PC W\\ RLD

October 1985 \$2.95
Canada \$3.95

The Comprehensive Guide to IBM Personal Computers and Compatibles

Popular Demand!

Our Readers

Pick the 40

Best PC Products

Make Your PC Perform Like an AT

1-2-3 Templates for Your Business



Share Your IBM PC... ...Add up to 31 Low-cost Work Stations!

With Advanced Digital's PC Slave

The scene at the left is typical of many companies today. Employees standing around idly awaiting their turn on those expensive PC's. Computer congestion multiplying by the minute. Computer confusion in sharing disks and files.

Eliminate that congestion and confusion. Free-up those unnecessary employee "waiting lines." Share a common data base without loss of speed or efficiency ... and valuable work time.

The choice is yours!

Install a Network. (LAN) Several software driven systems are available. But beware of the headaches - slow speed due to cable limitations and heavy costs. It may pay to heed the opinion of Tom Hogan, Editor-in-Chief, Business Software, "our experience has not been entirely positive." Call for reprints (Editors Page, June, 1985) and read for yourself the many pitfalls this publication has experienced.

Install an Advanced Digital PC-Slave work station. Low cost. Faster speed (8 MHz) and no headaches!

The choice is obvious. Advanced Digital's

PC-Slave concept allows you to add up to 31 low-cost "dumb" work stations to your IBM, PC, AT, XT, and the compatibles. Just plug Advanced Digital's PC Slave board into your PC expansion slot, a connecting cable, a low-cost dumb terminal and you're in business. Orderly work stations are readily apparent without employee congestion and confusion. Speed and performance are uninterrupted since only disk access is shared. Best of all, 2 to 3 work stations may be added for the price of an additional PC.

The next time you're standing around idly may be the best time to put the advanced technology from Advanced Digital to work for you. Start sharing your IBM PC today!

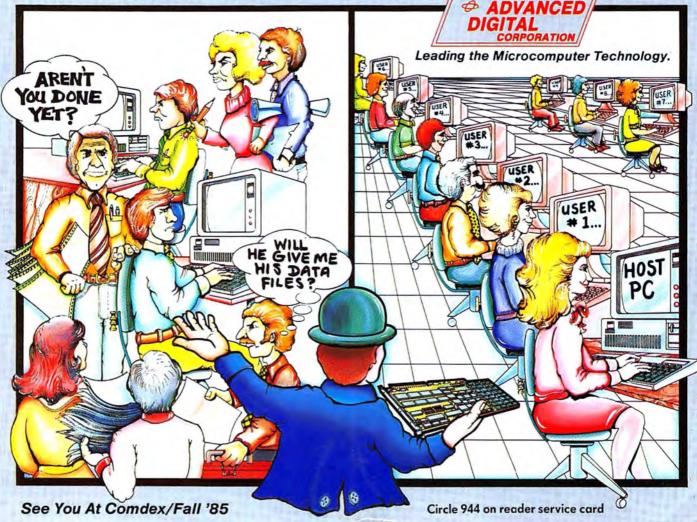
Advanced Digital Corporation also manufactures a complete line of S-100 single board computers and multi-user systems.

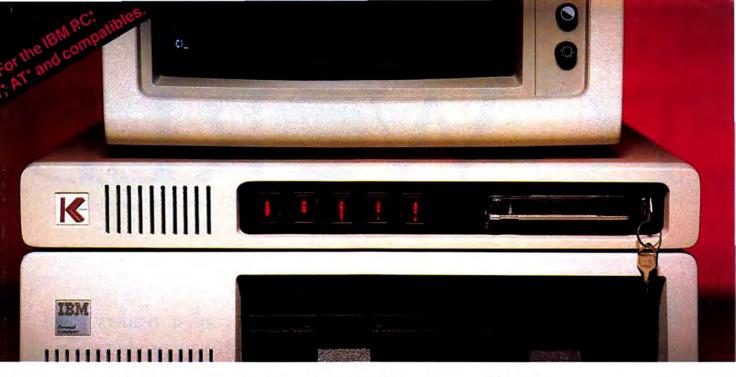
For more information and the name of the nearest dealer, call or write:

ADVANCED DIGITAL CORPORATION

5432 Production Drive, Huntington Beach, CA 92649 Toll Free (Out. CA) Tel. (714) 891-4004 • Telex 183210 ADVANCED HTBH ADVANCED DIGITAL U.K. LIMITED

27 Princes St., Hanover Square ● London WIR8NQ ● United Kingdom (01) 409-0077 ● 409-3351 Telex 265840 FINEST





We put hard disk storage and backup where it belongs.

Maximum storage in a minimum space.

A mass storage solution for personal computers need not occupy massive amounts of space.

That's why Kamerman Labs packs an entire hard disk storage and backup system into a package only 2½ inches high.

In fact, our Masterflight system is so well integrated with your PC, it looks like it should have been there all along.

Hard disk storage.

Hard Disk Unit

Controller Cards

Power Switches

Inside the Masterflight is a highperformance hard disk system, available in 10, 20 or 30 Megabyte versions. You get up to 100 times the storage capacity of floppies. At up to 10 times the speed. Spend more time working and less time waiting. Streamer tape backup.

Any professional working environment demands a reliable backup solution. The Masterflight provides it through a high-performance streamer tape that backs up an entire 10 Megabytes in less than 4 minutes. Streamer tapes are available in 20, 40 and 60 Megabyte capacities. Instead of just a hard disk, Masterflight gives you a complete data storage solution.

Streamer Tape Unit

Surge Protector

Security Lock

Power control.

Masterflight directs power to your computer, monitor, printer and two other devices through front panel switches. No more blind groping on back panels to power up your system.

Surge protection.

A little power surge can produce a lot of damage. Masterflight protects your system with special circuitry that filters out spikes, surges and line noise.

Security.

Masterflight guards access to your system through a fully lockable power switch.

Phone today. Dealer and OEM queries welcome. 800-522-2237

In Oregon, Hawaii and Alaska call 503-626-6877



8054 SW Nimbus, Bldg. 6 Beaverton, OR 97005 Phone 503-626-6877

*IBM PC, IBM XT and IBM AT are registered trademarks of International Business Machines.

Circle 683 on reader service card

PC W\\RLD

The Comprehensive Guide to IBM Computers and Compatibles October 1985



130 World Class PC

In our third annual contest, readers honor 40 hardware and software products that measure up to the World Class standard. *PC World* also awards \$36,000 worth of prizes to four readers selected at random.



160 Flipping Over Ability

Why be innovative when you can be right? Xanaro's *Ability* takes the best of software's standard solutions and comes up with an integrated package that's easy to learn for both pros and novices.



216 Lawyers On Line

Now you can tap the Lexis and Westlaw legal data bases with a PC. Careful search strategies make on-line legal research costeffective as well as convenient.

Getting Started

- 116 The Cookie Cutter, Ron Feldman Spreadsheets are ideal vehicles to help you define and monitor manufacturing flow and inventory—and keep your business rolling in dough.
- 124 PBX: The Network Switch, John A. Merritt Before you commit your company to the LAN solution, consider the network alternative—the PBX already in your office.

Community

- 130 World Class PC, Christine Whyte
- 146 Europe: Accent on Competition, Janette Martin
 For computer companies on the Continent, the spirit is willing but
 the fiscal setting is weak.

● Review

- 160 Flipping Over Ability, Bill Crider
- 170 Maximum Returns, Ralph Soucie

 CPAs arise! Cast off your service bureau shackles! Professional tax software for the PC is here—if you can afford it.
- 178 A 1-2-3 Foursome, William Urschel
 Four template packages transform 1-2-3 into ready-to-ware applications.
- 186 On the Trail of the Datavue 25, Eric Brown Quadram's 14-pound portable survives jeeps, snakes, and storms in the jungles of South America.
- 192 Every Word a Key, Bill Crider Two programs search every file on your hard disk for any word you specify. Zylndex and 4-1-1 manage documents for easy access.
- 196 Present WordPerfect, Terry Datz New features and continued agility work in tandem to deliver an efficient new word processor.

■ State of the Art

208 MIDI: The Music Interface, Warren Sirota A digital interface standard opens a gateway between synthesizers and PCs.

● Hands On

- 216 Lawyers On Line, Jordan J. Breslow
- 224 Retrofit Your PC, Jeremy Joan Hewes Tranform your PC into an XT or an AT with hand-picked hardware.

Departments

- 11 David Bunnell
- 29 REMark, William Rodarmor
- 53 John C. Dvorak
- 69 Letters
- 86 PC World View, Ken Greenberg In CPUs IBM goes in for the kill.
- 99 The Help Screen, Karl Koessel
- 234 From the Software Shelf, Edited by Robert Luhn The ultimate financial game
- 255 From the Hardware Shelf, Edited by Robert Luhn Notes from a turbo kind of a guy
- 281 Password: Communicate, Edited by Eric Brown The AMA goes on line, IBM takes MCl, and how much is that doggy in the window?
- 311 *.*, Edited by Steven Cook

PC World Directory

335 A classified guide to products and services

Index

347 Advertisers

Photo/illustration credits: Bill Apton, 179, 235; David Bishop, 117, 161; David Campbell, 131; Jay Daniels, 124; Matthew Foster, 89, 259; John Hersey, 87; Willy Keats, 281; Eleanor Leishman, 209; Steve Lyons, 224; Bryan Milstead, 187, 188; Jeffrey Newbury, 216-217; Elwood Smith, 146-147; George Steinmetz, 11, 126; Fred Stimson, cover, 134-145; Mark Ulriksen, 193.

PC W\RLD

David Bunnell Publisher

J. Kelley Younger Executive Editor

Harry Miller Editor

Editorial

Associate Editors: Eric Brown, Ken Greenberg, Robert Luhn Editorial Mgr.: Cynthia Hamburger Senior Copy Editor: Tema Goodwin Technical Editor: Karl Koessel Product Review Editor: Christine Whyte Assistant Editor: Darcy DiNucci Copy Editors: Barbara Lewis, Bonnie Monte, Peggy Nauts Editorial Assistant: Wesley Nihei Contributing Editors: Burton L. Alperson, Keith Richard Cook, Steven Cook, Bill Crider, Eddie Currie, Danny Goodman, Jeremy Joan Hewes, Larry Jordan, Lawrence J. Magid, Janette Martin, Seth Novogrodsky, Stuart R. Schwartz, Merrily Shinyeda, Andrew T. Williams

Art

Associate Publisher: Jacqueline Poitier Designer: Marjorie Spiegelman Art Director: Eleanor Leishman Associate Designer: Monica Ames Design Associates: Barbara Adamson, Donna Sharee Assistant to the Art Director: Nan Cassady

Production

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

Advertising Sales & Marketing

Associate Publisher/Director:
James E. Martin
Northern California (San Francisco):
Sharon Van Leuven
Northern California (San Jose) & Northwest:
Margaret O'Reilly (Western Mgr.)
Southern California (Los Angeles): Susan Curtis
(Southwestern Mgr.)
Southwest: Joanne Gillis
Midwest (Chicago): Richard Arzaga

New England (Boston): Larry Hilderbrand (Eastern Mgr.) Northeast (New York): Helaine Koffler Mid-Atlantic (Philadelphia): P. J. Boatwright Southeast (Atlanta): Judy Sutter Action Ads/Directory Sales: Carol Watson Advertising Services Mgr.: Ray Petsche Assistant to the Director: Loretta Giglione

Circulation

Director of Circulation: Penny Ertelt
Circulation Subscription Mgr.: Gail Egbert
Promotions Mgr.: Laurie King
Fulfillment Coordinator: Phil Semler
Director, Single Copy Sales: George Clark
Single Copy Sales Mgr.: William B. Cox
Dealer Sales Mgr.: Mary Ruth Kristoff
Account Mgrs.: Elaine McMahon, Jo Muilenburg

Research

Associate Publisher: Cheryl Woodard Research Mgr.: Gary L. Rocchio Administrative Assistant: Laura McCoy

Corporate Development

Special Projects: Jeffrey S. Glines International: Karen G. Dowell Administrative Assistant: Randi Glaser

Communications

Manager: Noreen A. Browning

Administration

Director: Janet D. McGinnis
Personnel Mgr.: Sarah Cox
Accounting Mgr.: Pat Murphy
Facilities Mgr.: Joseph Wollenweber
Assistant to the President: Christina W. Spence

Corporate

PC World Communications, Inc.

David Bunnell Chairman

Bartlett R. Rhoades

Herbert Linden Vice President

Jacqueline Poitier

Cheryl Woodard

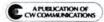
Vice President

Andrew Fluegelman 1943-1985 Founding Editor Volume 3, Number 10 October 1985

PC World'* (ISSN 0737-8939) is published monthly at \$23.75 for one year (12 issues), \$42.75 for two years (24 issues), \$57.75 for three years (36 issues) by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107, Additional postage outside the U.S. and Canada \$25 per year surface mail, \$100 per year airmail. Outside the U.S. all orders must be prepaid in U.S. funds drawn on U.S. banks. For questions regarding subscriptions call toll-free 800/525-0643 or 303/447-9330. To place new orders, call 800/628-2900 or 402/895-7284. Second-class postage paid at San Francisco and at additional mail offices. POSTMASTER: Send address changes to PC World, Subscription Dept., P.O. Box 55029, Boulder, CO. 80323-5029. Editorial and Business Offices: 555 De Haro St., San Francisco, CA 94107, 415/861-3861. CompuServe 74055,412 The Source STF908

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 © 1985, PC World Communications, Inc. All rights reserved. The following are trademarks of PC World Communications, Inc.: PC World View, *.*, PC World.

PC World" is a member of the CW Communications, Inc., group, the world's largest publisher of computer-related information. The group publishes 57 computer publications in 20 major countries. Nine million people read one or more of the group's publications each month. Members of the publication group include Argentina: Computerworld/Argentina; Asia: The Asian Computerworld: Australia: Computerworld Australia, Australian PC. World, Macworld, and Directories: Brazil: DataNews, MicroMundo; China: China Computerworld; Denmark: Computerworld Danmark, PC World, Run (Commodore); Finland: Mikro; France: Le Monde Informatique, Golden (Apple), OPC (IBM), Distributique; Germany: Computerwoche, Microcomputerwelt, PC Welt, SoftwareMarket, CW Edition/Seminar, Computer Business, Run, Apple's; Italy: Computerworld Italia. PC Magazine: Japan: Computerworld Japan; Mexico: Computerworld/Mexico, CompuMundo; Netherlands: Computerworld Benelux, PC World Benelux; Norway: Computerworld Norge, PC World, Run (Commodore); Saudi Arabia: Saudi Computerworld; Spain: Computerworld España, Micro-Sistemas; Sweden: ComputerSweden. MikroDatorn, Svenska PC World: United Kingdom: Computer Management, Computer News, PC Business World, Computer Business Europe; United States: Computerworld, Hot CoCo, inCider, InfoWorld, Macworld, Micro Marketworld, PC World. Run, 73 Magazine, 80 Micro, Focus Publications, On Communications; Venezuela: Computerworld Venezuela. Printed in the United States of America.

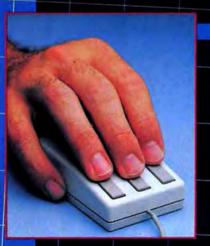




THE ACCENT™ IS ON EXPANDED MEMORY...

WITH MAYNARD'S NEW LOTUS-COMPATIBLE CARD!





Now, Maynard gives you 2MB of Lotus-compatible Expanded Memory with Accent.™ Designed expressly for your personal computer, Accent ™ adds memory power to Lotus 1-2-3*, Symphony,* and all other Expanded Memory programs so you can create larger spreadsheets than ever! An optional mouse places speed, access, and customized commands at your fingertips, saving time and eliminating inconvenient, multi-key cursor controls. Accent ™ is available at the finest computer retail stores everywhere. Contact your local dealer or write to us today for product information.

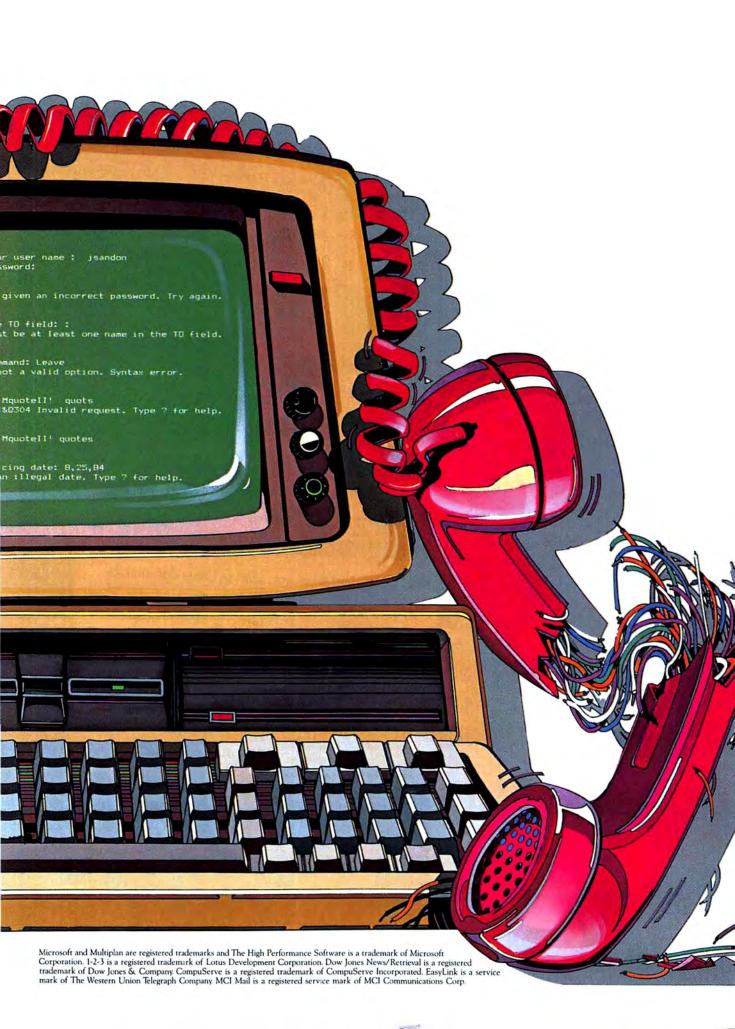
*Lotus 1-2-3 and Symphony are trademarks of Lotus Development Corporation.





430 E. SEMORAN BLVD., CASSELBERRY, FL 32707 305/331-6402

Circle 98 on reader service card



Don't get mad, get Access.

At Microsoft, we don't think you should have to hack your way through Dow Jones, CompuServe® or your electronic mailbox. First time. Or anytime.

Enter Microsoft® Access. The communications program that'll beam you straight through. No begging. No waiting. No fooling.

Get what you've got coming to you.

Access translates all the thorny commands of on-line services into specially designed, custom menus. You can forget individual quirks and codes.

The path is easy, fast, consistent.

Access' custom menus replace those reams of documentation that read like Adventures in Latin. They walk you through the database, step by step. So there's no on-the-job-training while the meter is running.

With Access, you dial in, pull out the facts

and log off. End of transaction.

Your mail is in the specs.

Access' built-in electronic mail facility gives you a simple, economical route to compose, send and receive messages on MCI Mail[®] and EasyLink[™]

It gives you one easily digestible menu for all electronic mail carriers. It lets you compose off-line. And lets you send the same message without recomposing it for each service.

Access knows how to apply itself, too.

Want to analyze or present data to your boss or your clients? Access' export capability lets you transfer information into Microsoft Chart and Multiplan® to update your whole portfolio. It works wonders with 1-2-3. Microsoft Word. And most any word processing program around.

If you think information services and electronic mail are playing hard to get, call (800) 426-9400. In Washington State and Alaska, call (206) 828-8088. In Canada, (416) 673-7638. Ask for the name of your nearest Microsoft Access dealer.

Access. You'll swear by it. Not at it.

Microsoft Access The High Performance Software



The #1 Multifunction Card Now Includes

The Best Multifunction Card Just Got Better. We've enhanced our SixPakPlus multifunction card with a new extra feature: Borland's SideKick desktop management software. Now you can get the best the industry has to offer together in one package - in 1984 SixPakPlus was voted the #1 multifunction card in PC World's World Class User Survey and chosen as Softsel's Best Selling New Product, while SideKick was selected as InfoWorld's Software Product of the Year.

The Best In Performance.

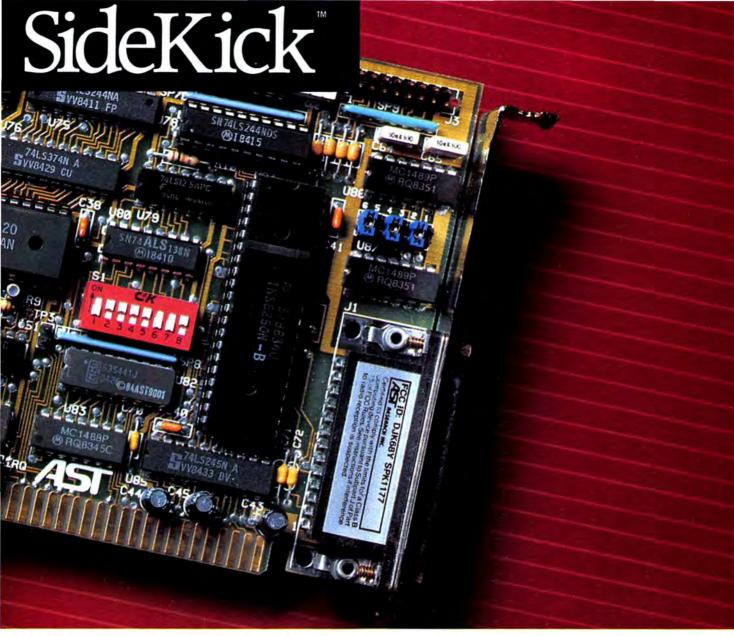
Over 400,000 satisfied customers will tell you SixPak-Plus provides the power for today's demanding requirements, whether you use an IBM® PC, XT, 3270 PC or compatible.

First there's more memory—an additional 64K to 384K RAM—to process more data, or to run today's software programs such as the SideKick multipurpose software we've included. Our extra memory and SideKick's features also work beautifully with your other favorite software pack-

ages like Lotus 1-2-3,™ WordStar,® Symphony™ and dBASE III.™

Next, more Input/Output ports—one serial, one parallel and an optional game adapter—to add peripherals such as printers, modems, a mouse, plotters or joysticks. Then there's our built-in clock-calendar for automatic time and date stamping.

And we've included another of our "World Class" award winners, SuperPak™ utility software. Selected top in its class for two consecutive years, SuperPak features Super-



The #1 Desktop Management Software

Drive[™] which works like a drive but fifty times faster, and SuperSpool[™] which lets you print and input at the same time.

The Best in Quality. If the industry's lowest rate of return is a good indicator, then SixPakPlus can't miss when it comes to quality. And we back this dedication to quality with a dedication to service and support. The AST commitment even extends to documentation, with our comprehensive user informa-

tion you'll find SixPakPlus is also the easiest to install and operate.

It takes an industry standard to advance the standard. When you want the best, look to AST's SixPakPlus—with the added value of SideKick software. For more information call our Customer Information Center (714) 863-1333. AST Research, Inc. 2121 Alton Avenue, Irvine, CA 92714 TWX: 753699 ASTR UR.

SIXPAKPLUS FEATURES

- Includes SideKick Desktop Management Software
- Memory Expansion to 384Kb, allowing total PC memory expansion to 640Kb
- Serial port for connecting to a printer, mouse, modem or other asynchronous devices
- Parallel port for use with parallel printer, plotters
- Optional game adapter port plug in joysticks and other cursor-control devices
- Battery backed Clock/Calendar for automatic time and date stamping
- AST's SuperPak includes SuperDrive electronic disk and SuperSpool print spooler



AST RESERRCH INC.

SixPakPlus, SuperPak, SuperDrive and SuperSpool trademarks AST Research, Inc. SideKick trademark of Borland International. IBM registered trademark of International Business Machines Corp. Lotus, 1-2-3 and Symphony trademarks of Lotus Development Corp. WordStar registered trademark of MicroPro International Corp. dBASE III trademark of Asthon-Tate.

FOR THE FIRST TIME... HIGH PERFORMANCE BACKUP AT A FLOPPY TAPE PRICE



WHO NEEDS FLOPPY TAPE!

The Everex EXCEL STREAM-20 Cassette Backup System

- No extra expansion slot needed
- High Speed—up to 10MB in just 2 minutes
- No time-consuming pre-formatting
- 20MB backup capacity
- Same price as 10MB floppy tape systems
- Internal and external models for the PC, XT and AT

Floppy	Sysgen
Tape	Image
10MB	10M8
16min.	4min.
	10000

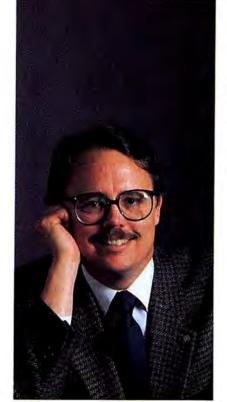
EXCEL STREAM-20 is a trademark of Everex Systems Inc.

Replace your floppy disk controller with Everex's combination cassette AND floppy disk controller-no extra cost, no extra slot needed. Data is automatically verified/corrected and the tape is pre-formatted during backup—saving you the 30 minutes you waste to format and verify with a floppy tape system. The STREAM-20 includes the most advanced backup/restore software. The choice is simple—the Everex **EXCEL STREAM-20 Cassette backup** system-High Performance backup at a floppy tape price. Visit your local Everex Dealer today and ask to see the STREAM-20 in action. For the name of your nearest Everex Dealer, please call 415-498-1111.

Address: 47777 Warm Springs Blvd., Fremont, CA 94539 TELEX: 5101000590 EVEREX FAX: 415-651-0728

Dealer Hotline: (800) 821-0806 In CA (800) 821-0807





David Bunnell

The computer industry has lost a powerful and prophetic leader, but his influence, vision, and dedication will live on.

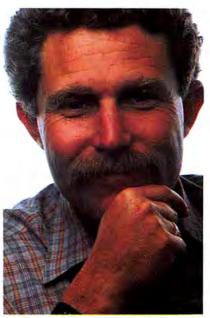
Tribute to a Great Friend

Andrew Fluegelman is gone. The founding editor of both *PC World* and *Macworld* and cofounder of our company, Andrew died suddenly at age 41.

Andrew was known far and wide in the personal computer industry. The day we were notified of his death, I happened to receive an envelope from our publicity department stuffed with press clippings containing references to him.

Andrew created the notion of Freeware—a wonderful concept of sharing and marketing software—when he decided how to distribute his *PC-Talk*, the first easy-to-use yet powerful communications program for the IBM PC. The marketing technique and the program are both milestones in personal computing history and will live on for many years.

Nationally known for his software exploits, Andrew contributed to the quality and success of our two magazines in ways that can be understood and appreciated fully only by those of us who worked closely with him. While creating PC World and Macworld, we relied heavily on Andrew's writing



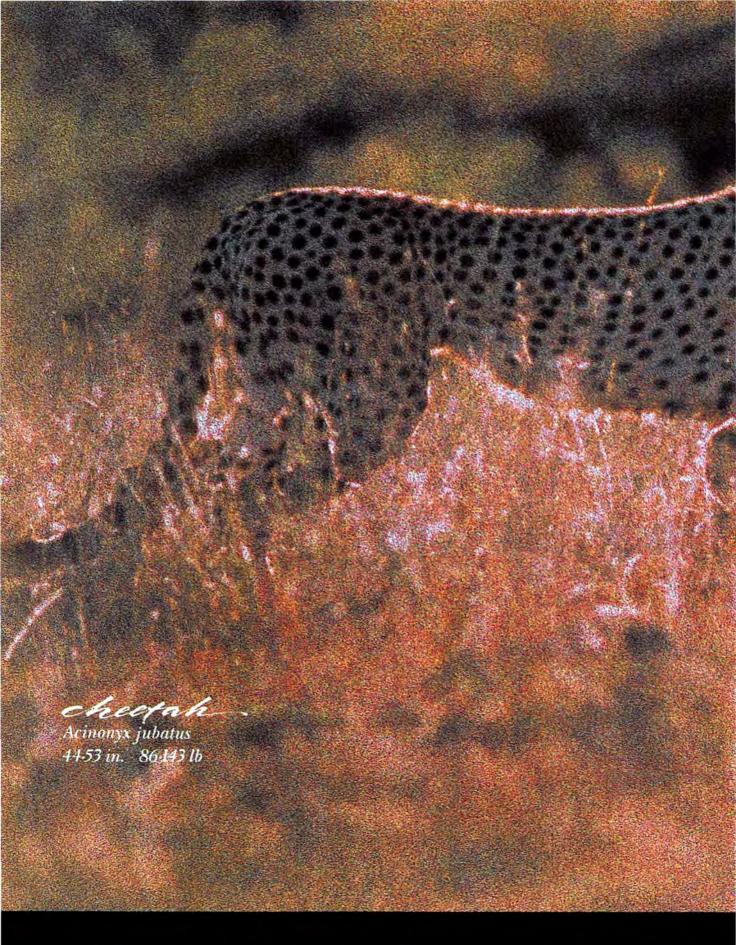
Andrew Fluegelman, a man for all seasons

and editing expertise, his wonderful insight and judgment, and his amazing computer skills. We trusted him implicitly.

We couldn't have done it without you, Andrew.

Literally 2 minutes after PC World cofounder Cheryl Woodard and I shook hands with IDG

(continues)



A SLEEK NEW STRATEGY FOR



chairman Pat McGovern to clinch the agreement to start PC World Communications, I called Andrew and asked him to join us as one of the company's founders. That phone call turned out to be one of the wisest moves I've ever made.

Andrew brought us a superb sense of style. He increased our understanding of the profound importance of maintaining high standards of integrity, appropriate discretion, and absolute honesty. His brilliant reviews of IBM's Easy-Writer and Lotus's Symphony were scathing, yet the people who knew him from those companies were among the friends most shocked and saddened by his death.

Just last April I had the opportunity to spend a week with Andrew in Japan. Perhaps because it was just the two of us facing the mysteries of Japan's culture and its electronics industry, I am able to bring back wonderful memories of Andrew that will always remain with me.

Andrew took to Japan the way he did to computing—like a duck to water. Though we were able to study Japanese for only a few hours on the plane, by our third day in Tokyo, he was already tossing off Japanese expressions as though he had traveled extensively in Japan. I have no doubt that if we had been able to stay for a few weeks, Andrew would have spoken fluent Japanese.

Andrew was always willing to listen. His innate courtesy helped us form strong relationships with several key people in Japan.

And throughout the trip, Andrew maintained a delightful playfulness and good humor, the same characteristics that many of his friends remember fondly.

For instance, as we drove back to the train station after visiting the Yamaha factory in

(continues)

Can your editor work with 16,000,000 bytes of memory? SPF/PC" 1.8 from Lacan!

The best full screen editor for the IBM PC is now even better than ever. It looks and works like IBM's large system SPF editor, but SPF/PC executes faster and handles larger files than its mainframe cousin.

AT EXTENDED MEMORY

SPF/PC can use up to 15,850 KB of memory.

TOP VIEW COMPATIBLE

SPF/PC supports windowing and background execution.

COMMUNICATIONS FEATURE

Easy to use communications software.

\$195

UPGRADES only \$50 (\$10 if communications upgrade) Add \$5 for shipping Canada \$10 Foreign \$15





Check or purchase order accepted.

FAMILY TIES

- SPF/PC is used by IBM to demonstrate the IBM 3270/PC to its corporate clients
- SPF/PC provides the same outstanding performance on any PC, from JR to AT
- SPF/PC works with DOS 1.00-3.00 and any IBM PC or true compatible with 192K

IBM is a registered trademark of International Business Machines, Inc. SPF/PC is a registered trademark of Command Technology Corporation.

TO ORDER SPF/PC...

Contact: Command Technology Corporation 1900 Mountain Boulevard Oakland, CA 94611.

(415) 339-3530 Telex: 509330

Circle 879 on reader service card

You're just \$8995 away from making your \$500 software work.

Your \$500 software isn't worth two cents if it's not working as hard as it should. That's why there's the \$89.95 Keyworks™ keyboard macro. With Keyworks, getting the most from your software is easy, because Keyworks lets you customize virtually any PC software to meet your needs.



If you're in Lotus 1-2-3, you could pop up a menu, select Count and your macro would play back, typing out @ COUNT(.



Sidekick is a trademark of Borland International Incorporated

Design your own menus

All keyboard macro programs let you record long sequences of keystrokes and then play them back with a single key. But Keyworks takes the simplicity of macro programs a giant step further. With Keyworks, you can actually design your own menus and pop them onto the screen whenever you need them. Commands are never overly complex or confusing, because Keyworks lets you simplify them.

DOS Functions

Keyworks also offers you access to all common DOS functions from within your program. Imagine being able to format a disk or check a directory without having to exit from the program you're working in!

Of course Keyworks is packed with other convenient features like a full screen editor so that you can instantly change your macros, a file encryption feature to keep your sensitive files secret, a screen saver to protect your monitor and text-only macros that let you design helpful prompts. With its unique "context sensitive menus" and extensive on-line help, Keyworks is not only the most powerful keyboard macro, it's also the easiest. Keyworks is the one PC Week called "miles ahead of the competition."

Of course Keyworks is packed with other convenient features to that you can instantly change instantly can instantly change your macros, a file encryption feature to keep your sensitive files secret, a screen saver to protect your monitor and text-only macros that let you design helpful prompts. With its unique "context sensitive menus" and extensive on-line help, Keyworks is not only the most powerful keyboard macro, it's also the easiest. Keyworks is the one PC Week called "miles ahead of the competition."

Or you could simplify your WordStar control codes by designing your own menus.

Money-back guarantee We're so sure you'll love Keyworks that we give you a sixty day money-back guarantee. So now don't you think you and your \$500 software deserve the simplicity and power of the \$89.95 Keyworks keyboard macro?

Keyworks be trademark of Alpha Software Corp. Alpha Software is a registered trademark. Lettus 1:23 is a trademark of International Corp.

Lettus 1:23 is a trademark of International Corp.

Lettus 1:23 is a trademark of International Corp.

Pleful

Nest Send me
Software Corp.
Alpha Software

Circle 6 on reader service card



View from F-16 Cockpit



Ejection from F-16 (Control Tower View)



Enjoy Microsoft Flight Simulator Scenery

Jet

From the author of Microsoft Flight Simulator comes a new dimension in flight simulation. Jet simulates two fast and maneuverable supersonic jet fighters, a land-based F-16 or a carrier-based F-18. The Jet simulation includes modern electronic flight instrumentation and the most advanced weaponry available. Jet's combination of simulation sophistication, excellent visual attitude references, and fast animation speed makes it truly enjoyable to fly.

Excellent aircraft control plus ballistic thrust gives you the kind of aerobatic maneuverability only a modern jet fighter can provide. The attitude indicator is easy to read no matter what your orientation. This indicator, combined with a full-screen out-the-window view, helps you get the most out of Jet's excellent flight controls. An important consideration when traveling at speeds in excess of 1300 MPH.

With Jet you can fly through either structured on non-structured environments. Engage in a deadly variety of combat missions. Explore the wargame territory, or relax by practicing precision aerobatic maneuvers. Load in scenery from optional United States Scenery Disks. You can even load in scenery off the Microsoft Flight Simulator disk.

Jet's technology incorporates our newest high-speed graphic drivers, and introduces new scenery concepts for improved viewing on non-color and RGB monitors.

Jet requires an IBM[™] PC, PC jr, PC AT, Compaq[™], or Tandy[™] 1000-series computer, with 128K minimum memory and the Color/Graphics Monitor Adapter, Hercules[™] Graphics Card, IBM Enhanced Graphics Adapter, or Sublogic High-Speed Graphics Card.

See Your Dealer...
or write or call for more
information. For direct orders
please enclose \$49.95 plus \$2.00
for shipping and specify UPS or
first class mail delivery. Visa,
MasterCard, American Express,
and Diners Club cards accepted.

SCENERY DISKS FOR MICROSOFT FLIGHT SIMULATOR AND JET ARE NOW AVAILABLE.

IBM is a trademark of International Business Machines Corp. Compaq is a trademark of Compaq Computer Corp. Tandy is a trademark of Tandy Corp. Hercules is a trademark of Hercules Computer Technology.

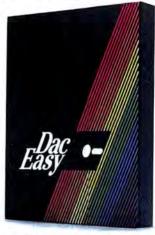
Corporation 713 Edgebrook Drive Champaign IL 61820 (217) 359-8482 Telex: 206995

Order Line: (800) 637-4983 (except in Illinois, Alaska, and Hawaii)

Lots of dollars.



Lots of sense.



hey've been doing it for years. Selling you accounting software module by module, till before you know it you've paid up to five thousand dollars for a complete system. That's a lot of dollars... which doesn't make good business sense.

Now, there's a better alternative, Dac Easy Accounting, For only \$69.95, Dac Easy is a fully integrated accounting package offering instant access to General Ledger, Accounts Receivable, Accounts Payable, Inventory, Purchase Order, Billing and Forecasting. And Dac Easy has the flexibility to manage either product or service oriented businesses.

It's not just the price that makes Dac Easy better. Only Dac Easy saves three years of history in all files, making automatic forecasting easier and more accurate. Plus, you can generate any of 300 different reports for instant access to the exact information you need.

Dac Easy is menu-driven for ease-of-use, and comes with easy-to-understand documentation inside a handsome slipcase binder. It's also non-copy-protected. Listen to what experts are saying:

"Dac Easy Accounting is remarkable, amazing, revolutionary, sensational..." Computer Buyer's Guide & Handbook, September 1985

Find out for yourself why Dac Easy is the fastest selling accounting package in history. Compare Dac Easy's range of features against systems costing thousands more. You'll see how Dac Easy can save you lots of dollars. Which makes a lot of sense.

PARTIAL LIST OF FEATURES

General Information

- Menu driven
- Password protection
 File capacity limited only by disk space
 Support contract available
 General Ledger

- Unlimited multi-level accounts
 Three-year account history for CRT inquiry

- Pencil and pen feature to correct mistakes
 Unique budgeting routine
 CRT transaction inquiry
 Activity report, trial balance, financial statements, unlimited departments and journals
 Accounts Receivable

- Open invoice or balance forward

 Customized aging report

 Unlimited number of customers

 Flexible mailing labels and directories

 Supports partial payments & finance charges
- Three-year customer history for number of invoices, sales, costs, and profits
 Customized statements
- Cash flow analysis/sales analysis
 Automatic sales forecasting
 Accounts Payable

- Check printing with multiple invoices and cash available
- Aging reports with seven customized columns
- Unlimited number of vendors
 Flexible mailing labels and directories
 Three year vendor history
 Unlimited allocations per invoice

Supports average, last purchase, and standard costing

- methods Powerful physical inventory routines
- Accepts any unit of measure
 Three-year product history in units, dollars, cost, and profits
 Automatic forecast of product sales

- Automatic pricing assignments
 Alert and activity reports with 11 sorts
 CRT shows on-hand/on-order/committed/sales/cost/profit/turns/GROI

- turns GROI

 Purchase Order

 Inventory and non-inventory items

 Allows up to 99 lines per P.O

 Per line discount in %

 P.O. accepts generic discounts/freight/taxes/insurance

 P.O. accepts back orders and returns
- Purchase journal

- · Service or Inventory invoicing on plain or preprinted forms with remarks Prints sales journal

Allows return credit memo

- Unique program that automatically forecasts using your three-year history:

 Revenue and expense accounts

 Vendor purchases

- Customer sales, cost, and profit
- Inventory item usage
 Forecast by same as last year, or % base from last year, or trend, or least square trend line analysis method

Easy - Accounting

To Order Call Toll Free

1-800-431-0800

Ask For Operator 310

For More Information Or In Texas Call 214-458-0038

dac software, inc 4801 Spring Valley, Building 110-B, Dallas, TX 75244

end in this coupon with your credit card number, money Oorder or check for \$69.95 plus \$7.50 for postage and handling. In Texas, add 61/8% sales tax (\$4.28). Outside U.S., add \$17.50 for postage and handling. No C.O.D.

- ☐ CHECK ☐ MONEY ORDER
- ☐ AMEX ☐ VISA ☐ MASTERCARD Expires _

Name _

Company Name ___

Address __

____ State _____ Zip _ Phone.

Signature _

30-Day Money Back Guarantee: dac software, inc. provides a 30-day money back guarantee that all claims and features listed in this ad are true

Minimum Hardware Requirements: IBM (PCjr, PC, XT, or AT) or other compatibles. 128K memory, one 5¼ DSDD floppy disk, 132 column printer in compressed mode, 80X24 CRT, MS-DOS², PC DOS¹ 2.0

¹Trademarks of International Business Machines Corporation.

-Trademark of Microsoft Corporation.

Easy Accounting

310

ALL THE TOOLS REQUIRED TO BUILD A PC NETWORK



If you can use a screwdriver and answer some simple, menu-driven prompts, you can build a high performance MS-DOS™ network.

Using an AT or XT as a system file server and PCs or PCjrs™as intelligent terminals, you can build PC-DOS™ compatible networks that work for as little as \$600 per node.

HOW? A highly efficient network structure using the best of TurboDOS,™ the only true multi-user operating system available for micros today, and ARCnet,™ the most popular local area network solution for minis and main frames. Combined with easy to install expansion products designed with speed in mind, Intercontinental's PC networking solution delivers.

PC networking made simple. Not to mention workable and cost-effective.

Call Intercontinental today, and put our years of networking experience to work for you.



4015 Leoverton Ct., Anaheim, Ca 92807, (714) 630-0964, TELEX: 821375 SUPPORT LID

ARCnet is a Trademark of Datapoint. MS-DOS is a Trademark of Microsoft. PC-DOS & PCjr are Trademarks of International Business Machines. TurboDOS is a trademark of Software 2000.

Circle 13 on reader service card

Hamamatsu, Andrew noticed a sporting goods store with Japanese baseball caps in the window. Even though we were in danger of missing our train-and therefore our return flight to San Francisco-Andrew had the taxi driver pull over to the side of the busy road. Together with our guide, Yasuo Ohira, we dodged the traffic to run into the shop. After quickly trying on caps and buying some, we rushed back to the taxi. We ended up having to charge up several flights of stairs to catch the train. But it was worth it. Once on the train, Andrew, the baseball caps, and I received long stares from the locals, who thought we were gaijin, American baseball players who play on Japanese teams.

A man of many talents and interests, Andrew led an incredibly full life. He loved the Grateful Dead, sushi, football, and kayaking on the San Francisco Bay. But baseball, in the form of the San Francisco Giants, was his consuming passion. Once he told me that if he were disabled and had to spend the rest of his life in a wheelchair, I should just roll him out to the ballpark, and he'd be happy.

As a self-appointed historian of personal computers, I intend to ensure not only that Andrew's contributions are remembered, but that they continue to make an

(continues)

Which leading monitor company lets you best display the advantages of IBM's new color graphics cards?





When you put Princeton Graphic Systems Monitors to work with IBM's new graphics cards, you step up to a new class of performance. Exciting RGB color, sharp, crisp graphics and text and Princeton's quality and reliability...all at a great price! Our full line of monitors clearly demonstrates why Princeton is an industry leader in high-resolution technology.

Princeton SR-12P Color Monitor

The first IBM compatible monitor available for the IBM Professional Graphics Controller.*



COMPARE:	Princeton IBM SR-12P 5175	
Dot pitch (The lower, the better.)	.26 mm	.31 mm
Sugg. Retail Price (The lower, the better too!)	\$999	\$1295
Warranty	1 Year	90 days

Designed for demanding professionals who won't settle for anything less than the finest color graphic capabilities. Displays more than 4,000 brilliant colors... features an anti-reflective coated black matrix tube for less fatigue and eye strain. You get the sharpest graphics and text... at a substantial savings!

Princeton HX-12E Color Monitor

The superior choice for use with IBM's Enhanced Graphics Adapter.*



COMPARE:	Princeton HX-12E	IBM 5154
Dot pitch	.28 mm	.31 mm
Sugg. Retail Price	\$785	\$849
Tinted Black Matrix Tube	Yes	No
Warranty	1 Year	90 days

Ideal for most computing applications, the HX-12E offers 64 high-resolution colors and easy-to-read text. Compare Princeton's quality to IBM's...



Princeton HX-12E

IBM 5154

The HX-12E gives you sharper colors, crisper characters...for less eye strain and easier viewing, hour after hour. Built-in versatility also allows you to display 16 colors with the IBM Color Graphics Adapter* automatically.

phic Systems above the rest

Princeton HX-9E

The first 9" RGB monitor to take advantage of IBM's Enhanced Graphics Adapter.*



For more performance in less space, the Princeton HX-9E is in a class by itself. Nobody else—not even IBM—offers a 9", high-resolution display. Features 64 brilliant colors and a .28mm dot pitch for sharp, crisp text. Can be conveniently used with IBM's Color Graphics Adapter.*

Our other monitors also give you full IBM compatibility:

Princeton HX-9 Color Monitor—features a built-in switch for green or amber text. Built-in tilt-and-swivel base.

Princeton SR-12 Color Monitor—boasts twice the vertical resolution of the IBM Color Display** ... and works with other cards such as the Sigma Designs Color 400.

Princeton MAX-12 Amber Monochrome Monitor—ergonomically designed to give you up to 15*** shades of high-resolution amber...plus high-resolution text and graphics when used with a monochrome card.

Princeton HX-12 Color Monitor—16 sharp, clear colors and superb character definition make the HX-12 the winning choice among monitor users...







IBM 5153



See the clearly superior Princeton Monitors at your Authorized Princeton Graphic Systems Dealer. For the dealer nearest you, please call: **800-221-1490 (Extension 606)**, 609-683-1660 (NJ only), Telex: 821402 PGS PRIN. Princeton Graphic Systems, 601 Ewing Street, Bldg. A, Princeton, NJ 08540.



- · Or equivalents.
- " When used with the Princeton Scan Doubler.
- *** When used with IBM Color Graphics Adapter or equivalent. IBM is a registered trademark of International Business Machines Corporation. Sigma Designs Color 400 is a registered trademark of Sigma Designs, Inc.



- Free UPS ground shipping. . Personal & company For next day air service add \$7
- VISA & MASTERCARD
- For C.O.D.'s add 2%-minimal machine compatibility. service charge is \$3.
- checks will delay shipping 2 weeks.

IBM

- · We do not guarantee
- · Company & school administration purchase orders accepted upon approval.
- Prices & availabilities subject to change without notice.

SPECIALS	BUSINESS	GAMES/HOME
Multiplan \$125	Copy II PC \$ 23	Dollars & Sense \$126
Sidekick	D Base III 486	Flight Simulator 35
Unprotected \$ 48	Desk Organizer 69	Gato 28
Super Calc \$250	Multimate 346	
Word Perfect \$250	Multiplan 136	To The Galaxy 28
	PFS: File 98	Norton Utilities 70
LANGUAGES	Sideways 42	P.C. Paint136
Microsoft Basic \$245	Superkey 49	
Turbo Pascal 3.0 49	Turbo Graphic Toolbox 38	Call Toll Free to
Turbo Pascal		
3.0 8087/BCD 77	Wordstar 2000 Plus 416	

IF YOU DON'T SEE THE TITLE YOU WANT, CALL US

1-800-826-2447 1-800-222-0697

Calls originating outside Colorado.

Calls originating inside Colorado.

7830-A North Academy Blvd., Colorado Springs, CO 80918

Circle 57 on reader service card

"SYSLOG automatically logs all of your computer time. Maintains detailed records of dates, times, user, project, type, **SYSTEM LOG UTILITY** and elapsed time. Reporting options are equally detailed by user, project, date, or

range. You can even create graphs of usage with Lotus 1-2-3" and Symphony or do some number crunching with dBase . So unobtrusive, you'll hardly know Syslog is there. Only \$34.95 + Shipping.

Finally! A pop-up calculator for the programmer. In addition to the features PROGRAMMERS' of a standard calculator, P-Calc includes many functions just for the programmer. **CALCULATOR**" P-Calc features decimal, hexidecimal.

octal, and binary radix conversions, logical AND, OR, XOR, One's Complement, Bit Shifts, and more. A wide display lets you handle double words. Makes short work out of tough problems. Even functions like a programmable! A great companion for Pascal, C, and assembly language programmers. Only \$49.95 + Shipping.

23 Christine Court Stormville, NY 12582-9612 914-221-2611

APEX RESOURCE, INC. Ask your dealer or order direct. Credit cards accepted: most orders shipped within one business day.

P-Cale and SYSLOG require an IBM* PC jr/XT/AT, COMPAQ*, or other MS-DOS compatible computer with 128K memory, one disk drive, Display, and a printer. Also require DOS 2.0 or greater.

Circle 961 on reader service card

impact on the industry. For this reason I have asked some of Andrew's friends and colleagues to help establish an annual Andrew Fluegelman Award.

This award, which we hope will include a substantial cash prize, will be presented to the software author whose work best exemplifies outstanding programming and shows dedication to furthering the personal computer community. If you would like to make contributions or help participate in creating the Andrew Fluegelman Award, please write me in care of this magazine.

The people who worked with Andrew, read his articles, or continue to use his communications program gained a lot from him. And with a little help from his friends, Andrew Fluegelman and the example he set for all of us will live on among personal computer users, the industry, and perhaps even humanity.

We're going to miss him.

Affordable CAD/CAM access: New SmarTerm® 4014 makes Tektronix 4010/4014 terminals obsolete!

Now you can use your PC to access popular mainframe graphics products like PLOT-10, SAS/GRAPH, RS/1, TELLAGRAPH and DISSPLA.
SmarTerm 4014, the newest member of our SmarTerm communications software family, gives you full Tektronix 4010/4014 graphics plus DEC VT102 text terminal emulation.

As you've learned to expect from Persoft, the industry leader in software terminal emulation, SmarTerm 4014 continues the tradition of offering "smart" software solutions where hardware limitations prevent exact duplication of terminal features. SmarTerm 4014 can display the entire 1024x780 Tektronix graphics image on the lower resolution PC using reduction scaling, or you can examine the image in detail using the powerful instant ZOOM feature. Any portion of the screen can be instantly magnified to full Tektronix resolution giving you sophisticated CAD/CAM level accuracy. We even provide real-time "panning" so you can rapidly scroll any portion of the zoomed image into view. In addition to the Graph, GIN, and Alpha modes of the Tektronix terminal, SmarTerm 4014 adds Picture Playback and Picture Capture capabilities.

SmarTerm 4014 is not only an outstanding graphics terminal emulator, it fills your need for quality text terminal emulation as well. Our DEC VT100, VT102 and VT52 emulation is fully compatible with popular DEC host software including All-In-One, and EDT. We give you horizontal scrolling for 132-column text display, and also support popular 132-column video display boards. And we provide "convenience" features not found in other terminal emulation packages like: "Branch to DOS" hot key, automatic installation, color support, multiple setups, and online help screens detailing PC and AT keyboard mappings.



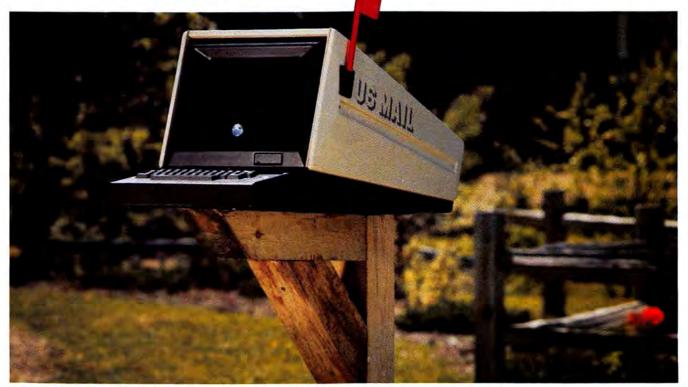
Like all SmarTerm emulators, SmarTerm 4014 includes powerful text and binary file transfer facilities, XMODEM and PDIP protocol support, and TTY mode.

Join the more than 25,000 "FIRST CLASS" people who use SmarTerm. Try it for 30 days with full refund privileges.

The SmarTerm family:

SmarTerm 220—DEC VT220 SmarTerm 100—DEC VT100 SmarTerm 125—DEC VT125 SmarTerm 400—Data General Dasher D400 SmarTerm 4014—Tektronix 4014

YOUR DAYS OF BUYING TEKTRONIX TERMINALS ARE OVER!

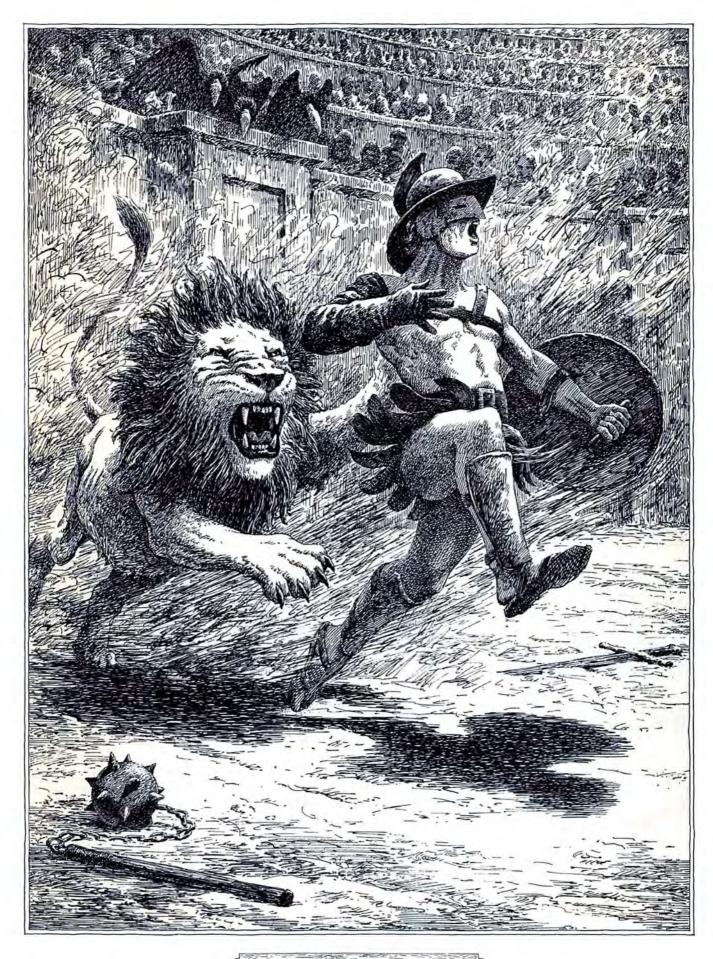


After SmarTerm, what do you do with your obsolete terminal?

Persoft, Inc. - Madison, WI - (608) 273-6000 - TELEX 759491

*Smarterm is a registered trademark of Persont, Inc. *PDIP is a trademark of Persont, Inc. *DEC and VT are trademarks Digital Equipment Corp. *DASHER is registered trademark of Data General Corp. *Textronix and PLOT-10 are registered trademarks of Textronix inc. *SASGRAPH is a trademark of SAS Institute, Inc. *RSTI is a trademark of Bott Beranek and Newman, Inc. *TEELLAGRAPH is a trademark of Corp. *OISSPLA is a trademark of Cortrol Data Corp. © Persont, Inc. 1985. All rights reserved.





SOMETIMES YOU CAN AFFORD TO FINISH IN SECOND PLACE. SOMETIMES YOU CAN'T.

hen you're comparing database software, there are all kinds of things to think about. Ease of use. Power. Application development time.

Well, we think execution speed should be way up on your list, too. Because the last thing you need is a program that runs in slow motion.

That's why we've designed new R:base™ 5000 to outrun every other DBMS package available. For example, just look how it compares to dBASE III:

EXECUTION-TIME BENCHMARKS: R:base 5000 vs. dBASE III

Using an IBM PC XT, we ran a series of performance benchmarks comparing the speed of R:base 5000 to dBASE III. The functions performed were identical. The execution times were a different story.

Function	R:base 5000	dBASE III
SORT 1,000 rows of 8 columns each on a dollar field by amount.	26 seconds	65 seconds
SEARCH 1,000 rows for unique number in non-keyed field.	7 seconds	14 seconds
REPORT with one lookup to a second table stored to a file.	6 minutes, 49 seconds	11 minutes 8 seconds
PRINT a report of sorted data with subtotals.	6 minutes, 39 seconds	10 minutes, 30 seconds
TOTAL (All functions per- formed in sequence.)	14 minutes, 1 second	22 minutes 57 seconds

R:BASE 5000. NOBODY OUTRUNS IT.

As you can see, for almost every important individual function, R:base 5000 is 60% to 150% faster than

dBASE III. But that's only part of the story. If you're performing a typical operation that calls for searching, sorting, reporting and printing, then R:base 5000 puts you more than 8 minutes ahead of dBASE III.

And we're just talking about the time you save on one report. As the years go by, you'll save that much a thousand times over. Since we also help you develop applications up to ten times faster, you'll be even farther ahead.

SEE FOR YOURSELF: 1-800-547-4000.

If you believe in common sense as much as we do, you won't buy something this important without trying it out first. And that's just what we'd like you to do. For only \$9.95 (plus shipping) we'll send you a mini-version of the product that lets you build real-life applications.

Just call 1-800-547-4000 and ask for Dept. 845. From Oregon, or outside the U.S., call 1-503-684-3000, Dept. 845. We'll send your copy right out. If you'd like to see R:base 5000 today, head straight for a leading software store or computer dealer. If you own R:base 4000, ask your dealer for a trade-up kit.

We'll show you how to earn all

the rewards of coming in first. Which sure beats the prize for second place.



R:BASE 5000 FROM MICRORIM

IT ALL COMES DOWN TO COMMON SENSE.

dBASE III is a trademark of Ashton-Tate.

IBM is a trademark of International Business Machines, Inc.

INTIME VERSION

CHAIRMAN OF THE BOARDS

THE 2400 bps MODEM FOR IBM-PCs & COMPATIBLES.

Plug the new USRobotics Microlink 2400™ modem board into any slot in your IBM PC or compatible—to give your computer full 2400 bps data communications

capability.

The Microlink 2400 can communicate twice as fast as 1200 bps modems. (It transmits a double-spaced page of text in as little as 7 seconds!) Faster communication means lower phone bills and increased productivity. The modem can even redial busy numbers until it gets through - freeing you for other tasks.

SOFTWARE COMPATIBILITY. SUPERIOR PERFORMANCE.



The Microlink 2400 is CCITT and Bell compatible, and responds to the full AT command set. You can use it with any of the popular telecommunications software packages including Telpac™ by USRobotics, Crosstalk™, PC

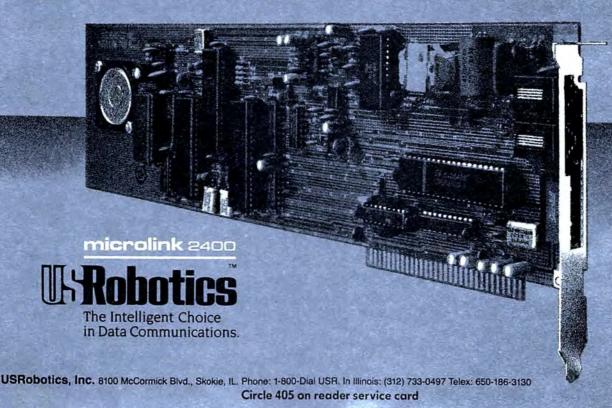
Help Screens Talk™ and Smartcom™. In addition to the features you'd expect, our new, improved Telpac enhances Microlink 2400's performance with such features as easy-to-use windows, multilevel security, and log files to monitor your outgoing calls.

Microlink 2400 displays call status and length on your screen, as well as operational parameters, including the command set and S-register settings. The modem's auto-answer feature automatically adjusts from 2400 bps to 1200 or 300 bps to match the speed of incoming transmissions.

What's more, a powerful equalizer assures peak performance on every call.

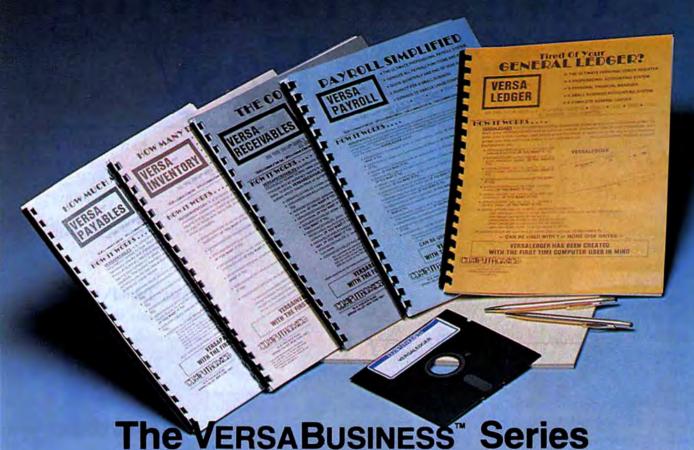
ALL THIS PLUS HIGH RELIABILITY AND LOW COST, TOO.

Microlink 2400's low chip count results in exceptional reliability backed by a full 2-year manufacturer's warranty. But best of all is the price - only \$699! And if you prefer an external Courier 2400" modem, our new Courier 2400™ will deliver the same superior performance at the same affordable price. We set out to build the best modems on the market. Now, they're ready. Microlink or Courier. Being faster is important. But being best was our goal.



Introducing the Most Powerful Business Software Ever!

FOR YOUR TRS-80 • IBM • APPLE • KAYPRO • COMMODORE 64 • MSDOS OR CP/M COMPUTER*



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

VERSARECEIVABLES**

PERSARCELIVALES" is a complete menu-driven accounts receivable, invoicing, and nonthly statement generating system. It keeps track of all information related to who wes you or your company money, and can provide automatic billing for past due accounts. Versarcelyabless prints all necessary statements, invoices, and summary eports and can be linked with Versaledger II" and Versaliventory."

VERSAPAYABLES**

\$99.95

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

VERSAPAYROLL**

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

Versalnventory"

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

COMPUTADNICS

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

Versaledger II* \$149.95

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

• VERSALEDGER II" gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),

• stores all check and general ledger information forever,

• prints tractor-feed checks,

• handles multiple checkbooks and general ledgers,

• prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account

balance sheets, income statements, transaction reports, account

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

SATISFACTION GUARANTEED!

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

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

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





DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

The VersaBusiness Series is available for TRS-80 - IBM - APPLE - KAYPRO - COMMODORE 64 - OSBORNE - XEROX - TELEVIDEO - SANYO - ZENITH - NEC - DEC - TI - EPSON - MORROW MICRO DECISION - NORTHSTAR - MSDOS and CP/M computers with 8° disk drives (Computer names are tradenames and/or trademarks of their respective manufacturers).

Introducing In-a-Vision

Complex Drawing Made Easy

Me created In·a·Vision just for you. The engineer who needs more productive drafting support. The designer who needs versatility for alternate ideas or quick revisions. The architect who needs to manage a variety of working drawings. And the businessman who

needs first-class presentation materials as well as detailed flow charts and organization charts.

Point. Click. Draw.

Now all you do to create complex technical drawings, systems designs, blueprints, diagrams, illustrations, and proposals is point,

click and draw. With In·a·Vision's mouse support, windowing, icons, and pull-down menus, you produce drawings more quickly, accurately and efficiently than ever before.

In·a·Vision's advanced technology includes many features not found on comparable systems costing thousands more. For example,

Most popular graphics cards, plotters and printers supported.)

Microsoft Windows compatible. Call for specific operating

environment requirements.

Unlike more expensive CAD systems, In·a·Vision is easy to install and use. Even the computer novice can be productive immediately. And In·a·Vision is not copyprotected.

Ten Day Trial Period.

We're so sure In·a·Vision will

you can pan around in a user-definable drawing space up to $68'' \times 68''$ and zoom in on specific areas for greater detail. Scale, rotate and

dimension symbols, fill an area with your choices of predefined colors and patterns, as well as draw lines with multiple styles and widths. Other features include overlays, predefined and userdefinable page sizes, rulers,

grids, and symbol libraries.

Multi-tasking in a PC-based CAD system.

In·a·Vision uses multi-tasking to enable you to continue drawing while printing hard copies as well as edit multiple drawings simultaneously.

make you more productive, we'll give you ten days to prove it to

yourself. If In·a·Vision doesn't improve your productivity, return it within ten days for a full refund.

In·a·Vision will make your complex drawing tasks simple and make you more productive. Satisfaction guaranteed. Dial 800-272-3729 to order or for a free brochure. In Texas

or for customer support, call (214) 234-1769. MICROGRAFX, Inc., 1820 North Greenville Avenue, Richardson, Texas 75081.

The Picture of Success.

In-a-Vision and MICROGRAFX are trademarks of MICROGRAFX, Inc. Windows and Microsoft are trademarks of Microsoft, Inc.

Circle 718 on reader service card



William Rodarmor

As Silicon Valley leads the nation in toxic waste dumps, the "clean" industry needs to reexamine its methods of production.

REMark: Sermons and Soda-Water

ike a weekend drunk, the computer manufacturing industry is suffering a fate Lord Byron described nearly two centuries ago: mirth and laughter on Saturday night, sermons and soda-water on Sunday morning. What initially looked like a "clean" industry has turned into a major source of pollutants and toxic wastes. The heady days of mirth and laughter are giving way to grim sermons and soda water—and in some communities, bottled water.

When it first appeared on the scene, the computer industry promised jobs and growth without unsightly smokestacks. Sleek, low buildings spread in tasteful ribbons along Route 128 in Massachusetts and Silicon Valley in California. The industry promised to revolutionize the workplace, and it did. Money followed money, and the boom was on.

Then the fish died.

In May 1978 about 100 fish turned up poisoned in Stevens Creek, a seasonal Silicon Valley stream. An investigation found a highly alkaline substance in the water and traced it to a Fairchild computer chip manufacturing plant. Under pressure from the California Fish and Game Department, the company cleaned up the mess, but without admitting liability. Press coverage of the spill was minimal.

Meanwhile, the industry was hitting its stride. Microcomputers were showing up in schools and offices across the country. Few people worried about environmental pollution, much less the risk to workers exposed to chemicals used in chip manufacture. The boom times were too good, the future too bright.

Then the bubble burst. In early 1981, an unusual number of birth defects started showing up in Los Poseos, a neighborhood in south San Jose. As luck would have it, the finger was again pointed at Fairchild. For the first time in Silicon Valley's history, spilled chemicals had leaked into a public water supply.

Suddenly, high-tech pollution was a hot subject. Day after day, spills and toxins associated with

(continues)

One great idea deserves another.

"My idea was to give my AT users the performance of a minicomputer."



Our IDEA Supermax multifunction board lets her do that at microcomputer prices.



Get the performance of a minicomputer for the price of a microcomputer with Supermax,

the latest addition to the IDEAboard line.

The new IDEA Supermax gives users more memory and greater options than ever before. Now they can have an AT board that goes beyond 3MB of RAM. IDEA Supermax lets users go all the way from bare board to 4MB of memory.

And we don't stop there!

Two serial ports and one parallel port are standard with the Supermax. These powerful interfaces make your AT the kingpin of your office computing system.

And IDEA Supermax features outstanding price

and performance, too.

At 3MB and 4MB of RAM, you save thousands of

dollars and still get three standard I/O ports. That's a four figure cost advantage over the competition.

You'll never lack additional memory for integrated software applications like Symphony™or Framework™ when you plug in Supermax. In a LAN with the AT acting as a file server, you can partition memory on the Supermax for individual users on

the network. You can even combine the Supermax with our 10MB to 120MB IDEAdisks to build the AT into a desktop supercomputer.

Like every IDEAboard, the Supermax comes with our free library of software, including IDEAmenu, RAMfloppy, Printer Spooler, Diagnostics, Clock Routine, and more.

For your other applications, these IDEAboards offer the same price and performance advantages as the Supermax:

 IDEAmax 384 has 384K RAM, parallel, serial, game ports, and clock/calendar.

 IDEAmini short I/O card is perfect for the XT, Portable, and PC/3270 short slots. Your choice of two serial ports, parallel port and clock.

 IDEA Minimax has the same short slot size and holds up to 384K RAM.

So when you have a great idea for your IBM AT,

look to IDEA to make it a reality. Call 800-257-5027 for the IDEA dealer nearest you.





Geneva, Switzerland (22) 86.11.19, Telex 428 388 KBSCH
nal Business Machines Corporation. Symphony is a trademark of Lotus Developme

IBM and the IBM logo are registered trademarks of International Business Machines Corporation. Symphony is a trademark of Lotus Development Corporation. Framework is a trademark of Ashton-Tate Corp. IDEAboard, Supermax, IDEAdisk, IDEAmenu, IDEAmax, IDEAmini and Minimax are trademarks of IDEAssociates, Inc.

You're in Good Company When You Program in BetterBASIC



All of these companies rely on Better-BASIC to write their software programs. They have found that BetterBASIC combines the features they need from BASIC, Pascal, C and Forth in one familiar environment. Some of these features include the following.

640K Now you can use the full memory of your PC to develop large programs.

STRUCTURED Create well organized programs using procedures and functions that are easily identified and understood and completely reusable in future programs.

MODULAR Use procedures and functions grouped together to form "library modules."

INTERACTIVE BetterBASIC acts like an interpreter, responding to the users' commands in an immediate mode. However, each statement is actually compiled as it is entered.

EXTENSIBLE Create your own
BetterBASIC modules which contain
BetterBASIC extensions (ideal for OEMs). **COMPILED** Each line of the program

is compiled as it is entered into the computer's memory rather than interpreted at runtime. The optional Runtime System generates EXE. files.

BetterBASIC Runs on IBM PC, IBM PC/XT and compatibles.

CALL 1-800-225-5800 (In Canada: 416-469-5244) Order BetterBASIC now, or write Summit Software Technology, Inc. TM, P.O. Box 99, Babson Park, Wellesley, MA 02157. Prices are listed below.

BetterBASIC: \$199 Runtime System: \$250 8087 Math Module: \$99

Still not convinced? Order the Better-BASIC sample disk which includes a demo, a tutorial, compatibility issues, 50 lines of BetterBASIC and more. Only \$10.

MasterCard, VISA, P.O. Checks, Money Order, C.O.D. accepted.

BetterBASIC is a registered trademark of Summit Software Technology, Inc.

IBM PC and IBM PC/XT are registered trademarks of International Business Machines Corp. Tandy is a registered trademark of Tandy Corp. Illustrated above are registered trademarks of the following companies: Mobil Oil Corp.; AT & T. General Electric Co.; Westinghouse Electric Corp., TRW, Inc.



ALSO AVAILABLE FOR THE TANDY 2000, 1200 AND 1000

the electronics industry made the front page and the evening news. Public officials belatedly took notice. In San Jose, IBM spent \$20 million cleaning up a nearby spill. The "clean" industry was beginning to look filthy.

To their credit, the manufacturers did more than circle their wagons. When the Fire Chiefs Association of Santa Clara County set up a task force in 1982 to develop a model ordinance regulating chemical handling, a committee of industry groups, chaired by Larry Borgman, Intel's manager of plant facilities, joined to help.

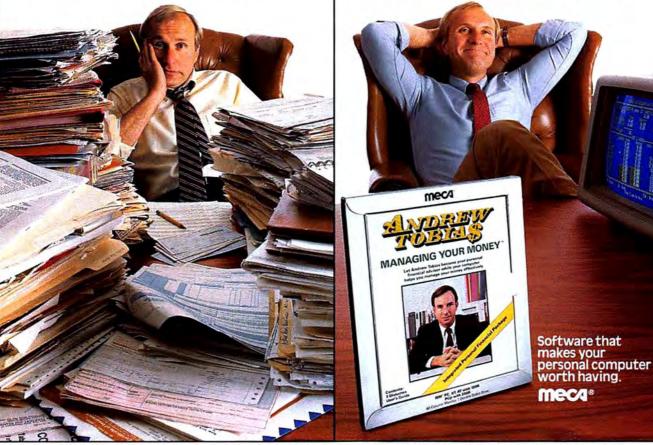
Most of the companies checked their sites on a case-by-case basis, but as a group they worked on prevention. "The approach we took is that what you're storing in a tank isn't supposed to get out of the tank," said Borgman, "no matter what it is—even water."

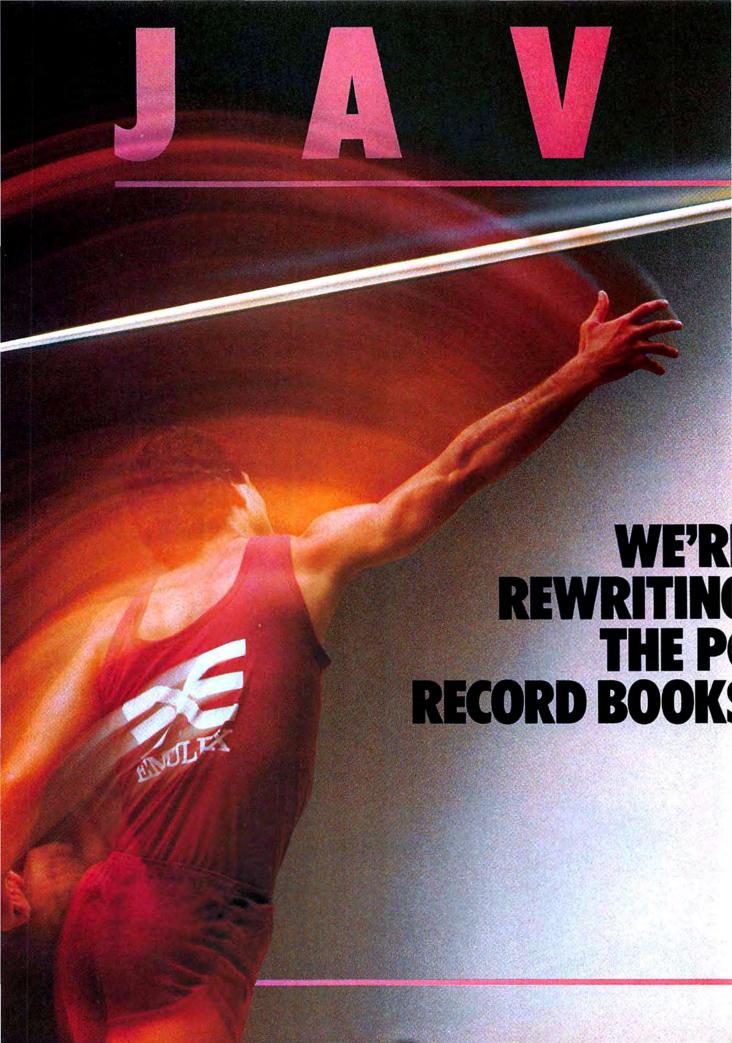
As a result, every Silicon Valley community has strong regulations on double containment of underground tanks, disclosure of the chemicals used, and monitoring of leaks. Meanwhile, the Environmental Protection Agency has allocated \$1 million to study groundwater pollution at 92 sites in Silicon Valley. The EPA plans to put 19 sites on its Superfund cleanup list, giving Santa Clara the dubious distinction of having more pollution sites than any county in the nation.

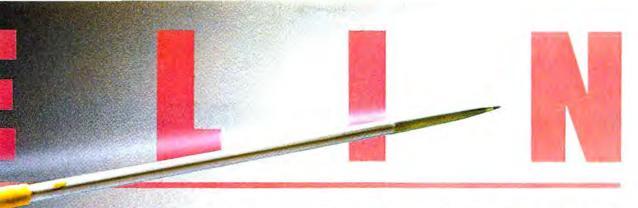
(continues)

MANAGING YOUR CHECKBOOK? MANAGING YOUR BUDGET? MANAGING YOUR BILLS? MANAGING YOUR CASH FLOW? MANAGING YOUR TAXES? MANAGING YOUR INSURANCE? MANAGING YOUR STOCKS? MANAGING YOUR BONDS? MANAGING YOUR REAL ESTATE? MANAGING YOUR TAX SHELTERS? MANAGING YOUR SAVINGS? MANAGING YOUR MORTGAGE? MANAGING YOUR AUTO LOAN? MANAGING YOUR RETIREMENT? MANAGING YOUR CALENDAR? MANAGING YOUR CHARGE ACCOUNTS? MANAGING YOUR CAPITAL GAINS? MANAGING YOUR ANNUITIES? MANAGING YOUR APPOINTMENTS? MANAGING YOUR DIVIDENDS? MANAGING YOUR INTEREST? MANAGING YOUR RECORDS? MANAGING YOUR VALUABLES? MANAGING YOUR KEOGH'S? MANAGING YOUR IRA'S?

MANAGING YOUR MONEY®
BY ANDREW TOBIAS.
THE ONLY FINANCIAL
SOFTWARE THAT DOES IT ALL.







Breakthroughs in flexibility and performance let you upgrade your PC storage and optimize your total system.

Introducing Javelin, the first storage subsystem that lets you increase your IBM PC, PC XT, or PC AT capacity to exactly the level you require. No more, no less.

How does Javelin do it? By offering you the widest range of storage capacities available today. 5¼" Winchester disk drive from 36 to 110 MB and ¼" streaming tape backup of 60 MB. A choice of two peripherals—one disk and one tape, or two disks.

Whether you use Javelin as added storage to a stand-alone PC or as a high-capacity, high-performance file server in a network—you only pay for what you really need.

Keep your options open for the future.

The SCSI* technology used in the leveling

The SCSI* technology used in the Javelin offers easy future expansion. This technology also allows for backup and restore without CPU intervention—with special commands included in the controller.

Javelin's rigorous quality program.

Javelin's reliability, like that of every Emulex product, is built in and guaranteed. All active components are pre-aged. Subassemblies are cycled environmentally — under power, performing diagnostic tests and the total system is integrally tested.

The Small Computer System Interface (SCSI) is an interface standard that specifies the mechanical, electrical and functional requirements for a small computer I/O bus interface and command set for peripheral devices commonly used with small computers.

Javelin features a full range of utilities that allow for flexible expansion with minimal user intervention.

Call or write us for more information, or ask your dealer for a demonstration. Seeing Javelin in action is a breakthrough experience.

Javelin's unique features include:

- Easy to install and use
- 100% IBM compatible
- · 30ms average access rate
- Compact, desk-top design to complement your IBM PC
- Network ready
- Designed for data intensive applications
- Reliable backup and restore utility
- Ideal data-base management storage/retrieval device
- Backup media interchangeability
- Advanced disk and tape diagnostics

Javelin is a product of Emulex Corporation, an industry leader in the development of high-performance controllers, communications products and packaged subsystems for PC's, micro, mini and super minicomputers.



3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, CA 92626, (714) 662-5600



Printer Output Redirection

Disk Services

Scientific/Business Calculator

Pop-Back Feature

Electronic Typewriter

Printer Output Redirection

BEST FRIEND



Makes PC-DOS™ Easy to Use!

Best FriendTM rescues you from cryptic DOS commands with easy to use menu selections for disk and file operations, printer output redirection, "pop-back" features and more.

Disk and File Services

- Copy, Delete, and Rename Files
 Find, View, and Print Files
 Change File Attributes (Make hidden files)
 Sort files and directories using up to two keys
 Tag files for group copy and delete operations
 Format and Copy Disks
 Wake and Remove Sub-directories
 Change Disk Volume Label Names

Scientific/Business Calculator

- Over 40 math and business functions
 Printable on-screen tape display

Electronic Typewriter

- ·Straight type-thru and line edit modes
- · Automatic word wrap and margin controls

Printer Output Redirection

Capture the printer output (even "Print Screen" data) from any program into a disk file

Pop-Back Feature

Use Best Friend even while running another program. "Pop-Back" to Best Friend from all your favorite programs

Call or send for a free brochure. The demo is only \$14.95 while the full program is \$84.95 and is available for the IBM-PC and true compatibles.

1-800-648-9523, Texas 409-846-2340

Elite Software

Development Inc.

P.O. Drawer 1194 Bryan, Texas 77806

Circle 527 on reader service card

Pop-Back Feature

Electronic Typewriter

But it may be a case of too little, too late. Press coverage of high-tech pollution has dwindled, but new dangers continue to appear. In 1982 a plume of contaminated groundwater half a mile wide and a mile long was discovered near the Silicon Valley town of Mountain View. The pollution is believed to have come from leaking underground tanks at a cluster of five local electronics firms: Fairchild, Intel, NEC. Raytheon, and Siltec. Initially, the plume was thought to be relatively shallow, because a layer of clay 50 feet down covers the deep aquifer from which Mountain View draws its drinking water. But new evidence suggests that the clay barrier itself may have been breached.

A test well drilled into the deep aquifer recently turned up evidence of contamination, and Mountain View is now worried that the pollution may be percolating down through the clay barrier, possibly through abandoned wells. The electronics companies are squabbling among themselves over which one is responsible for the cleanup.

"We were told that computer manufacturing would provide steady jobs and no smokestacks," says Ted Smith, an attorney who heads the watchdog Silicon Valley Toxics Coalition. "In fact, they buried the smokestacks and forgot about them. And now we've discovered that was a very bad thing to do.

(continues)



An Interface disk or tape subsystem is simple to install and simple to use for IBM PC, XT, AT, and most PC-compatibles

For the PC and compatibles we give you:

- External DiskSystems® from 10 to 119MB.
- Internal with 10 to 55MB.
- 10MB removable cartridge Winchester.
- 10MB TapeSystem.
- DualStor® with 10, 22, or 33MB of DualStor with fixed storage plus 10MB tape or 10MB remov-

For the PC-XT, we give you:



10-megabyte TapeSystem

 Internal 10 to 55MB.

 DoubleBarrel is an internal combination with

10, 22, or 33MB fixed storage combined with 10MB of tape back-up.

- External 10MB tape cartridge
- External ExtraDrive is a 10MB removable cartridge Winchester.
- External DiskSystem with 10 to 55MB of additional storage.

For the PC-AT, we give you:

- Internally mounted hard disk drives with 21 to 117MB
- Internal 10MB removable cartridge Winchester.



has been providing quality storage subsystems at affordable prices for the personal computer market.

DiskSystems, TapeSystems, DualStor, DoubleBarrel and ExtraDrive are copyrights of Interface, Inc. IBM is a registered trademark of IBM Corporation

able Winchester.

Interface, Inc.

21101 Osborne Street. Canoga Park, CA 91304 Or call (818) 341-7914

Canada Santronic Sales Ltd (604) 522 1658

SYLVIA PORTER'S PERSONAL FINANCIAL PLANNER DOES MORE THAN MANAGE YOUR MONEY IT PLANS YOUR FINANCIAL FUTURE TOO

Sylvia Porter, and the editors of Sylvia Porter's Personal Finance Magazine, now combine with all the computer tools you'll ever need to help manage your money on a day-to-day basis and plan your financial future, too. In Sylvia Porter's style, without complicated financial jargon or "computerese".

Volume 1

Your Personal Financial Planner:

Helps you track your day-today financial data, then combines this information with your future financial objectives to produce the most comprehensive and easily-understood financial planning program available.

For Your Day-to-Day Affairs:

- Maintains your electronic checkbook and credit card system.
- Writes your checks and balances your checkbook. (We even built in a calculator and memo pad for you.)
- Prepares and monitors your budget.
- Classifies and tracks your taxable income and expenses.
- Calculates your net worth and generates customized personal financial statements.
- Tracks your financial assets and your insurance policies.
- Graphically generates supplemental data, such as percentages, ratios and charts.
- You get our Toll-Free Hotline and our Customer Technical Support Team at no charge.
- You get Timeworks' Money Back Guarantee. (Details in each package.)



- · You'll be led step-by-step through a series of questions regarding your life and lifestyle, your financial goals, and your current financial condition. Your answers will enable a computer to determine and print a summary of the amounts you must save each year to meet your financial objectives - in both real and inflated dollars.
 - Helps you plan for protection against major medical adversities and other financial setbacks.
 - · Each program interfaces with others in this series. Your information can be incorporated into letters and reports produced by Timeworks' Word Writer.
 - Everything is integrated. You need to enter data only once.

Available for Apple, IBM and Commodore computers

Moderately Priced - from your favorite Dealer or contact

Timeworks for the Dealer closest to you.

Next in this integrated series: Your Personal Investment Manager.

onner

From Americal Advise Other Timeworks Programs: The Evelyn Wood Dynamic Reader * Word Writer with Spell Checker - Data Manager 2 - SwiftCalc with Sideways - Business Systems - Swiftax -Cave of the Word Wizard . Wall Street



More power for your dollar.

