL
Symphony $439.00
MECA
Managing Your Money ...$119.95
Managing the Market $94.95
MERIDIAN TECHNOLOGY
Carbon Copy $109.00
MICROPRO
Wordstar 2000 ..... $237.00
Wordstar 2000+ $279.00
Wordstar Release 4 ..... $CALL
MICRORIM
R Base System 5 ..... $427.00
Clout $124.00
MICROSOFT
C Compiler $249.00
Chart $164.00
Flight Simulator $32.95
Fortran $267.00
Macro Assembler $87.00
MS-DOS & GW Basic ..... $CALL
Mouse $109.00
Pascal $167.00
Project $227.00
Quick Basic $57.00
Windows $57.00
Word $279.00
MICROSTUFF
Crosstalk XVI $94.00
NORTON PRODUCTS
Norton Utilities $49.95
Norton Commander $39.95
Norton Advanced Utilities .$84.00
PAPERBACK SOFTWARE
VP Planner $52.95
Executive Writer $39.95
Executive File $29.95
Paperback Writer $25.95
Paperback Speller $25.95
VP Expert ..... $CALL
VP-Info $59.00
PERSONICS CORP
Smart Notes $47.95
ROSESOFT
Prokey $74.00
SOFTWARE PUBLISHING
Harvard Total PM $257.00
Harvard Presentation
Graphics $229.00
PFS Access $87.00
PFS First Choice $94.00
PFS Graph $79.95
Professional Plan ..... $CALL
PFS Report $69.95
Professional File $139.00
Professional Write $109.00
SIMON & SCHUSTER
Typing Tutor III $39.95
SPRINGBOARD
Newsroom Pro $79.00
Clip Art ..... $CALL
SYMANTIC
Q&A $21.00
TURNER HALL
Note It $57.00
SQZ $57.00
WORD PERFECT
Wordperfect $207.00
Executive $127.00
Library $79.00
Math Plan ..... $CALL
XEROX
Ventura Publisher ..... $CALL

HARDWARE

PRINTERS

CITIZEN
120D $174.00
MSP-10 ..... $279.00
MSP-15 ..... $379.00
Premier 35 ..... $459.00
Tribute 224 ..... $CALL
EPSON PRINTERS
FX-86E $317.00
FX-286E $447.00
LX-800 ..... $179.00
LQ-800 ..... $447.00
LQ-1000 ..... $627.00
EX-800 ..... $387.00
EX-1000 ..... $497.00
GQ-3500
LASER PRINTER $1499.00
CALL FOR PRICE ON EPSON COMPUTERS
PANASONIC PRINTERS
1080i $159.00
1091i $199.00
1092i $279.00
1592 ..... $389.00
1595 ..... $439.00
3131 ..... $259.00
3151 ..... $399.00
Laser Printer ..... $CALL
STAR MICRONICS
NX-10 ..... $169.95
NP-10 ..... $144.95
PRICES ARE FALLING ON ALL STAR PRINTERS!!! PLEASE CALL FOR LATEST PRICE ON THESE MODELS:
ND-10 ND-15
NX-15 NR-10 NB SERIES

CHIPS

Numeric Coprocessors
8087 ..... $104.00
8087-2 ..... $147.00
80287 ..... $179.00
80287-2 ..... $CALL
Memory Chips
256k - 120 or 150ns
64k - 120 or 150 ns
64k x 4 120 or 150ns
PRICES ARE TOO VOLATILE TO LIST! PLEASE CALL FOR CURRENT PRICE.
IMSI
PC mouse w/Dr. Halo II ..$104.00

Kensington Accessories in stock!!! Call for Best Price

PC ADD ON BOARDS

AST
Advantage(128k) $319.00
Rampage AT $419.00
Rampage PC
6 Pak +(64k) ..... $CALL
I/O Mini II $159.00
ATI
Graphic Solution $187.00
EGA Wonder $274.00
HERCULES
Graphics Plus $179.00
Color Card $147.00
Other Hercules boards in stock.
INTEL
AboveBoard PC $227.00
AboveBoard PS/XT $267.00
AboveBoard AT $339.00
KEYSTONE TECHNOLOGIES
-Compatibility guaranteed
-1 year replacement warranty
CGA card w/printer port $69.95
Hercules Compatible Mono card w/printer Port $69.95
300/1200 internal modem 1/2 card $99.00
Multi I/O ..... $CALL
PARADISE
Autoswitch ..... $CALL
STB
EGA+ $259.00
Chauffer HT $214.00
ZUCKER
CGA $89.95
Monochrome Graphics $94.95
300/1200 Half Cd Modem includes software $87.00
Memory Expansion ..... $CALL

MODEMS

Keystone Technologies 1/2 Card Internal 300/1200,Includes PC Talk III software $99.00
Packard Bell External 300/1200 baud $149.00
US Robotics Sportster 300/1200 baud $139.00

DISKS

per box of 10		3.50"	5.25"
BONUS	DS/DD	-	$6.95
MAXELL	DS/DD	$17.95	$9.95
VERBATIM	DS/DD	$19.95	$9.95
SONY	DS/DD	$17.95	$8.95

PC HARD DRIVES

Miniscribe
30mb XT Drive w/controller $359.00
Call for price on other Miniscribe Hard Drives
Seagate
ST-225 20MB w/controller $307.00
ST-238 30MB w/controller $379.00
Western Digital
File Card 20 ..... $439.00
File Card 30 ..... $CALL
AT Hard Drives
ST-4038 ..... $549.00
ST-251 ..... $469.00
W. D. AT Controller $169.00

MONITORS

TTL Monochrome
Amdek 410A Amber, Green,or White $149.00
Blue Chip Green $89.00
Packard Bell Amber w/std. $97.00
Samsung TTL $89.00
Xtron Amber
TTL/CGA autoswitch $119.00
Zenith 1240 ..... $139.00
RGB
Magnavox 8562 ..... $269.00
Magnavox 515 ..... $289.00
Thompson...All Models .... $CALL
Zenith 1330 ..... $407.00
EGA
NEC Multisync $549.00
Packard Bell
EGA/CGA/TTL Auto $419.00
Amdek 722 ..... $477.00
Thompson Ultrascan $499.00
Zenith 1470 Mono $219.00

MODEMS

Hayes Smart Modem
1200B w/sw $329.00
2400B w/sw $499.00
Keystone Technologies 1/2 Card Internal 300/1200,Includes PC Talk III software $89.00
2400 Baud Internal $199.00
Packard Bell External
300/1200 baud $149.00
2400 Baud External $279.00
US RoboticsSportster
300/1200 baud $139.00
Ventel Modems
Call for best prices on all models

DON'T SETTLE FOR LESS...

tcp SHIPS IT

FEDERAL EXPRESS®

Software orders over $50.00 will be shipped FEDERAL EXPRESS (yes even at these prices). You only pay TCP's standard shipping charge of $4.00 per order. This offer also valid on peripherals and accessories under 8 pounds. Orders arriving before 11:00 AM our time will be shipped out same day. If part of your order is backordered the remainder will be shipped UPS Ground for FREE

TOLL FREE 1-800-468-9044

INFORMATION AND PA ORDERS 814-234-2236

OPEN: 9AM-9PM M-Thurs, 9AM-6PM Fri, 10AM-6PM Sat, Noon-6PM Sun EAST COAST TIME

AMSTRAD

PC-1512
Full PC Compatibility
Plus ■ 8MHz Processor ■ 3 Available Slots ■ 512K Memory ■ Parallel Port, Serial Port, Game Port Standard ■ Microsoft Compatible Mouse ■ MS-DOS 3.2, GEM Desktop, GEM Basic 2 ■ CGA Video Card

"CALL FOR BEST PRICE IN THE USA"

COMMODORE PC COMPATIBLES

Includes: ■ CGA/Herc TTL Switchable Video Card ■ MS-DOS 3.2, GW-Basic ■ 512K Memory Borland Sidekick ■ Parallel & Serial Ports ■ 5 Slots

PC-10 Single Drive.....$569
PC-10 Dual Drive.....$699

BOCA RESEARCH, INC.

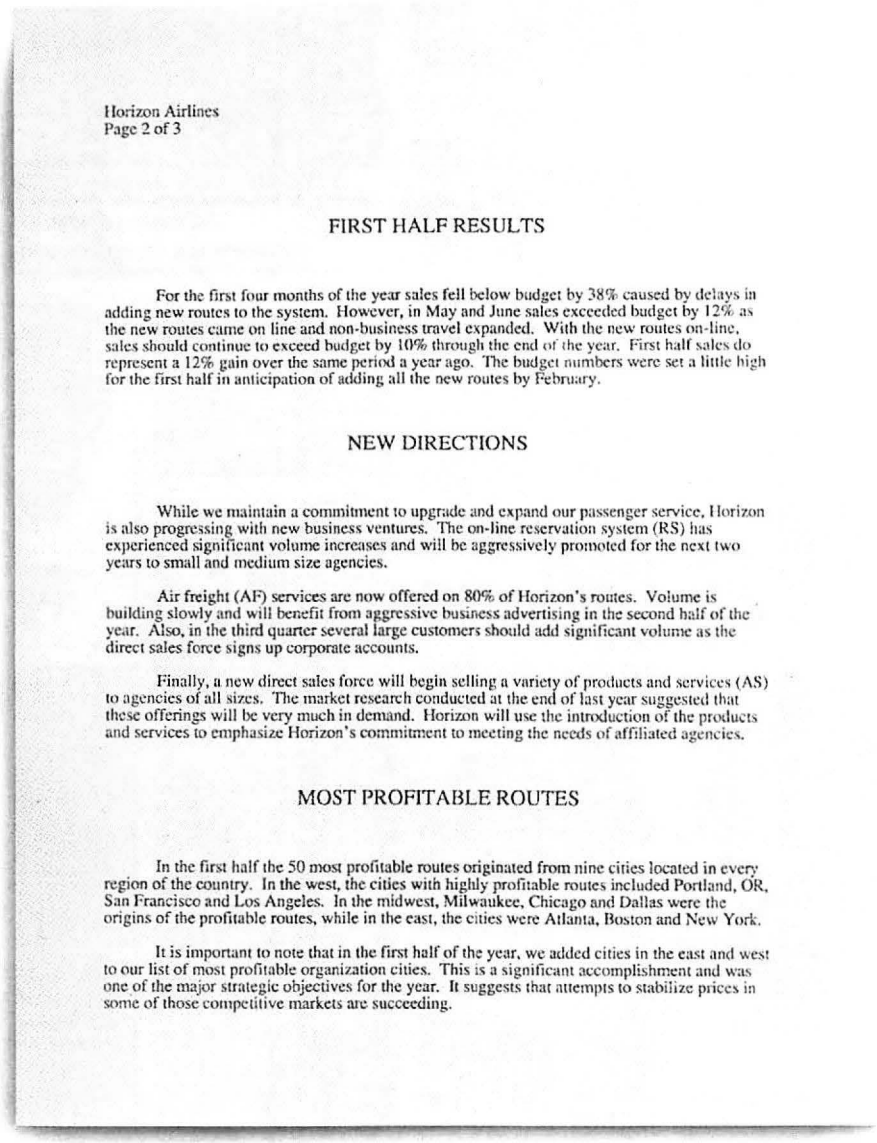
EGA/CGA/MDA/MCA $149.00
BOCARAM XT w/0K $139.00
BOCARAM AT w/0K $169.00
Bocarams are Intel above board compatible
BOCA I/O AT $79.95
BOCA I/O XT $79.95
Gameport Adapter for I/O $19.95

EDUCATIONAL & CORP ACCOUNTS
CALL 1-800-533-1131
Inside PA Call 814-234-2236

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal check to clear. Shipping: $4.00 for software and accessories/ $10.00 for printers and color monitors/ $8.00 for disk drives and other monitors/ Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI, and foreign orders.
Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.
All products include factory warranty
ALL SALES ARE FINAL Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

Maybe it's not what you're saying that's so dull.



Horizon Airlines
Page 2 of 3

FIRST HALF RESULTS

For the first four months of the year sales fell below budget by 38% caused by delays in adding new routes to the system. However, in May and June sales exceeded budget by 12% as the new routes came on line and non-business travel expanded. With the new routes on-line, sales should continue to exceed budget by 10% through the end of the year. First half sales do represent a 12% gain over the same period a year ago. The budget numbers were set a little high for the first half in anticipation of adding all the new routes by February.

NEW DIRECTIONS

While we maintain a commitment to upgrade and expand our passenger service, Horizon is also progressing with new business ventures. The on-line reservation system (RS) has experienced significant volume increases and will be aggressively promoted for the next two years to small and medium size agencies.

Air freight (AF) services are now offered on 80% of Horizon's routes. Volume is building slowly and will benefit from aggressive business advertising in the second half of the year. Also, in the third quarter several large customers should add significant volume as the direct sales force signs up corporate accounts.

Finally, a new direct sales force will begin selling a variety of products and services (AS) to agencies of all sizes. The market research conducted at the end of last year suggested that these offerings will be very much in demand. Horizon will use the introduction of the products and services to emphasize Horizon's commitment to meeting the needs of affiliated agencies.

MOST PROFITABLE ROUTES

In the first half the 50 most profitable routes originated from nine cities located in every region of the country. In the west, the cities with highly profitable routes included Portland, OR, San Francisco and Los Angeles. In the midwest, Milwaukee, Chicago and Dallas were the origins of the profitable routes, while in the east, the cities were Atlanta, Boston and New York.

It is important to note that in the first half of the year, we added cities in the east and west to our list of most profitable organization cities. This is a significant accomplishment and was one of the major strategic objectives for the year. It suggests that attempts to stabilize prices in some of those competitive markets are succeeding.

Funny thing about business communications. You may have some perfectly brilliant ideas, but if the way you present them lacks impact, your audience may never get your message.

So how do you make your presentations, proposals, and memos look brilliant?

With graphics. Specifically, with Lotus® Freelance® Plus.

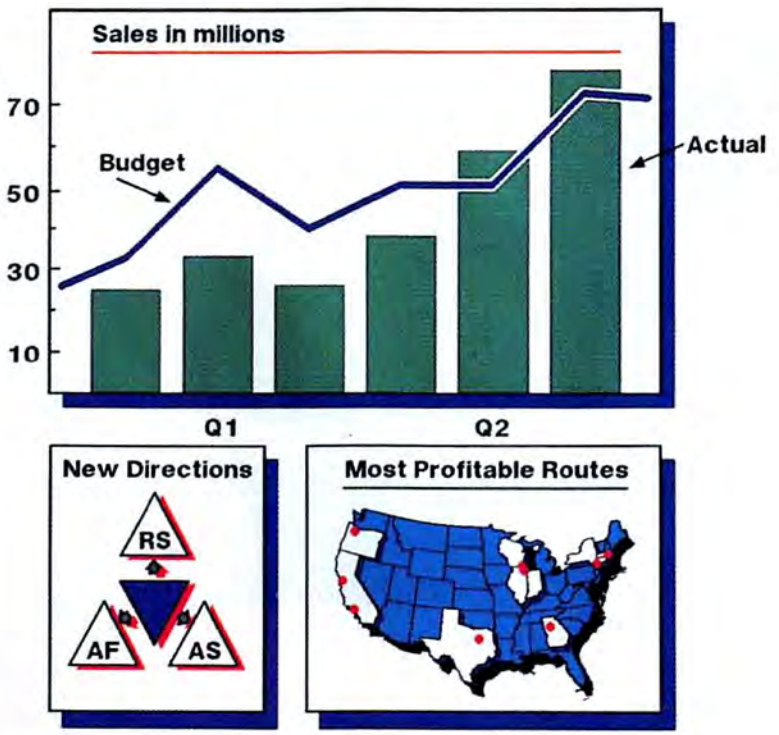
Using Freelance Plus, you can communicate more quickly, thoroughly and effectively. And Freelance Plus is versatile and easy to learn.