TIMEWORKS, INC., 444 Lake Cook Rd., Deerfield, IL 60015, 312-948-9200 © 1984 Sylvia Porter's Personal Finance Magazine Co. & Timeworks, Inc. All rights reserved.

Circle 213 on reader service card



Two perfectly good reasons we should be happy.

Maximizer_™. And Maximizer AT_™.

Most companies would be satisfied with successful multifunction boards like these.

No one else's quality is so high. We perform exhaustive tests on everything, not just once but 3 times. We use multilayer construction for better noise immunity.

The only returns we've been getting are customers coming back for more. And no one else offers so much for so little: Maximizer comes with 64K-512K RAM. Maximizer-AT comes with 128K to 4MB. Each comes with a printer spooler, and not just a parallel port, but a bidirectional I/O interface. We don't just give you one RS-232C serial port. You can add a second serial port and even a game control adapter. Maximizer features RAM disk software plus clock

and calendar, with battery backup. And both boards allow you to disable any unused function with a simple flick of a switch.

With all this, you'd think we'd be happy, but our engineers are still looking for ways to make it better.

For the dealer nearest you, call (408) 943-9480.

At Sigma Designs, we have a simple philosophy: It's our job to be dissatisfied. So you don't have to be.

Maximizer and Maximizer-AT are trademarks of Sigma Designs, Inc.



SIGMA DESIGNS, INC. 2023 O'Toole Avenue San Jose, CA 95131 (408) 943-9480 Telex: 171240

REMark

NOW YOU DON'T HAVE TO SEARCH YOUR MIND OR YOUR THESAURUS FOR THE RIGHT WORD

Now you can find the right word for your thought without taking your hands off the keyboard or your eyes off the screen. Just place your cursor on a word you want a better word for, pop up a window showing a list of alternatives, pick the one that works the best—and the new word replaces your old one automatically.

Introducing Word Finder,™ a new computerized thesaurus with 90,000 synonyms for over 9,000 key words. No more looking it up,

deleting and retyping.

Word Finder integrates itself within your word processor to function as you type or edit. Use it to clarify your meaning and improve your writing. It even maintains capitalization from old word to new.

Put Word Finder in your WordStar (3.0 to 3.31), WordStar 2000 Multimate, Word Perfect, Pfs:Write, Microsoft Word, IBM Writing Assistant or Easy Writer II now. It's fast, easy to install and operate, and it's not copy protected.

Do It Now For Only \$79.95 And Save A Bundle Off The Regular \$124.95 Price.



Charge my VISA/MC acct.	#	Expires/	_
Name	Phone		_
Company			_
Address			
City	State	Zip	_
Mord Processes	Computer/Op S		

Circle 69 on reader service card

"To a greater extent than ever, the computer industry is hooked on the toxic treadmill—a total dependence on chemicals that we know can cause cancer and birth defects."

To be fair, in a number of cases the industry has tried to use less toxic chemicals, but the result looks like a game of catch-up. For years carbon tetrachloride was the commonly used solvent in chip manufacture. When carbon tet was implicated as a health hazard, the industry switched to trichloroethylene (TCE). When TCE in turn was discovered to be an animal carcinogen in the mid-1970's, the industry phased it out in favor of another solvent, trichloroethane (TCA). It now looks as if TCA may be connected not only with cancer but with birth defects as well.

Other changes in manufacturing may be making the problem worse, not better.

To replace the silicon in microwave chips, the industry is currently looking at a substance called gallium arsenide. As its name suggests, it is an arsenic derivative and highly toxic. A Boston firm called M/A Com is one of 50 companies nationwide that is involved in developing the gallium arsenide process. On June 22,

(continues)

Borland Introduces the Laws of TURBO DYNAMICS

Laws That Work Like Magic. Whether considering

technological excellence, or innovation in

areas such as pricing, not copy-protection, licensing agreements, site licenses, 60 day money-back guarantee -Borland is clearly recognized as the software industry leader. The following three laws of "Turbo Dynamics"™ exemplify our pledge for excellence.

2ND LAW: NOT COPY-PROTECTED SOFTWARE AND

that even a child can under-

SPEED, POWER AND PRICE.

Borland products are known to be fast, powerful and to deliver an incredible price performance ratio. We only believe in absolutely superb software at rock bottom prices.

Turbo Dynamics Applies to Turbo Pascal.

Borland's Pascal family of products is growing N. L. L.

by leaps and bounds.

You can now join hundreds of thousands of users and enter the world of Turbo Pascal programming. And remember, all three laws of Turbo Dynamics

apply to all Borland products.

REASONABLE LICENSING

AGREEMENTS. We will always offer not copy-protected versions of our software. Also, our licensing agreement is now so simple

TURBO PASCAL™ \$69.95

The Industry standard. With more than 350,000 users worldwide Turbo Pascal is the industry's de facto standard. Turbo Pascal is praised by more engineers, hobbyists, students and professional programmers than any other development environment in the history of microcomputing, And yet, Turbo Pascal is simple and fun to use. Free spreadsheet included on every Turbo disk with ready-to-

compile source code. Options: We offer the exciting Binary Coded Decimal (BCD) option for your business applications as well as an 8087 option for your number-crunching applications at a very low charge. Please refer to the coupon. Portability. Turbo Pascal is available today for most computers running PC-DOS, MS-DOS, CP/M-80 or CP/M-86. Jeff Duntemann, PC Magazine: "In its simplicity it achieves an elegance that no other language compiler has ever displayed."

TURBO GRAPHIX TOOLBOX™ \$54.95

High resolution monochrome graphics for the IBM PC.



The Turbo Graphix Toolbox will give even a beginning programmer the expert's edge. It's a complete library of Pascal procedures and functions. Tools that will allow you to draw and hatch pie charts, bar charts, circles, rectangles and a full range of geometric shapes. Procedures that will save and

restore graphic images to and from disk. And much, much, more. You may incorporate part or all of these tools in your programs and yet we won't charge you any royalties. Best of all, these functions and procedures come complete with commented source code on disk ready to compile.



3RD LAW

60 DAY MONEY-BACK

GUARANTEE.

first in the industry! We are so

This third law is actually a

sure that you will love our

software that all of our pro-

a 60 day money-back

ducts now come backed with

guarantee. No questions asked.

TURBO TUTOR™ \$34.95

From start to finish in 300 pages. Turbo Tutor is for everyone from novice to expert. Even if you've never programmed before Turbo Tutor will get you started right away. A must. You'll find the source code for all the examples in the book on the accompanying disk ready to compile. Turbo Tutor might be the only reference on Pascal and programming you'll ever need.

TURBO DATABASE TOOLBOX™ \$54.95



The Turbo Database Toolbox is the perfect complement to Turbo Pascal. It contains a complete library of Pascal procedures that allows you to sort and search your data and build powerful applications. It's another Borland set of tools that will give the beginning programmer the expert's edge. Get started right away: free database! Included on every Toolbox disk is the source code to a working.

data base which demonstrates how powerful and easy to use our search system, Turbo-Access, really is. Modify it to suit your individual needs or just compile it and run. Remember.

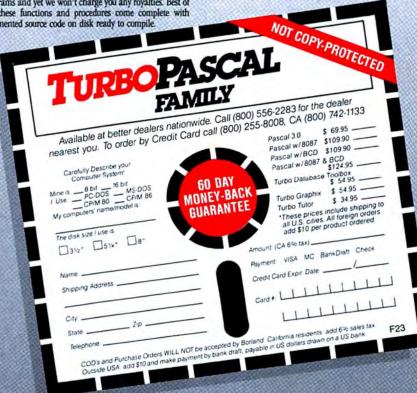
BORLAND INTERNATIONAL

4585 Scotts Valley Drive, Scotts Valley CA 95066 Phone (408) 438-8400 Telex 172373

Copyright 1985 Borland International BI-1011

Turbo Pascal, Turbo Database Toolbox, Turbo Craphix Toolbox, Turbo Tutor and

Circle 954 on reader service card





THE BETTER LETTER BOX

Introducing EasyPlex. The new, easy-to-use electronic mail system from CompuServe.

Finally! Electronic Mail that's so easy to use you can start composing and sending messages the first time you get online.

Designed for various experience levels, EasyPlex has a menu mode with simple, easy-to-follow directions for beginners, and it lets experienced users save time by working in the prompt or command modes. With EasyPlex, you can compose, edit, send, file, and take advantage of sophisticated options previously available only with more expensive services.

CompuServe's EasyPlex lets friends and relatives, associations and club members communicate any time of the day or night. And small business owners, real estate professionals, insurance agents, lawyers, writers, etc. can communicate quickly and simply—either interoffice or interstate. "It's Easy." "Just Plex it!"

Best of all, EasyPlex is available to all CompuServe subscribers. And, along with EasyPlex, you get hundreds of valuable and entertaining computing options. Plus the assurance of belonging to the largest, fastest

Circle 856 on reader service card

growing computer information service in the world and the premier supplier of business information to FORTUNE 500 companies.

Start communicating! To buy a CompuServe Subscription Kit, see your nearest computer dealer. To receive our informative brochure or to order direct, call or write:

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

Borland's SuperKey And SideKick Work So Well Together, You'll Hardly Work At All.

AN UNBEATABLE TEAM AT AN UNBEATABLE PRICE! We've teamed the best with the best to make the greatest. The best keyboard enhancer, SuperKey®. The best desktop organizer, SideKick®. The dynamic duo working hand in hand to let you do many different things at once. A way that cuts down the keystrokes, so you're working instead of just typing. A way that wasn't possible until we paired the electronic wizardry of SuperKey with the practical efficiency of SideKick. SuperKey brings the magic. SideKick does the details. The "S-Team" works beautifully together because we designed them

GET SUPERKEY AND SIDEKICK TODAY and you'll have an unbeatable team at an unbeatable price - and a \$15 rebate back in the mail.

that way.

SuperKey

SIDEKICK INCLUDES: * Calculator * Notepad * Auto dialer & phone directory * ASCII table * Perpetual calendar & datebook * Help window * Full-screen editor with word-wrap, paragraph editing and much much more.

(Chances are that once you have SuperKey and SideKick working together for you, you'll never need to use a word-processing program again).

SUPERKEY INCLUDES:

*Encryption to keep confidential files confidential * Programmable keys that let you turn a thousand keystrokes into one * Keyboard lock * Automatic turn-off of your screen after a pre-set time so the expensive phosphorus in your monitor's screen isn't etched or ruined * Secret Password protection and more.

IF YOU USE SIDEKICK, YOU NEED SUPERKEY. BECAUSE SUPERKEY AND SIDEKICK CAN MAKE YOUR DAY GO SOMETHING LIKE THIS:

8:00 am. You got to work on time, despite the 44-mph turkey ahead of you in the fast lane. It's spreadsheet time. You hit one key. Lotus 1-2-3 (or whatever) is up and running. (One key, because SuperKey has recorded all the CD\123 <ENTER >123 < ENTER > / F < ENTER> R < ENTER> SALES < ENTER> < PgDn> foolishness and your one keystroke played all that back instantly. One keystroke instead of a minuet).

8:03 am. You're into the spreadsheet. Phone rings. You kick in SideKick's Notepad-without leaving your spreadsheet. You talk. You listen to Frank. You make notes that tell you that Frank is upping the numbers from yesterday's order and he needs a new price and delivery date. He wants a meeting. Fast, but when? You have SideKick fire up your Calendar. Time agreed and noted-in SideKick's NotePad. Conversation ends. Your spreadsheet is still there

8:07 am. You're watching the spreadsheet but you're thinking about the new hid you have to figure out. So you have SideKick's Calculator pulled up on the screen-over a small piece of the spreadsheet—which doesn't go away.

8:08 am. SideKick is coming up with new numbers SuperKey keeps the spreadsheet on a roll. Satisfied with the numbers, you have SideKick auto-dial Frank's number.

8:89 am. Spreadsheet about done. You're watching it, but thinking about what Frank just said on the phone. He liked your numbers. He ordered. He said, "That was fast. We won't need that meeting. (SideKick cancels it from your Calendar). And he also said, "How did you get all that done so quickly?" And you said, "I've got a couple of new guys working for me."

Copyright 1985 Borland International BI-1014 Superkey and Sidekick are registered trademarks of Boriand International, inc. 1-2-5 in a trademark of Louis Development Corp.

18M is a registered trademark of International Business Machines Corp.

IF YOU DON'T USE SIDEKICK YET, YOU GET THEM BOTH AND FOR A LIMITED TIME, A

\$15.00 CASH-BACK! Because SuperKey and SideKick are so compatible, we let them move in together. Into their own blister-pack. With the \$15.00 cash-back coupon and the manuals. Which is what you get for \$139.90 instead of the usual \$154.90. You need to fill-in the cash-back coupon, along with your registration cards and proof of purchase, and mail it back. We'll rush you your \$15.00 rebate right away. Rebate offer ends March 31, 1986. (PS: You can still buy SuperKey and SideKick separately. SuperKey \$69.95. SideKick \$84.95. Not copy-protected.)

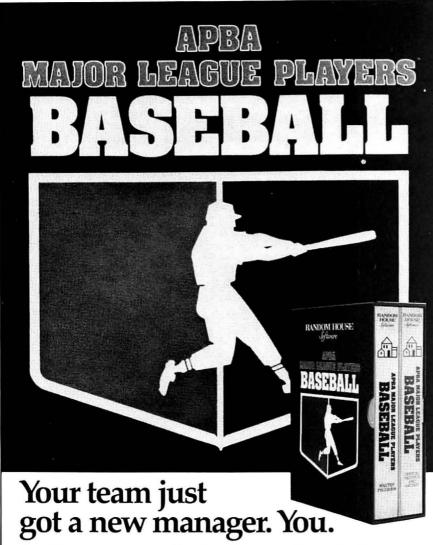
THE CRITIC'S CHOICE

'If you want the ultimate in sophistication, you won't find any thing finer on the battlefield right now than Borland's SuperKey and SideKick combo." LEON A. WORTMAN, InfoWorld

BORLAND

4585 Scotts Valley Drive, Scotts Valley CA 95066 Phone (408) 438-8400 Telex 172373





Here comes your chance to manage the major leagues. "APBA Major League Players Baseball." The sophisticated, realistic computer *version of the best-selling APBA Baseball board game. It's the first baseball program to take full advantage of the power of your personal computer. You can draft teams from a list of 676 big-league players or play with the rosters of all 26 real teams. Each play is based on actual performance measurements, so players perform for you just as they do in the ball park.

This 1985 Master Edition includes the program disk, a 1984 records and ratings disk, a 52-page instruction manual and 2 manager's reference cards—all in a hardback slipcase. What's more, each year the records and ratings disk is updated to make it a whole new ball game year after year.

Available wherever software is sold. Or call 1-800-638-6460 (in Md., 1-800-492-0782).



Based on APBA Major League Baseball Master Game. Licensed by the Major League Baseball Players Association. Program Design and Implementation: Roswell C. Miller, Kenneth B. Miller.
*For IBM PC, PCjr, XT or AT, with color or monochrome adapters. € 1985 Random House Inc. All rights reserved.

Circle 643 on reader service card

1984, John Zemotel, who worked at M/A Com in the company's semiconductor division, died of toxic poisoning after he accidentally came into contact with the substance.

So far, industry engineers have mainly focused on the near term, trying to handle toxic chemicals safely or find better ways to dispose of the resulting wastes. But even double-containment tanks won't last forever, and the waste dumps multiply every year. Critics say the real solution lies in finding production methods that don't generate toxic wastes in the first place.

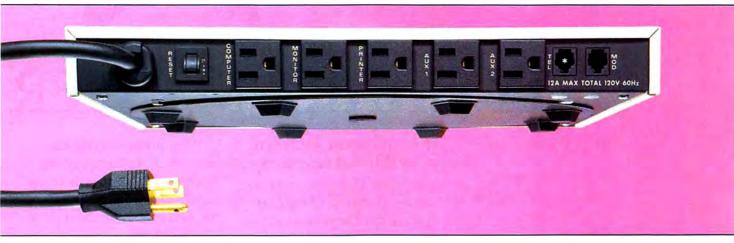
As computer buyers, we have a direct stake in what the industry does. After all, we are at the top of the manufacturing "food chain." We—and our children—are the beneficiaries of high-tech poisons, and unless we bring pressure on the industry to change its ways, we may eventually face sermons and soda water ourselves.

William Rodarmor is a San Francisco Bay Area writer with a special interest in computers and high technology.

Front,



Back,



No matter how you look at it, Master Piece *from Kensington makes your IBM* PC more accurate, reliable, accessible, and last longer, too.

Master Piece protects your PC from damaging power surges and spikes with the best two-stage surge suppression circuitry available. It protects your PC, software and data from RFI and EMI line noise. It even protects your PC from dangerous static shocks, with static dissipation built right into its silver nameplate.

Master Piece also makes your PC more convenient. It has five outlets so you can plug all your components into one place. It gives you one master switch for your whole system and five individual power switches for your components, all right at your fingertips. And it gives you a hidden swivel that lets you adjust your monitor to the viewing angle most convenient for you.

Master Piece, the most important, most convenient, most elegant accessory ever made for the IBM PC. For a detailed brochure, see your local dealer. Or contact Kensington at 251 Park Avenue South, New York, NY 10010; (212) 475-5200.

*Modem surge suppression available in Master Piece Plus.

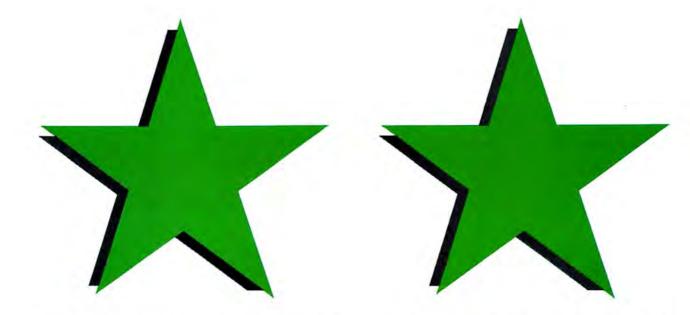
Trademarks: Master Piece, / Kensington Microware Ltd.; 5 1985 Kensington Microware Ltd

And In Between.









ONLY CHART-MASTER

CHART-MASTER® is #1—again.

For the second consecutive year, we've been rated the top business graphics program by *Software Digest*, the "Consumer Reports" of the software industry.

What does it take to be #1? Plenty.

We had to beat a field of 16 heavy competitors, including Lotus 1-2-3,™ Graphwriter,™ Microsoft Chart,™ and a dozen others.

And we had to score better than anyone else in a total of five comparative ratings to do it.

In printed and plotted graphs, we were judged "excellent."

Our user's manual, term definitions, and on-screen instructions were praised for their extraordinary clarity.

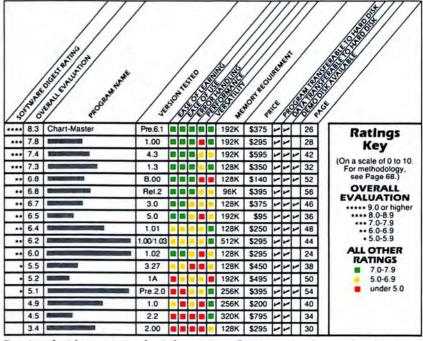
And our ease of data access and use scored higher than any other program.

How to choose between powerful and easy to use.

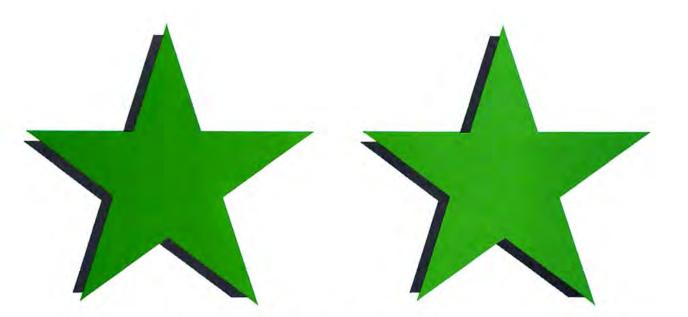
Software Digest recommends you decide which of their ratings are most important to you before consulting their head-to-head comparisons.

What if you can't decide between a graphics program that's easy to learn, easy to use, easy to change and fast, versatile, and able to produce picture perfect graphics?

Easy. Choose CHART-



Reprinted with permission by Software Digest® Ratings Newsletter, July, 1985 issue.



CAN MAKE THIS CLAIM.

MASTER, the graphics software that received the highest rating for both power and ease of use.

What the <u>new</u> version CHART-MASTER 6.1 brings to the picture.

Decision Resources now offers IBM PC users expanded graphics capabilities with the new CHART-MASTER 6.1.

- Our DataGrabber[™] allows you to pull selected spreadsheet or data base files into a chart quickly and easily.
- Two new text fonts give you a choice of Helvetica[™]-like type in Swiss and Swiss Bold.
- A new symbol font gives you
 94 business symbols and icons to draw from.
- And more—network compatability, support for over 90 plotters and printers, floppyless hard disc support, mixed charts—and more.
 Much more.

If you currently have a version that's earlier than

CHART-MASTER 6.1 or SIGN-MASTER™ 5.1, call Decision Resources for information on how to receive an updated copy.

A total graphics package.

CHART-MASTER stands alone among its competition, but it doesn't stand alone at Decision Resources. It's part of a complete business graphics package. For text, try SIGN-MASTER. For organization and Gantt charts and a free-form Drawing Board, try DIAGRAM-MASTER.™

All three programs give you the ideal power and usability to help you solve your business graphics needs.

How to get your free copy of the Software Digest report.

For the name of the nearest dealer who can give you a demonstration of CHART-MASTER, please call us at (203) 222-1974.

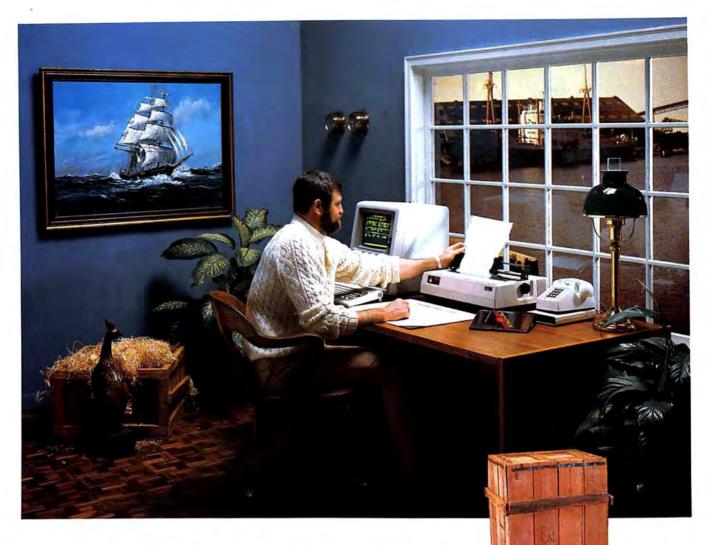
If you'd first like to see the evidence for yourself, send in the coupon below. We'll send you a copy of the July 1985 issue of *Software Digest*, which evaluates and ranks the industry's 17 top business graphics software—at no cost.

When it comes to choosing the best graphics software for your business, we think you should feel free to be the judge.

Decision Res 25 Sylvan Ro	oad South
Westport, C	T 06880
Please send me issue of Softwar to see for mysel	e Digest. I'd like
Name	
Title	
Company	
Address	
City	
State	Zip
Phone	
	PC

DecisionResources Software Designed for Decision Makers

Circle 342 on reader service card



International Connections

With the industry's most popular data communications program, the world is at your command.

An import/export office in New Jersey can instantly check the London market for current dollar exchange rates ... send Hong Kong an updated production schedule ... print-out the week's sales results from the Dallas branch.

There's virtually no limit to how far you can reach with your microcomputer, ordinary telephone lines, and CROSSTALK.

Even if your own business and personal needs are closer to home, you'll appreciate CROSSTALK's compatibility with a wide user base ... smart terminal characteristics ... total modem control ... and the ability to capture data at a high speed for later off-line editing. CROSSTALK has extras you may not find in other programs. Data capture to memory buffer (and on-line display). Protocol error-checking file transfer. Modem/telephone hangup, and display of elapsed time of call. Command file power and flexibility. Remote takeover and operation. And much more.

There is a CROSSTALK version for almost every CP/M, CP/M-86, or IBM DOS based microcomputer system. See your dealer, or write for a brochure.





1000 Holcomb Woods Parkway / Roswell, Georgia 30076

Pure power.

QIC-60 streaming tape backup is more than just fast and simple to operate. It's also the leader in powerful processing.

For example, our unique five-head tape deck offers immediate read-after-write verification. No rewinding necessary. And no re-recording of the entire backup after an error.

Another powerful advantage is automatic adjustment of the head mechanisms to seek the best track alignment every time a tape is inserted. Plus our exclusive power sensor is designed to alert and freeze the write head if PC power is reduced, which eliminates the chance of disk damage. We're so confident in the technical excellence of QIC-60 that we offer an aggressive one-year limited warranty on the entire line, compared to the 90-day warranty provided by other manufacturers.

Best of all are a pair of backup bonuses that turn QIC-60 into a sophisticated data management tool. When you select mirror-image restore, QIC-60 sees bad disk sectors and automatically reroutes data to safe locations for improved data reliability. Tecmar offers AT owners a special enhancement with an internally-mounted QIC-60 tape drive that costs even less than external systems. And when you add our internal AT Hard Disk to the package, you have a fully upgraded system ready to use today.

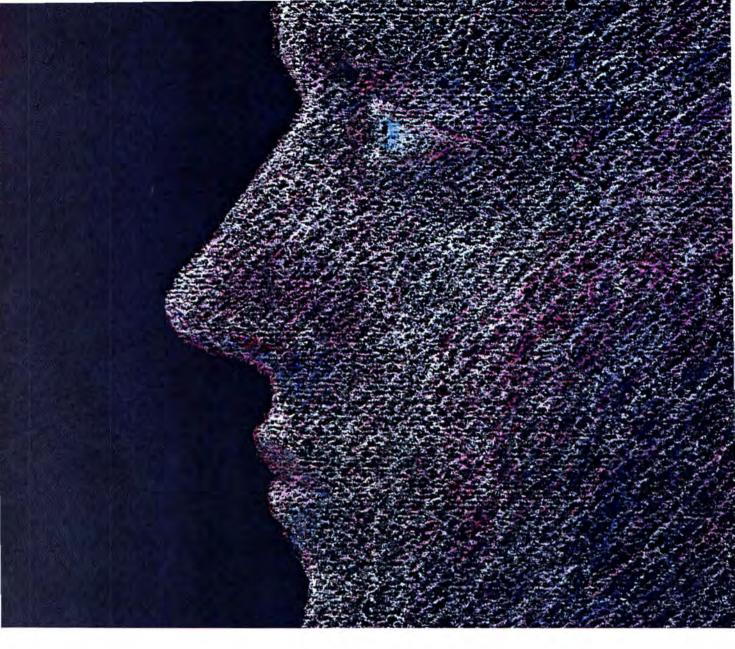
Pure speed. Pure power. Pure innovation from Tecmar.

For a free demonstration of the new standard in tape backup, see your Tecmar dealer or call us at 216/349-1009 for the location of the dealer nearest you.



TECHNAR

6225 Cochran Road Solon, Ohio 44139



The test three out of four

It's simply no contest.

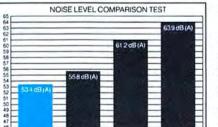
Compare operating sound levels on four of the

leading \$500-range printers and one stands clearly below the rest.

The Mannesmann Tally MT85/86.

A printer so perceptibly quieter that once you hear it, you won't hear of anything else.

Which is why we suggest the following:



EPSON EXBO

According to tests conducted in the independent laboratories of H.L. Blachford, Inc.*, the MT85 is significantly quieter than its major competitors.

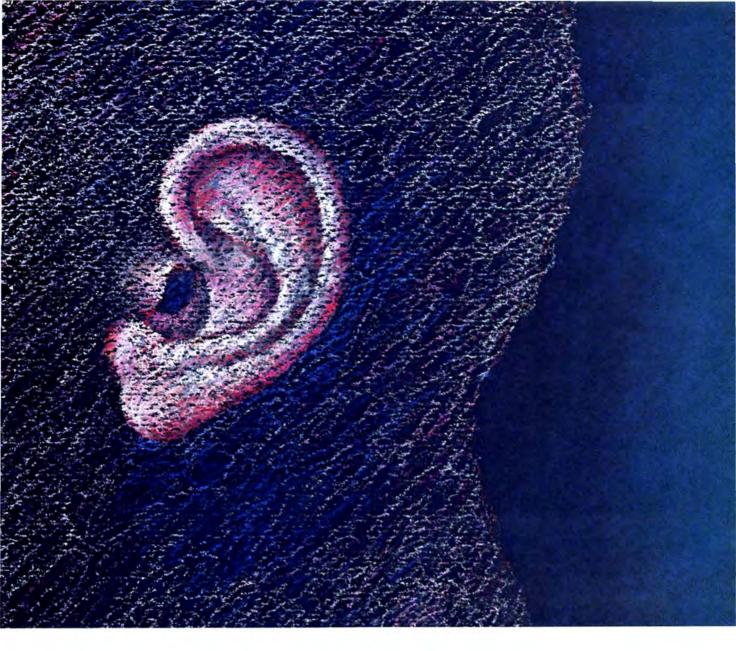
*ISO 7779 test pattern, front bystander position, overall rating, June 1985.

Go to your Mannesmann Tally dealer for a test listen. And run the MT85 or wide carriage MT86

through its paces.

Hear how quiet it is. See how crisp and clean its draft and NLQ characters are. Watch output zip by at a speedy 180 cps. Or at 45 cps NLQ on one of two resident fonts or one of three additional type style cartridges.

And rest assured. This excep-



printers don't want you to hear.

tional printer is fully compatible with Apple® ImageWriter,[™] IBM® Graphics[™] and the Epson® FX series.



So call now for a Mannesmann Tally MT85 free do-it-yourself test brochure and the name of the Mannesmann Tally dealer nearest you. And put us to the test.

If any other printer can match the quality, flexibility and durability of the MT85/86, then let them be heard.

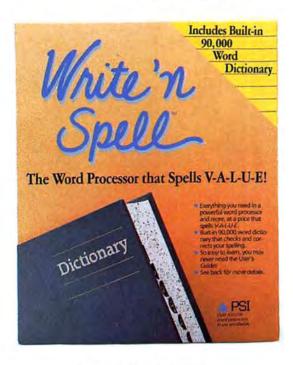
The silence is deafening.

MANNESMANN TALLY

Put us to the test. 1-800-447-4700

Apple and Apple ImageWriter are trademarks of Apple Computer Inc. IBM and IBM Graphics are registered trademarks of International Business Machines Corporation. Epsiness a registered trademark of Epsine Corporation

Write'n Spell[™] and pfs[®]:write Went Head-to-Head.





We Won.

They Lost.

PSI Write 'n Spell

- INCLUDES virtually every important word processing function and much, much more.
- INCLUDES on-line 90,000 word Dictionary that checks and corrects your spelling.
- INCLUDES "Pull Down" Option Windows and exclusive Context Sensitive HELP Windows. It's so easy you may never even need the manual.
- INCLUDES Mail Merge for personalized mailings.
- INCLUDES ability to type while printing.

PSI Write 'n Spell \$149.00
Built-in Spelling N/C
Built-in Mail Merge N/C

Write 'n Spell spells V-A-L-U-E.

\$149.00*

vs. pfs:write

- Simply the basics.
- NOT included. It's that simple.
- NO pull down windows for options or help.
- NOT included. Simple as that.
- NOT available . . . at any price.

pfs:write \$140.00
Separate spell checking program \$95.00
Separate merge program \$140.00

Write is simple. But NOT a smart buy.

\$375.00*

Insist on Write 'n Spell from your retailer. It does a lot more than just write. Operates on IBM PC/XT/AT/jr or compatible systems. Call 1-800-343-4074 for more information or for the dealer nearest you.



Professional Software, Inc. 51 Fremont Street Needham, MA 02194 Telephone: 617/444-5224

Over 100,000 word processors in use worldwide.

^{*} Based on manufacturer's suggested retail prices. Write 'n Spell is a trademark of Professional Software, Inc. pfs is a registered trademark of Software Publishing Corp.



John C. Dvorak

The parallels between the histories of the automobile and the personal computer indicate a bright future in store for the PC industry.

The Revolution Has Just Begun

ince the beginning of the personal computer revolution, old fogies have argued that the scene is a fad, like CB radios or Hula-Hoops. Fortunately, that's not the case. The country has become so immersed in computing-personally, in business, and for entertainment-that the machines have begun to alter our culture. Even the language of the hard-core computerist has started to infiltrate normal discourse. (Who ever said "data" before the advent of computers? Not to mention the abhorrent use of "interface" or those oft-repeated requests for your "input.")

Few fads result in hundreds of magazines and thousands of books. Only a major trend has the momentum to sustain those classic indicators of acceptance, whereas a fad typically has one manufacturer (and maybe a few imitators) making the dough. How many Pet Rock clones were successful? None.

A major trend has a number of competitive brands and a glut of related accessories. We've seen this with the car as well as the personal computer. The personal computer is no more a fad than the automobile was.

In fact, the histories of the personal computer and the the automobile have significant parallels. The automobile is an ideal standard by which to gauge society's acceptance of a new technology. Automobiles have been so fully absorbed into our culture that everyone can relate to them.

It is no coincidence that the country that has the most cars—a country symbolized by the automobile—is the country that pioneered the development of the personal computer. The country that places such high value on personal modes of transportation also prides itself on the concept of "one person, one computer."

Before the automobile, people relied on scheduled mass transportation. (To this day in Europe, you can set your watch by the comings and goings of the trains.) Until the emergence of the now-ubiquitous microprocessor in the mid-1970s, computers were part of large organizations and were controlled by

(continues)

THE AMERICAN BUS

SONY BRINGS THE BRILLIANCE OF TRINITRON* TO COMPUTER MONITORS.

From now on, business people all across America can enjoy all their favorite programs on a Sony Trinitron.

Because Sony proudly unveils the first computer monitors in the world endowed with Trinitron technology. RGB monitors which, in the laudatory words of Computer Buyer's Guide and Handbook, give you "crisp, brilliant, utterly flicker-free images that take the eyestrain and headaches out of both color graphics and text or data processing.

We've achieved this through technological breakthroughs that literally divide the computer-monitor world in half: Sony's, and all the others'.

First, the patented one-gun, one-lens Trinitron system itself,

with a picture sovivid, so critically of text—to 13"—a model that lets lifelike, it's become a legend.

Second, Sony Trinitron's exclusive Super Fine Pitch™ Aperture Grille. It dramatically increases the number of red, green and blue electrons reaching your screen.

Which dramatically increases the vibrance and brightness of the colors reaching your eyes.

And third, a dot pitch so fine the horizontal resolution of a Sony is not only the highest in its class, but "close to that of models costing twice as much" (Computer Buyer's Guide and

you switch from software to

Handbook).

You can enjoy this extraordinary picture quality on screens ranging from 9"-the first ultracompact monitor in the business capable of displaying 2,000 characters

Typical coarse dot pitch vs. Sony Trinitron super-fine dot pitch.

Aperture Grille Shadow Mask

With a Fine Pitch Aperture Grille, Trinitron monitors give you dramatically brighter colors than the conventional shadow mask.

soaps at will by merging a computer monitor and full-feature TV into a single unit.

They're all compatible with the IBM PC, Portable PC, PC/ XT and PC/AT through built-in RGB circuitry. And compatible with most Apple* and other personal computers through optional accessories.

So call Sony for further information at 1-800-222-0878 (In New Jersey, 1-800-222-0879).

Because there's no longer any reason to view your technologically-advanced computer through a technologicallydeprived monitor.

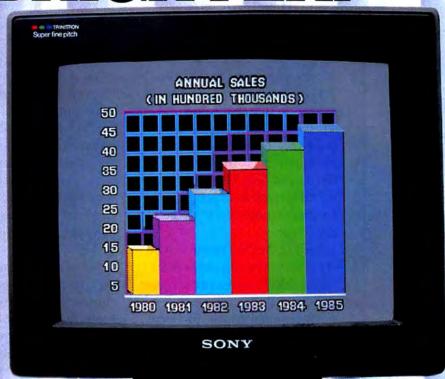
Information Products

registered trademarks, and Super Fine Pitch a compatibility: The microcomputer industry lacks its monitors will be compatible with any combimonitor's compatibility in any particular instance.

Circle 579 on reader service card

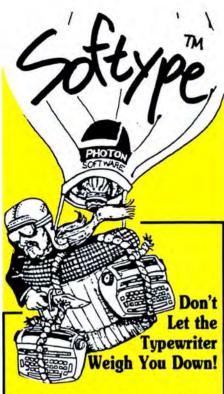


INESS PICTURE HAS ED BRIGHTER.









Use your PC and printer like a typewriter — and more — instantly, even during another program!

Type . . .

Print text on a line-by-line basis — just like a memory-typewriter. Great for addressing envelopes.

Fill in pre-printed forms . . . Create a file of your own office forms using Softype's * exclusive * Define* program. Then select a form, fill it out on-screen, and print — no mistakes!

Control your printer . . .

Select any type size or style your printer will support. Works with any type of printer.

Risk-Free Money-Back Guarantee!
Try Softype™ for 30 days. If not completely satisfied, return the package for a full refund!

formerly ProType at \$119.95

non copy-protected now just . . .

\$69

order toll-free: 1-800-446-2263 in Washington: (206)641-8411

> VISA MasterCard Company PO's accepted

Photon Software, Inc. 14021 N.E. 8th. St. Bellevue, WA 98007

Circle 575 on reader service card

the data processing priests. Waiting for batch processing was like waiting for a crosstown bus.

Steam trains were certainly large, safe, and powerful, but not as attractive as your own humble jalopy when it came to personal freedom. Large mainframes are analogous to the train (or the jetliner) in that they support a large number of people and are not owned by just one person. Minicomputers are like the Greyhound bus: They carry a considerable number of people and are more economical than the family car.

Even in the 18th century, society possessed a need to personalize modern transportation. Sure, you could always use a horse—it was a personal vehicle, just as a typewriter is a personal word processor. But the technology was available to create a personal vehicle that was faster and better than a horse.

In 1770 a Frenchman named Cugnot invented the first powered land vehicle-a steam tractor designed to pull artillery. With its boiler puffing clouds of steam, it could haul a 5-ton load for about 15 minutes at an astounding 5 miles per hour. The monstrosity reportedly crushed a stone wall during one test, making it not only the first motorized road vehicle but also the first to have an accident. (Insurance rates soared.) The computer equivalent would be the early home-brew, solder-it-together-vourself kits that were as likely to blow up as not.

A slew of screwball steampowered carriages and stagecoaches came and went during the 1800s. All were heavy clunkers, unusable as personal transportation. Road locomotives, they were called. If the owners weren't killed by an exploding boiler (boiler explosions and consequent deaths were commonplace throughout the period), they might die of boredom waiting for the road locomotive to get up a head of steam: The heavy cast-iron boilers took hours to heat, much as early computer users wasted time toggling in each start-up program, bit by bit.

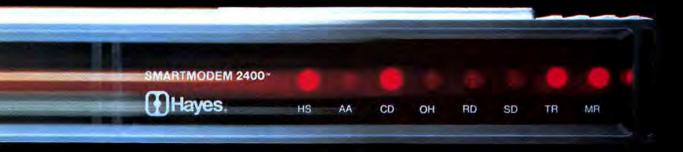
Soon, near the turn of the century, the gasoline-powered car rolled onto the scene, and with it, a new fellow turned up-the enthusiast. The first years of the automobile age abounded with hobby magazines for enthusiasts. A flood of car-enthusiast magazines appeared between 1900 and 1910-Motor World, Carriage Monthly, Auto Week, Motor Age, Motorcycle & Automobile Maker and Dealer, Horseless Age, and dozens of others. The microcomputer industry followed the same pattern-and although some micro magazines have folded, more than 100 still vie for the enthusiasts' loyalty.

Just like microcomputer magazines, most early car magazines appealed to the diehard, tended to be undermanaged, and lacked insight into the business on which

(continues)

Want to hear a demonstration of Hewlett-Packard's ThinkJet Printer?

Hayes sets the standard for personal computer communications. Again. Smartmodem 2400.



The new fast mover from Hayes. The telecomputing leader. When it comes to communications products for personal computers, we're the leader! Hayes Smartmodem 1200™ set the industry standards for quality, reliability and performance.

Now our new, faster Smartmodem 2400 goes even further to lower telephone line costs and improve user productivity. So, at twice the speed of a 1200 bps modem, it quickly pays for itself in any high-volume communications operation.

Smartmodem 2400 provides a quick link to minis and mainframes. Both synchronous and asynchronous transmissions are supported by an advanced version of the well-known Hayes "AT" command set. You can download from the IBM mainframe at the home office. Send data to the mini upstairs. And guarantee accurate transmission with information services.

With worldwide communications in mind, Smartmodem 2400 was designed to meet CCITT international standards. It provides a fast, cost-effective way to transmit data between approved countries.

New version of Hayes Smartcom II® communications software creates a complete telecomputing system with Smartmodem 2400. Our new Smartcom II, Version 2.1, is available for the IBM* PC and many popular compatibles. Smartcom II makes the most of Smartmodem's exceptional features, at the same time it makes communicating easy for you. And, if you're currently using an earlier version of Smartcom II, Hayes offers a \$25 upgrade to Version 2.1.

So if you're looking for ways to streamline your communications, see your authorized Hayes dealer right away. For a hands-on demonstration of Smartcom II and our new Smartmodem 2400. Guaranteed to get you moving fast! Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092, 404/441-1617.

Smartmodem 2400

- Direct connect Asynchronous and synchronous communications
- Accommodates Hayes-compatible modems of slower speeds • Meets CCITT worldwide standards • Keyboard control of all communications parameters • High speed indicator • Voice/data capabilities • Call progress monitoring
- Two-year limited warranty with optional four-year extended warranty available.

Smartcom II

- Hayes Verification and XMODEM protocols
 Emulates DEC* VT 52 and VT 100/102
 Totally unattended operation
- Voice/data capabilities.

Innovative products for enterprising people



You made about as much noise turning the page as the ThinkJet Printer makes turning one out.

So it lets you do two things at once. Print. And think. Without sound hoods. Without remote printing stations. Without aspirin. (And without a lot of clutter. The only thing smaller than the ThinkJet Printer is its price: \$495.*)

Better still, it works with just about every personal computer. Hear the ThinkJet Printer sound off.

Call (800) FOR-HPPC, Dept.710C, for the Hewlett-Packard dealer nearest you.





*U.S. list price. PG02511

Circle 242 on reader service card

they reported. In 1904 *Horseless Age* wrote about car racing as a "barbarous exhibition." But when the Indianapolis Speedway was built in 1911, car racing became a permanent part of our culture.

I figure we're at about that point with PCs... 1911. Although we don't have the computer equivalent of the Indy 500, we have made spreadsheets, *Pac-Man* clones, and video gaming permanent features of the culture. With the next generation of equipment we should be able to invent new uses for the machines and continue on our merry way.

It looks like there's a good distance left to go. Personal computing is still at the beginning of a long growth curve toward acceptance. The PC represents as radical a change as the automobile did, and one that has met as much resistance. Nearly 100 years after the stormy introduction of the horseless carriage, society still finds personal automobiles to be useful and preferable. Thus, demand is still healthy. So let's not get too worried about a few short slumps in the PC market, OK? The growth curve will be rising for a long time to come.

John C. Dvorak is a writer and editor in Berkeley, California. He recently edited Dell Publishing's Dvorak's Instant Expert Series, and his columns are featured in the San Francisco Examiner and InfoWorld.

FOR THE // ATARI

CENTER NEAREST YOU PLEASE CALL OUR SALES OFFICE IN YOUR AREA

New England

Bellavance, Fassler, Iarrobino, Inc. Needham, Maine 617-449-3910

Upstate New York

Seeber Sales Corp. Latham, New York 518-785-4523

Metro New York, North New Jersey The Spieler-Weiss Group, Ltd.

Spring Valley, New York 914-352-2502

South New Jersey, East Pennsylvania, Delaware

R. K. Marketing Havertown, Pennsylvania 215-446-6400

Maryland, Washington, Virginia

Alexander & Samet Rockville, Maryland 301-251-9300

South Nevada, Arizona, New Mexico, El Paso

Mountain Micro Markets Scottsdale, Arizona 602-998-4357

Washington, Oregon Barnsley-Weis Associates Yakima, Washington 509-248-7250

No. California, No. Nevada New-West Companies Mountain View, California 415-940-6033

Southern California

Tri West Marketing, Inc. Culver City, California 213-390-8591

Tennessee, Georgia, Alabama, Mississippi, No. & So. Carolina

John Lee Company, Inc. Nashville, Tennessee 615-321-5012

Florida

Intratec Technology Rep.'s Inc. Boca Raton, Florida 305-393-1925

W. Pennsylvania, W. Virginia, Ohio, Kentucky

Incom Marketing, Inc. Columbus, Ohio 614-451-5146

Minnesota, North Wisconsin, North Dakota, South Dakota

Continental Merchandisers, Inc. St. Paul, Minnesota 612-645-6441

South Wisconsin, North Illinois, Michigan, Indiana

Hawthorn Marketing, Inc. Buffalo Grove, Illinois 312-541-8846

Missouri, Kansas, S. Illinois, Nebraska, Iowa

Sound Marketing Associates St. Louis, Missouri 314-644-2400

Texas, Oklahoma, Arkansas, Louisiana, Mississippi Miller & Associates

Miller & Associates Richardson, Texas 214-437-5733

Utah, Idaho, Colorado Wyoming, Montana, Alaska

Schreyer Associates, Inc. Salt Lake City, Utah 801-483-1331

Hawaii

SCS Co., Inc. Honolulu, Hawaii 808-845-9937

JLATARI®

Power Without the Price



Apple Mac 512™



IBM PCAT™



Commodore Amiga™

THERE'S ONLY ONE WORD FOR THESE PRICES: RIP-OFF.

Introducing the Atari 520ST personal computer system. \$799.95*complete.

Go ahead. Compare those other machines with the new Atari 520ST.™
They cost hundreds of dollars more, but you don't get much in return. That's what we call a rip-off.

For \$799.95,* the 520ST comes comblete with high-resolution monochrome

	ATARITE 520ST	PCATT	APPLE™ Macintosh™	COMMODORET AMIGAT
rice	\$799	\$4675	\$2795	\$1795
PU peed MHz	68000 8.0	80286 6.0	68000 7.83	68000 7.16
tandard RAM	512K	256K	512K	256K
lumber of Keys	95	95	59	. 89
Mouse	Yes	No	Yes	Yes
creen Resolution Non-Interlaced Mode olor Monochrome	640 x 200 640 x 400	640 x 200 720 x 350**	None 512 x 342	640 x 200*** 640 x 200***
olor Output	Yes	Optional	None	Yes
lumber of Colors	512	16	None	4096
isk Drive	3.5"	5.25"	3.5"	3.5"
uilt-in Hard Disk DMA) Port	Yes	Yes	No	No
MIDI Interface	Yes	No	No	No
la of Sound Voices	3	1	4	4

^{..} With optional monochrome board (non bit-mapped)

**Interlace Mode - 640 x 400

monitor, 2-button mouse, 3.5" disk drive, TOS™ Operating System, including GEM™ Desktop, plus Logo™ and Atari BASIC programming languages. \$200 more gives you an RGB color monitor with 512 glowing colors.

Choose innovative business, entertainment, education, systems management, and integrated package software. Expand your 520ST with industry standard parallel printers, modems, MIDI controlled synthesizers and keyboards, 1 megabyte floppies, 10 MB and larger hard disks, and more. All available now. At re-



markably low prices.

So, go ahead. Compare the ST system to those other guys. Only Atari gives you so much. For so little.

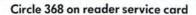
For the dealer nearest you, write Atari Corp., Customer Services, 1196 Borregas Ave., Sunnyvale, CA 94086.

^{*}Plus applicable local taxes. \$999.95 with color monitor.

All prices are manufacturer's suggested retail list.



IBM & PCAT are registered trademarks of International Business Machines Corp. Commodore & Arniga are trademarks of Commodore Electronics LTD. Apple & Macintosh are trademarks of Apple Computer, Inc. GEM is a trademark of Digital Research, Inc. Atari, TOS & Logo are trademarks of Atari Corp.



The Project Scheduler NETWORK



As a manager, you know the key to a successful project is good planning. You can't afford to overlook critical costs and deadlines.

COMPREHENSIVE PROJECT MANAGEMENT

The Project Scheduler Network will help you meet deadlines and beat cost targets using effective project scheduling, resource planning, costing, and status tracking.

Advanced screen graphics. Produce Network diagrams, Gantt charts, and color graphs to provide the concise information you need for timely decision making.

Work Breakdown Structure (WBS).
Organize project activities to produce summary level schedules and reports.
Multiple projects can be integrated to present project level schedules and total resource utilization.

Baseline schedules. Save them to compare with current schedules for schedule tracking. Actual, original plan, and current plan costs can be graphically compared for cost tracking.

Comprehensive report generator.

Simplify communications with management by synthesizing project information into presentation-quality hardcopy reports and graphs.

SCHEDULE WITH THE CLICK OF A BUTTON

The Project Scheduler Network provides the most advanced software technology available. Start with our mousecontrolled menus to select spreadsheetstyle input templates to enter your project data.

Graphically build your dependency Network with only a "click of a button." Zoom to view the Network at selectable resolution levels. Now use the mouse to edit the Network to your satisfaction.

Select a Gantt chart and obtain schedules at any WBS level with a single click. Window resource graphs with the schedule to analyze resource allocations. And finally, select our integrated graphics to view color histograms, bar charts, and line plots of project resources and costs.

FEATURES

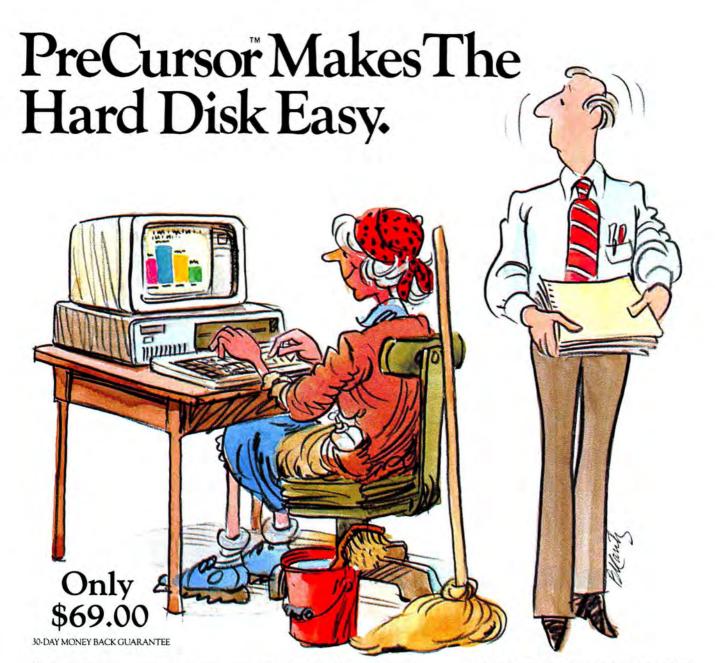
- Critical Path Method
- Network Analysis
- Gantt Chart
- Work Breakdown Structure (subtasks)
- Multiple Project Integration
- Tracking with Baseline Schedule and Complete Status
- Resource Scheduling
- · Financial Planning and Tracking
- Presentation-quality Graphics

REQUIREMENTS

- IBM® PC, XT, or AT
- PC-DOS 2.0, 2.1, or 3.0
- Monitor plus IBM graphics adaptor
- IBM or Epson graphics printer
- 320K RAM (minimum)
- Mouse (Microsoft compatible)
- Two disk drives (one double-sided)
- IBM or HP plotter optional
- Project Scheduler Network is a trademark of Scitor Corporation.
- IBM is a registered trademark of International Business Machines Corporation.

(415) 570-7700





PreCursor™ is an amazingly compact and sophisticated indexing system for your hard disk. It runs just ahead of your other applications and makes some very user-friendly arrangements. And at a very businesslike price.

Without PreCursor™, it takes a whole manual of commands to find and execute programs from your hard disk. In a business setting, where novice users must access your system, this is aggravating and expensive.

Tailoring PreCursor™ to your system is an easy operation. On-line help is available at the touch of a function key. A triple level of password protection is built right in. You don't need to know paths or subdirectories or other complicated syntax. You can even change the color of PreCursor™.

After PreCursor™ is setup on your hard disk, it greets you each time the machine is turned on with a list of available programs. You can make simple index choices of even the most complex DOS commands. And set up your printer with the speed and ease of an old pro.

If you're a sophisticated user, you'll love the convenience of full interaction with batch files, passable parameters and user prompts. Home users will appreciate the sure ease of operation.

If you depend on your hard disk for businesslike performance, you can rely on PreCursor™ for instant access.

Thanks to PreCursor™, The Hard Disk isn't so hard anymore.

Dealer Inquiries Wekome PreCursor™ will run on IBM compatible MS-DOS systems. IBM is a registered trademark of International Business Machines Corporation.

☐ Here's my order for	or copies.	
 Find my check for postage and hand 	r \$69.00 each enclosed (p ling).	olus \$5.00 for
Please charge this	purchase to my 🗌 Vis	a ☐ MasterCard •
Card #		Exp. Date
Name		10.21.11
Title		
Company Name		
Address		
Cin	State	Zip

Send to: PreCursor"

The David L. Aldridge Company, Inc. 540 Town & Country Village, Houston, Texas 77024 o place credit card orders by telephone, call 713/464/7465 or, I free, call 800-5388157 8822 in Calif. call 800-672-3470 8822





TI introduces Arborist, the decision tree software that proves smart decisions do grow on trees.

Now making smart decisions consistently is easy. Because TI has taken the analytical power of classic decision tree analysis and combined it with the speed and graphics of your personal computer. The result is the first of a new generation of software that extends your ability to use the computer to solve problems requiring judgment as well as numerical accuracy.

It's the Arborist Decision Tree Analysis Package. Coupled with a TI or IBM® personal computer, it allows you to order the decision factors, does the calculations, plots the Decision Tree,

Arborist is a trademark of Texas Instruments Incorporated. IBM is a registered trademark of International Business Machines Corporation.

28230 ©1984 TI projects the probable outcomes and highlights the optimum decision path. Simply and rapidly.

Then you can use your PC to graphically communicate the sound reasoning behind your decisions to others, with the printout, network transmission or largescreen projection.

Should any factor in your deci-

sion change, a few keystrokes and your Arborist Decision Tree Analysis is revised and reprinted. It's that simple, that fast and that smart.

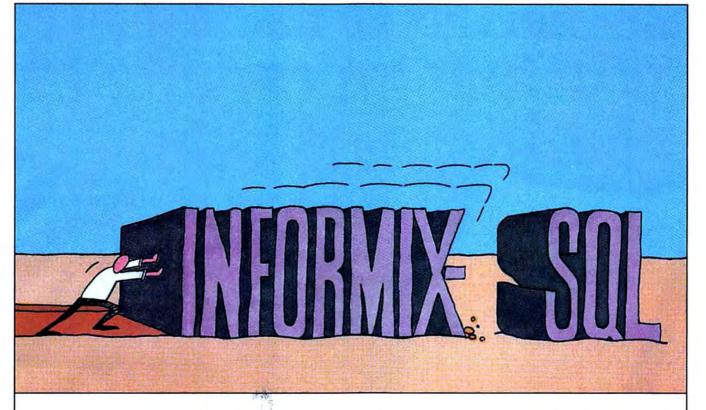
How much does it cost to turn your PC into a decisive tool! TI's suggested list price is just \$595.

So, now that you know how quickly and economically smart decisions can be grown on trees, make a smart decision yourself. Call 1-800-527-3500, in Canada, call 416-884-9181, and ask for Arborist Decision Tree Analysis, the software that makes those hard decisions easy.





Creating useful products and services for you.



How we our products, but And when you improved Structured Query Language. ATE ALL

Actually, we didn't change a thing.

We just combined it with the best relational database management system.

Introducing INFORMIX*SQL.

It runs on either UNIX™ or MS™-DOS operating systems. And now with IBM's SQL as part of the program, you can ask more of your database. Using the emerging industry-standard query language.

To make your job easier, INFORMIX-SQL comes with the most complete set of application building tools. Including a full report writer and screen generator. Plus a family of companion products that

all work together.

Like our embedded SQLs for C and COBOL. So you can easily link your programs with ours. File-it!," our easy-to-use file manager. And C-ISAM," the de facto standard ISAM for UNIX. It's built into all

INFORMIX is a registered trademark and RDS, C-ISAM and File-it! are trademarks of Relational Database Systems, Inc. IBM, UNIX and MS are trademarks of International Business Machines Corporation, AT&T Bell Laboratories and Microsoft, respectively. © 1985, Relational Database Systems, Inc.

our products, but you can buy it separately. And when you choose RDS, you'll

be in the company of some other good companies. Computer manufacturers including AT&T, Northern Telecom, Altos and over 60 others.

And major corporations like Anheuser Busch, First National Bank of Chicago and Pacific Bell.

Which makes sense. After all, only RDS offers a family of products that work so well together. As well as with so many industry standards.

So call us for a demo, a manual and a copy of our Independent Software Vendor Catalog. Software vendors be sure to ask about our new "Hooks" software integration program. Our number: 415/424-1300.

Or write RDS, 2471 East Bayshore Road, Palo Alto, CA 94303.

And we'll show you how we took a good idea and made it better.



RELATIONAL DATABASE SYSTEMS, INC.

MULTIPLE HARD DISC BACK-UP? HANDLE IT WITH BP-10™!

BP-10 —the totally portable system that combines the advantages of high speed tape back-up with the flexibility of 10 megabytes of random access storage.

Survival[™] software gives BP-10 the flexibility to either stream data on command, or store and retrieve data on a file by file basis. You can avoid copying bad or non-essential disk sectors—a perfect way to handle archiving, sensitive files, or infrequently used data.

A complete BP-10 is smaller than the cartridges other tape back-up systems use, and simply plugs into the external floppy disk expansion port of your IBM PC, XT, or AT*. There's no need to open your computer (and risk your warranty in the process!) or waste a valuable internal expansion slot.

At the easy-to-handle price of \$895, BP-10 puts the best features of mainframe tape drives—self-threading, single spool simplicity, a tape transport system that never touches the data surface, and fixed head design—well within your reach.

Additional 10 MB tape spools are available at a fraction of the cost of cartridges.

*AT models require an additional internal board.

IBM PC, XT, and AT are registered trademarks of International Business Machines.

More than one PC to handle? Compact, rugged and lightweight, BP-10 moves easily from one computer to another, lowering your back-up costs as it goes.



Get a handle on your hard disk back-up needs. Get a BP-10 — the leader in totally portable tape back-up systems.

To order your BP 10, call 1-800-531-5255, ext. 823. In Texas, call 1-800-252-9146, ext. 823.

For information call Scott Richards at 512-448-4965.

Or write to: BP-10 International Corporation 1701 Director Blvd. Suite 250 Austin, Texas 78744

Circle 471 on reader service card

GET YOUR FET WET...



...IN THE INFORMATION AGE
WITH THE DOW JONES
NEWS/RETRIEVAL® MEMBERSHIP KIT.
SAMPLE A CONTINUOUS STREAM
OF KNOWLEDGE AT A PRICE
YOU CAN AFFORD.

Now you and your whole family can experience the information age without getting in over your head.

For just \$29.95, the new Dow Jones News/Retrieval Membership Kit leads you step-by-step into entertaining and informative data bases. With **five free hours** to sample and explore, you can find a fact, shop at home, get the

scores, plan a trip, review a movie, choose a stock, or check world and business news. There's a lot more, too. All you need to get started is a computer and modem:

The Membership Kit is a big value that entitles you to:

- FREE password (\$75 value)
- Easy, step-by-step User's Guide
- FIVE FREE HOURS of usage to explore the magic of this comprehensive service

- FREE subscription to DowlineTM, the magazine of Dow Jones Information Services
- A special introductory offer!

Get your feet wet in the information age with the Dow Jones News/Retrieval Membership Kit. At \$29.95, you'll enjoy the dip without getting soaked. Available at computer retailers and selected bookstores. For the location nearest you, call:

1-800-257-5114

In New Jersey, Canada, Hawaii and Alaska 1-609-452-1511

'Free time' offer limited to five (5) hours per household. Must be used within 30 days of receipt of password. Nominal service fee still applies.

Circle 176 on reader service card

"Toss away any preconception that Dow Jones News/Retrieval is a stuffy, one dimensional data base service designed only for an elite corps of stock analysts and Wall Street wizards. Far from it—Dow Jones News/Retrieval also provides entertaining movie reviews, current weather and sports reports, convenient electronic shopping and inexpensive electronic mail. . . Dow Jones News/Retrieval is informative, entertaining and well worth the money."

-Brad Baldwin, InfoWorld Magazine



DOW JONES NEWS/RETRIEVAL © 1885 Day lores and Company Inc.

© 1985 Dow Jones and Company, Inc. All Rights Reserved. Dow Jones News/Retrieval[®] is a registered trademark of Dow Jones and Company, Inc.



AN EPIC ACHIEVEMENT— WITH A CAST OF THREE.

For an award-winning performance every time you print, bank on these three *letter-quality* printers from JUKI®. Stellar achievements in all the most-needed word-processing functions . . . and well within budget. Our three daisywheel stars are rapidly winning new fans all over the globe:

JUKI 6100

18 cps—and under \$600! Prints graphics, 2K buffer memory (expandable to 8K), the smalloffice printer with big-office productivity!

New! One-Year Warranty!

JUKI 6300

The big one. Handles spreadsheets and other documents up to 13 inches wide. 40 cps-for under \$995! Quiet, lightweight, and tough! 3K buffer memory (expandable to 15K).

JUKI 6000

Ideal for home use. Prints 10 cps—costs under \$300! 13 lbs. quiet—built to JUKI's acclaimed specifications, for reliable service.

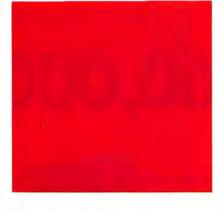
The workers. JUKI OFFICE MACHINE CORP.

EAST COAST:

299 Market St., Saddle Brook, NJ 07662 (800) 932-0590

WEST COAST:

23844 Hawthorne Blvd., Suite 101, Torrance, CA 90505 (800) 325-6134 • (800) 435-6315 (California)



Letters

Reactions and responses from the PC World community

Heartless, Heartless

I'm in the paradoxical position of taking issue with John Dvorak ["IBM Needs Heart," PCW, June 1985] even though I agree with what he says. He contends that IBM has been less than forthcoming in acknowledging its mistakes and imperfections, especially with the PCjr and the AT, and that a more open attitude would be better for both the company and the consumer. I agree, but why confine these comments to IBM? The "I-am-perfect" syndrome is universal.

When Apple admits that the Lisa was not an unqualified success, when Union Carbide admits that its safety measures in India were less than perfect, and when Reagan admits that perhaps he shouldn't have gone to Bitburg, then I'll revise my opinion.

Robert Gelman Silver Spring, Maryland

No Laughing Matter

John Dvorak's comments on IBM in the June issue would have angered me had I not purchased a PC AT from an IBM Product Center. The unit's 20MB hard disk had 10K of bad sectors. I complained to an IBM representative who promised that despite the bad sectors, I'd "never have any problems with the disk."

After a format failure, IBM replaced the disk, and again 10K of bad sectors appeared. Several replacement hard disks, lost files, a system crash, and an abundance of bad sectors later, I once again filed a complaint with IBM. In return, I received a registered letter stating that I was jeopardizing future transactions with the company. The letter also contained this gem:

"There exists no apparent reason to suspect that bytes in bad sectors will cause you any problems."

Mr. Dvorak is wrong when he implies that IBM lacks a sense of humor. The company has one—albeit a sick one.

Carlos Corredor Sausalito, California

Sonic Debate

Keith Yates, the so-called certified audio consultant who wrote "Hi-Fi Floppy," [PCW, April 1985] seems to have been brainwashed by the people at CompuSonics.

Yates referred to the compact disc (CD) as a device that "makes a Steinway sound like a synthesizer." Have you ever listened to a CD play music that was originally recorded with a digital recorder? I've witnessed tests in which several "audiophiles" compared the original digital recording played on a Soundstream Digital Recorder to an analog tape (from which records are made) and a CD counterpart. Not one person could distinguish the difference between the CD and the digital recorder, but all agreed that due to tape hiss, distortion, and a lower dynamic range, the analog didn't measure up to the other two.

Operating at its lowest data transfer rate (160,000 bits per second), the DSP-1000 fills a 6.6MB floppy in 5½ minutes. Who wants to listen to music on a machine that requires changing floppies that often? A CD holds nearly 1 gigabyte of data, which is why optical memory is ideal for the vast amount of data storage that digital audio requires.

(continues)

Discover what 60,000

Discover the finest peripherals available in terms of features, reliability and price/performance. Corporations like IBM, General Motors and Exxon buy peripheral equipment from Qubie', and have for years. Check some of your old back issues of PC -- we've been satisfying PC owners since 1982.

Discover low prices, with service and support unparalleled in the microcomputer industry. Our 30 day No Risk Guarantee and 48 Hour Turnaround on warranty repairs is proof our products are first rate. We stand behind what we sell. We also offer our exclusive Preferred Customer

Plan with 24 hour repairs and 24 months of coverage.



Discover money-saving prices that are the total prices. No small print telling you to add up for credit card charges or shipping and handling. Our prices include surface UPS charges and insurance. In a hurry? 2-day air UPS service is available.

Then discover it takes more than a low price to keep customers satisfied. We answer your questions and concerns before and after you buy.

The Staff of Qubie'

HIGH RESOLUTION MONOCHROME MONITORS

HR 39 \$139 HR 134 \$149

Plugs Into IBM Monochrome Or Compatible Card • 720 x 350 Resolution • 12" Diagonal Screen • Super Crisp Text Capability • High Resolution TTL • HR 39 (Green) and HR 134 (Amber) • Includes Tilt/Swivel Base





INTERNAL MODEM PC212A/1200 \$179

Auto-Dial, Auto-Answer • Runs Hayes Compatible
Software Like
Crosstalk, Smartcom
II, and Sidekick •
Two Phone Jacks
Allow You To Hook
Up Desk Phone •
300/1200 Baud
Operation (Bell
103/212A) • RS232C Serial Port •
Includes Modular
Phone Cord and PCTalk III Software

PC MULTIFUNCTION CARD

BT6Plus (64K) \$147.50 BT6Plus (384K) \$197.50

Memory Sockets For Adding Up To 384K • Parallel Printer Port • Asynchronous Serial Communications Port • BTPak Software (Disk Emulation and Printer Spooling) • Battery-Powered Clock/Calendar •



PC owners now know.

Optional Game Port •
Includes Dual Mounting
Bracket

STANDBY POWER SUPPLY

SB200 \$329 XT300 \$429 AT800 \$779



Noise Filtering/Surge Suppression • Powers Your Computer For Up to 30 Minutes In The Event Of A Blackout or Brownout • SB200 (200 Watt) For Floppy-Based Systems • XT300 (300 Watt) For Hard Disk Based Systems • AT800 (800 Watt) For Multiuser Systems

EXTERNAL MODEM 212A/1200E \$199



Auto-Dial, Auto-Answer •
Runs Hayes Compatible
Software Like Crosstalk,
Smartcom II, and Sidekick •
300/1200 Baud Operation
(103/212A Compatible) •
RS-232C Serial Port Interface • Includes Modular
Phone Cord • Eight Status
Indicators • Snap Hatch For
Easy Switch Access

AT ENHANCEMENT KIT BT44 Hard Drive &

BT44 Hard Drive & AT4X4Plus (512K) \$1495



44 Megabyte Drive • Runs All The Popular AT Software • 28 msec. Access Time • Voice Coil Driven Heads with Closed Loop Servo Positioning • Full-Height Unit • No Extra Chips Needed

AT MULTIFUNCTION CARD

AT4X4Plus (128K) \$395 AT4X4Plus (512K) \$495



Memory Sockets For Adding Up To 4 Megabytes • 1 Standard and 3 Optional Serial Communications Ports • Parallel Printer Port • Game Port Option

No Risk Guarantee

If you are not completely satisfied with your purchase you return it within 30 days of purchase for a complete refund, including the cost to send it back. If you can get any dealer or competitor to give you the same No Risk Guarantee, buy both and retun the one you don't like.



HIGH RESOLUTION COLOR MONITORS

HE31 200 \$399 HE31 350 \$499 WITH COLOR CARD, ADD \$120

14" Diagonal Screen • Black Matrix Picture Tube • Plugs Into IBM Color/Graphics or Compatible Card • Dot Pitch .31mm • HR31 200 (640 x 200) and HR31 350 (640 x 350) Resolution • Includes Tilt/Swivel Base

For fastest delivery, send cashier's check, money order, or order by Mastercard/Visa. Personal checks, allow 18 days to clear. Company purchase orders accepted, call for prior authorization. California residents, add 6% sales tax.

Hours: M -F 8 am - 5 pm PTZ Sat 8 am - 12 pm PTZ



London (01) 223-4569 Paris (01) 321-5316 Sydney (02) 579-3322 Canada (403) 434-9444



Outside California

800-821-4479

Inside California

805-987-9741



4809 Calle Alto Camarillo, California 93010

Circle 907 on reader service card

As a five-year member of Soundstream's technical staff, I've seen a great deal of absolute nonsense published about digital audio. Claims have been made that digital audio will sap a person's strength or destroy an audio amplifier. It seems that even in the eighties, the industry is plagued by darkness, misunderstanding, and ignorance.

Dane Brewer Midvale, Utah

CompuSonics indicated throughout the developmental phases of the DSP-1000 that the possible record and playback times with 6.6MB floppies are insufficient to

make the product commercially viable. The firm is now using Maxell's new 25MB particle floppies. As the article indicated, the DSP-1000 technology may also be applied to any erasable storage medium-hard disk, bubble memory, or floppy disk.

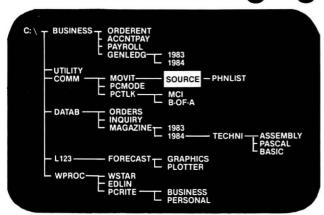
The other factor governing record and playback time is the data rate, which in the DSP-1000 is determined by both the user and the nature of the signal. It is important to understand that Compu-Sonics uses a proprietary technology that, unlike other digital systems, deliberately discards redundant and perceptibly unretrievable musical information to obtain a 160,000-bps data rate

compared to the CD's 1.4 million bps. CompuSonics is now experimenting with data rates significantly lower than 160,000 bps.

Readers interested in debating the performance of digital versus traditional analog recording technology should audition the best of both technologies-say, a Meridian MCD or Mission 7000 compact disc player and a Linn Sondek LP12 turntable-and draw their own conclusions. Based on my experience as an audio retailer, I suspect that few will dispute digital audio's tremendous potential and

(continues)

DIREC-TREE III® — the experts' choice for managing your Hard Disk.



You construct and organize your hard disk directories.

Here's what reviewers said about DIREC-TREE III:

"Before I used it, I thought my directories were well organized... To be honest, I am surprised to find myself liking and using DIREC-TREE.

-Timothy Berry, Business Software, 8/85.

"Helps enormously in waltzing through directory trees." —Peter Norton, PC Magazine, 8/20/85.

"None of the utilities I've seen to date come close to a program called Direc-Tree." -Gary Ray, PC Week, 10/23/84.

"...a standout" shell program.

-Alan Hoenig, PC World, 8/85.

Whether you're an expert or a beginner, you'll like the ways that DIREC-TREE III helps you organize and operate your hard disk. You'll be able to see and organize all of your directories on a simple tree format which you construct. The arrow keys highlight any directory and a simple keystroke lets you run, create, copy, remove and rename parts of your "tree" to suit your needs. Moving files between directories or disks is also a snap.

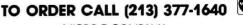
A feature of DIREC-TREE III lets you view, or even edit a text file (like a letter) by simply pointing to it and pressing a key. Reviewers also rave about DIREC-TREE III's ability to set up macro commands and run up to 100 programs from one's own menu. Run DOS functions and run programs, too. Print. And locate missing files anywhere, quickly.

Take a tip from the experts and thousands of satisfied users. Get DIREC-TREE III. It's the best hard disk manager your money can buy. "Worth the price," says PC World, 8/85. Money back if not completely satisfied.

Version 3.0 operates with IBM® PC, XTTM, or ATTM(or true compatibles) using monochrome or graphics board/display. Requires PC-DOS or MS-DOS version 2.0 or higher — 128K RAM. Operates on any IBM® compatible printer.

Only \$49.50, plus \$5.00 shipping/handling. California residents add tax.







P.O. Box 2426, Rolling Hills, CA 90274

is all you need to turn you IRMA board into a 327

It's full name is the PCOX[™]/3270 PC Upgrade (that's pronounced "peacocks").

But you'll pronounce it "terrific."

First of all, it's available today. Not next week, not next month. Now.

Second, it costs just \$395. And since it upgrades the IRMA™ board you already have, you can protect your investment. And still get the IBM™3270 PC capability you really want.

Third, you can be sure this software's reliable because we've been shipping it for more than a year in our own PCOX/3270 PC.

PCOX is a trademark of CXL Inc. IRMA is a trademark of Digital Communications Associates. Inc. IBM is a registered trademark of International Business Machines Corp. = C 1985 CXL Inc.

Finally, like all PCOX products, the PCOX/3270 PC Upgrade is backed by our proven track record in micro-to-mainframe connectivity. Which you'll be hearing more about in this series.

But back to the PCOX/3270 PC Upgrade. For immediate delivery call (800) 225-PCOX. In California, (415) 424-0700. Or write CXI, Inc., 3606 West Bayshore Road, Palo Alto, CA 94303, Telex: 821945.

And turn the IRMA board you have into the 3270 PC you want.

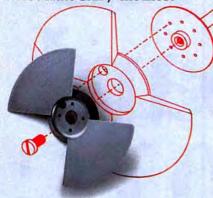
We don't have all the answers, just more of them.



See us at Booth #H7624 in the Hilton Pavillion.

Picture this on a \$2

With movie budgets in the tens of millions, and television production costs soaring with every day of filming, the professionals in the entertainment industry demand the best of tools. When Ultracam Incorporated set out to design Ultracam™ K35, a new top-of-the-line \$200,000 movie camera, they knew that their design tool needed to be as professional as the camera they were designing. That's why they chose AutoCAD™ the most



widely used computer-aided design and drafting tool in the world today.

Mainframe CAD Capability at 5% of the Price

If you have an IBM PC, PC/XT, PC/AT, NEC, DEC, TI, Tandy, Wang, or one of over 30 desktop computers AutoCAD supports, you already own the most expensive part of a CAD system. Add AutoCAD for only \$2500 more, and you can have the power of CAD on your desktop at a price you can afford. With a pointing device and a plotter (the choice is yours, we support over 50 popular peripherals), you can assemble a complete CAD workstation

for less than \$10,000.

Once you've installed AutoCAD on your computer, you'll have a tool at your fingertips which removes the drudgery from designing. You can draw, modify, copy, and scale objects, or define commonly used parts and insert them anywhere in your drawing. You can fill an area with any of our 38 predefined patterns, or make up your own. Use an unlimited number of layers, like overlays in drafting, and automatically dimension distances, angles, radii and diameters with full ANSI standard dimensioning. You can even do threedimensional visualization with AutoCAD.

Quick to Learn, Easy to Use

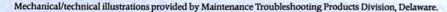
The beauty of Auto-CAD is that you need no prior knowledge of computers. Even if you've never seen a CAD system, you'll pick it up in a matter of days,

and feel comfortable within a week.

Sound to good to be true?
Simple pop-up menus
point you in the right
direction. You can also
easily create your own menus.
On-line HELP keeps you on track.

Sailboats, Landscapes, and Contact Lenses

Tens of thousands of Auto-CAD users are creating PC



,500 CAD program.

board layouts, elevator designs, electronic schematics, technical illustrations, architectural designs, civil, structural, mechanical engineering drawings, trade show floor plans, and race car suspension designs. Since AutoCAD is general-purpose and user-customizable, it doesn't matter what type of drafting your work requires.



Technical illustration is a snap.

Camera designs provided courtesy of Ultracam Incorporated.

The Heart of Your CAE System

Drawings are only part of the story. Pre-defined standard symbols, translators to allow AutoCAD to exchange drawings with mainframe CAD systems, data base analysis programs for bill of material lists, job costing and drawing distribution by telephone are only some of the capabilities available with AutoCAD. These capabili-

ties make AutoCAD the central component in your desktop computer-aided engineering (CAE) system.

Whether you're in a twoperson shop or a two-billion dollar company, you'll find that AutoCAD pays for itself in just a few months.

In the future, AutoCAD will run on newer, more powerful computers as they become available—so that you can be sure your investment in creating drawings and training staff won't be wasted.

Powerful New Capabilities

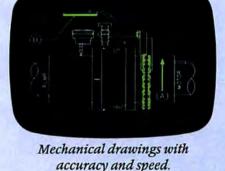
Call or write us today for the name of the dealer nearest you and a demonstration of the latest in AutoCAD capabilities, including polylines, curves, and 3D visualization with hidden line removal. Also ask about other cost-effective Autodesk products: AE/CADD™ and CAD/camera.™

AutoCAD will save you time and money.



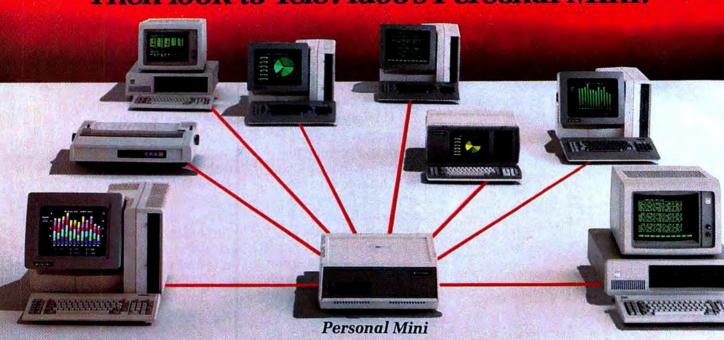
AUTODESK, INC. 2320 MARINSHIP WAY SAUSALITO, CA 94965 (415) 331-0356 or (800) 443-0100 EXT. 406 TELEX 275946 ACAD UD

Ultracam K35 is a trademark of Ultracam Incorporated. AutoCAD, CAD/camera and AE/CADD are trademarks of AutoCesk Inc.



Looking for the Most Efficient, Established, and Low-Cost PC Network System?

Then look to TeleVideo's Personal Mini.



If you're looking for a proven and low-cost network for your PCs, then TeleVideo's network system may be your answer.

Over 3000 TeleVideo® PC network systems were installed the first year. You're assured of a reliable and stable system the first time out. And you can connect your existing TeleVideo, IBM,® AT&T® or other PC, XT, or AT computers. Add more PCs only as you need them.

The TeleVideo Network is focused around the highperformance dual-processor Personal Mini[™] network servers. You can pick the right configuration to match your needs from two to sixteen users, 20 MB up to 142 MB hard-disk storage, fast tape backup (20 MB in 4.5 minutes) and a DOS read/write-compatible floppy.

What's more, you retain your original PC-DOS application investments because software runs on the TeleVideo network. In addition, hundreds of industry-proven multi-user applications are converted from the minicomputer business environment. Concurrent

user access and data security are built into the InfoShare network operating system.

Our PC network interface costs are the lowest in the industry—less than \$200 per PC. So your original investment in hardware, software and training is never lost. From a one-user PC, to a two-user or a 16-user TeleVideo network system, your growth opportunity never ceases.

TeleVideo
Systems

IBM and AT&T are registered trademarks.

Regional Sales Offices: Northwest (408) 971-0255, Southcentral (214) 258-6776, Southeast (404) 447-1231, Southwest (714) 476-0244, Midwest (312) 397-5400, East (516) 496-4777, Northeast (617) 890-3282.

its lower background noise, freedom from pitch wavering (wow and flutter), and user convenience.

The best analog systems still offer a slightly more natural, pleasing sound, but that will change as digital audio technology, now in its infancy, matures. –Keith Yates

Word Wars

While I thoroughly enjoy my subscription to your magazine, I must take issue with the "review" of *Samna Word III* by Merrily Shinyeda ["From the Software Shelf," *PCW*, April 1985].

If Ms. Shinyeda had had any experience at all with the program, I

doubt that her review would have been so glowing. Anyone who has had to watch *Samna* endlessly scroll through a document while reformatting must wonder if a multitude of features is worth the wasted time. Every other review I've read of this program criticizes its sluggishness and its inefficient text editor, yet Ms. Shinyeda makes no mention of these shortcomings.

My experience has shown that Microsoft Word runs circles around Samna Word III. I have since traded the features offered by the Samna product for the speed, accuracy, and friendliness of *Word*.

Bruce W. Derr Syracuse, New York

To each his or her own. My choice happens to be Samna Word III—a product I've been using since its introduction. It not only is feature rich but provides a consistent user interface and the flexibility required to handle a wide variety of applications.

The review is not meant to compare Samna Word III with Microsoft Word or any other PC word

(continues)





THOMSON

To those of you who stare and stare—and stare at computers, blessed relief has arrived. Thomson™ monitors. We promise clearer, crisper resolution, remarkable colors and print-like text. Thomson builds a full line of monitors, from basic monochrome to high-resolution color models. All are designed to fulfill your needs today, and sophisticated enough to fulfill your needs in the future.

Thomson monitors are designed and built by Thomson, a \$6 billion international corporation. They're going to change the way America looks at computers.

Ask your local computer dealer for a Thomson monitor, or call 1-213-821-2995, ext. 30, for the Thomson dealer nearest you. Then take a stare at a Thomson monitor. It's a sight for sore eyes.™

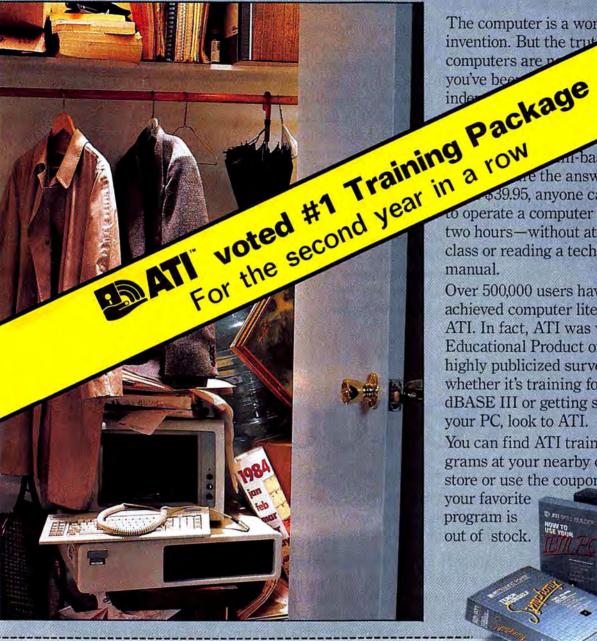
Telex 3720233 Thomson is a trademark of Thomson S.A.



Model CM 31311SL 12" diagonal, 31mm dot pitch RGBI color monitor with text switch and non-glare tinted screen

THOMSON Consumer Products Corporation

A\$39 training program can get your \$3900 computer out of the closet



The computer is a wonderf invention. But the truth computers are

or no use. ni-based training e the answer. For as lit-39.95, anyone can learn how to operate a computer in less than two hours-without attending a class or reading a technical

Over 500,000 users have happily achieved computer literacy with ATI. In fact, ATI was voted the Educational Product of 1984 in a highly publicized survey. So, whether it's training for 1-2-3 dBASE III or getting started with your PC, look to ATI.

You can find ATI training programs at your nearby computer

store or use the coupon below if vour favorite program is out of stock.

	lease rus	h me ti	he follo	wing traini	ng	programs:
9				The second second	1000	

- dBASE III EasyWriter II
- Framework Lotus 1-2-3 MacCoach ☐ Microsoft Word ☐ MultiMate
- \$39.95 SKILL BUILDER™ PROGRAMS

 ☐ How to Use your IBM PC
 ☐ How to Use your IBM PC| ☐ BASIC
 ☐ How to Use your COMPAQ ☐ CP/M
 ☐ How to Use your TI
 ☐ Intro to Business SW
 ☐ MS-DOS
 - Intro to Word Processing Intro to Databases
- \$75.00 ATI TRAINING POWER* PROGRAMS

 BPI General Accounting | Multiplan |

 dBASE II | Multiplan (Mac version) Multiplan
 Multiplan (Mac version)
 Peachtree Accounting
 Series Specify: AR,
 AP, GL, IC, LM, SI
 Super Calc³
 Super Machaeute

 - Symphony TK!Solver ☐ TK!Solver☐ WordStar

 - Applesoft BASIC

 BASIC

 CP/M

 The Home Accountant

 MS-DOS

 PC-DOS

 Visicata ☐ volkswriter deluxe

Please enclose the appropriate amount plus \$2.50 shipping (CA add 6.5%)

Phone (Street

Los Angeles, CA 90066

My computer is a:

My computer uses: ☐ PC DOS ☐ MS DOS ☐ CP/M ☐ Macintosh ☐ APPLE IIe 80 col.

Mail order form to: 12638 Beatrice Street

For rush order call: (213) 823-1129 (800) 421-4827



ATI Money Back Guarantee: If you're not completely satisfied with how fast you learn with ATI Interactive Training Power Programs, simply return within 3 days for full purchase refund.

The following names are trademarks of the following companies: ATI Training Power and Skill Builder, of American Training International; CP/M, of Digital Research; PC-DOS, of IBM; WordStar, of Microporc, MS-DOS, Multiplan, Microsoft Word and BASIC, of Microsoft, BBASE Ill and Framework, of Ashton-Tate, SuperCalor, of Sordier; Visicalc, of Visicorp; Lotus 1-2-3 and Symphony, of Lotus Development; COMPAQ, of COMPAQ; IBM PC and IBM PC; of IBM; TI Professional, of Texas Instruments; MultiMate, of MultiMate International; TKISolver, of Software Arts; volkswriter, of Lifetree, Inc.; The Home Accountant of Arrays, Inc.

© 1985 American Training International



Training is our middle name.

processing software package. However, in time tests that included reformatting, Samna Word III outperformed two of the industry's most respected dedicated word processors—Wang and NBI. —Merrily Shinyeda

Ir Forever!

I remember when I scoured the marketplace for the personal computer deal of the century. After diligently researching all the ads, knowing that I didn't want to make a purchase only to discover a better buy days later, I chose the IBM PCjr. And I was content.

It's now six months later and even though IBM has ceased PCjr production, I have yet to experience the hopeless feelings and anxiety that plague owners of other outdated personal computers.

My thanks to the creators and writers of *PCjr World*. You've saved me many sleepless nights and countless dollars for psychotherapy.

Robert Andersen Utica, Michigan Letters should be mailed to Letters, PC World, 555 De Haro St., San Francisco, CA 94107, or sent electronically to MCI Mail PCWORLD, CompuServe 74055,412, The Source STE908, or Direct-Net 500. We reserve the right to edit letters. Letters should not exceed 300 words. ●

PC TOOLS

AT LAST! Powerful disk utilities from the people who brought you Copy II PC.

Put all the popular features of the NORTON UTILITIES* together with a powerful DOS interface. Then make them **resident** like SIDEKICK** and what do you have? PC TOOLS—the only product that lets you execute virtually any DOS command from within any other running program! Here's how you might use it:

- UNDELETE an accidentally erased file while using your word processor!
- **FORMAT** a data disk without leaving your spreadsheet!
- COPY files from one subdirectory to another within your communications program!
- LOOK at another file (and even edit it) from your graphics package!
- **SEARCH** for any file name or text within a file without leaving your data base manager!
- **PRINT** a file (as text or hex and ASCII) at any time!

PC TOOLS works on most IBM compatibles, requires 192K, 256K to use the memory resident feature.

PC TOOLS is unprotected, of course, to work great from your hard disk!

CENTRAL POINT Software, Inc. 9700 SW Capitol Hwy., *100 Portland, OR 97219 503/244-5782 M-F, 8-5:30, W. Coast Time CHECK, COD WELCOME (Prepayment Required) \$39.95

*Norton Utilities is a registered trademark of Peter Norton **Sidekick is a registered trademark of Borland International

Circle 339 on reader service card

Make Any Computer Do Exactly What You Want With McGraw-Hill's

Budget Plan

Declining Interest

Contemporary Programming & Software Design Series Any one language or machine. Why? Be

Household Inventory

From Writing Your Own Programs to Modifying Existing Software, Here's the New, Easy, and Low Cost Way to Unlock the Secrets of Your Computer

Whether you use computers for business, for personal applications, or for fun, off-the-shelf programs will never do everything you want them to do for you. That's because they were written by programmers to satisfy what they perceived as the needs of the greatest number of potential users—often missing some or many of your specific needs.

That's why McGraw-Hill's new Contemporary Programming and Software Design Series

teaches you how to create your own software . . . either from scratch or by making key modifications to existing programs.

There is nothing magical about it. You learn the process of building a computer program step-by-step with McGraw-Hill Concept Modules sent to you one at a time, once a month. Each of the ten modules in the Series takes you through an important step in the development of the structure and

detailed logic of a program, including testing, debugging, and documentation.

Unique Interactive Hands-On Instruction

Each module includes an easy-to-understand guide PLUS a 51/4" floppy disk containing typical programs and interactive instruction that you can run on any IBM or IBM-compatible computer for hands-on experience.



In the first Module, for example, when your sample program (Declining Interest Loans) appears on your screen, you'll find errors on certain program lines. You'll also see that the program is only three-quarters completed.

Now comes the fun part. You'll discover how this program is built, and in the process you'll learn how to identify and correct errors. And by the end of Module 1, you'll actually have

completed this program yourself.

But there's more. Special graphics on your screen work in conjunction with the accompanying guide to amplify, illustrate, and deepen your understanding of software design principles.

Learn the Foundation of All Computer Languages

Although the Series teaches you programming procedures, it is not aimed at

any one language or machine. Why? Because 95% of the programming process is carried out using design techniques that are independent of a specific language or machine. Nevertheless, we include enough training in BASIC and machine language to get you started. You'll find that the whole process of learning new languages will be greatly accelerated once you complete the Series.

Create a Complete, Customized Family Financial Package As You Learn

The sample programs you work with throughout the Series are excellent learning tools. But they're more than that. By combining the sample programs onto one master disk, you'll create your own family financial package that will help you balance your budget, figure loan amortization, and much more. And — of course — you'll be able to further modify your financial package to fit your own specific needs!

15-Day No-Risk Trial

To order your first module without risk, send the postage-paid card today. Examine the first module for 15 days and see how the Series will

> help you make any computer do exactly what you want it to do!





If someone has beaten you to the card, write to us for ordering information about the Contemporary Programming and Software Design Series.

McGraw-Hill Continuing Education Center

3939 Wisconsin Avenue Washington, DC 20016

IBM is a registered trademark of International Business Machines, Inc.





High performance driving machines

finely tuned for 100% compatibility with IBM's PC.

The sleek, aerodynamic lines of StorageMaster drives promise high performance. The underlying state-of-the-art electronics deliver it.

• StorageMaster 500 Series Fixed Disk Drives, as fast as they look, are ideal for frequent accessing of large data bases and local area networking applications. An average seek time of only 40 milliseconds, makes them twice as fast as most other drives. Plus, you boot directly from the drive.

Available in both 18 and 30 megabyte models, the 500 Series offers data storage up to 3 times that of IBM's PC/XT.

StorageMaster 700 Series
 Streaming Tape Drives provide

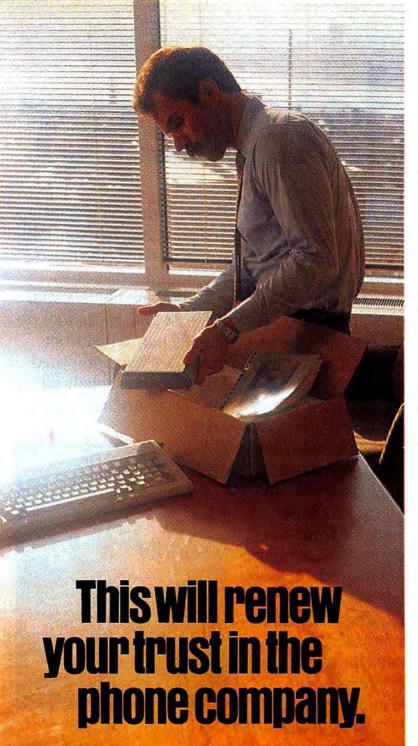


back-up storage of selected files or image copying of entire disks. They store data safely on readily available 45 megabyte cartridges.

StorageMaster drives are built under stringent quality control, maintenance-free, and backed by Control Data's 25 years of on-line experience. StorageMaster is true high performance you can count on for years to come.

For more information and the name of your nearest dealer, call toll-free: 1-800/232-6789.





Anybody who's ever sent data over phone lines knows the problems it can present.

Information gets mumblejumbled. \$4,000 invoices become \$40,000 invoices. And soon your company's lost a pretty penny over some modem foul-up.

Well, now you can say good-by to all that.

Because Codex just came out with a modem that overcomes the inadequacies of phone line performance.

(Codex, as your friends in data processing will tell you, is the industry's acknowledged leader in state-of-the-art products, in service, in just about everything that has to do with networking.)

The Codex error-correcting pc modem is a serious business modem.

It gives you data transmissions more than 10,000 times more reliable than most other modems. Over anybody's phone lines.

A sophisticated errorcorrection system called MNP™ detects breakdowns in phone line performance and retransmits data. And the beauty is all this happens without you ever knowing it.

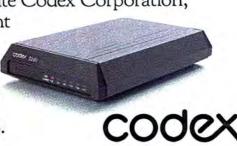
Just think. Data you can trust.

Now don't you feel better about those crazy phone lines?

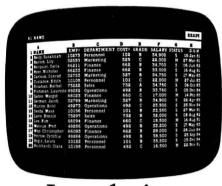
If you're a data communications manager responsible for purchasing modems, call 800-426-1212. Extension 225.

Or write Codex Corporation,

Department 707-225, 20 Cabot Boulevard, Mansfield, MA 02048.



Yourdata never



Introducing 1-2-3 Report Writer. ™

Now you can get customized reports and forms right from your 1-2-3*database files.

With 1-2-3 Report Writer,* a separate, stand-alone product, you can create and print professional looking documents in minutes. You can use 1-2-3 Report Writer for

personnel reports, sales analyses, claim forms, invoices, purchase orders, and even mailing labels.

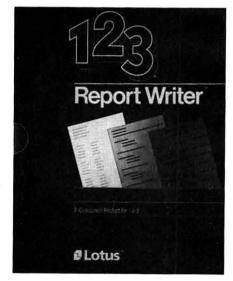
You select the data you want to see and see it the way you want it. Emphasize a point with an underline, italics or a bold heading. Change field names, widths and formats simply by using a cursor key. Or insert multiline headers and footers, delete unwanted fields, and sort on up to four levels.

1-2-3 Report Writer can even do your most common calculations: averages, totals, sub-totals, counts and minimums/maximums. And customized formats can be easily saved for generating periodic reports with updated information.

If you're familiar with 1-2-3, you'll immediately feel comfortable with 1-2-3

Report Writer. Similar menus and prompts guide you until you have exactly the report you want. It's that easy.

If you'd like to make your database look better, look at 1-2-3 Report Writer from Lotus. See your authorized Lotus dealer or simply fill out and return the coupon below.



looked so good.

				SUILDER'S SU PO So West Hertfo	216 rd, CY 21321				Ann. Beduer 11 Allen Street Harbleheed MA DELIN	British Sparie 6 Serioufished Perken Houter by (0:14)
	REGIONAL SALES : Sales Under Q Second Quarte	REPORT Nota Ar	et Main Stree rough, MA 01		95/30/1 95/30/1 A/2004T 164404A 21676			ion et	Catherine Miles Finaltherine Miles Aclington Ma USES	Cynthia Gregory of Florence head fedurosci Ha USDR
EASE & TITLE	EEGICH SW	QUOTA AS BOUOTA			-			PROF PER	David Helf St 17 States Assessed Booton SA 02524	Funnipolica Million (SGI ME Verticon Selection Select MS (11ML)
Caren Nelson Corporate Rep Eaith Smith	A \$1,640	\$13,000 518 \$4,000 418						list FL	MAIN. FL. teenndallyn Jistell LSJ Teck beserv accross PA (1970)	Harris Hard Less State San Less Harris HA BERN DE BANK BERN HARREST SAN BERN DE BANK BERN DE BAN
Sharon Tucker Corporate Rep	A \$1,290	\$9,530 141 515,000 978	03/13/00		52 940 0 .76		8408.70	Ale, test	2006 FL toffrey Spector of State Stad Last Burdan MA (1946	James Lackin James Lackin Sandy Marilland Lack Sandy Marilland
John Decamp Retail Rep Diane Johnson Ratail Rep	A \$7,450	57,500 594	03/30/85 04/10/85	Heat 30 0	12 1211.60	E005.00	9402.70 9614.30		Date During No Olyan Date Of Date Of	1
Ann Luce Petsil Rep Brian Adler Corporate Rep	A \$1,010 B \$1,300	\$5,550 16% \$6,000 22%	04/27/65 05/15/65	Net 30 0		8402.70	#211.60 #673.70		900m. F)	ed Fore Office Steam Ma. 11 /200 Miles Per In Hilasula
Eathy Jones Corporate Rep Rhonda Faters Corporate Rep	8 \$1,100 B \$7,500	\$3,000 36% \$8,000 94%	c/a/e	Net 30 Committee		1	****.70	5/20/63 U	ST April 100 Appropries	Moris Milabaka at headody stranet framich BA other frameth BA other
John Wiles Corporate Rep Maury Breen Retail Rep				de Communicata, Im 310 Comm Avv. Sail Senton, No. 02215					M 0210-	on Delicent (Immunication Communication Com
pute to:	Aree Mar.	SM ARY SEVERN		Staven Scraffield o/o Pleat Service 1 Control Court Derry, 38 13035	Dog -		sate to:		3/95** 3AN 97	Aud Orland AUD Springarth Street Services MA (1986) (Selection (1986)
Rosen Hatfield	, insert	teer.	Cost Center Salary 860 840,000 660 832,550 860 817,000	at tube in the	effication of year	outer for tarke	re & supplies.		Prop. 61	ANG MORE TO
		Lee, Kim Berquist, Carla Bryer, Nicholas Roserio, David Rivers, Sandra Gabor, Hargot	660 \$32,550 660 \$17,000 662 \$18,500 662 \$29,000 662 \$33,000 662 \$33,000 662 \$34,700	Ferthere Component ECE Personal Compo		don	1 2633.		- 235 201-4	Page tighte 130 Stoom Street (market market)
		Wilson, Diane Carlson, Dowrad Gelsen, Jacob Barton, Lily Sanders, Gaorge St. Jeses, John	325 522,000 325 633,000 328 637,500 328 616,500 327 634,750 327 534,750	ECE Personal Computed Structure Die Die Structure Die Structure Die Die Die Die Die Die Die Die Die Di			1 8531. 1 955. 1 935. 1 335. 1 55. 1 500. 1 200.	60 63 60 40		Millian Money 5 Mak Terroric Moverly HA (CCLES
9	Operatio		\$13,100 132 \$23,200	local Sout				9 4826	100	
		Malcuk, Fred Mashington, Law Morson, Dylan Van Dylan, Allen Fishmon, Lukirette Petrus, Oynthia Murler, Ariel	492 \$33,200 492 822,780 492 817,7800 492 854,000 492 833,760 492 838,800 492 838,500		Please	send me	an autom	ated der	nonstration disk o	of the new
	w. 	Lane, Sonnie	852,173 732 159,000			Report Wi ave enclose			. (U.S. currency only	•)
		Lane, Bonnie Smedler, Januifer Estaben, Aschel Hulfe, Mitchell	732 E32,000 732 E37,500 732 E34,750 732 E34,750 732 E34,750			l my credit	card for \$5		S. currency only) Exp. Date	
0.00										
					SIGNATIO	IDE				
Selection of the select		1600			SIGNATU		(olesse print)			
		123	Report V	Vriter	NAME		(please print)			
Similary III (Chinase)	F -	123.	ReportV		NAME COMPAN		(please print)		DAYTHE	PHONE
	-	123.	Report V Lotus		NAME COMPAN		(please print)		DAYTIME	PHONE
	-	123.			NAME COMPAN		(please print)		DAYTIME STATE or PROVINCE	PHONE ZIP or POSTAL CODE

PC W\\ RLD

New Chips: In for the Kill?

Will a new generation of semiconductors sound a death knell for PC compatibility?

IBM may be ready to flex its muscles and try delivering a killer punch to manufacturers of compatible personal computers, according to one market watcher. A recent report by International Resource Development (IRD) of Norwalk, Connecticut, predicts IBM will develop its own custom, proprietary microprocessor chips—a move that IRD predicts will, because of its impact on industry standards, reverberate through the PC marketplace like a sonic boom.

PC World View reports new developments in computer technology, items of interest to computer enthusiasts, and the most significant and enticing insights about industry trends and personalities. We've reserved the "Grapevine" section of this column for industry reports that are still at the speculative stage.

-Ken Greenberg

Since IBM already owns manufacturing rights to a number of Intel chips, Big Blue could easily layer proprietary masks on top of a standard 8086 or even an 80286. IRD predicts that IBM, perhaps as early as next year, will introduce a KIL/AR (Kustom Integrated Logic/ARray) chip that includes a microprocessor, BIOS, instruction sets to simplify programming, and an operating system. The result would be proprietary machines much faster and more efficient than current offerings-thereby creating a new standard that would be difficult if not impossible to clone.

"It's not inconceivable that IBM will try to regain some control from the customer—control it had before the personal computer phenomenon—by taking a standard chip and twisting it a little," says Steven Weissman, an IRD analyst. Most other industry officials remain skeptical, however.

"I don't buy it," says Daniel Klesken, semiconductor analyst at Montgomery Securities in San Francisco. "Standard microprocessor chips will be key to personal computers because of the breadth of software written for them." For IBM to move away from the standard it created with the PC would mean abandoning customers' \$7 billion investment in PC software, Klesken reasons.

"I think IBM would be cutting its throat if it did that," agrees Brian Halla, director of marketing for the microcomputer group at Intel Corporation. "Standards create the momentum in this business." Although IBM owns nearly a third of Intel, Halla insists the relationship is structured to make it impossible for his company to know in advance about any proprietary IBM chips based on Intelstandard CPUs.

Perhaps, says IRD's Weissman, IBM is simply looking for a new upwardly compatible machine with which to lock in its customers. The new box would be capable of running all current PC software but could also handle programs written expressly for the proprietary chip's operating system. In some ways such a machine would resemble the new Commodore 128, which boasts three

Views and notes for the computing community



CPUs. That machine can run offthe-shelf software written for the earlier Commodore 64 and CP/M machines, but its new operating system enables the computer to perform far faster with specially written software.

A closer analogy may be IBM's new System/36 PC office computer. Though its System/36 System Support Program (SSP) operating system cannot run software written for the PC, the computer serves as the base station for up to three PCs, XTs, or ATs that can run their own software or serve as terminals for the System/36. The System/36 PC uses an open architecture hook-the standard PCbut offers enticements for the user to move up to the proprietary architecture of the System/36.

"The System/36 PC capability does not mean you take the PC itself and get rid of that architecture," argues Skip Bushee, executive vice president of InfoCorp, a market research firm based in San Jose, California. "I think that is extremely unlikely." -John Eckhouse

87

... Or Just for the Thrill?

In the words of a recent TV commercial hawking yet another panacea for yellow waxy buildup, it's "more better." More better than what? you say, reaching for an aspirin and Fowler's Modern English Usage.

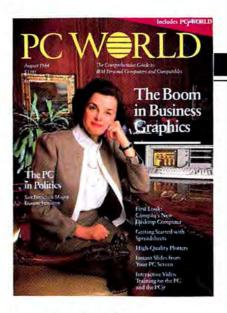
Better than the PC's 8088, the Deskpro's 8086, and the AT's 80286, according to master chip maker Intel. The "it" that threatens to relegate these faithful data crunchers to the Home for Feeble CPUs is the 80386, a microprocessing tour de force that Intel claims can directly access 4 billion bytes of memory, manipulate 64 trillion bytes of virtual memory (usually disk storage), provide true multitasking and multiuser performance, and process data three times faster than the 80286.

Of course, the road to more powerful processing and multitasking has had its potholes. Students of recent history may recall that the 80286-based AT is not nearly the multiuser powerhouse that industry insiders predicted. Digital Research's publicized difficulties in unleashing the 80286's protected memory mode (vital for any useful multitasking operating system) have also raised questions about Intel's designs. What Intel promises and what the 80386 can deliver may be two different animals.

If the 80386 is everything Intel says it is, the computing world is indeed about to be knocked on its ear. The CMOS 32-bit chip contains nearly 300,000 transistors—

double the number found in the 80286-and packs the equivalent power of a late 1970s mainframe. Its raw processing power alone is sufficient to keep pace with coming developments in high-speed memory, optical storage, and Ethernet networks. If you can't bear to part with WordStar or 1-2-3, rest assured that your investment is safe. Because the 80386's design is essentially an extension of the 80286's architecture, the chip should run these and most other PC packages unaltered, Intel affirms.

Intel expects to release the new chip this fall. Although the specifics of an 80386-based PC are unknown at this point, such a machine should have the ability to orchestrate many tasks simultaneously, serve up to ten users, and at last transform PC-oriented expert systems into true desktop consultants. There's no telling what new and exciting shakeouts the 80386 may portend. When will this SuperPC hit the shelves? Only Intel and IBM know for sure. —Robert Lubn



Say It Ain't So, Madame Mayor

Ah, politics. You're in one year, out the next.

In San Francisco, for example, computers seem to be distinctly déclassé this fall. As evidence, Mayor Dianne Feinstein recently garnered several column inches in Business Week as part of that journal's cover story on the computer industry's latest round of convulsions. "Why Feisty Feinstein Put Her Foot Down," read the headline. The item revealed that the mayor has "always been suspicious of the golden glow of high technology" and chronicled her recent clampdown on computer-related expenditures in the city's budget. "I wouldn't have one on my desk," proclaimed the mayor.

Faithful PC World readers may recall that Mayor Feinstein and her desk—which sported an IBM Portable PC—graced our August 1984 cover. Just for the record, as they say, we rummaged through



LANs Ho!

Computers have drawn a tightknit world even closer. Now, some of the luckier folk among us get to enjoy both a computer and the world.

A roomful of PCs is part of the "entertainment" package on the world's only five-star cruise ship, the *Queen Elizabeth II*, owned by Britain's Cunard Line. The *QE II*'s Computer Learning Centre was installed in time for her 1984 world cruise.

As much as this association with the upper crust has spruced up the PC's slightly gray image, Cunard is strictly a paying customer. "It was a seller's market in those days," recalls John Whitney, Cunard's New York marketing manager and the man who pushed the idea to fruition. "We went to a number of vendors, and some of our staff actually suggested Commodore 64s. I said, 'You just can't do that. Sure it's entertainment, but let's get the right equipment. This is a first-class ship."

Cunard bought six PCs initially and doubled that a year later, adding some XTs as well. Each station now includes an Epson printer or equivalent, and a score of programs lines one wall.

Among those packages now at sea are 1-2-3, VisiCalc, Multiplan, WordStar, Electric Pencil, dBASE II, and dBASE III. If the prospect of playing with a DBMS doesn't jibe with notions of what one is supposed to do on vacation, there are at least letters to write and travel diaries to keep.

The units are firmly secured to prevent sliding in bad weather (and to discourage sticky-fingered passengers). Closed from 2 to 6 a.m., the Centre is otherwise at the complete and free disposal of QE II guests. "I've seen people in tuxedos at 1 a.m. working there," Whitney says. "I don't think anybody expected it to be such a success. One round-the-world passenger wrote a complete novel during her three-month trip."

Whitney admits that the majority of passengers shove off as computer neophytes and eagerly sign up for the 1-hour introductory seminar that is offered twice daily. "The Centre provides a rare opportunity to get introduced to computers," he says. "People are not so embarrassed to try them at sea. They figure everybody else is a novice, too, and if they're lucky they'll never see any of these people again." —Sally Adamson Taylor

that issue, noting that a campaign aide using dBASE II on the PC shared a bit of the credit for Feinstein's reelection. In an item entitled "You Can Automate City Hall," the mayor herself offered these words: "I think that a sophisticated approach to microcomputing is important to San Francisco. The computer industry is and will continue to be a major job base for our people.... We in San Francisco are increasing computer-related training in our elementary and secondary schools, vocational centers, and community colleges."

So mea culpa: You can't automate city hall. Not this year, anyway.

Grapevine

Ruminating Over Nonsupport

Getting a line on IBM's next move is akin to fathoming cubist paintings, tea leaves, or the works of Martin Heidegger. Nonetheless, the company's recent quiet cessa-

tion of support for the UCSD p-System, a gaggle of games, and a raft of programs from Software Publishing and Peachtree Systems may portend big doings in Boca Raton.

Our first thought is that IBM is backing away from software that gives *TopView* seizures—an indication the company may intend to enshrine *TopView*, the lumbering

window manager, as its Brave New Operating System. Our second thought is that the newly orphaned programs—some of which make direct calls to the hardware—may not mesh with IBM's current and future scenarios for the 80286 architecture embodied by the AT.

Withdrawing support means Big Blue stops product sales, discontinues customer assistance, and ceases guarantees of software compatibility. For vendors bumped off the list, it's back to burning the midnight oil in cozy cubicles until the code is cleaned up.

Big Blue's News

Desktop Derby

By mating its System/36 with the PC line, IBM has bred another foal for its stable of office automation products. Christened the System/36 PC, the hybrid unit consists of a PC attached by cable to the S/36 5364 desktop processor. This umbilical arrangement allows a PC, an XT, or an AT to serve alternately as a system console, a System/36 workstation, or a standalone PC. Three additional stations, either PCs, printers, or System/36 displays, can be added to the system.

Even though IBM refers to the 5364 processor as an "entry-level System/36," there's no doubt Big Blue expects the newcomer to keep pace with the rest of the pack. The 5364 runs a full-blown version of the SSP and uses a special microcode that works with DOS to ensure PC-to-S/36 communications. A PC workstation can flip between S/36 and PC modes, so the 5364 processor runs

S/36 programs while the workstation runs PC applications.

A slightly trimmed-down version of its larger brothers, the 5364 contains 256K of System/36 main storage and a single 5½-inch 1.2MB disk drive. A 40MB 5½-inch hard disk is standard, with another 40MB disk available as an option. The 5364 will communicate with other System/36 processors and can access the host of System/36 software now on the market. A utility program from IBM converts System/36 data and applications programs from the 8-inch disks to 5½-inch format.

IBM offers the 5364 processor with 256K and a 40MB hard disk for \$5995. With 80MB of hard disk storage, the price is \$8090. The PC is priced separately.

Just how well the System/36 PC fits in with its stablemates has yet to be seen, but the Big Blue herd continues to gallop along in the office automation sweepstakes.

—Wes Nihei

Two In One

TopView has been criticized for its speed-impeding girth. It appears now that TopView's pudginess isn't baby fat; it's a proprietary, IBM-written operating system, buried within the code—fresh evidence of Big Blue's striking out on its own, perhaps. On the other hand, this avoirdupois may simply be a hard-to-remove vestige of the unique but unwieldy development language used to create TopView.

Go East Young Jr

Remember PCjr? Seems that Jr lives, at least in the Far East. IBM Japan is reportedly developing a PCjr version of the IBM 5550–a Japanese-built PC that sports 3½-inch disk drives. This retooled Jr is expected to be compatible with both the IBM 5550 and the garden variety PC. Never say sayonara.

are you sure you want to exit

When in Doubt, Dive

All you inveterate game players out there know the feeling too well. You're approaching the Critical Moment, the penultimate point in your favorite guilty pleasure, when Mr. Big strides into your cubicle, shattering your concentration, your composure, and your credibility as a crackerjack cog in the corporate cause. The jig is up, and your midday *Run for the Money* excursion is kaput.

Well, tremble no more. If your game of choice is *Gato*, a submarine simulation from Spectrum Holobyte, help—in the form of a dummy spreadsheet—is but a keystroke away. When your supervisor appears to be closing in, you can submerge your game behind a meaningless matrix—and even do away with those distinctly unprofessional squawks and beeps.

Since no one at *PC World* would even think of playing a game during business hours, this little wrinkle—known generically (and for obvious reasons) as a "boss switch"—was brought to our attention by an irate reader. He lamented this "new form of white collar crime" and took umbrage at "the unethical practice of using company time to play games."

P L77: (F3) 24, 20-18, 41-5

P L77: (F3) 24,

Patricia Herringer, product manager for Spectrum Holobyte, prefers a more lighthearted interpretation. "It's really just a novelty. Some business owners have written us in mock upset, but mostly, people think it's hysterical." Still, Spectrum Holobyte is discreet; the *Gato* documentation is silent on the spreadsheet switcheroo.

With Gato (top), game junkies can obtain instant relief from unannounced visits by the boss; at the touch of a key, it's back to business (and a curiously static spreadsheet).

The AT's True Blue Collar

Never let it be said that IBM is afraid to get its hands dirty.

Big Blue continues to extend its reach from the upstairs office to the factory floor by significantly expanding its PC-based vertical market offerings. Coming on the heels of the Professional Graphics Adapter/Monitor—a potent tool for engineers, scientists, and industrial designers—and the 5531 Industrial Computer (a variation of the XT), IBM's newest releases confirm the company's interest in tailoring the PC to the job site.

IBM devised the 7531 and 7532 Industrial Computers by drafting the PC AT from the desk top and dressing it in the armor necessary to endure the harsh environs of the manufacturing workplace. To ensure maximum endurance on unfriendly turf, the 80286-based machines contain removable filters to collect dust and other particles, plus cooling fans to protect the power supply and system unit components. The keyboard is shielded with a plastic membrane, and the disk drives are guarded by a keylocked door. Expansion boards are secured by a retainer bar, which also cushions them against shock and vibration.

The 7531 and its rack-mountable counterpart, the 7532, are otherwise outfitted with 512K of RAM expandable to 3MB, a high-capacity 1.2MB floppy disk drive, a clock/calendar with battery backup, seven expansion slots, and ROM-based BASIC. Up to 40MB of hard disk storage is available by installing two optional 20MB drives.

Not one to miss a marketing opportunity, IBM has recognized a demand in the manufacturing sector for a machine with the AT's capabilities. "We believe there's a present and future need for an ATtype machine on the factory floor," says IBM spokesperson Michael Dutton. "This machine is intended for a wide variety of applications that require a PC controller unit on the plant floormechanized assembly control. quality control, computer-aided manufacturing management, tool maintenance, preventive maintenance, machine monitoring, and other information-gathering and processing tasks associated with manufacturing."

Although the AT is Entry Systems Division's baby, these industrial-strength machines were produced by Manufacturing Systems Division, an independent business unit charged with developing

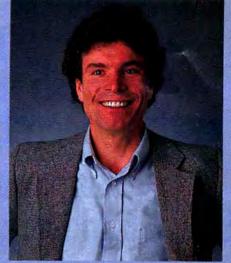
products for the manufacturing environment. Accompanying the introduction of the 7531/7532 Industrial Computers was a raft of software for the machines, including products from Allen-Bradley and Gould-Modicon, two established factory computer products vendors.

Fueled in part by increasing interest in vertical applications, the AT has caught on—whatever the color of its collar. —Wes Nihei

John Eckhouse is a business correspondent for the San Francisco Chronicle. Sally Adamson Taylor is a freelancer based in Hong Kong.

PC World View welcomes contributions from readers, and we'll pay up to \$50 for the items we use. Please include your name, address, and phone number with your contribution; send it to PC World View, PC World, 555 De Haro St., San Francisco, CA 94107.

Let David Rose tell you about our powerful new ProKey4.0.



David Rose, inventor of ProKey

Spend 2 minutes learning how to add a powerhouse of function to your keyboard with a terrific new version of ProKey!

"Suddenly others have discovered what RoseSoft has known since we invented the ProKey concept. If your keyboard could work a whole lot harder, your life would be a whole lot easier.

The original idea behind ProKey was a program that would let you store strings of keystrokes you could recall at a touch. Now there's ProKey 4.0 and it's better than ever."

ProKey 4.0 keyword macros unsnarl PC use.

"If you're a serious PC user, you probably use a variety of software programs. Spreadsheet. Word processing. Database. Communications. Plus the special-function programs you use to run your business or department.

And all these programs have different complicated commands that are tedious to type and easily forgotten. How much easier life would be if all you needed to operate your program was a small vocabulary of sensible words.

Want to log onto Dow Jones with your communications package to check on how your IBM stock is doing? Just type the keyword you previously selected for this function, "IBM". Need to print a profit and loss statement? Typing "p&l" is all it takes.

Behind the scenes, ProKey 4.0 checks its memory for the string of commands required to carry out the task and executes them automatically. Forgotten what functions you have available? Just call up the built-in menu that describes them in plain English.

Need to add a function? Enter the commands. Enter a description. Store them both away without leaving the program you're working with. Built-in editing, English language menus, multicharacter macro names and the ability to instantly change sets of functions. These are just four of the exciting new features that make ProKey 4.0 the most powerful macro processor you can buy."

ProKey 4.0 lets you customize your keyboard.

"Only ProKey has the unique Layout program that lets you redesign your keyboard to correct design flaws the manufacturers built in. You can change the location of any key, create a DVORAK layout, or make a duplicate set of arrow keys away from the keypad."

ProKey Is the Industry Standard.

"ProKey has all the features you need to make your life a whole lot easier. And RoseSoft has three years experience supporting customers who use macros. Including over 80% of the Fortune 100.

Don't be misled by the recent claims of ProKey imitators; they're comparing themselves against old versions of ProKey.

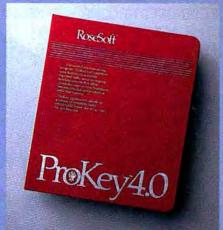
The choice is simple. Do you want an unknown, untested product in its first generation, or ProKey 4.0's power and features? The difference in price will hardly pay for dinner. The difference in performance is like night and day."

ProKey 4.0 runs on IBM and other compatible MS-DOS computers, and works with 99% of the software they use. \$130 suggested retail price at software dealers everywhere. Or call RoseSoft. (206) 524-2350.



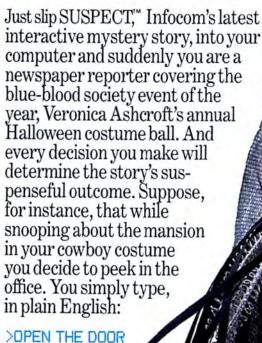
4710 University Way N.E. Seattle, WA 98105 (206) 524-2350

Circle 162 on reader service card





Fortunately, there's a suspect. Unfortunately, it's you.



>OPEN THE DOOR THEN ENTER THE OFFICE

And the story responds:

YOU OPEN THE DOOR,
SLUMPED BEHIND THE
DESK IS THE BODY OF VERONICA
ASHCROFT, HER MASK HAS BEEN
PULLED OFF, AROUND HER NECK
IS THE AGENT OF DEATH, A
ROPE, IN FACT, IT'S YOUR
LARIAT, WHICH
YOU GOT TIRED
OF CARRYING
AROUND AND HUNG
IN THE CLOSET WITH
YOUR COAT,

You've been framed. And you have mere hours to discover who the real killer was. Because if you don't, you could be in serious trouble:

THE DETECTIVE GRABS YOU FIRMLY BY THE WRIST, AND WITH

A PRACTICED TWIST, SLIPS THE CUFFS

ON YOU.
"YOU'RE UNDER
ARREST FOR
THE MURDER
OF VERONICA
ASHCROFT."

SERGEANT DUFFY APPEARS

AS THOUGH OUT OF

NOWHERE AND ESCORTS YOU TO THE WAITING POLICE CAR.

You communicate—and the story responds—in full sentences. Which means that at every turn you have literally thousands of alternatives. So if you decide it might be worthwhile, for example, to dance with Mrs. Ashcroft's corpse, you just say so:

>DANCE WITH VERONICA'S BODY

And the story responds:

YOU'LL HAVE TO LEAD, YOU CAN BE SURE OF THAT,

This masquerade ball is one bash where you'd better go easy at the bar. Because simply staying out of the slammer is a challenge that could send the soberest soul staggering.





Other interactive mystery stories from Infocom include The WITNESS," a 1930's style whodunit thriller in which a case of blackmail turns into murder before your eyes. And DEADLINE," which gives you just twelve hours to find the murderer, before he finds you.

You'll have to solve puzzle after puzzle as you build your case. You'll search for clues. Analyze evidence. Overhear conversations. You'll even question suspects:

>COCHRANE, TELL ME ABOUT SAMUEL OSTMANN

And the story responds:

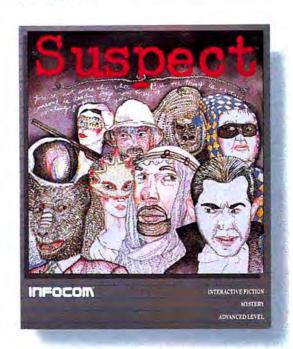
COCHRANE IS UNSTEADY AND SWALLOWS A LITTLE MORE OF HIS DRINK BEFORE ANSWERING, "THAT SLIME! HE'LL GET WHAT'S COMING TO HIM ONE OF THESE SUSPECT gives you clues even before you flip on your trusty computer. Your invitation. A cryptic note on the back of a business card. An article torn from a magazine. A receipt for your rented costume. Even a guide to proper etiquette during a murder.

DAYS, HE'S GOT AN IN WITH THE REAL ESTATE BOARD AND HE'S TIGHT WITH VERONICA, HE'S RUINING MY BUSINESS!"

And if you're clever enough, then maybe, just maybe, you'll prove your own innocence. But you'll have to hurry.

So polish up your party manners and rush down to your local software store to pick up a SUSPECT today. And remember, the costume ball lasts from 8 to 12. But if you don't solve the mystery, you'll soon be doing 18 to 20. With no parole.

Still not convinced? Try our Sampler Disk which includes portions of four different types of stories for just \$7.95. If it doesn't get you hooked on the addictive pleasures of Infocom, return it for a full refund. If it does, you can apply the price toward your first Infocom story. You can't lose!



INFOCOM

For more information call 1-800-262-6868. Or write to us at 125 Cambridge Park Dr., Cambridge, MA 02140.

c 1985 Infocom, Inc. SUSPECT, The WITNESS and DEADLINE are trademarks of Infocom, Inc.

PO WERLD

The Comprehensive Guide to IBM Personal Computers and Compatibles

Give PCW RLD for the Holidays!



You can give a gift this holiday season that's not only thoughtful but thought provoking.

PC World is the ideal gift for family, friends, and associates who enjoy the exciting world of personal computing.

A world of savings at holiday time Your first one-year gift: only \$17.97

Each additional gift ... just \$14.97 (Less than \$1.25 per issue!)

You can take advantage of these exceptional gift rates from now until January 31, but we urge you to act quickly so we can announce your gift with our special card . . . in time for the holiday season.

Give PC W**●**RLD for the Holidays!



Your Special **Holiday** Benefits:

Save \$1743! on your first gift

Save \$20431 · on each additional gift

Holiday Gift Card

sent to each. recipient

Toll-free **Holiday Hotline** 800/628-2900 (from Nebraska call .402/895-7284)

Visa and MasterCard accepted



Make PC WORLD part of their world with Holiday Gift Subscriptions

First Subscription: Each Additional Gift: Only \$1497

Each gift you give after the first saves you 36% off the basic subscription rate-more than 58% off the singlecopy cost!

Your name Company Address . City, State, Zip . ☐ Enter or ☐ Extend my own subscription to PC WORLD at the Special Holiday Rate of \$17.97. I have entered a total of _____ subscriptions.
\$ _____ enclosed □ Please bill me
Charge my □ Visa □ MasterCard Exp. date. Acct # Signature A personalized gift card will be sent to each recipient.

Make PC WORLD part of their world with Holiday Gift

Subscriptions

Holiday offer good in U.S. only. Gift rates expire January 31, 1986.

First Subscription: Each Additional Gift: Only \$1497 ^{Just} **\$17**97

Each gift you give after the first saves you 36% off the basic subscription rate-more than 58% off the singlecopy cost!

Your name Company . City, State, Zip . □ Enter or □ Extend my own subscription to PC WORLD at the Special Holiday Rate of \$17.97. _ subscriptions. Signature

A personalized gift card will be sent to each recipient.

Holiday offer good in U.S. only. Gift rates expire January 31, 1986.

Gift Subscriptions

Name
Company
Address
City, State, Zip
Sign card from:
Name
Company
Address
City, State, Zip
Sign card from:
Name
Company
Address
City, State, Zip
Sign card from:

Gift Subscriptions

Name	
Company	
Address	
City, State, Zip	
Sign card from:	
Name	
Company	
Address	
City, State, Zip	
Sign card from:	
Name	
Company	
Address	
City, State, Zip	
Sign card from:	



BUSINESS REPLY CARD

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 CARD

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



You know that choosing the right software is serious business. So does WATCOM.

Before you make any decisions about your software needs, talk to WATCOM—the people major software users around the world have trusted for years.

WATCOM has the products you need to get the job done right. Proven performers like WATFOR*, WATFIV*, WATBOL*, and SCRIPT. Plus new leaders in software for PC workstations and micro-to-mainframe communications. Networks, language interpreters and compilers. Text preparation and data management.

All WATCOM products are human engineered to provide the optimum in people efficiency and productivity. And they're designed to run compatibly on IBM mainframes and PC's, Digital main frames and micros, and Commodore micros.

WATCOM's innovative maintenance and support services will help you get the most out of your software investment. Our publications and seminars keep you up to date with the latest in product enhancements and information. And our PC site licenses make it possible for you to create unlimited copies of WATCOM's powerful software packages.

WATCOM, Quality products. Professional service. And a reputation built on more than 150,000 licensed mainframe and micro software programs throughout the world. Talk to us before you decide. After all, choosing the right software is serious business. For you. And for WATCOM.

Make the right choice: WATERLOO JANET NETWORK

Creating a productive classroom environment for your students makes Waterloo JANET the right choice in PC-DOS networks.

Waterloo JANET is an academic PC-DOS network developed by educators at the University of Waterloo. Waterloo JANET can be configured for courses, classes, and individual students so that teachers can personally set up the right environment.

Waterloo JANET provides excellent system security because access to private data is strictly controlled. PC's connected

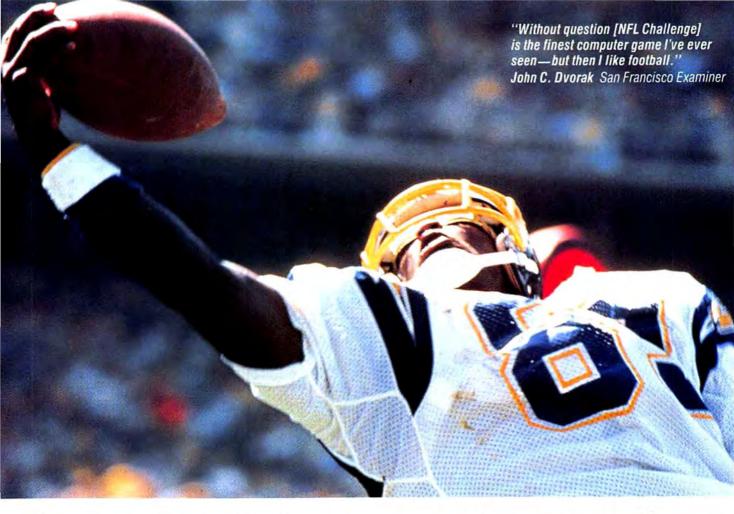
to Waterloo JANET's file server share centralized file storage and print facilities.

Make the right choice. Call or write WATCOM today and we'll tell you all about Waterloo JANET or any of WATCOM's other people-efficient products.

WATCOM

The right choice in software.

Name:			WATCOM PRODUCTS INC.
Company:			415 Phillip Street Waterloo, Ontario, Canada
Title:			N2L 3X2
Address:			— (519) 886-3700
City:	State:	Zip:	Telex 06-955458



Put the NFL at your fingertips.

Hands-on pro football excitement is as close as your keyboard with **NFL Challenge** from Xor. This is the officially licensed NFL action computer game with offensive plays and defensive sets based on the ones in NFL playbooks, plus complete updatable rosters for all 28 NFL teams. All impressively packaged.

Every game can be the Super Bowl when you take the field with Xor NFL Challenge software. Feel the pressure as you choose starting lineups, drive downfield against the clock, and go head-to-

head, down-by-down against the league's most innovative offenses and formidable defenses. It's the most intense computer simulation of the pro football experience ever devised.

Xor's NFL Challenge requires IBM® PC or PC/XT with DOS 2.0, 256K bytes of memory, monochrome monitor with IBM® monochrome card or RGB color monitor with IBM® color graphics adapter. Also runs on the IBM® PC/AT.

With NFL Challenge from Xor, you have 50-yard line seats for every game!

Ordering Information

NFL Challenge is in short supply. To kick off your NFL season, send us \$99.95, or if you're in a hurry-up offense, order by major credit card:

1-800-NFL-CHAL

(in MN call (612) 938-0005)

Add \$6.00 for shipping to all U.S. cities. Minnesota residents: add 6% sales tax. Dealers call Navarre: 1-800-328-4827 ext. 1765



IBM is a registered trademark of International Business Machines. NFL Challenge is a trademark of NFL Properties, Inc. □ 1985. All rights reserved.





5421 Opportunity Court Minnetonka, Minnesota 55343 (612) 938-0005



The Help Screen

PC World offers answers and advice at every level

This month we discuss CONFIG.SYS, the DOS configuration file, and learn how to find our way batch backwards.

Karl Koessel

CONFIG.SYS: The DOS Configuration File

O. Recently I installed an integrated software program on the office computer, an IBM PC with an external hard disk. Everything worked fine, but the next time I turned on the computer, I couldn't access the hard disk. A colleague, who had originally installed the hard disk, took a look and told me that my CONFIG.SYS file had been changed. Then I realized what had happened. The integrated program's installation instructions said that to take full advantage of a 640K system, I should copy the software manufacturer's CONFIG.SYS file onto the hard disk. According to my colleague, that version replaced the original CONFIG.SYS file and made the hard disk inoperative.

My colleague has finally reinstalled the hard disk, and I'm now working on the integrated package, but without taking advantage of all my system's memory. What exactly happened? Why didn't the installation manual warn me about potential problems? How can I access the rest of my PC's memory now without erasing my CONFIG.SYS file?

George Camey Kansas City, Missouri

A. When you instruct DOS to copy a file from one disk or directory to another and the name you give the copy matches the name of another file on the target disk or directory, the copy will replace the identically named file. (If you do not specify the name for the copy, it will be given the same name as the original.) In your case, as your colleague has pointed out, the integrated software's CONFIG.SYS file replaced the hard disk's CONFIG.SYS file.

When you start DOS (2.00 or a later version), it automatically looks for a CONFIG.SYS file in the root directory of the disk from which it was started. The CON-FIG.SYS file is used to augment the default DOS configuration. Commands within the CON-FIG.SYS file control a variety of system functions. They define the situations in which DOS should check for a <Ctrl>-<Break> interrupt, specify the number of disk buffers, and choose date and time formats. Other commands install device drivers so that DOS can use "nonstandard" peripherals (such as mice, graphics tablets, and some hard disks), or replace the default device drivers so that standard input, output, printer, floppy disk drive, hard disk drive, and clock functions may be extended.

In CONFIG.SYS you can also set the last drive letter that DOS can use, identify the file name and location of a command processor to replace COMMAND.COM, and specify the maximum number of file control blocks and file handles that DOS can concurrently open (two methods used by applications to create, open, read, and write to files). More information on the DOS configuration commands can be found in the "Configuring Your System" chapter of the DOS manual.

In your case, the original CON-FIG.SYS file contained a command specifying the file name of the driver for the hard disk. The integrated program's CON-FIG.SYS file did not contain this command, so the hard disk was no longer available. The new CONFIG.SYS file probably con-

(continues)



Two-for-one special.

Tired of the perplexing decision about which desk-top computer to buy?

We don't blame you. On the one hand, there is the sophistication, power and advanced technology of the Macintosh. On the other is the IBM PC and its library of almost 10,000 software programs.

So which computer should you buy?

MacCharlie from Dayna Communications offers an easy answer. Because with MacCharlie, your Macintosh now becomes compatible with IBM PC software.

What's more, MacCharlie actually enhances IBM PC software. For instance, because

your Macintosh menu bar and window sizing are still active with the mouse, you have use of options like the clipboard, calculator and notepad with IBM PC software.

And through MacCharlie, you can link Macintosh to IBM serial networks and mainframes. Data files are also transferable from Macintosh to IBM and vice versa.

So even if you've taken the plunge into IBM's world, you can now advance to Macintosh and still keep your software library intact.

In short, you can have your Macintosh, and IBM PC software too. Thanks to MacCharlie, the best of both worlds.

Maccharlie by Dayna Communications

For more information, call Operator 12 toll-free, 1-800-531-0600. (In Utah, call 801-531-0600.)

MacCharlie is a product of Dayna Communications, 50 S. Main, Salt Lake City, Utah 84144





BIG SAVINGS on **TANDY** Compatibles

PRINTERS

TANDY 1000/1200	
Tandy 1000 HD 256K 10 Meg.	1539
Tandy 1000 Disk Drive Kit	159
Tandy 256K Ram Board (inc. 128K)	199
Tandy 300 Baud Modem Board	129
Tandy RS-232C Serial Board	89
Tandy Hard Disk Controller	249
Tandy 10 Meg. External Hard Disk	579
Tandy 1200 Text Monitor Adapt.	179
Tandy 1200 Color/Graphics Adapt.	240
Persyst Monochrome Text Adapter	179
Quadram Exp. Quadboard 384K	259
Bernoulli Box 20 Megabyte	2495
MONITORS	
T-1: O14 4340	

Okidata 192
Okidata 193
Star Micronics SG-10
Star Micronics SG-15
Star Micronics SD-10
Panasonic P-1091
Toshiba 351
Silver Reed EXP-550
Epson FX, LX, JX, LQ, SQ, DX, HS

MONITORS
MONITORS

Tatung CM-1360

RGB Color/Green/Amber

Tatung MM-1222G TTL Green

Tatung MM-1222A TTL Amber

149

P.O Box 1094
480 King Street
Littleton, MA 01460

CALL TOLL FREE 1-800-343-8124

IN MA CALL (617) 486-3193

Circle 210 on reader service card

To get a lot sur out of your size printer, you need a lot of programs,

programs right?



SoftStyle, Inc. 7192 Kalanianaole Hwy. Suite 205 Honolulu, Hawaii 96825 Phone (800) 367-5600

\$69.95. Enhances over 30 dot matrix printers, including Epson and Okidata. IBM P.C. or compatible. Wrong.

Sure, you could buy one package to change type sizes, another to create fonts, and still another to print sideways.

Or you could get one simple program to do it all!

Printworks. It's loaded.



tains buffer and file configuration commands that increase the default number of buffers and file handles. Because your PC has plenty of memory, you can afford to dedicate some RAM to an augmented system configuration that speeds up the integrated program's operations. What you need is a CONFIG.SYS file that contains the commands for both the hard disk and the integrated program.

Because CONFIG.SYS files are ASCII files, they can be created, read, or altered with a word processor such as WordStar (in nondocument mode) or a line editor such as EDLIN. Use your word processor or line editor to look at the commands in your hard disk CONFIG.SYS file and in the integrated program's CONFIG.SYS file. Then create a CONFIG.SYS file that contains both sets of commands. If both files contain BUFFERS = FCBS = FILES = FILor LASTDRIVE = commands, use the commands that set the largest values. You will then have a CONFIG.SYS file that installs your hard disk and takes advantage of your PC's large memory.

Why didn't the installation instructions warn you about copying the company's CONFIG.SYS file over an existing CONFIG.SYS

(continues)



Get prompt relief from the primary cause of computer anxiety. Because ours can't be outgrown.

That's right. The SBT Accounting Software Library is the first business software package that works just as well whether your business is small or big. Here's why.

One.

It's modular. You can start with the modules you need today. Then add more as your needs grow. And all the modules work together.

Two.

It runs with dBASE III or dBASE II database management software.* So you get all the power and flexibility of those best-selling programs. And you can use any computer, small or large, that runs dBASE.

Three.

You can customize our software in just hours to fit your business. No matter what size or shape your business is. Because we give you the source code (the key to changing our software) absolutely free. The SBT Accounting Software Library. Try to outgrow it. We dare you.

Call today for our demo disk and free brochure. (415) 331-9900.

dProfessional	Time & Billing	\$395
dOrder	Sales Order Processing	\$195
dInvoice	Billing/Inventory Control	\$195
dStatement	Accounts Receivable	\$ 95
dPurchase	Purchase Order	\$195
dPayable	Accounts Payable	\$295
dPayroll	Payroll/Labor	\$395
dLedger	General Ledger/Finance	\$395
dAssets	Asset/Depreciation	\$195
dProject	Project/Job Accounting	\$395
dBackup	Menu/Backup	\$ 65



Three Harbor Drive Sausalito, CA 94965

If you've ever outgrown your accounting software, it wasn't ours.





With SummaMouse® and GEM software, you'll never get lost in DOS again.

You know the feeling. Panic sets in as you stare at the dreaded A> prompt wondering, "Now what?"

Here's what! Now you can cure this condition with SummaMouse and GEM software. The hardware and software team that makes the IBM® PC so friendly it's downright huggable.

GEM software is the graphics environment that's sparking interest everywhere. And Summa-Mouse makes it sparkle plenty. It's made by Summagraphics, a company that's been in the computer graphics business as long as there's

been a computer graphics business.

We're packaging our state-of-theart electronic mouse with the GEM Collection.™ So you can write, paint and organize your desktop with the wave of a hand. And the click of a button.

But that's not the half of it.We're bringing out a whole line of prod ucts. Including SummaSketch, a PC-sized version of the digitizers we put on six-figure CAD systems. Available in two sizes, Summa-Sketch will be packaged with GEM Draw. And of course, Summa-Sketch and SummaMouse are also

available separately.

Think of it. Freedom at last from the tyranny of DOS. Summa-Mouse and GEM software are good for what ails you. For the dealer nearest you, call (203) 384-1344, or write Summagraphics Corporation, 777 State Street Extension, P.O. Box 781, Fairfield, CT 06430.



Draw on our experience.

SummaMouse and SummaSketch are registered trademarks of Summagraphics Corporation. IBM is a registered trademark of International Business Machines Corporation. GEM, GEM Collection and GEM Draw are trademarks of Digital Research Inc. Color available with IBM Enhanced Graphics Adapter and compatible color monitors only.

LIFESAVER



On-Line Performance When You Need It, Streaming Backup When You Don't

You get two different flavors of data protection from Variant's IBM-compatible Bakpak.® When your hard disk is working, it functions as a normal 26MB streaming backup. If your Winchester fails, it's also a high-speed, on-line memory device that can actually take the place of your hard disk.

In the on-line mode, Bakpak supports all MS-DOS commands, so you can create and execute files right on the streaming tape. It's fast, too.



Bakpak's Express software and exclusive cache memory really keep things rolling.

There's more to sweeten the deal. At five pounds, the Bakpak won't weigh you down when you're backing up several PCs. And it's so well designed, we haven't had a field failure yet.

If you need protection fast, we'll get a Bakpak to you within three days of your order. All at a price that won't put a sour taste in your mouth—\$1,095 complete. So give us a call before a failed hard disk puts a hole in the middle of your database.



Variant Technologies, 9421 Winnetka Ave., Chatsworth, CA 91311, (818) 885-5955.

IBM is a registered trademark of International Business Machines Corp.

Dealers Circle 61 on reader service card endusers Circle 462 on reader service card

COPY II PC OPTION BOARD

At last, an almost foolproof method of making archival backups of protected software! The Copy II PC Option Board is an 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 full size slot in an IBM PC, XT, or AT (with at least 1 360KB floppy disk drive), Compaq Deskpro. Compaq Portable requires an extra \$15 cable.

CENTRAL POINT Software, Inc.

503/244-5782

\$95.00

9700 SW Capitol Hwy., *100 Portland, OR 97219 M-F, 8-5:30, W. Coast Time
CHECK, COD WELL'OME.
(Prepayment Required)

plus \$3 s/h (\$12 outside U.S.

Except those "protected" by physical disk damage

Circle 450 on reader service card

file? Simple inexperience is my guess. Send the manufacturer a copy of your question and this answer—the company will appreciate it.

Batching Back to a Previous Directory

Q. We've been using batch files quite extensively as menu selections for specific application software. For example, Lotus's 1-2-3 is in a separate subdirectory, and a batch file (LOTUS.BAT) automatically switches to that subdirectory, prompts the user to place the system disk in drive A:, and loads LOTUS.COM. When LOTUS.COM finishes, the batch file returns the user to the root directory and displays the main menu. We have 12 subdirectories at the present time.

Since not all of our users are DOS wizards, we have also developed a series of help screens for the DOS commands using the HELP.BAT routines published in your magazine [see "Cooking Up a Batch File," PCW, May 1985, and "A Batch of Help," *.*, PCW, Vol. 2, No. 12].

Here's the problem. Our help screens are kept in their own subdirectory just like the other software applications. To execute the IF EXIST %1.HLP... batch command, which tests for the existence

(continues)



The Panasonic Exec. Partner. What makes it an executive? The 7.16 MHz 8086-2 microprocessor for high-speed processing. So you can do more in less time.

What makes it your partner? Like all ambitious achievers the Panasonic Exec. Partner gets along with others. Namely, IBM hardware and software.

You'll also accomplish more with the new high-resolution plasma display. It lasts four times longer, offers clearer definition and is easier to read than an ordinary screen.

The Exec. Partner's built-in dual mode printer will help

you make a good impression. From silent, draft-quality mode

to correspondence quality.

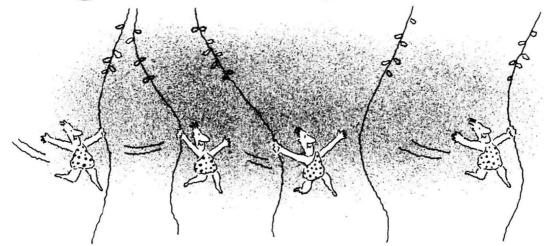
The 256K internal memory has built-in expandability to 640K. So the Exec. Partner will run the most sophisticated data base management programs. And its expansion slot allows you to fulfill the needs of specific applications like telecommunications and Local Area Networks.

Tomorrow's technology

Panasonic for today's executives. The new Panasonic Exec. Partner. Industrial Company

Get a carrying case (model FXZC751) at no charge with any Exec. Partner purchased through 12/31/85. For the location of your nearest participating dealer, call 1-800-PIC-8086.

Programming with ease



... for PC applications

Why struggle with programming your PC when you can let your creativity reach new heights by using the Micro Focus* integrated programming environment. Micro Focus **Professional COBOL*** converts an IBM* PC into a programmer's work-station containing all the tools you need for serious development of PC applications. These state-of-the-art development and debugging tools are closely integrated to combine great power with ease of use.

Professional COBOL uses the Micro Focus High Performance Level II COBOL* compiler certified by the GSA at High Level ANSI '74 with zero errors. And the integrated environment lets you switch between the Syntax Checker and the Editor, to correct each error as it occurs, then go to Animator* to debug by watching the source code executing then to Compile, Run, Library and Build. Easy to use screens in full color can be added to your program by simply entering our Forms* generator while editing.

If you'd like to hear from someone who's actually experienced Professional COBOL and the ease of use we're talking about then how about this extract from PC World's July COBOL review written by Marilyn Z. Smith, "Winners Circle. I found it hard to dislike Professional COBOL. It is clearly the best of the compilers evaluated. It also takes into account the wear and tear most COBOL programmers experience . . ." Professional

COBOL ranked first both in this and in a series of reviews finalized in the August issue of PC Tech Journal.

For Fourth Generation language buffs our Source-writer product can help you quickly build finished systems. It uses a data-dictionary plus screen painting and file linking techniques to allow rapid development of prototypes and complete database applications. And because it generates standard Level II COBOL you can use the power of Professional COBOL to add the same richness and complexity as hand-coded solutions.

If your applications have a mathematical turn of mind then CO-MATH will help you by providing a library of mathematical functions. And then there is CO-GRAPHICS which provides the COBOL application programmer with a full graphics capability to the Graphics Software Systems Inc VDI standard.

If you want to port the applications you develop on the PC to the Apple Macintosh* use our **Mac COBOL*** which contains the same Level II COBOL compiler as Professional COBOL.

To find out more about our products and for copies of the review articles mentioned above just call or write.

...building applications better

MICRO FOCUS

2465 E. Bayshore Rd., Suite 400, Palo Alto, CA 94303 • (415) 856-4161

*Apple Macintosh is a registered trademark of Apple Computers Inc., IBM is a registered trademark of International Business Machines Corporation, Micro Focus registered trademarks --Micro Focus, VS COBOL Workbench, Animator, FORMS-2, Profesional COBOL, Mac COBOL, Sourcewriter, VS COBOL Compiler

ALL THE SOFTWARE YOU SEE IN THIS PUBLICATION, WE'VE GOT.

So call us for the price! 1-800-227-0545

We invite you to study all the software ads in this publication. Look at our competitors' selections. Take note: most offer the popular products; some offer a few rarities.

But we offer them all.

Diamond Software is the one software distributor that gives you whatever you want, whenever you want it—and at a competitive discount price.

And we do it with an experienced team of salespeople and technicians trained to service

you quickly and professionally.

Our people alert you to Diamond specials. They tell you about our cumulative volume discounts and our other quantity incentives.

So when it comes to business software,* call Diamond. In a 30 second telephone call

you'll save a bunch of money, and the time it would have taken to wade through the fine print in our competitors' ads.

THIS WEEK'S SPECIAL PRODUCTS

\$359 ♦ Volkswriter Dlx.	\$159
♦ Crosstalk	\$95
\$259 ♦ AST 6 Pak w/ 384K	\$269
\$239 ♠ AST Advantage	,
\$249 (w/1.5 megabytes)	\$699
\$295 ♦ Quadboard w/384K	\$245
	◆ Crosstalk \$259 ◆ AST 6 Pak w/ 384K \$239 ◆ AST Advantage \$249 (w/1.5 megabytes)

To order call toll free 1-800-227-0545

In California call 415/633-2588 • Technical Department 415/633-2589 • International Telex 338139 (attn: 149) • Software Specialists for the IBM PC Special Corporate Incentives • IBM,® CPM,® Apple® Formats • Same Day Shipment • Visa, M/C, American Express • Overnight Delivery Available • Free UPS Service With Prepaid Check • Purchase Orders Accepted from Qualified Organizations.

Diamond Software

Whatever you want, whenever you want it.

7916 Capwell Dr., Oakland, CA 94621

Compare the Hercules Color Card to IBM's.

Five reasons why the Hercules Color Card is better.





IBM Color Adapter \$244

1. Compatibility

Runs hundreds of graphics programs.

Hercules Color Card \$245

Runs the same hundreds of graphics programs. "The Hercules Color Card is so nearly identical to the IBM Color/ Graphics Card that it's almost

uncanny." PC Mag.

2. Printer port.

None.

Standard. Our parallel port allows you to hook up to any IBM

compatible printer.

3. Size.

13.25 inches. Limited to long

slots.

5.25 inches. Fits in a long or short slot in a PC, XT, AT or *Portable*.

4. Flexibility.

Can't always work with a Hercules Graphics Card.

Always works with a Hercules Graphics Card by means of a

software switch.

5. Warranty.

90 days.

Two years.

Any one of these five features is enough reason to buy a Hercules Color Card. But perhaps the most convincing reason of all is just how easy the Hercules Color Card is to use: "Right out of the box, the Hercules Color Card goes into an empty expansion slot, ready for you to plug in... and go to work—no jumpers, no software. For most applications, it's just that easy." PC Magazine.

Call 1-800-532-0600 Ext. 421 for the name of the Hercules dealer nearest you and we'll rush you our free info kit.

We're strong on graphics.

of a specified help file, you must be in the directory where the help screens are located. To get HELP.BAT to work you have to change to the HELP subdirectory. In creating the batch file, our only alternatives were to leave users in the HELP subdirectory or return them to the root and the main menu.

The question is, how do we get users back to the subdirectory where they were originally working? As far as I can tell, there is no way to get DOS to remember where it came from when HELP.BAT was invoked. Having separate HELP screens and batch files in each subdirectory wastes space and destroys much of the elegance of this system.

Robert R. Stone Schodack Landing, New York

A. DOS 3.00 and later versions accept paths in the IF EXIST command, so you don't have to leave the current directory to test whether a file exists in another directory.

For DOS 2.00 and 2.10, output redirection and BASIC can get the user back to the directory from which HELP.BAT was called. Modify HELP.BAT as follows: echo off
cls
cd > c:\help\original.dir
cd c:\help
if exist c:%1.hlp goto does
if x = =%1x goto help
echo Sorry. Help unavailable for %1
goto end
:does
type c:%1.hlp
goto end
:help
type c:help.hlp
:end

basica c:reset_cd

pause

There are three basic differences between this HELP.BAT and the one you are currently using. The line 'cd >c: \help \original.dir' redirects the output of this CD command (display current directory) into a file named ORIGINAL-.DIR. The drive designator C: has been prefixed to the file names in HELP.BAT so that those files are found even when C: is not the default drive. And the new batch file ending, 'basica c:reset_cd', returns the user to the directory that was current when HELP.BAT was called.

Load BASIC or BASICA and create RESET_CD.BAS:

10 OPEN "C:ORIGINAL.DIR" FOR INPUT AS #1

20 INPUT#1, AS

30 CHDIR AS

40 SYSTEM

Use the command **SAVE**"C:\HELP\RESET_CD" to save this
BASIC program in the HELP subdirectory on drive C:. This program reads the name of the user's

gram reads the name of the user's original subdirectory from the file ORIGINAL.DIR (lines 10 and 20), changes to that directory (line 30), and exits to DOS (line 40).

This routine assumes that BASICA and HELP.BAT are available via the extended directory search path defined by the latest PATH command. For example, with HELP.BAT in a directory called BATCH and BASICA in a directory called DOS, your hard disk's AUTOEXEC.BAT file might contain the command 'PATH = C:\BATCH; C:\DOS;' so that the commands in those directories are available from any directory (see "Directory Assistance," PCW, August 1985).

Do you have any questions concerning the IBM PC or compatibles? Send them to The Help Screen, PC World, 555 De Haro St., San Francisco, CA 94107, or electronically to CompuServe 74055,412 or The Source STE908.

■

PC World

denotes IBM-AT compatibility. **SOFTWARE**

We only carry the latest versions of products Version numbers in our ads are current at press time

press time.	
Aptec	
Rainbow Writer Color Text Formatter 2.1.3	110
Rainbow Writer Screen Grabber 1 1	
ColorScreenPrint 2.0	59
Ashton-Tate	35
	0011
dBase III 1.1	call
Framework 1.1	Call
Best Programs	220
PC/Fixed Asset System 3.0	
PC/Tax Cut (for 1984 taxes)	
PC/Personnel (Level 2) 3.0	419
Bible Research	
THE WORD 3.0 (KJV Bible)	
THE WORD 3.0 (NIV Bible)	145
Borland International	214
-Sidekick 1.5 (non-protected)	48
→Turbo Pascal 3.0 →Turbo Pascal 3.0 w/BCD	37.
→Turbo Pascal 3.0 w/BCD	59
Turbo 8087 3 0	59
-Turbo 8087 3.0 w/BCD. -Turbo Database Toolbox 1.0	72
Turbo Database Toolbox 1 0	30
Graphics Toolbox 1.0	30
→Turbo Tutor 1.0	19
Superkey 1.0	
Breakthrough	
-Timeline 2.0. sp	ecial
Broderbund	
-Bank Street Writer	49
O	
Connecticut Software	
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research	
→Printer Boss 5.0 →Sideline 5.0 (more features than Sideway Digital Research	
→Printer Boss 5.0 →Sideline 5.0 (more features than Sideway Digital Research →GEM Desktop 1.1 →GEM Desktop 1.1	99 s)37 30
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop)	99 s)37
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft	99 s)37 30 93
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller)	99 s)37 30
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software	99 s)37 30 93.
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11	99 s)37 30 93
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software	99 s)37 30 93. 55
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0	99 s)37 30 93. 55
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI	99 s)37 30 93. 55 37 279
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8	99 s)37 30 93. 55
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom	99 s)37 30 93. 55 37 279 69.
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0	99 s)37 30 93. 55 37 279
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree	99 s)37 30 93. 55 37 279 69.
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge)	99 s)37 30 93. 55 37 279 69.
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext	99 s)37 30 93. 55 37 279 69. 279
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0	99 s)37 30 93. 55 37 279 69.
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA)	999 s)37 30 93. 55. 37 279 69. 279 159
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA)	999 s)37 30 93. 555 37 279 69. 279 159 109
Printer Boss 5.0 Sideline 5.0 (more features than Sideway Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA) Managing Your Money 1.52 Running Program (Jim Fixx) 1.2	999 s)37 30 93. 55. 37 279 69. 279 159
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA) Managing Your Money 1.52 Running Program (Jim Fixx) 1.2 Micropro	999 s)37 30 93. 55 37 279 69. 159 109 99 49
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA) Managing Your Money 1.52 Running Program (Jim Fixx) 1.2 Micropro WordStar 3.31	999 s)37 30 93. 555 37 279 69. 279 159 109
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA) Managing Your Money 1.52 Running Program (Jim Fixx) 1.2 Micropro WordStar 3.31 Hard disk recommended for Wordstar	999 s)37 30 93. 55 37 279 69. 159 109 99 49
Printer Boss 5.0 Sideline 5.0 (more features than Sideway) Digital Research GEM Desktop 1.1 GEM Draw 1.0 (includes GEM Desktop) FriendlySoft FriendlyWriter 2.0 (with FriendlySpeller) Funk Software Sideways 2.11 Harvard Software Harvard Total Project Manager 1.0 IMSI PC Paintbrush 2.8 Infocom Cornerstone 1.0 Lifetree Volkswriter Deluxe 2.2 (with TextMerge) Living Videotext ThinkTank 2.0 Micro Education (MECA) Managing Your Money 1.52 Running Program (Jim Fixx) 1.2 Micropro WordStar 3.31	999 s)37 30 93. 55 37 279 69. 159 109 99 49

PC Connection Software Special

through October 31, 1985

BREAKTHROUGH ∠Timeline version 2.0

- The most popular project management software on the market
- Powerful, flexible, easy to use
- Unlimited number of tasks dependencies, resources, and cost
- Exports directly to 1-2-3. Symphony. Multiplan, dBase II and III, and others Works with PC, XT, AT, 3270PC \$249

Microrim
R:base 5000 1 0 \$369
Extended Report Writer 1.2 85
Clout 2.0
Microsoft
Multiplan 1.2
Microsoft Spell 1.0 30
Microsoft Word 2.0
Both of the following Microsoft mice now
come with PC Paintbrush software
Microsoft Mouse with software 4.0 135
Microsoft Serial Mouse with software 4.0 135
Microsoft Project 1.01
Microsoft Chart 1.01
Microstuf
Crosstalk XVI 3.5. 99
Transporter 1.3 (includes Crosstalk) 169
MultiMate International
-MultiMate 3.3 ca
Peter Norton
Norton Utilities 3.0 59
Powerbase Systems
Powerbase 2.1 239
Rosesoft
Prokey 4.0
Satellite Software
WordPerfect 4.0 239
Software Digest
Ratings Newsletter
Single copy 18.50
Year subscription
Software Group
►Enable 1.1
Software Publishing
PFS:File B:01
PFS:Graph B:01
PFS:Plan A:01
PFS:Proof B:00
PFS:Report B:01
PFS:Write B:01
Virtual Combinatics
Micro Cookbook 29
Warner Software
The Desk Organizer 2.0

TDAINING

	IHA	IINIP	NG	
ATI SKILL BUIL Intro and H			RAMS	
Word Proce		MS-I	20 C C C C C C C C C C C C C C C C C C C	
Business S		100000000000000000000000000000000000000		
Data Bases	i		e Accountant	
Compaq			Deluxe	
IBM-PC		BAS	1.77	2525
********			each	\$32.
TRAINING How to Use		PROC	GRAMS	
dBase II	dBasel	[]	Lotus 1-2-3	
MS Word	Easywr	iter II	Multimate	
Multiplan	Superc	alc 3	Framework	
Symphony				
			each	49.
-Survival Kit	(include	s Intro	to the PC. Intri	0
to PC-DOS,	& Intro	to Bus	siness Software,	79.
Individual	Software	9	,	
The Instruc	tor II			35
-Professor D	OS		*******	47

-Tutorial Set (both items above)......

Professor Pixel

Training for Lotus 1-2-3

MasterType

Typing Tutor III.....

-Typing Instructor ...

Simon & Schuster

Scarborough Systems

75.

47

39.

EDUCATIONAL

LDOCATIONAL	
Barron's Computer SAT	59.
Designware Spellicopter (ages 6 to adult) Mission Algebra (ages 13 and up)	25. 27.
Digital Research	
Diagnostic Test (PSAT) OwlCat SAT (15 hours)	14. 63.
OwlCat SAT (60 hours)	169.
Computer SAT	49.
Spinnaker Educational Games for Young Computer	
Users. (All require graphics board) Delta Drawing (ages 4 to adult)	27
President's Choice (ages 13 to adult)	27.
Snooper Troops I (ages 10 to adult)	23 20.
Most Amazing Thing (ages 10 & up) . Face Maker (ages 3 to 8)	23 18
Kids on Keys (ages 3 to 9)	18.
Fraction Fever (ages 7 to adult) Kinder Comp (ages 3 to 8)	18. 18.
Springboard Early Games for Young Children	
(ages 21/2 to 6)	22.
Stone (requires graphics board) My Letters.Numbers.Words (ages 1 to 5)	29.

^{*}DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS "COPYRIGHT MICRO CONNECTION INC. 1985. ALL ITEMS SUBJECT TO AVAILABILITY PRICES SUBJECT TO CHANGE WITHOUT NOTICE JIF CONNECTION AND PC CONNECTION ARE REGISTERED TRADEMARKS. AND MICRO CONNECTION IS A TRADEMARK. OF MICRO CONNECTION INC. MARLOW NH



PC Palace.

A man's phone is his castle.

hether you call up on our toll-free number, or tool up in your private coach, PC Connection will roll out the red carpet. Because here under the majestic skies of Marlow, NH (pop. 547) we're offering a regal selection of PC add-ons and software at prices even a pauper can afford. Backed by warranties and support services as solid as the crown jewels.

My kingdom for a DOS.

You know the feeling of power you have when you first get a PC? You can do anything! In no time at all! Better than you've ever done it before! It's like being sixteen again.

But after a while, the novelty wears off. Things get ordinary. It's time to conquer new lands, learn new languages. It's time to call PC Connection. We'll make you feel like queen (or king) for a day.

Because our job is to figure out

how you can put your PC back on a pedestal without spending a king's ransom. We've checked out those new integrated software packages, we've tried those new printers, we've micro'd to mainframe, moused to menu, and modemmed to more mailboxes than most might mention.

On your knees, bees.

When you call us, you not only get honest advice,

you get some very sweet deals. Like the vessel of pure New Hampshire royal nectar we're sending free to everyone who places a \$500 order 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. The showroom closes at 8:00 M-F and at 5:00 on Saturday.



A container of PC Connection honey, featuring our most hair-apparent mascot. Free to all com-moners, but not commercial accounts. Limit one

For the IBM-PC (XT & AT) exclusively.

efficiency, ea

Kids Stuff (ages 3 to 8)	\$29
Across the U.S.A. (ages 5 and up)	22
The Learning Company	
Magic Spells (ages 6 to 10)	23
Word Spinner (ages 6 to 10)	23
GAMES	
Blue Chip	
Millionaire	32
Tycoon	32
Baron	32
Broderbund	
Lode Runner	25
FriendlySoft	
FriendlyWare/PC Arcade	35
Hayden Software	00
	35
Sargon III	00
niocom Dilliculty levels shown in italics	05
Seastalker (junior)	25
Enchanter (standard)	25
the Witness (standard)	25
Planetfall (standard)	25
Cutthroat (standard)	25
Hitchhiker's Guide (standard)	25
Zork I (standard)	25
Zork II (advanced)	29
Zork III (advanced)	29
Infidel (advanced)	29
Sorcerer (advanced)	29
Suspect (advanced)	29
	31
Deadline (expert)	
Starcross (expert)	31
Suspended (expert)	31
Invisiclues (hint booklets) are available	
for most Infocom games. Specify game.	. 7
Microsoft	
Flight Simulator 2.12 (now works with Herc	ules
Mono Card)	32
Origin Systems	
Ultima III	39
PCSoftware	
Armchair Quarterback	27
Chess 2001	27
Championship Blackjack	
Professional Software	20
Trivia Fever	22
	22
Sir-Tech	
Wizardry	42
Spectrum Holobyte	-
GATO	27
Sublogic	
Night Mission Pinball	29
Jet	33
HARDWARE	
AST Research (For IBM-PC, XT or AT)	
All AST Boards come with SuperDrive.	
SuperSpool, and one year warranty.	
SixPakPlus 64k upgradeable to 384k wit	h
SixPakPlus 64k upgradeable to 384k, wit clock calendar, serial and parallel ports	
& now includes Borland Sidekick version	15
(non-copy protected) game port optional	

384k (fully populated).

MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar

PC Connection Hardware Special

through October 31, 1985

IMSI

PC Mouse w/PC Paintbrush

- 3-button optical mouse made by Mouse Systems
- Includes PC Paintbrush software version 2.8
- Features Designer Pop-up menu software
- Connects to serial port
 Works with PC, XT and AT...... \$109

OUR POLICY

- We accept VISA and MASTERCARD
- No surcharge added for charge cards.
- · Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- · All shipments insured; no additional charge.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. \$1000. Cash or certified check.
- 120 day guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30.
 You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Continental US: For monitors, printers, and drives, add 2% for UPS ground shipping. Call for UPS Blue or UPS Next-Day-Air. For all other items, add \$2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. Hawaii: For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add \$2 per order. Alaska and Outside Continental US: Call 603/446-3383 for information.

1-800/243-8088

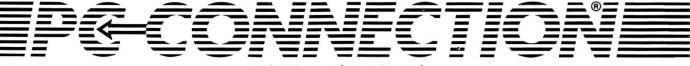
PC Connection 140W

6 Mill St., Marlow, NH 03456 603/446-3383

269

For the IBM-PC Exclusively.

MegaPak 128k (not upgradeable) \$159 MegaPak 256k 249
I/O Plus II with clock calendar and serial port (parallel, game, or second serial
port optional)
Parallel, Game, or second Serial Port for any AST board (specify board)
Connectall connector bracket (PC only) 19 AST-5251-12 529
AST-5251-11
AST-3780. 589 Reach Modem (half card 300/1200 baud
internal modern includes Crosstalk XVI). 389
Advantage 128k upgradeable to 1.5 Meg
(more with Piggyback Card), with clock calen dar, serial and parallel ports game port
optional
Amdek Video 300G monitor (green)
✓Video 300A monitor (amber)
 Video 310A monitor (amber)
Color 600 - RGB monitor
Plastic Keyboard & Drive Cover Set 17
IBM Mono Screen Enhancement 17 Curtis
ACCESSORIES
PC Pedestal (for IBM Mono or Color) 37
PGS or Quadchrome Adapter for above 9 Low Profile Tilt and Swivel Pedestal 37
AD-2 Adapter for Portables
System Stand
System Stand for IBM-AT
The Crystal 150-watt
The Crystal 300-watt
CABLES Extension Cables for IBM Mono Display 33
-Keyboard Extension Cable (3 to 9 feet) 27
-AC Plug Adapter (any monitor to your PC) 8 -Printer to IBM Cable (specify printer) 19
Smartmodem to IBM Cable
SURGE SUPPRESSORS
All surge suppressors have an on/off switch. Diamond (6 outlets)
Emerald (6 outlets; 6 ft cord)
Sapphire (3 outlets; EMI/RFI filtered) 52 Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) 59
Epson
All Epson printers have built in graphics
capability. In addition, the LX80, FX85, and FX185 can all print in near letter quality (NLQ)
LX-80 cal
-RX-100 cal -FX-85 (replaces FX-80+) cal
FX-185 (replaces FX-100+) cal
~JX-80 cal ~LQ-1500 (letter quality dot matrix) cal
Printer to IBM Cable (specify printer) 19
Hayes Smartmodem 300
Smartmodem 1200
Smartmodem 1200B (w/Smartcom II) 369
✓Smartmodem 2400 cal



se, economy.

Smartcom II 2.1 (software)	
-Curtis' Smartmodem-to-IBM Cable	19.
Hercules	200
Hercules Graphics Card (parallel port)	
Hercules Color Card (parallel port)	169
Graph-X Software 2.0	42
IMSI	an al
PC Mouse w/PC Paintbrush 2.8 sp Kensington Microware	ieciai
	94
✓ Masterpiece✓ Printer/portable computer stand	17
key tronic	17.
Deluxe keyboard (KB 5151)	169
AT Converter (makes 5151 keyboards	. 00
work with AT)	12
Kraft	
-Joystick	35.
Executive Cursor Control (software)	27
Maynard Electronics	
Floppy Drive Controller	119.
Mouse Systems	
PC Mouse (w/software, pad. & PC Paint)	139.
Orchid Technologies	
All Orchid Boards come with PCnet Driv	
(Ram disk), PCnet spool (print spooling)	
disk caching & partitioning.	
Blossom 64k upgradeable to 384k, with	
clock calendar, serial and parallel ports	199
PCnet Daughter Board (piggybacks to	
Blossom) with version 3.0 networking	
software	call
PC Net (stand alone card)Paradise Systems	Call
Modular Graphics Card	275
-Multidisplay Card	195
5-Pack (ØK expandable to 384k) w/cloc	k
and serial port	
Princeton Graphics	
-HX-12 RGB monitor (690 x 240)	call
→MAX-12E Amber monochrome monitor	call
SR-12 RGB Monitor (690 x 480)	call
Scan (II) Board for SR-12	
Quadram	
Expanded Quadboard with clock calend	dar.
parallel, serial & game port, I/O bracket.	
and Quadmaster software.	
64k upgradeable to 384k	199.
384k (fully populated)	239.
Microfazer Printer Buffer (parallel) w/cop	y
MP 64 (64k) upgradeable to 512k	159.
-Quadcolor I	197
-Quadchrome RGB Monitor	469
SMA (Systems Management)	
PC-Documate Keyboard Templates	
available for:	
DOS/Basic 1.1 Supercalc 3	
DOS/Basic 2.0-2.1 Wordstar	
DOS/Basic 3.0-3.1 Wordstar 2000	
-Lotus 1-2-3 Turbo Pascal -Symphony -WordPerfect	
Multiplan (IBM) dBase II Multiplan (Microsoft) -dBase III	
Framework Multimate	
Volkswriter Deluxe eac	h 12
TOMOTHING DOUGLO	11 16

Tallgrass Technology TG 5025—25 meg hard drive w/controller and 60 meg backup unit	r call
Fr Co Printo	129 569
Joystick	35
DRIVES	
All floppy drives are completely pre-tested are supplied with a printout of the test res They are shipped with complete step-by- installation instructions. Drives are 320k/3	ults. step
Control Data (CDC) (5¼") half-height drive (DS.DD) (5¼") full-height drive (DS.DD) Free mounting bracket with each pair of half-heights. IOMEGA	89 99
	489
-10 Meg cartridge	48
Maynard Electronics	
Internal Hard Disk (10 Meg) with	797
WS-1 Controller Internal Hard Disk (10 Meg) with	191
	969
Tandon	505
TM 100-2 (51/4") full-height drive (DS,DD) 10 Meg Internal hard drive w/controller	109
	479
FD-55B (5½") half-height drive (DS.DD) Free mounting bracket with each pair of half-heights.	109

MEMORY

64k Memory Upgrade Set for IBM-PC	
or XT system board (9 chips)	\$8
64k Memory Upgrade Set for any memor	ry
board specify make of board (9 chips)	8
Install memory upgrades & run diagnosti	CS
at time of board purchase only	10
256k Memory Upgrade Set for any	
IBM-AT memory board (9 chips)	39
<u>128k Memory Upgrade Set</u> for IBM-AT	
System Board (18 chips piggybacked)	49
DICKC	
DISKS	
Fuji	
Disks for IBM-AT (96-TPI) Box of 10	39
MAXELL	
Disks for IBM-AT (96-TPI) Box of 10	45
Verbatim	
Datalife Disks SS/DD Box of 10	
→Datalife Disks DS/DD Box of 10	25
Disks for IBM-AT (96-TPI) Box of 10	47
Disk Drive Analyzer ∴	19
Flip Sort (holds 75 disks)	15
INFORMATION SERVICES	
IN ONWATION SERVICES	
Compuserve	

Compuserve Information Service
(includes subscription, manual, 5 hours of connect time, monthly publications)

Source Telecomputing

The Source (subscription & manual)

39

Hardware and software specials for junior.