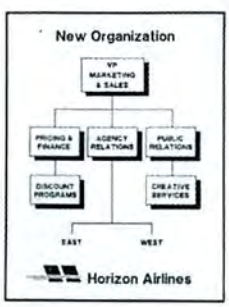
The applications are virtually limitless—everything from charts to bulleted lists, organization charts, maps, diagrams, drawings, and more. And while Freelance Plus can help you create simple graphs very quickly, it gives you the power to develop even more sophisticated graphics as well.

Freelance Plus works with your IBM® PC and is compatible with your existing software. So you can use it to embellish charts from Lotus 1-2-3,® Symphony® or Graphwriter® with, for instance, symbols, diagrams, and comments. Also, Freelance Plus works

© 1987 Lotus Development Corporation. Lotus Manuscript, Lotus, Freelance, Symphony, Graphwriter and 1-2-3 are registered trademarks of Lotus

Maybe it's just how you're saying it.





You can easily incorporate changes as they occur, in charts, diagrams and drawings.

with dBase® and standard ASCII text files.

With Freelance Plus you can mix different types of graphics on a page. Or, you can mix graphics and text on the page, when you use Freelance Plus along with the document processor Lotus Manuscript.®

Freelance Plus is as versatile a graphics tool as is available today. So even if the ideas in your business communications *are* brilliant, Freelance Plus will help insure that the rest of the world sees them that way.

Your next brilliant idea should be to take advantage of our free Freelance Plus demo kit. To order, simply call **1-800-345-1043** and request demo kit PS-3092.

Lotus Freelance Plus

Development Corporation. dBase is a registered trademark of Ashton-Tate. IBM is a registered trademark of International Business Machines Corp.

Portrait of the Great American Investor

He practiced six hours a day to get to Juilliard. That was the easy part. Now he's there and practices eleven. He invests his time in music and his money in U.S. Savings Bonds.

People everywhere are discovering that Bonds have changed. When held five years or more, Bonds pay competitive rates, like money market accounts. They're also free from state and local income tax.

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

U.S. SAVINGS BONDS
THE GREAT AMERICAN INVESTMENT

Bonds held less than five years earn a lower rate. A public service of this publication.

Next in PC World

October

WORLD CLASS PC

For the fifth year in a row, *PC World* readers air their opinions on the best PC hardware and software products available in 1987. Just as in previous years, there are big surprises as industry giants IBM and Compaq, and Xerox and Aldus face off for dominance in the computer and desktop publishing categories. Who are the winners? See our special coverage.

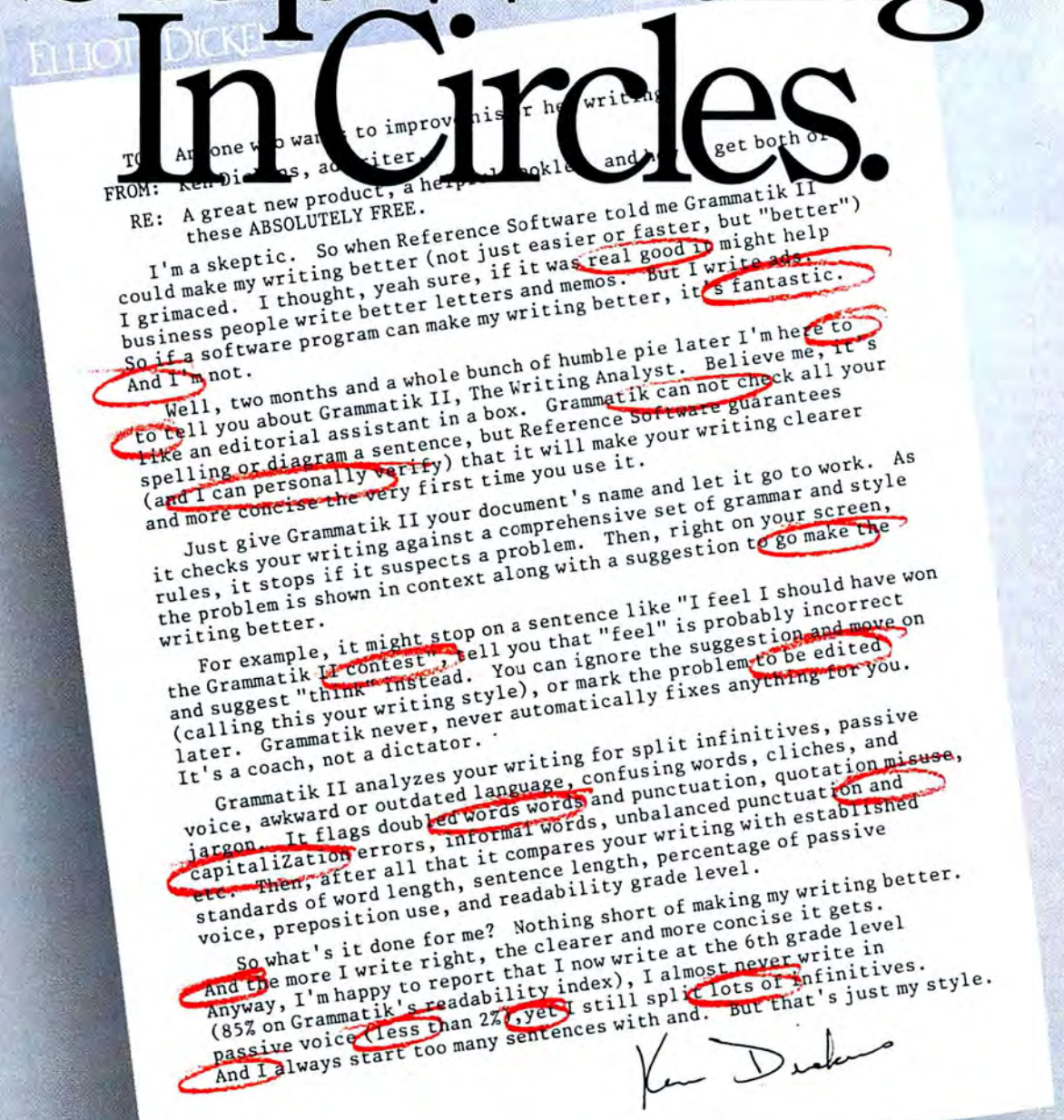
CROSSTALK MK.4

More than two years since it was first announced, the successor to the highly popular *Crosstalk XVI* communications package has finally seen the light of day. With CASL, a complex and powerful programming language, *Crosstalk Mk.4* is capable of creating interactive script files and stunning graphic displays. But can it communicate? *PC World* takes the shrink-wrap off this long-awaited package to find out.

BUILD A BETTER BUDGET WITH REFLEX

Spreadsheets are a great tool for budgeting, but they're not a perfect fit for multidepartment consolidations and line-item analysis. *PC World* shows how flat-file managers like Borland's *Reflex* can help you create a budget model that grows along with your business.

Stop Writing In Circles.



TO: Anyone who wants to improve his or her writing
FROM: Ken Dieckmann, author, and buckle and buckler. Get both of
RE: A great new product, a helpful booklet and buckler. Get both of these ABSOLUTELY FREE.

I'm a skeptic. So when Reference Software told me Grammatik II could make my writing better (not just easier or faster, but "better") I grimaced. I thought, yeah sure, if it was real good it might help business people write better letters and memos. But I write ads. So if a software program can make my writing better, it's fantastic. And I'm not.

Well, two months and a whole bunch of humble pie later I'm here to tell you about Grammatik II, The Writing Analyst. Believe me, it's like an editorial assistant in a box. Grammatik can not check all your spelling or diagram a sentence, but Reference Software guarantees (and I can personally verify) that it will make your writing clearer and more concise the very first time you use it.

Just give Grammatik II your document's name and let it go to work. As it checks your writing against a comprehensive set of grammar and style rules, it stops if it suspects a problem. Then, right on your screen, the problem is shown in context along with a suggestion to go make the writing better.

For example, it might stop on a sentence like "I feel I should have won the Grammatik II contest." Tell you that "feel" is probably incorrect and suggest "think" instead. You can ignore the suggestion and move on (calling this your writing style), or mark the problem to be edited later. Grammatik never, never automatically fixes anything for you. It's a coach, not a dictator.

Grammatik II analyzes your writing for split infinitives, passive voice, awkward or outdated language, confusing words, cliches, and jargon. It flags doubled words and punctuation, quotation misuse, capitalization errors, informal words, unbalanced punctuation and etc. Then, after all that it compares your writing with established standards of word length, sentence length, percentage of passive voice, preposition use, and readability grade level.

So what's it done for me? Nothing short of making my writing better. And the more I write right, the clearer and more concise it gets. Anyway, I'm happy to report that I now write at the 6th grade level (85% on Grammatik's readability index), I almost never write in passive voice (less than 2%), yet I still split lots of infinitives. And I always start too many sentences with and. But that's just my style.

Ken Dieckmann

Improve Your Writing Or Your Money Back.

Grammatik II found 17 ways to improve this letter in just over one minute. That's only half the battle, and only half of what Grammatik II does. See if you can finish the other half by entering our contest. Just send us a list describing the problems in the circles above. Every 50th entry wins a FREE Grammatik II. And everyone gets a copy of the *World's Shortest Writing Course* just for entering.

PC MAGAZINE EDITOR'S CHOICE

Enjoy the contest, but here's how you can be a sure winner. Get the writing help you need right now. Call and order Grammatik II today. We guarantee it will improve your writing in 30 days or your money back. For only $89.00, it's the fastest way to get your writing out of the red.

Order Today: (800) 872-9933

Gram·mat·ik II™
The Writing Analyst

☐ Here's my contest entry, please send me the *World's Shortest Writing Course* FREE ($4.95 value).
☐ Please send me _____ copies of Grammatik II for $89.00 plus $5.00 per unit shipping ($10 per unit outside USA). CA residents add $6.30 sales tax per unit. PCW 9/87
I enclose $_____ ☐ VISA ☐ MC ☐ AMEX
Card # _____ Exp. Date _____
Name _____
Company _____
Address _____
City/State/Zip _____
Phone ( ) _____ Word proc. _____
330 Townsend St., Suite 131 • San Francisco, CA 94107

30-Day Money-Back Guarantee

Reference Software

330 Townsend St., Suite 131, San Francisco, CA 94107, (415) 541-0222 Limit one (1) free World's Shortest Writing Course/Grammatik II per person/address. Contest ends December 31, 1987. Program © Wang Laboratories, Inc. Grammatik II is a trademark of Wang Laboratories. Reference Software is a trademark of Reference Software, Inc. © 1987 Reference Software, Inc. Call for volume World's Shortest Writing Course purchases.

Get more info. Go to Ad index.

print360

COMMITTED TO PRINT

Welcome to the world of printers...welcome to the world of *Print360,* specialists in a full circle of service for printers and printer accessories. You see...

Print360 is unique; printers are our only business. Our salespeople are trained experts in printers and their applications. They are prepared to answer any questions you have concerning printers—from configuration to software and hardware compatibility. Plus we go that extra step...

Print360 makes sure that when you order a printer, you receive everything you need to run. All the cables, interfaces, everything. In fact, we're so concerned with getting you the proper printer and equipment, we may ask you more questions than you ask us!! Which is why...

Print360 does the best we can to ensure the printer you receive will be compatible with your software and hardware package!! It's just part of...

Print360 - an authorized distributor, with enormous buying power, specializing in printers. When you buy from...

Print360, you're buying more than just a printer. You're buying a printer from a company as committed to print as you are to your job.

Print360.
Committed to print.

print360
30 DAY REPLACEMENT GUARANTEE*

Mfg/Model	Pin/Type	Speed (cps)	Print Quality	Buffer (KB)	Column Width	Interface
OKIDATA						
M192 Plus	9 Dot Matrix	200/40	Draft/ NLQ	8	80	Centronics or RS-2322C or IBM Version
M193 Plus					136	
2410		175/87.5 350		4	136	
HEWLETT PACKARD Laser Jet Series II	Laser	8 pgs/min	LQ	512	Letter & Legal Size Paper	Parallel & RS-232C/422
EPSON						Standard Parallel with "Dual Identity" Dip Switch
Fx-86e	9/Dot Matrix	240/ 48	Draft/ NLQ	8	80	
Fx-286e					136	
LQ-800	24/Dot Matrix	180/ 60	Draft/ LQ	7K/ 1K	80	Parallel (Centronics Compatible) or Optional Serial (RS-232C)
LQ-1000					136	
NEC						
P660	24/Dot Matrix	216/ 65	Draft/ LQ	8	80	Parallel (Serial Models are available)
P760					136	
DICONIX 150-P	12 Thermal Ink Jets	150/50	Draft/ LQ	1	7½" Print Line	Centronics (Optional RS-232C)
TOSHIBA						
P321SL	24/Dot Matrix	216/ 72	Draft/ LQ	32	80	Parallel/Serial Standard
P341SL					136	
P351		300/100		4		Centronics Parallel w/RS-232C Serial

OKIDATA
M-193 Plus

The desktop user's choice due to the Microlines' sleek, spacesaving profile. Okidata has combined speed, paper handling, and compatibility with the latest in technology, making these printers among the finest in their class. Proprinter & 5152 graphics printer compatibility with IBM versions. Complete with semi-automatic sheet feed (friction and tractor).

M-193 Plus List Price $649 **Our Price $495**
M-192 Plus *(not shown)* List Price $449 **Our Price $345**

OKIDATA
2410

When you need versatility, this one's for you!! This printer has 3 speeds for 3 applications — like having 3 printers in one!! It can produce up to 350 cps, handle 4-part carbons, print full graphics; even variable paper widths are a breeze for this professional printer. A factory configured IBM compatible model available with Centronics & RS232C. Friction and tractor feeds for smooth sailing.

2410 Plus List Price $2395 **Our Price $1759**

HEWLETT
PACKARD
Laser Jet

The industry standard!! This second generation of Laser Jet printers from HP is compatible with the original Laser Jet and Laser Jet Plus printers, but it is 36% lighter, more reliable, does more, and costs less!! This whisper-quiet printer now comes with 6 internal fonts, so you can customize the printing environment. Contains input and output trays as well as friction feed.

Laser Jet List Price $2595 **Our Price $1949**

Never a surcharge for American Express, Visa or Mastercard. Credit cards are not charged until after your order has been shipped. No sales tax on orders shipped outside NY State. Please add 2% for insurance, and handling ($3.00 minimum). Defective merchandise can be returned for repair or exchange (please call for R.A. no.) All prices and products subject to change without notice.

**If, within 30 days, your printer fails, either upon arrival, or during the normal course of use, we'll replace it immediately. We will not fix or repair your printer—we'll replace it.*

ORDER TODAY CALL TOLL FREE
1-800-543-TYPE

AUTHORIZED DIRECT DISTRIBUTOR

EPSON
FX-86e

From the company that has become America's business choice for quality and reliability comes the perfect everyday printers. With IBM graphics capability and IBM printer emulation, these workhorses have a wide selection of options available. Friction and pull tractor feeds are standard. If your printing needs include spreadsheets and financial reports, the 136 column width of the 286 is recommended.

FX-86e List Price $499 **Our Price $339**
FX-286e *(not shown)* List Price $699 **Our Price $479**

DICONIX
150-P

The printer to take when you've got places to go. So small and light, it runs on rechargeable batteries or electricity; specially designed to be portable, so you won't be weighed down. Even prints on tranparencies. Reliable tractor feed helps get the job done. Great for laptops and desktop use between office, home, or client.

150-P List Price $479 **Our Price $339**

EPSON
LQ-1000

From Epson, the price performance leader, comes another advanced, high-tech answer to your business printing. Capable of outstanding graphics, the new 24 pin line gives you a higher resolution for sharper letters. Choose between Extended Epson Graphics, IBM Graphics, or Diablo 630 codes with Identity Modules. Paper is friction fed. Use the 1000 if your needs include spreadsheet and financial report printing.

LQ-1000 List Price $999 **Our Price $679**
LQ-800 *(not shown)* List Price $699 **Our Price $479**

TOSHIBA
P351

Another 3-in-one printer, we feel this has the highest quality "Letter Quality" dot matrix printing available; it even prints on 6-part forms!! Accepts type font cartridges and down-loadable type font disks. Emulates IBM Graphics Printer and the Qume Sprint 11. Complete with auto paper loading and friction feed.

P351 List Price $1399 **Our Price $999**

NEC
P760

With 24 resident fonts, this is a typesetting dream!! High resolution, plus 4 paper handling options puts this printer a step above the rest. Epson LQ series software compatible; color kit upgrade and added memory available. Uses a standard friction feed. The P760 adds multi-column word processing and full-size spreadsheet capability.

P760 List Price $995 **Our Price $659**
P660 *(not shown)* List Price $699 **Our Price $479**

TOSHIBA
P321SL

One of the easiest printers to use, due to a new front panel which lets you choose type fonts, pitch, emulation, quiet mode, lines per inch, page length, and more, all at a touch of a button. Fanfold by-pass eliminates the need to unload the continuous form paper when using single sheets. Standard emulations include IBM Proprinter and Toshiba/Qume. Paper is fed through tractor feed for continuous forms; also features auto loading, single sheet guide, and friction feed.

P321SL List Price $749 **Our Price $559**
P341SL *(not shown)* List Price $999 **Our Price $749**

Get more info. Go to Ad Index.

We also carry a complete line of HP, Epson, Okidata, NEC, Toshiba, Brother, Citizen, Panasonic, and Canon.
We have a complete selection of cut sheet feeders, tractors, sheet guides, cables, buffers, and accessories.

print360

1 West Main Street, Smithtown, NY 11787 1-800-543-TYPE
(8973)

Products Featured in This Issue

Reader Service Number

PC World View
pages 68-71
401 DAVE, Goldata Computer Services
402 Sportsbook, Sports System Design

Product Outlook
pages 79-99
403 ACT, Conductor Software, Inc.
404 Byline, Ashton-Tate
405 Co-Compute 2.0, Harmony Technology Associates
406 Data Display, Computer Accessories
407 Eazy PC, Zenith Data Systems
408 PC1640, Vidco Electronics
409 Quadstarter Kit, Quadram
410 Repeat Performance 1.40, WordPerfect Corp.
411 Spellin, Turner Hall Publishing
412 Tokenstar, Telegence
413 Turbo 888-XT, Vendex Pacific
414 TurboVision, AST Research
415 Wyse PC, Wyse Technology

From the Software Shelf
pages 102-124
416 Glyphix, SWFTE Int'l
417 Eureka: The Solver, Borland Int'l
418 Opt-Tech Sort, Opt-Tech Data Processing
419 True BASIC 2.0, True BASIC Inc.
420 Xerox Ventura Publisher, Xerox Corp.

From the Hardware Shelf
pages 127-146
421 Datavue Spark, Datavue Corp.
422 Laser Stacker, Bairnware Industries
423 Maynstream 60, Maynard Electronics
424 PC Laser 6000, Ricoh Corp.
425 Slimline 4200, Cordata

The Knowledge Engineers
pages 172-178
426 Exsys version 3.2, Exsys, Inc.
427 First Class, Programs in Motion, Inc.
428 Goldworks, Gold Hill Computers, Inc.
429 Guru version 1.0, Micro Data Base Systems
430 KDS2, KDS3, KDS Corp.
431 M.1 version 2.1, Teknowledge, Inc.
432 Personal Consultant Easy version 1.0, Personal Consultant Plus version 2.01, Texas Instruments

NewViews Breaks the Rules
pages 184-191
433 NewViews Accounting Software, Q.W. Page Associates, Inc.

Letters From Cell A17
pages 192-199
434 4Word, Turner Hall Publishing
435 InWord, Funk Software
436 Write-in, Blossom Software Corp.

Dimensional Fortitude
pages 200-207
437 Boeing Calc 3.00E, Boeing Computer Services
438 MVP Spreadsheet Plus, Bell Atlantic

Magical Multiscan Tour
pages 208-217
439 8060S, Nanao USA Corp.
440 GD-H3214, JVC Information Product Company of America
441 Multimode, Magnavox
442 Multiscan, Sony Corp. of America
443 MultiSync, NEC Home Electronics
444 Super Vision 770, Taxan USA Corp.
445 Ultra Scan, USA Thomson Consumer Products Corp.

Cache on Demand
pages 218-224
446 Flash version 5.0, Software Masters
447 Lightning version 4.5, Personal Computer Support Group
448 PolyBoost version 1.7, Polytron Corp.
449 Quickcache version 2.1, Micro Systems Developers, Inc.
450 Super PC-Kwik version 1.5, Multisoft Corp.
451 Vcache version 2.1, Golden Bow Systems

Routines for Rent
pages 228-233
452 Alacrity, Alacritous, Inc.
453 Framework II Developer's Toolkit, Ashton-Tate
454 Lotus Developer Tools, Lotus Development Corp.

From Ledger to Spreadsheet
pages 234-239
455 EasyBusiness Inventory Control and Analysis 4.1A, Computer Associates Int'l
456 EasyUpgrades DOS Exports 4.01, L&L Services Inc.

Up From Wordstar
pages 240-245
457 Keyworks version 3.0, Alpha Software Corp.
458 ProKey version 4.0, RoseSoft Inc.
459 SmartKey version 5.3, Software Research Technologies
460 SuperKey version 1.16a, Borland Int'l

The Upgrade Path
pages 247-258
461 Essential Card, P.C. Computer Brokers
462 Mach 10, Microsoft Corp.
463 The Kicker, Aristocad Inc.

The Help Screen
pages 319-332
464 Acutype, Acu-Business Systems
465 Acutype Tutorial, Acu-Business Systems
466 Dragnet, Access Softek
467 Dvorak Conversion Kit, KT Services, Inc.
468 Dvorak Developments, Freelance Communications
469 Dvorak Keytop Layout, MaxiSwitch
470 Keyworks 3.0, Alpha Software Corp.
471 Lap-Link, Traveling Software, Inc.
472 Microsoft Windows 1.04, Microsoft Corp.
473 PageMaker version 1.0, Aldus Corp.
474 PCKey, Freelance Communications
475 ProKey 4.0, RoseSoft Inc.
476 SmartKey 5.2, Software Research Technologies, Inc.
477 SuperKey, Borland Int'l
478 The Dvorak Keyboard, Freelance Communications

PLACE
FIRST-CLASS
POSTAGE HERE.

(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP.)

PC WORLD

Product Information Service
P.O. Box 8259
Boulder, CO 80329-8259

PLACE
FIRST-CLASS
POSTAGE HERE.

(POST OFFICE
WILL NOT DELIVER
WITHOUT STAMP.)

PC WORLD

Product Information Service
P.O. Box 8259
Boulder, CO 80329-8259

PC WORLD

The Business Magazine of PC Products and Solutions

Free Reader Information Service

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

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					

*Circle number 999 to subscribe to *PC World*. We will bill you $29.90 for a 1-year (12-issue) subscription (U.S. only).

It's easy to get more information on products advertised in PC WORLD.

Here's how:

- Print or type your name and address, and circle the appropriate answer to each question.
- Circle the number(s) of the product(s) you're interested in. Product numbers appear in the Advertiser Index.
- Apply first-class postage before mailing.

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			

999

Valid through 12/15/87.

Please print or type all information.

Name

Title

Company

Address

City, State, Zip *(zip code needed to ensure delivery)*

Phone: Area code/Number

1. Your primary job function:
a. Corporate or general manager
b. Department manager
c. MIS or micro manager
d. Engineering or R&D
e. Finance or accounting
f. Reseller/VAR
g. Other

2. Number of employees in your company:
1. 25 or fewer
2. 26-99
3. 100-499
4. 500-999
5. 1000 or more

3. Plan to buy:
a. Now
b. In 4-6 months
c. In 7-12 months
d. More than 12 months from now
e. For reference only

4. For how many IBM PCs and compatibles do you buy products? (Include both company and personal units, please.)
1. 1
2. 2-4
3. 5-9
4. 10 or more

PC WORLD

The Business Magazine of PC Products and Solutions

Free Reader Information Service

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

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					

*Circle number 999 to subscribe to *PC World*. We will bill you $29.90 for a 1-year (12-issue) subscription (U.S. only).

It's easy to get more information on products advertised in PC WORLD.

Here's how:

- Print or type your name and address, and circle the appropriate answer to each question.
- Circle the number(s) of the product(s) you're interested in. Product numbers appear in the Advertiser Index.
- Apply first-class postage before mailing.

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			

999

Valid through 12/15/87.

Please print or type all information.

Name

Title

Company

Address

City, State, Zip *(zip code needed to ensure delivery)*

Phone: Area code/Number

1. Your primary job function:
a. Corporate or general manager
b. Department manager
c. MIS or micro manager
d. Engineering or R&D
e. Finance or accounting
f. Reseller/VAR
g. Other

2. Number of employees in your company:
1. 25 or fewer
2. 26-99
3. 100-499
4. 500-999
5. 1000 or more

3. Plan to buy:
a. Now
b. In 4-6 months
c. In 7-12 months
d. More than 12 months from now
e. For reference only

4. For how many IBM PCs and compatibles do you buy products? (Include both company and personal units, please.)
1. 1
2. 2-4
3. 5-9
4. 10 or more

Advertiser Index

Get more information–circle the appropriate number on the reader service card.

Reader Service Number		
1	a.l.p. Systems,	246
2	ALPS America,	38-39
—	AST Research,	8-9
4	Access Micro Centers, Inc.,	316-317
5	Ad Lib,	262
6	Advanced Digital Corporation,	12
7	Advanced Logic Research,	80
8	Alloy Computer Products, Inc.,	10
9	Amdek,	110-111
10	American Small Business Computers, Inc.,	327
11	Amstrad Computer Corporation,	147
—	Anthro Corp.,	26
13	Archive Corp.,	149
14	Archives Inc.,	314
—	Arlington Computer Products,	310-311
16	Ashton-Tate,	35
17	Autodesk, Inc.,	143
18	BPI Systems,	23
19	Bedford Software,	275
20	Bible Research Systems,	146
21	Boeing Computer Services,	113
22	Borland Int'l. Corp.,	IFC-1,105
23	Brother Int'l. Corp.,	271
24	Bulldog Computer Products,	100-101
25	Bytel Corp.,	94
26	CCDA,	378
27	Canon U.S.A., Inc.,	36, 37
29	Canon U.S.A., Inc.,	118, 119
31	Central Point Software,	124
32	Central Point Software,	118
33	Citizen America,	15
—	Comb Co.,	305
—	Compaq,	225-227
36	CompuCover,	342
—	Compusystems,	324
38	Compuserve,	289
39	Computer Accessories,	279
40	Computer Aided Technology,	142
—	Computer Discount Warehouse,	314
42	Contemporary Computer-Wear,	350
43	Control Automation, Inc.,	140
44	Core, Int'l.,	115
45	Cottage Industries,	146
46	Crosstalk,	60
47	DAC Software, Inc.,	83
48	DCA,	49-51
49	Data Access Corp.,	325
50	Datacopy, Inc.,	341
51	Diconix,	135
52	Digital Research,	323
53	Diskette Connection,	48
54	Ditron Corp.,	368
—	Dow Jones News/ Retrieval,	379
56	Dresselhaus Comp. Products,	119
—	Eastman Kodak,	148C
58	Electronic Arts,	321
59	Enertronics Research,	336
—	Epson,	148E
61	Fast Computer Co.,	264-265
62	Fox Software,	109
63	Fox and Geller,	138
64	Funk Software,	251-253
—	GE Information Services,	320
66	GE/RCA,	129
67	General Parametrics,	362
68	Genest Technologies,	40
69	Global Computer Supply,	368
70	Golden Bow Systems,	342
71	Grafpoint,	342
72	Gulfstream Micro Systems,	88
73	Haventree Software Ltd.,	24
—	Hayes,	338
75	Hercules,	87, 89, 91
76	Hersey Micro Consulting,	346
77	Hewlett Packard,	30
78	Hewlett Packard,	126
79	Hewlett Packard,	349
80	Honeywell,	107
81	Houston Instrument,	52
83	ISICAD, Inc.,	339
—	Innovative Software,	280-281
85	Inset Systems,	112
—	InstaPlan Corp.,	293
87	Intel,	328-329
88	Intelligent Optics,	335
89	Intellisoft Int'l.Inc.,	144
90	James River Corp.	257
91	John Wiley & Sons, Inc.,	48
92	KEA Systems, Ltd.,	346
93	Kenosha Computer Center,	306
94	Kensington,	IBC
95	Key Tronic Corp.,	121
96	Laser Connection,	59
—	Liquid Paper Corp.,	81
97	Logicsoft,	63-67
98	Logitech, Inc.,	267
99	Logitech, Inc.,	269
100	Lone Star Software,	304
—	Lotus Development Corp.,	139, 272-273, 370-371
—	Magnavox,	133
105	Mannesman Tally,	351
—	Maxell Corp.,	6
107	Maynard,	131
108	Megahertz Corp.,	33
109	Merritt,	346
110	Micrografx, Inc.,	27
—	Micrologic,	353
112	MicroCom Systems,	104
113	Microprocessors Unltd.,	348
—	Microsoft Corp.,	46-47
115	Migent, Inc.,	57
116	Migent, Inc.,	148F-148G
117	Moneysworth,	364-365
118	Multi-Tech Systems, Inc.,	21
—	Multitech Electronics, Inc.,	343
—	NEC Home Electronics,	248-249
121	NEC Information Systems,	5
122	Nitro Micro,	318
123	North America Mica, Inc.,	58
—	Oracle,	28-29
125	PAMCO,	348
—	PC Connection,	180-183
127	PC Mart,	148A
128	PC Network,	308-309
129	PC Pitstop,	296
130	PC's Limited,	284-287
131	Paperback Software Int'l.,	25
133	Para Systems,	20
134	Patton & Patton,	348
135	Paul Mace Software,	22
136	Peachtree Software,	120
137	Personal Computer Products, Inc.,	359
138	Personal Computer Support Group,	356
139	Plus Development,	276-277
140	Polaroid,	255
141	Polytron,	90
142	Print 360,	374-375
—	Quaid Software,	122
144	Quarterdeck,	291
145	Qubie',	294-295
—	Quill Corp.,	85
147	Reference Software,	373
148	SBT Corp.,	14
149	SPSS, Inc.,	78
150	SST,	44
151	Saba Technologies,	76-77
—	Scitor,	56
153	Seagate Technology,	333
154	Secure It,	296
155	Server Technology,	363
156	707 Computer Sales,	312
157	Sigma Designs, Inc.,	367
158	Soft/Plus Research,	350
159	Soft Stream Tech,	298
160	Softcraft,	345
161	Softland Co.,	96
—	Softline,	148D
163	Softlogic Solutions,	123
164	Softlogic Solutions,	125
165	Softlogic Solutions,	259-261
166	Softronics, Inc.,	86
167	Software Link, The,	41
168	Software Link, The,	95
169	Software Network, The,	90
—	Software Publishing,	16-17
—	Software Publishing,	145
—	Software Publishing,	19
173	Sorbus,	300
174	SourceMate Information Systems,	92
175	Star Micronics,	290
—	Static Guard,	55
177	StatSoft,	58
178	StatSoft,	358
—	Sturges Publishing,	315
180	Sublogic,	334
181	Super Sell Software,	299
182	TDA,	97
183	Tandon Computer Corp.,	331
184	Tandy/Radio Shack,	347
—	Telemart,	355
186	Telescan,	148H
—	Toshiba,	54
—	Toshiba,	141
189	Turner Hall,	34
190	Turner Hall,	282
191	Tussey Computer Products,	369
192	U.S. Robotics,	301
193	USA Flex,	307
194	Unlimited Processing,	148B
—	VLM Computer Electronics,	350
196	Ven-Tel,	BC
197	Video Seven,	137
198	Viking Technologies,	7
199	Warehouse Data Products,	361
200	Wells American,	11
201	White Crane,	140
202	WordPerfect Corp.,	93
203	Worthington Data Solutions,	82
204	Xerox,	42-43
205	Zenith,	98-99