IBM taketh, but JR. CONNECTION* still giveth away. Well, not quite giveth. But this month we do have two specials to keep PCjr owners in the money and in the action.

First, we're continuing to offer Microcom's ERA 2 internal 300/1200 baud error correcting modem for just \$259. It features auto answer/auto dial, menu driven communications software, owner's manual, and four year warranty. You'll be able to send and receive messages and files as fast as the big boys in blue with this package, designed specifically for the PCjr.

And, for those of you who missed out on our springtime FINANCIERjr. special, we once again are offering it for \$19. This is the program that tells you everything you ever wanted to know about your home finances, but were terrified to ask.

Whatever your junior add-ons/software needs (or to receive our complete pricelist full of junior-compatible products), call the junior experts at 800/IBM-jrPC or 603/446-7761.

1-800/IBM-jr PC Monday-Saturday 9:00-5:30

140WJ



The Cookie Cutter

Planning every step in the manufacturing process and constantly monitoring the implementation of those plans is crucial to the success of any manufacturing business. A worksheet model not only keeps track of the production line—it also gives you control over such critical items as inventory, yield, and expenses.

Ron Feldman

Manufacturing is the sometimes tortuous, always intricate art of transforming raw materials into finished goods. The principles of production apply to anything you're making. Whether your finished work is a chocolate chip cookie or a silicon chip, only the sophistication of the product itself changes. Whether you start with a pinch of flour or a grain of sand, your ingredients inevitably pass through a series of manufacturing stages, yielding products that are offered for sale and, ultimately, shipped to customers.

Keeping the production flow smooth is essential to efficient manufacturing. It not only satisfies your customers by enabling you to ship products on

schedule, it also provides the key to keeping costs down; you can optimize the use of materials, equipment, and labor while maintaining inventories at desired levels. The net result, of course, should be higher profits.

Although a PC may not be directly involved in manufacturing, the computer can be used to monitor production and inventories, to prevent delays and other problems, and to plan for changes in operations. This article presents a 1-2-3 worksheet, Cookie Cutter, that you can customize to meet your manufacturing needs. Working through the example will provide a clear idea of how 1-2-3 can be used to model and monitor any process. The tutorial assumes that you are familiar enough with 1-2-3 to move around the worksheet, format cells, enter formulas, and so on. Consult the 1-2-3 manual for assistance if you need it.

Cookie Cutter can easily be adapted for non-manufacturing businesses, such as warehouses and retail stores, that track inventory and work flow; it also functions in paperwork-intensive operations like insurance companies and banks.

Chip Off the Old Cookie

The manufacturing flow presented in our worksheet is a simplified model of chocolate chip cookie production. It was adapted from a more complex model used in my business, the manufacture of integrated circuits. The computer chip model is much larger than Cookie Cutter because of the many manufacturing steps that must be monitored.

116 October 1985



In adapting this model to your needs, begin by listing all the steps in your manufacturing process or work flow. Think of each step as a bucket: Units are dumped into it, something is done to them, and the results are poured into the next bucket. In the case of our chocolate chip cookie model, the major activities are making dough, cutting cookies, baking, packaging, counting, and shipping. Throughout this process, two primary types of information need monitoring: activities and inventory.

Essential information about activities includes the number of units processed in each step—how many go in and how many come out—as well as when transfer takes place.

Monitoring inventory requires tracking the units as they move through the process, particularly at work-in-process (WIP) steps (in which case they'll keep moving through the process) or static inventory steps (where they will stay until you send them on to the next step).

You also need to decide whether the worksheet will represent the monitoring of only one product or a variety of products. If you were a tire retailer, for example, you might divide your work flow into ordering, warehousing, and selling. You would then have to decide whether the worksheet would represent your entire stock, a specific make and model of tire, or something in-between, such as all tires made by a particular manufacturer, all tires of a certain size, or all tires for certain types of cars.

However you structure your manufacturing flow, this worksheet functions as if you were dealing in only one type of commodity; interpreting the data when that is not the case (as it rarely is) remains your managerial duty.

Building the Worksheet

For the purposes of this worksheet, the cookie-making process was divided into a six-step model.

Dough Making. Flour, sugar, milk, butter, chips, and other delectables are blended into cookie dough.

Cutting. Pounds of dough are formed and shaped into individual cookies.

Baking. In this "assembly" phase of the process, the cookies assume their final form.

Packaging. Baked cookies are inspected and wrapped for shipping.

Counting. Packaged cookies are counted immediately prior to shipping.

Shipping. The delicious morsels set off to see the world.

Four of these steps were divided into subordinate stages, explained in the cell-by-cell discussion of the worksheet that follows.

In setting up the worksheet, first enter its title in cell C1 (see Figure 1). As long as cells to the right of C1 remain blank, this title can be wider than the column. You can also include the current date, which you may have entered at the DOS date prompt before invoking 1-2-3. You can insert the system date in your



Each manufacturing step in this worksheet is slightly different, illustrating some possible variations.

worksheet automatically by entering @TODAY, in cell B1 for example, and formatting that cell by moving the cursor to cell B1 and typing /Range Format Date 2 < Enter > < Enter > . (The sample worksheet here displays only a keyed-in month as the date.)

The time periods for which you want to display plan activities and measure manufacturing performance run down the left side of the worksheet (column A). In this case, performance is tracked weekly; each Work Week's *planned activities* have a label (Plan 1 in cell A7, Plan 2 in A10, and so on). Those designations can refer to any time periods, so you needn't be confined to weeks; months, days, or hours work just fine.

Immediately below each Plan row is a row in which to enter *actual* data as it becomes available (Actual 1 in cell A8, Actual 2 in A11, and so on). The

5 PrevPlan 4 100 90 80 80 80 80 16 200 12 10 10 9 7 5 6 6 7 Plan 1 100 90 80 80 80 80 12 150 9 15 14 9 7 9 8 Actual 1 100 100 70 70 80 13 163 15 10 10 9 7 9 9 10 Plan 2 100 90 80 80 80 80 16 200 15 10 10 10 9 7 14 11 Actual 2 100 90 90 80 80 80 10 130 16 10 10 9 7 14 12 12 13 Plan 3 100 90 80 80 80 80 10 130 16 10 10 9 7 14 14 Actual 3 100 90 80 80 80 90 11 122 14 15 12 8 9 20 15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 80 80 80 80 80 80 80 80 80		-A-	-8-	-c-	-0-	-E-	-F-	-G-	-H-	-1-	-1-	-K-	-L-	-#-	-14-	-0-
3 Nork Week Lbs. WIP Lbs. Dough Lbs. Cookies Cookies Unbaked Cookies WIP Unpacked Packed Inventory's In (mix) Out (tbs.) In Cut* per Lb. [Cookies* In* (baking)*]Cookies* Cookies* OHE* Cookies* Cookies* OHE* Cookies* In* (baking)*]Cookies* Cookies* OHE* Cookies* Cookies* In* (baking)*]Cookies* Cookies* OHE* Cookies* In* (baking)*]Cookies* Cookies* OHE* Cookies* Cookies* In* (baking)*]Cookies* Cookies* OHE* Cookies* Cookies* OHE* Cookies* In* In* OHE* Cookies* In* In* OHE* Cook	1							IIING			BAKING-		IPACK	AGINGI	-COUNTING-	ISHIPPIN
5 PrevPlan 4 100 90 80 80 80 80 16 200 12 10 10 9 7 5 6 7 Plan 1 100 90 80 80 80 80 12 150 9 15 14 9 7 9 8 Actual 1 100 100 70 70 80 13 163 15 10 10 9 7 9 9 10 Plan 2 100 90 80 80 80 80 16 200 15 10 10 14 7 13 11 Actual 2 100 90 90 90 70 12 171 18 10 10 9 7 14 12 13 Plan 3 100 90 80 80 80 80 10 130 16 10 10 9 7 14 14 Actual 3 100 90 80 80 80 90 11 122 14 15 12 8 9 20 15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 18 Plan 1 100 90 80 80 80 80 80 16 200 22 10 10 9 7 27 16 Plan 4 100 90 80 80 80 80 80 16 200 20 10 10 11 8 26 18 19 Plan mtd 400 320 520 54 170 45	3 W															
6	4			(mix)		(lbs.)		Cut*	per Lb.	Cookies*	In*	(baking) *	Cookies*	Cookies*	OHE.	[Cookies
8 Actual 1 100 100 70 70 80 13 163 15 10 10 9 7 9 9 10 Plan 2 100 90 80 80 80 80 16 200 15 10 10 14 7 13 11 Actual 2 100 90 90 90 90 70 12 171 18 10 10 9 7 14 13 13 Plan 3 100 90 80 80 80 80 10 130 16 10 10 9 7 14 14 Actual 3 100 90 80 80 80 90 11 122 14 15 12 8 9 20 15 15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 16 200 20 10 10 11 8 26 19 Plan mtd 400 320 320 320 54 170 45 32	5 P	revPlan 4	100	90	80	80	06	16	200	12	10	10	9	7	5	5
8 Actual 1 100 100 70 70 80 13 163 15 10 10 9 7 9 9 10 Plan 2 100 90 80 80 80 80 16 200 15 10 10 14 7 13 11 Actual 2 100 90 90 90 70 12 171 18 10 10 9 7 14 15 12 8 10 10 90 80 80 80 90 11 122 14 15 12 8 9 20 15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 16 200 20 10 10 11 8 26 19 Plan mtd 400 320 320 54 170 45 32	7 PI	an 1	100	90	80	80	80	12		9	15	14	9	7	9	5
12		tual 1	100	100	70	70	80	13	163	15	10	10	9	7	9	3
12	0 P	an 2		90	80		80	16		15	10	10	14	7	13	4
15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 16 200 20 10 10 11 8 26 18 19 Plan mtd 400 320 320 520 54 170 45 32	2	tual 2				90			171				9	7		2
15 16 Plan 4 100 90 80 80 80 80 16 200 22 10 10 9 7 27 17 Actual 4 100 90 80 80 80 80 16 200 20 10 10 11 8 26 18 19 Plan mtd 400 320 320 520 54 170 45 32				90	80	08	80	10		16	10	10	9	11	21	3
18 19 Plan mtd 400 320 320 54 170 45 32	5						197							9		
18 19 Plan mtd 400 320 320 54 170 45 32				90	80	80	80			22	10	10	9	7	27	5
	8			90		80				20	10	10	11	8	26	5
								54						32		11
20 Actual mtd 400 320 320 52 163 45 31 21 Plan m 400 90 320 80 320 54 170 22 45 10 9 32 27				0.00		.55				1		51 35		31		10 11
21 Plan m 400 90 320 80 320 54 170 22 45 10 9 32 27	1 PI	an m	400	90	320	80	320	54	170	22	45	10	9	35	27	11

Figure 1: The Cookie Cutter manufacturing plan, showing both Plan and Actual data for all four weeks in July. The worksheet is designed so that production flow moves from the upper left to the lower right.

model requires a record of previous activities (whether actual or planned) from another worksheet, in this case the previous month's Work Week 4 (PrevPlan 4 in cell A5). The three summary rows at the bottom of the screen are particularly useful; here they include the month-to-date plan total (Plan mtd in cell A19), the month-to-date actual total (Actual mtd in A20), and the total month plan (Plan m in A21).

The manufacturing steps extend across the top of the worksheet from left to right, starting in column B. The number of columns used to track data for each step depends on the amount of detail you need; each manufacturing step in this worksheet is slightly different, illustrating some possible variations.

Figures 1 and 2 reflect a simplified plan, showing activities at each manufacturing step as 100-pound batches of cookie dough move through the production process each week. (Figure 1 represents the worksheet with data and results of calculations; Figure 2 shows all formulas.) Manufacturing activities begin in the upper left corner of the worksheet and flow diagonally to the lower right corner.

Ins and Outs

The first manufacturing step, labeled Dough Making, spans columns B, C, and D. In column B, titled Lbs. In, record your raw materials base for each week of the month (cells B7, B10, B13, and B16). In column D, Lbs. Out, record the acceptable amount of remaining dough projected for each week (cells D7, D10, D13, and D16).

The primary assumption in this plan is that 80 percent of each week's "Ins" become the next week's "Outs." Two other assumptions also apply. The first is the *yield loss* for the step: The missing 20 percent represents the number of units that are lost during the manufacturing process because of imperfect execution. The second is the *cycle time*—how long it takes for an In to become an Out (in this example, one week). The formula in cell D10 (Figure 2), +B7*0.8, finds the yield loss by calculating 80 percent of the dough put into the process at the beginning of the previous week. In reality, cycle times for many steps are much longer, in which case you will have to adjust the Outs by additional weeks.

Column C monitors inventory of the dough at a WIP stage, mixing. For any given week, the model assumes that inventory consists of the Ins for that week that are due out the following week. The model also stipulates that this phase of the manufacturing process is half completed, and therefore that the inventory has already sustained half of the total yield loss expected for the entire process. (That is, loss is assumed to occur evenly throughout the process

	-A-	-B- July	Cookie Cutter	r,-0-	-6-	-F-	-G-
	Work Week	Lbs.	DOUGH MAKING	Lbs.	Dough	Lbs.	Cookies
	PrevPlan 4	In	(mix)	Out	(lbs.)	In	Cut
	Plan 1	Y - 1	 +B7*(0.8+0.2/2)	+B5*0.8	+E5+D7-F7	+05	 +F7*H7/1000
	Actual 1						
	Plan 2	3	+B10*(0.8+0.2/2)	+B7*0.8	+E7+D10-F10	+07	+F10*H10/1000
	Actual 2						
	IPlan 3		+B13*(0.8+0.2/2)	+B1U*0.8	+E10+D13-F13	I+D10	+F13*H13/1000
	Actual 3						
	Plan 4		+B16*(0.8+0.2/2)	+B13*0.8	+E13+D16-F16	I+D13	+F16*H16/1000
	Actual 4						
	Plan mtd	+B7+B10+B13+B16		1+D7+D10+D13+D16		+F7+F10+F13+F16	+G7+G10+G13+G16
6 7 8 9 0	Actual mtd	+B8+B11+B14+B17	1	+D8+D11+D14+D17		1+F8+F11+F14+F17	+G8+G11+G14+G1
1	Plan m	+B7+B10+B13+B16	+C16	+D7+D10+D13+D16	+E16	+F7+F10+F13+F16	+G7+G10+G13+G1

Figure 2: A listing of all formulas and headings in the worksheet shown in Figure 1. This display of each cell's contents was prepared with The Spreadsheet Auditor from Consumers Software of Gilroy, California.

rather than in spurts.) The formula in cell C7, +B7*(0.8+0.2/2), calculates this WIP quantity; similar calculations are made in cells C10, C13, and C16.

The Outs for Dough Making become the Ins for the next step, Cutting. The model anticipates that the Lbs. Out from the previous week will go into Cutting; thus the entry in cell F7 is +D5. Entries in cells F10, F13, and F16 similarly refer to the previous week's Lbs. Out cell. In the transition between Dough Making and Cutting activities, the pounds out are located at an inventory point titled Dough (lbs.), which follows the basic inventory equation: Inventory equals beginning on-hand units (in this case, pounds of dough) plus Ins minus Outs. In cell E7 of Figure 2, for example, the formula is +E5+D7-F7; similar formulas are entered in the rest of the column.

Since Cutting is virtually instantaneous—cut dough immediately becomes cookies—the Outs occur in the same week as the Ins, and there is no WIP calculation. Because the Cutting yield is critical, column H displays the Cookies-per-Lb. yield; it is not buried in the equation for a cell, as was the 80 percent Dough Making yield. Thus, the entry in cell G10 is

+F10*H10/1000. (Dividing by 1000 expresses these values in thousands to simplify reading the worksheet; subsequent quantities of cookies are also expressed in thousands.)

By now, the principle of the worksheet should be apparent: The steps that require management decisions—such as determining how many units go into a certain step or what the Cutting yield ought to be—are numbers or values that must be keyed in. All other numbers in the worksheet are calculated according to the yield and timing assumptions built into worksheet formulas. (Whether or not you decide to use 1-2-3's Protect function to prevent you from accidentally writing over formulas in protected cells, it is helpful to unprotect cells requiring input.)

Baking Ins require a management decision and thus must be keyed in. The Unbaked Cookies column is therefore an inventory point (calculated in cells I7, I10, I13, and I16) that acts as a buffer between Cookies Cut and Cookies In (under Baking). The model assumes that Cookies Cut can become Cookies In during the same week, passing intact through the Unbaked Cookies inventory point. The cycle time in assembly is one week and the assumed total yield, 90 percent. Thus, like the WIP calculation used in Dough Making, the WIP (that is, the actual

-H-	-I-	-J-	-K-	-L-	-M-	-N-	-0-
Cookies per Lb.	Unbaked Cookies	BAKING Cookies In	WIP (baking)	p Unpacked Cookies	Packed	COUNTING Inventory OHE	SHIPPING Shipped Cookies
((G8/F8)*1000)	+15+G7-J7		+J7*(0.9+0.1/2)	+J5*0.9	 +L5*0.8	+N5+M7-07	
((G11/F11)+1000)	+17+G10-J10		+J10*(0.9+0.1/2)	+J7*0.9	+L7*0.8	+N7+M1U-010	
((G14/F14)*1000)	+110+G13-J13		+J13*(0.9+0.1/2)	+J10*0.9	+L10*0.8	+N10+M13-013	
((G17/F17)*1000)	+I13+G16-J16		+J16*(0.9+0.1/2)	+J13*0.9	+L13*0.8	+N13+M16-016	
((G19/F19)*1000) ((G20/F20)*1000) ((G21/F21)*1000)	and the second	+J7+J10+J13+J16 +J8+J11+J14+J17 +J7+J10+J13+J16		+L16	 +M7+M10+M13+M16 +M8+M11+M14+M17 +M7+M10+M13+M16		+07+010+013+016 +08+011+014+017 +07+010+013+016

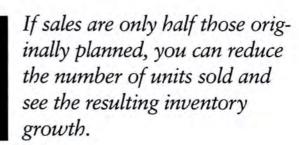
time in the oven) in cell K10 is expressed as the formula +J10*(0.9+0.1/2), with similar formulas in cells K7, K13, and K16.

For purposes of brevity, the model includes only one activity step for Packaging. In contrast to Baking, however, the Outs are displayed (in column M) because that data is the more significant management parameter for this step. The formula in cell M16, +L13*0.8 (and also in cells M7, M10, and M13) assumes an 80 percent yield, with the Unpacked Cookies inventory (column L) packaged the following week.

Because the model assumes that all inventory from the previous week gets packed, the Outs from Baking in any week equal the Unpacked Cookies in cells L7, L10, L13, and L16. Again, to conserve space in this worksheet, there is no Baking Outs column.

Packaged cookies either can be shipped immediately or can be entered into packaged Inventory. Shipped Cookies (column O) must be keyed in because shipping entails a crucial management decision. Like Unbaked Cookies in column I, the on-hand ending (OHE) column is a "buffer stock," consisting of the balance between Packed Cookies and Shipped Cookies; thus, the entry in cell N16 is once again the inventory equation + N13 + M16-O16. Obviously, when your buffer stock is depleted you experience product shortages.

The planned totals for the month entered in row 21, Plan m, of Figure 2 are straightforward. For the activity columns (B, D, F, G, J, M, and O), the formula in row 21 adds the four weeks. For the inventory columns (C, E, I, K, L, and N), the formula merely pulls the number from Work Week 4 in row



16, which, in addition to being the planned ending inventory for the week, is also the planned ending inventory for the month. Column H, which represents a yield, is different; while a yield was keyed in for each Work Week, the formula in cell H21 calculates the weighted average yield for the month. (The multiplication by 1000 in this formula offsets the division by 1000 in certain column G formulas.)

Once you've constructed your worksheet, go to cell B5 and set the Titles by requesting /Worksheet Titles Both. As you scroll around the worksheet, this command will keep the column and row labels in view. In addition, format the worksheet to display

only whole numbers by typing /Worksheet Global Format Fixed 0 < Enter > .

When manufacturing activities are continuous, you get a worksheet that is full of numbers, as shown in Figure 1. Filling in data from the previous month (row 5) is critical. Without that data, the model assumes nothing is designated for the later manufacturing steps until new manufacturing activity works its way through the process.

Putting the Matrix to Work

With all the formulas for the manufacturing model in place, you're now in a position to let it work for you. You'll soon find that the model helps with rigorous planning, in part because of the way it integrates inventory control into the manufacturing process. Given a starting point and the manufacturing assumptions built into the equations, you can perform an almost infinite number of "what if" analyses with this worksheet. By varying the data you can forecast the results of specific courses of action.

For example, if sales are only half those originally planned, you can reduce the number of units sold and see the resulting inventory growth. If you don't want to amass inventory, you can see the impact of trimming production by adjusting the number of units made. On the other hand, if sales double you can see how much your inventory will be depleted or how much raw material you'll have to plug into the manufacturing pipeline to avoid shortages. In addition, the cycle times built into the model demonstrate how changes to a given factor ripple through subsequent steps in the manufacturing process.

By expanding the worksheet to cover more than a single month you can perform long-range planning. Or, as in this model, you can set up a monthly worksheet and copy the Plan 4 data from each month (row 16) into the succeeding month's PrevPlan 4 category (row 5)—that is, copy June's Work Week 4 data into the July worksheet.

The worksheet is also designed to compare actual events to planned events. In Figure 1 you enter the Actual data for all four weeks (rows 8, 11, 14, and 17), except in column H, which calculates Cookies per Lb. based on the Ins and Outs in columns F and G. By comparing Plan and Actual data for each week, you can determine for each step in the manufacturing process whether you're exceeding the plan, falling short, or hitting it exactly. In Work Week 1, for example, you can see that the 70 Actual Lbs. Out is lower than the planned 80, while the 163 Cookies per Lb. is higher than the planned 150, resulting in more Cookies Cut and Unbaked Cookies than planned.

Given a starting point and the manufacturing assumptions built into the equations, you can perform an almost infinite number of 'what if' analyses with this worksheet.

Not only can you track events weekly; the bottom three rows of the worksheet enable you to monitor Actual month-to-date results (row 20) versus Plan month-to-date results (row 19), and weigh your progress against the total Plan for the month (row 21). For example, even though the Actual Lbs. Out total was 10 below the amount planned in Work Week 1, it was 10 above in Work Week 2, so the Actual month-to-date total of 320 (cell D20) is the same as the Plan month-to-date total (cell D19).

To obtain the right totals in row 19, the formulas must be adjusted each week when Actual figures are entered so the Plan month-to-date totals include the number of weeks for which Actual figures have been entered. For example, the formula in cell D19 calculates the total planned for all four weeks, because the Actual figures for all four weeks have been entered. If only the first three weeks of Actual figures had been completed, however, the formula in cell D19 would have to be changed to add the Plan

figures for only the first three weeks. This formula would then read +D7+D10+D13. It is possible to adjust formulas automatically with a lookup table, but that operation is beyond the scope of this worksheet exercise. Moreover, adjusting the formula manually forces you to compare the Plan and Actual figures.

The formulas that require this adjustment are in cells B19, D19, F19, G19, J19, M19, and O19. Like the entry in cell H21, H19 calculates the planned weighted average Cookies per Lb. to date. (Note that row 20 doesn't need to be adjusted each week; it totals the activities in all four weeks, which are zero for the weeks that have not yet been entered.) No entries are made in rows 19 and 20 for the inventory points since that information is readily available on the appropriate Work Week line. Remember that inventory already represents a total.

Remaking the Model

To get a feel for this sample worksheet, consider reproducing it as is, then varying some of the data. The model's value will truly hit home when you start modifying and expanding it to realistically represent your situation.

In my own work, for example, I segment the manufacturing process into three times as many steps, create rows for the three months in a fiscal quarter, and use worksheets for two or more consecutive quarters. In a separate section I also expand on the inventory, multiplying beginning and ending inventories for each period by standard values in order to calculate planned dollar and unit inventory changes.

By updating the worksheet with the Actual figures and modifying future plans on an ongoing basis in response to changes in sales and manufacturing conditions, you can use this model as a potent management tool for guiding actions today that will meet your goals tomorrow.

Ron Feldman is a senior financial analyst with Advanced Micro Devices in Sunnyvale, California.

1-2-3
Lotus Development Corp.
161 First St.
Cambridge, MA 02142
617/494-1270
List price: \$495
Requirements: 192K, two disk drives
Copy protected





PBX: The Network Switch

Discover the PBX, that ubiquitous office machine in control of your phones. It just might be the answer to making PCs even more conversant.

John A. Merritt

You hold the phone casually to your ear and punch a few numbers. A pause, a slight click, then a tone. It stops, starts again, then is interupted by a voice: "Hello?" It's your secretary and you ask if a report is ready for the morning staff meeting. Not a very exciting process? Think again. From the phone on your desk to the one on your secretary's, your voice travels a circuitous route

through some minor technological marvels. One leg of that journey is through a bulky box known as a Private Branch Exchange, or PBX, the central controller and switching coordinator of your office's autonomous phone system (see Figure 1).

Today's PBX is more than a silicon version of tin cans and string. With the right hardware and software your secretary could transmit the report to desk-bound meeting participants sitting in front of their PCs over a route similar to the one your voice traversed just seconds earlier. This knack for transmitting both voice and data has elevated the PBX from ungainly intercom manager to ungainly-but effective-complement to local area networking. Anyone planning to electronically strap PCs together should get acquainted with the PBX.

Originally designed to replace human switchboard operators for office phone systems, PBXs are getting faster and more in tune

with the world of PC communications. Although the new automated PBX has the ability to provide PC-to-PC communications, its major role may be that of arbitrator, acting as a common link among a variety of proprietary local area networks. Before thrusting your company into a PBX pigeonhole, consider the nature of the beast.

Whither PBX? A PBX is essentially an automated switchboard, an electronic bridge between two phones. In an office, phone calls circulate through the PBX over companyowned lines, while calls placed to the outside world are handed over by the PBX to one of Ma Bell's orphaned public phone systems. Of course, PBXs do more than simply connect phones. Under microprocessor control, they can route, track, and account for calls; permit automatic redialing; provide call forwarding, holding, and transferring; and decide whether MCI, Sprint, or some equivalent is the cheapest long-distance service

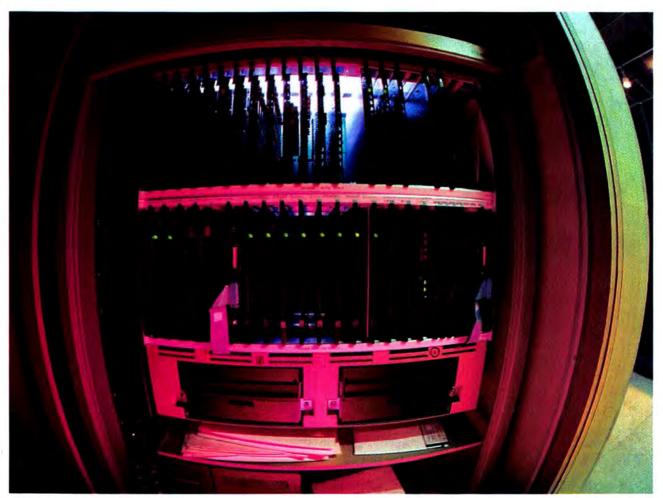


Figure 1: Ungainly but multitalented, the Saturn PBX from Siemens is a fully digital, solidstate PBX that handles phones and PCs with equal ease.

for outgoing calls. Better still, within the heart of new PBXs are many of the capabilities for PC-to-PC communications that are provided by local area networks.

All PBXs consist of five basic elements: system control, switching matrix, cabling, trunk interfacing, and telephones—and now PCs (see Figure 2). In the days of the horse-and-buggy switchboard, human operators were the *system control*, recognizing which telephones needed to communicate and manually making the necessary connections.

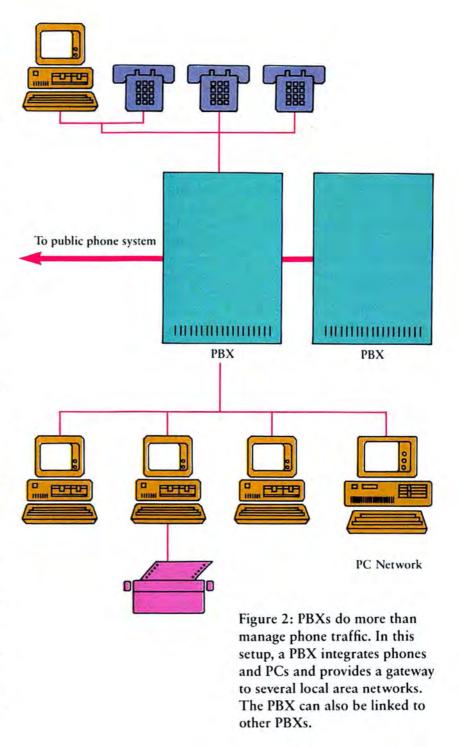
The switching matrix is the physical and electrical medium that links phones or PCs. In older setups the matrix was a central panel attached to the wires emanating from each phone. An operator would connect two phones by plugging one line into the appropriate socket connected to the other phone. When a phone was hung up, the circuit was broken by an operator pulling out a plug or flipping a switch.

Solid-state microprocessorcontrolled PBXs, of course, automate this entire process. Instead of operators, the PBX's time- and frequency-division techniques regulate connections between phones attached to the PBX. With time division, a PBX essentially allots a certain amount of time to each phone in use, transmitting conversations in precise dollops at lightning-fast speeds over the appropriate lines.

Instead of switching back and forth between phones, frequency-division techniques assign a unique frequency to calling and receiving phones. Thus, a number of calls can be routed through the PBX over one line, each conversation segregated by frequency.

Cabling is the PBX's physical wiring scheme. The wire strung between phone sets and the PBX is called twisted pair cabling, because it consists of two intertwined parallel strands of copper wire coated in plastic. When a PC is directly connected to a PBX, two extra twisted pairs are required to handle incoming and transmitted data. Trunk interfacing connects one elephantine PBX to another PBX, the public telephone network, or other long distance lines.

The most recognizable element of a PBX, of course, is the telephone. Originally a much more humble, single-line creature, Bell's firstborn has kept up with our high-tech times. Contemporary telephones are almost as programmable as PCs and come with an array of special function keys that let you forward calls, pick up calls on another line, automatically redial numbers, and perform a number of other functions.



The PBX Family Tree The current crop of PBXsoften labelled "third generation"lays claim to a formidable heritage. The first generation of PBXs, mostly installed before 1975, are human-controlled, electromechanical devices that transmit only sound. Second generation PBXs replace the army of human operators with software and microprocessors. These PBXs provide all manner of telephone conveniences but are similarly confined to transmitting sound. Hitching a PC to a first or second generation PBX requires a modem to convert the PC's digital output into analog signals and back again.

Technology, of course, marches on. Several vendors have unveiled PBXs that are true digital devices. These third generation machines can hook up directly to PCs, networks, terminals, printers, disk drives, and so on with special interface boards that replace modems. PC-to-PC communications in a PBX is not unlike that in a LAN. PCs can share files with one another, swap electronic mail, or transmit documents to a workstation that has a printer. A PBX also has a far greater reach than most LANs-workstations on a PBX can be literally miles apart.

Some PBX makers are discovering that blurring the distinctions

between the phone and the PC can be a profitable undertaking indeed. One notable example is the Cedar workstation from IBM subsidiary Rolm (see Figure 3). The Cedar incorporates a touch-tone phone in an IBM PC-compatible computer that plugs into Rolm's PBX. You can dial up a remote online data base, send a file to another Cedar or PC in the office. and call your stockbroker, all at the same time. Similar products from compatibles upstart Compag and communications giants GTE and Northern Telecom are also elbowing into the market; other PBX vendors are likely to follow their lead. But can the PBX replace the LAN? It depends on who you talk to.

In This Corner...
Pitting PBXs against local
area networks doesn't always yield
conclusive results. LANs are better
at high-speed, short-haul networking; PBXs, at long-distance linkups. The degree to which LAN



Figure 3: A PC for the PBX. Rolm's compatible machine runs most off-the-shelf software for the IBM PC and offers a phone to boot.

and PBX technologies may converge is still a function of market pressures. Industry-watcher Greg Carlsted of Dataquest contends that PBXs and local area networks will continue to have different roles for at least three to five years. "New PBXs are beginning to act like high-speed local area networks," says Carlsted, but their reliability has yet to be demonstrated in the helter-skelter world of office communications.

Although attaching PCs to a PBX requires only the appropriate expansion boards, easily and quickly sharing data stored on a hard disk (called a file server) presents some serious obstacles. Scott Wolf, data PBX product manager for Gandalf Technologies, notes that using a file server on a PBX poses few problems—unless, of course, you have two or more users simultaneously trying to get at data on that drive.

"Users are always contending for data in a networking environment," says Wolf, "but unfortunately, file servers must be attached to a PBX via a serial port. Users get access to the disk on a first-come, first-served basis. It's not a very attractive approach to sharing data." Solutions for getting around this bottleneck are in the works. Meanwhile, Wolf bluntly notes that "a PBX is no replacement for a LAN. But it can be a natural gateway for all kinds of networks."

PBX to Order As the PC has evolved from office novelty to necessity, canny PBX makers have dreamt up schemes that make their product more attractive. PCs are typically scattered throughout a company, each coterie often tied together in a LAN and dedicated to a single application such as word processing or financial analysis. In an attempt to accommodate the variety of needs found in most organizations, PBX designers are decentralizing the PBX-a radical break with the everything-in-onebox approach of earlier generations.

Since each distributed PBX controls a small area, such as one floor or building, it can be customized easily. A PBX in a data processing department might be set up to simultaneously control phones and link a network of PCs to a mainframe computer; another PBX might be connected to dot matrix and letter quality printers for a word processing department. A sales group might need only voice functions. In short, a company adds only those functions it

needs and can afford. Decentralizing has another bonus: A company-wide PBX failure is virtually impossible.

Keep in mind that these fourth generation PBX networks are not yet in mass production. The majority of PBXs sold today use second and third generation technologies.

Buy or Wait? Before the arrival of third generation PBXs, local area networks were the only option for PC communications in the office. Even with the introduction of newer PBX technology, local area networks may still be the best choice in many situations. As Don Glynn, communications consultant for John Hancock Mutual Life Insurance Company, points out, "Sometimes you need to share data and devices extensively within a given department, but there is little or no need to share interdepartmentally, which makes the cost of a sophisticated PBX hard to justify."

Making the PC-to-PBX connection also fattens the price tag. Slipping a PC onto a local area network can cost anywhere from \$695 to \$1100; the equivalent PBX hookup can be as high as \$1200, particularly when more PCs are added to the system.

Software is equally crucial and costly in a successful networking scheme. Local area network software—operating systems, data bases, word processors, and the

like—is expensive and embryonic. Software developers, finally lured into the networking market by IBM's PC Network, are devoting their energies to multiuser programs for that LAN. Not surprisingly, PBX development has lagged. Only companies that can sustain the expense, such as AT&T and Northern Telecom, have created PBX-based programs.

If your company already uses a PBX or has a crushing need to control both interoffice voice and data, a mix-and-match approach may provide the most expedient and cost-effective networking solution. There's little doubt that future voice and data PBXs will increasingly encroach on the turf local area networks have staked out. The PBX promise is great, but only time in the real world will determine if it will take over the PC's networking reins—or share them.

■

John A. Merritt is president of Merritt Communications of Natick, Massachusetts, and a freelance writer concentrating on microcomputer communications.

World Class PC

Christine Whyte



ineteen eighty-five may be remembered as the year of the shakeout in the computer industry. Not a few companies—both well-known and fledgling-gave up the ghost or teetered precariously on the edge of the Chapter 11 abyss. But many others with widely popular products, such as Lotus Development and Ashton-Tate, vigorously defended their positions as industry leaders. Public confidence in these battlescarred survivors remains strong year after year, as the results of the third annual World Class PC contest clearly demonstrate. This year's contest also welcomes several newcomers to the ranks of World Class winners-those who dared to gamble on innovation instead of imitation, and won.



In the March 1985 issue, *PC World* asked readers to vote in each of 38 hardware and software categories for one product that was tops in performance and value. With a few notable exceptions, the winners' circle is crowded with familiar faces. Given the here-today, gone-tomorrow nature of this industry, it seems that most *PC World* readers (and likely most *PC* users) are playing it safe and sticking to what they know and, presumably, like. Contrary to the frantic pace so alluring to industry insiders, buyers are seduced by stability rather than the newest trend on the block. To scale the heights and woo buyers away from the tried and true, a product must be clearly superior or unique.

World Class Prizes

For the first time, the World Class PC contest awards winning products to four (instead of two) lucky individuals whose contest entry forms were selected from among thousands in a random drawing by *PC World* Publisher David Bunnell. Each year the contest has expanded to include more product categories, consequently boosting the contest's total prize value.

The 1985 World Class PC contest grand prize, worth \$29,210.45, consists of a PC AT, the readers' favorite desktop computer, plus the winning peripherals and software in 33 categories spanning everything from modems and hard disks to spreadsheets and word processors. The only unawarded product is the favorite local area network. This new category was included to discover reader preference and level of interest, which turned out to be surprisingly low.

Second prize is the Compaq Portable Computer, voted the most popular transportable computer. Awarded as third prize is the most acclaimed lap-size computer (not required to be PC compatible to receive votes), the Data General/One, which probably topped the list because of its sophisticated features and high PC compatibility.

Fourth prize is the most popular under-\$1200 recreational computer used at home or at school (again, not required to be PC compatible). Not surprisingly, the only PC-compatible home computer, the PCjr, won in this category even though IBM stopped production of the machine about the time the contest was announced.

PC World congratulates all the hardware and software manufacturers whose products were named as 1985 World Class winners. Although reader votes should not be construed as endorsements of the winning products by PC World, they do signify the readers' seal of approval.

Luck of the Draw

as David Bunnell reaches into the revolving bin of contest entry forms; the neon flashes—Anotha Winna!

The grand-prize winner is Joseph R. Decillis of Newark, Delaware, who pinched himself and called *PC World* back an hour after receiving the news, just to make sure he hadn't dreamed the whole thing. As general manager for a footwear wholesaler, Mr. Decillis uses *dBASE III* and *SuperCalc 3* to produce management reports on cash flow, cost analysis, and inventory control. Since he does not own a PC, he was thrilled at his good fortune.



To scale the heights and woo buyers away from the tried and true, a product must be clearly superior or unique.

Ron Schwebs of Deltona, Florida, won the second prize, a Compaq Portable Computer. He does BASIC programming as a research analyst for a county agency and is delighted that he can now get some work done at home (we won't hold him to his word).

Third-prize winner of the Data General/One is Vincent S. Vitali of Lombard, Illinois. He provides technical support and recommends hardware and software purchases for his health care administration company. Charles T. Dick of Cincinnati, Ohio, won the fourth prize, a PCjr. He hopes his two young children will enjoy PC educational and games software, most of which runs on the Jr.

Products on Parade

In addition to the winning product for each hardware and software category, the following tables list products that received a significant number of votes. Each product's percentage of the total votes cast in its category is reported. The "Others" entry notes the combined percentage for all products that failed to receive at least two percent of the votes (with one exception in the Financial Modeling category). The percentage of respondents who voted in each category presumably indicates reader experience with or interest in that kind of product.

The World Class PC contest added 10 new soft-ware categories this year for a whopping total of 23. *PC World* created the Integrated category to accommodate the large number of programs introduced since last year's contest that provide several applications in one package. *Symphony* is the winner, and the ever-flexible 1-2-3 follows in second place. The third-, fourth-, and fifth-place products–*Framework*, *Enable*, and *The Smart System*–are all successful newcomers.

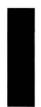
Although *PC World* added a Project Management category to reflect that new, prolific breed of software, last year's Business Management winner—*Harvard Project Manager*—crossed over to outdo the many newcomers. This program was among the first of its kind for the PC, and evidently our readers think it's still the best.

Two new Investment products share the limelight in the contest's first-ever tie: *Dow Jones Market Manager Plus* and *Andrew Tobias' Managing Your Money*. The former replaces last year's winning *Dow Jones Investment Evaluator*, which received votes this year even though it is no longer on the market. The multifaceted *Andrew Tobias' Managing Your Money* also wins in Personal Management (it does budgeting) and places third in the Tax Planning category.

PC World defined the Financial Modeling category with dedicated financial modeling programs in mind, including those descended from mainframe

forebears. Surprisingly, only one product fitting this narrow definition received a significant number of votes—*Micro/Prophit* from Via Computer. Again, our readers prefer to stay with familiar products and stretch them to fit any application.

The new Tax Planning or Preparation category spotlights a successful but not-so-new product: *Tax Preparer* from HowardSoft. The Decision Making category was created in response to a new crop of



Borland International's Side-Kick shows that a new idea at the right price is often unheatable.

programs that turn the PC into a consultant able to rank in importance the elements in a project. Interestingly, none of these specially designed products, such as *Lightyear* from Lightyear, Inc., received a significant number of votes. Instead, we found that PC *World* readers largely use humbler decision support software such as 1-2-3 and *ThinkTank* for plotting corporate courses.

Borland International's *SideKick* easily won the Desktop Manager derby by ten lengths—which shows that a new idea at the right price is often unbeatable.

This year *PC World* created a new category, Training, for application tutorials. The favorite is *ATI's Training Power Series*, which won in the Education category last year.

Another Borland International product, Turbo Pascal, created a big upset in the Language category by leaving last year's first-place product, IBM BASIC, in the dust. As a structured language, Pascal has long been a favorite in academia, but Turbo Pascal's crossover into mainstream prominence is attributable to its speed, ease of use, and affordability. True BASIC, a new structured version of BASIC from the language's originators, John Kemeny and Thomas Kurtz, may turn the tide and revive academic and

general interest in this language. Watch next year's World Class PC contest for BASIC progeny.

PC-Draw squeaks by with the blue ribbon in a new Graphics category for drawing programs, with three other products in hot pursuit. *PC-Draw* is an old-timer compared to the new generation of painting programs and, unlike them, does not "draw" its inspiration from *MacPaint*'s screen design.

The Applications Integrator category, which highlights software that integrates off-the-shelf applications, shows IBM's *Top View* as the favorite. (*Microsoft Windows* was not on the market until well



1-2-3 deserves a round of applause for winning in no less than four categories.

after the contest entry deadline.) Two products that don't exactly fit—*Framework* and *SideKick*—may have received votes because the former can, in certain circumstances, incorporate off-the-shelf applications, while the latter lets you cut and paste data between applications.

Two Communications products have traded first and second places every year of the contest. Crosstalk XVI, first-place winner in 1983 and runner-up last year, has regained World Class status by beating out its major competitor, Smartcom II; PC-Talk III remains nestled in third place. Since the World Class PC contest began, no other program has come close to challenging these three favorites.

1-2-3 deserves a round of applause for winning in no less than four categories: Spreadsheet, of course, Business Graphics, Financial Modeling, and Decision Making. In Word Processing, *WordStar* still holds a strong lead against stiff competition from at least three other popular programs: *MultiMate*, *WordPerfect 4.0*, and *Microsoft Word*.

PC World added four new hardware categories to this year's contest: three types of computers and Local Area Network. Aside from these new categories, the 1985 hardware winners are the same as last year's with only two exceptions. The first is in the Color Graphics Board category, where the Hercules Color Card pushes last year's winner, the IBM Color/Graphics Adapter, into second place.

The second newcomer to the ranks of World Class PC hardware winners is the Iomega Bernoulli Box, which received the most votes in the Hard Disk Storage category although it does not use rigid disk media. The most popular Iomega unit consists of two 10MB removable cartridges—each containing an 8-inch floppy disk—housed with a power supply in a system unit. Additional cartridges can be purchased for unlimited, removable storage. The Iomega Bernoulli Box is reputedly as fast as if not faster than a conventional hard disk drive, more reliable (virtually immune to head crashes and data damage), and simpler to back up.

Since the contest had no category for alternate storage media such as the Bernoulli Box, *PC World* decrees two winners in the Hard Disk Storage category. The other winner is the hard disk drive receiving the most votes—the Tallgrass TG-3020.

Be sure to look for the 1986 World Class PC contest announcement and entry form in a future issue of *PC World*. It's your opportunity to express yourself and take a shot at winning valuable prizes.

Christine Whyte is the Product Review Editor for PC World.

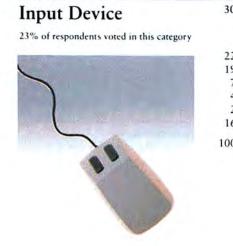
134 October 1985

	% of Votes	Product, Manufacturer
Desktop Computer 94% of respondents voted in this category	40	IBM PC AT, <i>IBM</i> Entry Systems Division, P.O. Box 1328, Boca Raton, FL 33432 800/447-4700, 800/447-0890 Alaska and Hawaii, 800/322-4400 Illinois List price: \$4090 (basic system with 512K)
	21	IBM PC, IBM
2 mg	18	IBM PC XT, IBM
	6	Compaq Deskpro (no hard disk), Compaq Computer Corp.
THE ACCOCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	5	Compaq Deskpro (hard disk), Compaq Computer Corp.
THE CONTRACT OF THE PARTY OF TH	100	Others Total
T 11	42	Compaq Portable Computer, Compaq Computer Corp.
Transportable Computer	42	20555 FM 149, Houston, TX 77070, 713/370-0670 List price: \$2699
66% of respondents voted in this category	36	Compaq-Plus Portable Computer, Compaq Computer Corp.
	11	IBM Portable Personal Computer, IBM
	7	Sr. Partner, Panasonic Others
	100	Total
A Manusconson and a Manusconso		
Lap-Size Computer 54% of respondents voted in this category	69	Data General/One, Data General Corp. 4400 Computer Dr. MS E132, Westboro, MA 01580, 617/377-8911 List price: \$3495
	17	HP 110 Portable, Hewlett-Packard
	5	Model 100, Tandy Corp.
	2	Model 200, Tandy Corp.
	2	GRiD Compass, GRiD Systems Corp.
	5 100	Others
The second second	100	Total
Recreational Computer	47	IBM PCjr, <i>IBM</i> 1000 N.W. 51st St., Boca Raton, FL 33432, 800/222-PCJR
48% of respondents voted in this category		List price: \$1124
	15	Apple IIC, Apple Computer, Inc.
	12	Commodore 64, Commodore Electronics, Ltd.
	6	Apple IIE, Apple Computer, Inc.
	5 15	Macintosh, Apple Computer, Inc. Others
Unitarie	100	Total
Westernamen Westernamen		

	% of Votes	Product, Manufacturer
Color Monitor 60% of respondents voted in this category	26	HX-12, Princeton Graphic Systems 601 Ewing St., Bldg. A, Princeton, NJ 08540, 800/221-1490 List price: \$695
	23 21 7 23	IBM Color Display, IBM SR-12, Princeton Graphic Systems IBM Enhanced Color Display, IBM Others
	100	Total
Hard Disk Storage	26	Iomega Bernoulli Box, <i>Iomega Corp.</i> 1821 W. 4000 S, Roy, UT 84067, 801/778-1000 List price: \$3695,20MB dual-drive model (not pictured)
36% of respondents voted in this category	10	Tallgrass TG-3020 (20MB/20MB tape), Tallgrass Technologies 11100 82nd St., Overland Park, KS 66214, 913/492-6002 List price: \$3395
	8	Tallgrass TG-3012 (12MB/20MB tape), Tallgrass Technologies
AND DESIGNATION OF THE PARTY.	8	PCi10, Maynard Electronics
	7	IBM PC 10M Fixed Disk Drive, IBM
	7 5	PC10, Qubié Distributing Sysgen XL, Sysgen Inc.
	29	Others
	100	Total
Printer—Dot Matrix 82% of respondents voted in this category	18	FX-100, Epson America, Inc. 2780 Lomita Blvd., Torrance, CA 90505, 213/539-9140 List price: \$699
No.	10	LQ-1500, Epson America, Inc.
gunnamununungg	10	P1351, Toshiba America, Inc.
	9	FX-80, Epson America, Inc.
	8	Microline 92, Okidata Microline 93, Okidata
	5	Omni Series Model 855, Texas Instruments, Inc.
-	4	RX-80, Epson America, Inc.
	28 100	Others Total
Printer– Letter Quality	20	NEC Spinwriter Model 3550, NEC Information Systems, Inc. 1414 Massachusetts Ave., Boxborough, MA 01719, 617/264-800 List price: \$1440
56% of respondents voted in this category	19	Hewlett-Packard LaserJet, Hewlett-Packard
and the second s	9	Quietwriter, IBM
THE STATE OF	9	Model 630 ECS, Diablo Systems, Inc.
	6	NEC Spinwriter Model 8850, NEC Information Systems, Inc. Wheelprinter, IBM
	4	Starwriter F10 Daisywheel, C. Itoh Electronics, Inc.
16.	28	Others
	100	Total
E		

	% of Votes	Product, Manufacturer
Modem	40	Smartmodem 1200, Hayes Microcomputer Products, Inc.
		P.O. Box 105203, Atlanta, GA 30348, 404/449-8791
68% of respondents voted in this category		List price: \$599
	34	Smartmodem 1200B, Hayes Microcomputer Products, Inc.
noof.	8	Smartmodem 2400, Hayes Microcomputer Products, Inc. PC212A, Qubié Distributing
	5	Smartmodem 300, Hayes Microcomputer Products, Inc.
I management	2	1200 Plus, Ven-Tel, Inc.
(B)-sixes	2	ProModem 1200, Prometheus Products
_	6	Others
	100	Total
Plotter	60	HP 7475A Plotter, Hewlett-Packard
1 lotter		16399 W. Bernardo Dr., San Diego, CA 92127, 619/487-4100
24% of respondents voted in this category		List price: \$1895
	17	HP 7470A Plotter, Hewlett-Packard
	6	IBM 7372 Plotter, IBM
	5	Colorwriter, Gould
	4	HIPLOT DMP-40 Plotter, Houston Instrument
	8	Others
	100	Total
Color Graphics	26	Hercules Color Card, Hercules Computer Technology, Inc. 2550 Ninth St., Berkeley, CA 94710, 415/540-6000
Board		List price: \$245
7.7.3	22	
49% of respondents voted in this category	22 11	IBM Color/Graphics Adapter, IBM IBM Enhanced Graphics Adapter, IBM
	10	Graphics Master, Tecmar
	4	Colorplus, Plantronics Enhanced Graphics Products
LICOCULEO	4	Quadcolor I and II, Quadram Corp.
HERUII FC I	4	IBM Professional Graphics Adapter, IBM
ColorC	19	Others
convicand	100	Total
Combination Board	52	SixPakPlus, AST Research, Inc.
Combination Board 62% of respondents voted in this category	-	2121 Alton Ave., Irvine, CA 92714, 714/863-1333 List price: \$895 (with 320K)
	13	Expanded Quadboard, Quadram Corp.
-	6	Advantage!, AST Research, Inc.
	5	MegaPlus II Multifunction RAM Board, AST Research, Inc.
	5 19	Captain, Tecmar Others
	100	Total

tsworth, CA 91311, 818/993-6644
1
M

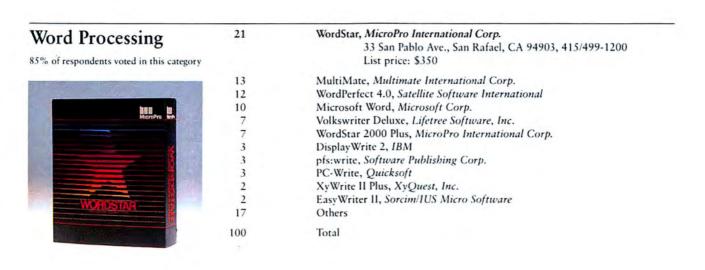


30	Microsoft Mouse, Microsoft Corp. 10700 Northup Way, Bellevue, WA 98004, 206/828-8080 List price: \$195
22	KB5151 Deluxe IBM PC Keyboard, Key Tronic Corp.
19	PC Mouse, Mouse Systems Corp.
7	IBM PC Keyboard, IBM
4	KoalaPad Touch Tablet, Koala Technologies Corp.
2	IBM PC AT Keyboard, IBM
16	Others
100	Total

Local Area Network 23		EtherSeries, 3Com Corp. 1365 Shorebird Way, Mountain View, CA 94043, 415/961-960
16% of respondents voted in this category		List price: \$3295 (four-PC configuration)
	19	PCnet, Orchid Technology
	9	Omninet, Corvus Systems, Inc.
	9	Netware/S-Net, Novell, Inc.
	7	PC Network, IBM
	7	PC Net II, AST Research, Inc.
	3	Net/One, Ungermann-Bass, Inc.
	23	Others
	100	Total

% of Votes Product, Manufacturer Spreadsheet 71 1-2-3, Lotus Development Corp. Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142, 78% of respondents voted in this category 617/577-8500 List price: \$495 8 SuperCalc 3, Sorcim Corp. Multiplan, Microsoft Corp. 6 Symphony, Lotus Development Corp. 8 Others 100 Total

Data Base-Major 52 dBASE III, Ashton-Tate 10150 W. Jefferson Blvd., Culver City, CA 90231, 213/204-5570 60% of respondents voted in this category List price: \$695 16 dBASE II, Ashton-Tate R:base 4000, MicroRim, Inc. 4 Knowledgeman, Micro Data Base Systems, Inc. 3 Revelation, Cosmos, Inc. Cornerstone, Infocom, Inc. 16 Others 100 Total



	% of Votes	Product, Manufacturer
Communications 50% of respondents voted in this category	34	Crosstalk XVI, Microstuf, Inc. 1000 Holcomb Woods Pkwy. #440, Roswell, GA 30076, 404/998-3998 List price: \$195
	26 21 2 17	Smartcom II, Hayes Microcomputer Products, Inc. PC-Talk III, The Headlands Press, Inc. Relay, VM Personal Computing Others
CROSTNI -	100	Total
Graphics—Business 28% of respondents voted in this category	21	1-2-3, Lotus Development Corp. Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142 617/577-8500 List price: \$495
	14	Microsoft Chart, Microsoft Corp.
	13	ChartMaster, DecisionResources
grantited (a)	6	Symphony, Lotus Development Corp.
74	6	pfs:graph, Software Publishing Corp.
	4	Energraphics, Enertronics Research, Inc.
The same of the sa	36	Others
Ingualitati Correct (carrier (carrier (carrier) (carrier	100	Total
Integrated	32	Symphony, Lotus Development Corp.
43% of respondents voted in this category		Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142 617/577-8500 List price: \$695
	23	1-2-3, Lotus Development Corp.
Symphony 1	22	Framework, Ashton-Tate
	7	Enable, The Software Group
	4	The Smart System, Innovative Software, Inc.
	12	Others
	100	Total

	% of Votes	Product, Manufacturer
Accounting 25% of respondents voted in this category	16	Peachtree's Business Accounting System, Peachtree Software, Inc. 3445 Peachtree Rd. NE, Atlanta, GA 30326, 800/554-8900 List price: eight modules \$4760, each module \$595
Rightree	9 8 8 6 5 48 100	Easy Business Accounting Series, Sorcim/IUS Micro Software BPI Systems Business Accounting Software, BPI Systems Open Systems Accounting Software, Open Systems Solomon III, TLB, Inc. RealWorld MBSI Accounting Software, RealWorld Corp. Others Total
Project Management 18% of respondents voted in this category	46	Harvard Project Manager, Harvard Software, Inc. 521 Great Rd., Littleton, MA 01460, 617/486-8431 List price: \$395
	26 8 20	Microsoft Project, Microsoft Corp. Project Scheduler 5000, Scitor Corp. Others
	100	Total
Investment 11% of respondents voted in this category	17	Dow Jones Market Manager Plus, <i>Teleware, Inc., and Dow Jones & Co., Inc.</i> P.O. Box 300, Princeton, NJ 08540, 800/257-5114 outside New Jersey, 609/452-1511 List price: \$249
	17	Andrew Tobias' Managing Your Money, MECA 285 Riverside Ave., Westport, CT 06880, 203/222-1000 List price: \$199.95 (Pictured under Personal Management)
DowJones	7 59	Dow Jones Investment Evaluator, Dow Jones & Co., Inc. Others
Tarking out	100	Total

Winning Products for the World Class PC Contest

	% of Votes	Product, Manufacturer
Financial Modeling 16% of respondents voted in this category	41	1-2-3, Lotus Development Corp. Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142 617/577-8500 List price: \$495
LONGS 123	14 4 3 3 1 34 100	Symphony, Lotus Development Corp. Dow Jones Market Analyzer, Dow Jones & Co., Inc. PC/Professional Finance Program II, Best Programs, Inc. TK!Solver, Software Arts, Inc. Micro/Prophit, Via Computer, Inc. Others Total
Tax Planning or Preparation	31	Tax Preparer, <i>HowardSoft</i> 8008 Girard Avc. #310, La Jolla, CA 92037, 619/454-0121 List price: \$295
18% of respondents voted in this category	27 6 36	PC/TaxCut, Best Programs, Inc. Andrew Tobias' Managing Your Money, MECA Others
TAX PREPARER	100	Total

Data Base–Index File 36% of respondents voted in this category	20	pfs:file, Software Publishing Corp. 1901 Landings Dr., Mountain View, CA 94043, 415/962-8910 List price: \$140
	15	PC-File, Jim Button
	10	1-2-3, Lotus Development Corp.
	9	dBASE III, Ashton-Tate
nis:	5	dBASE II, Ashton-Tate
Fofile	41	Others
	100	Total

% of Votes Product, Manufacturer **Decision Making** 16 1-2-3, Lotus Development Corp. Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142, 8% of respondents voted in this category 617/577-8500 List price: \$495 15 ThinkTank, Living Videotext, Inc. 7 Framework, Ashton-Tate 3 Harvard Project Manager, Harvard Software, Inc. 59 Others 100 Total 75 SideKick, Borland International, Inc. Desktop Manager 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 800/742-1133, 800/255-8008 in California, 408/438-8400 35% of respondents voted in this category List price: \$84.95 (not copy protected), \$54.95 (copy protected) 9 The Desk Organizer, Warner Software, Inc. 5 Spotlight, Software Arts PolyWindows, Polytron 2 Others Total 100 Education 13 Spinnaker Educational Games, Spinnaker Software One Kendall Square, Cambridge, MA 02139, 617/494-1200 List price: \$20.95-\$39.95 12% of respondents voted in this category Math Blaster, Davidson & Associates Mastering the SAT, CBS Software 3 Computer Preparation for the SAT, Harcourt Brace Jovanovich, Publisher 2 71 Others 100 Total ATI's Training Power Series, American Training International Training 12638 Beatrice St., Los Angeles, CA 90066, 800/421-4827 outside 10% of respondents voted in this category California, 213/823-1129 List price: \$75 each 13 Individual Software Series, Individual Software, Inc. 8 Cdex Corporation Series, Cdex Corp. Typing Tutor III, Simon & Schuster 3 2 MasterType, Scarborough Systems Others 24 100 Total

PC World 143

Winning Products for the World Class PC Contest

	% of Votes Product, Manufacturer	
Language 40% of respondents voted in this category	39	Turbo Pascal, Borland International, Inc. 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 800/556-2283 800/255-8008 in California, 408/438-8400 List price: \$69.95
TURSE PASCAL	11 10 9 6 25 100	Lattice C Compiler, Lifeboat Associates BASIC Compiler, Microsoft Corp. IBM BASIC, IBM Microsoft C Compiler, Microsoft Corp. Others Total
Personal Management	38	Andrew Tobias' Managing Your Money, MECA 285 Riverside Ave., Westport, CT 06880, 203/222-1000 List price: \$199.95
15% of respondents voted in this category TOBLES MANAGING YOUR MONEY MANAGING HONEY MANAGINE HONEY MANAGING HONEY MANAGING HONEY MANAGING HONEY MANAGINE HONEY MANAGING HONEY MANAGING HONEY MANAGING HONEY MANAGI	16 11 5 30 100	Dollars and Sense, Monogram The Home Accountant Plus, Arrays Inc./Continental Software PC/Professional Finance Program II, Best Programs, Inc. Others Total
Games 43% of respondents voted in this category	56	Microsoft Flight Simulator, <i>Microsoft Corp.</i> 10700 Northup Way, Bellevue, WA 98004, 800/426-9400 outside Washington, 206/828-8080 List price: \$49.95
MICROSOFT Flight Simulator	7 6 5 26	Zork I, II, and III; Infocom, Inc. Nightmission Pinball, Sublogic Communications Corp. Sargon III, Hayden Software Others
De la Paried Cartain	100	Total

	% of Votes	Product, Manufacturer
Graphics-Drawing	17	PC-Draw, Micrografx, Inc.
23% of respondents voted in this category		1820 N. Greenville Ave., Richardson, TX 75081, 214/234-176 List price: \$395
	16	PC Paint, Mouse Systems
The state of the s	14	AutoCAD, Autodesk, Inc.
P P	12	PC Paintbrush, Z-Soft
C	5	Dr. HALO, Lifeboat Associates
D	36	Others
D A A W	100	Total
Utilities	63	Norton Utilities, Peter Norton Computing, Inc. 2210 Wilshire Blvd., Santa Monica, CA 90403, 213/399-3948
47% of respondents voted in this category		List price: \$99.95
Section 2000	9	ProKey, RoseSoft, Inc.
ENORTON	5	Copy II PC, Central Point Software, Inc.
FITTI ITIES	2 2	Sideways, Funk Software Copywrite, Quaid
UULIIES	19	Others
The second secon	100	Total
Applications Integrator	31	TopView, IBM
	31	TopView, IBM Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: \$149
	31	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149
		Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate
	25 6 6	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International
	25 6 6 4	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc.
	25 6 6 4 28	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others
	25 6 6 4	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc.
Terminal Emulator	25 6 6 4 28	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: S149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others Total IRMA, Digital Communications Associates, Inc. 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000
11% of respondents voted in this category Terminal Emulator	25 6 6 4 28 100	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: \$149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others Total IRMA, Digital Communications Associates, Inc. 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000 List price: \$1195
1% of respondents voted in this category Terminal Emulator	25 6 6 4 28 100	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: \$149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others Total IRMA, Digital Communications Associates, Inc. 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000 List price: \$1195 Crosstalk XVI, Microstuf, Inc.
Applications Integrator 11% of respondents voted in this category Terminal Emulator 16% of respondents voted in this category	25 6 6 4 28 100	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: \$149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others Total IRMA, Digital Communications Associates, Inc. 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000 List price: \$1195 Crosstalk XVI, Microstuf, Inc. IBM 3101 Emulation, IBM
Terminal Emulator	25 6 6 4 28 100	Customer Relations, 100 N.W. 51st St., Boca Raton, FL 33432, 800/447-4700 List price: \$149 DesQ, Quarterdeck Office Systems Framework, Ashton-Tate SideKick, Borland International GEM, Digital Research, Inc. Others Total IRMA, Digital Communications Associates, Inc. 1000 Alderman Dr., Alpharetta, GA 30201, 404/442-4000 List price: \$1195 Crosstalk XVI, Microstuf, Inc.

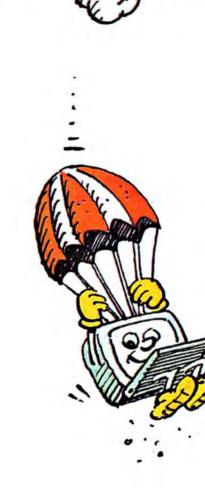
Europe: Accent on Competition

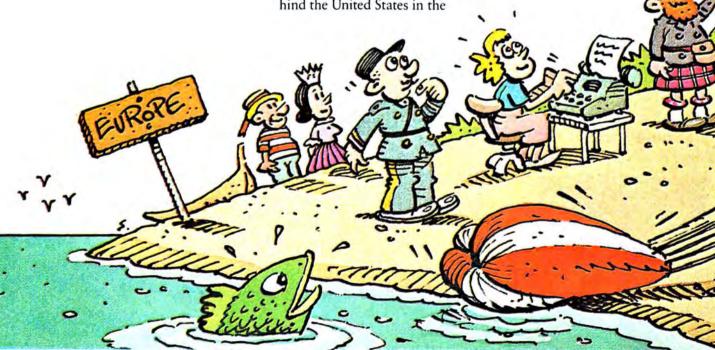
The European personal computer marketplace is jammed with opportunities and obstacles for both American and European companies, but the Europeans need to play catch-up to compete.

Janette Martin

Think of Europe and you're likely to envision royalty at Buckingham Palace, the flying buttresses of Notre Dame, castles lining the Rhine, and the exquisite frescoes of the Sistine Chapel. Europe's image is bound up with both tradition and cultural diversity. For companies and consumers in the European personal computer marketplace, it's an image packed with potential and laden with problems.

The European reverence for history suggests a certain suspicion of change, a reluctance to embrace new technologies. This resistance, complicated by economic factors, places Europe a year or two behind the United States in the







number of personal computers and the variety of business applications in use: Today, the European computer market bears a striking resemblance to the American market of two years ago. Europe is primed to enjoy explosive growth resulting from falling prices of computers and peripherals.

For American and European manufacturers, Europe represents

A New Frontier

a competitive frontier. Dataquest, a San Jose, California-based market research firm, predicts that European sales of personal computer systems in the \$1000-to-\$5000 range will increase by more than 300 percent between 1984 and 1989, compared to a projected sales growth of 127 percent in the U.S. for the same period (see Table 1). The greatest immediate activity is likely to occur in Italy, followed by France, West Germany, and Britain, in that order.

That growth will be accompanied by a formidable set of challenges. Every player in the market must grapple with the Continent's linguistic and cultural barriers and even, on occasion, with nationalistic obstinance. While the American market is a relatively cohesive entity, European disparateness is a marketing fact of life. As Alan Nonnenberg, major accounts marketing manager of Hewlett-Packard's personal computer group, recently observed, "I don't believe there is a European market-there are really about 14 separate markets consisting of the individual countries in Western Europe."

Table 1: Unit sales of personal computers in the \$1000-to-\$5000 range (in millions)

	1984	1989 (estimated)	Market increase 1984-1989
U.S.	4.1	9.3	127%
Europe	1.1	4.6	318%

Source: Dataquest, San Jose, California

Rising to the challenge, American manufacturers are crossing the Atlantic in pioneering style. Increasingly, however, Europeans are refusing to sit back and allow American companies to grab an ever-larger share of personal computer sales on their home turf. They are simultaneously educating their citizens about computers and launching well-funded research and manufacturing efforts to capture a major share of the market.

European-Style Computing When it's time to buy a PC, caution is generally the byword among European small business and corporate users-a restraint enforced by limited capital and the relatively high cost of systems. Like a show-me Missourian, potential buyers typically want to know what the computer can do for them before carefully weighing benefits against costs.

Throughout Europe, businesses acquire personal computers and software for specific applications rather than as personal productivity tools for individual staff members. Even in Britain, which currently leads the Continent in personal computer sales, you won't often find a personal computer on an executive's desk or in a middle manager's briefcase. Instead, machines are generally ensconced in accounting departments, handling spreadsheets or

financial applications, or in warehouses, running data management or inventory programs.

The other major themes among Europe's corporate users are economy and simplicity. Thus far, most European businesses have had difficulty justifying the cost of specialized-and sometimes flashyperipherals and systems. Desktop personal computers far outsell portable and briefcase machines. Dot matrix and daisy wheel printers predominate, while the newer ink jet and laser printers remain scarce.

As a corollary of their availability and functionality, American spreadsheet, word processing, and data base management packages have a hold on the personal computer market abroad. Homegrown software is usually designed with a specific task in mind. Consider Britain's FT Moneywise, a financial modeling package marketed jointly by Moneywise Software and London's Financial Times; it resembles a spreadsheet but is designed to compute specific functions such as compound interest and net present value. The program's general calculation functions are limited.

IBM's Head Start In the joust for European market share, IBM's advantages over its rivals-both local and U.S .based-are legion. Its sizable installed base of mainframes throughout Europe translates into name recognition and sales cachet when wooing this diverse market with PC products. IBM's longtime presence on the European scene, combined with its economic muscle, places the company in an enviable position (particularly in light of the Common Market's recent decision to end an antitrust action against IBM).

The numbers confirm IBM's swift emergence as a leader in the European personal computer market. According to InfoCorp, a Silicon Valley-based market research firm, IBM will sell an estimated 241,000 PCs in Europe during 1985, nearly a 50 percent increase over 1984's total sales of 163,000 units. Observers note that 88 percent of these machines are bound

IBM is also taking the long view, placing PCs in schools throughout Europe. The company has donated some 800 machines to more than 100 schools in Germany, Italy, the Netherlands, Spain, Sweden, and Britain. As in the United States, IBM backs its donations with teacher training.

The American Foothold Where IBM goes, a host of other American manufacturers are sure to follow. At present, products from American computer vendors are outselling their counterparts in Europe chiefly because the U.S.-based firms have managed to export their substantial marketing, service, and support expertise along with their hardware and software. (See Table 2 for a summary of sales revenues for the leading American and European personal computer manufacturers.) The computer industry trade show, that ubiquitous symbol of high-tech America, has clearly

Table 2: 1984 European sales of all personal computer products and services (dollars in millions)

U.Sbased companies	
IBM	\$ 2074
Apple	279
Tandy/Radio Shack	127
Hewlett-Packard	199
Digital Equipment	148
Other	1101
Subtotal	\$ 3928
Europe-based companies	
Olivetti	\$ 1864
Triumph-Adler	322
Philips	403
Other	44
Subtotal	\$ 2633

Source: InfoCorp, Cupertino, California

The numbers confirm IBM's swift emergence as a leader in the European personal computer market.

for corporations. IBM's growing strength is all the more impressive in light of CPM's popularity in Europe.

To ensure an ample supply of PC software, IBM has established a plan to help distribute programs developed by European companies. Under the Vendor Logo Software Agreement, IBM uses its dealer network to promote selected programs that carry the developer's logo, not IBM's.

caught on in Europe, as the Hannover Faire and COMDEX Europe demonstrate with a flourish.

Although many are lured by the obvious potential of the European marketplace, most American companies must meet stringent requirements before establishing a foothold in Europe, and relatively few have gained entrée to that

market easily. Among those that are in, Osborne Computer and Victor Technologies (now a wholly owned subsidiary of the Swedish firm Datatronic A.B.) have emerged from the Dark Ages of Chapter 11 into a latter-day Renaissance.

Distribution channels are tight throughout the Continent, and retail shelf space for a burgeoning array of products remains limited. Stiff import tariffs also tend to deter American companies from breaking into the European scene. Some American firms have resolved these distribution and tariff tangles by establishing Europeanbased operations. A few companies, IBM included, have pockets deep enough to set up their own manufacturing plants and retail outlets. The European welcome to that approach is warming; through reliance on

PC World 149



various financial inducements, a few countries are now saying, in effect, "If you set up shop here, you're free to compete."

Britain is a prime locale for American companies interested in targeting the European market. IBM assembles its PC products in Greenock, Scotland, for distribution throughout Europe. AST Research of Irvine, California, which makes a variety of plug-in boards for the PC, recently established sales, support, and distribution offices in Worcestershire, England.

Ireland offers attractive incentives to foreign firms, including a low 10 percent corporate tax on manufactured goods (guaranteed through the year 2000) and a 100 percent depreciation allowance. Not surprisingly, American dollars now make up half the high-tech foreign investment in Ireland. Lotus Development is building a software duplication plant in Dublin that will also handle worldwide product distribution, and Micro-Pro International's major European manufacturing effort also calls Ireland home.

The Netherlands too is vying for investment dollars from American high-tech firms. The Dutch government offers companies generous research subsidies, the only proviso being that the resulting product is manufactured at least partially on Dutch soil. Various grants, loans, and tax breaks are also available. ITT has taken the Netherlands up on its offer, basing ITT's principal European distribution point in that country.

Meeting the Locals

If certain countries are clamoring for product development facilities, manufacturers are finding that existing products must be tailored to the specific needs of a diverse European market. Although unmodified versions of many American software offerings have been marketed in Europe for some time, U.S. companies now recognize the necessity of "localizing" products. Localization involves modifying products for specific audiences-from redesigning keyboards and video interfaces to making changes in character sets and screen graphics and providing full translations of manuals.

International Products Ltd. (IPL), a European IBM subsidiary responsible for marketing and modifying Entry Systems Division products, has developed PC keyboards for use in Britain, Germany, France, Italy, Denmark, Norway, Spain, Sweden, and Finland. IPL also translates system software and product documentation for each language. PC power supplies are produced to meet each country's requirements. For

the IBM Portable PC and the PC AT, no retrofit is required; both are factory-equipped with dual power supplies. As part of its localization responsibility, IPL ensures that every IBM personal computer product meets the safety and power requirements of its potential destination.

Thanks to MicroPro's localization efforts, you can buy WordStar in any of nine languages. The European versions contain the same program code and menu formats; information screens and manuals are simply translated.

MicroPro has done well in Europea. The company's European sales of *WordStar* constitute a very respectable 20 percent of its total worldwide. Frank Frost, Micro-Pro's international operations vice president, notes that the company experienced a 250 percent rise in European sales from 1983 to 1984, substantially better than its 53 percent growth in the U.S. during the same period.

Microsoft has also hit pay dirt abroad. The company saw 1984 European sales increase tenfold over those of the previous fiscal year, according to Carl Stork, the company's European business development manager. Microsoft's elaborate plans underscore the company's feeling that Europe is a market to be reckoned with. The firm is setting up operations in three countries, localizing software for diverse markets and supporting its products with books translated into a variety of languages.

Microsoft's software localization extends beyond translating screen text and user manuals. Products are being revamped to accommodate different paper sizes, peripherals, character sets, and date/time formats. Mnemonic commands have been altered to fit each target market's language. Microsoft has even managed to coin new jargon when the vernacular doesn't quite fit.

Ashton-Tate, a fourth major American presence in the European software market, recently signed distribution agreements for its products in France and Italy. The company's first offering, dBASE II, has been on software shelves in Europe for more than two years; the new distribution arrangements add Framework, dBASE III, and Friday! to that inventory. International sales account for about one-fifth of Ashton-Tate's revenues.

In addition to manufacturing, distributing, and localizing products, American companies face the weighty task of marketing their wares to a discriminating public that tends to favor the home team. Cast as outsiders by some Europeans, American companies play up the "local" nature of their foreign operations and stress that they're stimulating regional economies by providing jobs and paying taxes like any European firm.

The European Answer
European computer makers
have reacted vigorously to their
stateside competition. One response has been to hop aboard the
PC-DOS bandwagon and develop
machines with some degree of PC
compatibility (thus lending credence to DOS as an international
standard). The list of those flattering IBM is impressive: Ing. C.
Olivetti, the giant Italian concern,
makes the PC-compatible M24,
which AT&T labels in the States
as its PC 6300; AT&T owns a

chunk of Olivetti and recently extended its joint product agreement with the firm. England's Applied Computer Techniques (ACT) markets the Apricot, a sleek MS-DOS portable. Ericsson, the Swedish phone company, sells the Step One, an MS-DOS machine that the company claims runs four times faster than the PC; the highly compatible Ericsson PC, meanwhile, has made the trek across the Atlantic and continues to receive good notices as the firm plumbs the American market. And

Olivetti and West Germany's Triumph-Adler together control about 25 percent through concession agreements that tie stores to a given manufacturer. Another 25 percent is dedicated to manufacturers operating independently. It's open season for the remaining shelf space, with European manufacturers battling American firms—and each other.

Companies like Ericsson overcome the shortage of distribution channels by opening support centers focused on developing vertical



American companies face the weighty task of marketing their wares to a discriminating public that tends to favor the home team.

Steinmetz, Krischeke, Systemtechnik GmbH (SKS) of West Germany offers two portables that run MS-DOS, CP/M, MP/M, or Oasis.

Even the heftiest European manufacturers have had trouble expanding the European personal computer market; most face many of the same problems as do American companies. The Europeans must also confront other woes, principally an absence of the venture capital that proved so instrumental to the success of America's high-tech industry. High costs for components, some of which are subject to the same import tariffs that, ironically, were imposed to protect Europe's manufacture of computer products, are yet another barrier to PC growth.

Of all the distribution channels currently available in Europe,

market software and providing technical support and training for dealers. Joining forces with Texasbased Tandy Corporation, ACT has formed AT ComputerWorld. Incorporating Tandy's 430 European retail stores (with plans for additional stores on the books), AT ComputerWorld stocks both ACT and Radio Shack products.

Venture capital may be hard to come by in Europe, but wily hightech financiers are finding ways to inject cash into their industry. Some firms have chosen to go public, while others have sought American investors. Germany's US Nixdorf raised \$125 million in its first public stock offering, while Tweidata AG of Munich went public in 1983 for a net of \$4 million.

PC World 151

Europe's Balancing Act Even as European companies succeed in penetrating and broadening the personal computer market, competition is expected to remain fierce. Some see the Continent's opportunity for leadership in the international personal computer business as linked to the ability of its companies to develop, apply, and sell new technologies. The Economist recently described Europe's high-tech manufacturing as "dangerously stable," chastised the industry for its failure to innovate, and blamed this stagnation in part on government protectionism through "mobility inhibitors" such as job security legislation, bankruptcy laws, and fragmented research and development efforts.

Accordingly, companies and countries alike are struggling to put new products on the market and thereby cut through much of the regulatory thicket. The landscape now includes cooperative ventures funded totally by European companies as well as projects backed jointly by private industry and governments. "What's holding back the Continent is translation," says ACT managing director Roger Foster. "People are quite prepared to accept new technology, and Europe is beginning to push for its own independent standard of computing."

One recent arrangement brought together six European hardware manufacturers that collectively endorsed the UNIX operating system (thereby issuing a mild rebuff to IBM). In this case, computers from the six-ICL, Nix-dorf, Olivetti, Siemens, Philips, and Bull-will be able to share data painlessly.

More critical is an undertaking by the European Economic Community (EEC). The EEC is overseeing an ambitious scheme to make Europe a major contender in the high-tech sweepstakes. The project is known as Esprit, an acronym for European Strategic Program for Research and Development in Information Technology. Participants may hail from any pool \$500 million during the next five years while receiving an additional \$167 million in government support. Philips and Siemens hope to apply pressure to the U.S. and Japan by producing chips for about 10 percent less than the going rate.

Siemens is also taking part in the Joint Research Institute, a private-sector project. Other participants include Campagnie des Machines of France and ICP Plc of Britain. Here, the emphasis is on exploring and implementing



Esprit plans to spend \$1.3 billion by 1989 to elevate Europe's competitive standing in high technology.

EEC member nation and can include European subsidiaries of multinationals; indeed, IBM Germany is nominally participating in Esprit. The venture aims to advance European R&D in five major high-technology areas: microelectronics, advanced information processing, software technology, office information systems, and computer-integrated manufacturing. Esprit plans to spend \$1.3 billion by 1989 to elevate Europe's competitive standing in high technology. It is, in a sense, a response to the American enterprise known as MCC (see "Thinking Big on Silicon Prairie," PCW, April 1985).

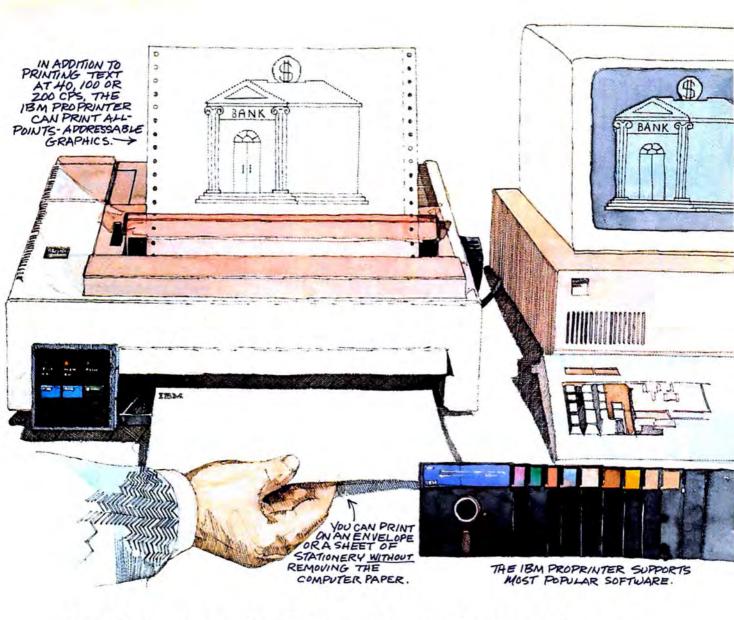
On a slightly less ambitious scale, N.V. Philips of the Netherlands and A.G. Siemens of West Germany have joined forces in the Mega Project, an effort to develop and manufacture enhanced memory chips. The companies will

knowledge-based systems, a key step en route to fifth-generation computing and artificial intelligence.

All of these endeavors are part of a concerted drive by Europeans to give the Continent's stodgy, tradition-bound image some high-tech panache. If Europe proves to be half as successful producing personal computer technology as it is consuming it, time and tradition will have been no barrier at all.

Janette Martin is a Contributing Editor for PC World and a freelance writer.

152 October 1985



Built to take it. Priced to take it with you. The new Proprinter from IBM.

There's just one thing that's as remarkable as the rugged reliability of our newest personal printer—and that's its price. Under \$550.

The new Proprinter is built by IBM to last. And simplicity of design is what makes it so reliable.

Yet the IBM Proprinter is a full-featured machine. It has three printing speeds to give you everything from fast first drafts to sharp, near-letter-quality correspondence. It takes perforated computer paper for long jobs and —without removing the paper—will easily print on a sheet of stationery or an envelope, thanks to a handy slot in front.

With its all-points-addressable graphics and its comprehensive character set. the IBM Proprinter supports most popular software.

The new Proprinter attaches to every IBM PC and to other leading personal computers. And it's just part of our growing family of personal printers. All are designed to serve a single purpose: To give everything you do the finishing touch.

For the IBM Product Center or authorized dealer nearest you —or for free literature—call 1800 IBM-2468. Ext. 553/LH. Or contact your IBM marketing representative.