No Kidding!

Incredible Limited Offer

IBM PC-AT Compatible

10 MEGAHERTZ

EGA Color System

$1295

PRICE INCLUDES:
- Enhanced graphics adapter video card
- Samsung 640 x 350 EGA color monitor
- Intel 80286 running at 10MHz
- 8 expansion slots
- Phoenix or Award BIOS
- 640K RAM up to 1MB on motherboard
- 360K floppy drive
- Dual floppy/hard disk controller
- KeyTronics 101 new enhanced keyboard
- 185-200 watt power supply

Lowest Price Ever!

$895

PRICE INCLUDES:
- Intel 80286 running at 10MHz
- 8 expansion slots
- Phoenix or Award BIOS
- 640K RAM up to 1MB on motherboard
- 360K floppy drive
- Dual floppy/hard disk controller
- KeyTronics 101 new enhanced keyboard
- 185-200 watt power supply

SAME AS ABOVE WITH 43 MEG HARD DISK:

$1350

Seagate

43 Meg Hard Drive Samsung EGA Color System

$1750

ccda

CLONE COMPONENT DISTRIBUTORS OF AMERICA
17610 Midway Road, Suite 134-342
Dallas, Texas 75252

For Order Information, Call Toll-Free

1-800-637-CCDA

Terms: Because of this *extraordinary offer*, we accept *only* personal checks, cashier's checks, money orders or wire transfers. C.O.D.'s and credit cards, call for information.
Shipping: Free shipment within the continental United States U.P.S. ground. Insurance or special shipping extra. Immediate shipment subject to availability.
Warranty: One year limited warranty (parts and labor included, shipping not included) on CCDA products. Brand-name products have manufacturer's warranty.
All prices subject to change without notice.

IBM PC-AT is a trademark of IBM Corporation.

Get more info. Go to Ad Index.

WEALTH INSURANCE.

Dow Jones News/Retrieval®

Membership gives you instant access to:

Current Stock Quotes	Trading Online
Breaking Financial News	Insider Trading Activity
Investment Analysts' Reports	Corporate Profiles
Automatic Portfolio Tracking	Company vs. Industry Performance
Income Statements	Balance Sheets
Financial Overviews	Government Securities
Dow Jones Averages	Earnings Reports & Forecasts
Dividends	Historical Stock Quotes
Interest Rates	P/E Ratios

. . . Above is just a sample of the many business and financial services available.

Protect your present financial well-being and help ensure your future investing success—for only $29.95.

Can a $29.95 membership in Dow Jones News/Retrieval®—the premier online financial information service from Dow Jones & Company, Inc.—really help ensure your personal wealth?

Judge for yourself.

Just mail the Membership Enrollment Form at right. Within a few days your Membership Kit will arrive and you can go online, getting news alerts on stocks in which you're interested—before they hit the newsstand. All you need is a personal computer and modem.

You'll also have instant access to leading investment analysts' comments on your investment hunches and strategies, plus the ability to automatically track up to 125 different stocks.

And those are only three of our 40-plus services.

Look over the others when your Membership Kit arrives. It includes your personal password and more. You'll find all the details in the enrollment form at right.

Fill it out, drop it in the mail and give our service a try.

After all, having the best investment information is always your best investing policy.

*Per account. New domestic and Canadian subscribers only. Free time must be used within 30 days after receipt of password(s). Some additional fees apply on certain services.

© 1987 Dow Jones & Company, Inc. All rights reserved.

Membership Enrollment Form

Show me how Dow Jones News/Retrieval® can help ensure my wealth.

☐ Send me a $29.95 Dow Jones News/Retrieval Personal Membership Kit which includes 5 free hours* of online time, my personal password, a User's Guide, 12 months of *Dowline*™ Magazine, and waiver of my first year's $12 annual service fee.

☐ Give me even greater assurance—send a $49.95 *Corporate* Membership Kit, including *8 free hours** of online time plus *multiple passwords* (for myself and my colleagues).

☐ Check enclosed

☐ Charge to my: ☐ AmEx ☐ MC ☐ VISA ☐ Bill me later

Card No._____ Exp Date_____

Signature (required) _____

If you pay by credit card, all future charges will be billed to that account.

Name _____

Address _____

City/State/Zip _____

Daytime Phone_____ ☐ Please send more information

Mail to: DJN/R Membership Kit, P.O. Box 186
Drexel Hill, PA 19026-9973

For faster service, call
1-800-221-7700, Ext. 199I today!

Dow Jones News/Retrieval®

The premier source of online business and financial information.

199I

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 $1074 ($358 per issue). We offer a six-time insertion, 17 percent discount contract for a total of $1788 ($298 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 415/546-7722 or 800/435-7766 (nat'l), 800/435-7760 (CA). Please send copy and prepayment to* PC World Directory, *501 Second St., San Francisco, CA 94107.*

Accessories

Expansion Units

Add Slots to IBM PC
The Addcard unit updates your IBM PC system adding 4 more card slots. Easily installs in the existing 5 slot chassis providing 8 card slots total. Accepts many boards including turbo, ram, cga, tape backup, modem, voice, floppy/hard disk controllers, & others. Visa/MC. Only $79 + $3 p/h. *Merak Industries, 8704 Edna, Warren, MI 48093, 800/231-4310, ext 768, 24 hours, 313/562-9768*

Keyboard Enhancements

Customize Your Keyboard
Blank or custom imprinted replacement keys, shells & snap-on caps for IBM. Imprinted keytop labels supporting most software or custom. FlexShield keyboard protectors. Key Lockouts. Vinyl templates. Original Touchdown™ Keytop Expanders/Extenders. FREE '87 Catalog of keyboard accessories. *Hooleon Corporation, Dept. PCWD, PO Box 201, Cornville, AZ 86325, 602/634-7515; FAX 602/634-4620*

Save 2 Hours Per Week!
Knock 10% off time you spend at your PC keyboard. Unique "chording" feature assures ease of use. Free up 2 hours per week of your valuable time. RAPIDWRITER® comes complete with 101-type keyboard, software, manual: $199. Satisfaction gtd.! Call for info or to place order. Major credit cards, or check. *800/523-8356, (in IL 800/325-1850.* On-site installation, training, customization, support avail. at additional cost from local RAPIDWRITER dealers.

Okidata

An Uki for Your Oki!
Compatability of IBM Plug-n-Play & versatility of Okidata Instruction Set at flick of switch. Easy to install. Complete–no other ROM needed. Utility software included. Specify printer model. Add $3 ship. NY res add sales tax. Oki 83, 92, 93–$49.95. Oki 192, 193–$79.95. *Uki Switch Corp., Dept. PW, 326 Linden Place, West Hempstead, NY 11552, 212/685-8199*

Stationery

Custom PC Stationery
Continuous printed letterheads w/micro perf edges. Matching window or regular envelopes. Numerous colors, inks & papers at lowest prices. Fast delivery & top quality. We'll print your present design or set type for your new design. Call toll free 800/624-2961 (TN: 901/756-7010) for free sample & price info., or write: *PerFORMS Press, 8456 Loften, Cordova, TN 38018*

Supplies

Laser Cartridge Recharge
Don't throw out empty toner cartridges. Sell them to us. Cartridge $6.50, cleaner $3, & box + packing $.50. • PRINTERS: HP, Apple, + more • COPIERS: Canon PC models • BUY OUR RECHARGED CARTRIDGES $50, Blu/Brn $70. We supply empty cartridge & felt cleaner. QC test sheet provided. Support available. *Michlin Computer Consultants, Inc., Laser Cartridge Division, 3770 Plaza Dr. #1, Ann Arbor, MI 48108, 313/663-9800*

Bar Code

Menu Label Printing
Design your label on the screen. Print on Epson/Oki/IBM dot matrix or your LaserJet printer. Flexible format-10 bar codes, 13 text sizes. Text readable at 50 ft. Bar codes: MSI,2of5,UPC/-EAN,MIL-STD,AIAG,Code 39. Reversals, Color, File Input. Easy/Fast $279. Other label programs from $49. 30 day $ back guarantee. *Worthington Data Solutions, 417-A Ingalls St., Santa Cruz, CA 95060, 408/458-9938*

Print Bar Codes
Add bar codes and/or big graphics text to your program. Print from inside of dBASE, BASIC, C, any MS-DOS language or even a word processor. Bar codes: UPC-A/E, 2 of 5, & Code 39. Big text .5", .3", & .2" tall in wide & narrow sizes. Prints on Epson, Oki/IBM/LaserJet $179-$239. 30 day money back guarantee. *Worthington Data Solutions, 417-A Ingalls St., Santa Cruz, CA 95060, 408/458-9938*

Bar Code Readers
PC/XT/AT Reader reads bar codes into dBASE, LOTUS,—any program w/o change, attaches as 2nd keyboard–one model for BOTH internal slot or external attach–$385. PS/2 30 Model-$399. RS-232 Model-$399. All have rugged metal wand & read Codabar, 2of5, UPC/EAN, Code 39, etc. 30 day money back guarantee. *Worthington Data Solutions, 417-A Ingalls St., Santa Cruz, CA 95060, 408/458-9938*

Data Input Devices
Bar Code & Mag Stripe (credit card) Readers, easily installed on keyboard circuit. No card slot or RS-232 port required, transparent to all software. For IBM PC, AT & terminals, as well as many other micros & terminals. Magnetic Encoder & Bar Code Printing Program are also available. GSA approved. *TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833*

Read & Print Bar Codes

Internal unit (eliminates inconvenient external box) or Dual Serial Port unit. Compatible w/all DOS software & keyboards, excellent read rate. Includes stainless steel wand or non-contact laser gun. User-friendly label printing software formats codes & text your way. Ask about money back guarantee. *Seagull Scientific Systems, 601 University Ave. #150, Sacramento, CA 95825, 916/386-1776*

Bar Code Database

Save thousands on bar code applications with !BARSOFT. No programming! *dBASE* compatible. Up/download to host. Scan data directly into relational database. Print labels/menus/forms:popular symbols. Report, sort, edit, calculate & search. Indorsed by IBM. Full fn. eval. pkg. w/complete manual: $45. MC/Visa. *ASAP Inc., 1041 41st Ave., Santa Cruz, CA 95062, 408/476-3935*

dBARCODE™

Print Code 3 of 9, 2 of 5, UPC-A using dBASE III Plus & dot matrix or HP LaserJet printer. Vary bar code width, height, spacing, print multiple columns, etc. dBASE program (source code included) prints bar codes from your databases, or use assembly module in your own programs. $99 + s/h. *TimeKeeping Systems, Inc., Dept. PCW, 12434 Cedar Rd., Cleveland, OH 44106, 216/-229-2579*

Books

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 and IBM special keys fully explained. Order your copy today. Send $12.95 or MC/Visa: *English I Computer Tutorials, 1617 N. Troy St., Dept. B, Chicago, IL 60647, 312/489-1588*

LaserJet Unlimited book

"A big plus for anyone with the HP LaserJet." –John Dvorak, *InfoWorld*. "A fantastic resource for any laser printer owner." –*PC Publishing*. "Demystifies the popular printer."–*LA Times*. 228 pages, 45 illustrations. $24.95 plus $3.50 s/h. CA res add 6.5% tax. Chk/Visa/MC. *Peachpit Press, 2127 Woolsey St., Berkeley, CA 94705, 415/843-6614*

DOS Shell Kit

Learn the DOS tricks and techniques used by the consultants. Compiled in one easy to read book. A must for hard disk users. "One of the best books we've seen on batch programming"–*PC* Magazine. 1000's of readers since 1983. Includes disk with utilities & sample files. $25 + $1.50 s/h. Visa/MC. *Sheldon Publishing, 789 Casiano Dr., Santa Barbara, CA 93105, 805/687-0865*