THE WORLD OF POURGRADES

IS10 IS10R	10 Mbyte Hard Disk with Controller 10 Mbyte Removable Hard Disk Controller	\$ 525 \$1295
IS20 IS30	20 Mbyte Hard Disk with Controller 30 Mbyte Hard Disk with Controller	\$ 625 \$ 995
	All the above available for the Tandy 1000	
	TAPE BACKUP	
MT10 MT60	10 Mbyte Micro Tape Backup "works like a floppy 60 Mbyte Streaming Tape Backup	\$ 425 \$ 995
	AT HARD DISKS	1
AT20	20 Mbyte Hard Disk	\$ 695
AT33	33 Mbyte Hard Disk	\$ 995
AT120	120 Mbyte Hard D <mark>is</mark> k	CALL
and the same of	SPECIAL SOFTWARE	
COMMAND/ASSIS	T DOS MANUAL ON DISK	\$49.95
CACHE/ASSIST	SPEED UP DISK ACCESS	\$49.95
FREE/ASSIST	*FREE SOFTWARE WITH ANY PC HARD DISK (COMES ON YOUR HARD DISK)	FREE

AND OTHER PC ACCESSORIES

FILE SERVER NETWORK:

"WITH THE PURCHASE
OF ANY PC HARD DISK"

*FREE

SOFTWARE 5 MEGA BYTES

PROGRAMS INCLUDE:

100 GENERAL PURPOSE 100 DATA BASE II 20 PASCAL PROGRAMS 80 "C" PROGRAMS ACCOUNTING PACKAGES FINANCIAL PROGRAMS WORD PROCESSOR VT100 EMULATOR

AND FOR CHILDREN:

90 games I.Q. Builder Word processing Math

— AND — MUCH, MUCH MORE

ORDER LINE OUTSIDE FLORIDA

FS20

1-800-228-0891

VISA Mastercard

1 YEAR WARRANTY, 30 DAY MONEY BACK GUARANTEE ON ALL OUR PRODUCTS



<u>Micro Design International Inc.</u>

CALL

66 University Boulevard, Winter Park, Florida 32792 (305) 677-8333 TELEX 332559 MD

Circle 761 on reader service card IBM is a Registered Trademark



BARR/HASP: POWERFUL, VERSATILE, EASY TO USE for the IBM PC, XT, AT and compatibles includes software, synchronous adapter board and manual

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

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

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

Host Systems: MVS/JES

MVS/JES2 MVS/JES3 VM/RSCS VS1/RES NOS/RBF MVT/HASP

Requires: 128K

synchronous modem

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

FREE 30-DAY TRIAL

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

800-BARR-SYS (800-227-7797)

in FL, call 904-371-3050





BARR SYSTEMS, INC.

Suite M, 2830 NW 41st Street Gainesville, FL 32606

Put your PC in Pictures

With PC-EYE™ your IBM PC can capture real-life pictures of people, products, drawings, text - anything a video camera can see. Add one or more of CHORUS' software packages and you can perform sophisticated graphic arts, data base management, security and long distance communications tasks.



Start with the PC-EYE™ video capture system. There are three models to choose from with up to 640 x 512 resolution — 16, 64, and 256 gray levels or color combinations. Then add one or more of the following software packages for your application.



PhotoBase™ - Integrates pictures with your data base

Compatible with dBase II, R:Base 4000 and the IBM Filing Assistant and others, PhotoBase lets you use your data base system as you now do. BUT, now you can add a quarter screen picture captured by a video camera or VCR and display data, pictures, and signatures on the screen simultaneously. Applications include real estate, bank security and signature verification, medical record keeping, product cataloging and more.





IMiGIT™ - Graphic Arts Capability

IMiGIT is icon driven and ideal for creating traditional or exotic illustrations using combinations of art, text and photos for slide presentations, video graphics, CAD, medical, advertising and publishing applications. IMiGIT PLUS delivers high quality true color graphics you can manipulate and edit with text, painting, air brushing, curve fitting, filled and unfilled circles, boxes and much more via mouse or digitizer pad.







PhotoMail™ - Two-way Communications using pictures, text and voice.

Transmit pictures over ordinary telephone lines to remote computers. Pictures of people, diagrams, text, houses, construction sites - anything you can capture with standard video equipment you can display and transmit at resolutions up to 640 x 400 x 16 levels of gray or color. You can edit pictures with text and labels. Dual cursors permit simultaneous pointing to common pictures. PhotoMail supports alternate voice and image transmission, disk storage, and hardcopy printout. File conversion is included to support "electronic mail" systems.



Great Value Added Opportunities

OEMs and software developers can incorporate high quality pictures into their products. Systems can be upgraded with PC-EYE digitizing expansion boards using an EIA RS-170 or RS-330 video source and PC-EYE imaging subroutines.

Call us about our other imaging products like Colorverter,™ ScreenMaster,™ and CompressIT™ to help meet your application needs. 1-800-OCHORUS or 603-424-2900. Or write for our "Seeing is Believing" comprehensive brochure.

TM: All are trademarks of CHORUS DATA SYSTEMS, INC.

*dBase II is a trademark of Ashton-Tate; R-Base 4000 is a trademark of Microrim, Inc.; IBM Filing Assistant is a trademark of International Business Machines Corporation.



dbase-III Power tools

FOX&GELLER

From the Enhancement Specialist

QUICKCODE-III™ dBASE Program Generator

The most popular dBASE enhancement in the world for over 3 years! Here's why:

QUICKCODE-III writes up to 15 different kinds of dBASE programs for you *automatically*. They are complete programs: bug-free, and well-commented. Beginners can run them the very first day. Experienced programmers can eliminate 70% or more of coding time.

- Data entry forms with advanced line and box drawing features
- Computed fields and totals (using any formulas) on all forms
- Three types of data entry error checking (list, range, file)
- Three new data types not found in dBASE (phone, SSN, money)
- Link together up to 8 databases automatically using relations
- Automatic Menu Generator

"...it succeeds admirably"—Infoworld
"Thanks Fox & Geller!!!"—Ashton-Tate
dNEWS

QUICKREPORT dBASE Report Writer

The most powerful report writer ever found on a micro:

- · Connect up to 6 databases in one report!
- Break on up to 16 fields, with unique headers and footers for each field
- TOTAL, COUNT, AVERAGE, MIN, MAX on each field
- · Define your own computed fields—as many as you need
- · Built-in high speed sort on up to 16 fields
- Use special printer features (e.g. BOLD) anywhere on reports
- · Complete line and box drawing capabilities
- Easy to use pull-down menus, work like Framework, Macintosh
- · Run reports from within dBASE

"In my 30 years of experience with computers, I find that QUICKREPORT is the most versatile, easiest to use, and most exciting piece of software I have ever had the pleasure of encountering."

—W. Woodson, consultant Charlotte, NC

bly"—Infoworld !!"—Ashton-Tate

QUICKINDEX™ High Speed Indexer

NEW

Index dBASE files 10 times faster than dBASE-III or dBASE-III!

dUTIL-III™ dBASE Program Utility

Double your programming productivity with dUTIL-III. dUTIL finds program errors (such as unclosed IF, DO, and CASE), cleans up code, speeds up programs. INCLUDE feature lets you store commonly used routines in just one place.

dGRAPH-III™ dBASE Graphics System

- Like REFLEX, dGRAPH can cross-tabulate data
- Tabulate data using range or list matching
- · Graph computed values using multiple fields
- · High quality pie, bar, and line charts
- · Output to printer, plotter, or CRT
- ZOOM and AUTOGRAPH features let you adjust scales

Versions available for dBASE-II

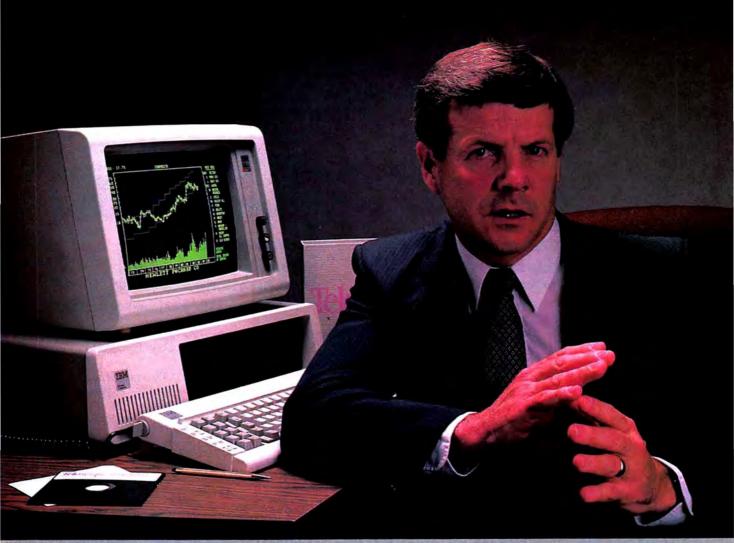
Available from your local dealer

800-221-0156

IN NJ (201) 794-8883 VISA, MASTER CARD accepted FOX & GELLER
604 MARKET STREET
ELMWOOD PARK,
NEW JERSEY 07407

FOX&GELLER

TM-QUICKCODE-III,QUICKREPORT,QUICKINDEX,dUTIL-III,dGRAPH-III of Fox & Geller dBASE-III, dBASE-II, Framework of Ashton-Tate, Macintosh of Apple Computer, REFLEX of Analytica Corp.



Telescan's use of advanced technology makes it one of the fastest, easiest to use, and comprehensive stock analysis systems available

Telescan helps you invest as well as the Insiders!

Software and on-line database for stock analysis

Telescan covers most every stock you'll want to know

With up to 12 years of information on over 7200 stocks, you'll have all the data you're ever likely to need at your fingertips. Updated every day. Earnings, sales, dividends, cash flow, capital spending, book value in simple graph form. Moving averages, cycles, momentum, on-balance volume, relative strength, trendlines, channels if you are more technically inclined.

Indicators you won't find anywhere else

Like our insider tracking service which not only tells you who bought and sold what, within 24 hours of release by the SEC, but how good, or bad, insiders have bought or sold in the past. Like our unique indicator which shows if your stock is over or underpriced by Wall Street.

No computer experience necessary

Telescan is simplicity itself. Automatic log-on. Clear instructions are always displayed on the screen. You press one key to get the information you want. Telescan does the arithmetic for you and displays only the buy and sell signals you need.

You can afford to use Telescan everyday

High speed and nominal connect charges keep the cost of using Telescan to a minimum. And with the automatic save feature, you can look at more stocks and for much longer than you thought possible.

And we keep your Telescan system updated free

Once you subscribe to Telescan, we provide you with free updates, so you get program enhancements, new indicators, etc. as soon as they are available. Got a

question? No problem, just phone our 800 number for a quick answer.

100% money back guarantee

Buy Telescan only if you like it. You must be completely satisfied or we'll refund your money. No questions asked.

Write today for our special limited-time offer, or call

1-800-752-7001, ext 903

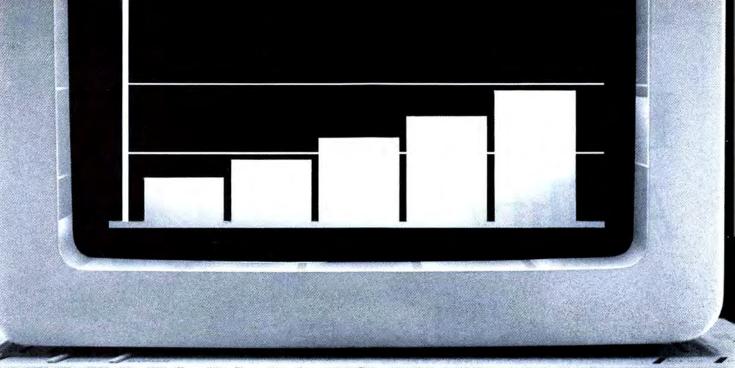
Texas 1-800-442-4799, ext 903 Telescan, Inc. 11011 Richmond Ave., Suite 600

Telescore

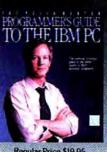
A new way of analyzing stocks

Circle 839 on reader service card

*For IBM PC and 100% Compatibles



ible books 1-compa



Regular Price \$19.95 Sale Price \$17.89



Regular Price \$18.95 Sale Price \$16.89



Regular Price \$18.95 Sale Price \$16.89



Regular Price \$17.95
Sale Price \$16.09



Regular Price \$19.95 Sale Price \$17.89



Regular Price \$22.95 Sale Price \$20.69

Come in to B. Dalton and save on the IBM computer books pictured here from October 13 through November 9.

At B. Dalton you'll find one of the largest selections of computer books anywhere including the newest books to help you use your IBM computer more productively and profitably.

B. Dalton stores are conveniently located throughout the U.S., and you can count on our friendly sales people to help you find whatever you're looking for.

So for everyday values on IBM computer books, visit your nearby B. Dalton store today.

OKSELLER

Check Yellow Pages for the location nearest you. To order by phone, call toll free 1-800-232-5866 ext. 900.

Flipping Over Ability

Sometimes the most impressive innovation results from doing more things in noninnovative ways than anyone else. Xanaro's Ability takes the most obvious path toward software integration and arrives in one versatile piece.

Bill Crider

Lately I have become skeptical regarding the claims of new integrated software packages. Software companies that have tried to transplant several unrelated applications onto one worn-out body use the term *integrated* far too loosely. By their definition, Frankenstein's monster would be called an integrated man. Ability by Xanaro Technologies does not fall into that trap. The various applications—word processing, spreadsheet, data base management, telecommunications, presentation graphics, and DOS file management—are as smoothly coordinated as the arms and legs of an Olympic athlete.

In the last few years, certain ways of doing things have become standard in software because they work well. One of *Ability*'s strongest points is

that it does the usual things in standard ways but adds original touches. As a result, I was able to sit down and begin using *Ability* immediately, without even consulting the documentation.

But common ways of doing things are not always the most intuitive for beginners. As my computer adolescence fades from memory, I have found it useful to have a novice work through programs under my observation but without my assistance. A novice perspective is especially helpful when evaluating a package such as *Ability*, which is targeted for beginners rather than power users.

I had an ideal guinea pig. My novice friend had never used a computer and had no idea how to turn on an IBM PC. If he could use *Ability*, anyone could (see the sidebar "A Novice's Perspective").

From the Beginning

Ability comes in an extravagantly designed plastic case held together with six screws and embossed with the company logo and an image of a disk. Although the artistry is impressive, a simple binder would have sufficed and might have reduced the price by \$10 or \$15.

Ability is not copy protected and is quite easy to install. If you have more than the required 256K, you can speed up the program by copying a special CONFIG.SYS file onto your root directory. However, the manual does not warn you that you will delete



your current CONFIG.SYS file in the process. To avoid deleting the file, see *The Help Screen* in this issue.

The package comes with an interactive diskbased tutorial that includes realistic, functional examples. The tutorial allows you to make mistakes but immediately notifies you when you do. Because of *Ability*'s voluminous help screens, advanced users may not need the tutorial in order to learn the program. Xanaro also provides a customer service phone line, but it does not have an 800 number.

The documentation is refreshingly brief, consisting of a one-page flier ("What to Do First") and a clearly written 200-page manual. The manual contains a tutorial for each application and only one chapter of reference notes. Although the attempt at succinctness is laudable, a more complete reference section would be helpful—for example, a menu tree showing the relationships of all the menus.

The Library

When you start *Ability*, you see a large-type introductory screen that lists the five major applications. Selecting any of these brings you to the Library screen. Not only is the opening screen useless, since applications are chosen from the Library, but the enormous type creates an erroneous impression of simplemindedness. Business executives want easy-to-use software, but they may be embarrassed to load a program that looks like a kindergartener's educational game.

The Library is the core of *Ability* (see Screen 1). The first five columns list the data files belonging to each application, the sixth lists other programs in *Ability*'s directory, and the seventh lists other data files not belonging to *Ability*. To choose an application and open a related data file, point to the file with the cursor and press <Enter>.

Function key assignments appear at the bottom of the screen when applicable. The function keys operate consistently throughout the program: For example, pressing <F2> brings up a line menu whose selections change depending on what application you're in. You select an item with a cursor key or by typing the first letter. Most of the selections have submenus of their own.

In the Library, pressing <F2> brings up a row of DOS commands for changing the drive or directory; erasing, renaming, and copying files; and displaying file statistics. You can even "Put-away" all the files in memory, à la *Framework*.

Selecting Other brings up a submenu with several useful features not found in most programs. The Macro selection allows you to easily create up to 30 macros and assign them to the <Alt>, <Shift>, and <Ctrl> keys. The macros can record any sequence of up to 250 keystrokes, including the function and cursor keys. Notably lacking is the ability to call macros from within other macros.

On the Devices menu you can change the defaults for devices connected to your computer, such as printers, modems, and plotters. You can print files from the Print menu or from within their applications. One unique feature enables you to print documents sideways using a dot matrix printer. Other selections let you run external programs and exit to DOS without closing *Ability*.

Flipping and Linking

Ability lacks the windows of its famous competitors, but its Flip command allows you to have two files open simultaneously. Pressing <F9> flips the display from the primary screen to the flip screen and vice versa. This is handy for comparing two documents or swapping information between documents.

To move text, data, or graphs, you open both the primary and target files, use <F7> to shade the section you want to move, pick it up with <F5>, flip to the other screen with <F9>, and put it back down with <F6>. The original is left intact. The Put-down

function also serves as an "undelete": *Ability* remembers the most recently deleted shaded item and puts it back down anywhere you want. However, the undelete does not work for characters deleted individually with or <Backspace>.

Along with providing consistent function keys and file flipping, *Ability* achieves tight integration between applications with its dynamic linking of fields. A field is like a minispreadsheet composed of just one cell. You can type formulas in directly or call information from linked fields or spreadsheets.

For example, with the mail merge facility you introduce fields into the word processor to define the variable information in the form letter. You print the mail merge letters at the other side of the link in the data base application. You can also link a spreadsheet to a numerical field in a letter so that each time the spreadsheet is updated, the corresponding figures in the letter change automatically.

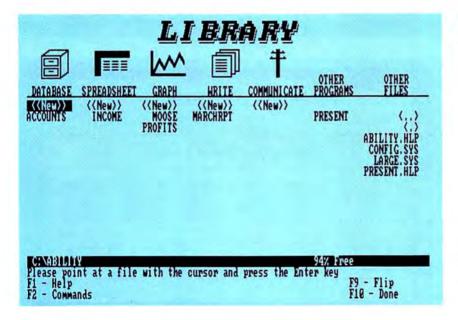
When you load a spreadsheet into a word processing document, you are working with the actual spreadsheet, not a copy. Unless you specify otherwise, any changes you make to the spreadsheet while in the word processor will be reflected in the original. If you want, you can also create a spreadsheet from scratch in the middle of the word processing document.

None of these features is revolutionary; variations of copying, flipping, and linking occur in other software packages. Yet *Ability* has implemented these standard integration features in a useful, understandable way and has added its own variations with care and restraint. The result is a sophisticated package that can be easily learned.

Word Processing

Ability's word processing module emulates page-oriented dedicated word processors. Like Wang, the program is normally in overstrike mode; to insert text, press <Ins>, and the lines below the cursor drop down a line. *Ability* uses the standard cursor key combinations, such as <Ctrl>-<CursorRight> to move a word to the right and <Ctrl>-<Home> to move to the top of the document.

Each page is surrounded by a thick, shaded border, which may help some users visualize the page but may make others claustrophobic (see Screen 2). Pressing <F2> brings up a line menu of selections, including margin control, centering, setting tabs, and creating headers and footers. You can include a date function in a header linked to the system clock so the



Screen 1: The Library is the starting point for each Ability application.

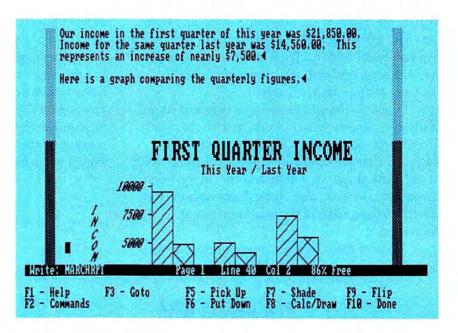
document will automatically display the current date. If you have a graphics display, the screen will show any italics, underlining, and boldface. Pressing <F3> brings up a sophisticated array of search and replace options, including wild-card and case-sensitive searching.

The best feature of the word processor is its ability to establish links with other applications and include spreadsheets and graphs. Its worst feature is the rather slow screen response, especially during word wrapping and scrolling.

Screen 2: The Ability word processor can insert spreadsheets and graphs in documents. Word processing dinosaurs take note: Ability's word processor loads WordStar files directly, converting the coding in the process. The word processor also accepts and creates ASCII files.

Spreadsheet

Ability's spreadsheet is more than three times as large as Symphony's, permitting 9999 rows and 702 columns, for a total of 7 million cells (see Screen 3). But comparisons of spreadsheets based on size make no sense beyond 1 million cells. Not even an AT has enough memory to support a spreadsheet larger



Screen 3: Ability's spreadsheets can be linked to any application in the package.

INCOME:	INK, Inc M	aron morazne		
Company	Description	Invoice #	Date	Amount
Trendy! Mt. Moving Co. Don's Shoes Gemini Designs	Magazine ads Sales flyers Window banners Logo design	12201 12198 12208 12200	3-19-85 3-19-85 3-12-85 3-26-85	3,895.00 985.00 375.00 2,100.00
TOTAL INCOME			0.500	\$7,355.00

than that. Personally, I prefer to link several small worksheets. They are more manageable, load and recalculate faster, and are less subject to 'Out of Memory' and 'Disk Full' messages. But whether you like them big and independent or small and linked, *Ability* can handle them.

More important than size, *Ability*'s spreadsheet possesses almost all the features of 1-2-3 and other advanced spreadsheets. And with the small spreadsheets I use, *Ability*'s speed compares favorably to Lotus products.

Lotus DIF files can be loaded with relative ease. Since it is a DIF interchange, only the labels and current cell values are exchanged, not the formulas or macros. *Ability* files can also be exported to Lotus programs, but with similar restrictions on functions and formulas.

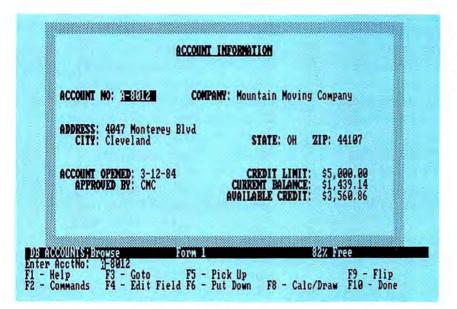
Each *Ability* spreadsheet cell can include oneand two-way links. That is, the value of a cell can depend on another cell, or two cells can depend on each other so if you enter a value into one, it will be entered into both. This process is similar to circular reference, not usually possible in spreadsheets.

Data Base Management

The *Ability* data base management system (DBMS) is form oriented, similar to the card-file approach of *pfs:file* (see Screen 4). Fields are limited to 75 characters, and field names to 13 characters. No command language is provided for tailoring applications.

To design a form, you type descriptive information and then specify field location and size. You can search for any record using any criteria on any field, including logical AND, OR, and NOT operators. Creating a working subset is similar, but you start with the subset command instead of the search command.

Because the data base is form oriented, you can't change the data while it's in a column format. You can view the data base by creating a columnar report and previewing it on the screen, but you won't be able to modify it in that format. To create a column-oriented report, you indicate the order in



Screen 4: The Ability data base is form oriented. The program provides no way to view and change data in a column-oriented fashion.

A Novice's Perspective

Brian McClure

As a computer innocent, I found *Ability* fairly easy to learn and use. True, I don't have any basis for comparison other than typewriters, calculators, and my own preconceptions of what a software program should do, but then again, a lot of potential *Ability* users may share my perspective.

The tutorial was helpful, but I was disappointed with its frequent statement, 'I can't show you all there is about ...' Why not? I would have been happy to take time to learn about some of the more advanced topics. Time and again, the tutorial left me hanging just when things were getting interesting.

I found the first program screen somewhat confusing. I expected to go directly to the word processor if I chose it from the menu, but I kept finding myself in the Library. I assumed I was doing something wrong but subsequently found out I wasn't.

The Library screen itself is well designed and provides a good overview of the whole package. I like being able to copy, erase, and rename files without having to go to DOS,

and I appreciate the consistent operation of the function keys.

The first time I flipped the screen I feared I had lost my file. Once I understood what had happened, I realized that the Flip function could be useful for moving paragraphs from one letter to another.

The best thing about the word processor is that what you see on the screen is similar to what prints out on paper. If you have a graphics system, any italics, underlining, and boldfacing show up on the screen. The program also puts a border around each page so you can see exactly where each element will appear on the finished document; I would have had a hard time visualizing it otherwise.

I was surprised to find I could include a graph in the middle of a letter, a capability that helps to get a point across. With the word processor I could add labels and text not available in the Graph module. What really surprised me, though, was that a document linked to a spreadsheet is not static. When I changed the spreadsheet the graph depended on, the graph in the letter changed too. I eventually discovered I could turn off that function so I could keep the graph intact even when I changed the spreadsheet. This made the graph more valuable for "what-if" comparisons.

The same principle applied to the date command I used in the header of a letter. When I looked at the letter on screen a few days later, the header had changed to the current date. If you want the date to remain the same, type it in as text.

The telecommunications module proved less intimidating than expected. I don't understand communications terms like *parity* and *duplex*, but I had no trouble calling a local bulletin board and leaving some messages. I had more trouble understanding what went on at the bulletin board than I did with *Ability*'s communications module. Next I'm going to call CompuServe and The Source. I don't know what they do, but I plan to find out.

Brian McClure is a salesman in Tucson, Arizona. which the fields will appear on the printed report and provide a heading for each column. You can also enter a code to tell *Ability* to subtotal or sort on a certain field.

Creating a form-oriented report is much like defining the data base in the first place. You type whatever descriptive text you need on the screen and create fields with the same names as the fields of the data base. When you print the report, the fields will be filled with information from the data base.

Telecommunications

Ability's telecommunications module is easy to use, flexible, and better integrated than that of any other integrated program I have seen. The commands and function keys are the same as in the rest of the program, and the communications parameters are easily set and changed from a menu screen.

Ability supports the Hayes Smartmodem and compatibles. It can be used with other modems, but the auto-dial and auto-answer features may not work. The program also allows the PC to emulate VT 52 and VT 100 terminals, which means you can connect satisfactorily to a wide variety of minicomputers and mainframes. Transmission speeds of up to 9600 bits per second are available.



Presentation enables you to control the display sequence, duration, and transition type of screens in a slide-show format.

The program comes with a proprietary errorchecking protocol, but it works only if you're calling another PC that's running *Ability*. The absence of the popular XMODEM protocol is a serious deficiency, which Xanaro should remedy as soon as possible.

You can write scripts for automated logon and other common tasks and use macro functions to assign them to the function keys. If the computer you are calling is also running *Ability*, you can perform unattended file transfers.

Graph and Presentation

Ability's graphics are split into two programs—a business graphics module called Graph, and a "slide-show" program called Presentation. With the Graph module you can create bar, stacked bar, line, and pie charts. You can type data into one of the seven data fields manually or you can link it to a spreadsheet. If you change the spreadsheet, the graph changes automatically.

Ability graphs are notable for their lack of color. When using a color plotter you can select the colors the plotter will use to draw the graph, but you can't alter the display colors. However, you can change the shading, choosing from ten patterns. You can also rotate a bar chart 90 degrees and explode any or all of the segments of a pie chart.

The least integrated application in *Ability* is Presentation, which requires a separate disk on a floppy-based system. Since it is not run from the Library screen, you cannot flip to it from another *Ability* application. Yet all the menus and screens are in the familiar *Ability* format, and the function keys do exactly what you would expect.

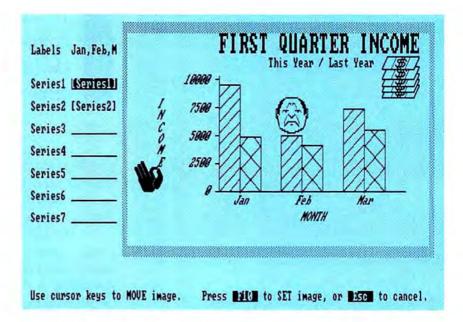
Ability allows you to take an electronic "snapshot" of any screen. Later, you can modify screen images and create an automated slide show. Once you've loaded the snapshot into Presentation, you can add text in one of seven sizes (but only one typeface), add shadowing to the text, and choose from three slant angles. You can also include symbols, such as arrows, bullets, boxes, and icons, or select one of 25 short tunes to be played when the slide appears on the screen (see Screen 5).

Presentation enables you to control the display sequence, duration, and transition type of screens in a slide-show format. *Transition* refers to the manner in which screens change. For example, transitions in Presentation include fading in from top to bottom, left to right, and diagonally.

Unfortunately, you can't add your own icons or tunes. The module would be much improved with the addition of a bit editor to allow freehand drawing and screen editing. Presentation's most limiting factor is that it does not support creative use of color—as in the rest of *Ability*, you are limited to one foreground and one background color for display.

Presentation requires a graphics monitor and an IBM-compatible color graphics board. The module wouldn't operate with a MultiDisplay color board, but it worked fine with a Hercules Color Graphics Adapter.

Screen 5: Presentation can take snapshots from any of Ability's screens and reproduce them in slide-show format.



Although Presentation's features don't compare with professional slide show products like General Parametrics Corporation's VideoShow 150 or IBM's PC Storyboard (for example, only eight transition types are available), Presentation is an attractive option not found in most integrated packages.

Bill Crider is president of the Tucson Computer Society. He is a microcomputer training consultant and a Contributing Editor for PC World.

There You Go Again

I have yet to find a program I could not crash while performing relatively standard tasks, but *Ability* seems to go down more than most. Once I moved a graph into a letter, and when I tried to add text to it, my computer froze up. When I pressed a random combination of function keys in the Macros Help screen, my hard disk light came on, and the computer froze again. I tried in vain to reproduce both problems.

Ability
Xanaro Technologies Inc.
321 Bloor St. E #815
Toronto, Ontario
M4W 1G9 Canada
702/322-4455
List price: \$495
Requirements: 256K, two disk
drives (384K, hard disk, and
IBM Color/Graphics Adapter
recommended)

Growing Up in a Crowd

Grabbing a niche in today's integrated software marketplace is no easy task. Unsuccessful integrated programs have shown that it takes more than stitching several applications together to guarantee popularity. Xanaro has sewn together no monster, but has instead created a well-integrated, user-friendly program with negligible flaws.

Although *Ability*'s modules, most notably its word processor and spreadsheet, are more advanced than those found in the majority of integrated packages, the lack of a command language will probably keep the package from seriously challenging *Framework* and *Symphony* among power users. Yet it should be an attractive choice for the much larger group of people who thought they wanted high-end packages until they realized how time-consuming and complex such products are. *Ability*'s most remarkable quality is that it truly lives up to that worn-out phrase, "easy to use."

Maximum Returns

Professional tax preparation programs for the PC have come of age. They match independent service bureau features while offering instant access and privacy. PC World examines two at the top: Tax Machine and Micro-Tax.

Ralph Soucie

Of all the PC applications used by accounting firms, it's surprising that tax preparation is the last to gain a foothold. In the early 1960s, mainframe-equipped service bureaus such as Fast-Tax introduced computerized tax return preparation to CPAs and other professionals. By the mid-1970s, service bureaus were as familiar as the accountant's green eyeshade. Bureaus handled

noxious chores such as keypunching, printing, and collating. They provided preparers with uncomplicated questionnaires and input sheets for collecting a client's financial and tax history. Without the service bureaus, professional preparers would have spent more time generating returns and less grappling with the IRS's serpentine tax code.

PC tax programs have been around for several years, but only a handful of newcomers are beginning to seriously challenge service bureaus. The gap between programs and bureaus continues to shrink as desktop computers get faster, hard disk storage grows cheaper, and software developers learn the golden rules of customer support.

Two prominent professional tax packages scrutinized here are *Tax Machine* from Accountants Microsystems, Inc. (AMI), of Bellevue, Washington, and *Micro-Tax* from Fast-Tax of Carrollton,

Texas. Both packages are sculpted for professional tax preparers who churn out at least 100 moderately complex returns a year. Both mirror the service bureau approach to gathering and entering data, incorporate tax tables and formulas for computing taxes, transfer calculations automatically between related tax forms, and print a multitude of forms and schedules (see Figure 1). Keep in mind that *Tax* Machine and Micro-Tax are designed only for tax preparation, not tax planning and analysis. Both AMI and Fast-Tax offer optional planning modules as well as some state income tax modules. (Tax Machine covers ten states: Micro-Tax covers 27 states and Washington, D.C.)

1984 versions of both programs were tested on an IBM PC with a 20MB external hard disk drive. *Tax Machine* requires at least a 10MB drive (AMI recommends 20MB); *Micro-Tax* will run on a dual-floppy system. Given the latter's girth (over 600K of program code) and penchant for frequent disk access, a hard disk is strongly recommended.

US Individual Income Tax Return Department of the Treasury -- Internal Revenue Service Use IRS Your first name and initial (if joint return, also give spouse's name and initial) For the year Jan 1 - Dec 31, 1984 or other year Present home address including apt number or rural route City, town, or post office, State, and Zip code Do you want \$1 to go to this fund? 98431-0000 If joint return, does your spouse want \$1 label. Otherwise, Married filing joint return (even if please print Married filing separate return. Ente or type. Presidential Single Election Campaign Head of household (with qualifying child but not your dependent, w X Qualifying widow(er) with depen 3 Filing 4 Status Check only Yourself First names of dependent childr 5 one box. 6a Michael P. Exemptions Other dependents C 2)

Tax Machine Like a tax service bureau, Tax Machine provides paper organizer forms that help preparers summarize a client's tax information (see Figure 2). The preparer reviews these forms, resolves questionable items, and transfers the information to input, or "interview," sheets, which organize the data into the proper format for Tax Machine.

The program is entirely menudriven (see Screen 1a); you enter data in either an Interview or Interactive mode. The former is generally used by firms with a data entry staff, the latter, by small firms with one or two professional preparers. Your choice of entry mode for any given return is permanent.

To enter data in the Interview mode, you select Enter Client Data from the Client Preparation menu. You then type in the client's Social Security and interview sheet numbers; the program displays an electronic facsimile of the

Always check the box labeled Total number of exemption Yourself. Wages, salaries, tips, etc. Check other boxes if they Interest income (attach s Dividends (attach Sche apply. Subtract line 9b from 8 Refunds of State and do not enter an instruction page 9 of Instruction Income ga C Alimony received . 10 Business Income C Capital gain or (in 11 40% capital gain 12 Attach Copy B 13 Supplemental 9 of your W-2, 14 Fully taxable p W-2G, and 15 W-2P here. Other pension If you do not have 16 Taxable amo 172 a W-2, 500 Rents, royal 0

page 4

of instructions.

Farm incon

Unemploy

Tayable !

18

19

202

Form 1040 Form 1040A Form 1040ES Schedule A Schedule B Schedule C. Schedule D Schedule E Schedule F Schedule G Schedule R Schedule SE Schedule W Form 1116 Form 2106 Form 2119 Form 2210 Form 2210F* Form 2441 Form 3468 Form 3800 Form 3903 Form 4136 Form 4137 Form 4255 Form 4562 Form 4684* Form 4797 Form 4835 Form 4952 Form 4972 Form 5695 Form 6251 Form 6252 *Tax Machine only

Figure 1: Federal tax forms prepared by Tax Machine and Micro-Tax

sheet for data entry. Once you've completed all the sheets, the program processes the entire batch—much as its mainframe cousins would.

In Interactive mode, you enter data directly from organizer sheets. The program's data entry screen (see Screen 2) remains the same, but after you complete a form or schedule, a filled-in facsimile of the appropriate IRS form appears on screen.

Regardless of the entry mode, *Tax Machine* accepts more data than a standard tax form permits. When the program prints the return, it generates supporting schedules to hold the overflow and references them to the appropriate forms.

Tax Machine is skilled at eliminating redundancies and flagging input errors. For example, previously entered information forces the cursor to skip inappropriate fields. You can also use proof totals (all numeric entries, including dates) to flag entry errors. Yes and no entries are also checked.

Tax Machine offers one feature many service bureaus don't. The Form 4562 input screens, which are used to enter fixed asset information, can also record fixed asset dispositions. You simply enter Y to flag the item and indicate the sale price and the date. The information is transferred to Forms 4797, 4255, or 6252 wherever applicable.

Returns in Hand

Tax Machine can process a single form or schedule, a single return, or a batch of returns. Computing time varies with a return's complexity, but you can expect to wait from 7 to 10 minutes per return.

As it processes, *Tax Machine* creates a diagnostic message file for each return. Most messages point out the obvious ('Beginning to process form 1040'), but some supply vital information about missing data, improper use of a depreciation method, and so on. Be prepared to sift through the file for these informative nuggets; error messages are mixed in with the dross. After computation, a condensed version of the completed 1040 and Schedule A forms is available for on-screen review.

Powerful Printing

You can print the results of *Tax Machine*'s ministrations on official IRS forms or on blank paper, which you can photocopy with acetate overlays; you can also generate facsimiles. In the latter case, *Tax Machine* wisely supports the Hewlett-Packard LaserJet printer. Instead of completing a blank form or merging a printout with an overlay, a laser printer simultaneously generates IRS-approved forms and their data (see Figure 3).

Once a return is prepared, *Tax Machine* can produce *pro forma* organizer and input sheets for next year's returns, along with personalized client instruction letters. *Tax Machine* will even carry

over prior-year client data for a second year. Depreciation data is the exception, but AMI plans to remedy this by the end of 1985.

Two to Learn By AMI's dedication to user training is first-rate. Tax Machine's price tag covers a videotape tutorial, plus a one-day seminar for your staff at one of six training centers in New Jersey, Florida, Illinois, Texas, California, and Washington. User manuals are geared to everyone in the preparation process: system operator/clerk, administrator, preparer using Interactive mode, and preparer using Interview mode. The manuals are clearly written and liberally sprinkled with flowcharts illustrating Tax Machine's structure. Clarifications and cautions for each federal tax form are also included. The documentation can be faulted. however, for lacking an index of error messages.

Expensive Support Though Tax Machine comes with every learning aid imaginable, a time will undoubtedly come when you have to pick up the phone and call for the cavalry. Your first howl for help is free-if it's related to installing the program. Subsequent queries run a stiff \$1 per minute-note that the minimum charge is for 10 minutes. The company plans to offer unlimited phone consultation in 1986 for an as yet undisclosed fee. Considering the program's complexity,

Client ID [223-988]]
Citent ID [223-986] 1
1. Allocate Form(s)
2. Enter Client Data
3. Compute Client Form(s)
4. Compute Form(s) at end of session . []
5. Compute and Print at end of session []
6. Deallocate a Form

* * * * MICRO-TAX SYSTEM DIRECTORY * * * * (c) 1978-84 Microcomputer Taxsystems, Inc.

1984 SILVER

THE FOLLOWING FUNCTIONS ARE AVAILABLE:

- 1 CREATE NEW FILES FOR CLIENT SELECT SCHEDULES AND FORMS
- 3 DISPLAY ACCOUNT STATUS
- 4 PRINT QUESTIONNAIRE 5 ENTER DATA
- COMPUTE TAX
- DISPLAY RECAP
- PRINT TAX FORMS
- DEPRECIATION MODULE
- BATCH COMPUTE/PRINT

- 11 INITIALIZE NEW CLIENT DISK
- 12 LIST CLIENTS ON FILE
- 13 ACTIVATE ANOTHER CLIENT
- 14 COPY CLIENT FILES
- 15 DELETE CLIENT FILES
- EXIT TO OTHER TAX SYSTEMS EXIT TO TAX ORGANIZER
- 18 LOAD SALES TAX TABLE
- TAX-NET SYSTEM UPDATE 19
- SET SYSTEM SPECIFICATIONS

EJ EXIT FROM SYSTEM

PLEASE ENTER FUNCTION NUMBER _

Screens 1a and 1b: Tax Machine's Client Return Preparation submenu (top) and Micro-Tax's 20-command main menu (bottom).

first-year users should make the investment.

Keep in mind that *Tax Machine* is not sold like an appliance but is actually licensed to users. First-time buyers pay \$1495; program updates, which include system enhancements and reflect changes in the tax laws and tables, cost \$900 per year or \$225 per quarter.

Taxing Problems Tax Machine's biggest plus is its ability to calculate and transfer most figures automatically from one form to the appropriate lines in others. The few exceptions, however, are potential sources of error. For example, Tax Machine will compute the bottom line for Form 4952 (allowable investment interest), but you must then enter that figure manually in Schedule A. For an installment sale of depreciable personal property, it is easy to mistakenly enter prior depreciation in the wrong field. Tax Machine will not flag either of those errors. It's easy enough to sidestep these little traps, but you

Micro-Tax

have to watch out for them.

Micro-Tax comes in three versions: Bronze, a low-cost issue that handles only the essential tax schedules; Silver, which prepares complex returns (and is the subject of this evaluation); and Gold, which is Silver modified to support the Canon Formwriter II laser printer. Installing the program

takes about 10 minutes and includes establishing system configuration and preferred printing specifications.

Like *Tax Machine*, *Micro-Tax* is menu-driven (see Screen 1b). The main menu lists 20 functions; submenus aplenty expand on these selections. For example, after you enter all client data, one submenu option offers to load the tax computation module.

Micro-Tax can print out questionnaires, which serve as both client data organizers and data input sheets (see Figure 2). A better option is to obtain preprinted organizers (available from third-party suppliers) for clients and to use the questionnaires as input sheets. Micro-Tax asks for one entry at a time, each prompt corresponding sequentially to line items on the client questionnaire. Micro-Tax repeats that process for each form or schedule until the entire return is completed.

Each client is assigned a 3-digit code—a step *Tax Machine* eliminates by logical use of Social Security numbers. Normally, you select all of a client's tax forms and schedules from the main menu before entering data. Fortunately, you can select additional forms as needed if you're hip-deep in a Form 1040 input screen.

Micro-Tax does not compute results as each form or schedule is completed but processes the entire return (or group of returns) in one gulp. Nor does the program make use of the PC's <PgUp> and <PgDn> keys. Like Tax Machine, Micro-Tax skips inapplicable input lines based on previous entries and accepts proof totals. But other

obstacles await, for *Micro-Tax* obliges you to specify which forms and schedules in a return are interdependent. For example, *Micro-Tax* will compute the alternative minimum tax only if Form 6251 has been selected.

Impressive Printing
Micro-Tax prints individual
forms, single returns, and entire
batches on IRS forms, via lasergenerated facsimiles (in the Gold
version of the program) or using
overlays. Unfortunately, you can
select print specifications "on the
fly" only in batch-print mode. In
all other instances, you must return to the main menu, open the
system specifications file, and
change specifications before
continuing.

Like *Tax Machine*, *Micro-Tax* produces customized client instruction letters and questionnaires that reflect the previous year's tax information.

On-the-Shelf Help

Micro-Tax's user manual is illustrated and concise and includes an index of error messages. Fast-Tax provides free telephone support 11 hours per day, five days a week during January and February; from March 1 through April 15, the company extends support to 13 hours on weekdays, 9 hours on Saturdays, and 6 hours on Sundays. You can telecommunicate questions and receive answers (as well as program updates) via The Source.

AMI TAX MACHIME Form: 1848H #1 EMTER HODE	"Your Firm Name (3 2/Fidelity Ltd.	8 chars)"
Filing Status - enter number []	P	reparer's initials [
1 - Single	Forced ID [_]	AND LONG OF SHIP SHAPE OF
Z - Married - joint return.		
3 - Married - separate return.	Lived with spouse .	[N] Forced ID [N
 4 - Head of household. Unmarr 5 - Qualifying widow/er with de 	ied child's name [
5 - Qualifying widow/er with de	pendent child	Spouse died 191
Names as shown on 1848 [1
First Name	Last Name	M22
Payer's name [11	[]
Payer's name [Spouse's name [1 []	[]
00 000	J.	Phonel
Street Address I	1 04-4	e [_] Ziy [
Street Address [I County [1 Stat	
City [I County [Occupation []		1 n

Screen 2: A Tax Machine onscreen data entry form

TAX INFORMATION ORGANIZER

DESCRIPTION	PSJ.	CURRENT YEAR	LAST YEAR
ITEMIZED DEDUCTIONS CON'T.			
INTEREST EXPENSE			
HOME MORTGAGE			8,360
MORIGAGE PAID TO PRIVATE PARTY?			YES - NO
CREDIT AND CHARGE CARDS			145
AUTOS			
ABC CREDIT LOAN			217
FIRST STATE BANK			175

Figure 2: Sample sections from Tax Machine's client information organizer and Micro-Tax's client questionnaire. Data from the organizer is summarized and transferred to input sheets; the questionnaire serves as both organizer and input sheet.

	A ITEMIZED	DEDUCTIONS
33	CASH CONTRIBUTIONS UNDER \$3000	
	CONTRIBUTIONS \$3000 OR MORE	
35 36	ORGANIZATION AMOUNT	* 1
	CONTRIBUTIONS OTHER THAN CASH	
38	ORGANIZATION	. :
39	PROPERTY DESCRIPTION	H 1
41	DATE ACQUIRED DATE CONTRIBUTED COST OR BASIS	
43	DEDUCTION AMOUNT (FMV)	* 1
44	CARRYOVER FROM PRIOR YEARS	
	CASUALTY AND THEFT LOSSES	

Figure 3: A 1040 form generated by Tax Machine and Hewlett-Packard's LaserJet printer

or the year Jan 1 - Dec 3	1, 1984 0	r other year	er	nding			- "	VI.			OMB #1545	5-0074
ISE IRS Your first name	and initi								Your So	icial Security No		
abel. Rober	t W	W. & Ellen A. Olsen							-	7 89 89		
Apiv		State of the state						100000000000000000000000000000000000000	's Social Security			
16036		42nd ffice, State, and Zip code Your occupation Pro							6 45 79	30		
or type. City, town, or Fife,								each				
Presidential		Do you want \$1 to go to	this fun	d?			Yes		No No		NOTE: Checking	Yes wi
Election Campai	gn /	If joint return, does your	spouse v	vant \$1	to go	to this fund.	. Yes		No	Х	not increase your or reduce your	refund
	1	Single				For Privacy	Act a	nd Pape	rwork Reduc	ction Act	Notices see Ins	truction
Filing	2	X Married filing joint r										
Status	3 4	Married filing separate return. Enter spouse's soc. sec. no. above and full name here Head of household (with qualifying person). See page 6 of instructions. If the qualifying										
Check only one box.	4	child but not your d					of instr	uctions.	if the quant	ying per	son is your unma	rried
	5	Qualifying widow(er)					ed 19	>)	(See page 6	of Instr	uctions.)	
	6a	X Yourself		$\overline{}$	65 or c				Blind	٦	Enter number of	_
Exemptions	b	X Spouse			65 or (over			Blind	3	boxes checked on 6a and b	2
	C	First names of dependen	t childre	n who	lived	with you	_			}	Enter number	T.
Always check the box labeled		Michael P.		_				_			of children pon 6C	
Yourself.	d	Other dependents 1) Name	2) Rela	tionehi	n	(3)Number of months lived	havein	come of	more than	1/2 of	Enter number of other	
Check other _ boxes if they		i) itano	L) Hola	uonan	Ρ	in your home	\$1000 0	r more?	dependents	support3	dependents	
apply.											Add numbers entered in	
	е	Total number of exemption	ns clain	ned (a	so co	mplete line :	36)				boxes above	3
	7	Wages, salaries, tips, etc.								. 7	33	_
Income	8	Interest income (attach S								. 8		74
	9a c	Dividends (attach Schedu Subtract line 9b from line				575		xc 2	30	9	200	37
	10							ae 9 o	f Instructio			3 /
		Refunds of State and loc (do not enter an amount page 9 of Instructions)	unless	you de	ducte	d those taxe	s in a	n earlie	r year	see 10		
	11	Alimony received								11		
Attach Copy B of your W-2,	12	Business Income or (loss								. 12		,14
W-2G, and	13	Capital gain or (loss) (attach Schedule D)										
W-2P here.	14 15	40% capital gain distributions not reported on line 13 (see page 9 of Instructions) . Supplemental gains or (losses) (attach Form 4797)										
If you do not have	16	Supplemental gains or (losses) (attach Form 4797)										
a W-2, see page 4	17a	Other pensions and annu						.,		32		
of instructions.	b	- The state of the									b	
	18 Rents, royalties, partnerships, estates, trusts, etc. (attach Schedule E)									18		
_	19											
									20	ACA		
Please attach check	21a	and the same of th				_	21a	115		20		
or money	b								21	b		
order here.	22	Other income Washington State Lottery										
	_									22		50
	23	Add lines 7 through 22.								23	36	,51
Adjustments	24	Moving expense (attach					25		_	_		
to Income	26a	Employee business expe IRA deduction, from the					26a			-		
	b	Enter here IRA payments								### ### ### ### ### ### ### ### ### ##		
(See Instructions		line 26a 🕨 L		1								
on page 11)	27	Payments to a Keogh (H					27					
	28	Penalty on early savings					28			6000 7.45		
	29	Alimony paid					29		020		440	
	30 31	Deduction for a married Add lines 24 through 30					30	'S	839	. 31		83
Adj Gross	32								his line is			0.3
Income	_	Subtract line 31 from lin than \$10000, see "Earne If you want the IRS to f	d Incom	e Cred	dit" (lin	e 59) on pa	ige 16	of the	Instruction	32	35	,67

Many Happy Returns? Although *Tax Machine* and *Micro-Tax* perform identical tasks, the two programs differ substantially. *Micro-Tax* has severe capacity limitations: If a client's return encompasses more than 20 federal schedules or 400 data items, you must prepare excess schedules manually. And multiple occurrences of the same tax form (such as two Schedule Cs) in the same return force you to issue a different client code for each.

But the most striking difference is *Tax Machine*'s superior integration of tax forms. Based on the information you enter, the program selects the appropriate tax forms (with the exceptions noted here) and passes information among them automatically in accordance with IRS instructions. For example, entries in Form 4797 generate a Schedule D, and Schedule C income automatically conjures up a Schedule SE. You manually select a form only when it appears twice in a return.

As noted earlier, *Micro-Tax* obliges you to select all forms and schedules in advance. The program also forces you to drag out a calculator on occasion. For example, limits on earned income (IRA and Keogh deductions) must be computed manually. The program will not determine whether a gain is long-term or short-term, based

on dates entered on Forms 6252 and 4797 or Schedule D. You must indicate the holding period for asset sales.

The Returns Are In Which program is the taxtime saviour? On the whole, *Tax Machine* is more thorough and sympathetic to the user. Its documentation is superior and aimed specifically at hard disk users equipped with MS-DOS; its tutorials and classroom instruction beat *Micro-Tax*'s brief written tutorials hands down; its integration of tax forms greatly reduces manual data entry.

Of course, if ample and free phone support is vital and *Tax Machine* does not compute full returns for your state, you may find this program fatally flawed. And if you expect to prepare fewer than 120 returns, you might favor *Micro-Tax* for its significantly lower price tag.

But *Tax Machine* is easier to use, and it calculates and extensively integrates almost all forms and schedules. It requires far less attention and on the whole represents an advance in the state of the art. In the final analysis, *Tax Machine* yields a better return.

Ralph Soucie is tax manager with Kenneth M. Mitchell & Co., a CPA firm in Oregon City, Oregon.

Tax Machine Accountants Microsystems, Inc. (AMI)P.O. Box 50 Bellevue, WA 98009 800/426-8201, 206/643-2050 List price: federal package \$1495. annual update \$900. Each state package \$395 (AL, IL, MI, NI, OH, VA); \$595 (OR); \$795 (CA, NY, PA). Quarterly license fee (telephone support and program updates) \$225 (federal); \$50 (AL, IL, MI, NI, OH, VA); \$75 (OR); \$100 (CA. NY, PA). Tax planning package \$495. Hewlett-Packard Laserlet printer with AMI GX font cartridge \$4495; GX cartridge alone \$1500; laser printing software for federal forms \$495. Requirements: 256K, 10MB hard disk (20MB recommended) Not copy protected

Micro-Tax, Silver version Fast-Tax 2395 Midway Rd. Carrollton, TX 75006 800/327-8829, 214/250-7000 List price: federal package \$995, annual renewal \$695; with laser printing capability \$1195. annual renewal \$1195. Each state package \$350 (CT, FL, GA, HI, IA, KS, LA, MS, NE, NJ, OH, OK, OR, VA, WI); \$500 (AZ, CO, DC, IL, IN, MD, MA, MI, NC, PA); \$750 (CA, MN, NY); state renewals at one-third original cost. Tax planning module \$295 Requirements: 96K, two disk drives Not copy protected

PC World 177

A 1-2-3 Foursome

Templates package the flexibility of 1-2-3 in a spreadsheet customized for any application.

William Urschel

How do you harness the power of 1-2-3 without mastering formulas, macro commands, and other spreadsheet minutia? The answer is to use a template—a 1-2-3 spreadsheet with formulas and macros already built in.

1-2-3 is a veritable chameleon. While its heart and soul remain untouched, its outward appearance changes with each template to suit a wide range of applications. These include accounting, real estate, project management—almost anything you can think of.

Whatever the application, 1-2-3 templates are usually cheaper, simpler to use, more flexible, and

often faster than programs dedicated to a specific task. Templates stretch 1-2-3 well beyond its original design, often by buttressing weak points, particularly in the area of data base management.

A template's real strength is its adaptability: you can conveniently modify it with additional macros. What's more, you can sidestep the template at any time and have 1-2-3 commands at your disposal. Not surprisingly, spreadsheet templates are among the hottest commodities in the software industry—with 1-2-3 templates representing the vast majority of the 1500 template programs now on the market.

The four templates reviewed here are outstanding examples of their respective applications and embody different levels of sophistication. *Bottomline V* aids financial decision making, *Key II* is a data base analysis tool, *CPA* + is an all-in-one accounting package, and *Stock Record/Query/Portfolio Manager* tracks stocks and performs technical analysis.

Template Tour

Templates come in three levels of sophistication. The simplest kind—in existence since the first copy of *VisiCalc* was sold—is sometimes referred to as an open matrix. What you get is a spreadsheet (the matrix) filled with interlocking formulas but without any driving macros or menus. This template design's strength lies in its elegant simplicity, but with no helpful prompts you must at least know your way around a *1-2-3* spreadsheet. *Bottomline V* falls into this category.

The other three templates reviewed are classified as semiautomated because they use the power of macros. These templates present menu options on the 1-2-3 command line, often explaining the options more fully at the center of the screen. These features serve mainly to position the cursor logically for each data entry task and to shuffle calculated results



automatically to the appropriate areas in a spreadsheet. The crucial point to remember about semi-automated templates is that they don't provide true data entry screens or entry validation; you enter data directly into individual spreadsheet cells.

A fully automated template presents a data entry screen, which isolates you completely from the spreadsheet (see "Readyto-Run Accounting," *PCW*, September 1985). The screen prompts you for the type of data to be entered. Then the template tests the entry to make sure it's the right type. An incorrect entry, such as a

letter where a number should be or an account number for a nonexistent account, elicits a beep or some other prompt to try again.

After entered data is validated, the fully automated template sends the data to the correct spreadsheet cell. Because you never descend to the spreadsheet level, you need not be a 1-2-3 expert. Be forewarned: Only a small percentage of templates now on the market are fully automated, although many are labeled as such.

Bottomline V

Bottomline V is a superb open matrix template for corporate or small business managers who do financial planning, analysis, and forecasting and who are comfortable with basic 1-2-3 operations. Although it lacks menus and macros, Bottomline V is intuitively easy to use because what you see on the screen, whether an income statement or a balance sheet, looks exactly like the familiar printed version.

Bottomline V is a great timesaver. Using this template I recreated the basic financial state-

COMPANY		LES JOURNAL REFERENCE NUMBER	AMOUNT 29,067.67	ALLOCATION 29,067,67	ACCOUNT	BALANCE
	04	4400		F 000 00	CALCO	/ 544 04
HERCULES RADIO	01-Jun-85	1100	5,000.00	5,000.00	SALES	4,566.01
PAUL JOHNSON	01-Jun-85	1101	15,000.00	15,000.00	SALES	14,000.0
XYZ CORP	15-Jul-85	1102	3,195.00	3,000.00	30000	3,000.0
XYZ CORP	15-Jul-85	1102		195.00	SALES TAX	195.0
AMEX	19-Jul-85	1103	3,872.67	3,872.67	CREDIT SALE	3,872.6
HOWARD ELECTRONICS	20-Jul-85	1103	2,000.00	2,000.00	SALES	

Figure 1: CPA + displays eight accounting journals plus a work area in adjacent columns within a 1-2-3 spreadsheet. Two of the eight journals—Sales (accounts receivable) and Employee Payroll—are shown here. Macros appear in columns to the right of the journals.

ments for a medium-size manufacturing company in 90 minutes, a job that had taken me two weeks working with a CPA.

To use Bottomline V, you begin by entering a 12-month budget, plugging all data directly into the spreadsheet. Next, you enter other pertinent data into any of the nine journals, which are located in separate sections of the spreadsheet. The journals collect information on sales forecasts, cost of sales, operating expenses, average collection period, days of inventory carried, debt funding, equity funding, capital expenditures, and research and development costs. The final step is to select 1-2-3's Calc function (<F5>); Bottomline V automatically churns through nearly 9000 calculations to produce the correct totals for each journal.

What results from these machinations are income statements, balance sheets, cash flow reports, financial ratio analyses (debt versus equity, cash versus long-term debt), one-year quarterly forecasts, five-year annual forecasts, and so on. All reports can be printed.

Anyone who's a competent bookkeeper will understand *Bottomline V* at a glance because it adheres to familiar, conservative accounting practices. For example, all depreciation is calculated using the straight-line method.

You should, however, know how to use 1-2-3 in case you need to change data or formulas. For example, you might decide to change from straight-line to ACRS depreciation. Other possible changes relate to program logic: On the projected income statement, for instance, if an asset becomes fully depreciated during the period forecast, you may have to remove the item manually—a quick, straightforward procedure

that only an extremely sophisticated (translation: expensive) accounting program would do automatically. If you haven't altered formulas before, don't worry. The user manual contains detailed notes and good examples.

Key II

Key II enhances 1-2-3's data
base function, its weakest feature,
by providing six menu-driven
modules that perform various data
base analyses. Key II is exactly the
sort of analysis tool a manager
needs to dissect an existing data
base, whether it was created by
1-2-3, dBASE II or III, or any
other program that can convert its
data base files to ASCII format.

Key II is semiautomated, so you need not be a 1-2-3 expert to use it. The template's menus and macros run combinations of 1-2-3's data base commands, such as those that create criteria ranges or data tables. To make life even easier, Key II is accompanied by a well-organized user manual and a thorough, step-by-step tutorial disk.

EMPL	OYEE PAYRO	LL JOURNAL	FROM: 01-Jun-85 TO: 15-Jun-85		
EMPLOYEE	EARNINGS	TAXABLE I AMOUNT DE			TOTALS . AMNT. DESCRIP.
JAMES JENNINGS		REG 100.00			866.65 REG.
SS # 546-78-7894 BIRTH - 4/4/44	86.67			EIMBURSE (34.61)STATE	75.00 OVER.
HIRE - 1/1/85	10.00	RATE	0.00 M	NSURANCE (76.96)FICA ISC (6.55)SDI	150.00 TAXABLE (10.00)NON-TAX
TERM -		OVER	0.00	0.00 LOCAL	(280.13) TAXES
RAISE - 6/1/85	5.00	HRS			
SEX - M	15.00	RATE			
MARITAL STATUS - 1 EXEMPTIONS - 1					
GROSS YTD			22222222		********
\$5,149.95	941.65	150.00	(10.00)	(280.13)	801.52 NET PAY

A major disappointment is that the template only analyzes data in existing data bases; it cannot help you create a data base. *Key II* lacks a menu-driven screen to speed up manual entry or provide entry validation. The program is flexible enough that I was able to jury-rig an entry screen with 1-2-3 macros in just a few hours. I don't see why the manufacturer failed to provide such a screen.

A sales manager overseeing a nationwide operation could use *Key II's* Inquire module—the simplest of the six—to simultaneously find the lowest and highest values and the sum, average, and number of items for as many as eight numeric fields, such as price and profit margin. Like *Key II's* other modules, Inquire gives you the choice of printing a report, saving it to disk, graphing the results, or beginning another analysis on the same or modified data.

Other Key II modules perform more complex analyses. The Analyze module selects data base records that meet certain criteria and then performs basic mathematical operations on selected fields. For example, the module could sort for all salespeople who have more than 50 sales, arrange them by district, and automatically calculate the profits generated by each. Similar in function, the Extract module could pull individual sales records for each salesperson based on specific criteria, then total the numeric fields in the final report.

The Distribute module is exceptionally useful, proving that a picture is worth a thousand words, or several thousand bytes as the case may be. The module creates a two-dimensional data table, with the *x* and *y* axes representing any

Count module simplifies use of 1-2-3's often neglected data distribution function, which calculates how many fields in a given range contain values that match a given criterion.

Key II also has two ancillary modules. The Report module prints a copy of a sorted data base with totals and subtotals, and adds dates and headers. The Modify module helps you add and delete records from existing data bases.

Other than the lack of a data entry screen, *Key II*'s only shortcoming is the restricted number of



Key II is exactly the sort of analysis tool a manager needs to dissect an existing data base.

two fields in a record. Thus, months might be listed across the top of the table and salespeople down the left column, with each person's monthly sales inserted into the appropriate cell. The data base records it accommodates—a limitation imposed by 1-2-3, which holds all data and program code entirely in RAM. Although I didn't push *Key II* to its limit, I was able to import an 8-field, 1200-record *R:base 5000* stock data base on a 512K PC

without a problem. The secret to using *Key II* effectively is to initially cull records with the source data base program, reserving *Key II*'s talents for data analysis.

CPA+

If you are doing the books for a small to medium-size business, you will need at least a general ledger program and quite possibly accounts payable, accounts receivable, and payroll modules. An outstanding template that incorporates all of these functions in one trim package is *CPA* +.

One of *CPA* + 's most notable features is speed. It posts entries and runs updates many times faster than any dedicated accounting program I've used. This speed is due primarily to the placement of its eight journals (general ledger, accounts receivable, accounts payable, payroll, cash disbursements, cash receipts, general [for miscellaneous entries], and names) and a work area in adjacent columns of the spreadsheet rather than in separate modules (see Figure 1).

CPA + 's columnar format limits the number of accounts and transactions you can manipulate at once. However, the maximum number should be more than adequate for almost any small business, because a 640K PC accommodates up to 700 general ledger accounts, with 700 entries per journal per period. CPA + does not allow you to link spreadsheets

to overcome memory limitations.

While evaluating *CPA* + I was continually surprised by the wealth and variety of features packed into its macros—the journals perform functions you would expect from dedicated accounting programs. The accounts payable journal, for instance, stores vendor name, invoice date, purchase order number, amount, allocation, account number, due date, and balance. (The names journal also stores the vendor's name, address,

shows the total owed by each customer, with an aged breakdown from any date.

The Payroll journal accommodates up to 39 employees and is keyed to the employee's name, rather than to a number. The journal automatically updates the general ledger and the year-to-date and quarter-to-date data files, and calculates federal and state tax withholdings, FICA, and SDI deductions. Both paychecks and pay stubs can be printed.



While evaluating CPA + I was continually surprised by the wealth and variety of features packed into its macros.

telephone number, and contact.) A report lists the total owed to each vendor, with an aged breakdown. *CPA* + also pays partial invoices, calculates discounts, provides automatic payment for all accounts or for selected disbursements, and prints checks.

Check printing is a bear with many accounting programs because of the difficulty of aligning checks properly in a printer.

CPA + at least lets you print trial runs with dummy checks. You have the choice of printing checks for all open payable accounts, a selected range of dates, or a range of vendors.

The accounts receivable journal is similarly comprehensive. Each invoice records customer name, invoice date and number, breakdown by item, and balance due. The journal generates a report that

To give you a quick snapshot of your financial condition at any time, *CPA* + displays or prints out a set of financial statements that includes a simple balance sheet, an income statement, and a summary of financial ratios such as current assets versus current liabilities, an inventory turnover ratio, and a profit margin on sales ratio.

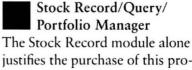
For a template, *CPA* + provides an impressive number of helpful features. For instance, most double-entry bookkeeping systems don't help in making the corresponding entry, so if you debit one account you have to figure out on your own which account to credit. While *CPA* + can't make specific suggestions, program prompts nearly always point you toward the correct account. The template

also makes it extremely easy to enter beginning balances, zero out accounts, and clear the general ledger at the start of a new year—a burdensome and exacting ordeal that every bookkeeper dreads. At print time, the template also asks what type of business you run (retail, manufacturing, or service) so that the income statement is properly formatted.

CPA + makes good use of 1-2-3's graphing functions, providing forecasts of cash disbursements and receipts, and summary information from the original journal entries. All these features are thoroughly described in the user manual, on an excellent tutorial disk, and through in-context help screens.

CPA + 's omission of true data entry screens, however, is a shortcoming that should give pause. When a program does not check spreadsheet entries for accuracy, the potential for problems is great. Without data entry screens, it's also easy to wander off into the macro area and, through curiosity or carelessness, damage the macros. This damage is particularly onerous with CPA+, because the same spreadsheet contains all eight journals. Transferring scrambled data from all these journals to an unadulterated copy of the template would be difficult, to say the least.

CPA + does not catch errors before you finish a data entry session. Instead, it requires on a monthly basis that you invoke the Update Chart command to check that all the accounts used in the original entry journals appear in



justifies the purchase of this program. While serving as a data base for tracking stock performance, Stock Record produces an



CPA + makes it extremely easy to clear the general ledger at the start of a new year—a burdensome ordeal that every bookkeeper dreads.

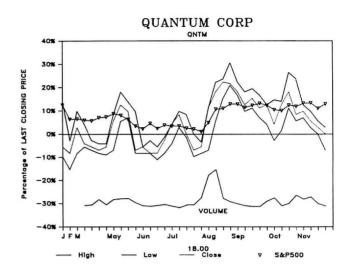
the chart of accounts. The other required monthly check is the Trial Balance report, which ensures that the books are balanced. To check for errors more frequently, you must issue these two reports more often.

An additional pitfall-CPA + 's original entry records can easily be altered, unlike in manual accounting and many other accounting programs. Thus no dependable audit trail is created to trace the source of errors. For this reason alone I would recommend CPA + only to accountants or bookkeepers who are familiar with 1-2-3 macros and who have sole responsibility for entering transactions. I would hesitate to recommend the package to people sharing bookkeeping responsibility or to those with less experience in the ways of 1-2-3. At \$695, CPA + isn't inexpensive, but for an educated user, there is no faster or more flexible accounting system on the market.

incredible array of graphs for technical analysis. It charts high, low, close, and volume data—for one stock or a group of stocks. You can compare stocks on a one-to-one basis, in terms of relative strength against other stocks, or against an index such as the Dow Jones Industrial Average or the S&P 500. You can graph current year figures only, or graph price changes for the stock's entire history as stored in the Stock Record data base.

Stock Record also creates several graphs not provided by any other template I know of. One charts current-year data as a percentage of the year's median price, the last price, the minimum price, or another value of your choosing. The benchmark value appears as a horizontal line across the graph. Another graph charts 13-week, 26-week, and 39-week moving

Figure 2: The graph on the left charts the high/low/close quotations for Quantum Corporation as a percentage of the last closing price and includes a scaled market index (S&P 500) for comparison. The bar graph compares the low/close, high/close, and high/low ratios of four stock issues for a period specified by the user. The graph on the right charts Hewlett-Packard's 13-, 26-, and 39-week moving average, using a scaled 13-week Dow Jones Industrial Average as a reference point.



averages in one-week increments.

Keep in mind that as you accumulate stocks and data in a chart, the screen quickly grows illegible. The blame lies with the poor resolution of most PC monitors and 1-2-3's own graphic limitations, so it's best to stick to charting one stock or one stock and an index on screen at a time. An alternative is to rely on printouts for detail (see Figure 2).

Query lets you screen the Stock Record data base for stocks worth looking into. You're provided with thumbnail sketches of companies based on four fundamental elements: cash, assets, liabilities, and P/E ratio. Portfolio Manager handles basic portfolio maintenance, reporting on the current value of the portfolio, its potential and actual gains, and its long- or short-term capital gains status.

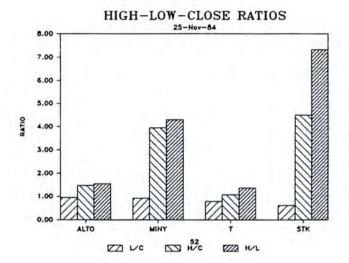
Portfolio Manager is far less compelling than the other two modules. It functions as designed, but I wouldn't recommend it. Data accuracy is unreliable because you enter data directly into the spreadsheet without validation and, to make matters worse, the portfolio matrix is cluttered with labels and entry cells.

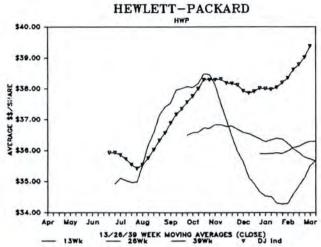
A better approach is to use a cheap portfolio management program (you can obtain free programs from on-line services such as CompuServe), convert the data into an ASCII file, and then import it into Stock Record for graphing. Perhaps the best solution is to download data from the Dow Jones News/Retrieval service using any communications software, then graph it with Stock Record. An upcoming Symphony version of this template will reportedly make good use of Symphony's superior on-screen graphics and built-in communications program to download data from on-line services.

Final Analysis

The big question is, can template software replace dedicated programs? In many cases the answer is definitely yes. Look for open matrix templates if your application is simple and you know the basics of 1-2-3. Semiautomated templates are fine for more complex applications—as long as you know the 1-2-3 basics and you're careful about data entry. Fully automated templates are suitable for any template application, no matter what your level of 1-2-3 expertise.

A template may not be the ideal solution for some accounting and investment applications that require a large data base. For many straightforward, modest-size applications, however, a template is clearly the most efficient and economical way to go.





Hundreds of real bargains are available—\$50 and \$100 templates, such as those in the *OptionWare* or *TaxCalc* series, that perform almost every conceivable accounting or tax preparation chore. Some higher-priced programs, like *CPA* +, are also good values considering the impressive number of features they offer and the boost they give to 1-2-3. ■

William Urschel is a freelance writer and the author of 1-2-3 applications software. He is currently working on stock market analysis and tax strategy projects for Hayden Books.

Bottomline V, version 2.0 ILAR Systems, Inc. 1300 Dove St. #105 Newport Beach, CA 92660 800/828-7257, 800/523-7201 California, 714/476-2842 List price: \$295 Requirements: 128K, two disk drives, 1-2-3

Key II Data Management for 1-2-3 Quadram Corp. 4355 International Blvd. Norcross, GA 30093 404/564-1975 List price: \$99 Requirements: 256K, two disk drives, 1-2-3 (version 1A)

CPA +
GNP Development Corp.
1244 E. Colorado Blvd.
Pasadena, CA 91106
818/577-7767
List price: \$695
Requirements: 256K, two disk
drives, 1-2-3 (version 1A)

Stock Record/Query/Portfolio Manager MicroRealities P.O Box 60123 Grand Junction, CO 81506 303/245-8358 List price: \$125 Requirements: 256K, one disk drive, 1-2-3 (version 1A), monochrome graphics board supported by Lotus

For a free catalog of 1-2-3 and Symphony templates contact: 4-5-6 WORLD P.O. Box 22657 Santa Barbara, CA 93121 800/524-5678, 805/564-2424

On the Trail of the Datavue 25

Quadram's innovative PC-compatible portable passes the durability test on an expedition through South America.

Eric Brown

I drove all day through the hot plains of scrub jungle before arriving in Calabozo. The town sat like a warty toad on the Venezuelan Llanos. Calabozo—the word sent shivers down my spine. In Spanish the name means jail. As night fell, the streets filled with tough vaqueros and oilmen. I made my way to the outskirts of town, my Datavue 25 in hand. Inside was a fresh battery pack and a disk that contained the message.

I arrived at the appointed cantina and entered. A few shady characters stared at me from the bar. A Julio Iglesias record was blaring from the jukebox.

"Sẽnor Brown! Ven acá," hissed a voice from a dark corner. "I've been waiting for you." I couldn't see the face, but I would know that voice anywhere. It belonged to the man, the man called ...

"You have information." A hand penetrated the dusty light, beckoned. "I want."

I crossed the room and set the Datavue 25 down on the rum-splotched table, folded down the keyboard, and flipped on the power switch. Then I proceeded to load WordStar. A giggle emanated from the darkness.

"You still use WordStar?" said the man, laughing like a jackal.

"Well what of it?" I said defensively. "I'm used to it. I know all the commands."

"He still uses WordStar!" he bellowed. The men at the bar broke into uncontrollable laughter. Okay hotshot, I thought, this should impress you. I yanked off the keyboard cord, walked 10 feet away, and loaded the file.

"Big deal, infrared beam. You think that impresses me?" The man leaned forward into the light; I could see a bushy black beard and the flash of a scar.

"Well, what's wrong with it?" I stammered.

"What's wrong with it? It's a gimmick. Besides, it didn't help the PCjr any."

"Forget it, then," I said, starting to close the file. "You can buy your own computer."

A large, hairy hand grabbed the keyboard; another held a knife to my throat. "Are you threatening me?" hissed the man. "I wouldn't do that if I were you. Life is cheap in Calabozo, Senor." The smell of cheap rum overwhelmed me, and I felt myself growing faint ...



Several months ago I tagged along with a biological expedition to the jungles of Venezuela and Trinidad and Tobago. Not to be outdone by my scientific friends and their mountain of technical gear, I brought along my own piece of high-tech wizardry, Quadram's 14-pound portable computer, the Datavue 25. Although Quadram's first entrant in the PCcompatibles marketplace was designed primarily for home and office use, I granted no handicap and showed no mercy in my testing. If the Datavue 25 could handle this South American torture test, it could handle anything.

During our travels, the Datavue 25 suffered long, bumpy ordeals in jeeps and pickup trucks. It was stymied by erratic electrical systems, scorched and dusted on the hot plains of the Venezuelan Llanos, and backpacked deep into a rain forest to record field data. It even withstood the loving embrace of a 6-foot rainbow boa constrictor. Throughout these tribulations, the Datavue 25 performed unfailingly.

But before the story unfolds, a profile is in order: The Datavue 25 measures 10½ inches high, 12¾ inches wide, and 6¼ inches deep; it fits snugly into a padded black carrying case equipped with both a handle and a shoulder strap. The computer is built around a CMOS 8088 microprocessor and comes in 128K and 640K versions, but users can expand the system by

The author bearing his Datavue 25 down the Aripo River in the interior of Trinidad. Although the Datavue 25 worked perfectly in the jungle, its usefulness in data collection for biological research was limited by the short battery life.



The Datavue 25 passed the official PC World South American torture test, including this wrestling bout with a rainbow boa constrictor, with high marks.

adding standard memory chips and even an 8087 math chip. For storage, the Datavue sports one 51/4-inch floppy disk drive and a built-in RAM drive, which acts as drive B:. Power is provided by an AC adapter or a rechargeable battery pack. The detachable keyboard can be connected by cable or operated independently by infrared beam. The unit's 80column by 25-line liquid crystal display (LCD) screen tilts to six positions and is capable of fourshade monochrome graphics. The standard model provides both an RS-232C port and a Centronics parallel port.

The Datavue 25 appears to be fully compatible with the IBM PC. It easily runs 1-2-3, WordStar, dBASE III, Symphony, Flight Simulator, Draw-It, Thor, Bluebush Chess, and many other popular programs.

Running on RAM
The Datavue 25's bestdesigned feature is its elegantly
simple implementation of the
RAM drive. When you turn on
the power, the screen displays
memory as dashes along a horizontal line, each dash representing
8K of memory. You can adjust the
ratio between main memory and
RAM disk with the cursor keys.
On my 640K system, the upper
limit of the RAM disk is 360K.

Once the RAM drive is set, you load the DOS disk in the disk drive on the right side of the computer and press <Enter>. However, you must insert the disk with the label facing toward the rear, or the computer can't read it. The

drive was designed "backward" to position the sensitive read/write head as far as possible from the heat-producing power supply. This idiosyncrasy may provide a primitive form of system security.

The system reports the current time and date from the Datavue's battery-driven clock. At the DOS level you decide what to store on the RAM drive. When both the program and the data are located on the RAM disk, saving and loading files is faster, and the battery lasts longer. However, the time-consuming process of copying files into RAM should also be factored into the performance equation.

To run a program from the RAM drive, you must change the default drive by pressing <Ctrl>-<LeftShift>-D. This elicits the rather Zen-like message 'A = B/B = A', which means the disk drive is now designated as drive B: and the RAM drive is drive A:. Copy the program files from drive B: to drive A:, and start the program from the RAM drive.

Like all RAM drives, this one is fast, silent, and volatile. However, unlike with other RAM drives, a <Ctrl>-<Alt>- doesn't destroy your data—it simply resets from the disk drive. To erase the RAM drive, you can switch the computer off or press the system reset button, which empties the RAM drive and brings up the introductory screen.

October 1985

Power Trips
The Datavue 25's two
power options—AC adapter and
rechargeable battery pack—fit (one
at a time) in a slot on the lower
left side of the computer. Corresponding corners of the slot and
the power packs are shaved so
you cannot insert the packs
incorrectly.

power. Leave the battery in the computer, and attach the clip end of the charger adapter to the AC adapter. Plug the AC adapter into an electric outlet, and plug the other end of the charger adapter into a connector on the right side of the computer (see Figure 1). Power will resume, and the warning light will stop blinking.

The Datavue 25 suffered long, bumpy ordeals in jeeps and pickup trucks and even withstood the loving embrace of a 6-foot rainbow boa constrictor.

The battery pack provides about 2 hours of operation, depending on the amount of disk access. You can check battery capacity at any time by pressing <Ctrl>-<LeftShift>-B. For those accustomed to portables without disk drives, the length of battery operation may seem woefully short.

When the battery begins to run low, a red light blinks on the front of the computer below the screen. To recharge the battery, remove it from the computer and clip on the charger adapter, a short cord with a clip on one end and a plug on the other. Plug the free end of the cord into the AC adapter pack, which plugs into an electric outlet. It takes about 3 hours to fully charge the battery.

Quadram provides an ingenious second charging option—assuming that you have access to electric Although this method of recharging the battery takes longer, and the battery reaches only 80 percent capacity, it is indispensable when you want to recharge while using the computer. This alternative also acts as a battery backup against uneven power flow, a problem I suffered continually during my travels. Unfortunately, I didn't discover this secret until I had lost several pages of inimitable prose.

As I showed off the Datavue 25 to my Venezuelan friends, they were dutifully impressed with the latest technology from the North (actually from Japan, but no matter). Yet, one comment was consistently heard: "No puedo ver la pantalla," or, "I can't see the screen." I tried to explain that all LCD screens were hard to read, and that as a matter of fact, this screen was slightly better than most. Still, they shook their heads

in disbelief, amazed that anybody would buy a computer with a screen so difficult to read.

The creators of the Datavue 25 realized the limitations inherent in LCD and did the best job possible under the circumstances. First, the screen can tilt upward into six different positions to a maximum of about 60 degrees. The unit's intensity control provides the second leap over the LCD screen barrier. If you press <Ctrl>-<LeftShift>-S, all normal characters appear bold while bold characters dim to normal intensity.

The screen provides the standard 640- by 200-pixel resolution in monochrome and 320-by-200 resolution in its unique four-shade graphics mode. Somewhat like the Compaq's graphics mode, the various shadings imitate colors when you use graphics programs.

The screen's finest feature, however, is its full 80-column by 25-line display. Although the true size of the screen is 4 by 9 inches, and graphics may consequently appear squashed, the full display is nonetheless a welcome highlight that several other portables lack.

Quadram recently announced an optional electrofluorescent backlit screen for the Datavue 25 and an RGB connector to plug the unit into a color monitor. The new screen was not available for testing at the time of this review but should be on the market by the time you read this. According to Quadram, the screen enhancement will not measurably increase the

PC World 189

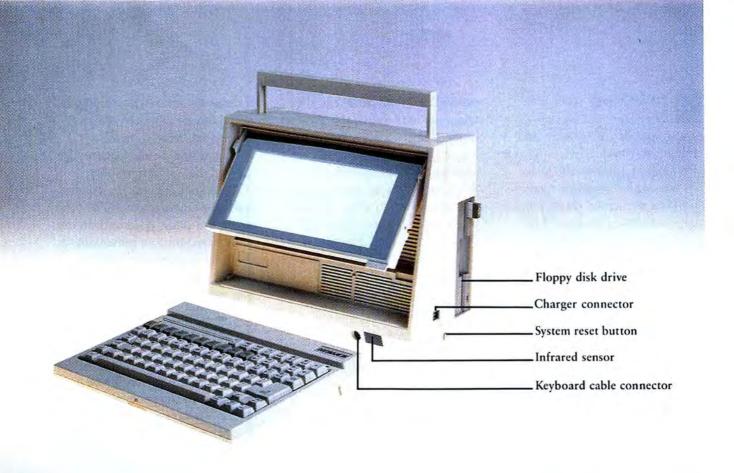


Figure 1: Side view of the Datavue 25

computer's weight or power requirements. Although backlighting should considerably improve legibility, it will also boost the system's list price by \$500, increasing the cost of the 128K version, for example, from \$2195 to \$2695. Current Datavue 25 owners can have their old models enhanced for the same \$500 price tag.

Keyboard Confusion
The Datavue's detachable infrared keyboard is independently powered by four standard AA 1½-volt batteries that fit into a slot in the upper left corner. The keyboard also comes with a standard cable. The lack of a bottom hinge on the keyboard makes using the computer difficult in

tight places, such as on airline flight trays, although the unit fits quite neatly underneath the seat.

The infrared beam works from up to 12 feet away. However, pointing the keyboard more than 45 degrees away from the sensor breaks the connection. If you move out of range or if something passes through the beam while you're pressing a key, the computer may become confused. Keys can appear stuck, or untyped characters may appear on screen. On two occasions the keyboard froze altogether.

When I first tested the computer, I was appalled by the keyboard's poor response. The <Space> bar seemed particularly sluggish and failed to register about half the time when I typed

at high speed. To let you know when your keystrokes have made contact, the Datavue 25 provides two feedback indicators, a red light that flickers in the upper right corner of the keyboard and an audio signal that can be modified from the keyboard. Unfortunately, the beeps and flashing LEDs are difficult to decipher and don't attack the main problem—the mushy touch of the keys.

Fortunately, Quadram recently revamped the keyboard and sent me a model to test. The layout is unchanged, but key tension is markedly improved. The <Space> bar still drops out occasionally at high speeds, but now I can type faster with fewer mistakes. Whereas the old keyboard was fit only for hunt-and-peck typists, the new version should be more than adequate for anyone who types up to 80 words a minute.

Keyboard layout is passable, although the placement of some keys may take getting used to. Function keys run across the top, and the cursor pad has been crammed into the upper right corner. Rarely used keys appear to

boards. A second version of the expansion chassis comes with a 10MB hard disk. For communications, you can attach your current modem to the serial port, or tuck Quadram's 1200-bps internal modem neatly into a compartment on

sent me scurrying for pen and paper, the Datavue 25 proved a durable and trustworthy fellow traveler. It passed the South American torture test with flying shades of gray.

The Datavue 25 contains a number of features that set it apart from the portables crowd. The ability to expand to a desktop system, the 80-by-25 backlit screen, the ingenious power alternatives, and the built-in RAM drive all match or supersede the talents of other entrants in this class. What's more, Quadram accomplishes all this without sacrificing competitive pricing. Whether you're collecting data in the tropical bush or taming spreadsheets in the corporate jungle, the Datavue 25 should light a path through the heart of data darkness.

Eric Brown is an Associate Editor of PC World and the author of the South American travel book The Alvarez Trail.

Datavue 25 Quadram Corp. 4355 International Blvd. Norcross, GA 30093 404/923-6666 List price: 128K \$2195, 640K \$2795, battery pack \$65, external floppy disk drive \$349, expansion chassis \$749, expansion chassis with 10MB hard disk \$1995, 300/1200-bps internal modem (with Crosstalk XVI) \$495, backlit screen and RGB connector \$500, RGB connector only \$350, extralarge carrying case \$50, car connector \$50

The Datavue 25 contains a number of features that set it apart from the portables crowd.

have been squeezed in at random. Strangely enough, a blank plastic strip occupies the upper left corner. Perhaps the designers plan to add more function keys or a touch-sensitive control pad. If such options fail to materialize, I can only conclude that the keyboard was rushed into production at the last moment.

Settling Down on the Desk A portable such as the Datavue 25 is usually bought as a second computer, perhaps as a domestic complement to an office desktop PC. You may want to expand the system to handle all the applications you use at work. Some portables don't allow you to do this, but the Datavue 25 was designed to settle down on the desk top and grow.

If you tire of constantly copying files to and from the RAM drive, you can add a second, external 360K floppy disk drive, hooking it directly to the back of the system. You can also connect a PC-compatible expansion bus that holds an independent power supply and three full-size expansion

the left side of the system. The modem comes with the *Crosstalk XVI* communications program.

To modify the computer you must flip some DIP switches, conveniently located in the mother-board compartment on the upper left side of the computer. Here you can inform the Datavue 25 of an extra disk drive, switch to a color monitor, perform ROM and RAM tests, or instruct the system to automatically set up the RAM disk in its largest configuration, thereby skipping the introductory screen.

You can find DIP switch assignments in the manual or display them on the introductory screen by pressing <Ctrl>-<LeftShift>-T. This help screen also lists system commands for battery check, contrast, intensity, audio feedback, and drive designation.

Passing the Torture Test
There is nothing like the
rough-and-tumble intimacy of
travel to reveal both the hidden
virtues and the unpleasant idiosyncrasies of your traveling companion, whether human or computer. Although the sluggish
keyboard drove me bananas, and
the short battery life occasionally

PC World 191

Every Word a Key

A new category of software, the file-indexing program, brings powerful text-searching capabilities to the PC. Now you can instantly locate any word or phrase that's in your electronic library.

Bill Crider

I have an incredible memory. Not incredible in terms of quantity or quality—incredible in the sense of incredibly capricious. And of course this applies to my work with computers: If I give a file a name that I am sure to remember, I will forget it. If I write down the name, I'll lose the note. Yet I can remember exact sentences from letters I wrote years ago.

It's not that I can't remember anything—it's just that I can't always retrieve information stored in my head, or in my computer files. So I spend a lot of time looking through files for information. What did I call that file I downloaded from CompuServe about importing and exporting electronics? Which price quotes mention products by the Acme Company? I remember writing a letter to a guy about a program to calculate how much carpet my house needs, but I've forgotten his name, the name of the package, and even which disk has the letter. How can I find it?

My hard disk now has more than 600 files, and my floppies are proliferating faster than fruit flies. The need for help is increasingly obvious. Fortunately, a new kind of software now exists for people like me–file-indexing programs. These programs create an index of nearly all the words or specified combinations of words in the documents on your disk. The index is actually a highly compressed version of your data that includes notations of each word's location.

Only a Word Away
When you need to find a
particular file or part of a file, you
specify one or more words that
you know are in the file. The program then searches the index and
presents you with a list of files that
contain the word or words specified. You can then display some
or all of each file. One of the programs even lets you select a portion of the text and transfer it to a
new file.

For example, I ask the program which files contain the words *import*, *export*, and *electronics*. Presto! The program tells me the words are found in two files and identifies them. When I search for the words *Acme Company*, the program locates only one file. When I specify *carpet*, it finds four files in my electronic library. Which one am I interested in? If the file name alone doesn't refresh my memory, I can display each of the four *carpet* files to locate the correct one.

This process is like surveying the index at the back of a book—a

192 October 1985



valuable shortcut to specific information. The computer finds the words you request, but instead of telling you a book's page number, it tells you the name of each file containing those words.

File-indexing software for personal computers is relatively new, although similar programs have been used for over a decade to search the mainframe computer data bases of commercial information services such as Dialog (see "Gateways to On-Line Services," *PCW*, May 1985). Two leading file-index products for the PC and compatibles are 4-1-1 from Select Information Systems and *ZyINDEX* from ZyLAB. This article compares the two programs feature by feature.

Selecting Files to Index
The first step in using these programs is creating the index. I chose to index a hard disk sub-directory that contained 13 files, totaling 325K of data. I indexed the files with each program, once with 4-1-1 and twice with ZyINDEX, which offers two indexing methods.

ZyINDEX has a definite advantage in the indexing process. For one thing, 4-1-1 requires you to be in the same subdirectory as the files; ZyINDEX lets you index any directory or disk from any subdirectory or disk.

Second, although 4-1-1 has an optional directory display, the directory is not shown on the screen when you type the names of files to be indexed. Thus, you must write down or correctly remember the names of all such files. By contrast, in the *ZyINDEX* directory you move the cursor from file to

file and highlight those you want indexed—you don't have to type file names at all.

Third, with 4-1-1 you can correct only the most recent entry in a list of file names to be indexed. If you discover a typing mistake in an earlier name, you must add the correct file name to the list. ZyINDEX allows you to "unhighlight" any file you decide you don't want indexed simply by moving the cursor to it and pressing <Enter>. And of course, since you don't have to type the names, there are no typos to correct.

Fourth, and most significant, ZyINDEX allows you to index files stored on floppy disks and to put your index on floppy disks if you wish. 4-1-1 is strictly a hard disk management tool. It does allow you to later transfer an indexed file to a floppy disk and will still be able to tell you which floppy the file is on-but the file must be on the hard disk when it is indexed. My text files are stored primarily on floppy disks (I consider the hard disk too vulnerable). so 4-1-1 is a less practical fileindexing tool for me than ZyINDEX.

The Indexing Process
After you select files for indexing, the actual indexing process begins. *ZyINDEX* has two modes of indexing: File Only (equivalent to 4-1-1's indexing method) and Full Text (which also stores information about each word's location within the file). The results of my three indexes (see Table 1) show that *ZyINDEX* has the edge in both speed of indexing and in the amount of disk space the resulting index uses.

One 4-1-1 asset is its ability to run other menu functions during indexing. Thus, you can locate, display, print, or transfer files already indexed while the program is creating an index of other files. Unfortunately, 4-1-1's indexing process is "blind"-you cannot tell what progress is being made. If you try to leave the program during indexing, a message advises you to wait until the process is completed. ZyINDEX does not index concurrently with other program operations, but it does keep you informed of progress by displaying the percentage of the file indexed.

In either program, once you have built your index you can add and delete files at any time.

Searching the Index
The next step in using a fileindexing program is to enter a
search request. Both programs allow you to search for a single
word or word combinations, such
as car OR auto, or import AND
export, using the Boolean operators OR and AND. 4-1-1 allows
searches based on dates and titles
assigned to the files.

ZyINDEX tops this by allowing searches that contain the Boolean NOT parameter, such as a search for files that contain Acme Company but not July. If you have indexed in the Full Text mode, the program allows you to narrow your search by specifying that two words must appear within a specific number of words of each other, such as carpet within five words of software.

Both programs allow use of the standard PC-DOS wild-card characters (* and ?) when searching. For example, a search for *soft** would find *software*, *softly*, and

Table 1: Speed and index file size comparison

Indexing time (min:sec)	Index file size (bytes)	Percent of original files
7:25	73,839	22.7
5:55	67,894	20.9
14:15	77,643	23.8
	7:25 5:55	time (min:sec) file size (bytes) 7:25 73,839 5:55 67,894

Original text: 325,124 bytes in 13 files

Table 2: ZyINDEX surpasses 4-1-1 on most counts.

Feature	ZyINDEX	4-1-1
Indexing on hard or floppy disk	good	poor*
Indexing speed	good	fair
Searching flexibility	excellent	good
Searching speed	excellent	excellent
File viewing	excellent	good
Printing	excellent	good
Documentation	good	good
Added features	good	good

[&]quot; Hard disk required

softness, and c?t would find cat, cot, and cut. Both programs automatically locate the plural of search words specified in the singular.

The two programs use different search request methods. With ZyINDEX you just type in the request as a phrase, which can be up to 160 characters long, including optional parentheses to indicate order of precedence for searching. 4-1-1 uses a more structured method whereby you type the search words in boxes. Side-byside boxes request only files that contain both words; if the boxes are lined up vertically, 4-1-1 searches for both words and reports the names of files containing either one. Although the 4-1-1

manual explains this scheme for entering words, no screen prompts appear during the procedure. I prefer *ZyINDEX*'s direct entry.

Both programs have their indexing limitations. 4-1-1 uses the simple expedient of indexing only words with three or more characters. This eliminates a lot of chaff, but it also means you can't search for short words like ox or id.

ZyINDEX uses a "noise list" of character combinations that will not be indexed, such as *the*, *this*, *that*, and other words classified as noise, as opposed to content. If you don't like the program's noise list, you can delete or add entries.

Both programs locate documents instantaneously. Singleword searches in each program produced a list of files meeting my criteria faster than I could time the search with a stopwatch. Naturally, the longer and more complex the criteria, the slower the search—but no search took more than a few seconds.

Viewing and Printing Files Once you retrieve a list of files containing your search words, you can either view the files or print out the list. 4-1-1 allows only sequential viewing of a file, similar to using the TYPE command.

Both programs will print the located files. *ZyINDEX* also supports the control codes of the major word processing programs, so the printed files will look as if your word processor printed them. If you don't want to print the whole file, *ZyINDEX* allows you to mark a block of text and save it as a separate file for future printing or retrieval.

Installation and Documentation

Both programs are easily installed. 4-1-1 must be in a hard disk subdirectory, while *ZyINDEX* can be either in a subdirectory or on a floppy disk. Both include sample files, indexes, and examples in the documentation.

ZyINDEX and 4-1-1 get high marks for documentation. The 4-1-1 manual is nicely typeset, with all the information you need in just 50 pages of clear explanation. ZyINDEX's documentation is not as attractive, but it includes more theory and explanation of the program's numerous features.

Menus and Help Screens
Both programs provide
good on-line, context-sensitive
help screens. I used this feature
more in 4-1-1 than in ZyINDEX,
possibly because the ZyINDEX
menus are almost help screens in
themselves and require little or no
explanation. ZyINDEX has one
option I wish more programs had:
If you don't like its help screens or
menus, you can rewrite them to
suit yourself.

Other Features

4-1-1 includes a major function that ZyINDEX lacks-data encryption. I have no current use for data security, so I looked at this feature just briefly. Because my selective memory always manages to misplace the passwords to locked files, I avoid locking them. To my way of thinking, the best way to protect a file is to keep it on a floppy disk in a vault. I never put confidential information on a hard disk. Data on a hard disk is just too susceptible to damage and prying eyes, especially in a networking system.

For someone with data security needs, 4-1-1 may be worthwhile for its encryption feature alone. It uses a public key/private key encryption method, which allows files to be locked with one key or password (the public one) but requires a different key (the private one) to unlock them.

As more files are added to an index it can become cumbersome and inefficient. *ZyINDEX* includes a utility that speeds up searches by compacting the index and removing obsolete references. The documentation says this utility can speed up searches by 50 percent. I could not confirm this, but I was working with a limited amount of data.

The Differences Are Kev Never have I seen such a clear-cut difference between two programs designed to do the same thing. ZyINDEX is clearly superior to 4-1-1 (see Table 2). Even if 4-1-1 were the only such product on the market, I would not buy it until the publisher added the capability of indexing floppy disk files and storing the indexes on floppy disks. ZvINDEX, on the other hand, is fast, effective, and easy to use. It is a worthwhile product for anyone who has a lot of information to handle.

Bill Crider is a Contributing Editor to PC World.

ZyINDEX 1.3
ZyLAB Corp.
233 E. Erie St.
Chicago, IL 60611
312/642-2201
List price: ZyINDEX Standard
(indexes up to 1500 files) \$145,
ZyINDEX Professional (indexes
up to 5000 files) \$295,
ZyINDEX Plus (indexes up to
15,000 files and multiuser
systems) \$695
Requirements: 192K, two disk
drives, DOS 2.00 or later
version

4-1-1, Version 1.0
Select Information Systems
919 Sir Francis Drake Blvd.
Kentfield, CA 94904
415/459-4003
List price: \$149
Requirements: 256K, one hard
disk and one floppy disk drive,
DOS 2.00 or later version

Present WordPerfect

The latest release of this first-class word processing program adds new features and corrects old problems—resulting in a product that closely matches its name.

Terry Datz

Word processors have a way of periodically shedding their skins and emerging in shiny new packages. With each successive release of a program, the publisher tacks on more features and devises new twists for existing ones. But features don't tell the whole story. After several revisions, some programs grow so unwieldy that their operation slows to a crawl. Happily, such is not the case with the latest release of WordPerfect. With version 4.0, SSI

Software has polished the program's rough spots and embellished it with new features without cluttering its clean screens or slowing its nimble performance.

Among the capabilities that version 4.0 adds to *WordPerfect*'s already lengthy repertoire are automatic file backup, outline and paragraph numbering, and generation of indexes, lists, and tables of contents. In addition, responding to user feedback, SSI has intensified the use of the function keys, rewritten the manual, and increased the spelling checker's dictionary from 30,000 to 100,000 words.

A variety of operations are now concentrated in the function keys, making effective use of this area of the keyboard. Commands previously assigned to the top row's number keys in combination with <Ctrl> or <Alt> have been transferred to the function keys, eliminating a clumsy and inefficient command structure. Because each function key now controls four separate commands, the plastic function key template provided by SSI is a necessary prop. Although the template's print is

small, color coding makes it readable: Commands printed in red combine a function key with <Ctrl>, those in blue with <Alt>, and those in green with <Shift>. Frequently used commands, such as those for saving files and getting help, are printed in black and use the function keys alone.

Installation is quick and easy, with the help of step-by-step instructions aimed at inexperienced users. Once you've selected your printer from among the 30 that are supported, self-explanatory prompts elicit the information needed to establish communication between program and printer.

For all its power, *WordPerfect* is compact enough to fit on three disks: a main program disk, a dictionary disk, and a supplementary disk containing learning exercises and printer files. Thankfully, none of the three disks is copy protected.



Efficient Editing
WordPerfect not only is
aimed at, but was in a sense designed by, users who spend long
hours at the keyboard. Through
repeated testing, SSI's programmers learned that all-day users
wanted a program that, above all,
wouldn't get in their way. As a result, WordPerfect is geared for
streamlined editing, with minimal
intrusion from menus and

prompts. This low-profile philosophy is exemplified by the editing screen, which is empty except for column, line, and page-number indicators in the bottom right corner.

Getting from place to place in a document is easy. In addition to moving the cursor by word, screen, and page, you can scroll

by a specified number of lines or pages or jump directly to any character or page number. As you insert, delete, and perform other editing tasks, *WordPerfect* automatically reforms text to fit the current format settings. But unlike most word processors, the program waits until you move the cursor forward through your text to perform the reformat. To reform text without moving the cursor, you give the Rewrite command, *<*Ctrl>-*<*F3>.

An improvement that's been a long time coming to WordPerfect is the highlighting in inverse video of blocks of text marked for deleting or copying; previous releases provided no visible evidence of which blocks were marked. You can easily expand or decrease the size of a marked block of text with the cursor keys, and the inverse video makes your changes instantly visible.

WordPerfect's hyphenation procedure is a potential annoyance for users accustomed to uninterrupted typing. Using a "hot zone"-a designated number of columns to the left of the right margin-the program singles out words that need splitting between lines, then beeps and waits while you position the hyphen. You can reduce or eliminate these interruptions, however, by enlarging the size of the hot zone, which allows more words to escape hyphenation (they are automatically wrapped to the next line), or by turning hyphenation off altogether.

With WordPerfect's flexible macro feature you can insert often-used sections of text or execute a series of commands without retyping them time and again. Macros can be chained together so that one calls another or repeats itself a set number of times

automatically. Since each macro is stored in its own file on the default drive or directory, there's virtually no limit to the number of macros you can define or to their length.

One task that WordPerfect 4.0 can't handle is split-screen editing. The program offers a useful, and perhaps even preferable, alternative, however. You can load two documents into memory at the same time, and then switch back and forth between them on the screen with the press of a key. Thus, while you cannot see small sections of both files simultaneously, you can see a screenful of text (up to 24 lines with a standard display adapter) instantly in either active file, and you can easily move or copy blocks of text from one active file to the other.

WordPerfect 4.0 also lacks an "undo" feature. The only time you can retrieve text that you've mistakenly deleted is when you've used the line-delete command.

Faithful Formatting WordPerfect concentrates formatting commands on just a few function keys, which makes remembering keystrokes easy. Frequently used features, such as boldface, underlining, and centering, are each accessed with a single keystroke; other formatting functions are carried out by pressing a function key and then following menus and prompts. For example, while <F8> turns underlining on and off, <Shift>-<F8> calls the Line-Format menu, which displays options for line spacing, tabs, margins, and the like. Similarly,

<Alt>-<F8> displays the Page-Format menu, and <Ctrl>-<F8> shows the Print-Format menu.

These menus supply just enough prompting to keep you on course, showing the current settings for or three evenly spaced columns, WordPerfect can handle up to five columns, all of which can be sized and spaced individually (see Screen 2). Although formatting into multiple columns doesn't take



You can load two documents into memory at the same time, and then switch back and forth between them on the screen with the press of a key.

each formatting option as well as other pertinent information, such as the standard page-length settings for legal- and letter-size paper (see Screen 1). An example of SSI's attention to detail is the Center-Page command found in the Page-Format menu. A real time-saver for letters and other single-page documents, this command formats the page displayed on screen so that its text is centered from top to bottom when the page is printed.

In keeping with its uncluttered screens, WordPerfect hides all formatting codes, displaying text as it will appear on the printed page. The program cannot display right-justified margins or text in multiple columns on the screen, however. To see codes that you've inserted, you use the Reveal-Codes command, which displays the text with codes interspersed; when displayed on screen, formatting codes can be deleted with the <Backspace> key.

One of the trickiest formats for a word processor is newspaperstyle columns; this program handles them effortlessly. While most word processors limit you to two place until the file is printed, the status line at the bottom of the screen tells you which column you're editing.

Printing and Filing WordPerfect's printing features are geared for rapid throughput. An option that's handy for short documents such as memos is printing text directly from the editing screen without first saving it to disk. Using this option, you can print either the full text of a file or just the page that is currently displayed on the screen. If you save your document before printing it, WordPerfect assigns it a job number and can print in the background while you edit another document. Printing and editing simultaneously does not slow either operation significantly, as often happens in other programs.

One useful option missing from *WordPerfect* is a quick way to stop printing. If the printer jams or you discover you're printing the wrong

198 October 1985

file, the only way to put on the brakes is with a three-step command sequence.

The best thing about WordPerfect's automatic file backup is that it's optional. You can have the program initiate a save at any time interval you specify, or you can take care of the saving yourself. If you, or the automatic backup feature, attempt to save a file to a full disk, you'll be prompted to change disks. The program's auto-save feature is primarily insurance against a power failure or computer breakdown, however, because the files it creates are discarded when you exit the program. Consequently, you still have to remember to save your document before exiting.

To see a listing of files in a directory, you press <F5> and type the name of the directory or drive. The program's directory screen lists files alphabetically, along with the file size and the time and date of your most recent revision. The amount of free disk space is displayed at the top of the screen, and numbered options for retrieving, deleting, renaming, printing, and importing and exporting DOS text files appear at the bottom. You can initiate any of these operations by moving the cursor to the appropriate file name and then typing the option's number.

The program also includes a security feature that lets you assign passwords to your files and a convert utility that translates *Word-Perfect* files to and from several formats, including *WordStar*, DIF, and a DCA (revisable-form-text) format used by many data base management programs. The

Page Length

- 1 Letter Size Paper: Form Length = 66 lines (11 inches) Single Spaced Text lines = 54 (This includes lines used for Headers, Footers and/or page numbers.)
- 2 Legal Size Paper: Form Length = 84 lines (14 inches) Single Spaced Text Lines = 72 (This includes lines used for Headers, Footers and/or page numbers.)
- 3 Other (Maximum page length = 108 lines.)

Current Settings

Form Length in Lines (6 per inch): 66
Number of Single Spaced Text Lines: 54

Selection: A

Screen 1: When you choose the page-length option from the Page-Format menu, WordPerfect gives you the current settings and other helpful information.

Text Column Definition

Do you wish to have evenly spaced columns? (Y/N) __ If yes, number of spaces between columns:

Number of text columns (2-5): 0

Column margins Left Right
Column 1:
Column 2:
Column 3:
Column 4:
Column 5

Screen 2: The column definition screen. Unlike most other word processors, WordPerfect lets you define width and spacing for each column.

CONVERT utility also allows you to specify the characters used to delimit fields and records in files to be merged.

Merging and Spelling WordPerfect's merging capabilities include generating form letters, printing mailing lists and reports, and assembling multiple files for printing as one document. An exceptional feature is the program's ability to display the merged text so that you can preview the final document. To save time, you can eliminate the display step and send the merged document directly to the printer. If you want to sort records for selective merges, you'll need SSI's WordPerfect Sorter, sold separately.

One of version 4.0's most welcome improvements is the upgrading of the spelling checker's dictionary to 100,000 words,

including 20,000 legal and medical terms. You can initiate a spelling check without ending an editing session, and you can spotcheck a single word, a page, or a marked block of text. Although the spelling checker doesn't automatically suggest alternative spellings for each flagged word, it will do so on request, supplying a list of phonetic matches for the word in question.

Catering to Special Interest Groups

Besides handling routine word processing chores efficiently, WordPerfect offers enough advanced features to meet the needs of specialized users such as medical and legal professionals, scientists, and writers. For example, footnotes can be placed at the bottom of the page on which their

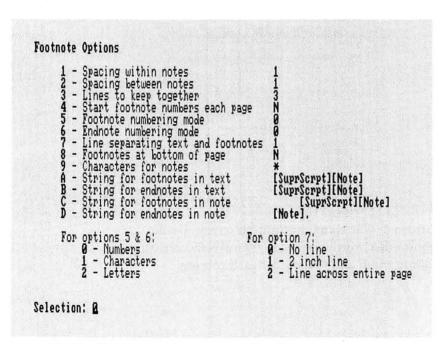
reference appears or compiled and printed at the end of a file. In either case, you can control their format and style down to the last detail (see Screen 3). You can specify the line spacing both within and between notes and choose a numbering mode of numerals, characters, or letters, which can be underlined, superscripted, boldfaced, or styled with any other printing option. And lengthy footnotes need never pose a problem; one footnote can span up to 300 pages if necessary.

For users who crunch numbers, WordPerfect has a Math/Columns mode. You can define as many as 24 columns of numbers, text, or a combination of the two. Numbers can be aligned by decimal, comma, or any other character. The program automatically calculates subtotals and totals for each column.

WordPerfect also handles fourfunction formulas, which makes it possible to use a number from one column as part of a calculation in another. For example, you can calculate a 5 percent sales tax in column B based on revenue figures in column A by defining column B as (A * .05).

A space-fill feature simplifies the typing of complex equations. Before typing such an equation, you set line spacing to half-line increments and fill several lines with blank spaces. Using Typeover mode, you can then insert the equation into the blank lines, using the arrow keys to move in half-line increments.

New features that will appeal to those with more sophisticated word processing needs include



Screen 3: The footnote options screen. WordPerfect lets you control footnote style and format down to the last detail.

paragraph and outline numbering and automatic generation of indexes, lists, and tables of contents. Outlines and numbered paragraphs can have seven levels of subentries. Pressing the <Tab> key automatically indents the current line to the next sublevel and generates the appropriate number or letter for that level; pressing <Enter> generates the next number or letter on the same level. The charm of this feature lies in its ability to renumber all subsequent subentries whenever you add or delete an entry.

WordPerfect's indexing and table of contents components are easy to learn and efficient in use. Once you mark selected words, phrases, headings, and subheadings throughout your text and select formatting and numbering styles, the program will generate an index with headings and subheadings, up to five lists (for figures, charts, graphs, and so on), and a table of contents with five levels of entries.

An additional nicety is the Date command, which enables you to insert the system date in the document or in a mail merge command.

Improved Documentation
One area in which practice
hasn't yet made WordPerfect perfect is documentation. Though the
manual for version 4.0 is vastly
improved over those of previous
versions, it is still unworthy of the
program it describes. The new
manual includes a tutorial that, in
combination with a set of sample

files, takes you through everything from setting tabs to generating indexes. Unfortunately, the lessons focus more on which key to press next than on teaching a process that you can apply to other situations.

The completely rewritten reference section, though it thoughtfully directs you to related information elsewhere in the manual, is still short on specifics. A few features, such as background printing, are totally undocumented. In many cases you can get more specific information about a function from the on-line help feature. The on-line help is not context-sensitive, but pressing the help key (<F3>) presents an index of help topics. You get help about a command by pressing the help key followed by the command.

Fortunately, however, any short-comings in *WordPerfect*'s documentation are offset by SSI's excellent customer support; registered owners are provided with a toll-free number and receive courteous help from a knowledgeable staff.

Powerful but Agile
Despite its numerous added capabilities, *WordPerfect* continues to perform smoothly and efficiently. You don't have to switch out of editing mode or (with the exception of the spelling checker), swap disks to access different features.

Although it lacks the intuitiveness of programs that walk you through menus or use mnemonic commands, this program isn't intended for the writer of occasional memos. Rather, it is a program that performs day-today word processing chores efficiently yet can also meet the most sophisticated demands. One of the rare word processors with no major flaws, *WordPerfect* shines at whatever it does.

Editor's note: As this article went to press, SSI was planning more features for WordPerfect. The additions include a macro editor and a macro library (which saves disk space), a type-writer-style printing option, and a windowing option to allow viewing of two files on a split screen. Switching between full-screen views of two files will still be possible if you want to see more text than a partial-screen window can display.

Terry Datz is a freelance writer specializing in word processing applications. Her latest book, Processing Words with Your PC, PC XT or PC Compatible, was published by the Hayden Book Company.

WordPerfect 4.0 SSI Software 288 W. Center St. Orem, Utah 84057 801/224-8554 List price: \$495 Requirements: 192K, two disk drives (one can be either a hard disk or RAM disk) Not copy protected

THE IBM PC-AT ONLY HAS THREE STRIKES AGAINST IT.

PERFORMANCE.

With PCturbo 186™ your IBM PC or XT can run 200-400% faster. That's much faster than the AT. It's faster than any other accelerator board, too. And the optional 8MHz 8087-2 makes it faster still.

	Lotus 1,2,3	Frame- work	Auto-
IBM PC	243	90	85
PC AT	84	N.A.	37
PCturbo 186 PCturbo	82	43	35
186/87	N.A.**	12	23

Benchmark tests. All times in seconds.

PRICE.

You get more than 100% of the performance for less than 15% of the price.

COMPATIBILITY.

The AT is only 70% compatible with the IBM PC. PCturbo 186 is 100% compatible. So you can run *every* popular PC program.

You get more RAM, too. Up to 768K on-board, for a system total of up to 1.4 Mbytes. And PCturbo 186 installs in one simple step. Call 415-490-8586 for your dealer's name. PCturbo 186 puts AT performance in everyone's ballpark.



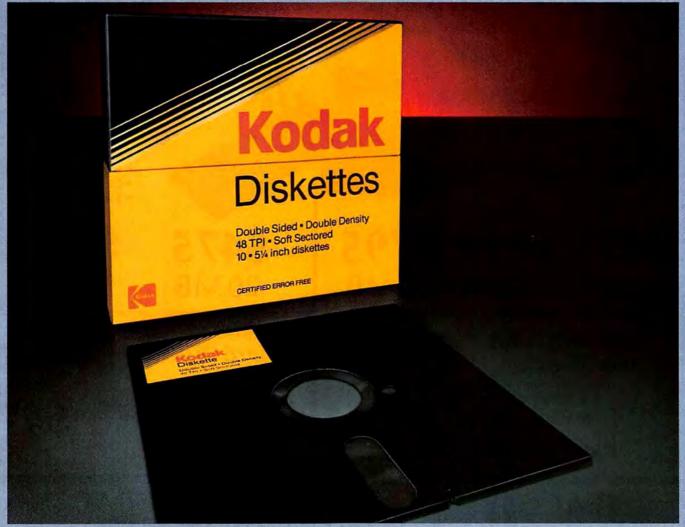
790 Westinghouse Dr., Fremont, CA 94539, TLX: 709289

PCturbo 186 is a trademark of Orchid Technology, IBM PC-AT is a trademark of International Business Machines, Inc. Lotus 1,2,3 is a trademark of Lotus Development Corp. Framework is a trademark of Ashton-Tate. AutoCAD is a trademark of Autodesk, Inc.

^{*}Future version 1.1 of Framework will be AT compatible.

^{**}Future release of Lotus will support 8087.

THEREIS NO FINE PRINT.



IT PERFORMS, OR WE REPLACE IT.

Diskettes

With all the care and precision that goes into every Kodak diskette, it's only natural that you'd expect extraordinary performance.

And that's exactly what you'll get.

You see, Kodak diskettes are made for any application where trouble-free performance is essential and data protection is critical.

For openers, every Kodak diskette has the stamina to sustain signal strength far above industry performance standards, even after millions of read-write passes.

Every Kodak diskette is individually tested for read-write performance over every sector, every track.

And it's not until those tests and many others are completed that

Kodak diskettes are certified error-free.

Diskettes

Naturally, every Kodak diskette is backed by our Performance Guarantee, which promises a free replacement in the unlikely event that a Kodak diskette is defective. No other warranties are expressed or implied.

You'll find Kodak diskettes at computer stores, office supply dealers, and other retail outlets. In standard-

density 8- and 51/4-inch formats, plus high-density 51/4-inch diskettes, and 31/2-inch micro diskettes. The Kodak diskettes. Performance without the fine print.

KODAK.
The name says it all.



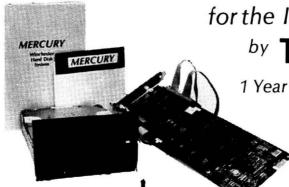
Your Hard Disk Source

Half Height

Mercury Hard Disks

for the IBM PC

- Boots from Hard Disk
- Instruction Manual
- Cables and Mounting Hardware
- Full or Half Height Bezel
- Western Digital Controller
- Software
 - ✓ Low Level Format
 - → Head Park Routine
 - Diagnostics



Enhancement Hard Disks

for the IBM AT

by Tulin

1 Year Warranty

- Boots from Hard Disk
- Uses AT Controller
- Instruction Manual
- Cables
- Mounting Rails

\$429 \$549 \$795 10 MB 20 MB 30 MB

\$475

20 MB

\$729

30 MB

Hard Disk Kit For The...

COMPAQ

Complete Winchester Hard Disk Kits Internal and External

20 MB 33MB • 44MB

Call For Current Prices....

Mercury **Hard Disk Kits** For The.....

Portable

COMPAQ"

- 31/2" Shock Mounted Cables Winchester Hard Disk • Manual

Hard Disk Controller
 Software

20 MB

\$629

10MB

TEAC 55B



Half Height Double Sided



Mercury Tape Back-up



Fully DOS Compatible Software

\$395

IBM® AT Compatibl

360 K



Oty. 5 \$99

10904 Marble Road

SOURCE



Austin, TX 7875

45T SixPakPlus



w/384K

5T Advantage! *W128K....*

STANDARD **BRAND PRODUCTS**

All Standard Products

Have A 2 Year Warranty!



• Parallel Port Software

 Memory Expansion Clock Calendar

Serial Port

Memory

64K

1 Year Warranty!

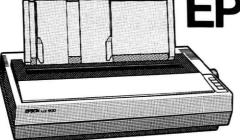
256K

\$29

el Math Co-Processor

80287 \$219 8087

\$98





Number one. And built like it.

LX80	\$229
FX85	\$379
FX185	
I O1500 W/Parallel Interface	\$929

MINUTE ADMAN "

Total Power Protection!

- Blackouts
- Surges
- Interruptions
- Spikes
- Brownouts
- EMI/RFI Noise

Minuteman 250

250 watts output power capability \$339

Minuteman 500

500 watts output power capabilty

\$549

135 Watt **Power Supply**



\$95

- 1 Year Warranty
- Fully PC Compatible
- Replaces Existing Power Supply

Software

croPro \$259 rdStar Pro Pak. rdStar 2000 +

croSoft \$259

nton-Tate mework

IEM"

PC's & AT's



Call for current prices.

Standard 5151 5151 Keyboard



5151 Style Keyboard Compatible With IBM PC & XT Standard Printer Cable



Nine Foot Length
Grounded
Parallel



HEWLETT PACKARD

Plotters

HP7475 6 Pen

HP7470 2 Pen

\$1419

PGS

Princeton **Graphic Systems**

HX-12

Color Monitor...



Monochrome GraphicsCard GraphicsCard

\$165



300	. \$159
1200	
1200B	. \$359
2400	. \$699

CORPORATE AND INSTITUTIONAL ACCOUNTS

r national accounts division is dedicated to providing the prompt professional service required to keep your business running smoothly. accept P.O.'s on a Net Terms basis, (minimum purchase of \$50) offer same day shipping, free fully insured UPS ground shipment. We er full-time technical staff to answer any questions that might arise and to make fast repairs if neeeded. Call our national accounts staff lay. We Make Your Job Easier ...

OUR POLICY

accept Mastercard & Visa (with no Surcharge!), money orders, certified checks, personal checks (allow 10 days for processing), COD nimum purchase of \$50), Company/Institutional P.O.'s and wire transfers. We do not charge your card until we ship. We pay shipping Ps ground, fully insured) on orders delivered in continental U.S.A. d 6-1/8 sales tax if Texas resident. Prices are subject to change. All equipment carries a new factory warranty. Any return item must be

ompanied by a return authorization number. all Toll Free (800) 643-0992

Within Texas (512) 331-6700







YOUR STROKE OF GENUS

Let our On-Line Reference series increase your productivity...

Just a keystroke away!



OLÉ™, our new On-Line Encyclopedia series for IBM PC's and compatibles is organized by subjects and alphabetically by keywords ... for quick specific reference or indepth study. OLÉ uses pictures, animation, text, and understandable annotations to help you get up to speed quickly on any covered topic.

OLÉ is just a keystroke away because it sits co-resident in memory allowing you to access one or more of our encyclopedia series. OLÉs will increase your computer proficiency and enhance your productivity. Using OLÉ will be a stroke of genius on your part!

The first six volumes currently available are:

OLÉ DOS Makes all the complex DOS commands easy to understand and implement. Suggested retail price, only \$69.95.

OLÉ UNIX A clear, concise and unambiguous introduction to the UNIX multi-user operating system. Suggested retail price, only \$69.95.

OLÉ Data Communications Clarifies complex concepts with more than 75 key

terms presented. Suggested retail price, only \$69.95.

OLÉ BASIC An excellent guide for learning to program using BASIC. Quick on-line reference of key terms. Suggested retail price, only \$69.95.

OLÉ Computer Literace Vols. 1 & 2 Volume 1 is a keyword based tutorial of fundamental terms. Volume 2 provides an easy intro to databases, spreadsheets, word process accounting and graphics. Suggested retail price, each volume, only \$39.9

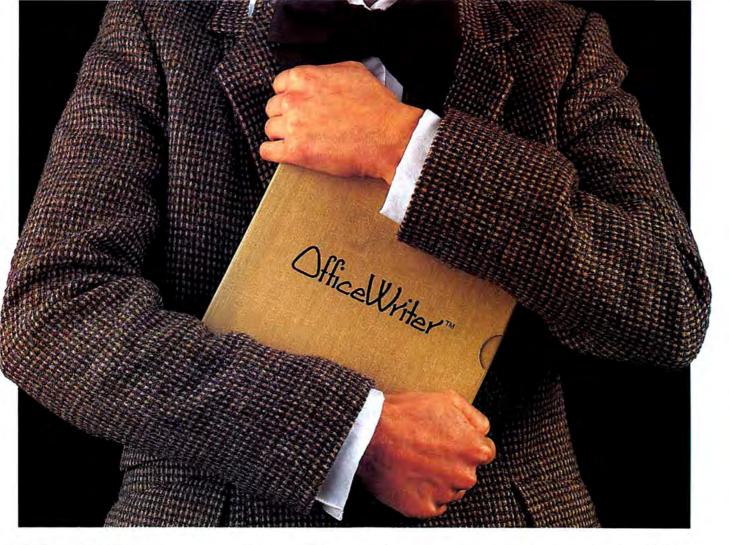
Requirements: IBM Color Graphi Adaptor Card required. 256K RA

308 N. Carroll Blvd

Denton, TX 76201

To order call toll free $1 \cdot 800 \cdot GET \cdot OLES$





FINDERS KEEPERS

Once you get your hands on OfficeWriter™, you won't ever let go.

And no wonder. OfficeWriter's Wang-like similarity to dedicated word processing makes it the easiest IBM® compatible PC system you'll ever use.

Just ask Johnson & Johnson, Wells Fargo Bank, Mobil Chemical and hundreds of other companies now using OfficeWriter.

Or check the new Software Digest ratings. Once again OfficeWriter was among the top four word processors in a comparison of 22 IBM PC software systems appearing in the January 1985 issue of the Software Digest Ratings Newsletter.

Start up is easy with OfficeWriter—so you can expect a quick pickup in productivity. No other system is easier to use. Goof-proof text is guaranteed every time with **OfficeSpeller**, our electronic spelling corrector. And our complete set of editing features get high marks for speed, productivity, versatility and performance.

You can even link your PCs and dedicated word processors with **OfficeLink**, our affordable, software-only solution to Wang® and IBM DCA compatibility.

Sound like the word processor you've been looking for? Send in the coupon or call us. You may qualify for our free 30-day trial. Once you've tried OfficeWriter, we know you'll want it.

For keeps.



FREE 30-DAY	TRIA	L		
I am interested in O	fficeWr	iter for:		
Less than 10 PC	s _	10 to	50 F	PCs
More than 50 PC	Cs			
Please send me mo			bou	t a free
Name				
Title				
Company				
Address				
City		_ State _		Zip
Telephone				
Return coupon to: Offi				VI 5371

1-800-228-0747 (1-608-274-5047 in Wisconsin)

MIDI: The Music Interface

The music industry put its heads together and came up with the Musical Instrument Digital Interface. The result is an explosion in the contemporary music world—with repercussions in the world of PCs.

Warren Sirota

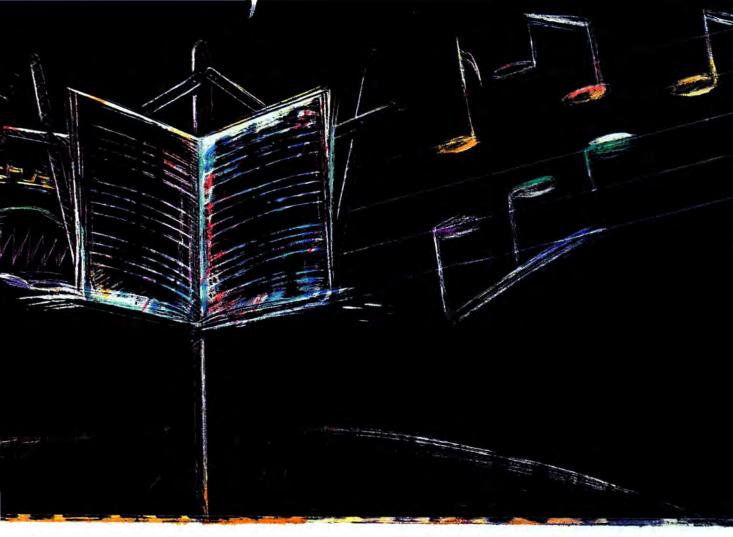
The music industry is experiencing a computer revolution as profound as the one that swept through America's businesses-and it's being spearheaded by MIDI (Musical Instrument Digital Interface). At the National Association of Music Manufacturers (NAMM) conference in January 1982, the giants of the American electronic music industry-Roland, Yamaha, E-mu, Oberheim, CBS-Rhodes, Korg, and Octave Plateau-agreed on a standard for digital communications among electronic musical instruments. The result was MIDI specification 1.0, which defines hardware and software standards that will be supported by all major manufacturers. (Copies of the specification are available from the International MIDI Association, a nonprofit group formed to promote the use of MIDI and to provide information about it.)



MIDI was developed to enable musicians to control multiple synthesizers from a single keyboard. Previously, performing musicians who wanted the sound texture possible only with several instruments needed to somehow summon two hands for each component—a challenge requiring multiple octopuses or a large stage crew. MIDI solved the problem by allowing musicians to send digital signals from a master keyboard to control the other instruments on stage.

Although MIDI wasn't developed expressly to bring PCs into music making, its creators recognized that the microprocessors in the PC and those in electronic instruments like synthesizers and drum machines could, with a little planning, cooperate beautifully. But though the PC may have had the heart of a musician, its voice left something to be desired: single-voice capability limited its power to produce music of any complexity, so software developers ignored the machine's latent talent. MIDI gives the PC a voice—and what a voice, supplied by the most sophisticated electronic instruments on the market.

By automating music performance as never before, MIDI has already begun to change the way performers, music educators, and sound technicians work. Composers can keep an orchestra at hand to



bring musical ideas to life as they conceive them. Today, virtually every synthesizer produced contains MIDI circuitry, and several manufacturers have developed MIDI interfaces and software for the IBM PC, with more likely to follow.

Nuts and Bolts
MIDI specification 1.0 was released in August
1983 and is still in effect. It details the nuts and bolts
that turn the PC into a composer's tool. Specifically,
it defines hardware connections and communications
protocols to accomplish the transmission of musical
performance information.

Since MIDI was to be a system for linking electronic components, its designers' first order of business was deciding on a physical connection. They chose 5-pin DIN connectors, which were both suitable and readily available in electronics stores. The shielded twisted-pair cable that the specs called for was equally accessible.

The simplest MIDI network consists of several MIDI instruments strung together like Christmas tree lights (see Figure 1). Components (nodes) of the network can be synthesizers, drum machines, sequencers (devices that record performance information and play it back through synthesizers), or computers. Each component must have the necessary ports, labeled MIDI Out, MIDI In, and MIDI Thru. The MIDI Out port sends original messages to other nodes. The MIDI In port accepts incoming information. MIDI Thru passes a copy of incoming messages along the network.

Hitting the Right Note

MIDI messages are divided into two types: channel messages and system messages. Channel messages control the voices and modes of MIDI instruments. Each instrument on the network is tuned to a certain channel and can be set either to respond only to messages addressed to its specific channel (Poly mode) or to respond to all incoming messages regardless of their channel address (Omni mode).

Table 1: MIDI channel voice messages

Message Note Off Note On Polyphonic Key Pressure (after touch) Control Change Program Change Channel Pressure (after touch) Pitch Wheel Change		Status Byte	Okkkkkk Ovvvvvv		
		1000nnnn			
		1001nnnn	Okkkkkk Ovvvvvv		
		1010nnnn	Okkkkkk Ovvvvvv Occccc Ovvvvvvv Oppppppp		
		1011nnnn			
		1100nnnn			
		1101nnnn	Ovvvvvv		
		1110nnnn	Ovvvvvv Ovvvvvv		
nnnn kkkkkkk	specifies the voice channel number specifies the note number, 0 through 127, where 60 is middle C				
vvvvvv	specifies the key velocity				
cccccc	specifies the control number; each manufacturer defines the numbers for the controls on its own instruments				
ррррррр	specifies the program number				

Adapted from MIDI specification 1.0

When a synthesizer or a drum machine receives a message through its MIDI In port, it first determines whether the message is addressed to it. If so, the instrument plays the specified note and then passes the message via its MIDI Thru port to any other instruments on that channel. If the message is addressed to another channel, the component passes the message along without responding to it. MIDI recognizes 16 channels, making possible the control of 16 distinct voices in a synthesizer orchestra from a single keyboard. Without this channel organization, composers would be limited to electronic Gregorian chants.

Most MIDI messages consist of a status byte, which tells the system which type of message to expect, followed by one or two data bytes. In status bytes the most significant bit is on; for data bytes it is off. In channel messages the status byte also defines the channel for which the message is intended. (Table 1 shows the syntax for MIDI's channel messages.)

System Exclusive messages can include any number of data bytes; System Real-Time messages contain only a status byte.

The messages that MIDI defines reflect the standard's use as a remote control tool and should be viewed as communications of events rather than as commands. The channel messages Note On and Note Off are at the center of MIDI events. When a keyboard player presses a key on a MIDI-equipped synthesizer, a Note On message is sent through the MIDI Out port. Other synthesizers on the network that are tuned to the keyboard player's channel respond to the Note On message by sounding that note. When the player releases the key, a Note Off message for that note is sent, and all synthesizers on the channel respond accordingly. The effect can be enhanced by using a sequencer to record and combine successive tracks of a performance.

Most new synthesizers can measure the velocity with which a key is pressed, a variable that controls the music's dynamics (loudness and softness). If the controlling keyboard has this capability, the information will be transmitted as a parameter of the Note On message. MIDI can also transmit after touch information, a measure of how hard the player is pressing a key after he or she has initially struck it.

Most synthesizers also allow a musician to enter *presets*, programmed control settings that the player can call up by entering a single number into the synthesizer's front panel. The MIDI Program Change message directs presets by remote control. Other channel messages include Control Change, which governs continuous controllers on remote synthesizers, and Pitch Wheel Change.

Don't Touch That Dial

The channel messages form the basis of the MIDI message structure, but they encompass only the broadest requirements for communicating musical events. To take advantage of the more subtle, specialized capabilities of each instrument, MIDI defines a class of messages called *System Exclusive*. The only parts of these messages that MIDI standardizes are the beginning and ending byte sequences. The status byte tells the network components that a System Exclusive message is about to begin. The next byte is a

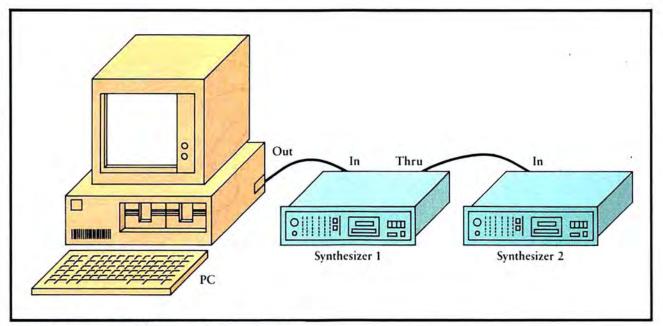


Figure 1: A simple MIDI network using the PC as a controller. The synthesizers will respond to the MIDI performance information sent out by the PC.

manufacturer code that identifies the brand of instruments for which the message is intended. The message can be any length and is terminated by a byte sequence that signifies the end of a System Exclusive message. Each instrument manufacturer defines the codes to implement functions on its own components. On many synthesizers System Exclusive messages control all the dials and switches on an instrument.

The system class of messages includes three other message types: System Real Time, System Common, and System Reset. These are used primarily to synchronize sequencers and drum machines.

The result of each message depends on the capabilities of each node on the network. Not every MIDI synthesizer supports all aspects of the MIDI code. A synthesizer that doesn't support keyboard velocity information will still respond to incoming Note On messages but will ignore the velocity parameter.

Other hardware limitations must also be taken into consideration. For instance, some synthesizers, like the popular Yamaha DX7, will transmit only on MIDI channel 1. If you have two such instruments on a network you must either put one of them through a *channelizer* box, which uses hardware to convert MIDI messages from one channel to another, or use a PC to intercept the messages and convert the channels via software.

MIDI recognizes 16 channels, making possible the control of 16 distinct voices in a synthesizer orchestra from a single keyboard.

The MIDI specs define a signal speed of more than 31.5 kHz-31,250 bits per second, or more than 1000 MIDI messages per second. Although a chord's individual notes are actually sent in sequence, separated by milliseconds, MIDI's speedy transmission rate enables the ear to perceive the notes as simultaneous. The same thing happens when a musician

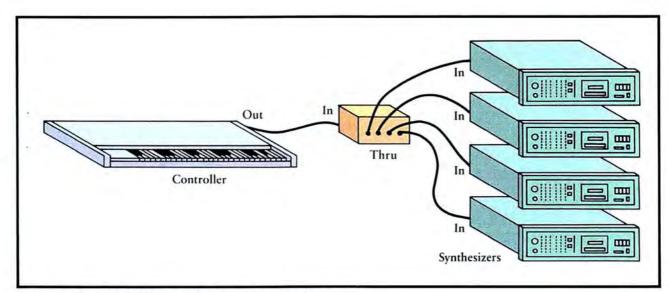


Figure 2: Sending MIDI signals through more than a few sound modules may cause a perceptible lag in the music's timing. For larger orchestras, a star configuration using a MIDI Thru box should be used. The controller can be a synthesizer, another MIDI-equipped electronic instrument, or a PC.

plays a chord on any instrument; although the notes are not played at precisely the same time, the ear hears them as a unit. The MIDI signal speed, however, is too slow to allow a message to be sent through more than four or five instruments in sequence without perceptible delays. This problem is easily solved with a star configuration using a MIDI Thru box as a distribution center (see Figure 2).

The PC Connection

To use a PC for MIDI communications, you must install a MIDI board in the computer. MIDI boards supply the necessary ports and usually include several programmable timer chips. Each timer has a baud rate generator that allows transmission at the 31.5-kHz MIDI speed. The timers also *timestamp* incoming MIDI information and measure time intervals between notes to be sent out. The resolution of the

PC's internal clock, which interrupts the CPU 18.2 times per second, is not fine enough for musical purposes. Some MIDI boards also send out *tape sync* signals, timing pulses that can be recorded on an unused track of a tape to synchronize the tracks of a recording.

The PC to MIDI Card from Noteworthy Systems is one board that provides all those functions. It resembles an IBM Asynchronous Adapter in function and programming and plugs into any free PC slot. A switch on the board allows you to address the MIDI port as either COM1: or COM2:. Two connectors are provided, one for MIDI In and one for MIDI Out. In addition to a baud rate generator, the board contains two programmable counters with a resolution of up to 2 million ticks per second.

RolandCorp's MIDI adapter for the PC takes a different approach. The adapter is a small, standalone computer called the MPU-401—the MIDI Processing Unit. Roland hopes the MPU-401 will become the standard MIDI interface. The unit includes built-in MIDI interfaces and ROM routines that record and timestamp incoming MIDI information as well as send MIDI information out. The MPU-401 connects

to the PC via the Roland MIF-IPC interface kit, which consists of a board that plugs into a slot in the PC and a cable connecting the board to the MPU-401. Software written for use with the MPU-401 sends out MPU-401 commands rather than MIDI commands.

The Software Shuffle

At press time, most MIDI software for the PC was at the hobbyist stage. Programs with broader appeal remain in development. The software that Noteworthy Systems supplies with its board consists of demos for programmers rather than usable music software. Ryan Sanders, president of Noteworthy Systems and designer of the board, says he plans to create a programmers' source library consisting of routines in C, BASIC, and assembly language, all of which will be distributed free with the board.

Roland recently demonstrated a program, not yet released, called MPS (Music Processing System). This software illustrates the stunning possibilities of combining computers and MIDI. MPS's built-in sequencer can record all the MIDI information from a performance and, when you choose an item from a

MPS can record all the MIDI information from a performance and, when you choose an item from a menu, generate the score of the piece just played.

menu, generate the score of the piece just played. The program can correct small timing errors in the performance by rounding the time values of all notes to the nearest 16th note or to any other duration specified. After the music is saved, you can edit the score on screen, much as you would use a word processor to edit a document. Copy, delete, and move functions

are provided, as well as less familiar functions like Transpose. The score can be printed on an Epson FX-80 or a compatible graphics printer (Figure 3). The program handles with finesse traditionally knotty notation problems, such as beaming, ties, and (with some restrictions) multiple time signatures. Eight tracks of performances can be recorded and manipulated with the MPS and then played back on a synthesizer orchestra.

You can also experiment with the wonders of MIDI in your own programming. This can be difficult but worthwhile if your needs tend toward the offbeat. I have obtained satisfying results using Laboratory Microsystems' PC/FORTH to send MIDI messages via the Noteworthy adapter board to a Roland Juno-106 synthesizer. This setup allows me to use programming techniques like pseudo-random processing and to manipulate the Juno's controls on a note-to-note basis—capabilities not available with existing commercial software.

MIDI and Music

MIDI puts computer technology at the disposal of many composers and musicians for the first time. Before MIDI, computer-aided composition was primarily the province of those with access to large university computers and was subject to severe constraints of cost and complicated software. But the personal computer revolution is already reverberating through the music world.

MIDI is beginning to affect the way recordings are made. Studio time is a major expense for musicians, and MIDI provides a way to reduce studio time dramatically. A musician with a computer, several MIDI synthesizers, and a MIDI drum machine can create a complete, ready-to-play score in his or her own studio, taking as much time as necessary to perfect the composition. In the recording studio, the artist can then hook everything up, read the performance from disk, and have a perfect take on tape the first time.



Figure 3: A score printed by Roland's MPS software. The printing facility makes printing of individual parts easy. Production of scores showing several different parts per page is possible, although not as easy, through cut-and-paste procedures.

October 1985

Alternatively, a more traditional composer could use the computer simply as a sketch pad—a means of hearing how the parts of a piece fit together. When the composer is satisfied, scores can be printed out and distributed to musicians, who can then play the parts on more traditional instruments.

As the prices of electronic instruments and computers continue to drop, it becomes increasingly likely that MIDI will find its way into the home. Tra-

As the prices of electronic instruments and computers continue to drop, it becomes increasingly likely that MIDI will find its way into the home.

ditional home organ manufacturers like Baldwin already include MIDI ports in their products. The vast possibilities for educational music software and games have been explored only superficially to date.

But the computerization of music is clearly on the rise. On one hand, musicians have begun to speak of *applications* instead of *compositions*; on the other, British musicians have picketed recording studios to protest the effects of automation on employment. Computers have not affected live performances dramatically, primarily because excessive automation tends to detract from the visual and entertainment values of a performance.

Ultimately, a successful marriage of music and personal computers will depend on the quality, utility, and imagination of MIDI-based software. Progress is bound to be rapid—the field is both economically and creatively attractive to programmers right now.

Warren Sirota is a composer and programmer living in Oakland, California. He is a member of The Electric Guitar Quartet and creates computer/environmental music installations.

International MIDI Assoc. 11857 Hartsook St. North Hollywood, CA 91607 818/505-8964

MIF-IPC MPU Interface Kit RolandCorp US P.O. Box 22289 Los Angeles, CA 90022 213/685-5141 List price: \$110

MPU-401 MIDI Processing Unit RolandCorp US List price: \$200

Music Processing System RolandCorp US List price: \$495 Requirements: 192K, MPU-401

PC to MIDI Card Noteworthy Systems 2835 Seventh St. Boulder, CO 80302 303/444-8765 List price: \$250

PC World 215

Lawyers On Line

Lexis and Westlaw can bring a giant legal library to your desk top. Online costs are high, but with careful search strategies your research will pay off.

Jordan J. Breslow

The legal profession, always at the vanguard of new technology, has recently discovered that some electronic gizmo called a photo-something-orother can make copies without carbon paper. A few of the trendsetters are dictating letters and briefs into little boxes, freeing their secretaries to perform other tasks, like erasing typos from high-tech erasable paper. But times change, and it's looking like the old-timers who refuse to talk to inanimate objects or push buttons will soon find themselves selling a type of justice that nobody will want any more.

Notable among the technological advances that are changing the way lawyers work are the on-line legal data bases Lexis, from Mead Data Central, and

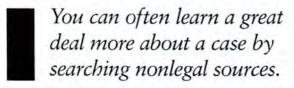




Westlaw, from West Publishing Co. These services offer a staggering breadth of legal and nonlegal information, far beyond the scope of most law firm libraries. And Westlaw and Lexis can be accessed by the same personal computer that more than half of all law firms already use for word processing and timekeeping.

Everything You Want to Know
The most impressive aspect of these systems is
the volume of information they offer. Both systems
serve up, in full text, the decisions of the U.S. Supreme Court, of all federal circuit and district courts,
and of the appellate and supreme courts in all 50
states. Both Westlaw and Lexis claim that opinions
are on line within a few days after they are announced. The systems also include the entire United
States Code as well as the Code of Federal Regulations and the Federal Register. A sampling of the data
available is shown in Table 1. And the monthly subscription fee of \$100 to \$125 is comparable to the
cost of library upkeep for only one or two sets of
books.

This wealth of data is grouped and regrouped in various combinations, which Westlaw calls data bases and Lexis calls libraries, with each library divided into files. For example, one group might hold



the decisions of all federal courts, while a smaller group would contain the decisions of the federal district courts only.

In addition to the general sets of data, both systems cluster information for attorneys practicing in areas such as taxation, securities, intellectual property, labor, trade regulation, bankruptcy, energy, government contracts, admiralty, international trade, and military justice. These specialty data bases regroup data from other categories, bringing together, for instance, all of the cases, U.S. Code sections, and

regulations that pertain to the subject. The Lexis specialty libraries and some of the Westlaw specialty data bases add supplementary material. For example, Lexis generally adds Matthew Bender publications, such as *Nimmer on Copyright*, and some Bureau of National Affairs (BNA) publications. Both systems generally add decisions of administrative bodies, such as the Federal Communications Commission (FCC), the National Labor Relations Board (NLRB), and the Securities Exchange Commission (SEC), that affect the specialty area. The data bases on Westlaw and Lexis are continually being expanded; each time you log on you may see an announcement of something new.

Westlaw supplements the text of case reports with "headnotes," which briefly summarize major points of law in each case. Westlaw also adds West's key number indexing system and a synopsis of the cases.

Nonlegal Resources

Lawyers tend to think of legal research as a hunt for cases and code sections, but you can often learn a great deal more about a case by searching nonlegal sources. A subscription to Lexis includes access to Mead Data's vast nonlegal data base, Nexis, which includes the full text of many newspapers, magazines, medical journals, financial reports, and more. You can use Nexis to search newspapers for mention of events similar to the ones on which a case is based, or review financial reports, market studies, and SEC filings to learn about defendants' or clients' net worth and the potential for collecting punitive damages. By searching trade journals you can find likely expert witnesses.

A Westlaw subscription includes Vu/Text, Knight-Ridder's news service. Although not as extensive as Nexis, Vu/Text provides on-line access to the full text of major daily newspapers like the *Boston Globe* and such minor locals as the *Gilroy Dispatch* (California). The service also includes stock quotations and the AP news service.

Table 1: Some offerings of Westlaw and Lexis

Lexis	Westlaw		Lexis	Westlaw	
		Federal			Patent, Copyright, and Trademark
		U.S. Supreme Court decisions Federal court of appeals and trial court decisions (all circuits, including the federal circuit and all districts) U.S. Claims Court United States Code		•	Utility, plant, and design patents Manual of Classification Court of Customs and Patent Appeals decisions Chisum on Patents
<u> </u>	4	Code of Federal Regulations	=		Nimmer on Copyright Gilson, Trademark Protection and Prac-
		Federal Register			tice
		Briefs filed in the Supreme Court Presidential documents			BNA Patent, Trademark and Copyright Journal
_		Federal Tax	-		State Law
		Tax Court opinions			Supreme Court and Courts of Appeal,
		Treasury Regulations Cumulative Bulletin (Revenue Rulings,			all states Attorney General Opinions
_	_	Revenue Procedures, etc.)	ä		California Deposition and Discovery
		RIA Alert files			Practice (Matthew Bender)
Ц		CCH Tax Day Cavitch, Business Organizations With			California Family Law (Matthew Bender)
		Tax Planning Technical Memos			California Products Liability (Matthew Bender)
		Federal Securities Law			General Legal
		SEC rules and regulations SEC interpretive releases SEC no-action letters			Black's Law Dictionary Shepard's Citations ABA Code of Professional Responsibility
_		BNA securities regulations and law re- port	=		ABA ethics opinions Law reviews from major law schools
		Federal Labor	-		European Law
		NLRB decisions			English case reports United Kingdom tax cases
					United Kingdom intellectual property cases
					French public and private cases

PC World 219

No More Indexes

The benefits of these services derive not only from the extent of information they offer but also from the ease with which they enable you to find information. In a traditional legal library, you are completely at the mercy of the editorial judgment and analytical legal skills of the indexers. If the information you are looking for is not indexed in the way you would have indexed it, you probably won't find it. For instance, to determine whether you should cash a check with a disputed note on the back saying "payment in full," you would have to look in the law book index under "Accord and Satisfaction."

Westlaw and Lexis don't depend on traditional indexes but on a free-text search for any word in any document. Instead of racking your brain for legal categories, you could just ask for material containing the words payment in full or check.

Freed from the constraints of a traditional index, you can search for opinions by a particular judge or for cases in which a particular lawyer or expert witness was involved. You can find all the cases in which a specific product was mentioned or in which a company or person was mentioned but was not a party to the suit. Both systems let you widen or narrow your search with the Boolean logical operators *AND*, *OR*, and *NOT*. (The last is expressed *AND NOT* in Lexis and % in Westlaw.)

Search Strategies

When you subscribe to Lexis, Mead outfits you with special PC software that can also be used with Nexis. Westlaw can be accessed with any asynchronous communications package, or you can obtain *LawSearch* software, designed specifically for use with Westlaw, from Direct.aid of Boulder, Colorado.

Borrowing a problem from the Lexis training class, suppose that a young man tried to defrost a refrigerator by using a hand-held electric hair dryer and was electrocuted. You want to know if his family can sue the manufacturer of the hair dryer on the grounds that customers should have been warned not to use the appliance in this dangerous manner.

The first step is to condense the research issue into one fine-tuned, concise sentence, as you would in stating the issue in an appeal. For this case you might

write, "Does the failure to warn users of an injury that can be caused by a foreseeable misuse of the product subject the manufacturer to strict liability?"

Don't log on to the service yet. First you must construct your query or search request—which can actually be fun if you like puzzles or word games. Begin by choosing the keywords in the issue; for example, warn, foreseeable, misuse, and strict liability.

Because many different words can express the same idea, your search request must be expanded in several ways. First, use the root expanders * and !.

In a traditional legal library, you are completely at the mercy of the editorial judgment and analytical legal skills of the indexers.

You add ! to the root of a word rather than typing in all its alternative endings. Warn!, for instance, retrieves cases with the words warn, warned, and warning. A wild card that can stand for any single character, * is useful in searching for different tenses (for example, kn*w finds knew and know); singular and plural forms (wom*n for woman and women); or words you can't remember how to spell (rec**ve for receive). Both systems automatically retrieve plurals formed by adding s or es or by changing y to ies. Next, think of synonyms and antonyms for the keywords. To the word foreseeable, for instance, you may want to add the synonym predictable (predict!) and the antonyms unforeseeable (unforesee!) and unpredictable (unpredict!).

The next step in query formulation is the choice of "proximity connectors," which specify relationships between keywords in a search. The connector *AND* should be used judiciously. If you want a case about informed consent, don't ask for *informed AND consent*—you may get a case with the word *informed* on page 1 and the word *consent* on page 39.

220 October 1985

Lexis and Westlaw allow you to specify proximity by number of words. For instance, try *informed w/5 consent* (within five words) or *informed +5 consent* (within five words, with *informed* appearing first). Westlaw also allows you to specify grammatical limits. For instance, *informed /s consent* asks for files that contain the two words in the same sentence, and *informed /p consent* specifies that the words must be in the same paragraph.

If you are using Westlaw, your query might look something like this: warn! /p (foresee! OR unforesee! OR predict! OR unpredict!) /s (use OR misuse) AND (strict OR product) /s liab!. On Lexis the construction might be warn! w/75 (foresee! OR unforesee! OR predict! OR unpredict!) w/50 (use OR misuse) AND (strict OR product) w/15 liab!. (In both systems the parentheses are optional but make the query easier to read.)

Now pause for a few moments of quiet reflection. The goal is to eliminate irrelevant responses. If you are looking for cases on RICO (the Racketeer Influenced and Corrupt Practices Act), be sure to exclude cases that refer to *Puerto Rico* by using one of the negative connectors, *AND NOT* or %. Review your use of ! to make sure you aren't inadvertently searching for unwanted words: *car!*, for instance, will give you *cartoon*, *carpet*, *and caribou*, among others.

With your issue defined and your search request formulated, choose the data base (Westlaw) or library and file (Lexis) you want to search. To eliminate irrelevant responses, search the narrowest group that suits your purposes.

Connect Time

After you enter your ID and the name of the account to bill your research to, specify a data base and carefully type your query. Proofread it for typos before you press <Enter>, or you'll lose precious time while the program gathers documents you'll never use. Click your heels together three times. In a few moments the computer will tell you the number of documents that satisfy your query.

If your first search request yields too many documents, review a few to see if you can eliminate an area of cases by narrowing your request with *NOT* connectors. The documents can be examined in a variety of ways. You can check each place in the document where the search words appear along with their surrounding text, or you can view the entire document. You can choose to examine only a particular portion of the document, such as the title, the opinion, or the name of the judge, or you can display and print the citations of the retrieved documents.

On Lexis, you can economize by taking advantage of the system's inverted-pyramid search technique. The first level of any search is more expensive than subsequent levels. If your search request can be separated into discrete concepts or categories, begin your search by asking for only the broadest category of documents. For the current example, your level 1 search request could be *strict OR product (15 liab!*

On Lexis, you can economize by taking advantage of the system's inverted-pyramid search technique.

AND warn! It is better to have your level 1 search yield too many cases than none or too few, in which event you would have to conduct a new level 1 search instead of a less expensive level 2 modification. Lexis retains the responses to each level, so if you reach a level with too few cases or documents, you can retreat to a previous level and review those documents without searching again.

The Good Shepard

Once you have reduced your documents to a manageable number, reviewed them, and found a case on point, you will want to know if that case has been overruled, cited as precedent by later cases, or otherwise affected by subsequent events. Every legal researcher is familiar with the loathsome but indispensable set of books known as *Shepard's Citations*. No

careful lawyer would dare cite a case in a brief without "Shepardizing" it to make sure that it is still good law.

If on June 15, 1985, you wanted to be sure that a 1965 California Court of Appeal case had not been overruled, you would have to look at the treatment of the case in five separate volumes of *Shepard's*. But by typing *sh* on Westlaw or *shep* on Lexis, you instantly have the citations from all *Shepard's* volumes. And now comes the real interactive splendor of computerized research. Each case citation has a number next to it. Type the number, and you have the case on screen.

Both Lexis and Westlaw offer an additional cite-checking service. West's Insta-Cite and Lexis's Auto-Cite show both prior history and subsequent treatment of a case, and limit the display to history



By typing sh on Westlaw or shep on Lexis, you instantly have the citations from all Shepard's volumes.

that directly affects the case in question, such as reversals, appeals, and new trials. Insta-Cite even told me that a Supreme Court case had been superseded by a subsequent statute, information not provided by *Shepard's*. With cases on line a few days after they're decided, both Auto-Cite and Insta-Cite are considerably more current than *Shepard's*.

When your research in the data base or file is complete, you can quickly repeat the search in another data base or file with a few keystrokes. For example, on Westlaw, by typing *s db* and the abbreviation of the new data base, you enter your query in the new data base. Although it may have taken you 10 minutes to refine your query and search the state

cases for information, in another few seconds you can make the same search through federal court decisions.

If you're using Westlaw, don't read the cases on screen—the meter is running. Instead, store the text of the cases on disk, sign off, and read the saved materials at your leisure. Reading time on Lexis costs only about 46 cents a minute rather than the \$2 or \$3 Westlaw charges, so you can be a little more relaxed about perusing your garnered cases on screen with Lexis.

Post On-Line Depression

Unfortunately, your work isn't quite done when you sign off the service. Both systems are useful, but neither offers all the research tools you need.

The most glaring deficiency is the absence of state statutes and codes. This means that any research done on the law of another state is necessarily incomplete, and any conclusion you reach could be just plain wrong. There is hope, however; West reports it is in the process of putting codes from five major states on line.

The other notable deficiency is the systems' failure to indicate on which page of the printed text the material is located. Rules of brief-writing require that a cite for a quote extracted from a case include the page of the printed book from which it is drawn. If you quote from a case you've discovered on line, you'll have to go to the library to get the full citation.

The practice of passing the cost of computer time on to clients may be universal—both Lexis and Westlaw assume that users will do so, and provide itemized billing for that purpose. But if costs are not managed carefully, legal bills will quickly rise from their current astronomical level to something nobody will pay.

Westlaw charges \$150 per hour for on-line time. Lexis's per-hour charge varies depending on what you do, and when. During peak hours on Lexis, you pay a connect charge of \$28 per hour, plus between \$7 and \$21 (depending on the file you use) for your first search in a file, \$3 for each modification to the search, and \$1.25 to "Shepardize" or Auto-Cite a case. Lexis discounts some charges by 50 percent during off-peak hours. Both systems give discounts for high-volume use.

Charges can add up fast. If you're like me, you'd much rather play with electronic gadgets than sort through dusty libraries, and would turn to these data bases at every opportunity. To guard against overuse, firms must develop guidelines about when to use the systems. The overriding policy should be not to use the services unless money will be saved or better results obtained—for instance, to access volumes not available in-house or to find information not usually available through traditional indexes.

Once the decision to use the system is made, the tactics outlined here can help keep costs in line. First and foremost, remember to do your thinking and learning off line. In most instances, you should not sit down at the computer until you have a solid grasp of the subject matter and a polished search request. With a little precaution and forethought, an on-line legal search can quickly pay for itself.

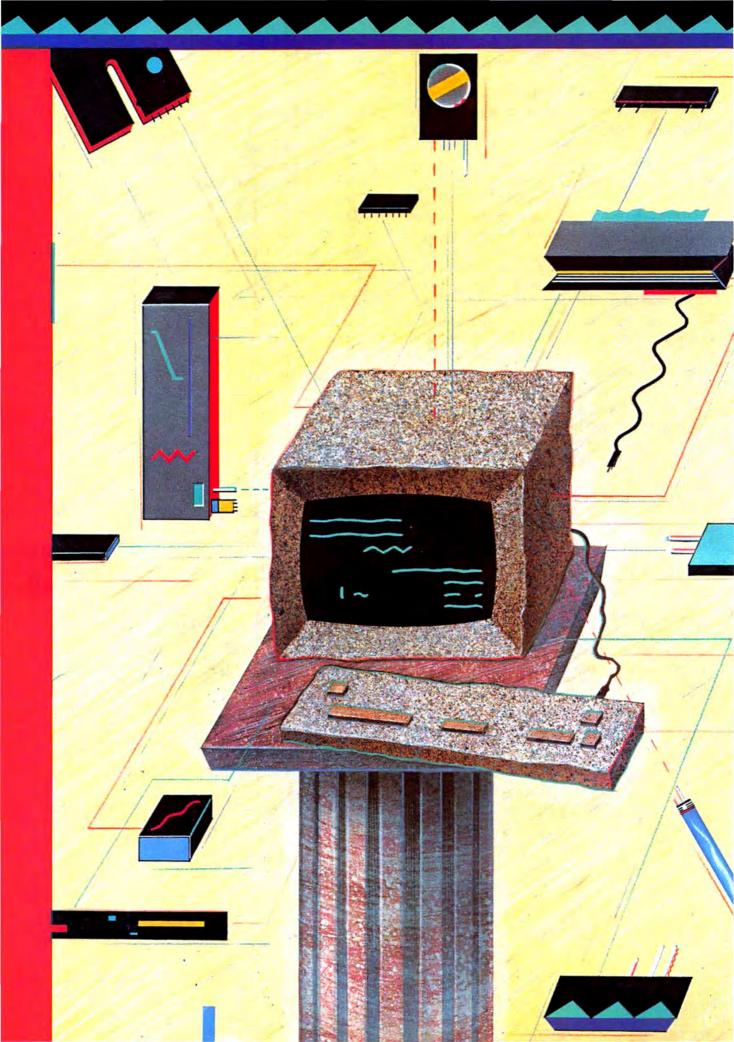
Jordan J. Breslow is a partner in the Walnut Creek, California, firm of Stewart, Stewart, and Breslow, which emphasizes computer law. Lexis Mead Data Central P.O. Box 933 9333 Springboro Pike Dayton, OH 45401 800/227-9597, 513/865-6800 List price: library access fee (includes Nexis) \$100/month plus \$10/month per person for first 20 users, \$4/month per person for next 60 users; \$7-\$21 per search; software \$225, \$165/copy for more than one copy; training \$75 per person Requirements: 128K, one disk drive, modem

Westlaw West Publishing 50 W. Kellogg Blvd. St. Paul, MN 55164-0526 800/328-0109, 612/228-2450

Alaska, Hawaii, and Minnesota List price: \$125/month plus \$100-\$150/hour, training \$280

(up to four persons)

LawSearch
Direct.aid
P.O. Box 4420
Boulder, CO 80306
800/433-8080
List price: LawSearch \$350,
LawSearch Plus \$495
Requirements: LawSearch 128K,
LawSearch Plus 256K; one disk
drive; Hayes-compatible
modem



Retrofit Your PC

If your old PC is still humming but you long for this year's model, take heart. You can give your PC the power of an XT or an AT—or better—with a little tinkering, some choice hardware, and surprisingly few bucks.

Jeremy Joan Hewes

A few hundred thousand of us bought our computers in the PC Stone Age—when memory chips held a whopping 16K of data, the RAM capacity of the PC's motherboard was 64K, and DOS 1.10 was the state of the art. Some of us even started with single-sided disk drives. These machines still do the work we bought them for, but since that time the possibilities have exploded. Disk storage and RAM capacities have

soared, and the introduction of the XT and the AT sparked envy even in owners of modern PCs.

Over the years I've added some features to my prehistoric PC, but until recently it was still pretty archaic and definitely kludgy; it sported one double-sided floppy disk drive, an internal 5MB hard disk (continually sending out 'disk full' messages) with an external power supply, and a 256K RAM board with a clock and a serial port. I had never moved up to DOS 2.00, and I had to run a special program each time I started DOS in order to use the hard disk with my old-fashioned ROM. So I decided to bring my computing power into the present.

I briefly considered selling my PC and buying an AT or a Compaq Deskpro, but a nostalgic attachment to my aging computer and an even deeper attachment to my hard-earned cash squelched the idea. Instead, I investigated all the possibilities for revamping my old PC and discovered that by buying the extra components and installing them myself, I could have the equivalent of an XT or an AT at a considerable savings over

the cost of a new machine (see Table 1). To prepare for the makeover, I sorted through all the alternatives for equipment, dealers, and information—and learned a few hard lessons along the way.

System Design

XT level requires a 10MB hard disk and a double-sided floppy disk drive. To add the hard disk, you will also need a hard disk controller board and possibly a larger power supply and an updated ROM. To match an AT, you must add to your PC at least a 20MB

Upgrading an early PC to

hard disk, one 360K and one 1.2MB half-height floppy disk drive, new disk controller boards to handle the high-capacity floppy drive and the hard disk, and an 80286 processor.

One advantage of upgrading an old machine rather than buying a new one is the opportunity to design your own system. The system I concocted is essentially an XT, with an additional high-capacity AT floppy drive for easier hard disk backup.

Table 1: Cost of upgrading the PC^a

Component	PC to XT+	PC to AT+					
Power supply	\$120	\$120					
ROM BIOS upgrade	\$30	\$30					
Memory board—256Kb	\$210						
Memory board—512Kb		\$250					
Floppy drives—two half height, 360K ^c each	\$250						
Floppy drives—one half height, 360K; one half height, 1.2MB with controllerb		\$500					
Hard disk— 10MB with controllerd	\$795						
Hard disk—20MB with controller ^b		\$1000					
Coprocessor board—80286 ^e		\$1995					
Total retrofit cost	\$1405	\$3895					
*Lowest advertised prices, June 20, 1985	^d Price source: First Class Peripherals						

^{*}Lowest advertised prices, June 20, 1985

*Price source: Seattle Telecom & Data

Memory

In recent months the PC's memory capacity has soared while the cost of memory has plummeted. The newest hardware-software schemes allow you to add up to 8MB of RAM to a PC, outstripping the AT's capacity and extending the performance of key programs. The Lotus-Intel Above Board, for example, provides a memory-management system called bank-switching, which can accommodate 1-2-3 spreadsheets as large as 4MB, in addition to a RAM disk and a print spooler of 1MB each. Many power users will want to send their computers into

this memory stratosphere; the rest of us will benefit from the memory cost cuts that these megaboards will stimulate.

When upgrading my system, I bought a 512K memory board from Tall Tree Systems, which, when added to my previous configuration of 64K on the motherboard and a 256K expansion board, brought my total RAM to 832K. I used most of this memory as a RAM disk and experienced no problem-until I added a hard disk.

I discovered that the driver for the Tall Tree board used the same port address as my hard disk. Fortunately, the dealer I bought the board from allowed me to swap it for an AST model that didn't conflict with my hard disk. This

taught me the most important rule of expanding a PC: Make certain that all the components-hardware and software-perform properly together.

Floppy Disk Drives Adding floppy disk drives to a PC is generally not too complicated. You can attach two 360K floppy drives to the disk controller already installed. To make room for an internal hard disk, you can replace one full-height floppy drive with two half-height drives. You can sell the one or two full-height drives you replace, save them as backups, or even use them externally by cabling them to the disk controller.

For more storage, I installed one standard half-height floppy disk drive (360K capacity) and one ATtype half-height floppy drive (1.2MB capacity). Data written by the large-capacity drive on a 360K floppy is not always reliably read by standard 360K floppy disk drives, but the high-capacity drive can read both standard 360K and 1.2MB disks. Although I have to be careful which drive I use for each function, I have no problem copying disks or using a program disk in one drive and a data disk in the other. This configuration requires a new disk controller (replacing the PC's original floppy controller) and a driver for the 1.2MB drive. It works perfectly with my hard disk and all my software. I bought all three components-the two Teac drives and the Tall Tree Systems controller and driver-for \$500 from DataVision. a consulting firm in Palo Alto, California.

bPrice source: DataVision, Palo Alto, CA

Price source: various mail-order suppliers

Hard Disks

A hard disk-one of the handiest contraptions you can add to your system-has recently become affordable. An XT-like 10MB hard disk for your PC costs about \$800 (see "Sensible Storage," PCW, September 1985). If you want to surpass the storage capacity of the XT, you can add a 20MB internal hard disk like the AT's for as little as \$1000. Hard disks that store 30MB or more are also available, ranging in price from \$1300 to \$5000. Other mass storage options for the PC include 5MB or 10MB removable cartridge hard disks, which cost from \$1500 to \$2000, and combination devices that include a hard disk or cartridge with a tape backup system.

Obviously, price is important, but additional factors must also be given attention when you select a hard disk. Most important, be sure your disk drives operate compatibly with the PC and with all the hardware and software in your system. Consider whether the hard disk contains its own power supply or will require you to replace the one in your PC, and whether you will have to update your PC's ROM BIOS. Also evaluate the quality of the utility programs that accompany the disk-the utilities supplied for data management and backup can make these functions either a breeze or sheer agony.

Unless your hard disk has a built-in power supply, it's a good idea to replace the computer's 63.5-watt power supply with a beefier 130-watt model. Extra expansion boards will also call for more power. A dealer or repair technician will install a new power supply in your PC, or you can

order one from a mail-order supplier and install it yourself. The procedure is simple: Unscrew the old unit, unplug its connecting wires, and fasten the new unit and wires in place. A new power supply will run you about \$120 if you install it yourself.

Most hard disks require that the PC have a late-model ROM BIOS. The PC's original ROM BIOS did not support a hard disk. (Listing 1 is a BASIC program that displays the date of your PC's BIOS chip; if the date is earlier than 10/27/82, you have the old ROM.) Starting DOS from the hard disk requires the BIOS upgrade, but a few disk drive suppliers offer a driver that enables a PC with the original ROM to use, but not boot from, a hard disk. Quadram offers such a driver with its QuadDisks.

If your hard disk requires a new ROM BIOS, you could have quite a task ahead of you. Although installing the chip is no problem, call you when your chip comes in. The wait averaged five months in mid-1985.

You can avoid this delay by choosing a hard disk that operates with the old BIOS, but another solution is possible. After a few hours of frustrating calls to dealers, I got lucky with Apex Information Systems in San Francisco. Owner Mike Nadelman anticipated the demand and had purchased a supply of upgrade kits when they were easier to get. He declined to sell the kit outright, however; instead, he charged the \$50 the kit cost when first released, plus \$45 for installation. Considering that I would otherwise still be waiting to use my hard disk, it was well worth the extra \$65.

My hard disk choice was the Sider, from First Class Peripherals of Carson City, Nevada; this external 10MB drive includes a controller board and a power supply,



The most important rule of expanding a PC: Make certain that all the components—hardware and software—perform properly together.

obtaining IBM's BIOS upgrade kit (for a paltry \$30) may be the toughest nut to crack in the upgrading process. For some reason, IBM has been releasing only a trickle of these chips, so they are nearly impossible to find. Most authorized dealers don't have them, and IBM Product Centers put your name on a waiting list and

and is linked by cable to a short expansion board in the PC. It sells for \$795 and requires the BIOS upgrade. I chose an external hard disk because when the disk is separate from the computer, noise is reduced and I can move the PC around without jeopardizing the disk drive. Also, because this drive has its own power supply, I was saved the trouble of upgrading the power supply in my PC.

Retrofit Components

These are the components necessary to turn your PC into an XT or AT. The products listed are the best values the author found. The prices quoted are manufacturer's list prices; careful shopping may yield even better deals. For the lowest prices found by the author, see Table 1.

Memory Boards

JRAM-2X
Tall Tree Systems
1120 San Antonio Rd.
Palo Alto, CA 94303
415/964-1980
List price: \$219 with no
memory; \$30 for each
64K bank of memory,
\$45 for each 256K bank

SixPakPlus AST 2121 Alton Ave. Irvine, CA 92714 714/863-1333 List price: 64K \$395, 256K \$695, 384K \$895

Floppy Disk Drives

JDISKETTE controller Tall Tree Systems List price: \$249

Teac 55B half-height, 360K floppy disk drive Tall Tree Systems List price: \$150

Teac 55GF half-height, 1.2MB floppy disk drive Tall Tree Systems List price: \$200

Hard Disks

The Sider
First Class Peripherals
3579 Highway 50 E
Carson City, NV 89701
800/538-1307
List price: \$795

QuadDisk Quadram Corp. 4355 International Blvd. Norcross, GA 30093 404/923-6666 List price: 10MB full height \$1450, half-height \$1195, removable \$1395

ROM BIOS Upgrade Kit IBM Product Centers 800/447-4700 List price: \$30 130-watt Power Supply IBM Product Centers 800/447-4700 List price: \$350, with trade-in \$225

Coprocessor Boards

Pfaster 286
Phoenix Computer
Products
1416 Providence Hwy.
#220
Norwood, MA 02062
617/762-5030
List price: 1MB \$2395
(each additional 512K
\$400), 2MB \$3195,
80287 add-on \$350
Requirements: 128K,
one disk drive, DOS
2.00 or later version

PC-286
Seattle Telecom & Data
2637 151st Pl. NE
Redmond, WA 98052
206/883-8440
List price: 6-MHz, 128K
\$1995 (each additional
128K \$100); 8-MHz,
128K \$2995 (each
additional 512K \$600);
10-MHz, 128K \$3995
(each additional 512K
\$1000)

Requirements: 128K, one disk drive, DOS 2.00 or later version

PCturbo-186
Orchid Technology
47790 Westinghouse Dr.
Fremont, CA 94539
415/490-8586
List price: 128K \$895,
256K \$945, daughterboard only \$165,
384K daughterboard
\$330, board with serial port for 8087 \$295
Requirements: 256K, one disk drive, DOS 2.00 or 2.10

PC Turbocharger Univation 1037 N. Fair Oaks Ave. Sunnyvale, CA 94089 408/745-0180 List price: 512K \$1195, 640K \$1295, 512K with 8087 chip installed \$1595, 640K with 8087 chip installed \$1695 Coprocessor Boards
You'll need one last component to obtain state-of-the-art personal computing—a coprocessor board, which puts the AT's 80286 microprocessor in your PC. At press time two such boards were available: the Pfaster 286 from Phoenix Computer Products of Norwood, Massachusetts, and the PC-286 from Seattle Telecom & Data of Redmond, Washington.

The Pfaster 286 contains an 8-megahertz (MHz) microprocessor and boasts full compatibility with both the PC and the AT. The board comes with software that lets you switch between the 80286 processor and the PC's 8088 with a keyboard command. With 1MB of RAM installed, this board costs \$2395.

The PC-286 can be configured with a 6-MHz, 8-MHz, or 10-MHz processor, and it has a RAM capacity of 128K to 2.5MB. The lowest-priced version of this board features a 6-MHz processor and 128K of RAM; it sells for \$1995. An 8-MHz version with 128K of RAM costs \$2995.

An appealing alternative to the expensive 80286 boards is the PCturbo-186 coprocessor board from Orchid Technology of Fremont, California. This coprocessor board contains an 8-MHz 80186 microprocessor (which speeds up PC performance appreciably but doesn't offer the multitasking capabilities of the 80286) and utilizes the PC's 8088 for some operations. PCturbo-186 with 128K sells for \$895. Another

option is Univation's PC Turbocharger, which replaces the PC's 8088 with an 8086 processor for double-time processing. (See From the Hardware Shelf for reviews of these two boards.)