Catalogs

PCjr Products

PCjr Catalog Hotline

Possibly the largest selection of PCjr products anywhere! Call or write to receive a free 24-page catalog. Features our lowest cost disk drives, keyboards, memory, multifunction and speech boards, pseudo DMA cartridges, joysticks, cables, dust covers, software and much, much more. *The jrProducts Group* PC Enterprises, *P.O. Box 292, Belmar, NJ 07719, 800/922-PCjr, 201/280-0025*

Computer Insurance

SAFEWARE

- Busines Computers
- Home Computers
- Overseas Computers
- Leased Computers
- Computers Leased to Others
- Computers Taken to Shows
- Computers Held for Sale
- Others' Computers in Your Care

Call for complete information! *SAFEWARE, The Insurance Agency Inc., 2929 N. High St., PO Box 02211, Columbus, OH 43202, 800/848-3469, 614/262-0559*

SAFEWARE

Insure your computer. SAFEWARE provides full replacement of hardware, media, & purchased software. As little as $39 a year provides comprehensive coverage. With our blanket coverage, no lists of equipment are needed. One phone call does it all! Call 8am to 10pm EST (Sat 9 to 5). *SAFEWARE, The Insurance Agency Inc., 2929 N. High St., PO Box 02211, Columbus, OH 43202, 800/848-3469, 614/262-0559*

Consultants

California

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, 800/445-9522, 214/357-7751*

Disk Copy Service

Software Duplication

One Stop Shopping
Custom Packaging
Copy Protection
Technical Support
Drop Shipping
Fast Turn-Around
Competitive Pricing
Maxell Bulk Diskettes
Satisfaction Guaranteed
"We are the Industry Leaders!"
MegaSoft, Inc., PO Box 710, Freehold, NJ 07728, 800/222-0490, 201/462-7628

BLANKET SERVICES

- Diskette duplication
- Packaging
- Stocking/Drop Shipping
- 48-hour delivery
- SUPERLOK copy protection
- Lifetime guarantee
- No "mastering" charge
- No charge for standard labels

Star-Byte, Inc., 713 West Main St., Lansdale, PA 19446, 800/243-1515, 215/368-1200

Duplication From 59¢

Announcing affordable duplication rates! Start at 59¢ & work your way down on our CUMULATIVE PURCHASE PLAN. PRICE INCLUDES:

- QUALITY 5¼" BROWN DISC DISKETTE, WITH YOUR LABELS
- APPLIED & DUPLICATION
- QUICK TURN AROUND
- GUARANTEED PRODUCT

Now! 3.5" MS-DOS from $1.59. *Diversified Systems Group, Inc., PO Box 1114, Issaquah, WA 98027, 206/392-0900*

Hardware

Clock/Calendars

Motherboard Clock $59

SideClock does not use an expansion slot! The Innoventions' Clock/Calendar, installs in seconds: Just open the computer cover & snap it into place. Never enter the time & date again, SideClock does it for you. Battery & Software included. 30-day $ back gtd. 2-year limited warranty. $59 + $3 s/h. Site discounts. Dealers welcome. *Aristo, 16811 El Camino, #213-J, Houston, TX 77058, 713/480-6288, 800/3ARISTO*

Memory Upgrade

640K On MotherBoard

640K RAM without using an expansion slot. Our upgrades allow easy insertion of 256K chips on the system board. Highly reliable due to reduced heat & chip count. 100% comp. 30-day $ back gtd, 2-yr wrnty. COMPAQ Portable, Zenith151,161: $29; $94 w/memory. IBM XT, Portable & 3270: $39; $104 w/mem. IBM PC: $49; $114 w/mem. $4 s/h. Site discount, dealers welcome. *Aristo, 16811 El Camino, 213-J, Houston, TX 77058, 713/480-6288, 800/3ARISTO*

PC-RISC System

PC Mini-Supercomputer

Up to 36 MIPS in your PC! Fill your PC/XT/AT with 1 to 6 PC4000 boards for a high speed PC-RISC system. PC4000 uses the Novix RISC Engine. Each PC4000 is a general purpose parallel coprocessor that delivers speeds in the 5-8 MIPS range...over 100 times faster than a PC...2X speed of a VAX11/780 or HP9000. C & Forth avail. From $1295. *Silicon Composers, 210 California Ave., Ste. I, Palo Alto, CA 94306, 415/322-8763*

Mailing Lists

IBM Mailing Lists

FREE CATALOG. Over 2 million names on 75 owner/user lists: IBM, Apple, mini sites, resellers, stores, VARs, chains, mail order dealers, educational, UNIX, Pascal, COBOL, Lotus, *dBASE*, modem, investor, publications, clubs. Call/write for free catalog. Include phone & type of business. *Targeted Marketing Inc., Irv Brechner, Box 5125-W, Ridgewood, NJ 07451, 800/323-8287, 201/445-7196*

Publications

PCjr Lovers!

The Junior Report: The National Newsletter for you! 24 pages of PCjr-specific articles, reviews, Q&A, Public Domain, and more! Acclaimed by: *PC World* Sept 86, *USA TODAY* Nov 6th 86, *COMPUTE!* Mar 87, *FAMILY COMPUTING* Apr 87. Write today for a free sample. $18/yr/12 issues, Canada $24(US). *The PCjr Club, Dept. W, P.O. Box 59067, Schaumburg, IL 60159-0067*

Software

Accounting

MicroMash Reviews

CPA. CMA. CIA. Each interactive program contains recent exam multiple-choice & essay/problems with text solutions. Cumulative records indicate future study areas & exam readiness. CPA Pass/Refund offer-individuals. IBM PCs & compatibles. Individual, Office, College Packages. AmEx/MC/Visa. *MicroMash, 14 Inverness Dr. E, F-104, Englewood, CO 80112, 800/241-9700, in CO 303/799-0099*

PC-FUND

The leading fund accounting system for local governments & non-profit organizations. Modules include General Ledger, Payables, Encumbrances, Obligation Tracking, Receivables, Payroll, Budgeting, Fixed Assets & Donor Receipts. PC-FUND runs on the IBM PC & compatibles under MS-DOS & Xenix. *American Fundware, Inc., Box 3028, Steamboat Springs, CO 80477, 800/551-4458, 303/879-5770*

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. Updated for TRA86. $695. 30 day free trial. 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, 505 East Huntland Dr. #340, Austin, TX 78752, 800/647-3863, 512/454-5004*

dBASE Business Tools

- GENERAL LEDGER
- ORDER ENTRY
- dINVOICER & A/R
- SALES ANALYSIS
- SERVICE BILLING
- ACCOUNTS PAYABLE
- PURCHASING/INVEN.
- JOB COSTING
- JOB ESTIMATING
- PAYROLL

$99 ea + s/h includes *dBASE* 2, 3 or 3+Source Code. MC/AmEx/Visa/chk/COD. *Datamar Systems, 4876-W Santa Monica Ave., San Diego, CA 92107, 619/223-3344*

Single Entry Bookkeeping

Don't be confused by assets, liabilities, debits & credits any longer. SEB has a built-in editor & prints five reports for direct entry into IRS 1120 or Schedule C forms. Both cash & accrual accounting. Easy to understand. PC DOS $49.95 postpaid. Visa/MC/chks. Send for brochure. *Clifford Vander Yacht, Computer Consultant, 3778 Hitching Post Rd., Jackson, MI 49201, 517/782-2297*

Non-Profits Only

ECHO products have been meeting agency needs since 1980 with complete Financial Accounting, Fund Raising Management, Human Services Client Information & Billing systems. All provide rigid audit trails with flexible reporting sub-systems. For more information: *Echo Consulting Services, Inc., PO Box 1199, White Mountain Highway, Conway, NH 03818, 603/447-5453*

Bos Business Accounting

The easiest, most complete small business acctng. Integrating G/L, A/R, A/P, Sales & Inventory, & Payroll. All for what others charge for a single module! *Special intro: $395* valid with this coupon (normal retail $495)! $30 demo (complete pack with usage time limit). 60 day $ back gtd! Call for a detailed brochure. VARs welcome. *Aristo, 16811 El Camino #213-J, Houston, TX 77058, 713/480-6288, 800/3ARISTO*

CheckMaster™
Professional Check Management System. Keep accurate books without knowing double-entry accounting. Reconcile bank statements in minutes. Save accounting fees by sending transactions right to your accountant. Recover $395 cost quickly. Special money-back guarantee. Explore CheckMaster with $5 demo. *Microcomputer Specialists, Inc., PO Box 795, Woodstock, VT 05091, 800/833-1500, 802/457-4600*

Artificial Intelligence

Artificial Stupidity
To understand Artificial Intelligence, you also need to understand the flip side–Artificial Stupidity. Our entertaining software and manual walks you through all 5 stages, starting with Basic AS. Written for PCs in C, with source code. Mail $20 (cash or check) or phone orders (COD) to: *InControl Systems, Inc., PO Box 974, Lewisville, TX 75057, 817/430-3828*

Software

Bible Study

GodSpeed™ Bible Search
In 3 seconds locate any word in the KJV Bible and display the full text of verses that contain the desired word(s). Verses may be printed for sermons, Sunday school, personal study, etc. Requires hard disk. Not copy protected. $100 + $6.50 CA tax.Visa/MC/mo/chk. *Jones Computer Systems, PO Box 5505, Carson, CA 90749, 213/538-1995*

Billing/ Time Keeping

Timeslips III–$199.95
Now there's an easy way to keep money falling through the cracks. Capacity: 3400 clients
- RAM-Resident
- 2000 char. desc. field
- Short-hand entry codes
- Procedure Macros
- 5000+ billing formats, plus narrative bills!
- Flat-fee, Trust/Retainer, & Contingency Billing
- Automatic data back-up
- *North Edge Software, 239 Western Ave., Essex, MA 01929. To Order: 800/-225-5669, 617/468-7358*

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, PO Box 32, Dept. P, Kingsville, TX 78363, 512/595-1937. Telex 6713995*

MILP88-Mixed Integer LP
A general-purpose system for solving mixed integer linear programs w/up to 64 integers, 255 constraints & 1255 variables. Solves problems by applying an advanced version of the branch & bound method. Menu-driven w/many useful features similar to *LP88*. Requires 192K. $99 w/8087 support, user's guide. Visa/MC. *Eastern Software Products, PO Box 15328, Alexandria, VA 22309, 703/360-7600*

Auto-Pilot™
Put your responsibilities on Auto-Pilot: ToDo list, sophisticated Tickler file, appointment calendar. Tracks employee assignments/action items. Windows display future, present, & uncompleted past events. Multi-users, multi-files, periodic & one time events. PC/XT/AT/ compatible. $29.95 chk/Visa/ MC. *Advanced Concepts, PO Box 246, Ironia, NJ 07845, 800/628-2828, ext. 655*

DECISION PAD™
NEW! Be more effective on tough decisions for tougher audiences. Easy-to-use menu-driven worksheet, graphics. Hold fewer better meetings. Improve your credibility & hit rate. Sample templates for evaluating people, purchasing, marketing, sales, investing. 256K PC. Intro Special $99 + $5 s/h. NO RISK 30-day money back. *Apian Software, Inc., Box 1224, Menlo Park, CA 94026, 800/237-4565 ext 101*

Business/Home

MoneyCounts® 4.0 $16
CPA designed Money Mgt & Accounting System for Home & Business. Checking & credit card Mgt, Smart checkbook balancer, budgeting, financial & inquiry reports, graphics, financial data base, on-line help, color, pop-up calculator, lots of capacity (up to 999 accts/24000 entries per yr), much more. Not copy protected. Call or send $16 + $3 s/h chk/Visa/MC. *Parsons Technology, 6925 Surrey Dr. NE, Dept. W, Cedar Rapids, IA 52402, 800/223-6925, 319/373-0224*

CARD FILE
Computerized address book—organizes 100,000 names & addresses; w/up to 100 Form Letters (designed for window envelopes); Rolodex Card & Label printing; self-generated Address Book; Zip Code ordering; and more. Includes manual. PC/XT/AT/compat. $25 + $5 s/h, CA tax, Visa/MC, or check. *Skeen Software, 812 Sycamore Dr., Azusa, CA 91702, 818/969-3717*

Calendar

TYMaster–(calendar)
A Time-management program that generates a Graphic monthly display (full screen), and "Windows" date cells into separate recurrent (Anniv., B-days, Holidays, etc.) from non-recurrent (Appointments/ Meetings, Tasks, etc.) entries. Numerous other features incl. Time Calc. IBM & compt.w DOS2.0+ $59. *Phoenix-Sierra, Inc., 600 E. William St. #303, Carson City, NV 89701, 702/882-3088*

Church Applications

Parish Data System™
Comprehensive census/contribution program. Easy to operate, menu-driven. Family, member, financial info & reports fully integrated. Selective listings, labels; contribution, tuition statements; personalized letters. User can create own reports, letters. Other church programs available. Over 2000 users. *Parish Data Systems, Inc., 3031 W. Northern Ave. #121, Phoenix, AZ 85051, 602/247-3341*

PowerChurch Plus!®
Fast, friendly, reliable church administration system. Full fund accounting, mailing lists, membership, contributions, attendance, word processing, accts. payable, payroll, multi-user support, & much more–all for $495 complete. Uses up-to-date software technology. Unlimited capacity. Demo $10. Details: *FI Software, PO Box 3096, Beverly Hills, CA 90212, 213/854-0865*

Romar Church Systems™
Membership %M1 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, 3377 Cimarron Dr., Santa Ynez, CA 93460, 805/688-7370. Please note our new address*

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*

PCPOLL
UNATTENDED Communications running on PC. Bisynch, SDLC, Asynch– Up to 8 lines. Call your branch office computers, transfer files up or down, remote batch processing, Mailbox. Scheduler provides weekend polling. POSTPROCs process collected data. Also COMM. DRIVERS & SYNCHRONOUS MODEMBOARDS. *RTI, 1200 Executive Dr. E. #124, Richardson, TX 75081, 214/783-4782*

American E-Mail™
Turns a PC into an electronic mail, BBS host. Mail may be automatically carbon copied to any user on the system, or even sent certified! The system also includes a File Section for transferring data & programs, a 'FYI' Section for posting public messages & a complete access security system. "American E-Mail is an excellent choice..." LINK-UP, May '87–$149. *Smith Micro Software, Inc., PO Box 7137, Huntington Beach, CA 92615, 714/964-0412*

Consolidation

High-End Analysis
TM/1 gives you *simultaneous consolidation* across departments, time, accounts, products, etc. Eliminates data-duplication errors. Translates DBMS data directly into spreadsheet format. $39.95 Evaluation Version includes: complete documentation, all features & functions, tutorials & support. Visa/MC. *Sinper Corporation, 8901 Tonnelle Ave., North Bergen, NJ 07047, 201/662-7999*

Construction

Construction Management
Affordable, understandable software for builders. Job cost, billing time & materials or percent complete, payables, change order & retention tracking in one package. Prints checks, statements, bids, 30+ reports. Clear manual & help windows, backed by our professional phone support staff. $795. *Yardi Systems, Inc., 3324 State St., Ste. "O", Santa Barbara, CA 93105, 805/687-4245*