At each step of the retrofitting process, diligently test the compatibility of all new components.

Incompatibility is always a concern when you are using components from various manufacturers. It can sneak up on you in many ways; the most common offenders are drivers that request the same addresses in RAM or require the same port address. Be sure to ask plenty of questions about the equipment before you buy.

It's impossible to ensure compatibility without actually testing each component with your complete system. Always insist on the right to return a component within a week or so if it does not work properly in your system. If a supplier will not offer that guarantee, either take your business elsewhere or get a demonstration of the component with a system exactly like yours. If necessary, take your own PC to the supplier's premises.

10 DEF SEG=8HF000

20 FOR X=&HFFF5 TO &HFFFF

30 PRINT CHR\$ (PEEK (X));

40 NEXT

Listing 1: BASIC program to display the date of your PC's ROM BIOS

Installation If you're familiar with the inside of your PC and comfortable handling electronic gear, you can probably get the best deal by shopping around for components and installing them yourself. If you want assistance in choosing equipment or installing it, though, you have several alternatives. For the least bother, but possibly the highest cost, you can go to local PC dealers, survey the components they offer, and have one of them remake your system. Having the dealer you bought your PC from install the components may be preferable, or even essential, if you have a service contract with that dealer. The contract may be invalidated if you do the work yourself.

Many independent consultants also put together customized systems and offer installation, support, and service. Because they generally have lower overhead than retailers, consultants can often give you a price break on components. Similar price breaks and installation services are offered by many independent repair technicians as well.

Even if you locate the components on your own and intend to install them yourself, it's wise to check your selections with an experienced consultant or technician. Alternatively, ask other PC owners in a user group or on a PC

Table 2: Comparative cost of retrofit PC and retail XT or AT

	XT	AT
IBM retail cost ^a	\$3895	\$5795
Minus used-PC selling priceb	-\$1250	-\$1250
Cost of new IBM machine	\$2645	\$4545
Cost of retrofit PC ^c	\$1405	\$3895
Savings with retrofit machine	\$1240	\$ 650

^aIBM XT includes one 360K floppy disk drive, one 10MB hard disk, 256K RAM; IBM AT includes one 1.2MB floppy disk drive, one 20MB hard disk, 512K RAM

bEstimated price of used PC based on survey of classified advertisements

Retrofit XT includes two 360K floppy disk drives, one 10MB hard disk, 256K added RAM; retrofit AT includes one 360K floppy disk drive, one 1.2MB floppy disk drive, one 20MB hard disk drive, 512K added RAM

bulletin board system if they have any experience with those components. By taking these precautions, you may avoid pitfalls like buying an expansion board driver that's incompatible with a hard disk.

Comparative Costs
Tables 1 and 2 show the cost
of retrofit and original XT and AT
systems, based on data obtained in
mid-June from a sampling of dealers, consultants, and magazine advertisements. The tables list the
lowest price available for each
component, excluding any installation or shipping charges.

As Table 1 shows, turning a PC into an XT is relatively cheap—\$1405. Of course this does not reflect the original cost of your PC, but you'd be saving approximately \$1240 over the cost of selling the old machine and buying a new XT (Table 2). Achieving AT compatibility is much more expensive at present, principally because the

coprocessor boards are so new to the market that competition has not driven their prices down. Still, you'd be spending \$3895 for AT power if you transformed your old PC, which is \$650 less than if you sold the PC and bought a new AT.

The nameplate will still say PC, but the performance will say XT or AT. Shine up the chrome. You'll have a state-of-the-art computer for a lot less money than you thought possible.

Jeremy Joan Hewes is a Contributing Editor for PC World. She is coauthor of Writing in the Computer Age (Doubleday, New York, 1983) and Word Processing on IBM PCs (Wiley, New York, 1985), and is currently writing The Computer Author's Tools, to be published by Harper & Row.

IF YOU THINK 60 MBYTE AUTOMATIC TAPE BACK-UP IS AN INCREDIBLE VALUE AT \$1395,



The Sysgen Smart Shopper Rebate Sysgen Fultfillment Center 3606 W. Bayshore Palo Alto, CA 94301

PAY TO THE ORDER OF: SMART SYSGEN TAPE PURCHASER

THE AMOUNT OF

ONE HUNDRED DOLLARS

DATE Before 1/31/86

6805

\$100.00

Sysgen

JOSAOS 1:1211265201: O64-012505



Sysgen™ has made its already bestselling tape back-up for your PC, XT, AT,™ or compatible an even smarter buy.

Automatic Back-up. Painless Data Protection.

Now you also get Sysgen's exclusive automatic tape back-up, as easy to program as a VCR! Set it once, and your Sysgen automatically backs-up your hard disk. No system demands less time or returns more consistent data security.

The new Smart QIC-File in gives you the terrific Sysgen quality and technical support you expect. And Sysgen gives you the QIC-24 industry standard tape data format. A must. Plus automatic back-up. All this for an incredibly low price: \$1395—internal or \$1495—external.

*Program begins October 1, 1985 and concludes January 31, 1986. Sales receipts dated by Jan. 31 will be honored if postmarked no later than February 28, 1986. Mail to: SYSGEN REBATE OFFER, Sysgen Fulfillment House, 3606 W. Bayshore, Palo Alto, CA 94303. Certain restrictions apply. Trademarks: Sysgen, QIC-File, Smart QIC-File—Sysgen, Inc.: AT—International Business Machines Corporation. Registered Trademarks: IBM, PC DOS—International Business Machines Corporation.

47853 Warm Springs Blvd., Fremont, CA 94539 (415) 490-6770, Telex 4990843

Buy the Smart QIC-File before Jan. 31, 1986 and Sysgen will sweeten the deal with a \$100 rebate.

Simply return your completed warranty card with proof of purchase to the Sysgen Fulfillment Center at the address below, and we'll send you a check for \$100.*

The Sysgen Smart QIC-File is IBM® PC compatible—including all versions of PC DOS® It copies disk data file-by-file in automatic mode and also includes an option for manual file-by-file and mirror image back-up.

Act before Jan. 31, 1986.

Don't miss out on the best deal in town for automatic tape back-up! For more information on Sysgen's superb line of hard disk and tape back-up products or the Sysgen dealer nearest you, call

SYSGEN

1-800-821-2151. I N C O R P O R A T E

The Switch Is On To Drown disc

We would like to extend our thanks – and our rebate.

We expected "The Switch Is On Sweepstakes" to be popular, but we couldn't help noticing the dramatic response to the opportunity to win a Chrysler Le Baron plus instant rebates, free diskettes and other prizes totalling over \$1,000,000.

To show our gratitude to everyone who made the switch to Brown Disc diskettes (and to those of you who soon will), we would like to extend your chance to receive an instant rebate worth up to \$15.00 or 6 free diskettes through the end of the year (Sorry, the sweepstakes drawing deadline for the Le Baron was August 31.). Look for your "Switch Is On" game card in specially marked packages of Brown Disc diskettes.

The switch is on to Brown Disc! We manufacture a complete line of the highest quality diskettes, including 3.5," 5.25" and 8" diskettes.

Call 1-800-654-4871 for the Brown Disc dealer nearest you!

Extended rebate/free diskette offer expires 12/31/85.

brown disc

WordPerfect 4.0. Our highest marks yet.



A perfect report card. It wasn't necessarily our goal when we added the most recent enhancements to WordPerfect. We were more interested in responding to the suggestions of our users and dealers.

But a perfect report card is like icing on the cake. And it makes us more confident than ever that WordPerfect 4.0 is the most perfect WordPerfect, yet.

Easier.

Most WordPerfect 4.0 functions require only one keystroke, a simple press of a finger. And new comprehensive documentation WordPerfect 4.0 represents a makes learning a new standard of excellence breeze.

Faster.

Document orientation means WordPerfect 4.0 never makes you wait between pages. No matter how fast you type, WordPerfect won't slow you down.

information, see your dealer. Or call or write:

new version lives up to its

InfoWorld

Better.

WordPerfect 4.0 includes several features not found on many word processors. Like a 100,000-word phonetic dictionary; multi-page footnoting capability; table of contents and index generation; automatic outlining and para-

graph numbering; and a 4.0 network version. Get the word processor that lives up to

InfoWorld

its name (and its report card): WordPerfect 4.0. For more

SSI Software 288 West Center Street Orem, Utah 84057 Information: (801) 227-4020 Order Desk: 1-800-321-4566, Toll-free





From the Software Shelf

PC World offers first impressions of recent software releases

This month: greenbacks without gamble, the PC as slide projector, curing the SAT blues, and is your property all it should be?

Edited by Robert Luhn

Squire

Things were definitely not going well. I'd closed a deal for 250 shares of Digital Equipment Corporation stock at 86½, only to be forced to unload it at 53 a short while later. Still eager to make a killing, I tried to snap up gold at \$397 an ounce but couldn't meet the margin requirements—too much of my capital was sewn up in Persian rugs, which later broke my fall when I discovered the price of gold had vaulted beyond \$500.

When Uncle Sam came knocking on my door for 35 percent of my annual gruel, I could at least point to a veritable negative cash flood. That, plus the cattle herd I purchased as a tax deferment, let me close the year without paying a cent in federal income taxes.

The best education is experience without risk—or so a fortune cookie once advised me. What brings this aphorism to mind is *Squire*, a financial planning simulation package from Blue Chip Software that aspires to be something beyond a game. As the preceding scenario suggests, financial plans implemented by untutored hands can lead to disaster.

The beauty of *Squire* is that you can take a financial battering without getting beaten. *Squire*, in short, is driver training for would-be investors, drama for the serious yuppie.

In the world according to Squire, you don't need extraordinary moxie or fortitude, and certainly not real cash. The program nicely conveys the thrill of riding a financial roller coaster while clearly imparting the dynamics and the sheer

intricacy of market forces. Even within *Squire*'s circumscribed world, the variables are staggering. In real life, it's amazing anyone makes money.

Squire's objective couldn't be simpler: Retire with enough lucre to live comfortably for the rest of your life. If you're not sure how much that is, don't fret—Squire assumes \$1 million is sufficient.

You play in either the Default (fantasy) mode, in which the financial world is created anew with each game, or the Reality mode, in which you plug in "live" data, from aging to assets; with an Income Requirements Summary you discover how far you must go before you can shuffle off to Miami. Squire's Reality mode is flexible enough to allow an occasional detour, like funding a college education or buying a boat.

The program plops you down in the 14th month of a 20-year simulation. You needn't fear immediate destitution, because your initial net worth checks in at \$70,500. When your net worth equals or exceeds your retirement goal, the game's over. En route to Miami, you step up the ladder in stages, from Novice to Investor, Speculator, Broker, and, ultimately, Squire. In a wry touch of reality, Squire warns you that remaining on the bottom rung condemns you to leeching off relatives for the rest of your life.

Your path to affluence is strewn with choices, most arising from the vicissitudes of various markets. You peruse headlines in Financial Journal—Squire's terse and often cryptic news service—scrutinize economic trends and company histories, monitor the monthly price and

yield fluctuations of the program's stock issues, weigh a given asset's tax consequences, then buy and sell from an intriguing, albeit limited, cross section of investment vehicles.

For example, you can dabble in growth stocks like Federal Express and blue chip issues like IBM, stodgy bonds and high fliers, commercial and residential real estate on both coasts, IRAs, money market accounts, oil and gas partnerships, commodities, and collectibles—the sorts of investments you might hesitate to consider with real money on the line. Squire churns out a prodigious number of reports that keep you apprised of the tax and profit/loss consequences of every transaction, year-to-date tax status, current portfolio, and overall net worth. The program also crudely charts (with asterisks) every investment's seven-month performance. It ain't VideoShow quality, but it's readable, and you don't need a graphics board.

The program's slick documentation includes a six-page guided tour of financial planning principles, addressing everything from leverage and income tax ("the investment thief") to pork bellies and annuities. *Squire* is the most general financial scenario-spinning package in Blue Chip's pecuniary quartet. *Baron*, *Millionaire*, and *Tycoon* respectively encourage you to make a killing in real estate, securities, and commodities.

Squire lives somewhere between disciplined money management and escapism—that uncharted zone where my first million probably dwells. —Ken Greenberg

Squire
Blue Chip Software
6744 Eton Ave.
Canoga Park, CA 91303
818/346-0730
List price: \$49.95
Requirements: 128K, one disk
drive
Copy protected

(continues)







Now you can satisfy all of your storage needs with one trip to Mountain. Upgrade your IBM,® AT&T,™ COMPAQ® and compatibles with Mountain's field-proven File-Safe™ disk, tape, and combo systems. All provide 100% compatibility with DOS 2.0, 2.1, 3.0, PC IX, UNIX and XENIX. And all come network-ready to support the 3COM Ether Series, Novell, Orchid PCnet® NESTAR and STARLAN."

THE HIGHER ROAD TO HARD DISK STORAGE.

For additional hard disk storage, choose from Mountain's high-

performance internal and external FileSafe disks, featuring capacities of 10, 20, 30, 35, 68 and 120 megabytes.*

CLIMB-UP TO WORRY-FREE TAPE BACKUP.

If super-reliable tape backup is what you're looking for, our 27 and 60 megabyte internal, external or Mini Mountain FileSafe tapes set the industry-standard for fast, flexible backup of either IBM, AT&T, COMPAQ or Mountain hard disks.** Each provides full error correction (CRC) logic and a wide range of simple, menu-driven backup options.



^{*}Every capacity not available for some computer models Contact your dealer or call Mountain for details
*QIC 24 interface, 450,000 installed in over 90% of all systems worldwide

^{*} registered trademarks and * trademarks of Mountain Computer, Inc., American Telephone and Telegraph Co., International Business Machines Corp., COMPAQ Computer Corp., Microsoft Corp., Orchid Technology, and AT&T Bell Labs. • 1985 Mountain Computer, Inc

EDESLERANCE E OPTIONS

DISK AND TAPE COMBINED? WE LEAVE NO STONE UNTURNED.

If you need both high-performance disk and tape, our FileSafe combo systems combine all the features of FileSafe hard disk and tape in one low-cost, compact unit.

A ROCK-SOLID REPUTATION.

Mountain's hard-earned reputation among business users over the last eight years for responsiveness, innovation and reliability means we'll be there when you need us.

YOU'LL LIKE THE VIEW.

Whether it's disk, tape, or a combination of the two, look to Mountain for the industry's widest range of proven, high-performance storage upgrades.

For more information and the name of your nearest Mountain dealer, call:





Mountain Computer, Inc., 360 El Pueblo Road, Scotts Valley, CA 95066, (408) 438-6650, TWX 910-598-4504. Mountain East Coast Office: (404) 441-7661. Australia: Data Peripherals 02-888-5733. Canada: Parity Plus, Inc. (416) 673-3321. France: Compusol 01-530 07 37. Spain: Chip Electronica 03-201-2266. Sweden: Nordic Data 08-730 50 50. West Germany: Distec Datensysteme 6172-23-081.

For a 28" x 36" poster (suitable for framing) of "Sunrise at the Grand Tetons in Wyoming," write Mountain Computer, Inc.



The Advertizer

Long before I was catapulted into the corporate tumult of PC World, I was an unassuming marketing student. I learned the ways of selling, packaging, advertising, and most important, the Zen of flip-chart maintenance. I can still remember grappling with a 5-foot easel, heavy-duty masking tape, and a Brobdingnagian flip chart in my Thursday afternoon marketing class as I made yet another presentation. Trotting out in the required corporate uniform was unnerving enough, but seeing the results of my late-night handiwork was even

more so, since I often discovered my presentation was illegible or arranged in the wrong order. Needless to say, I spent a lot of time back at the drawing board.

I'm no longer a student, and my dog and pony days are thankfully over. Nonetheless, my presentation skills still come in handy, especially when I must continually remind editors to do this or sign that. It was on one such desperate occasion that *The Advertizer* fell off the software shelf and into my willing hands.

The Advertizer is a menu-driven program that turns the PC into a text-only slide projector. Whether

you are giving a presentation, running a store promotion, selling your wares at a convention, or nudging procrastinating editors, *The Advertizer* can get your message up on the screen in a flash, without the bother and boredom of traditional presentation paraphernalia (see Screen 1).

The program uses a carousel metaphor for organizing related screens. Screens can accommodate up to four lines of text (8 or 16 characters per line) and can be played back in sequence like slides in a projector.

Creating a message is fairly simple. The program asks how many screens the carousel will hold, the

WHERE DID THAT NUMBER COME FROM?

	1	J	K	L	M
19	13,650	12,850	12,900	16,350	16,488
10	4,488	6,500	4,788	3,300	2,788
1	1,788	3,480	5,500	8,800	8,800
2	9,800	30,000	18,000	18,000	18,888
13	5,850	19,588	11,788	11,700	11,700
4	2,188	6,688	6,600	6,600	6,688
5	2,500	2,580	2,500	2,500	2,500
6	500	2,888	1,888		3,000
7	300	400	500	750	758
8	5,760	5,760	5,768	5,760	5,768
9	238	285	328	335	345
8	7,500	5,000	1,000	1,888	1,000
1	5,000	5,000	5,000	5,888	5,000
Z		9,588			
3			2,588		2,500
5 -	1,500	750	750	1,888	750
6	48,240	87, 295	55,630	52,645	57,985

Anyone who's ever used 1-2-3" knows the feeling.

The number's there in black and white, but you can't remember what assumptions or source numbers went into it.

Introducing Note-It."
The simple program that

lets you easily attach notes to any cell (labels, formulas, or numbers) of your new or existing 1-2-3 spreadsheets. To remind yourself. Or to explain things to others.

Note-It.

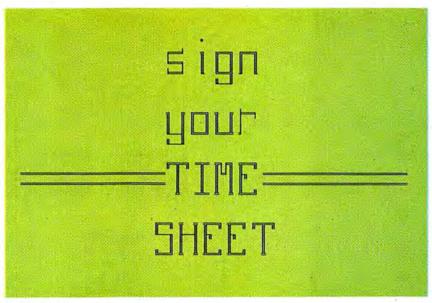
Program copyright c 1985 Access Learning Technology Corp. 1 2-3 is a trademark of Lotus Development Corp.



Circle 886 on reader service card

duration of the slide display, and the number of times the entire sequence will be repeated. Once a "slide" is entered, the program displays the entry in a window in the lower right corner of the screen, showing word and line spacing.

Be forewarned: A sharp eye helps when you enter and edit messages, for the program does not provide any on-screen formatting. Centering a line, for example, is no small feat. Keep in mind that the program is restricted to text display; it cannot incorporate bar charts or freehand drawings generated by paint programs. Note too that a graphics board is needed to display 8-character lines. When a color graphics board is used, messages appear in the colors of the rainbow.



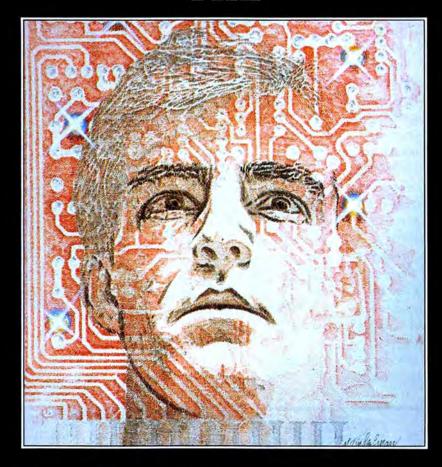
Screen 1

(continues)





INTRODUCING THE



"FRIENDLY SUPERPOWER"

Advanced Business Software That's on Speaking Terms with You!

Power or ease of use . . . until now, you had to choose. The more you had of one, the less you had of the other.

No longer. KnowledgeMan/2 was created to bridge the gap between simple, single-function programs and powerful integrated multi-function programs. KnowledgeMan/2 is powerful. But you don't have to be a computer wiz to tap that power. Easy-to-use menus help you until you're ready for direct commands. If you run into trouble, on-line help screens come to your rescue. Now both the casual user and the power user get everything you'd expect in a high-powered business software, with the best of both worlds—power and ease of use.

See KnowledgeMan/2 in action! For the name of the dealer nearest you, call or write MDBS, P.O. Box 248, Lafayette, Indiana 47902, 317/463-2581.







IF STAYING WELL INFORMED CAN KEEP YOU WELL AHEAD, COMPUSERVE'S GOT BIG NEWS FOR YOU.

Introducing the Executive News Service and state of the art access to all the news you need.

CompuServe's exclusive Executive News Service is an electronic clipping service that puts the power and scope of the entire Associated Press news wire at your fingertips. Simply enter words or phrases that interest you ... from business to politics to hometown news. The Executive News Service then screens all state and national AP wires around the clock and files selected stories for reading at your convenience.

Then there's USA TODAY Update, with late breaking business information available

for quick analysis by busy executives. USA TODAY's editors monitor hundreds of national and international news sources to bring you the latest, most important developments. General news reports are updated hourly. Reports for specific industries are provided daily in a concise, executive summary format.

Or access The Washington Post, with its fingers on the pulse of the national political scene. CompuServe delivers it all, plus a variety of other information, entertainment and communications options.

You can access CompuServe with almost any computer and modem, terminal or communicating word processor. To buy a Subscription Kit, see your nearest computer dealer. To receive our informative brochure, or to order direct, call 800-848-8199

Circle 856 on reader service card

(In Ohio, call 614-457-0802). Or send this

1	YES. Please send me your CompuServe Information Services brochure.
1	Name
I	Address
ĺ	City
	StateZip
	Business Phone
	Complicor

compaserve

Information Services P.O. Box 20212, 5000 Arlington Centre Blvd. Columbus, Ohio 43220

800-848-8199 In Ohio, call 614-457-0802

ENS-1310 An H&R Block Company

LETTRIX

Improves Your PC's Printing

Before: ABCDEFGabcdef
After: ABCDEFGabcdef

With LETTRIX™ your EPSON, Okidata, Gemini, Panasonic, IBM Graphics or ProPrinter prints letter-quality text directly from all software.

"The resulting sharpness and clarity nearly equals that of an expensive daisy wheel printer" THE NEW YORK TIMES "A fun program that is easy to use" PC WEEK "Surprisingly low price" BOARDROOM

LETTRIX resides in memory between your software and printer, responding to all printer codes. This ad is an actual-size LETTRIX sample.

Roman Broadway Park avenue WESTERN MOJAHS Old English Courier VBCBLOCK Art Deco BANKER Gothic **Engraved** Español OUTLINE Français Prestige Руссий Folio Έλληνικός ORATOR עברית OCR-A Print all IBM PC characters:

$$\frac{\sigma}{i} \int \left[\frac{\partial^3 u}{\partial t^3} + u \frac{\partial u}{\partial x} \right] = \frac{k}{n=1}$$

or design your own letters! LETTRIX includes all of the typefaces above for \$98.50. Call now toll-free with your MC or VISA card:

(800) 351-4500

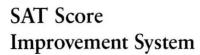
In CT. dial (203) 776-5699. Call for a free print sample. For IBM PC, XT, AT with 60kb free memory and any display.

HAMMERLAB CORPORATION 5700 ARLINGTON AVENUE RIVERDALE, NEW YORK 10471

Circle 495 on reader service card

The Advertizer may not be right for every presentation situation, but at \$49, it's bound to find its niche. If you have to display (and frequently revise) information, time and money are major considerations. The Advertizer is one way to save both. –May Sui

The Advertizer
Sylvia Products
P.O. Box 3515
Lantana, FL 33465
305/482-5295
List price: \$49
Requirements: 128K, one disk
drive, color graphics board for
8-character display
Copy protected



The symptoms: Anxiety builds somewhere in the vicinity of the sixth rib, radiates along a neural path. Breath grows short, extremities turn cold. A fist of fear seizes the heart.

Select the best diagnosis:

A. The maniac is closing in behind you on the deserted street.

B. You spy the shadow of the ax murderer against your screen door.

C. You discover an envelope from the IRS.

D. There's a message to call your automobile mechanic.

The correct answer: None of the above. It's the spectre of the College Entrance Examination Board Scholastic Aptitude Test (SAT), which seven times a year reduces

would-be college students to tapioca. If one or more such animals reside within your constellation, be you parent, teacher, or counselor, you might want to investigate the latest cure for College Board catalepsy-SAT preparation software. With Harvard entrants boasting SAT scores in the mid-600s and those at lesser campuses just a shade lower, ambitious high-school students would do well to avail themselves of all the help they can get. Because Amanda, my own captious resident scholar, had given her rare nod of approval to the SAT Score Improvement System from Hayden Software, I decided to submit my rusty scholastic aptitudes to its tutelage.

The Hayden program consists of three modules—simulated SAT exams, a verbal module, and a math module. Together they constitute a complete Mayo Clinic of SAT preparation, a carefully designed collection that provides diagnosis, prescription, remedy, and even a follow-up check.

The exam module includes one preliminary test and two practice tests, each a complete 2-hour exam with the same balance of verbal and math questions as on the SAT and scored on the SAT's infamous 800 scale. Each test is divided into four 30-minute sections, which may be taken individually or all in one bite.

The preliminary test is essentially a diagnostic tool that determines which mental muscles need further

(continues)

New PELICAN System stores 2.78 Mbytes on a floppy disk

Pelican packs more data onto a floppy than ever before

You've heard about the new Kodak high-density disk drives. And the new Kodak 3.3 Mbyte diskettes that can hold eight times the data of one ordinary floppy. Now the Pelican 3.3 system packages those exciting new components in a handsome and compact unit (along with internal half-slot controller card and high-speed cache software) that brings new levels of performance and convenience to users of IBM PCs and compatibles.

Advantages of a hard disk for users who now have just two floppy drives

- Just one Kodak high density 5.25 inch diskette stores 2.78 Mbytes of formatted data! So, for example, you could put all your spreadsheet data or word processing files on one HD floppy. Just four diskettes deliver more formatted storage than a hard disk: 11.14 Mbytes to be exact. And you can keep expanding in 2.78 Mbyte multiples, diskette by diskette. So Pelicans deliver storage capacity by the beakful-on a birdseed budget.
- Access your data at least twice as fast.
- The Pelican system accesses stored data at 500,000 bits/second—twice as fast as regular floppy disks. And Pelican software automatically creates cache buffers in the PC memory that mirror data on disk. So it is often presented ten times faster than data coming from disk.



Advantages to hard disk users who need data security

- Makes hard disk backup easy. And inexpensive.
- Since your Pelican is always on line, it is now fast and convenient to back up files frequently while they're being worked on. Or, at the end of the day, you can use a backup program to copy only modified files to a high density diskette. It's fast. To copy a full 10 Mbyte disk takes less than 15 minutes.
- Provides data security a fixed disk can't.
- The removable high capacity floppies can be locked up when not in use. Individuals can be given diskettes holding only the data they require. So confidentiality is preserved and the possibility of erasure by others is eliminated.

We start with Kodak reliability, then add a limited one-year warranty

The Kodak logo on the drive tells you about the quality inside. Should your unit ever need service, we do the work in our own plant. Support hotline? You bet—10 hours a day. Pacific Micro Systems, incidentally, has been supplying high-quality peripherals since 1981.

We're making the price right by selling direct.

At \$795, the Pelican makes a lot of sense. But at \$795, there's no room for the markups that would be added on if you bought your Pelican in a store. So you have to go to the place where Pelican's are hatched.

Free \$65 5-pak of Kodak high-density diskettes.

Order before December 1, 1985 and we'll include five Kodak HD diskettes—13.9 Mbytes of storage—at our expense.

Test fly the Pelican on a no-risk, money back guarantee.

The Pelican takes off with all programs that run under DOS 2.0 or higher. Soaring with a pelican presents no risks at all. Try it for 15 days. You can return it, then, if it's not for you, for a full refund.

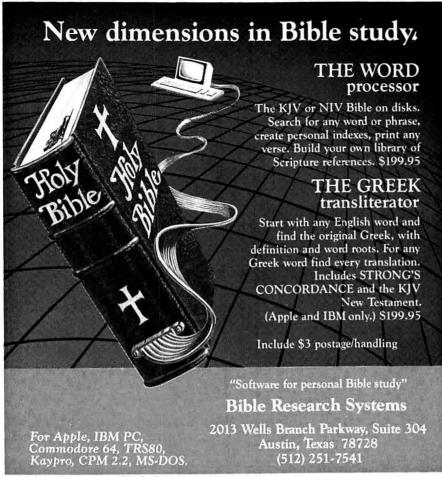
To order Pelican, send cashiers check or money order. Phone orders: charge to VISA or MasterCard. California residents add 6% sales tax.

To order, or for an informative brochure, call (800) 554-3282, In California, call (415) 331-2525.

Mail to: Pacific Micro Systems 160 Gate 5 Rd. Sausalito, CA 94965

NOW IT'S SMART
TO BE DENSE!
Pacific
Micro

Circle 555 on reader service card



Circle 845 on reader service card

COPY II PCTM

BACKS UP PROTECTED SOFTWARE

The backup insurance you need to protect your software investment, **COPY II PC** makes a floppy backup of most* protected software quickly and easily.

RUNS PROTECTED SOFTWARE FROM YOUR HARD DISK

COPY II PC makes using your hard disk as convenient as it should be. No longer will you have to keep your floppy disk in drive A with some of the most popular business software - *call for current list*.

Minimum Requirements: IBM PC, XT, AT, 256K jr and some compatibles.

One or two disk drives. 64K on most machines.

Call M-F 8-5:30 (W. Coast time) with your : **503/244-5782.** Or send a check (add \$3 s/h, \$8 overseas) to



\$39.95

CENTRAL POINT Software, Inc.

9700 SW Capitol Hwy. #100 Portland, OR 97219

We update Copy II PC regularly to handle new protections; you as a registered owner may update at any time for 1/2 price! (To update, just send original disk and \$20.)

This product is provided for the purpose of enabling you to make archival copies only.

Circle 31 on reader service card

flexing. The module analyzes re-

flexing. The module analyzes responses in 16 subject areas, compiles a performance profile, and prescribes further study where needed. The practice tests to be taken after this review provide further exposure to the test format and let the student measure score improvement.

The verbal module contains sections on reading comprehension and vocabulary, including review of antonyms, analogies, and sentence completions, plus a 1000-word dictionary of posers that have recurred on SAT exams.

The math module tackles algebra, geometry, quantitative comparisons, and word problems. Instruction and practice span topics ranging from linear equations to Train A traveling toward Train B. The module, in short, explores the full phalanx of mathematical knowledge that has sent mathophobes into swoons since the first amoeba learned to multiply.

Each module can be used with or without Hayden's Tutormode instructional feature. If you answer a practice question without Tutormode, the program simply tells you which answer is correct. With Tutormode, the system provides a step-by-step explanation of how to arrive at the correct answer and, frequently, why the wrong answers are wrong. I became quite fond of the sensibility informing Tutormode-thorough but not pedantic, respectful of the user's intelligence, and occasionally eloquent. Even with Tutormode, the program provides only practice and test-taking

(continues)

Choose from the best books available for business & professional personal computer users . . . and save up to 35% and more on list prices!

Only you can decide which books will help you get the most out of your computer. As a member of **Prentice-Hall's Personal Computer Book Club**, you are invited to sit in judgment of the best computer books being published today—computer books especially written for business and professional people like you. Every four weeks you'll receive news of vital new books on software, hardware and creative new computer applications. And each title will be carefully chosen by the **Personal Computer Book Club** editorial board to meet your demanding needs. As a member of the **Personal Computer Book Club**, you are never under any obligation to buy. There are no minimum purchase requirements. Your satisfaction is fully guaranteed.

Join the Personal Computer Book Club now and receive a FREE copy of THE COMPLETE MICROCOMPUTER HANDBOOK—With Tested BASIC Programs. We will also send you your first selection for only \$1.00 (plus local sales tax, postage and handling). It's BUSINESS PROBLEM SOLVING WITH THE IBM PC & XT, and you'll have 15 full days to decide if you want to keep it. If you aren't fully satisfied, you can send it back and your membership will be cancelled, no questions asked. In any case, THE COMPLETE MICROCOMPUTER HANDBOOK is yours to keep, just for giving the Personal Computer Book Club a try.

Read this book without charge or obligation . . . buy it for only \$1.00!

BUSINESS PROBLEM SOLVING WITH THE IBM PC & XT by Leon Wortman

This one-stop source of "tools," instructions and 29 error-free programs is all you need to make your IBM PC & XT meet your very special business needs . . . and solve a large number of your business-oriented problems!



YOUR FREE BOOK . . .

THE COMPLETE MICROCOMPUTER HANDBOOK—With Tested Basic Programs by Genn & Genn

You could spend hundreds of dollars for software and still not match the value of the 50, state-of-the-art programs in MICROCOMPUTER HANDBOOK—all ready to load into virtually any type or model microcomputer . . . complete with BASIC command descriptions . . . sample operational sequences . . . and complete, line-by-line instructions.

Join the PERSONAL

COMPUTER BOOK CLUB

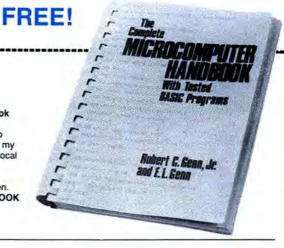
& Get This Book . . .

TO: Prentice-Hall Personal Computer Book Club Membership Enrollment Center P.O. Box 442, West Nyack, NY 10995

FREE GIFT AND BOOK EXAMINATION COUPON
YES: Please enroll me as a trial member of the Personal Computer Book
Club and send me immediately my FREE copy of THE COMPLETE
MICROCOMPUTER HANDBOOK—With Tested BASIC Programs. Also
send me BUSINESS PROBLEM SOLVING WITH THE IRM PC & YT as my

send me BUSINESS PROBLEM SOLVING WITH THE IBM PC & XT as my first club selection. I understand that it comes to me for only \$1.00, plus local sales tax, postage and handling. I also understand that I am under no obligation to purchase any more books and that I may cancel my membership at any time after I have paid for any selections I have chosen. Whatever I decide to do, THE COMPLETE MICROCOMPUTER HANDBOOK is mine to keep—FREE.

de to do, THE COMPLETE MICROCOMF -FREE. Signature _____



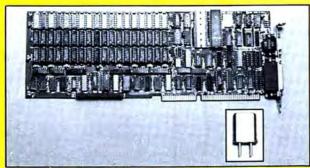
ase print)	
State	Zip
	ase print)State

71-1

D-2824-3 16219-8

PC105-BA(5)

There is a difference in quality and service, and the difference is ALPHA OMEGA

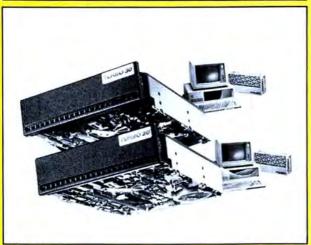


TURBO GENER8OR

256K RAM, 1 serial, 1 parallel, game port, 16 MHZ hi speed crystal

 TURBO GENERSOR™ is the true TURBO-CHARGED multifunction board for your AT. TURBO GENERSOR™ is the only multifunction board guaranteed and supplied with a 16 MHZ CRYSTAL, enhancing your computer by a 33% clock speed increase.

- Expansion of up to 3.5 megabytes of hi speed memory.
- User friendly installation. Only 2 dip switches to be set for memory size configuration.
- Fast memory is only the beginning of this multifunction board. It is available with a parallel port, a game port, and up to two serial ports.
- 2 years defective exchange warranty.



TURBO 10®				. ,														\$	599	
TURBO 20™ TURBO 30™			٠			+	٠		à	٠		٠		è				\$ \$1	799 049	
TURBOTAPE	i	2	5	TM				ì				•						\$	899	

 TURBO 10®, TURBO 20™, and TURBO 30™ are designed for the IBM PC*, PC/XT*, PC/AT*, and compatibles. All available internally and externally.



TURBO TRANSMIT**

Serial to Parallel or Parallel to Serial

- Your instant solution to the "interface incompatibility rut."
- Freedom to use different devices that was impossible to before: parallel dot matrix printers and serial dot matrix printer, serial plotters, modems, etc....
- Available in 16K or 64K buffer sizes (holds up to 32 pages).
- 300–38400 baud rate, jumper selectable hardware handshake.
- 2 year defective exchange warranty. Parallel to Parallel
- Your instant solution to the "wait for the printer rut."
- Available in 16K or 64K buffer sizes, (holds up to 32 pages).
- Compatible with all parallel devices. No extra cables necessary.
- 2 year defective exchange warranty.

Ser to Par or Par to Ser 16K buffer					. \$	99
Ser to Par or Par to Ser 64K buffer					. 5	175
Par to Par 64K buffer		ì			. 5	109
Par to Par 128K buffer			ì		9	175

Quality assurance - We pride ourselves in the highest quality, in all products that we produce.

Knowledge and Experience—years of experience in system configuration and problem solving are applied to each and every client's needs.

Exceptional prices — We guarantee we offer the best prices in the high quality of products we manufacture.

On time delivery-24 hour shipment turnaround time.

Speed, convenience, affordability, and reliability all come together at ALPHA OMEGA COMPUTER PRODUCTS.

- With an interleve factor that is 300% faster than the standard PC/XT® hard disk system, your progress will, in real time, run faster than you've ever thought possible.
- TURBO 10® and TURBO 20™ are hi-efficient 3½" half height hard disk systems requiring only 12 watts of power, and TURBO 30" is 51/4" half height system requiring only 16.5
- TURBO 10[®] and TURBO 20[™] are 100G shock mount proof, and TURBO 30™ is 45G shock mount proof.
- 13 month defective exchange warranty.



(818) 345-4422 WS



Accounts Retrievable.

Data cannow Wipe clear file, a your UnEr wiper could lion

A scary thought:
Somewhere in your database is last year's budget. But you don't know where. It could be on the hard disk with who knows what else. It could be on one of the zillion floppies spilling off your bookshelf. Worse yet, it could be gone. Deleted. Erased.

Time for The Norton Utilities.™

Designed for the IBM PC and compatible computers, The Norton Utilities are a set of powerful

ties are a set of powerful organizational tools famous for their file recovery abilities. A remarkable UnErase™ feature actually lets you search for and retrieve erased or deleted data with a few simple commands.

Here's how you could go about tracking down your missing budget with The Norton Utilities:

If you know the name of the file, punch up FF, the File Find utility. FF will search your directories and display your file by name. Text Search will search for specific text if you can remember some identifying words of the file. TS even searches erased file space. And if you truly have deleted your data, UnErase can bring it back.

Need help organizing your data so this won't happen again? The List Directories utility gives you a list of all the directories and sub-directories on your disk.

Then Directory Sort lists them quickly and effi-

ciently five different ways.

TIME-LIFE

ACCESS

NEWSLETTER

says "Highly

recommended for

business users."

Keep your data secure by employing the File Attribute utility which marks specified files 'read-only.'

Data labeled 'read-only' cannot be altered or erased. Wipe File allows you to clear or delete data file by file, and Wipe Disk clears your entire disk. Not even UnErase can retrieve data wiped out by these utilities.

Other special features measure available file space, test your disk for flaws or damage, and measure your computer's performance. The Norton Utilities version 3.0 is available at Computerland and most software dealers. Order direct for \$99.95 from Peter Norton, 2210 Wilshire Boulevard, Santa Monica, CA 90403. 213-399-3948. Visa and Mastercard welcome.

ENORTON UTILITIES

DATA RECOVERY
DISK MANAGEMENT

VOLUME/SITE LICENSES AVAILABLE.

A life saver for your data.





... of all your favorite software. Every FlipKit includes all of the following preprinted overlays:

Lotus 1-2-3® Multiplan™ for IBM® Framework^{IM} SymphonyTM dBase® III IBM® Filing/

Multimate™ Wordstar® Wordperfect™ Crosstalk XVIIM MSIM-DOS

Reporting Assistant Thinktonk¹ IBM® Writing Assistant Pfs®:write Microsoft® Word

5 "do-it-yourself" erasable overlays and keyboard attachments

You select your own combinations from the 20 color coded function key overlays, put them on the rings, and attach FlipKit to your keyboard that's all there is to it! FlipKit is durable, non-glare and easily removable.

Only \$15.95! Order Now!

Visa, Mastercard, Amex only, call 24 hrs/7 days 1-800-228-2028 ext. 120 toll free Cont. U.S. In Nebraska, call 1-800-642-8300 ext. 120 415 325-8000 for information, inquiries

Or send check, m.o., credit card info. and order to: **Micro Direct International Corporation** P.O. Box 60987, Palo Alto, CA 94306

Order several and save—shipping/handling per order: USA \$2.90/Canada \$6/Other countries \$15. CA residents add appropriate sales tax. Allow 2-3 weeks delivery.

Dealer inquiries welcome. Volume discounts available. Call about custom templates.

15-day money back guarantee!

The computer and software names used in this advertisement are tradenames and/or trademarks of their respective owners.

Circle 223 on reader service card

strategy for subjects already studied-it does not provide basic instruction. The program as a whole, however, is by no means simplistic; questions are carefully chosen to give users an undiluted foretaste of the SAT's wily nature.

The system is bug-free, and you should be able to navigate through program modules without referring to the documentation, for onscreen help is comprehensive, intelligible, almost clairvoyant in anticipating your questions. Of course, the program is not without flaw. The reading comprehension passages are difficult to read on screen, and reading the questions first, then paging back to the referenced passage, as the program advises, is time-consuming. The package also does not provide preparation for the Test of Standard Written English (TSWE) that accompanies the SAT.

But if you're looking for some preventive medicine for the SAT jitters, Score Improvement System is a good candidate for quelling this exam-time nightmare and replacing it with a comforting sense of déjà vu. -Barbara Lewis

SAT Score Improvement System Hayden Software Co. 600 Suffolk St. Lowell, MA 01854 800/343-1218, 617/937-0200 Massachusetts List price: \$99.95, Practice Tests \$19.95, Math Module \$39.95, Verbal Module \$39.95 Requirements: 128K, DOS 2.00, one disk drive, color graphics

board

Copy protected



Real Estate Models for the Eighties

Real Estate Models for the Eighties is a collection of 16 fairly simple spreadsheet templates for the real estate investor. Introduced in 1982 and recently updated, these templates, versions of which work with 1-2-3, Symphony, and Visi-Calc, calculate every conceivable type of mortgage schedule, perform a buy-down analysis, calculate a loan's components, compare depreciation methods, and even compute the number of days between any two dates. Many of the templates also include graphing functions that can automatically plot a line graph for a range of data.

One particularly useful and timesaving template is Cash Flow and Equity Return Projection, which determines whether a property is worth investing in. Given a set of assumptions, the template produces a ten-year (or longer) schedule showing income before and after taxes, equity, mortgage balances, depreciation, and various key ratios, along with an analysis of how much you'll make from a sale. The schedule can start and end in any month to accommodate an

(continues)



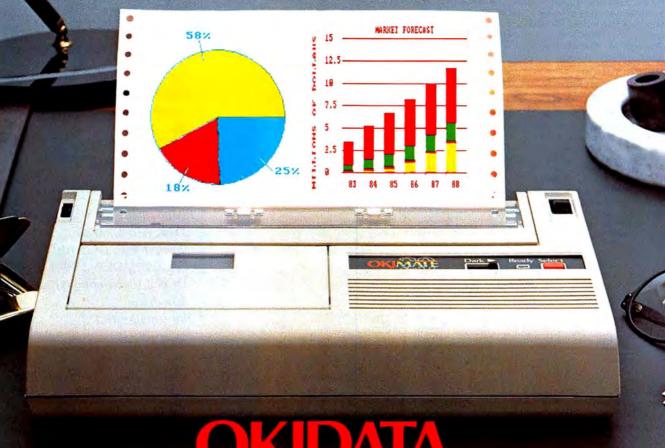
Introducing the \$268 OKIMATE 20 color printer for IBM° and Apple° users.

We admit it—the OKIMATE 20 isn't for everyone. Just IBM and Apple users who like to execute their big ideas with style.

The OKIMATE 20 is a powerful business tool, capable of printing ruthlessly accurate performance charts in over 100 vivid colors. It can paint sales records and forecasts with the same dynamic intensity. Or process your conclusions with crisp, near-letter quality

text. It can even make overhead transparencies to show your recommendations to the entire company. And it's easy enough for a busy executive to operate—everything is included.*

Rank sure has its privileges. And the new OKIMATE 20 certainly is one. For your nearest Okidata dealer, call 1-800-OKIDATA (in New Jersey 609-235-2600). Mt. Laurel, NJ 08054.



*\$268 is manufacturers suggested retail price.

OKIMATE 20 "Plug 'n Print" package includes black and color ribbon cartridges, paper and two software programs, "Color Screen Print" and "Learn to Print,"

The above charts were created with Fast Graphs* and printed using OKIMATE 20's Color Screen Print program through multiple passes.

Apple is a registered trademark of Apple Computer, Inc.

IBM is a registered trademark of International Business Machines, Inc.

ircle 273 on reader service card



Field Proven.

MCS-3, the system developed by the innovators in microcomputer software (Micro Manufacturing Systems), is designed specifically to help manufacturers control the functions unique to their industry.

Written For The Microcomputer On A Microcomputer

Because MCS-3 is designed for use on the microcomputer, information gathering is quick and easy. (You needn't have a data processing background to put this system to work for you).

You'll get user-friendly screens, professional reports, operator prompts, easy-to-understand documentations, and rapid computer response times. You'll also have representatives at your disposal from

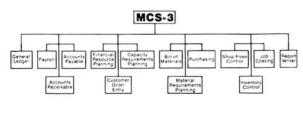
MMS's worldwide service and support network.

MCS-3 runs on the latest hardware available, including equipment from: IBM, NCR, DEC, TI Hewlett-Packard, Wang, ALTOS and Tandy (to name a few).

A Manufacturing System Integrated To Accounting.

By integrating MMS's seven manufacturing systems to MBSI's (A Division of RealWorld Corp.) accounting packages, our combined MCS-3 system eliminates the need for double data entries. This saves processing time (and time IS money).

For more information write: Micro Manufacturing Systems, 2600 Corporate Exchange Drive, Suite 190, Columbus, Ohio 43229, or call: (614) 895-0738.



Manufacturing Systems Solutions



2600 Corporate Exchange Drive Suite 190 Columbus, Ohio 43229

[614] 895-0738

Circle 791 on reader service card

early sale or a second mortgage obtained to finance capital improvements. I used this template to convince myself that I could not, in fact, make a profit on a certain avocado ranch I had my heart set on.

The user manual is a delight. Every template receives a concise description with several examples, and is accompanied by notes on usage and limitations. Among the extras are a glossary of real estate and computer terms, a bibliography, and appendices detailing installation, model layout, altering models, graphics, and data translation. *Real Estate Models for the Eighties* is a great value for \$89. —William Urschel

Real Estate Models for the
Eighties, version 2
Commercial Software Systems,
Inc.
7689 W. Frost Dr.
Littleton, CO 80123
303/973-1325
List price: \$89
Requirements: 128K (VisiCalc),
256K (1-2-3), 512K
(Symphony); DOS 1.10
(VisiCalc), DOS 2.00 (1-2-3),
DOS 2.10 (Symphony); one
disk drive
Not copy protected

William Urschel is a freelance writer and the author of Readyto-Run Accounting, a book and disk accounting package for 1-2-3 and Symphony users from Alfred Publishing.

●



TO HEAR HOW QUIET OUR NEWEST PINWRITER DOT MATRIX PRINTER IS, JUST CALL 1-800-543-8000.



We won't waste words trying to describe how quiet our new Pinwriter™P5 printer is. Besides we've come up with an easy way to for you to actually hear it. Without even getting up. Just call the toll-free number above and you can listen to a recorded demonstration.

You'll hear the actual sound of the Pinwriter. And how it compares to other leading dot matrix printers. You'll also see, that unlike most other dot matrix printers, you can talk on the phone or carry on a conversation, while the P5 is running.

The Pinwriter P5 not only sounds great, it looks great. It has superior graphics resolution. And more built-in true fonts than any other dot maxtrix printer. Plus it can use a variety of font cartridges.

It's also the fastest 24-pin dot matrix printer going. It clocks at 290 CPS in draft mode and 100 CPS in letter-quality. And you can select either speed at the touch of a button.

NEC printers are also incredibly reliable. With normal use they can run an average of 5 years without a repair.

The new Pinwriter P5 dot matrix printer. The first printer that offers less bang for the buck. To hear one in action, call the above toll-free number. Or see your nearest NEC dealer. For more information, call 1-800-343-4418 (in MA 617-264-8635).

Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

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



Pinwriter is a trademark of NEC Corporation.



New lightning-fast ZBASIC zaps the competition.

It's hot. It's brand-new. And light years ahead of anything else.

It's ZBASIC. Written for programmers by programmers. (If you know BASIC—you know ZBASIC!) Now you can write a program exactly the same way on an Apple, an IBM, a Tandy, or any other major micro and port the source code. You only write the program once ...and it runs on all the major micros. The commands stay the same—regardless of the computer*(even graphic commands and disk I/0!).

ZBASIC. Starting now, it's the only language you'll ever have to know.

*subject to hardware limitations.

The finest implementation of the BASIC language for microcomputers!

•-YES N/A-Not available	ZBasic Interpiler 3.0	TURBO PASCAL 3.0	MBASIC compiler	True BASIC	BASICA Interprete (IBM PC)
IBM and compatibles		•	•		
Apple //e, //c (6502)		N/A	N/A	N/A	N/A
Macintosh	4th Qtr.	N/A	N/A	N/A	N/A
CP/M-80 2.2, 3.0	•	•	•	N/A	N/A
TRS-80 Mod I, III, 4, 4p	•	N/A	•	N/A	N/A
Direct commands		N/A	N/A		
Maximum scientific digits of accuracy. (COS, SIN, ATN, LOG, EXP etc.)	6 to 54 selectable by the user	11 Binary BCD N/A	16	16	6
Device Indpdnt Graphics (same CMDS all graphic modes and computers)		N/A	N/A	NIA	N/A
SAME File commands all computers?		N/A	NIA	N/A	N/A
STRUCTURED: Labels. Functions, LONG IF etc.		7	N/A		N/A
Same editor commands all versions/computers		•	N/A	N/A	N/A
Sieve benchmark (Byte January 1983, 10 iter's)	13.7 sec.	14.1 sec.	14.9 sec.	261 sec.	2190 sec
Shell-Metzner SORT (Sybex-BASIC for Scientist's and Eng 2,000 5 char. strings)	19 sec	28 sec.	71 sec.	194 sec.	2700 sec
Executable Machine Lang. & approx. File size	12k	12k	32k	N/A	N/A
PRICE with BCD BCD=No rounding errors)	89.95	109.95	450.00	N/A	N/A
PRICE without BCD	89.95 BCD FREE	69.95	395.95	149.95	Comes with

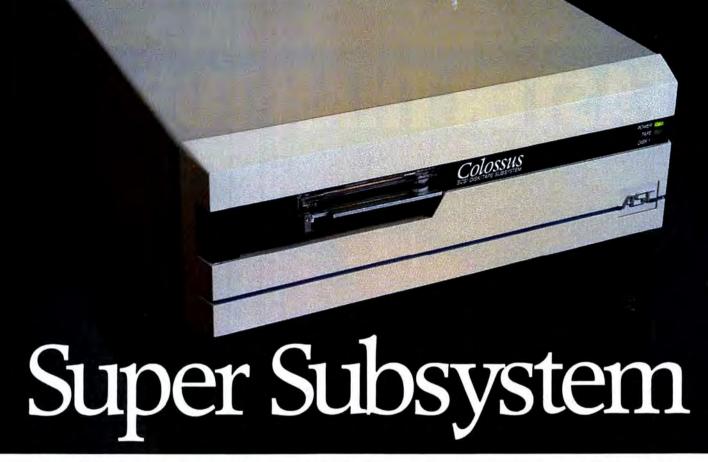
· Works the same on all micros

- Uses same commands—regardless of computer make
- Structured Basic—(spaghetti optional)
- Device-independent graphics (same graphic commands on all computers)
- 6-54 digits of precision (selectable by user)
- Built-in interactive editor and compiler—to compile and execute, just type "run."
- Choice of alphanumeric labels or line numbers

Not copy protected
One low price gives you everything—there
are no hidden costs. Only \$89.95 complete.

ZBASIC

To order use this coupon or call 1-800-453-4100	Compatible (128K, MS DOS 2.0 or better recommended) ZBASIC Apple //e, //c \$89.95	
Utah Residents 1-800-662-8666; Alaska Residents 1-800-982-1500	(128K, Dos 3.3)	•
Mail to: ZEDCOR 3438 N. Country Club Road / Tucson, AZ 85716	ZBASIC CPM-80 (Z—80—2.2 or 3.0) (Provided on 5 % * KAYPRO II-SSDD Format)	
(Name)	ZBASIC TRS-80 (48K) \$89.95 (Circle Model 1,3 or 4—6.2)	s
(Address) (Apt.)	ZBASIC Macintosh (Delivery 4th quarter) \$89.95	\$
(City) (State) (Zip)	DEVELOPERS— \$39975 BUY ALL 5, SAVE \$50, \$44975 VALUE	s
(Day Phone) CREDIT CARD—MASTERCARD/VISA/AMEX C.O.D.	Arizona Residents Add 5% Sales Tax	\$
	SHIPPING: U.S. add \$5 00 per program	s
EXPIRATION DATE:	Foreign or C.O.D. add \$10.00 per program (U.S. currency only)	5
registrate i delimente di forme con la figlio (165 - 1650). Il delimente di delimente di forme di delimente di forme di figlio (1650). Il delimente di figlio (1650). Il del	TOTAL	\$



AST's Colossus → The Complete Data Storage Solution For Unparalleled Performance, Expandability and Reliability

Unmatched Performance. Offering the industry's fastest disk access time and disk-to-tape data transfer rate, this 74Mb hard-disk subsystem—expandable to 370Mb—with 60Mb streaming tape backup is perfect for your large single-user data bases, as well as multi-user and local area network applications.



Rugged, Front to Back. SCSI Expansion Port ensures easy connection to more storage or other SCSI peripheral devices.

Advanced Architecture. Colossus uses state-of-the-art SCSI (Small Computer Systems Interface) architecture and high-performance intelligent peripheral controllers. This means you get automatic media defect management, extensive error identification and recovery, and power-on self-test for total hassle-free operation at all times. With Colossus, "bad sectors" are a thing of the past.

Features A Future. Colossus is easily upgraded as your needs increase.

Its SCSI expansion port lets you connect Colossus Expansion Units and other peripheral devices.

Complete Compatibility. Colossus is specially designed to be compatible with local area networks, including the latest from AST and IBM.[®] XT/AT compatibility means you can boot directly off Colossus and run PC-DOS and other operating systems. And its exclusive DMA/8/16 AT Interface maximizes performance in multiuser applications.

Rapid Backup. Colossus' tape backup allows streaming image or file-by-file backup operations with a choice of menu or command driven software operation. And it's fast—up to 5Mb per minute. Industry standard tape format means media is transportable for access on other systems. Of course, Colossus also provides backup for the XT and AT internal drives.

Modular Construction. Pop-in subassemblies make enhancement and maintenance literally a snap. We start out with the finest quality components available. Extensive testing and comprehensive burn-in procedures ensure that every completed subsystem will provide you with totally trouble-free performance, no matter what your application.

Circle 18 on reader service card

Your data deserves the best storage system available. For the name of your nearest dealer call our Customer Information Center (714) 863-1333. Or write, AST Research, Inc., 2121 Alton Avenue, Irvine, California 92714 TWX: 753699 ASTR UR.

Colossus Disk Subsystem Features

- 74Mb Formatted Disk Capacity— Base Unit
- Expands Up to 370Mb Using Expansion Unit(s)
- 30 Millisecond Average Disk Access Time
- Optional Xenix[™] Driver (Q4 '85)
- 32-Bit Error Checking and Correction (ECC)
- 60Mb Tape Cartridge Backup –5Mb per Minute Backup/Restore
- Backup/Restore By Drive, Volume, Directory or File
- · Local Area Network Compatible
- · Boots Off Disk



Colossus trademark of AST Research, Inc. IBM registered trademark of International 4 Business Machines Corp. Xenix is a trademark of Microsoft Inc



From the Hardware Shelf

PC World offers first impressions of recent hardware releases

This month we doubly supercharge the PC and check out Kaypro's off-the-rack PC clone.

Edited by Robert Luhn

PC Turbocharger

It was a turbo kinda day. I slept right through my turbotime alarm clock and woke up late for work. I had to hurry; otherwise, I'd miss a demonstration of Univation's PC Turbocharger board. Shifting into overdrive, I tossed a few slices of bread into my turbotoaster, charged up my turbo-Mr.Coffee, and jumped under my turbomassage shower.

But even after breaking several FAA regulations in my burgundy turbocharged T-Bird, I discovered I was too late. My co-workers had already eviscerated my IBM PC and were in the process of extracting its humble gray-matter-on-a-chip, the 8088. "What are you you doing?" I fairly bellowed. "That's my computer you're-dissecting!"

"Calm down, Eric," said Associate Editor Robert Luhn, holding the 8088 up to the light with his chip-removal tool (a cleverly disfigured fork tine). "We're installing the new PC Turbocharger board with its own 8086. You'll double your PC's performance without sacrificing compatibility. That ain't chopped liver."

As I started to lose control, strains of "Swing Low, Sweet Chariot" swelled in the background. I yanked my nonexistent saber out of its imaginary scabbard and wheeled it over my head. "Give me back my chip, you swine!" I lunged for my faithful 8088, only to be physically restrained by several sleepy editors.

"Darn it, Eric, you've always wanted AT performance, and now that you're getting it, all you can do is complain." Robert cast me a withering look and turned on his heel. "Wipe the foam off his mouth and get rid of that polyester jacket. We're dealing with static-sensitive chips here."

After a few minutes, I pulled myself together and loaded my favorite slugabed word processor, *Word-Star*. Everything looked familiar, yet I noticed an immediate difference: My commands were heeded in lightning-fast fashion. I tried program after program—from *Framework* to 1-2-3, the story remained the same. My PC had assumed AT-like powers.

I quit complaining and dug into Univation's remarkably lucid documentation to see how the PC Turbocharger worked its sleight of RAM. Unlike coprocessor boards (see the PCturbo-186 review in this column), which share computing

(continues)





COMPUCARD BY ROLODEX

COMPUTERIZED CARD FILING SYSTEM

With Compucard by Rolodex, card sets can be created, updated, edited and duplicated fast and easy to improve office productivity and organization as card filing is simplified.

Compucard Software Program and Documentation Manual are available for IBM®/PC (CSM-I) or Apple® IIe (CSM-A) at \$49.95. They are also available complete with VIP24C Special file and 500 Rolodex Brand Continuous Form Cards, 2¼ x 4" at \$68.50 (CC500-I for IBM and CC500-A for Apple). Compucard features include: □ Free-form card format with up to 450 characters per 2½ x 4" card □ Rapid printing □ Full-screen editing commands □ Date stamping for each entry □ Dual indexing □ Flexible select code system.



Label and List Management Software

Label Express makes it easy to create labels, locate and update mailing lists, address envelopes, print name badges or Rolodex Brand Continuous Form Cards. Label Express by Rolodex. It keeps you in touch with people.

Label Express software is available for IBM/PC (LSM-I) and Apple IIe (LSM-A) computers, at \$49.95 each. Its powerful features include:

Creating your own label formats, up to 180 characters on five lines.

Full-screen editing with popular, word processing commands

Immediate indexing for each new entry

Extensive and time-saving search features

Full combine/merge capability

Customized printing up to 999 copies.

ROLODEX CORPORATION

245 Secaucus Road, Secaucus, N.J. 07094
An 1 Insilco Company

IBM/PC is a registered trademark of International Business Machines Corporation; Apple IIe is a registered trademark of Apple Computer, Inc.

Once upon a time, you needed a manual even to type a memo!



ronto frees you from the frustration of voluminous, unintelligible software manuals. Pronto is an all electronic word processing program. There are no bulky manuals to read. No boring examples to watch.

Just load the disk into your computer and you're ready to start typing...business and personal letters, memos, notes, outlines, lists...right now.

For just \$69.95, Pronto gives you all the features you expect from the big, complicated packages:

- A dynamic, interactive guide that lets you learn about those portions of the program that are useful or interesting to you—at your leisure or as you need them.
 - "Windows" and window "zoom".

- Automatic text and format storing capabilities.
- Print previewing.
- Formatting capabilities that enable you to change margins, line or paragraph justification, line lengths or spacing, et cetera as you're typing.
- "How-to" indexes that answer all your questions at the touch of a button.
- But best of all, because it's so advanced (and easy to use!) Pronto will keep up with you as your typing needs become more complex.

Get Pronto right now! If you're not satisfied with its performance, simply return the disk to us within 30 days for a full refund.

Pronto can be purchased through Electronic Software Publishing (ESP) with your VISA or MasterCard.

1-800-228-1551

Send mail orders to: Electronic Software Publishing, Dept. C, 27 Estrella Way, Novato, CA 94947 1-800-228-1551

Name		
Address		
City	State	Zip
City Telephone		

Pronto is a trademark of Electronic Software Publishing, COD's and Purchase Orders WILL NOT be accepted by ESP. California residents: add 6% sales tax. Outside USA: add 510 and make payment by bank draft, payable in US dollars drawn on US bank. Pronto requires 256 K of RAM DOS 2.0 and above to operate. For more than 3 windows 512 K of RAM are needed. IBM-PC, XT, AT and compatible computers. Limited to document sizes or sections not in excess of 20 pages.

\$69.95





ELECTRONIC SOFTWARE PUBLISHING

Please send me ____ copies at \$69.95 each. Plus \$2.50 shipping charge (CA residents also add \$4.20 per copy).

Amount enclosed ____

Get Pronto right away

Money Back Guarantee

AW...

WHAT THE HECK

ProDesign II The Easy to Use CAD System!

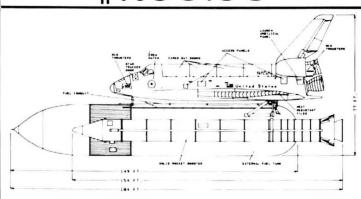
ProDesign II is one of the most advanced CAD packages available for microcomputers. We think it's absolutely the easiest to use. With competitive CAD systems priced at \$1500 to \$2500, we were posed with the problem of setting our price.

ProDesign II works a wide variety of digitizers and mouse devices. It works with nearly any plotter or printer available for the IBM PC. ProDesign II can produce plotter quality drawings on ordinary dot matrix printers - a feature found exclusively on ProDesign II. ProDesign II utilizes a virtual screen 4 times the size of the physical screen to make it practical to produce drawings on a normal resolution IBM monitor. ProDesign II is truly an outstanding CAD package for the IBM PC and compatibles. The question we had to answer was: Even though we had a better product, should we price it higher than the other CAD systems on the market?

We did market studies and calculations. We consulted with experts. We drew charts and graphs. We used the finest spreadsheet programs money could buy. When it came right down to it, we still didn't know what to sell ProDesign II for. \$2995? \$2495? \$1995? We even considered \$995.

Then, in the great American tradition, we said, "AW...WHAT' THE HECK! Let's see the other guys beat this price!" ProDesign II costs \$299. At that price, you can't go wrong!

AW...WHAT THE HECK! \$299.95

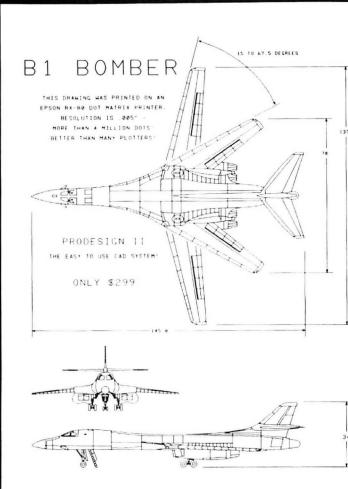


THE SPACE SHUTTLE DISCOVERY

American Small Business Computers 118 South Mill Pryor, Oklahoma 74361

918/825-4844

Circle 543 on reader service card



Why should you get ProDesign II? Four simple reason

- ProDesign II is easy to use. You won't have to spe weeks learning simple functions.
- ProDesign II works with the hardware YOU or ProDesign II supports most printers and plotte available for the IBM PC, as well as a wide variof digitizers and mouse devices.
- ProDesign II can produce plotter quality outpon ordinary dot matrix printers. (The B1 Bombabove was printed on an Epson RX-80.)
- ProDesign II is priced 70% to 80% below competit products!

What do you need to run ProDesign II? An IBM PC or compati with 512K RAM and graphics capability.

How do you get ProDesign II? See your local computer dea or contact us.

ProDesign II - The Easy to Use CAD System!

chores with the PC's native 8088, the PC Turbocharger's 8086 replaces the 8088. Because the 8086 transports data 16 bits at a time (versus the 8088's 8-bit approach), programs run much more quickly. Univation has further sped processing by using a special 8086 that runs at 10MHz-more than double the clock speed of the PC's 8088. Consequently, you can expect most programs to work doubly fast (see Table 1). For programs particularly sensitive to the 8088's timing, flipping a switch on the back of the board slows the chip down to the 8088's snail's pace.

PC Turbocharger comes with either 512K or 640K and includes RAM drive and print spooling programs. The board also has a place for a 10MHz 8087 coprocessor for further speed gains. (*Framework*, for example, takes advantage of this chip.) You can buy the Univation board with or without the 8087 installed; if you already have an 8087, remove it from the motherboard and place it on the PC Turbocharger board. Keep in mind

that most 8087s on the market are 5MHz versions and will work with the board only in 8088 mode.

Despite my initial, vocal misgivings, my only enduring reservation concerns the PC Turbocharger's inability to use previously installed memory. Your old RAM lies dormant unless the board is working in 8088 mode. And don't expect your printer, modem, or disk drive to speed up. These are all 8-bit devices, and the PC Turbocharger automatically downshifts for these and other standard peripherals.

Once upon a time I dreamt of having my own AT, but now I've shelved such expensive notions. I don't do much multitasking, let alone multiusing, and I already have an external 20MB hard disk attached to my PC. The only compelling reason for getting an AT is its faster processing. With a PC Turbocharger, that need is answered—and unlike an AT, my machine can use almost every PC program on the market. Besides, I'm a good consumer: I'll buy anything

Table 1: The turbo boards square off.

	640K IBM PC	IBM PC AT	Orchid PCturbo-186	Univation PC Turbocharger
Processor(s)	8088	80286	80186 and 8088	8086
Reformatting a 36K WordStar document	2:07	2:22	1:19	1:11
Recalculating a 46K 1-2-3 spreadsheet	2:01	0:46	0:49	0:46

(continues)

Davidson is #1, #1, #1, #1, & #1 in Education

For math, speed reading, spelling and vocabulary, Davidson's award winning software outsells all others. Why? Because enough people choose to buy the educational software that works.

MATH BLASTER makes it more fun to add, subtract, multiply, divide, and learn fractions, decimals



and percents. First through sixth graders master 600 math facts with exciting graphics, animation, sound effects...even an arcade game.

Apple™, Macintosh™, IBM™,

Commodore 64/128™, Atari™. 49.95.

SPEED READER II can quadruple your reading speed and improve your comprehension. Develop



good reading habits, chart your progress, and have fun! For high school age through adult. Apple II™, Macintosh™, IBM™, Commodore 64/128™. 69.95

WORD ATTACK lets students ten through adult discover the meanings and usages of 675 new words.



Includes a fun, fast-action arcade game and add-your-own-words editor. Apple™, IBM™, Commodore 64/128™, Atari™. 49.95

SPELL IT teaches ten year olds and older how to spell a thousand and one of our most commonly



misspelled words. Vivid graphics, animation, sound effects, a lively arcade game and add-your-ownwords editor, too! Apple™, IBM™, Commodore 64/128™, Atari™, 49.95

Davidson & Associates, Inc. 800-556-6141 (In Calif., 213-534-4070)

Danidon
Davidson

NEA.

Davidson & Associates, Inc. 3135 Kashiwa St. / Torrance. CA 90505

Please send me a FREE COLOR BROCHURE and the name of my nearest Davidson Dealer.

City_

Address ___

State Zip

Educational Software that Works

Circle 488 on reader service card

YOU FORCED US TO MOVE!



Because of the tremendous response you've given to our FREE OVERNIGHT DELIVERY and 510 OFF policies, our growth has been phenominal! Even we did not project how rapidly we would expand. Quite honestly there were times when it seemed like the whole country was trying to place an order...at the same time!

We realize that some of you have had problems getting through (our phones simply could not handle the volume) and, yes, some have even gotten their shipments late (our shipping department has been on a 12 hour schedule)...to those of you, WE APOLOGIZE for the inconvenience and would like to say THANK YOU for your patience.

A one million dollar investment has allowed us to solve these problems...we've just moved into our new World Head-quarters, beefed up our sales department, added a spanking new phone system and built a fully automated warehouse.

Oh, sorry, we almost forgot "Harold" (who's extremely fast, but very sensitive) our new 100 terminal computer system. He's designed to speed up order processing to get your shipments out the door...fast. Sorry Harold.

INTERNATIONAL ORDERS **EUROPE**

Announcing Logicsoft Europe!

Our European friends may now order directly through our Amsterdam Distribution Center, which carries the latest factory fresh versions of the most sought after IRM PC software and bardware. Now you can receive latest factory fresh versions of the most sought after IBM PC software and hardware. Now you can receive your order fast and still take advantage of the incredible savings that only mail order can offer. Please call or telex to confirm pricing & policies. Telex: 10759 Logic NI. Logic NL

Call 020-83.48.64 or mall orders to: LOGICSOFT EUROPE BV pb 9460, 1006 AL AMSTERDAM, HOLLAND

CANADA

For our Canadian customers we've installed a special local number, 416-283-2354. Now you can get the biggest savings in mail-order for the cost of a local call. Or, If you wish, Telex 286905 Soft UR.

FAR EAST AND AUSTRALIA

Call 516-249-8440 and ask for our International Department. They're experts on export and you get to take advantage of our great mail order prices. Telex 286905 Soft UR. Please call or telex to confirm pricing &



See Our Card for Details

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT BEATING A PRICE BUT WERE AFRAID TO ASK...

or How I Learned To Save Money Without Really Trying.

We know there are still a few of you who have shied away from ordering from us (you know who you are) perhaps thinking our \$10.00 off and FREE overnight policies were a "gimmick" or a "come-on" to pressure you into something.

We'd like to tell you how simple it really ls. Just pick up the phone and dial 1-800-645-3491, then tell your sales agent you'd like to beat a price (don't be embarrassed; he's not), the name and date of the publication and who you want us to beat. No gimmick, no come-on, it's that

CONFUSED SYSTEMS



We don't blame you, that's why we invite you to give us a call. We've evaluated over 50 of them and just because you can save a lot of money buying mail order shouldn't mean you have to sacrifice service...We want to take the time to assist you before you buy. We realize that an accounting system can add up to a sizeable investment and helping you end up with the right package for your money is what doing business is all about.

CCOUNTING SYSTEMS

	Information	1					
	Unlimited (IUS)	Open Systems	Great Plains	Peachtree Series 8	State of The Art	Realworld (MBSI)	BPI
Accounts Payable	1299	1409	*499	*389	1479	1575	139
Accounts Receivable	1299	1409	*499	*389	*479	*575	139
Fixed Assets		*409		1389			2
General Ledger	1299	°409	1499	*389	*479	*575	139
Inventory	1299	*409	*499	1389	*479	*575	*53
Job Costing		³409	*499	*389			*53
Material Management		1409					-
Order Entry/Processing	1299	³409		*389	1479	1575	
Payroll	*365	1409	1499	*389	*479	1575	139
Report Writer		³409					
Sales Invoicing				*389	\$479		-
Purchase Order Entry		409					
T00 00 11 1 0 1							

TCS Client Ledger System 11195

JUST A PARTIAL LISTING OF ACCOUNTING SYSTEMS - CALL TODAY!

THE LOGICAL CHOICE A Member of the Logic Group



110 Bi-County Blvd., Farmingdale, N.Y. 11735

1-800-64-5-34-91
In New York State...516-249-8440 • In Canada...416-283-2354
Customer Service 1-800-431-9037

See following pages for Software, Hardware, Special Order Dept., Programmers Dept., PC Jr. Corner and our Computer Forms Division.

Circle 995 on reader service card

OGICSOFT INCREDIBLE NEW SERVICE BREAKTHROUGH

Purolator courier



Ī Ī

1

3

Ĭ

COUNT MIT MIT

THAT'S RIGHT! OUR LOWEST PRICE GUARANTEE IS STILL EFFECTIVE! Tell us the advertiser and price of any software or hardware item on these pages cur-rently advertised in any popular computer publication and we'll beat that price by \$10. This offer does not apply to items under \$100 or where the price is not lower than Logicsoft's. NO DEALER'S PLEASE!

SOFTWARE for IBM PC

WORD PROCESS	ING
Wordstar 2000	\$259
WORDSTAR 2000 PLUS	309
Wordstar Pro Pac	
Wordstar Pro Plus	345
WORD PERFECT (New Release)	
Mineract Word	245
Microsoft Word Spellbinder	Lawret Pring
Spellbinder	Lowest Price
MULTIMATE	249
Volkswriter Deluxe	165
Peachtext 5000	199
Easywriter II/Speller/Mailer _	195
Edix & Wordix	255
FINALWORD	225
Samna III	
Xy Write II Plus	255
Think Tank	
pfs: write	85
Wordplus PC with Boss	359
Wordplus PC with Boss DATA BASE MANAG	EMENT
KNOWLEDGEMAN	
Cornerstone	Lowest Price
Tim IV	
R:Base 4000	
R:BASE 5000	
II.DAGE JUUU	

DATA BASE MANAGEME	NT (cont.)
d BASE III	\$36
Clipper (d Base III Compiler)	399
Data Base Manager II (alpha)	
Infostar plus	
Friday	
pts: file & pts: report	165
REVELATION	745
Powerbase	
Personal Pearl	
Easyfiler	
Superfile	
GURU L	owest Price
INTEGRATED/SPREAD	SHEETS
LOTUS 1-2-3 (While they last!)	
Enable	
Smart Series	
Ability	
FRAMEWORK	
Open Access	001
Electric Desk	
SYMPHONY (Limited Quantity)	
Supercalc 3	
Multiplan	
TK! Solver	
pfs: plan	8
FINANCIAL	
LIMMIONE	

FINANCIAL (cont.)	
inancier II	_\$115
MANAGING YOUR MONEY	119
lome Accountant Plus	
Professional Tax Planner	319
ixed Asset System (BEST)	439
Market Manager Plus (Dow Jones)	179
Market Analyzer (Dow Jones)	
GRAPHICS	
CHARTMASTER	_S275
Signmaster	195
BPS Graphics	289
ofs: graph	85
ofs: graph Graphwriter	319
Graphwriter Combo Pak	485
Microsoft Chart	175
NERGRAPHICS	
nergraphics with plotter option	325
PC Draw	295
Gem Draw (incl. Desk Top)	95
AUTOCAD as to	w as 799
PROJECT SCHEDULERS	
MICROSOFT PROJECT	\$165
SuperProject (IUS)	245
IARVARD TOTAL PROJECT MGR	285
Project Scheduler (Scitor)	195
Project Scheduler 5000 (Scitor)	299

SOFTWARE UTILITI

WORD PROCESSING			
FANCY FONT	\$139		
Wordplus (Oasis)	115		
pfs: proof	65		
Punctuation & Style	99		
Spellix	59		
Wordperfect Sorter	75		

DB Master

Condor III

VISA

EXPRESS

d Base II (New Release).

DATA BASE	
Quickode III	\$159
Graph III	175
d Util III	65
k Graph	175
k Paint	85
k Text	109

DOLLARS AND SENSE

475

299

349

Clout 2 DATA BASE (cont.)	\$145
Extended Report Writer _	_119
Sideways	45
PROKEY 4.0	\$89
Norton Utilities (New Release)	_65
SIDEKICK (unpertected)	65

\$115

GENERAL CROSSTALK XVI (New	
Smartcom II	109
Sideways	45
	39
Copy II PC	65
Spotlight	95

Prices & polices subject to change without notice.

National Sales Hot Line

THE LOGICAL CHOICE

3 110 Bi-County Blvd., Farmingdale, N.Y. 11735

IDE

New York State..516-249-8440

Customer Service

Canada.....416-283-2354 Domestic/International Telex...286905 Soft UR



NEW! Expanded Special Order Dept.

We know there are many products that simply cannot be found through mail order. We've solved that problem...just ask for our SPECIAL ORDER department...We've got the suppliers ...still at low mail order prices!



MOR CORNER

SOFTWARE Lotus 1-2-3 (While they last!) Wordstar	\$309 149	HARDWARE (Cont.) Keytronic 5151 Keyboard\$179 Keytronic 5149 Num. Keypad 50
Electric Desk		Jr. 128K Booster (Microsoft)145
HARDWARE		Quadram Expansion Chassis 519
Captain 128K (Tecmar)	339	Quadram Exp. Memory235
PC Mouse (Mouse Systems) _	129	Quadmem Jr219
NEW PRODU	CTS A	DDFD DAILYCALL!

PROGRAMMI

oncurrent PC DOS (w/windows)	Sgg	Pascal Compiler (MS)	S245
ascal MT + (PC DOS)		C Compiler (MS)	305
L/1 - (DR)		Microsoft Sort	159
Display Manager - (DR)		Cobol Compiler(MS)	479
Access Manager - (DR)		Business Basic (MS)	299
ATTICE C COMPILER		FORTRAN COMPILER (MS)	229
Food Smorgasbord	_119		329

PRINTERS*		PRINTERS (cont d	1.)	MULTI-FUNCTION BOA	RDS (cont.) MODEMS (cont.)
DIABLO		PRINTERS (cont d	619	STR		Poncom C100 35
36** 025**	\$1229	MSP20 MSP25	579	Super Rio (64k)	\$329	DDOMETHELIC
025**	619	MSP25	789	Rio Plus II (64k)	259	Pro-modem 1200\$37
530-API 530-ECS** EPSON L01500 Parallel Interface	1529	PRINTER/PLOTTE	RS*	Rio Plus II (64k) Rio Grande Chauffeur Low	375	Pro-Modem 1200B 31
330-ECS**	1799	HOUSTON INSTRUMENT		ChauffeurLow	est Price	QUADRAM Asher \$39 Quadmodem II Lowest Pric
EPSON	4.7.44	PC Plotter	\$475	TECMAR Captain (64k)		Asher\$39
_01500	\$1199	MONITORS*		Captain (64k)	\$199	Quadmodem IILowest Pric
Parallel Interface	79	MUNITURS		COMMUNICATIONS B	OARDS	
JX-80	599	AMDEK Color 300	COEE	AST		Maxwell 1200 PC\$39
JX-80	265	Color 500	\$255	AST-5251-11	\$699	Maxwell 1200 V 43
X-80 Tractor/Feeder	30	Color 600	470	AST-SNA	\$699	2400 PC
3X-100 ===================================	399	Color 710	570	AST-BSC	699	VEN-TEL
-X-80 Plus**	379	Color 710 12" Green 300G	135	AST-3780	749	PC Modem Half Card\$37
X-185 (New)**	569	12" Amber 3004	145	GRAPHICS BOAR	DS	PC Modem 120039
JUKI		12" Amber 300A 12" Amber 310A	169	AST	17.30	PC Modem 120039 1200 Plus39
MANNESMANN TALLY Spirit 80	\$439	NEC NEC		Monograph plus Preview	\$425	BACK-UP DEVICES
3300	799	NEC ID 1201	C150	Preview	279	ALLOY
MANNESMANN TALLY		JB 1201	140	EVEREX		PC Quick Tape (60Mb)\$171
Spirit 80	\$279	JB 1205	230	Graphics Edge	\$375	evecen
		JC 1215 JC 1216 PRINCETON GRAPHICS RGB HX-12 RGB SR-12	300	HERCHIES		SYSGEN Image (10Mb) \$83 MOUSE INPUT DEVICES
80	849	JU 1210		Graphics Card	\$325	MOUSE INDIT DEVICES
NEC		PRINCETON GRAPHICS		Color Card	169	MOUSE SYSTEMS
2030**	\$719	RGB HX-12	\$489	MA SYSTEMS		PC Mouse w/paintbrush\$13
2050**	695	RGB SR-12	599	Peacock Color Board	\$245	MICROSOFT
NEC 2030** 2050**	1329	Scan Doubler Board (for SR.	12)100	PARADISE SYSTEMS		Microsoft Mouse (Serial)\$14
3550	1395	Amber Max-12E	185	Color Card MA SYSTEMS Peacock Color Board PARADISE SYSTEMS Multi-Display Card Madulas Graphics Card	\$215	Microsoft Mouse (Serial) 314
8850**	1949	QUADRAM		Widdular draphics card		Microsoft Mouse (Buss)13 SURGE PROTECTORS
Pinwriter P2**	675	Quadrome 12" Quadscreen 17" Quadchrome II 14" Amberchrome 12"	\$465	Options A & BLov	vest Price	KENSINGTON MICROWARE
Pinwriter P3**	895	Quadscreen 17"	1595	QUADRAM Quadcolor I	****	Master Piece\$11
DKIDATA 182P		Quadchrome II 14"	465	Quadcolor I	\$195	CURTIS
182P	\$239	Amberchrome 12"	165	Quadcolor II	465	Diamond\$3
34-IBM	799	TAXAN		SIGMA	2-12	Emerald
192-IBM	409	100G	S125	Color 400	\$549	Sapphire ERUSY KEYBOARDS
193P 2410P	559	105A	135	STB		Duby
2410P	2295	121	149	Graphics Plus II	\$315	nuby
UME		122	149	TECMAR		KEYBOARDS
Sprint 11/40 *	\$1299	210	259	Graphics MasterTSENG LABORATORIES Ultra Pak	\$459	KEYTRONIC
Sprint 11/55**	1595	210 420 440	409	TSENG LABORATORIES		5150\$1! 5151 (Deluxe)1 5152B6
Sprint 11/90**	2199	440	699	Ultra Pak	\$545	5151 (Deluxe)1
SILVER REED				MODEMS		5152B6
400	\$279	MULTI-FUNCTION B		UNICO		MEMORY CHIPS
500	349	AST RESEARCH		Smartmodem 300	\$205	64k (200ns) S
550 770	449	AST RESEARCH Six Pak Plus (64k)	\$259	Smartmodem 1200	445	64k (200ns)\$ 256k (150ns)
770	795	Mega Plus II (64k)	275	Smartmodem 12008	385	DISKETTES
TOSHIBA		mega Pak (256k)	369	Smartmodem 2400	719	LOGICTRAK 51/4"-100% GUARANTES
P351 Tractor	\$165	Advantage (128K)	429	Smartmodem 2400 NOVATION Access 1-2-3		Double side, double density, 10 per box
P351	1375	OPCUID	135	Access 1-2-3	\$475	20 + boxesper disk \$2.
P351	779					10-19 boxesper disk \$2.
DITIZEN		BIOSSOM (U·K)	\$235	Professional 2400	635	2.0 hoves per disk \$2.
MCD10	0400	QUADRAM Quadboard (64k)	corr	PRENTICE		2-9 boxesper disk \$2. 1 boxper disk \$3.
M2510	\$409	uuadboard (64K)	\$245	Popcom X100	\$379	per disk \$3.

**Parallel interface req...Ask sales agent

*Due to weight restrictions, Printers and Monitors are shipped UPS...FREE! **Parallel interface req...Ask sales agent

National Sales Hot Line

THE LOGICAL CHOICE

110 Bi-County Blvd., Farmingdale, N.Y. 11735

Customer Service 1-800-431-9037

New York State..516-249-8440 Canada....416-283-2354

Domestic/International Telex...286905 Soft UR

that has the word turbo attached to it. I'm not really sure what turbo means, but no matter. I guess I'm just a turbo kinda guy. -Eric

PC Turbocharger Univation, Inc. 1037 N. Fair Oaks Ave. Sunnyvale, CA 94089 408/745-0180 List price: 512K \$1195, 640K \$1295, 512K with 8087 chip installed \$1595, 640K with 8087 chip installed \$1695

Kaypro 16

Brown

People who walk into my office say either, "What a great-looking computer" or "That's the ugliest thing I've ever seen." The Kaypro 16 has a distinct personality. It roughly resembles a Compaq, but its charcoal-gray sheet-metal box is swathed in snappy stripes and studded with bolts. The ashen keyboard is similarly shrouded in a polished metal case. The Kaypro, in the words of PC World's art director, is "reverse aesthetic."