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 $20; most cookbooks $6. Demo $3. Free catalog. *Vanilla Software, 3345 Lakeshore Ave., Dept. W, Oakland, CA 94610, 415/482-4756*

Data Entry

Data Entry Emulator
Heads-down data entry for PCs. Fast & accurate preparation of batch data files. Formatting in minutes. Features include: auto-dup, 2 pass verification, constants, format chaining, range checks, table lookups, batch totals, 129 keyboard option, and much more...30 day trial period. ONLY $395.*Computer Keyes, 21929 Makah Rd., Woodway, WA 98020, 206/776-6443*

VDE–Viking Data Entry
The premier data entry system. Full-featured to replace key punch & keydisks. Full screen "FORMS", double-key verify, wide variety of options, crossfoots, subtotals, batch balancing, duplicating, statistics, skipping, etc. Character, field & record level validations. $120-600. Also for minis. *Viking Software Services, Inc., 2815 East Skelly Dr. #816, Tulsa, OK 74105, 918/745-6550*

KeyEntry III®
The most widely used data entry system *in the world*. Unsurpassed in "heads-down" environment, and for *all* other types of data entry. You won't see the ease or full potential of PC-based data entry until you see KeyEntry III. Complete Evaluation Copy (all programs & documentation) just $42.50 delivered. *Southern Computer Systems, Inc., 2732 Seventh Ave. South, Birmingham, AL 35233, 800/533-6879, 205/251-2985*

Data Management

Base SAS® Software
Offers tools for data manipulation, information storage & retrieval, descriptive statistical analysis, & report writing. Also includes a windowing facility; file conversion capabilities for *dBASE II®* & *dBASE III®* DBF files & DIF files; & a micro-to-host link. Compatible with the SAS System for mainframes & minicomputers. *SAS Institute Inc., Box 8000, SAS Circle, Cary, NC 27511-8000, 919/467-8000*

Demo/Tutorials

Instant Replay II
Build Demos, Tutorials, Prototypes, Music, Presentations, Timed Keyboard Macros, & Menu Systems. Includes Screen Maker, Keystroke/Time Editor, Program Memorizer, & Animator. Received Great Reviews! Simply The Best. 60 day satisfaction money back guarantee. IBM & Compatibles. $149.95 U.S. chk/credit card. Demo Diskette $5. No royalties. *Nostradamus Inc., 3191 South Valley St. #252, Salt Lake City, UT 84109, 801/487-9662*

Desktop Publishing

Letter Perfect 2.1–$150
Overcome Jaggies. Create newsletters, brochures, overheads, posters, inventory tags, ship labels on LaserJet without add-on Hdw, fonts or mouse. Bold text in pt size 4-720 with rulings, boxes, and perfect circles. Combine layout with word processor, spreadsheet, drawn or scanned art. 30-day $ back. *Systems Strategies & Solutions, 13791 Serraoaks Ct., Saratoga, CA 95070, 408/741-1082*

Development Tools

Programmer Tools $99
Library subroutines. Save hundreds of hours in programming & debugging. No royalties. WINDOW.LIB-WINDOW.LIB w/dENTRY-FILES.LIB-BIOS.LIB-DOS.LIB. For programs compiled in:

• BASIC	IBM	MS
• C	LAT	MS
• COBOL	MS	RMF
• PASCAL	MS	TUR
• FORTRAN	MS	RMS
• dBASE	NAN	

Glenco Engineering, 3920 Ridge Ave., Arlington Heights, IL 60004, 312/392-2492

Screen Development System
Design instant screen I/O for MS C & Fortran programs with "Route 66". Create input screens, help windows, code windows, bar menus & more. ASM & C w/-BIOS hook for speed. Data comp for less space. Includes ed, lib & doc. Demo for $10. System for $195. Visa/MC/chk/mo. Call or write. *Innovative Business Designs, 1100 FM 1960 West #F116, Houston, TX 77090, 713/-444-1186*

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, 2601 North Shore Rd., Bellingham, WA 98226, 206/734-8248*

Teacher Turned Author!
Courseware Authoring System. Create great instructional courseware in minutes. No programming. No Royalities. Mix color graphics & text. Imbedded drawing system. Recordkeeping & fast editing. Prices $119-485. Demo Disk $15. IBM PC/XT & Compatibles. *Raster Sciences, Inc., P.O. Box 3477, Longwood, FL 32779, 800/233-4465(tone) 8555; 305/889-8555*

GradeBook/Testing

MICROGRADE-Flexible course & grading, 400 students/80 assignments per class, prints stats & various reports. Ideal any grade level. $65. MICROTEST II-create, update, generate & store exam materials. Extremely easy to use. Compatible with major publisher's test banks. $95. Free brochures-$5 Demos. *Chariot Software Group, 3659 India St., Suite PC1, San Diego, CA 92103, 619/298-0202*

Educational/ Self-Improvement

Would You Like to Know?

- Your I.Q.?
- Memory Level?
- Response Time?
- Coordination?
- Visual Perception?

Expand your mind with MENTOR™–software that lets you explore your hidden talents. Over 58 psychometric exercises, including 25 complete IQ tests

- IBM PC/comp • 256K
- Graphics board • $49.95
- Visa/MC. *Heuristic Research, Inc., 3112-A West Cuthbert Ave., Midland, TX 79701, 800/443-7380, (In TX, collect 915/694-5936*

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, 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. Specifically designed for interactive use on today's high-speed microprocessors, it is loaded with features such as interactive graphics & animation. Using GPSS/PC, you can predict the behavior of complicated real-world systems. *Minuteman Software, PO Box 171/W, Stow, MA 01775-0171, 800/223-1430 ext. 315, 617/897-5662 ext. 315*

Estate Planning

Will-Planner™

Use your PC to write a personalized will! Easy program creates typed will/trust valid in your state. Written by lawyers. Has asset inventory, estate tax estimate, dictionary, info on probate & using lawyers. For IBM PC & comp. Copy protected: $79.95; hard disk special: $89.95 unprotected (+ $4 postage, $8 foreign). Will-Planner™ by *Noetic Technologies Corp., PO Box 3085, Englewood, CO 80155, orders & info 303/770-2380*

Film Library

VCR Film List

Versatile filing & cataloging system for VCR film collectors. Easy to use. Titles automatically alphabetized, scroll for review, print 100 to a pg. Detail record, spaces for director, cast, notes. Search locates, lists films with any director, cast member, key word in notes. $29.95 Visa/MC/AmEx, free next day ship. *Manhattan Software, PO Box 148, Peterborough, NH 03458. Orders: 800/432-5656; info: 603/924-9998*

Flow Charting

New Flow Charting II+

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'l), 800/672-3470, ext. 897 (CA)*

Forms

Custom Forms. Easy.

Use FormWorx to quickly make your own forms & data sheets with lines, boxes & different type sizes. Cost effective, time efficient, customized. Or use FormWorx to efficiently fill out pre-printed forms to minimize retyping and wastage. WYSIWYG. A "Best Buy" at $95. Call or write for reviews & sample forms. *FormWorx Corp., 1365 Massachusetts Ave., Arlington, MA 02174, 800/992-0085, 617/641-0400*

Gambling

New! Lotto Picker™ Plus

BE THE NEXT LOTTO MILLIONAIRE! New Lotto Picker Plus lets you store winning Lotto & Pick 3/4 numbers & choose 1 of 3 statistical modes (unbiased, 'hot', or 'due') to select what might be your winning million $ numbers! All U.S. & Canadian games incld. Never Obsolete! IBM & other vers. $34.95 + $4.55 s/h. *Save Shipping*, Order by Mail: *GE Ridge Services, Inc., 170 Broadway #201-PCW, New York, NY 10038. Inquiries/Dealers: 718/317-1961*

Pro Football Analyst™

Handicap NFL games against the point spread easily & profitably with your computer! Only 5 minutes/week & your local newspaper is needed to uncover hidden overlays in the betting line. Winning season GUARANTEED or your MONEY BACK! $34.95(+ $4.55 s/h). IBM & other versions avail. Save shipping–Order by mail. *GE Ridge Services, Inc., 170 Broadway #201-PW, New York, NY 10038, inquiries/Dealers: 718/317-1961*

Football Wager $$$ Ware

Uncle VITO and Rotten Robbie have developed a program that will show YOU the trueline on all football games. Update in 5 min/week & store to disk. Complete with wager summary, schedule, 3 years database, gives 2 opinions on games, sorts out the best games, and MORE. You have user support & winners. For our neighbors to the North, Canadian football, $49.95. NFL or COLLEGE $39.95. *J & R Software, 523 2nd St., Towanda, PA 18848, 717/265-4259*

Games

Master Casino Games

- Learn casino skills w/o risk!
- Craps, Blackjack, Roulette
- Video Poker, Baccarat
- Vivid color displays
- Odds/strategy info, compl. manuals.

EACH GAME–$29
ANY TWO–$49
ALL FIVE–$69
For IBM PC/comp w/color graphics. Chk/MC/Visa ppd. *Hitech Management Corp., PO Box 2121, Boca Raton, FL 33427. Telephone charges accepted–800/332-2049 x3017, 305/392-3678*

Blackjack, Craps, Systems

Casino Blackjack Counter/-Tutor is like playing in a real casino; deals 5 hands from up to 6 decks. Teaches card counting, expert plays. *Casino Craps* has all major bets, correct odds, detailed bet analysis. *Casino Betting Systems*: see how major systems work(or don't), or try own, with on-screen & printed results. $35 each pgm, $60/2, $80/3. Visa/MC, free ship. *Manhattan Software, PO Box 148, Peterborough, NH 03458, 800/432-5656 orders, 603/-924-9998 info*

ProChallenge Baseball

Tony Kubek of NBC Sports & former Yankee great says, "For realism, for challenge, no other game can touch it". Officially licensed by MLBPA. Features 10 game & help screens. All 26 league teams. For the Baseball Strategist who enjoys the challenge. $79.95(US) + $5 shipping. Visa/MC/chk/mo. 256K PC/XT/AT. *JBE Ltd., 869 Yonge St. #110, Toronto, Ontario M4W 2H2 Canada, 416/-961-6233*

Genealogy

Family Reunion
New version 3.2 provides 32 types of charts, worksheets & reports, including address labels, birthday lists, pedigrees, group sheets, descendants, histories, facts, indexes. Powerful data entry & search capabilities, fancy screens, *many* user options, fast, fun, easy to learn! $195 (refunded if not satisfied). MC/Visa/AmEx/COD. Superior value! *Personal Software Company, 1580 E. Dawn Dr., Salt Lake City, UT 84121, 801/943-6908*

ROOTS II™
New version 2 helps more than ever to organize your family history. Now produce 12 types of genealogical charts & forms including automatic paginated index for your family book. Send for free 50 page *Kennedy Family History* sample. Any PC or compatible. Satisfaction guaranteed. $195 (+ tax in CA). *COMMSOFT, 2257 Old Middlefield Way, Ste. B, Mountain View, CA 94043, 415/967-1900, 800/32-ROOTS, 800/53-ROOTS (CA)*

Graphics

Grafmatic/Plotmatic
Grafmatic (screen graphics): 75 MS FORTRAN/Pascal (3.2,3.3) R-M, Profort, Lahey callable graphics routines. 100 page user manual. Graphics primitives, total 2D plot support, 3D plots & solid models. $135. HP, HI plotter? Get Plotmatic plotter driver. Use with Grafmatic. $135. Both–$240. *Microcompatibles, Inc., 301 Prelude Dr., Silver Spring, MD 20901, 301/593-0683*

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*

Demo-Graphics Writer
Creates HiRes animated color graphics presentations & sends them via modem to other Writer users in seconds. Also create software demos, courseware or just plain images. Graphics can be passed between differing systems (ie EGA to AMIGA). No other system does this at any price; ours does at $249 incl/ship. *JONSOG associates, PO Box 81, Keedysville, MD 21756, 800/255-WRIT, 301/432-2062*

Graphic Printer Support
At last! IBM PC graphics support for your dot matrix, laser, or inkjet printer. Use the PrtSc key to produce quality B&W or color scaled reproductions of your display on any graphics printer. GRAFPLUS is now available for all versions of PC or MS-DOS & will operate with all major graphics boards (incl. EGA). $49.95. *Jewell Technologies, Inc., 4740–44th Ave. SW #203, Seattle, WA 98116, 206/937-1081, 800/628-2828 ext 527*

Hard Disk Expansion

AT/XT/PC 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, PO Box 3039, San Diego, CA 92103, 619/298-9349*

Health

HouseCall™
Home medical encyclopedia. Designed by doctors for consumers. Input symptoms via simple menu format. HouseCall gives likely diagnosis + information about the condition. You can also access data via topical index. Over 400 diagnoses! SPECIAL: $49.95 protected or $59.95 non-protected for hard disks, + $5 s/h. *Rocky Mountain Med. Software, 5680 Greenwood Plaza Blvd., Englewood, CO 80111, 800/233-3556*

FamilyCare Software™
Illness? Injury? Learn what to do when your child's hurting. FamilyCare will help you diagnose the problem & tell you how to get proper medical help–anytime day or night. Developed by expert pediatricians, FamilyCare is comprehensive, reliable, & easy to use. Ages newborn–15. $180, guaranteed. *Lundin Laboratories, 29451 Greenfield Rd. #216, Southfield, MI 48076, 800/426-8426*

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 modifiable dBASE source code. The menu-driven program lets you locate items by inventory name or number. It keeps track of reorder points, vendors, average cost, & other info $150. dFELLER PLUS with Purchase Orders & History $200. Requires *dBASE II* or *III* or *III PLUS. Feller Associates, 550 CR PPA, Route 3, Ishpeming, MI 49849, 906/486-6024*

Stock-Master 4.0
This commercial grade, high performance inventory system for Mfgrs has Stock Status Rptg, Trend Analysis, Purchase Order Tracking, QC Rptg, Transaction History Detail Analysis, Multiple Whse Locations, Bill of Materials & Purchase Order Writing. On minis since 1978, expanded/priced for micros. Demo avail. *Applied Micro Business Systems, Inc., 177-F Riverside Ave., Newport, CA 92663, 714/759-0582*

Super Retailer™ is HERE!
Find out why over 500 purchases a second are made on the finest point of sale program. Ultra-flexibility-cash, returns, credit, depts...Control your bus. Keep track of your money. Inventory module–$99. Become a Super Dealer. Modules for acctng integrate automatically. 60 Day Money Back Guarantee. Visa/MC. *PMC, 100 East 2nd Street, Mineola, NY 11501, 800-DIAL-PMC, in NY 516/294-1400*

Land Surveys

L-PLOT...
A Metes & Bounds program to plot/print plats of *Any* scale—*Any* description–use *Any* measurement! Calc. areas, error of closure, plots multi tracts. IBM/compat with monographics, CGA or EGA capability. $190. Or send $15 for real working demo, refundable with order. Visa/MC/chk. Free info. *LAN/SCAN, Inc., PO Box 6863, Abilene, TX 79608, 214/824-6419*

Loans

LOAN MAKER™ $89.95
Godfather of Loan Calculation & Amortization Programs. Instantly computes results on changes in Loan Parameters. Makes amort schedules for Level, Specified Amt., & Decreasing Pymts for any time period. Balloon Pymts. Save/Recall/Delete schedules. IBM/comp. Superb manual. Demo $2; 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)*

Execamort™-Amortizer+
Used nationwide by accountants/finance/legal/real estate. Simple/complex amortizations, solve for unknowns, present/future values, APRs, yields/IRRs, points/fees & mixed cash flows. Simple to use—great for client services! IBM PC/compatibles-requires 196k memory. $129.95 + $4 shipping-Visa/MC/AmEx. *Electrosonics, 36380 Garfield #1, Fraser, MI 48026-1212, 800/858-8448, 313/791-0770*

Local Area Link

Handshake!
Enables IBM PCs/clones to share resources like printers, plotters, and files. Uses standard DOS commands, has pop ups, requires no setup, and is memory resident. Allows portables and other PCs using 3½" disks to link with PCs using 5¼" disks. $99.95 ea, Cable $49.95 Starter Kit $229.95. *Sundance Software, PO Box 434, Redmond, WA 98073-0434, 206/885-0759*

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*

Mail-Track-II $195
Flexible, powerful, customizable, 1 to 24 user-defined fields, up to 20 user-defined reports, check for duplicates, auto city & state for more than 20,000 zip codes, allow US, Canadian & foreign addresses, import & export ASCII files, select & sort by all fields, mail merge. Bulk Sort option $195. Trial version for $2.95. *Sapana Micro Software, 1305 South Rouse, Dept PCWB, Pittsburg, KANSAS 66762, 316/231-5023*

ArcList
Professional list management for IBM PC/XT/AT. Capacity 20,000,000 names, automatic zip & state verification, print any label, custom charts & reports, merge-purge with excellent near-dupe recognition, match codes, postal presorting, Nth sampling. $595. Call for free brochure. *Arc Tangent, Inc., 923 Olive St., PO Box 2009, Santa Barbara, CA 93120, 800/843-5928, 805/965-7277(CA)*

Zip Directory on Disk
41,000 zip codes w/city, state & county on floppy disk set. Data file allows your programs to automatically lookup city, state & county info based on zip. Speed data entry; find errors in current list. Req. hard disk. DOS 2.0 & other pop. formats $195. Longitude/Latitude geographic data also avail. Call for free brochure. *DCC Data Service, 1200 18th St. NW #704, Washington, DC 20036, 800/431-2577, 202/452-1419(DC, AK)*

Rocket Mail
Flexible list manager, organizes multiple lists. 17 fields including UPS zone, help windows at field levels. Browse & dupe recognition. Print labels 1,3,4 across. Indexed by last name, zip code, record number & status. IBMs & compatibles w/384K, DOS & hard disk. $49.50. *Hooper Consultants, Rt 3 Box 382, Double Springs, AL 35553, 205/486-4669*

Zip Code Directory
79,000 zip codes on floppy disks. Complete file with city, state & county. Excellent for data entry use & for quick look-ups. "Look-up" software included. All formats available. Same day shipping. $99. Call or write. *MICROEAST, 28 Julie Lane, Barksdale Estates, Newark, DE 19711, 302/454-7342*

Mail Order

Mail Order Accountant
Order fulfillment/List management. Includes customer lists, labels in 6 formats, inventory, invoicing, accounts receivable, customer payments by cash/credit card. Prints shipping labels, credit card slips, UPS shipping manifests, sales tax reports. *dBASE III* Plus source code provided. Price $750. 90-day grt. Send $25 + $3.50 s/h for real demo. *Goldsmith & Associates, 48 Shattuck Square #86, Berkeley, CA 94704, 415/540-8396*

Mailing Programs

PostWare Mailing System
Automate mail prep. Reduce postage by up to 5¢ per piece! PostWare assigns carrier route numbers, sorts by US Postal Service regs & prints labels in pkg. & sack mailing order. Sack tags, tray labels & mailing reports. Works w/*dBASE III, DataEase*, Smart, Power-Base & others. Also ASCII.
- 1st & 3rd Class-$195
- 2nd Class-$395
- Carrier Route-$295
- PostWare Jr-$69

PostalSoft, 515 Division St., LaCrosse, WI 54601-4544, 800/831-6245, 608/784-3500

Maintenance Management

Maintenance & Inspection
An integrated maintenance management system, including parts inventory, with clients in Fortune 500 companies, utilities, hospitals, schools, manufacturing & service industries etc. The online system provides operational, planning & analytical reports such as work orders, schedules, skill & inventory requirements, budget reports & reports that summarize history of work performed. *Penguin Computer Consultants, PO Box 20485, San Jose, CA 95160, 408/997-7703*

Manufacturing

SUMIT MRP
DATA BASE oriented. Includes Material Requirements Planning, WIP Accounting, BOM, Standard Costing, Material/Inventory, Order Entry, Purchasing, & General Accounting (AR, AP, GL); all fully integrated. REVELATION with PC-DOS or network; or PICK Operating System. DOS demo diskette: $10 prepaid. *SUM Data Systems, Inc., 11222 La Cienega Blvd. #400, Inglewood, CA 90304-1104, 213/410-0022*

Manufacturing Inventory
Integrated Inventory Control, Bills of Material, & Purchase Orders with direct accounting interface, priced at only $995. Special money-back guarantee. Read the review in the 12/86 issue of *PC World*, pp. 246-251, or explore MISys yourself & print sample reports using our demo ($5 ppd). *Microcomputer Specialists, Inc., PO Box 795, Woodstock, VT 05091, 800/833-1500, 802/457-4600*

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., 526 South E St., Santa Rosa, CA 95404, 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)*

Medical/Dental Systems
Tenth Anniversary. Support for more than 130 machines. Featuring paper & electronic claims, patient billing, appointments, diagnostic data base, word processing, financial histories, payroll, accounts payable, & general ledger. Single & multi-user systems. Starting at $199.95. 2,400 Dealers. *CMA Micro Computer, 55888 Yucca Trail #6, Yucca Valley, CA 92284, 619/365-9718*

Menu Systems

Menu at Work
MENU AT WORK–the PC Maximizer. Organize your PC workstations! Unique Menu system allows you to standardize workstations, protect confidential data, measure usage, easy for novices, fast for experts, enhanced DOS commands at a key stroke. Call or Write: *Management Science Associates Inc., 6565 Penn Ave. at Fifth, Pittsburgh, PA 15206-4490, 800/MSA-INFO, in PA 412/362-2000*

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, Star printers. Send $49.95 plus $2 s/h, or write for free sample output. *SongWright, Route 1, Box 83, Lovettsville, VA 22080, 703/822-9068*

Mutual Funds

FUNDGRAF©
GRAPH & find best performing mutual funds or stocks. Graph PRICE and/or MOVING AVERAGE (any span). Superimpose graphs for comparison. Calculate relative strength RATINGS. Generate buy & sell SIGNALS when trend changes. FREE brochure. DEMO disk $10. FUNDGRAF disk with data for 32 funds for 4 years $100. MC/Visa/chk. *Parsons Software, Dept. C, 1230 West 6th St., Loveland, CO 80537, 303/669-3744*

Compare 580 Funds
Select, rank, total, average & print information using simple menu commands. No additional software required. Supports multiple search & sort criteria on 21 "screenable" information fields for individual or selected groups of equity funds. Data transports easily to *1-2-3* & other popular software. $49.95 annual or $149.95 for quarterly diskettes. *Business Week Mutual Fund Scoreboard Diskette, PO Box 621, Elk Grove, IL 60009-0621, 800/217-6172*

Nutrition

Diet Wise–Energy Wise
Ideal for individuals interested in nutrition, fitness, weight control, or special diets. ENERGY WISE calculates calories used in exercise & daily activities. DIET WISE analyzes diets, recipes, & menus. Designed by Registered Dietitians. $39-$120. PC/MS-DOS. Also inquire about NUTRIPAK PROFESSIONAL version. *Nutritional Data Resources, Box 540A, Willoughby, OH 44094, 800/NDR-DIET, 216/951-6593*

Printing Envelopes

Laser Envelopes
ERMASOFT makes printing envelopes on a LaserJet compatible printer EASY!
- One keystroke envelope printing
- Automatic address positioning
- Variable envelope size (from 3" × 6" to 8½" × 11")
- Automatic or input return address

$29.95 + $3 s/h. CA Res add 6½% tax. Chk/Visa/MC–mail or phone: *E.R.M.Associates, PO Box 1032, Agoura Hills, CA 91301-1032, 818/707-3818*

Public Domain

PD Shareware Software
We have 1000s of programs for IBM, CPM, Apple, Atari, Amiga, Commodore & MAC at $4 per diskfull. We have an exclusive IBM authors showcase library featuring the best in Shareware. Download our catalog (BBS #702-794-3665) or send a #10, 56 cent SASE, specify computer please, or call us. *Public Domain Software Int. Group Inc. PCW, 410 E. Sahara, Las Vegas, NV 89104, 702/732-0169*

$3 Software for IBM PC
Hundreds to choose from, word processors, data bases, spreadsheets, assorted games for all ages, communications, business, music, art, programming language & useful utilities for making your computer easier to learn. Most programs have documentation on the disk. Write for your FREE catalog today! No charge cards. *Best Bits & Bytes, PO Box 5332, Dept-W, North Hollywood, CA 91616, 818/893-6304*

Real Estate

• Property Mgt Plus/87 •
New version which looks up tenants & posts rent by Tenant Name. Prints.. Bank Deposit Slips, Rent Statements, & Automatic Checks. Reports.. Late Rents, Vacancies & Expired Leases. Posts Management Fees, Pays Owners & does 1099s. Saves up to 80% of accounting time & is the EASIEST system to use! *Realty Software, 1926 S. Pacific Coast Hwy. #229, Redondo Beach, CA 90277, 213/372-9419*

Management & Analysis
- "Real Property Management" $395/$595 for residential & commercial properties & other bookkeeping. Flags delinquent tenants; prints budgets, checks, invoices & 1099s. No retyping of recurring data.
- "Real Analyzer" $195 for deciding when to buy, sell, exchange, or refinance.

Visa/MC. 30 day money back. *Real-Comp Inc., PO Box 1263, Cupertino, CA 95015, 408/996-1160*

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, Inc., 930 Laguna St., Santa Barbara, CA 93101, 805/687-4245*

Analysis & Management
Completely menu-driven 123.wks developed by CPA/CFO of multi-million $ builder/developer.
- ANALYZER computes cashflow, mortgages, depr, taxes, ROI, projects sale–1986 Tax Act.
- MANAGER accounts for period, property, tenant, summaries. $29.95 each, $49.95 both.

Add $3 s/h (VA+4.5%) Visa/MC. *Compass Management Corp., 633 N. Main St., Woodstock, VA 22664, 703/459-3100*

$$ Investment Analysis

No one makes analyzing income producing property easier (free demo) with such price-performance comfort at $170. Stand alone, fully compiled, loan amort. & deprec. schedules, 1986 tax changes. Cash flow & detailed sale analyses uncover buy/hold/sell/refin./exch. decision insights. *The SOFT ESTATE, Five Villa Verde Dr. #110, Buffalo Grove, IL 60089, ** 312/259-6301 ***

Resort Property Mgmt.

Designed for properties that rent on a daily, weekly, monthly basis. Automatic search for available units, check-in check-out listings, current occupancy listing, monthly/yearly owner statements, checks, 1099s, mailing labels, history file. Fast access, user-friendly, mono/color. $895 Complete, Demo $10. *Contemporary Computer Services Inc., PO Box 6158, Fernandina Beach, FL 32034, 904/277-4170*

Scientific Word Processing

WordPerfect™ Add-On

Turn WP into a scientific word processor. Display & print complete Greek & math symbol sets. Incl. display chip, 1 printer download program, & free custom printer defs. & macros w/WP proof of purch. Supported display cards incl. IBM, Herc, ATT, Compaq, EGA, more; printers incl. HP LJ & many dot matrix. Call for flyer. ONLY $75. *Scientific Word Processing Enhancements, 8320 N. Lockwood Ave., Skokie, IL 60077, 312/677-4270*

Sort

Opt-Tech Sort/Merge 3.0

Extremely fast Sort/Merge program. Run as a DOS command or CALL as a subroutine. Unlimited filesizes, most languages, datatypes & filetypes supported including Btrieve & dBASE. Advanced features include record selection, record reformatting & much more! Call or write for more info. MS-DOS $149, Xenix $249. *Opt-Tech Data Processing, PO Box 678, Zephyr Cove, NV 89448, 702/588-3737*

Sports

STATBOOK SERIES

Features include printing of player/team game, y-t-d & lifetime stats; team/league leaders & team standings. Number of players/teams limited only by disk space. Ideal for coaches, sports info centers, table-top game enthusiasts et al. Available for football $69, baseball/softball $59, basketball $49 & hockey/soccer/misc $49. MC/Visa. *RJL Systems, 106 New Haven Ave., Milford, CT 06460, 203/878-0376*

Statistics

BMDP Stat Software

Pick & Choose for Your PC. BMDP offers 40 programs for data analysis. But you can choose any combination to suit your needs. From simple statistics & plots, to t-tests, ANOVA, stepwise regression, time series, frequency tables, survival analysis & more! Hard disk req'd. Call for free catalog. *BMDP Statistical Software, Inc., 1440 Sepulveda Blvd. #316, Los Angeles, CA 90025, 213/479-7799*

RATS! Version 2.1

Best selling econometrics program. Over 4000 copies sold. OLS, 2SLS, logit, probit & much more! Forecasting with ARIMA, VAR. Exponential smoothing. Model simulations. Support for daily/weekly data. High-quality graphics to screen, plotter, printer. $200-$300. Visa/MC. Demo available. *VAR Econometrics, Inc., PO Box 1818, Evanston, IL 60204-1818, 800/822-8038, 312/864-8772*

NCSS-5.0

ALL NEW spreadsheet style. Multiple & stepwise regression, ANOVA, time series, discriminant, factor, cluster, principal components, t-tests, contingency table, nonparametrics. Easy interface to Lotus, *dBASE*, etc. Sort, join, merge data base. $99. Visa/MC. *NCSS-PC, 865 East 400 North, Kaysville, UT 84037, 801/546-0445*

StatPlan III

Easiest to use statistics program available. Complete range of statistics: curve fitting, crosstabs, correlation, multiple regression, t-tests, time-series analysis, etc. Graphics with printer/plotter output. Capable of handling up to 50,000 data points. Interfaces with Lotus files. Demo disk available. $179. *The Futures Group, 76 Eastern Blvd., Glastonbury, CT 06033, 203/633-3501*

1-2-3 Statistics

Complete Statistical Package with graphics & data base management; Menu-driven; T-Tests, Correlations, Crosstabulation, Powerful Multiple Regression, Multifactor 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*

P-STAT®

Full mainframe package for PC/XT/AT & compatibles. Combines data & file management, data display, statistical analysis, report writing & survey analysis in a single package. 4GL programming language, online HELP, command or menu-driven, & interactive EDITOR. $95 demo & site license available. *P-STAT, Inc., 471 Wall St., PO Box AH, Princeton, NJ 08542, 609/924-9100, Telex: 466452*

PRO*CAST

Forecast sales, market demand, inventories, etc. Complete time series analysis from linear trend to Box-Jenkins. Ease of use for the novice + power for the expert. Great graphics! Exchange data with other programs. Not copy protected. $150. Unconditional 30-day money back guarantee. Demo $10. *Fleming Software, PO Box 528, Oakton, VA 22124, 703/591-6451*

StatPac Gold™

NOW StatPac Gold's got it all! A complete statistical & forecasting package. Fast. Accurate. Reliable. User friendly. Comprehensive. Large data sets. Presentation-quality graphics. Industry leader for seven years. COMPARE. Then choose the best. StatPac Gold. CALL FOR FREE BROCHURE. *Walonick Associates, 6500 Nicollet Ave. S, Minneapolis, MN 55423, 800/328-4907, 612/866-9022*

STATISTIX II

Comprehensive, powerful and incredibly easy-to-use. Full screen editor, transformations, linear models (ANOVA, regression, logit, PCA, etc), ARIMA, most standard stat procedures. Clear, well organized documentation. Satisfaction guaranteed. $169 PC DOS, $99 Apple II. *NH Analytical Software, PO Box 13204, Roseville, MN 55113, 612/631-2852*

SAS/STAT™ Software

A full-function statistical package created especially for the PC. Includes pre-written procedures for regression analysis, analysis of variance, common factor & component analyses, discriminant analyses, & scoring. Compatible with the SAS® System on mainframes, minicomputers, & personal computers. Requires base SAS® software. *SAS Institute Inc., Box 8000, SAS Circle, Cary, NC 27511-8000, 919/467-8000*

SL-MICRO

Tabulate survey results or analyze your experimental data using SL-MICRO. It has Frequencies with statistics, Crosstabs, Anova, T-Test, Multiple Regression & Correlation. Data Editor & Data Transformations. Runs on IBM PC, XT, AT & compatibles with 128K. $250. Manual $15. Free info. *Questionnaire Service Company, Box 778, East Lansing, MI 48826, 517/641-4428*

Spreadsheet Statistics

NEW! 23 comprehensive statistics & forecasting modules for analyzing LOTUS worksheets. Low cost $24.95 each. Easy to use. Includes tutorial. Ideal for vertical markets. Basic & advanced statistics with graphics & many user-definable options. Compare. Nothing else comes close. Free brochure. *Walonick Associates, Inc., 6500 Nicollet Ave. S., Minneapolis, MN 55423, 612/866-9022*

Surveys

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 $35. 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. CRT interviewing option available. *Creative Research Systems, 1649 Del Oro, Dept. W, Petaluma, CA 94952, 707/765-1001*

Telephone & Time Mgt.

Productivity Breakthru
PRODEX: Phone & Time Management System for ANYONE with a Phone & PC! Instantly locate names & phone numbers. Auto-dial. Record notes of conversations, log calls, create tickler files, maintain to-do lists, many more features. Essential for salespeople & professionals. Memory resident. $89.95 (Visa/MC). *Prodex Development Company, 5818 East Greenlake Way N, Seattle, WA 98103, 206/527-2898*

Terminal Emulation

Color VT102 4014 VT220
Our terminal emulators turn your PC/AT/jr into a full featured terminal. Features include: local printing, ASCII & KERMIT file transfer, softkeys, DOS key, ANSI COLOR, 4014 graphics support. Guaranteed compatibility. Also connects you to The Source and other services. Call today for free info packet. *General Micro Systems, PO Box 1553, Hopkins MN 55343-1553, 612/937-1442*

Text Retrieval

Free IBM PC Program
Golden Retriever uses text pattern recognition to search files for a given phrase; locate exact & similar matches; retrieve data even if you're unsure of spelling or order of words in phrase. $99 + $5 s/h. Or send $5 s/h for a free copy of Golden Retriever Pup which works the same but searches diskette files only. *S K DATA Inc., PO Box 413, Burlington, MA 01803, 617/229-8909*

Typographic Design

AUTOSPEC™
Expert typographic design generator for complex books/booklets. All-options or laser-printer route, defaults, copy fitting. Types traditional order for any typesetter. Menu-driven. By 25-year book designer. For designers & non-designers. IBM compatibles. Info available. $475. *AUTOSPEC Inc., Box 1037, Pacific Grove, CA 93950, 408/649-0890*

User Supported

Save 90% on Software!
Shareware programs compare favorably to commercial programs costing $200 and up! PC-Write 2.71, AutoMenu, PC-Outline, Monopoly, over 140 programs to choose from all for $6.95 or less per disk! Money-back guarantee. IBM PC, jr, or compatibles. Send today for FREE catalog. *Shareware Express, 31877 Del Obispo #102P, San Juan Capistrano, CA 92675*

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 hard disk protection and window library products. 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 200 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*

Copy II PC
Backs up most protected software quickly & easily. Even runs many popular business programs from your hard disk–conveniently! (Call for list) For IBM PC/XT/AT/some compatibles. Updated regularly. Not copy-protected, of course! (Also available for Apple//, Mac, C64/128, Atari ST.) $39.95 + $3 s/h. Visa/MC/chk. *Central Point Software, Inc., 9700 SW Capitol Hwy. #100, Portland, OR 97219, 503/-244-5782*

Speed-Up/Protect HD
POWER TOOLS....The ONLY Resident Disk Utility allowing Optimization, DeFragmentation, Data Recovery and File Management in One Integrated program. Powerful Command Set: Undelete, Copy, Move, Edit, Map and Lots More! Protect Actions with Date/Time. Requires IBM PC, XT, AT with 320K. $55 Ppd. *MLI MICRO-SYSTEMS, PO Box 825, Framingham, MA 01701, 617/879-2000*

Direct Access 4.1
The Ultimate Hard Disk Menu System. Bypass DOS, organize your software with an easy to use menu that's "user defined". Features: single key stroke access, password protection, usage tracking, not RAM resident, plus much more. MC/Visa. $89.95 + $5 s/h. Order today: 800/242-MENU. Network version avail. *Delta Technology International Inc., PO Box 1104, Eau Claire, WI 54702; for more info: 715/832-7575; FAX: 715/832-0700*

MenuMan! V 2.0
- Hard Disk Menu System
- One Key Program Access
- Supports 26 Programs
- Logging Facilities
- Reporting Facility for Log
- Password Protection
- Not Copy Protected

Need 256K & MS-DOS 2.0 or higher. $49.95 + $3 s/h, chk/mo to: *Online Search, Box 300533, Arlington, TX 76010, 817/467-4779*

DISK MECHANIC
The Ultimate Floppy Disk Backup, Unprotect, Analyze & Repair Utility for the IBM PC. Back-up "Protected" disks & "Unprotect" many others. Repair Damaged Diskettes. Unhide Files, Restore Deleted Files, Edit Sectors and Check RPM. Easy to use and Thoroughly Documented. Requires IBM PC, XT, AT with 256K. $75. PPd. *MLI MICRO-SYSTEMS, PO Box 825, Framingham, MA 01701, 617/879-2000*

EMPrint
Maximize printer efficiency & flexibility. New resident utility allows easy keyboard control of single or multiple printers. Lets you easily swap printers, print all or part of screen, send strings, define macros, format output. Works with most software. $75 incl s/h, Visa/MC, 30-day risk-free. *Tropus Software, #204 1303 Clear Springs Trace, Louisville, KY 40223, 800/426-3776, 502/426-9448*

Synchromesh
Aim-and-shoot simplicity for executing programs & making backup copies of data. Useful with or without fixed disc. View fixed disc as a bunch of floppies. Keep programs & data completely separate both on your discs & on screen. Carry work between desktop & laptop. $69 with support & 30 day trial, MC/Visa. *Spoon Software, Inc., Box 119, Northboro, MA 01532, 800/-666-1211, 617/393-9383*

Word Processing

Textra® 4.0–$32.45 %

The finest personal word processor ever written. *PC Magazine* Editor's Choice 2 years in a row (86,87). In any comparative review, Textra comes out on top. Why so inexpensive? Our strong commitment to low cost software. We'll change the way you feel about software & software companies. % includes $2.50 s/h. *Ann Arbor Software, 345 S. Division, Ann Arbor, MI 48104, 313/769-9088*

World's Bilingual Word

DuangJan 1.3, bilingual word processor for English and: Armenian, Bengali, Euro/Latin, Greek, Hindi, Khmer, Lao, Russian, Tamil, Telugu, Thai, or Viet. Create your own language with font editor. $69 + $4 s/h in US & Can. (+ $10 s/h for.) Require graphics & dot-matrix printer. LaserJet add $49. Demo $5. *MegaChomp Company, 3524 Cottman Ave., Philadelphia, PA 19149-1606, 215/331-2748/8138*

Word Processor Add-ons

CompareRite Finds Changes

Written up in *InfoWorld, PC World, PC Mag....* Used by thousands! *CompareRite!*™ compares two documents, instantly generating a third draft highlighting the differences. Great for contracts, proposals, articles, reports, source code.... You select appearance of added & deleted text. For major WPs & ASCII. $129.95 + $5 s/h. *JURISoft Inc., 763 Massachusetts Ave., Cambridge, MA 02139, orders: 800/262-5656 ext. 111, info: 617/864-6151*

Tape/Disk Conv.

Conversion Services

Conversion services to or from over 800 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*

Scan (25¢ Per Page*)

- DISK–1400+ WP & PC Formats, i.e. IBM, Wang, Xerox, Exxon, CPT, NBI, Macintosh
- TAPE–Convert 800-6250 BPI
- TYPEWRITTEN Text* Scan to Disk
- Scan TYPESET Text 6 to 24 Pt. Low Rates.
- QUICK TURNAROUND
- QUALITY GUARANTEED

1st Run Computer Services, 59 Acorn Ponds Dr., North Hills, NY 11576, 212/432-5252, 516/627-1493

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*

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 $1074 ($358 per issue). We offer a six-time insertion, 17 percent discount contract for a total of $1788 ($298 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 415/546-7722 or 800/435-7766 (nat'l), 800/435-7760 (CA). Please send copy and prepayment to* PC World Directory, *501 Second St., San Francisco, CA 94107.*

Don R. Allison

Another Angle: Who Pays for Piracy?

The trouble with software piracy is that it seems like just another victimless crime. But I see ample evidence that we're all piracy's victims–and we're losing more than just money.

Pirating software is an easy habit to fall into. Who hasn't saved a couple of bucks by using a backup copy of a friend's new program? That practice seems harmless enough. So what if it costs some faceless software company a few dollars.

Unfortunately, the dollars lost through piracy total too much for publishers to tolerate–$1 billion annually, by the Software Publishers Association's reckoning.

Let's assume that the figure is grossly exaggerated and that companies really lose only $500 million a year. Further, let's assume that they pass along only $250 million of those losses to us, their 10 million PC-owning customers. The bottom line: We pay the freight for the freeloaders.

Then there's the annoyance of copy protection and the serial-number checking by a software company's phone support staff. Trying to use software that you've paid for has become as hard as trying to cash a check at the grocery store.

I spend a lot of time on bulletin boards and at user gatherings, and I'm constantly surprised by new forms of software theft. The latest ploy is the fraudulent solicitation of beta test copies of software and hardware. I've been a beta tester for five years, so this one really hits home. People are accepted into beta testing programs, receive hundreds of dollars in products, and then fail to fulfill their part of the bargain–reporting on the product's performance.

I have seen groups set up fake companies with fake letterhead to rip off $5000 to $10,000 worth of software evaluation copies and then disappear into the woodwork. I know of college campuses where pirated copies are sold for a small fee along with manuals reproduced at local print shops. I have seen beta piracy at the professorial level too.

What I'm most concerned about, though, is that piracy reduces the chance for all of us to enjoy really clean, full-featured software. Software design is an imperfect science. Beta reports are a significant part of a company's R&D efforts; they help a company determine features, function, price, documentation, and ease of use. Every package in the hands of a beta pirate means one less package received by a legitimate tester, that much less guidance for the company, and that much more room for mistakes.

It's clear by now that software companies can't control piracy. It's up to each of us to resist its temptation and refuse to cooperate with others who are pirating. Otherwise, we're going to wake up one day to find ourselves on the wrong end of the cutlass.

Don R. Allison, CSP, is a beta tester and a programmer/analyst.

Have a different perspective on computing? Send your opinions to Another Angle, PC World, *or MCI Mail PC WORLD/ 179-3813*

Switch on a serious surge suppressor.

With test after test proving that 70-90% of all PC malfunctions can be traced to power problems, 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.

Meets IEEE 587-1980 Category A	✓
Meets IEEE 587-1980 Category B	✓
UL Listed	✓

The right surge suppressor passes all the tests.

Get a Kensington Master Piece® or Master Piece Plus. 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 and Master Piece Plus are equipped with our unique two-stage surge suppression circuit, containing a high-speed silicon semiconductor for the quick reaction necessary and heavy-duty metal oxide varistors for the brute force required to keep even the largest surges from penetrating into your system.

That's why the plus in Master Piece Plus is additional modem surge suppression circuitry to protect your modem from surges, spikes and noise on the telephone line.

And that's why the circuitry in both models can handle anything an electrical storm or your local power company can offer—up to 6,000 volts with a 3,000 amp follow-on current. (That's the kind of superior performance that passes not only UL* testing, but Categories A and B of the strict IEEE† specification 587-1980 as well.)

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 a serious surge suppressor?

Master Piece ($149.95) and Master Piece Plus ($159.95). For more info, or a dealer near you, call (800) 535-4242. In NY (212) 475-5200.

KENSINGTON™

*Underwriters Laboratories Inc. †The Institute of Electrical and Electronics Engineers. © 1987 Kensington Microware Ltd.

Get more info. Go to Ad index.

The last thing you want from your modem is excitement.

Ven-Tel modems let you use your phone to exchange information with PCs anywhere in the world. We think that's pretty exciting.

Getting line hits, dropped connections and incompleted calls from your modem can be thrilling in its own way, too. But that's not the kind of excitement you need in business. And we go to great lengths to make sure you don't get it.

At Ven-Tel we've been making more reliable modems since 1974.

Ven-Tel modems put less stress on your PC because they have fewer components—70 vs. the 300 or so in other modems. And while other manufacturers may settle for random testing, every Ven-Tel modem must pass a 72 hour "burn-in" period—plus extensive testing on real phone lines.

As good as Ven-Tel modems are, we still back every one with a free *five-year* warranty. No other major manufacturer even comes close.

So if you want a modem that won't add the wrong kind of excitement to your workday, you want Ven-Tel.

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.

Get more info. Go to Ad index.