But looks aren't everything. Kaypro's luggable compatible includes a 10MB hard disk, a 360K floppy drive, and 256K of RAM (expandable to 640K). The unit's built-in 9-inch monochrome monitor supports high-resolution bit-mapped graphics; the system's RGB connector permits generation of medium-resolution color graphics on an external monitor. The unit also

(continues)

Statistical Tools for OFESSIONALS

- easy to learn easy to use
- ▶ fast
- accurate
- comprehensive
- ▶ reliable

StatPac™

Complete statistical package proven for over 5 years



Goodness-of-Fit™

Advanced regression package for interactive model building

Forecast Plus™

Over a dozen graphical time-series analysis techniques

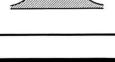
Call for Information 1-800-328-4907

WALONICK ASSOCIATES

6500 Nicollet Ave. S., Minneapolis, MN 55423

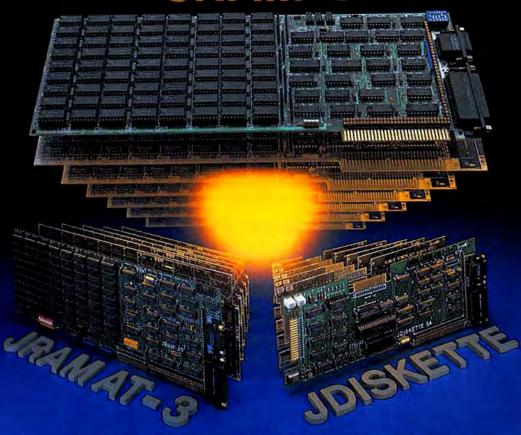


Circle 135 on reader service card





THE FAMILY TREE JRAM-3



BRANCHING OUT

Tall Tree Systems presents JRAM-3, the newest member of the JRAM family. JRAM-3 is a fourth generation multifunction memory board and the successor of the highly praised JRAM-2. Designed to meet the latest expanded memory specification standard being implemented by the major spreadsheet vendors, JRAM-3 can access up to eight megabytes of memory for larger, more efficient spreadsheets. JRAM-3 can also be used for DOS memory, electronic disk, print spooler, and program swapping applications!

Determined to maintain our reputation as the price leader in memory expansion, Tall Tree Systems offers JRAM-3 fully populated with two megabytes for an amazing \$699. A JETDRIVE/JSPOOL combo disk is included free of charge. This is the same highly acclaimed JRAM software that has helped make Tall Tree Systems the pioneer in the industry for bank switched memory and RAM disk technology. The new combo disk features JPAGER which allows any expanded memory application program to utilize multi-megabyte memory.

The family tree wouldn't be complete without an AT version. Look to us in September for the new JRAM AT-3, our third generation 16 bit board providing support for expanded spreadsheets. JRAM AT-3 will be available with two megabytes at \$799.

Don't forget the rest of the JRAM family either. We'll continue producing our popular JRAM-2 and our present JRAM AT board, along with our full range of "slim daughter board" modules. The JRAM-2 and JRAM-3 can co-exist in the same computer, but only the JRAM-3 can be used for expanded memory applications. Use JRAM-2 for DOS, multi-tasking, print spooling, and electronic disk.

To complete the family line-up we feature JDISKETTE. This controller card lets you put 1.2 megabyte diskette drive(s) in your PC or XT. You can read, write, and format the AT high density diskettes and communicate easily between a PC or XT and an AT. You won't lose a single slot, since JDISKETTE replaces your old controller and handles up to four internal floppy drives. Free of charge with IDISKETTE, you will receive the popular JFORMAT software, a DOS compatible device driver that gives your computer the ability to handle expanded disk formats.

Welcome to the family!

TALL TREE SYSTEMS

1120 San Antonio Road Palo Alto, CA 94303 (415) 964-1980

Circle 51 on reader service card



LOOK GOOD ON PAPER

Let's face it. You bought your printer for one reason only. To make what you think or feel come through in the best possible looking letter, memo, presentation or spreadsheet. That's why it's important for you to be able to use the full built-in capacity of your printer. Huge intimidating manuals and inscrutable instructions have probably stood in your way... until now.

FACELIFT™ 2 makes it easy, fast and fun to flex the muscles of your printer. Speedier and more versatile than the original bestselling FACELIFT, FACELIFT 2 offers many improvements to make you look better than ever on paper.

Be as creative as you dare. FACELIFT 2 gives you a choice of 92 different sizes and typeface combinations on EPSON® X-Series* printers, compatibles and on the IBM® Graphics Printer. (On the EPSON* LQ-1500 you can express yourself with over 400 typefaces!) You'll never produce a ho-hum letter again.

Get your spreadsheets read. If you use 1-2-3 m or similar programs, you can print an entire 12-month spreadsheet onto one regular page in clear crisp type.

Create professional-looking presentations and documents that stand out and command attention. FACELIFT 2 will automatically center titles and headlines on a page in 6 different typestyles — directly from your keyboard to the printer. Even in large reversed type! Without having to create a separate file.

Dash off quick notes or memos, also without separate files, by using your computer keyboard like a typewriter. Make a bold statement or underscore your ideas by mixing FACELIFT 2's typefaces on a single line or on a page. You can also set margins, indent, create columns and do automatic wordwrapping.

FACELIFT 2's keyboard feature also works on your letter-quality printer (COMREX* CR-II or CR-III and BROTHER* HR Series). Type directly onto the printer, set margins and even correct typos. Terrific for addressing those last-minute envelopes.

Save that important memo. You can save up to 40 pages' worth of text to print later... in any of the FACELIFT styles.

Need a symbol for the Yen? With one keystroke FACELIFT 2 puts you into the international character sets for Spanish, French, British, Swedish, Japanese, Danish, Italian and German. No more complicated codes to remember.

FACELIFT 2 takes only seconds to learn with minimal instructions. And it's only \$49.95.

Versions available: IBM* PC, PC AT,™and PC XT,™and IBM* PC compatibles; Apple* Il Series (available in November). Please specify on your order.

*MX-80 ™ must use GRAFTRAX.™

WITH THE NEW FACELIFT™ 2

mer e le remar entente le female		:	helle le remementemente	lifornia 1-800-423-7907
My printer n	eeds a FA	CELIFT 2. Please r	ush me	at \$49.95 each.
Please o	add \$2.50 p	ostage & handling. Cal	ifornia residen	ts add 6.5% Sales Tax.
Check/M.O.	(Make	checks payable to Cor	npanion Softv	vare, Inc.)
☐ MasterCard	☐ VISA	Account No.		Exp. Date
Signature				
Name				
Address				
City		5	State	Zip
I have the follow	ing compute	r make/model		
		Dealer Inquiries \	Valcomed	

COMPANION SOFTWARE, INC., P.O. Box 4339, Whittier CA 90607

sports a serial port, a parallel port, a composite video connector, and a single expansion slot. (The serial port is a 9-hole D connector, unlike IBM's 25-pin D connector. Don't let anyone sell you an IBM-standard serial cable.) The Kaypro 16 comes bundled with MS-DOS 2.00, GW BASIC, and a full complement of Micro-Pro software, including WordStar, MailMerge, CalcStar (a spreadsheet), InfoStar (a data management program), plus Mite communications software and program

tutorials. All this and rugged styling for \$3295.

The Kaypro 16 could be the most benign hard disk machine around. To set up the hard disk you simply turn on the computer, insert Kaypro's Autoload Diskette #1, follow the prompts, copy WordStar and the rest of the programs onto the hard disk, and reset the system. Once that's done, you're presented with an opening menu that lists available programs and features; space is reserved for on-screen help and system prompts. Hard disk directories are already allocated, with each application assigned to a separate directory. Select a program from the opening menu-the system finds the appropriate directory and loads the application automatically.

In addition to quick and easy access to programs, the menu offers Utilities, a disk tutorial that leads you through commonly used DOS utilities. BACKUP is also available from the opening menu, giving this DOS utility unwonted but welldeserved prominence.

(continues)

WHY WAIT FOR YOUR ORDER?

LIFETIME WARRANTY!

Boxed in ten's with write protect tabs and labels.

51/4" SS/DD

51/4" DS/DD

.97 ea.

.92 ea.

DISKETTES With envelopes.

Poly-bagged in 50's sold in increments of 250. 250 + 500 +

1000 +

51/4" SS/DD .85 ea. .80 ea. .69 ea. 51/4" DS/DD .89 ea. .85 ea. .75 ea.

Rolltop "Deluxe" Files

Holds 140 51/4" Floppies. Dividers and color coded labels. Buff body/oak top. Buff body/ Bronze top. Black body/Chrome top. Black body/Walnut top.

Only \$24.99



CALL 1 800 USA-FLEX

TOLL 1 (800) 872-3539 7 to 7 Central Time FREE in Illinois 1 (312) 351-9700

MasterCard, Visa. C.O.D. or Net 30 days with approved credit on purchases over \$200.00. Shipping/handling additional. Prices may change call and ask?

DELIVERS!

135 N. Brandon Drive, Glendale Heights, IL 60139

Circle 613 on reader service card

MOST IMPORTANT PC ADD ON YOU CAN BUY



ALEXIS, THE PHONE SYSTEM FOR SMALL BUSINESSES

- It speaks to you

- It's user programmable
 It records all phone calls & numbers dialed
 Restricts any number or prefix such as 411, 976
 Alexis uses standard touchtone telephones offering access to all features and lines
- A caller can retrieve information from the PC's diskette using his phones keypad

Alexis does not need a PC, but interfaced with one, will open a whole new world without interfering with the PC's operation.

Adax, Inc.

INTELLIGENT COMMUNICATIONS FOR ENTERPRISING BUSINESSES

Circle 476 on reader service card



PC/FOCUS outloads, outruns, outperforms and outreports dBase III™ and R:Base™ 5000.

Don't believe us. Believe National Software Testing Laboratories of Philadelphia. They proved PC/FOCUS to be clearly superior to dBase III™ and R:Base™ 5000. Here's how:

Several real-world, business situations were created to examine each system's speed and capability.

Their findings are published in an extensive report now available to you free of charge. Their results, as stated by NSTL, showed that..."PC/FOCUS was faster overall than the other programs tested." For example...

Database Loading:

In this test series, database loading time for each DBMS was measured by loading three transaction files. Eight separate test runs were conducted, with PC/FOCUS averaging 20.2% faster than dBase III,™ and 37.3% faster than R:Base™ 5000.

Database Reporting:

Report requests of various levels of complexity were run against single and multiple databases. Eighteen separate test runs were conducted, with PC/FOCUS averaging 45.2% faster than dBase III,™ and 40.0% faster than R:Base™ 5000.

REPORTING FROM DATABASES
AVERAGE ACROSS 18 TEST RUNS

PC/FOCUS 100.0

R:Base 5000 223.7

dBase III 407.9

There's more to the study than can be described in this ad. Lots more tests...and much more proof. So, we've reproduced the NSTL Performance Comparison in full. To obtain your free copy, just fill out the coupon and mail it to Donald Wszolek, Dept. U7, Information Builders, Inc., 1250 Broadway, New York, NY 10001.

dBase III is a trademark of Ashton-Tate. R:Base 5000 is a trademark of Microrim.

Dear Don;



INFORMATION BUILDERS, INC.



1-800-544-5182

VISA"

302-478-3776

4115 Concord Pike · Wilmington, DE 19810

FEATURES

IBM PC, XT, Jr., AT's AND ACCESSORIES!! 64K RAM KITS \$10!!!

PRINTERS

EPSON LX 80 \$	239.
EPSON FX 85 \$	375.
EPSON FX 185 \$	475.
OKIDATA 192 \$	375.
OKIDATA 193 \$	575.
OKIDATA 84 IN ST	
TOSHIBA 1340\$	
TOSHIBA 351	CALL
ALL CITIZEN PRINTERS	CALL
NEC 3550\$1	189.
NEC 8850\$1	395.
SG 10 \$	239.
SG 15 \$	395.
ALL STAR PRINTERS BEST PR	ICES
IBM QUIETWRITER	CALL
JUKI 6100 \$	380.
JUKI 6300\$	685.
ALL PANASONIC PRINTERS	

BOARDS

AST ADVANTAGE BOARD	\$389.
AST SIX PAK PLUS	\$239.
ALL HERCULES BOARDS BES	
ORCHID TURBO-186	\$625.
ALL TECMAR PRODUCTS	
EVEREX EDGE BOARD	
PARADISE	0.000 *******
MODULARGRAPHICS BES	T PRICES
PC ACCELERATOR	\$599
TECMARCAPTAIN IR	

MONITORS

AMDEK 310A						ý		ě					•				7	ř		CALL
PGS MAX-12	į		· ·	,		,		ï												\$169.
PGS HX-15																				
QUADRAM AM	8	E	I	1	C	H	F	11	0	١	M	E		20		iii iii				\$145.
ALL ZENITH M																				

SOFTWARE

TURBO PASCAL		\$35.
MULTIMATE		
TOTAL PROJECT MANAGER		\$305.
D-BASE III		\$369.
LOTUS 1,2,3,		\$305.
ALL IUS SOFTWARE	BEST I	PRICES
SIDEKICK v1.52		\$45.

MODEMS

HAYES 300/1200	EX				¥				¥		\$390.
HAYES 2400 EX					¥1		-	ç	×		\$625.
ANCHOLR VOLKS	120	0		i e					٠	r	\$179.

ACCESSORIES AND SUPPLIES

PC MOUSE w/ PAINT	. \$129.
KENSINGTON MASTERPIECE	CALL
CDC HALF HEIGHT DRIVES	\$110.
TEAC HALF HEIGHT DRIVES	. \$103.
BERNOULLI BOX 10+10	
ENERY ELECTRONICS	
SURGE PROTECTORS	\$59.

IF YOU DON'T SEE IT . . . CALL!!! WE CARRY EVERY PRODUCT!!!

FREE SHIPPING

IBM IS A TRADEMARK OF IBM, CORP

Circle 939 on reader service card

Kaypro's menu system and user manual cleverly hide the more arcane workings of DOS and the computer. The breezily written manual includes basic information on DOS and the computer but devotes a scant four pages to directories. Separate manuals are included with each bundled application. It all seems so simple-at first.

Though I use WordStar, I'm not particularly fond of its MicroPro siblings. I use 1-2-3, dBASE II, and sometimes Microsoft Word. And while menu systems are helpful when you're starting out, I prefer the convenience and speed of an AUTOEXEC.BAT file, which can automatically load a RAM disk program and my word processor when I turn on the machine. I immediately disabled the menu system when I discovered to my chagrin that it recognizes only the programs bundled with the Kaypro 16. Since portables are often adjuncts to or replacements for desktop systems, it's curious that Kaypro assumes you won't have your own software preferences. Unless you are devoted exclusively to the MicroPro family of software, dispense with this window dressing.

As hard disk compatibles go, the Kaypro 16 can hold its own in the performance and noise categories. The keyboard matches the IBM PC's layout, with the addition of LED <CapsLock> and <NumLock> keys; response is snappy enough for most typists. Because the Kaypro uses a graphics-oriented monitor, text is a little fuzzy. I've also encountered compatibility problems with a few

copy-protected programs, but most off-the-shelf software for the PC works flawlessly.

In the final analysis, the Kaypro 16 does the job and for less. It's portable, compatible, and affordable. If you're starting out and you're comfortable with the Micro-Pro family, Kaypro's menu system is definitely a great help. Add a modem, and this could be the only system you'll ever need. -Darcy DiNucci

Kaypro 16 Kaypro Corp. 533 Stevens Ave. Solana Beach, CA 92075 619/481-4300 List price: \$3295

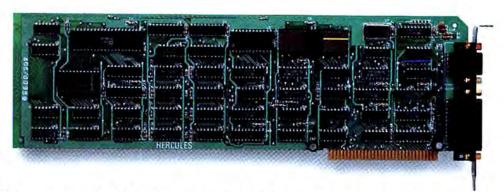


PCturbo-186

When I was in high school, I had three close friends. We did everything together, from night-beforefinals cramming to detention-hall meditations. We also made up our school's four-man, 440-yard relay

When we weren't preoccupied with adolescent antics, we practiced passing the baton. None of us qualified as budding Olympians, but we won most of the time, because in relay races, success is as much a function of teamwork as of speed.

(continues)



The world's best selling monochrome graphics card for the IBM PC.

There are more Hercules" Graphics Cards in more IBM* PCs, XTs and ATs than any other monochrome graphics card in the world.

Over a quarter of a million demanding users around the world use a Hercules Graphics Card to improve the performance of their software.

The Lotus 1-2-3 Booster.

Consider Lotus 1-2-3. Hercules gives an off-the-shelf



copy of 1-2-3 the highest resolution possible on an IBM

PC, XT or AT. More 1-2-3 users choose the Hercules Graphics Card to get crisper text and sharper graphics than any other monochrome graphics card.

And we bring the same performance to other integrated programs like Symphony, Framework, and SuperCalc*3.

But we don't stop there. The Hercules Graphics Card improves all kinds of software.

Like Microsoft* Word, a word processor that enables you to display text with subscripts, superscripts and italics. exclusive safety features help

Or pfs: Graph, an easy-touse business graphics program that converts your data into presentation quality graphs.

Or Microsoft* Flight Simulator, the high flying game for the overworked executive.

Or our own Graph X, a library of graphics subroutines that eases graphics programming.

Or AutoCAD, a computer aided design program that offers features normally associated with expensive CAD systems.

And we supply free software with each card | to do hi-res graphics using the PC's BASIC interpreter.

State-Of-The-Art Hardware.

The Hercules Graphics Card gives you graphics resolution of 720h x 348v and a

parallel printer port. Our unique static RAM buffer provides sharp 9 x 14 characters and flicker-free scrolling. Our

to your monitor. State-of-the-art custom IC technology delivers unsurpassed reliability. Ordinary graphics cards use up to 30 ICs to do what one Hercules IC does. By using fewer parts, we reduce the possibility of component failure.

prevent damage

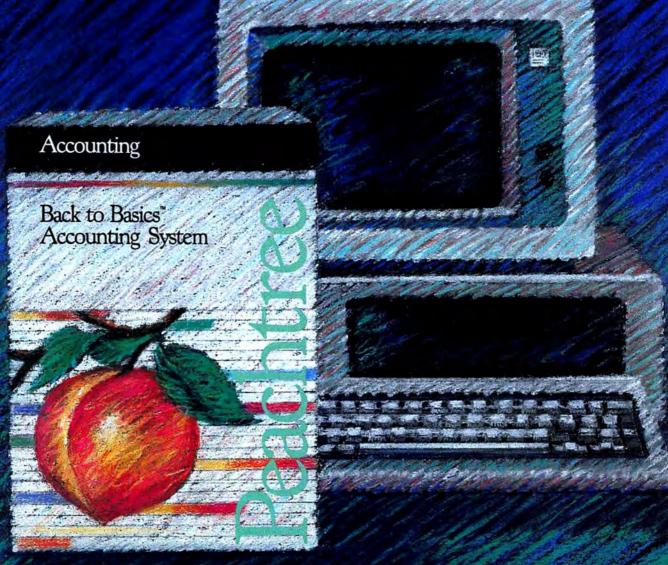
Which is one reason we warranty the Hercules Graphics Card for two years.

Unbeatable reliability. Advanced technology. Proven by over a quarter of a million users. Why settle for anything less than Hercules?

Call 1-800-532-0600 Ext 401 for the name of a Hercules dealer nearest you and we'll rush you our free info kit.

Hercules. We're strong on graphics.

Our "Back to Basics" Solution To Your Accounting Needs.



Back to Basics Accounting System by Peachtree Software® is an uncomplicated, easy-to-learn accounting system for small businesses.

You don't need any accounting experience and barely need any computing experience. The straightforward manual teaches both accounting and computing at the same time.

But make no mistake. This is a full-featured, interactive system including General Ledger, Accounts Payable and Accounts Receivable. And it's available for IBM, Apple, Atari and Commodore microcomputers.

Uncomplicated—easy-to-learn yet full featured. That's Back to Basics.

For more information, contact your local dealer or Peachtree Software, 1-800-554-8900.

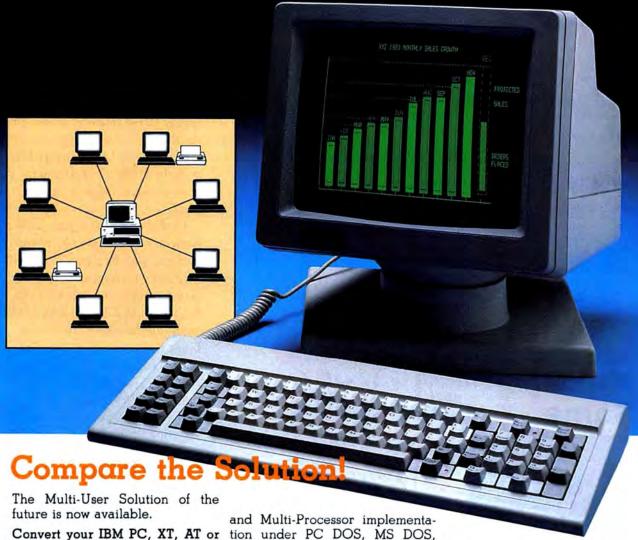
America's Software grows on the Peachtree.

Peachtree Software

Apple is a registered trademark licensed to Apple Computer. Inc. Atari is a registered trademark of Atari, Inc. IBM is a registered trademark of International Business Machines Corp. Peachtree and Peachtree Software are registered frademarks of Peachtree Software locompany.

Kimtron

MULTI-USER SOLUTION for IBM PC, XT, AT



Compatibles to a true multi-user system while maintaining display, keyboard and software compatibility.

monitor, with its look-alike also use the same software manual. Kimtron's multi-user solution includes file and record locking, shared data access, and communication between users. It is the PC's. intelligent alternative.

UNIX, XENIX, CPM 86, Multilink, Concurrent PC DOS, and other Enhancer Card, 80286 AT Card, compatible multi-user operating systems.

Since the KT-7/PC display is the Kimtron's multi-user solution may same as your PC monochrome be tailored for cost effectiveness; as low as \$1095 for an additional keyboard, operators will feel user, and for speeds more than ten they're using an IBM PC and can times faster than LAN. You can add one or as many as 31 additional users per PC. Kimtron delivers the future now by allowing an everwidening network of multi-user

The KT-7/PC may be comple-The KT-7/PC supports Time mented with one (or more) I/O Sharing, Enhanced Time Sharing Card, Memory Card, 8086 Speed

8088 Multi-Processor Card, 80186 Speed Enhancer Card, 68000 Card, and related software.

For more information about Kimtron's Multi-User Solution, or general video data terminals for other mini or micro multi-user systems, call your local computer dealers, distributors or Kimtron Corporation Today!

(408) 286-8790

TWX-910-338-0237



1705 Junction Court Building #160 San Jose, CA 95112

NOTE: IBM PC, XT, AT, PC DOS, MS DOS, UNIX, XENIX, CPM 86, Multi-Link, Concurrent PC DOS are registered trademarks of IBM Corporation, Microsoft Corp., Bell Labs., Digital Research Inc., Software Link Inc.

respectively.

LaserJet Printing with WordStar® and Lotus 1-2-3°

Polaris PrintMergetm is a print control program that prints WordStar and ASCII print files like Lotus 1-2-3. Polaris PrintMergetm creates the most professionally perfect printing possible by the LaserJet. Camera ready Documentation, Proposals, Spreadsheets, Reports, Manuals and Newsletters are all quickly and economically printed with a typeset appearance. Here's what others are saying about Polaris PrintMergetm:



InfoWorld Review "POLARIS PRINTMERGE TAKES THE WORRY OUT OF USING THE HP LASERJET EFFECTIVELY WITH WORDSTAR AND 1-2-3. Do we like Polaris PrintMerge? YOU BET."

John C. Dvorak, InfoWorld & PC World Columnist gave an unqualified plug to the program saying: "I highly recommend it."



Recommended by



PACKARD

Print any font Anywhere ★ Anytime ★ Micro Justified ★ In Columns ★ Lines & Boxes ★ Integrate Charts & Text ★ Merge Files & Text

Paragraph Reformatting of Proportional Fonts * Supports All 15 Font Cartridges



\$ 99.00 copy protected \$ 124.00 not copy protected \$ 5.00 s & h (tax in Ca.) Money Back Guarantee

Call or Write for Your Copy Today 619 471-0922 310 Via Vera Cruz, Suite 205, San Marcos, CA., 92069

PC or MS DOS *196K RAM IBM PC, XT, AT, or 100% Compatibles & 384K RAM HP 150

Circle 359 on reader service card

Make







NicePrint "windows" over WordStar.

The standard of printing excellence is the expensive daisy-wheel printer. Dot matrix printers are inexpensive and fast, but have poor print quality. The NicePrint software system provides the breakthrough giving dot matrix high quality print.



"Turns an IBM PC **Dot Matrix Printer** Into a Daisy."

The first 20 words of the simple instruction card tell you all you need to know to have NicePrint working smoothly with your current software. 13 font styles (Roman, Sans Serif, Script, Orator Large, Olde English, Scientific, IBM Graphics, etc.) are accessible. Over 300 variations of size and style are possible.



SPIES LABORATORIES

Phone: (213)538-8166

(Spies pronounced "speez") P.O. Box 336 • Lawndale, CA 90260

Circle 456 on reader service card



By contemporary computing standards, the PC is no Carl Lewis-but there are ways to slap some extra processing muscle onto your lean machine. One approach is to use the PCturbo-186 accelerator board from Orchid Technology, which features Intel's speedy 80186 microprocessor. Under the aegis of some special software, the board works in tandem with the 8088, transforming the PC from weekend jogger to speed

Orchid's offering is practically a computer-on-a-board: the 80186 is outfitted with its own BIOS ROM chip and entourage of RAM. The board initially comes with 128K RAM but actually requires 256K; an optional daughterboard can boost the retinue to 640K. The entire package barely fits into one full-size expansion slot. Installation involves adding a CON-FIG.SYS file to your DOS disk and inserting the board; switches are set at the factory.

Though the 80186 is a speed demon (in large part because of its 16-bit data bus and 8MHz clock speed), the team concept is what enables these chipmates to shave extra seconds off typical processing tasks. The faster 80186 concentrates on programs and directs the 8088 to field the input/output requests from peripherals such as disk drives, printers, and monitors. This collaboration is buttressed by Orchid's RAM disk caching software, which keeps track of frequently used data on disk and anticipates when that information will be needed by an application. The overall result is faster program execution.

(continues)

MPROVED, File Handing, Power Renorms

Statistics, reports and plots happen magically with SPSS/PC+" -the enhanced and expanded Statistical Package for IBM PC/XT/AT's.*

SPSS/PC+ is the most comprehensive statistical program for performing simple or complex tasks. For nearly 20 years, SPSS Inc.'s reputation and reliability as the leading producer of mainframe statistical and reporting software is unsurpassed. SPSS/PC+ carries this reputation into the PC environment.

SPSS/PC+ — Fully integrated: report writing. plotting, file management, communications with mainframes. Statistics: descriptives, crosstabulation, multiple regression, ANOVA. Simple facilities allow transfer of files between SPSS/PC+ and programs like Lotus 1-2-3, dBASE III, and SAS." SPSS PC*

SPSS/PC+ Advanced Statistics - Factor. cluster, discriminant analyses, MANOVA.

SPSS/PC+ Tables - Presentation-quality tabular reporting. Produce stub and banner tables. Handle multiple response survey data. Control content and layout completely.

SPSS/PC+ documentation is rated Number One by both novices and experienced analysts. SPSS Inc. also offers a full training schedule and a customer support hot-line.

Contact our Marketing Department today.

SPSS Inc., 444 N. Michigan Avenue, Chicago, IL 60611, 312/329-3500. In Europe: SPSS Europe B.V., 4200 AC Gorinchem, The Netherlands, Phone: +31183036711 TWX: 21019.

INC. PRODUCTIVITY RAISED TO THE HIGHEST POWER

SS/PC+ runs on the IBM PC/XT/AT with hard disk. Contact SPSS Inc. for compatible microcomputers. IBM PC/XT and PC/AT are trademarks of International Business Machines Corporation, dBASE III is a trademark of Ashton-Tate, 1-2-3 is a trademark of Lotus Development Corporation. SAS is a registered trademark of SAS Institute, Inc. SPSS, SPSS/PC+, SPSS/PC+ Tables, and SPSS/PC+ Advanced Statistics are trademarks of SPSS Inc. for its proprietary computer software.

You need a plotter that's compatible with your hardware, software and, especially, you.

More and more companies are discovering that color graphics help them communicate faster and more persuasively.

When you make this discovery, you'll want a Colorwriter™ pen plotter from Gould. Because Colorwriters are easy to use, and can meet all of your business and technical graphic needs. They'll work with virtually any computer and the most popular software packages available.

Whether you want simple bar charts or complicated CAD/CAM drawings in 81/2" x 11" or 11" x 17" formats,

we've got a plotter to suit your needs and your budget. Plus, we've got a unique automatic chart advance option for volume graphics applications.

When you buy a Gould Colorwriter plotter you're getting 45 years of proven experience in hard copy graphics technology. That's why you also get one of the best warranties in the business.

For more information and the name of the Colorwriter dealer nearest you, call toll free **800-447-4700**, operator 99. Or write Gould Inc., Recording Systems Division, 3631 Perkins Ave., Cleveland, Ohio 44114.





In A Pinch? Give QIC The Inch

We Have the Right Products ... at the Right Prices ... Right Now!

Mass Storage at Massive Savings

QIC-01 10, 20, 32 MB Internal Hard Disk Subsystem

QIC-03 300/1200 Baud Modems

More Functions Less Cost

QIC-05 Multi-Function Cord



\$1955

This low power Microscience subsystem comes complete with controller, cables, drive, easy instructions. Fits inside your floppy slot. Compatible with DOS 2.0, 2.1, and 3.0 without any patches 32 MB half-height w/controller, \$1,295 ... 20 MB Drive for the PC AT, \$895. Mounting hardware for Compag is available. External 10 MB \$695, external 20 MB \$895.

Our modems are fully Hayes compatible with features such as low heat dissipation, low power consumption, software volume control for the speaker, and large-scale-integration "Modem on a chip" for high reliability. It also comes with communications software which lets you emulate VT100 or IBM 3101. Half-size Internal \$299.

It gives you more than just added memory. It gives you reliable memory expansion (up to 384K), a serial port, a parallel port, a game port, and a battery back-up clock calendar. Includes RAM disk, print spooler, and clock utilities (The 64K RAM set is only \$15.) With 2 serial ports \$175.

QIC-2020 External Hard Disk with Tape Backup.

QIC-02 10, 20, 60 MB Half-Height Tape Back-up Systems

w on budget? Our MB reel tape back-up unit plugs into the back of your floppy controller. It works like a floppy disk so you can use all the DOS file commands such as COPY or DIR. Back-up 10 MB in 15 minutes. Our



20 MB cassette and 60 MB cartridge back-up systems come with controller, cables and drive. Backup 20 MB in 6 minutes. You can even do fast Image back-up and then file-by-file retrieval. Workson IBM PC, XT or AT. Internal 10 MB \$499, 20 MB \$699, 60 MB \$899. External 10 MB \$675, 20 MB \$875, 60 MB \$995.

Graphics Boards

Hercules, Color \$185 Hercules Compatible, Mono \$199 Color Graphics Card \$125 Everex Graphics Edge \$295

Half Size Cards

Memory card with 384K \$175 576K \$225 IO card with 2 serial ports, l parallel port, clock/calender \$125 Internal Power Supply 135 Watt \$ 99 150 Watt \$115 Expansion Chassis with I/O Slots \$695 IBM PC, 256K, 2 Drives..... \$1499

We Guarantee Satisfaction!

with 60 MB tape is only \$2450.

MB tape backup unit in a chassis with two extra I/O slots. Comes with cable and a half size host adapter card. 20 MB hard disk

No Risk. All our products carry the manufacturer's warranty. And remember, if for any reason, you are not completely satisfied within 30 days, you can return it for a full refund

> Call Us Today! (408) 942-8086

Telex: 5101002379 QICRCH



RESEARCH INCORPORATED

> 489 Valley Way Milpitas, Ca 95035

A FULL C \$1

The Eco-C88 C compiler is setting a new standard for price and performance. Compare Eco-C88's performance to compilers costing up to 10 times as much:

	Seive	Fib	Defref	Matrix
Execute	12.1 sec.	43.1 sec.	13.7 sec.	21.3 sec.
Code Size	7782	7754	7772	9120
Compile-link	76 Sec.	77 Sec.	77 Sec.	92 Sec.

Eco-C88 Rel. 2.20, on IBM PC with 2 floppy disks, 256K. Benchmarks from Feb., 1985 Computer Language.

Eco-C88 includes:

All operators and data types (except bit fields)

- * Error messages in English with page numbers that reference the C Programming Guide a real plus if you're just getting started in C
- Over 170 library functions, including color and transcendentals
- * New Library functions for treating memory as a file
- * User-selectable ASM or OBJ output (no assembler required)
- * 8087 support with 8087 sensed at runtime
- * cc and "mini-make" for easy compiles (with source)
- * Fast, efficient code for all IBM-PC, XT, AT and compatibles using MSDOS 2.1 or later.
- * Complete user's manual

If ordered with the compiler, the C library source code (excluding transcendentals) is \$10.00 and the ISAM file handler (as published in the **C Programmer's Library**, Que Corpl in OBJ format is an additional \$15.00. Please add \$4.00 for shipping and handling. To order, call or write:











Eco-C (Ecosoft), MSDOS (Microsoft), UNIX (Bell Labs), CP/M (Digital Research), Z80 (Zilog), 8086, 8087, 8088 (Intel

Circle 493 on reader service card

How could it be any good for only \$6? Many capable programmers have written high quality programs with complete documentation on disk and request a donation from satisfied users. Other program authors just want people to use the programs they have built and found useful. PC-SIG provides a single source of IBM-PC programs for \$6 per disk. Listed below are sets of some of the more popular disks from the library of over 350 disks

350+page printed Directory
Directory

\$8.95

- ☐ Set of 5 Introductory \$36 Disks and Directory (Includes word processing, filing system, utilities, games, and printed directory)
- ☐ Set of 3 Financial Disks \$18 (Personal general ledger, spreadsheet, stock trading)
- Set of 6 Lotus/Symphony Worksheet Disks (Templates, Tech notes, utilities, macro library)
- Set of 5 Language Disks \$30 (Assembler with tutorial, (Assembler with tuto Logo, XLISP, Forth)
- Set of 4 Educational Disks (Typing tutor, history, BASIC tutorial, math tutor)
 - **S24**

- ☐ Set of 3 Utility Disks (Disk cataloging program, file modify and restore utilities)
- Set of 4 Top Game Disks \$24 (Arcade quality games, severa on each disk)
- ☐ Set of Two
- Genealogy Disks ☐ How to Unprotect Popular Software (2 disks) \$12
- PC-SIG Directory on Disk (2 disk set) \$12
- 1 year PC-SIG membership (Receive all PC-SIG publications including printed \$15 directory, newsletters, and disk discounts)

Please add \$4 postage and handling to all disk orders, add \$1.50 postage and handling for the Directory only. California residents add state sales tax.

_ by □ Check □ Visa □ MC Total Enclosed _ Card No. Exp. date

Day phone -Signature Name

State

1030 E. Duane Ave., Suite J Sunnyvale, CA 94086 (408) 730-9291

Zip

To order, call:

800-235-6646 800-235-6647 (CA only)

Circle 293 on reader service card



When a PC with the 640K PCturbo-186 was pitted in speed tests against an unmodified PC with the same amount of memory, it was no contest (see Table 1). I found I could zoom from the top to the bottom of a 36K WordStar file or recalculate a 45K 1-2-3 spreadsheet in a flash with my beefed-up PC. For programs and peripherals inexorably dependent on the 8088, PCturbo-186 software switches the board from turbo to an 8088 mode.

A couple of caveats for speedhungry users: As with Univation's PC Turbocharger, the PCturbo-186's RAM becomes the PC's system memory; although in this case previously installed memory is used for RAM disks, print spooling, and caching. Both the PCturbo-186 board and the PC must also each possess at least 256K to function properly. Orchid sells the basic board with 128K and suggests that people with at least 384K in their PCs transfer some memory chips to the PCturbo-186 board.

But speed is the issue here, and that's what you get with Orchid's team player. -Wes Nihei

PCturbo-186 Orchid Technology 47790 Westinghouse Dr. Fremont, CA 94539 415/490-8586 List price: 128K \$895, 256K \$945, daughterboard only \$165, 384K daughterboard \$330, board with serial port for 8087 \$295

Requirements: 256K, one disk drive, DOS 2.00 or 2.10 €

TAPE IT EASY.

Boy, are you in for a surprise. You know you need mass storage. And you know you need some kind of backup.

But what you don't know is that making a backup from your hard disk can take the patience of a saint. And tax the memory of an elephant.

Unless, of course, you have a little TLC. The new TrimLine Combo from Corvus. You get mass storage (20 Mbytes). The incredible speed and efficiency of a hard disk. And an integral tape backup.

But there the similarity between a Corvus and anything else ends.

First of all, your TLC fits in beautifully. Between your IBM PC's monitor and base. No bulky boxes. And no clumsy cables and wires to trip over.

get the world's easiest tape

backup system. If you like using command lines, fine. The TLC will accommodate you. But if you're more interested in simplicity, just use one of the TLC's menus. And one of your fingers.

You can back up the entire disk. All your data for the day. A group of selected files. Or just one single file. As a matter of fact, you can back up whatever you want. Which will save you quite a bit of time and aggravation.

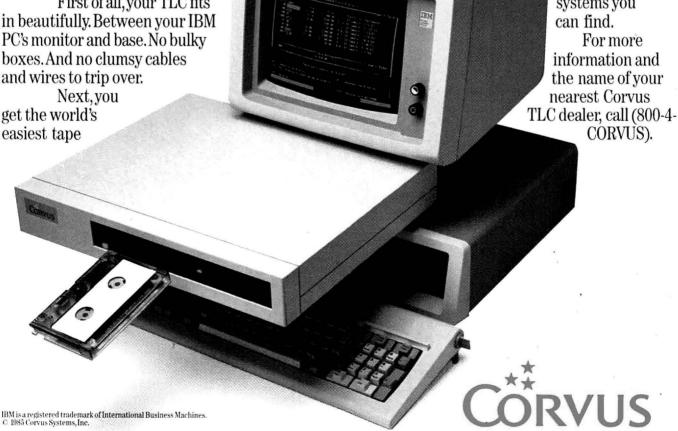
You'll also find backed up files in seconds with the TLC's Directory. No more searching an entire tape just to find one file.

Finally, you'll enjoy the backup speed of the TLC. There's no formatting of blank tapes (which can save you about two hours). And no worry about losing data to bad sectors the format has called good.

Scared? Don't be. Just tape it easy. Check out the TrimLine Combo from Corvus.

> In addition to all the features. it's one of the lowest-priced tape backup systems you can find.

information and the name of your nearest Corvus



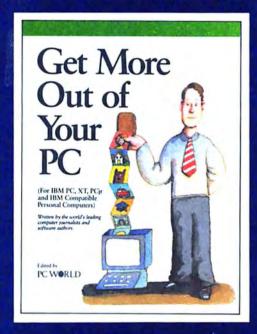


Subscribe to

PC W\\RLD

- Save \$17 off the newsstand price
- Have PC World delivered right to your desk
- Get a free book to help you get started

Save \$17 and get this book FREE



...when you subscribe to PC World!

This reprint of popular *PC* World articles will help you gain insight into the details, as well as the basics, of personal computing.

YES! Enter my subscription for 12 issues of <i>PC World</i> at just \$17.97 and rush my FREE copy of <i>Get More Out of Your PC</i> ! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate.
☐ Bill me ☐ Payment enclosed
VISA and MasterCard accepted–call TOLL-FREE: 800/628-2900 (in Nebraska 402/895-7284)
Name
Company
Address
City, State, Zip
Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires April 30, 1986.
PC W\RLD
YES! Enter my subscription for 12 issues of PC World at just \$17.97 and
rush my FREE copy of <i>Get More Out of Your PC</i> ! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate.
PC! I'll save \$17 off the single copy prices and
PC! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate.
PC! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate. □ Bill me □ Payment enclosed VISA and MasterCard accepted—call TOLL-FREE: 800/628-2900 (in Nebraska
PC! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate. □ Bill me □ Payment enclosed VISA and MasterCard accepted—call TOLL-FREE: 800/628-2900 (in Nebraska 402/895-7284)
PC! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate. □ Bill me □ Payment enclosed VISA and MasterCard accepted—call TOLL-FREE: 800/628-2900 (in Nebraska 402/895-7284) Name □ □ Company □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
PC! I'll save \$17 off the single copy prices and \$5 off the basic subscription rate. □ Bill me □ Payment enclosed VISA and MasterCard accepted—call TOLL-FREE: 800/628-2900 (in Nebraska 402/895-7284)

PC W\RLD

Offer good in the U.S. only. Please allow 6 to 8 weeks for shipment of your first issue. Offer expires April 30, 1986.

4BCB5

Boulder, Colorado 80321-1833

P.O. Box 51833

Subscription Department

PC World

BUSINESS REPLY CARD

GET

OUT

MORE

YOUR

DE FOR

PC

SEE OT

DETAILS

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY CARD

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

IF MAILED IN UNITED STATES

NO POSTAGE NECESSARY

Arlington Computer Products gives you the best prices on IBM PCs...

IBM-PC

2 Drives - 256K Monochrome Monitor

\$1925

Color Monitor \$2195

PC-XT

1 Drive - 256K 10 MB Hard Disk Monochrome Monitor

20 MB Hard Disk \$2795

PC-AT

1.2 Floppy - 512K 20 MB Hard Disk Monochrome Monitor

30 MB Hard Disk \$4499

...and disk drives too!

IRM (WHILE SUPPLIES LAST !) \$ 119

TANDON TM 100-2 99

SHUGART SA455 \$ 89

TEAC FD55B \$ 89

360K Drive for AT \$ 119

10 MB HARD DISKS

from \$449

20 MB HARD DISKS from \$629

10 MB TAPE BACK UP \$499

ISSUE HIGHLIGHTS

AST 6 PACK w/384K Clock/Calendar, P.S. and 384K

HAYES 1200R

\$259

\$339

\$145

QUADBOARD w/384K Clock/Calendar, P.S.G. and 384K . . .

EVEREX GRAPHICS EDGE PERSYST

\$269

COLOR CARD \$125

\$239

EVEREX MAGICARD w/384K Clock/Calendar, P.S.G. and 384K . . .

APPARAT 256K BOARD W/256K

PRINCETON HX 12 (Includes cable)

\$219

\$115

\$419

PERIPHERALS

STB GRAPHICS PLUS II	\$249	AST ADVANTAGE	\$399
PARADISE MODULAR GRAPHICS	\$259	AST 5251-11	\$649
HERCULES GRAPHICS CARD	\$289	HAYES 1200	\$389
HERCULES COLOR CARD	\$145	64K RAM CHIPS	\$ 10
EVEREX GRAPHICS EDGE	\$329	Bank of Nine	
PERSYST BOB, TAXAN 440	\$929	256K CHIPS ea.	\$ 5
PERSYST MONOCHROME CARD	\$139	128K CHIPS ea.	\$ 8

PRINTERS

FDSON

LFSUN	
LX 80	\$229
RX 100	\$369
FX 85	\$355
FX 185	\$489
LQ 1500	Call
OKIDATA	
ML192	\$349
ML193	\$499
84 IBM	\$639
SILVER REED	
FXP 400	\$249

EXF 400	Ψ 2 43
EXP 500	\$289
EXP 550	\$399
EXP 770	\$699

TOSHIBA

1340	\$549
P351	\$1099

Arlington omputer roducts



FOR ORDERS & SYSTEMS QUOTES:

FOR INFORMATION AND IN ILLINOIS CALL 312-228-6333

450 E. HIGGINS ROAD ELK GROVE VILLAGE, IL 60007

Prices and Availability Subject To Change Without Notice

The only complete telecommunications solution! TURBOLINK!



5 Year Warranty

Suggested Retail

\$449

includes:

Free cable

Free communications software

Free subscriptions to information services including Compuserve, Source, Dow Jones News Retrieval.

More than simply Hayes compatible.



Cableco International Corp. 8259 S.W. Cirrus Dr. Bldg. 16 Beaverton, Oregon 97005

For name of local dealer or to order, call

1-800-222-5320 Dealer inquiries invited.

Circle 642 on reader service card

Password: Communicate

Insights and information on the PC communications marketplace

This month: The AMA steps out into the competitive medical on-line services industry, IBM and AT&T step into each other's territories, and bulletin boards step up into long-distance electronic mail with Fido

Edited by Eric Brown

On-Line

The AMA's Medicine Show

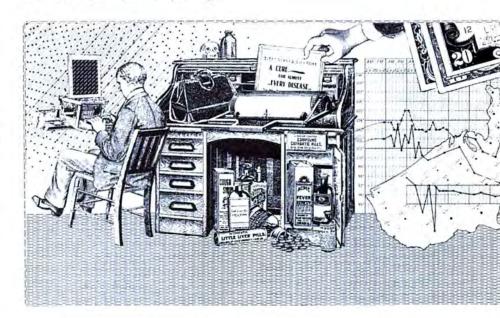
Its launch was dampened by mixed reviews. Skeptics said that although it managed to get off the ground, like Howard Hughes's Spruce Goose it would probably never soar. But in the three brief years since its inauguration, the American Medical Association's Medical Information Network (AMA/Net) has surprised critics and believers alike with an everexpanding list of services, a soaring number of subscribers, and a strong position in the competitive medical on-line services industry.

Although current users of AMA/Net still total no more than the circulation of some of the lesser journals in the AMA publishing empire, the network's 20,000 subscribers represent a 50 percent increase over the number of subscribers of just one year ago.

Next year AMA/Net will go international, offering service to physicians in Japan, the United Kingdom, the Netherlands, and several other countries as yet undisclosed.

AMA/Net offers many of the data bases found on its competitors' services, such as medical abstracts, literature-searching services, a drug data base, and a quick-reference disease data base. It also offers a special bibliography for articles on medicine's social concerns in areas such as ethics, legislation, and economics. But the network's main attractions for physicians are its dailyupdated medical news services and its broad scope of communications capabilities. A physician who signs on to AMA/Net can have direct access to the surgeon general's office, the Food and Drug Administration, the Atlanta Center for Disease Control, and the public health organizations of all 50 states. He or she can file reports

(continues)



My accounts receivables are under what???



A wrecking ball? Not likely! But every day vital records are destroyed by operator error, power failures, vandalism, fire or some other accident.

Think about it...what would it mean to you if the valuable data files stored on your computer disk were suddenly erased or destroyed?

Why take a chance when it is so inexpensive and easy to protect your records with an Irwin BACKUP™ Tape System. Simply plug it into your IBM PC/XT, AT or compatible microcomputer and the Irwin BACKUP™ Tape System is ready to go to work.

Easy to use. The power of one finger activates the Irwin BACKUP* Tape System. In a few <u>unattended</u> minutes, on a data cartridge so small it fits easily in a shirt pocket, the Irwin BACKUP* Tape System <u>automatically</u> preserves and verifies the information stored on a hard disk. Your vital records are safe, out of harm's way.

With almost <u>one hundred thousand</u> systems shipped, Irwin, the leader in Tape Backup Systems for microcomputers, knows your needs in backup protection and convenience.

INTEGRITY - It's critical that a backup system be accurate.

EC/TAPE™ is a unique automatic error correction system which assures you of data integrity.

INTERCHANGEABILITY - A backup tape must be capable of being reliably read from computer to computer.

Irwin's patented track following feature assures that your backup tape will be readable on any computer equipped with an Irwin BACKUP* Tape System.

COMPLETE/FRIENDLY SOFTWARE -Backup procedures, to be constantly followed, must be simple and convenient to

use or they won't be used consistently. Irwin's software permits <u>unattended</u> backup of your entire disk, or only those files you select. It's complete, easy to understand, and easy to use.

Don't wait for a problem. Protection is easy and inexpensive with Irwin. For more information, call 1-800/421-1879, or stop in for a "SHOW ME" demonstration at the nearest Computerland, Inacomp, Compu Shop, Computer Craft, BYTE Shop, The Computer Factory, The Computer Shoppe, Micro-Mart, as well as

Circle 5 on reader service card

selected Entré and Micro Age independent computer stores.

"No Problem, Thanks Irwin."



RWN

2311 Green Road Ann Arbor, Michigan 48105 313/996-3300 1-800/421-1879

Copywrited by Irwin Magnetics, Inc. All rights reserved. IBM PC/XT, AT are registered trademarks of International Business Machines Corporation.

"MY SECRET LIFE AS A WRITER"

by "D", Investment Banker



was always just a banker. Someone who used his computer for things like budgets, projections, and turning numbers into pie charts.

Until one night, I got this uncontrollable urge. Suddenly I had to write. And

I had to write fast.

Calmly, I took the Word Result disk from my secretary's desk. I was ready to enter the world of word processing.

I put the disk in my computer. As commands appeared in plain, simple English, I learned how to add, delete, rearrange.

Whenever I got stuck, I just pushed the *Help* button. Instructions telling me exactly what to do would appear on the screen. It was all so simple.

I typed a title on the screen. "The Chick From Fresno." The novel I'd been carrying in my heart for years was finally taking

shape.

The next day I bought a Word Result program of my own. I put it in my computer along with my spread sheet program, Calc Result. Now I can switch back and forth when nobody's looking. Sometimes I even split the screen and do both at once. But I have to be careful the chick from Fresno doesn't end up in the middle of some budget.

It's tough leading a double life. But isn't suffering part of being an artist?

WORD RESULT handles all word processing functions. CALC RESULT handles all math functions. Both programs can be used simultaneously. Software usable on IBM PC and compatible or Victor computers. Word Result, Calc Result, \$295 each; \$495 when purchased together.

Please send me a sample program of Word Result and Calc Result. Enclosed is \$5.00. (Money back guarantee.)

Name_____Address_____

City_____ State____ Zip____

Handic Software, Inc., 400 Paterson Plank Rd., Carlstadt, N.J. 07072. (201) 933-1455 or (800) 524-0484, New Jersey residents add 6% sales tax. Please allow three weeks for delivery.

A World Leader in Software

Word Result*/Calc Result*
by handic software, Inc.

with the FDA on adverse drug reactions, obtain excerpts from public health reports, and learn the latest on outbreaks of various diseases. Physicians can even earn continuing education credits through interactive programs developed by Massachusetts General and Harvard Medical School.

"Doctors are just becoming aware of the information that can be accessed with a computer," says Dr. Byron Oberst, a Nebraska pediatrician and chairman of the American Academy of Pediatrics' Section on Computers and Other Technology. "I've used AMA/Net an uncountable number of times in the past year for researching journal articles, researching infor-

mation on diseases, and sending electronic mail. It's become an integral part of my practice."

Other physicians are less enthusiastic about the network. Says one physician who prefers to go unnamed, "Frankly, I haven't been all that impressed with what AMA has to offer. Their data bases are inferior in quality. The indexing is poor. They cost three times more than they should. What I need is something to help me use the library and make it fun and easy. Dialog's Knowledge Index does that. BRS's Colleague does that. AMA/Net doesn't."

Knowledge Index, a simplified version of Lockheed's Dialog, and

Medical Colleague, a joint venture of Bibliographic Retrieval Service (BRS) and the medical publishing house of W.B. Saunders, are AMA/Net's most well-entrenched competitors. Although neither can compete with AMA/Net's networking capabilities, both are acknowledged heavyweights in the area where AMA/Net falters: volume and variety of data bases. Both provide a vast number of medical data bases, in addition to the National Library of Medicine's bibliographic data base, Medline. BRS's Colleague also stands out as one of the few on-line services that offer the complete text of medical books and journal articles, a service that the AMA doesn't provide



even for its own publications. Instead, the AMA licenses out rights to full-text electronic publication of its journals to Mead Data (NEXIS).

Medical Colleague, which was introduced just last year, and Knowledge Index have become popular among physicians who need a complete research library at their fingertips. Since both lack any networking capabilities, however, many physicians who subscribe to one or the other also subscribe to AMA/Net.

Although AMA/Net has a long way to go to catch up with its competitors, as the official network of the AMA the service has a strong advantage. In a recent promotional campaign, the AMA exercised its political clout by bringing 68 health professional societies on line. By offering the societies reduced group subscription rates, their own special bulletin boards, direct access to their members through electronic mail, and other incentives, the network not only significantly increased its number of subscribers but extended its influence well beyond the scope attainable by a private purveyor of on-line services.

"We've exploited every avenue we can," says Daniel K. Harris, director of AMA/Net. "Every time we can do something new in medical communications, we do it." The AMA plans to add more data bases, special services, and linkups to health organizations. According to Harris, plans are in the making to develop interactive programs for diagnosis and therapy and to introduce a service to file paperless insurance claims. In addition, the AMA plans to design a line of PC communications software especially for its network.

The AMA is even considering branching out from its strictly vertical market audience to include services for the general public. Already, there are plans for interactive programs on personal hygiene

(continues)

250,000 customers made us do it. The WYSEpc.

We established a precedent on better than 250,000 desktops with our terminals. So when our customers got ready to include PCs in their plans, they didn't think they should have to settle for less than Wyse style, performance and economy.

We agree. And now you can get the WYSEpc with IBM compatibility in hardware, software and expandability. We've thoroughly tested more than 350 software packages and accessories. It runs even the acid-tests—Lotus 1-2-3 and Flight Simulator—in beautiful Wyse style.

Our price *includes* dual floppy drives, monochrome 14" tilt/swivel monitor, height-adjustable keyboard, 256K RAM, two serial ports, one parallel port, MS-DOS with GW-BASIC—and more.

There's also an IBM PC/XT compatible model with a 10-Megabyte Winchester disk. A color graphics option is available on either model.

For more information about how much less all this costs from Wyse, call the regional office nearest you.

WYSE

Regional Sales Offices: Northeast (201) 725-5054; Southeast (305) 862-2221; Midwest (313) 471-1565; Southwest (818) 340-2013; Northwest (408) 559-5911; OEM Inquiries (408) 946-7115.

IBM and IBM PC/XT are trademarks of International Business Machines Corporation. Lotus 1-2-3 is a trademark of Lotus Development Corporation. MS-DOS and GW-BASIC are trademarks of Microsoft Corporation

Circle 438 on reader service card

What do you get when you cross 1-2-3° spreadsheets with dBASE™ files?

VP-planner

\$99%...It's a miracle!

VP-Planner is a powerful spreadsheet program that has everything 1-2-3 has. With more features, and more functions.

VP-Planner is compatible with
1-2-3 worksheets, templates and macros.
This means that any of the thousands
of existing worksheets and preprogrammed
application templates are available for
immediate use.

Accesses real dBASE IITM and dBASE IIITM database files directly from your worksheet. Create, read, write, update and join dBASE files. Use macros to do almost anything you can do with the dBASE programming language, but more easily and more quickly.



Forever ends multiple worksheet linking and complex consolidations. Using VP-Planner's Multidimensional Database™, store data and logic for up to five dimensions in a separate database on disk that you access from your worksheets.

You get 1-2-3 compatible worksheet macros, of course, plus macros to access dBASE and Multidimensional Database files. You can create macros in "learn" mode with Autokey™, and store macros in dBASE files, to be retrieved and executed out of any worksheet as needed.

If you <u>don't</u> own a spreadsheet program, the choice is clear. 1-2-3 workalike VP-Planner.

If you <u>do</u> own 1-2-3 or dBASE, you're ready for your next step. Paperback Software's VP-Planner.

Ask for Paperback Software at your local bookstore, computer store, or software store.

Or use the order form below.

VP-PLANNER

Advanced 1-2-3 compatible spreadsheet program that accesses dBASE and Multidimensional Databases.*

\$9995

EXECUTIVE WRITER

Advanced word processing with word wrap, global search and replace, footnotes, indices, graphics."

\$6995

EXECUTIVE FILER

An electronic file cabinet. Combine with Executive Writer to switch between documents and filecards at a keystroke.

\$4095

PAPERBACK SPELLER

Detects and corrects errors on the spot. 60,000 + word dictionary. Works with WordStar", Volkswriter", and others.

\$3995

DRAW-IT

Turns your computer into a full color electronic drawing board. Make h pictures, graphs. er". Requires color graphics card.

\$2995

PAPERBACK WRITER

The affordable high-value word processor for everyday use. Easy to read instruction book makes you productive in minutes.

\$3995

NUMBER WORKS

The spreadsheet that's simple to use for budgeting, financial planning, expense reports, homework.

\$3995

MY ABC's

Six colorful educational games for preschoolers that teach counting, letters, concentration. Requires color graphics

\$1995

VP-PLANNER copies	K SPELLER DRAW-IT Copies Copie	oples MY ABC's copies
All products work on the IBM PC, PC-XT, PC-AT and compatibles with DOS 2.xx or higher and 126K memory (156K memory for VP-Planner, 192K memory for Executive Filer and Draw-It). All products work on the PC is with 256K memory (126K for My ABC 1). "Graphics card optional to display graphics. Above total =	Quality Software at Affordable Prices	63
□ Check □ VISA □ MasterCard Card number Exp		
Ship to:	Paperback Software	.
Address:	2612 Eighth Street	PAPERBACK
City: State: Zip: Signature: Offer good in USA only. Allow 2-1 weeks	Daulaton CA 04910	SOFTWARE

THE WHERE ON EARTH DO YOU LOOK FOR IT" FINDER



Where on earth do you look for that product? The swer is DIRECT NET. If it exists, chances are u'll find it under one of our listings.

We offer, through your modem, software and rdware product information. We offer manufacrer information, PC World subscription and proam listings...even electronic mail and bulletin ards. And we're thorough. For instance, you want find that product but you only have a description. ur product information menu can find that product name, category, manufacturer, description, or r exclusive multiple parameters method.

After you've found it, we can tell you all you want know about it, give you a demonstration...and en order it for you. That's because we're DIRECT the "where on earth do you look for it" finder. nd after you've found us, you'll be sitting on top of e world.

Direct-Net is available at an introductory annual membership fee of \$50. There is no initial contact fee—connect time charges are \$10/hr.
A demonstration disk and instruction manual is available for \$10 (applied towards annual membership fee).
Special membership information for computer retailers and consultants is available.

upon request.

Nationwide: 800-223-0822 (In California: 800-824-5526)

MasterCard Visa orders through 800#.

□ \$50.00: Membership Fee, DN-COMM Software Package, Instruction manual
□ \$10.00 Demonstration Disk, Instruction Manual (applies toward membership) plus 6% sales tax for California Residents only

Name .

Company Name

Address

City/State/Zip

Telephone Number (

31220 La Baya Dr., Suite 110 Westlake Village, CA 91362 and health education for children. Along with its current networking capabilities, this broadening of AMA/Net's audience would distinguish the service from its competitors, transforming it from a medical research library into a multipurpose health network. If AMA/Net continues to provide unique services, while improving their indexing and ease of use, this newcomer may be around for a long time. –Judy Getts

Watson Watch

As the Giants Circle

Everyone knew it would happen. The only question was when and where. Although IBM's summer announcement that it would sell its 60 percent ownership rights of Satellite Business Systems (SBS) to MCI Communications Corporation in exchange for a 16 percent stake in MCI came as no surprise to many analysts, the agreement's impact is still creating shock waves. Over the next three years IBM plans to acquire up to 30 percent of MCI and invest \$400 mil-

Figure 1: IBM's partial buy-out of MCI should boost the carrier's share of the long-distance service market, but probably at the expense of smaller carriers, not AT&T.

lion in the carrier's network expansion.

MCI, heretofore a faltering, remote second to AT&T in the longdistance carrier industry, will undoubtedly receive a major boost from the agreement, in both financial and technical support. IBM has clearly picked MCI out of the chorus line of small carriers and cast it to star opposite AT&T. Yet this reshaping of the market should provide more immediate headaches for the smaller carriers, such as GTE SPRINT and Allnet Communications, than for AT&T (see Figure 1). For IBM the agreement signifies the first major step into telecommunications since its acquisition of Rolm, and a longawaited move in everybody's favorite master plan-the unification of the telecommunications and computer industries.

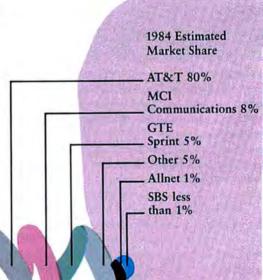
The deal also underscores the trend of telecommunications companies moving beyond long-distance telephone service into the more potentially profitable area of data communications via digital networks. IBM's investments should accelerate MCI's already

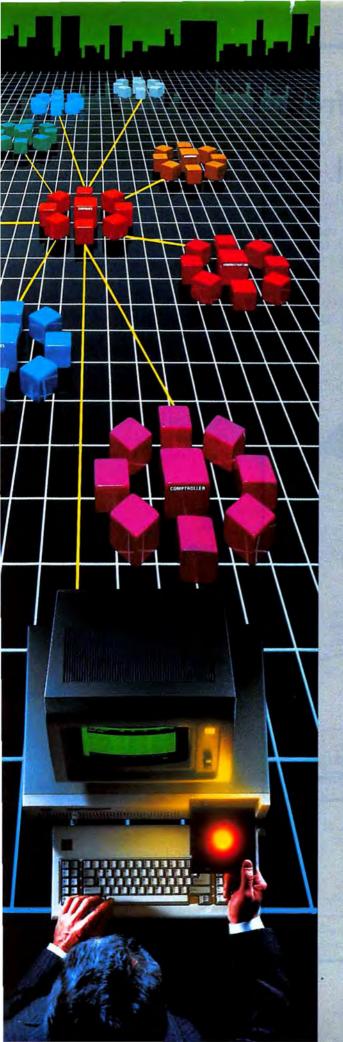
extensive implementations of optical fiber and digital microwave networks. The merging of SBS's satellite links into MCI gives IBM a foothold in all the major digital network technologies.

Meanwhile, AT&T looks on with mixed feelings. Although the IBM-MCI agreement should prove troublesome to AT&T in the long run, it might solve some problems in the near future. The new potency of MCI may persuade the Federal Communications Commission that competition is strong enough in the telecommunications marketplace to fully deregulate AT&T.

Meanwhile, AT&T hasn't been sitting around waiting patiently in the Watson wars. The same week as the MCI agreement, the telecommunications giant stepped boldly into IBM territory with an avalanche of product announcements, including tidings of new versions of the AT&T 3B minicomputer, links between the 3B

(continues)





We've Put a Local Area Network on a Disk

Corporate Information Sharing. It's been described as the key to increasing a company's productivity. It's also why large networks of PC's are becoming more and more common in the workplace...in spite of the fact that they're costly, difficult to install, and incompatible with much existing software.

Finally, there's a solution to this corporate dilemma.

Its name is LANLink™

A Software-Driven LAN That Uses Standard, RS-232 Ports. A major breakthrough in local area networks, LANLink™ uses your computers' existing serial ports and runs under PC-DOS.

Because all of the intelligence the network requires is on the server and satellite diskettes, expensive network interface boards aren't required.

A Powerful Network That's Cost-Conscious. If you've been pricing board-driven LAN's, you already know that they can cost over \$1,000 per workstation.

LANLink™ is different.

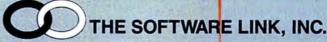
Boasting a data transfer rate in excess of 100,000 BPS, LANLink™ is compatible with a wide range of programs. And because special boards aren't required, installation costs are one-third that of a traditional network.

A Network Designed the Way Business Works. With LANLink, you're able to customize your network along departmental lines using a data-sharing hierarchy and password-protected access.

Get Started With LANLink™ TODAY. Call The Software Link TODAY for complete details and the authorized dealer nearest you. The LANLink™ Starter Kit, priced at \$495, comes complete with network software for both a server and a satellite computer. For a limited time, 50 feet of RS-232 cable will be included free of charge.

LANLink™ is immediately available and comes with a money-back guarantee. VISA, MC, AMEX accepted.

LATEINK



Developers of MultiLink™ and MultiLink Advanced™

8601 Dunwoody Place, Suite 632, Atlanta, GA 30338 Telex 4996147 SWLINK CALL: 404/998-0700

Dealer Inquiries Invited

THE SOFTWARE LINK, INC./CANADA
400 Esna Park Drive, Suite 18, Toronto (Markham), Ont. L3R 3K2 CALL: 416/477-5480
MultiLink, MultiLink Advanced & LANLink are trademarks of
The Software Link, Inc. PC-DOS is a trademark of IBM Corp.

Circle 526 on reader service card

Most project managers want just 3 little things from their software: Control, control, control.

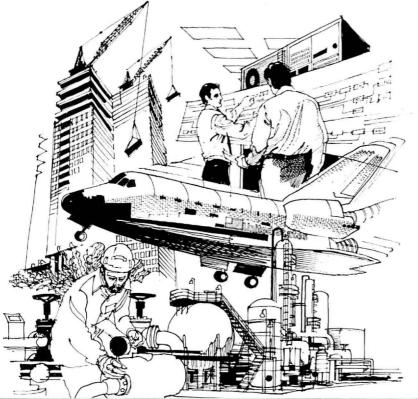
If you're a project manager, we know what you face every day.

We're project managers too. And we created our Project Planner software to provide comprehensive support for managers who run all kinds of projects . . . in engineered construction, aerospace, defense, new product development, data processing, plant maintenance and more.

PRIMAVERA Project Planner™ and Primavision™ Plotter graphics give you sophisticated scheduling capabilities for up to 10.000 activities, resource leveling, cost control, custom reporting, bar charts—the works.

PRIMAVERA PROJECT PLANNER

It's the most project management you can get from a micro. System Requirements: IBM-PC/XT, PC/AT (512k) or compatibles.



PRIMAVERA SYSTI Bala Cynwyd. PA 19004 • (2	EMS, INC. Suite 925 • Two Bala Plaza 215) 667-8600 • TELEX: 910 997 0484
I'm interested: □ Send working o □ Send free brochure. □ Call me	demo (\$75.00). e.
Name	Title
Company	
Address	
City	Ctate 7in Dhone

Circle 148 on reader service card

and IBM mainframes, and a version of UNIX that runs under IBM's VM operating system. The mainframe links should help lure potential customers who have hesitated to buy AT&T systems due to lack of IBM compatibility.

And so the story unfolds as prophesied. While the two giants circle each other slowly, treading on each other's turf, smaller companies run the risk of being squashed underfoot. No doubt a number of small manufacturers are waiting for a call from AT&T that might save them from such a nasty fate. They may even answer their phone on a telecomputer.



Trends

Fido: A SYSOP's Best Friend?

Nancy Miller steels herself before answering what she refers to as the hackerphone. She knows it will be a caller for her husband, someone needing help in accessing his bulletin board. Sure enough, she is greeted by an adenoidal voice.

"Hello, is Allen there?"

"No."

"Oh." Pause. "Is this his mother?"

(continues)

ALL DISKS INCLUDE THESE FEATURES...

- 5¼" DOUBLE-SIDED/DOUBLE DENSITY, SOFT-SECTORED
 - REINFORCED HUB RINGS
- WRITE-PROTECT TABS
- USER I.D. LABELS
- TYVEK PROTECTIVE SLEEVES
- 100% CERTIFIED AND GUARANTEED, OR YOUR MONEY BACK!

5 DISK STORAGE FILE!

t a DISKMINDER II™ storage file FREE when you order 50 disks for \$1.19 each! disks with color-coded labels and write-protect tabs in a DISKMINDER II™ (an \$11.95 value, absolutely free!)

9.95 for the entire package! (\$1.19 per disk plus a free DISKMINDER II $^{\scriptscriptstyle{ exttt{M}}}$).

SAVE...

8.70 WITH OUR VALUE-PAK! disks (51/4" DS/DD). Is the MICROCLEAN™ head Eleaning system 24 cleans- reg. \$19.95).

so includes the DISKMINDER II™ torage file

75 disk capacity– reg. \$11.95!). ue–Pak price \$47.95 retail value \$66.65).

?UY...

GUARANTEED DISKS FOR THE OW PRICE OF \$12.95! 1 51/4" DS/DD disks in a sturdy lip-up library case.

Nore.

rable, scratch resistant storage file 75 disk capacity) for just \$11.95! sy to use head cleaning system 24 cleans) for only \$19.95! eaning system refills 24 cleans) for \$11.50.



ORDER TOLL-FREE . . 1-800-222-9920 in California.

1-800-222-9920 in California. 1-800-345-8994 everywhere else.

SIGNATURE

ORDER NOW!

Call **MAGNACOM** today and use your VISA or MASTERCARD... or mail in the order form, adding 7% sales tax in California. Please allow 4 weeks for delivery.

No C.O.D. orders, please. Canadian orders add an additional \$2.00, please. Shipping \$3 for orders up to \$75.00, \$4 for orders exceeding \$75.00.

2395 OAKLAND ROAD, SUITE 44, SAN JOSE, CA 95131-1404

88 Ryders Lane, Stratford, Connecticut 06497

WE WILL TRY TO MATCH AND BEAT ANY ADVERTISED PRICE
 SCHOOL AND CORPORATE PURCHASE ORDERS ACCEPTED

		• CALL A	BOUT	OUR FREQUENT	PURCHA	SER PROGRAM ANI	SOF	TWARE RENTAL LIBRA	ARY
				PCcroyon II		Grammar Examiner	26.00	DISKETTES	
ACCESSORIES		GEM Desktop 1.1		PEACHTREE Back to Basic Series	CALL	Math Maze	23.00	BASE DS/DD	17.00
AST Keach	240 00	Chartmaster	229.00	POWERBASE SYSTEMS	225 00	DIGITAL RESEARCH Dr. Logo	83.00	CDC DS/DD	18.00
Six Pack Plus 384K	309.00	DOM TUNES		PRENTICE HALL		EDUWARE		Maxell DS/DD	18.00 45.00
Six Pack Plus 64K. CORE INTERNATIONAL	245.00	Investment Evaluator	99.00	Execuvision		Algebra I . II . III		Maxell DS/OD Maxell DS/OD Maxell DS/OD Maxell SS/DD Verbatim SS/DD	16.00
20 MG AT (complete package) HAYES	1250.00	Market Manager Market Microscope Spreadsheet Link	148.00	Word Plus	223.00	HARCOURT BRACE JOVANOVICH Computer GRE			10.00
Mach II Joystick	26.00	Spreadsheet Link	148.00	QUARTER DECK SOFTWARE		Computer SAT		ANCHOR MODEMS	
Mach III Joystick		ENERTRONICS Energraphics		Desq	139.00	HARVARD ASSOCIATES PC Logo	98.00	Volksmodern 1200	169.00
Color Graphics Card	143.00	EVED COETWARE		Business Programs	410.00	PC Logo	28.00	Cable for PC, Compaq	
INNOVATIVE CONCEPTS Flip n File 50	20.00	One-Write Plus FINANCIER, INC. Financier II.	114.00	SAMNA Samna +	315.00	KOALA		Smartrodem 1200 Smartmodem 1200 Smartmodem 12008 Smartmodem 12008 Smartmodem 12008 with software Smartmodem 2400	88.00 375.00
IOMEGA	20.00	FOX AND GELLER	114.00	CATCULITE COETWARE		Koola PodLEARNING COMPANY		Smartmodem 12008.	319.00
Bernoulli Box KENSINGTON	CALL	FOX AND GELLER Quick Code III dGraph or Quickcode	CALL	Word Perfect 4.0SCARBOROUGH	CALL	Addition Magician	20.00	Smortmodem 2400	620.00
Mosterpiece	85.00	ditti	43.00	Your Personal Net Worth	61.00	Magic Spells Number Stumper Reader Rabbit	24.00	PROMETHELIS	124.00
PC Saver. Universal Printer Stand	15.00	FUNK SOFTWARE Sideways 2, 11 HARVARD SOFTWARE	34.00	Spotlight	88.00	Word Spinner	20.00	Promodem 12008 hardware only Promodem 12008 with software	230.00
NEC 64K RAM Memory	12.00	HARVARD SOFTWARE Project Manager	208.00	SOFTWARE GROUP	224.00	MECA Basic Building Blocks	46.00	VENTEL	
		Project Manager	245.00	SOFTWARE GROUP Enable 1.1SOFTWARE PUBLISHING	CALL	Jim FixxSCARBOROUGH	45.00	PC Modern Halfcard	355.00
Modular Graphics Card	278.00	HAYDEN The Writer	. 31.00	Open Access	395.00	Build A Book About You		PC Modern Halfcard	385.00
Porollel Printer Port PERSYST	73.00	Please		PFS Access	77.00	Mastertype SCHOLASTIC Agent USA	23.00	PRINTERS	
PC Color Graphics Board	167.00	HOWARD SOFTWARE Real Estate Analyzer II	155 00	PFS File B:01 PFS Groph B:01 PFS Plan A:01	77.00	Agent USA	24.00	DM40 PAR	930.00
PC Monochrome Board	125.00	IMSI	. 155.00	PFS Proof B:00.	52.00	SIMON & SCHUSTER		HR 15 XL	500.00
QUADRAM		PC Point Brush PC Point Brush w/Logi Mouse	115.00		_	Typing Tutor III	23.00	HR 35 Tractor	114.00
Expanded Quadboard w/384K Expanded Quadboard w/64K RACCORE	229.00	IUS	CALL			Kid Writer	18.00	C. ITOH 8510	319.00
Drive Two for PC jr. Expansion Board for jr. w/128K	475.00	Accounts Payable	CALL	ODDEDCO	MIV	Story Morhine	18.00	F10-40 P F10-55 P Storwriter A-10-205P	1,110.00
Expansion Board for jr. w/128K SCREEN WIPE	199.00	General Ledger+	ALL /	ORDERS O	INLT	Troins. SPRINGBOARD		CENTRONICS	
Screen Wipe Kit	16.00	Order/Entry Processing CALL		TOLL	DEF	Music Moestro	21.00	IBM cable to parallel printer	20.00
J-Ram Board w/software	CALL	INFOCOM	/	TOLL F	-KFF	GAMES	21.00	DYNAX	379.00
TALLGRASS Hard Drive Sub Systems	CALL	INNOVATIVE SOFTWARE				BLUECHIP		EPSON LX-80	222.00
TANDON		Smart Software System 490.00	1 0	200	000	Baron	35.00	LX-80 New Models and all others	CALL
10MB Internal Hard Drive w/contr TM 100-2 Full Height 360K drive	CALL	KENSINGTON	-0	300-38	L-LL	Millionoire	35.00	HP Loserjet	CALL
TEAC FD-55B Half Height 360K drive	CALL	Easylink Mail Manager 57.00				BRODERBUND Ancient Art		HEWLETT-PACKARD HP Loseiet MANNESMAN TALLY All Models	CALL
TECMAR Captain Board (384K)		Instant Mail		7 DAYS/	WK	of War	27.00	NEC 2000	400.00
Captain Board (64K)	185.00	Manuger 58.00 KOALA		9AM to 11F	M EST	Lode Runner	21.00	2050 3550	660.00
Coptain Board (64K) Graphics Moster Board Maestro Multifunction	449.00 355.00	Executive Presentation 98.00				Calany	21.00	3550	970.00 CALL
BUSINESS SOFTWA	RE	Speed Key Controller Card	FRE	E OVERNIGHT.	AIR SHIPPI	Murder by the Dozen	21.00	8850 P2T with tractor P3T with tractor	525.00
ALPHA Data Base Manager II		Controller Card		CALL FOR D		HAYDEN Sorgon III.		OKIDATA	743.00
Electric Desk	187.00	Speed Key Toblet w/Software 113.	00	CALL TON D	LIMILS	INFOCOM		OKIDATA 193P. 2410P	1,790.00
Keyworks	57.00	LEADING EDGE Nutshell	58.00			Cutthroats or Seastalker	24.00	All others Microline 182. Microline 192 Okimate 20 with Tractor PANASONIC	CALL
Versa Form XL		Word Processor	140.00			Enchanter. Forbidden Quest	24.00	Microline 192	349.00
D Base II 2.43	245.00	LIFETREE SOFTWARE Volkswriter Deluxe 2.1 LIVING VIDEOTEXT Thinktank 2.0	149 00	PFS Report B:01	68.00		28.00	PANASONIC	215.00
D Base III 1.1. Framework 1.1.	CALL	LIVING VIDEOTEXT	140.00	SORCIM/IUS		Zork I. II III	26.00	KXP 1090 KXP 1092	187.00
BP1 General Accounting	340.00				285 00	MICRO LAB	24.00	KXP 1093	439.00
BPS Business Grophs		Managina Your Money	99.00	SPINNAKER Amazon or Drogon World STARBRIDGE TECHNOLOGY	24.00	The Heist	24.00	CVP 3151 QUADRAM Quadlaser	415.00
Overhead Express BATTERIES INCLUDED	128.00	MICROGRAFX PC Drow.	230.00	STARBRIDGE TECHNOLOGY	24.00	MICROPROSE F-15 Strike Eogle	. 21.00		
Electronic Checkbook	44.00	MICROPRO Pro Option Pack Wordstar 2000 1.01 Wordstar 2000 Plus 1.01	. 109.00	Starbridge DOSSTONEWARE		MICROSOFT	30.50	All Quine Printers	CALL
BORLAND Graphics Toolbex 1.0		Wordstar 2000 1.01	CALL	Advance DB Master TURNING POINT	265.00	ORIGIN SYSTEMS	24.00	SILVER REED EXP 400P	240.00
Sidekick	32.00	Wordstor 3.31	178.00	Time Is Money	64.00	LC SOLLMAKE		EXP 500P EXP 550P	249.00
Sidekick non-protected 1.5 Superkey 1.0	39.00	Wordstar Professional		EDUCATIONAL S	SOFTWARE	Armchair Quarterback	23.00	EXP 550P EXP 770P STAR MICRONICS	689.00
Turbo 8087 3.0	58.00 72.00	Clout 2.0	84.00	ATI		PROFESSIONAL SOFTWARE		Power Type	325.00
Turbo Pascal 3.0. Turbo Pascal 3.0 w/BCD	42.00	Extended Report Writer 1.2 R Base 4000 1.15	. 247.00	Troining Power Programs BARRONS Computer SAT	51.00	Trivia Fever SCREENPLAY Ken Uston's BlackJack	. 24.00	SD-10	469.00
Turbo Joolbax 1.0	32.00	R Base 5000 1.0 Upgrade Kit for R Base 5000	. CALL	DIDIE DECEADON		SEGA		SG-10 SG-15	229.00
Turbo Tutor 1.0 BREAKTHROUGH	21.00	MICROSOFT Chart 1.01		The Word 1.0	145.00	Super Zarran	26.00	SR-10	490.00
Time Line	235.00	Cohol Compiler	400 00	Goren's Bridge	45.00 87.00	AMDEK MONITORS		SR-15. TOSHIBA	CALL
Grafix Partner	84.00	Fortran Compiler Macro Assembler	97.00	CDEX		Color 600	450.00	SPECIALS	
Bank Street Writer		Mouse Multiplan I.2. Pascal Compiler Project 1.01	124.00	All programsCHANG LABS All programs	39.00	Color / 10	. 550.00		225 00
COMPUSERVE		Pascal Compiler	175.00	All programs	58.00	PRINCETON	147.00	Video 300G ***	123.00
Executive Subscription Kit	39.00 18.00	Project 1.01	. 145.00	Alien Addition	21.00		164.00	Copy PC	20.00
CONTINENTAL SOFTWARE	78.00	Crossfolk XVI 3 5	CALL	Demolition Division	20.00	SR 12	575.00	AMDEK Color 300 ** Video 300G ** Video 310A ** Copy PC JUKI 6100 ** 1-2-3	365.00
FCM	81.00	Remote MONOGRAM Dollars and Sense w/Forecast	. 107.00	Minus Mission	21.00	TAXAN	125.00	1-2-3. Symphony	285.00 410.00
	30.00	Dollars and Sense w/Forecast	95.00	Spelling Wiz DAVIDSON AND ASSOCIATI	20.00 ES	121 12" Green	. 135.00	Symphony Multimate 3.30 Norton Utilities 3.0	215.00
Property Management	275.00	MOUSE SYSTEMS							37.00
Property Management Tax Advantage DATA TRANSFORMS	275.00 38.00	MOUSE SYSTEMS PC Mouse with Mouse Paint	133.00	Moth Blaster	28.00			PANASONIC KXP 1091 ***	247.00
Home Cataloger Property Management Iax Advantage DATA TRANSFORMS Font Paks 1-11 (Each)	275.00 38.00 15.00	PC Mouse with Mouse Point	57.00	Moth Blaster	28.00			PANASONIC KXP 1091 *** Spy Hunter	247.00
Property Management Tax Advantage DAIA TRANSFORMS Font Paks 1-11 (Each) Fontix DIGITAL RESEARCH CFM/86	69.00	PC Mouse with Mouse Paint	. 408.00	Moth Blaster	28.00 48.00 28.00 28.00	411 Hi Res. RGB with audio 420 Super Hi Res. RGB. 425 Super Hi Res. RGB with audio 440 Ultra Hi Res. RGB Bob Board for 440 Persyst		Narrion Unities 3, 0 PANASONIC KXP 1091 Spy Hunter Printworks Gato. Verbatim DS/DS	247.00

*TOP RATED IN A LEADING CONSUMER MAGAZINE.

If something you would like is not listed, just call. For inquiries and Connecticut Orders Call (203) 375-3860.



Nancy has grown used to kids assuming that her husband is one of them. Actually, Allen is an investment analyst with American Financial Corporation, a Cincinnati firm. Like the kids who call, Allen was bitten by the bulletin board bug. But unlike most SYS-OPs, Allen set up his bulletin board system (BBS) at his office with the financial support of his company, and the board is considerably more sophisticated than the kind most kids are used to.

Allen's board (513/579-5287) is not an independent BBS but part of a network; all its members are linked by the same host software, a program that goes by the unusual name of *Fido*. A *Fido* board has many features commonly associated with other BBSs. For example, callers can leave and scan local messages, read editorials, answer questionnaires, and upload and download software. *Fido* provides three levels of help: Novice, Regular, and Expert.

But Fido has a special capability that distinguishes it from other systems: FidoNet. This long-distance electronic mail service can transport text or binary files to any one of the more than 150 Fido "nodes."

This is how *Fido* works: Allen's board accepts text from Cincinnati callers at local phone rates. Then, between 4 and 5 a.m. every

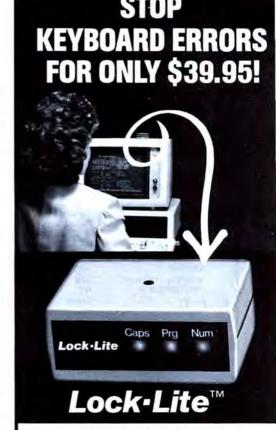
day it temporarily suspends normal operations to deliver its longdistance messages. First it bundles them, and then it whisks them to their destinations.

Since *Fido* processes several messages at a time, the service is speedy, and the rates are low. In most cases the charge for any message delivered within the continental United States is 25 cents. The rates are appealing even for overseas delivery—\$1 to Liverpool, England, for example, or \$2.75 to Djakarta, Indonesia, currently the farthermost point of the *Fido* empire.

Although the Fido program itself is free, long-distance phone costs add up, and some of the costs are passed on to users. Rates and payment procedures vary, depending on the volume of mail and the decision of the SYSOP. In some cases, the SYSOP requires the user to send \$5 to \$25 in advance, from which deductions are made. But even this hardly covers expenses. For example, Al De La Torre, a Miami-based SYSOP (305/554-4602) who charges \$25 for FidoNet, laments, "I've got \$9000 worth of equipment, which generates about \$200 in income." Every three months Lane Fowler of Atlanta (404/938-4808) throws a party for his subscribers, and they pass around the hat.

Currently, Allen Miller's company is underwriting many of the *Fido* board's expenses. Why does the company do it? "Primarily for

(continues)



Lock-Lite upgrades every IBM PC and XT keyboard beyond the capabilities of any keyboard—at any price!

- STOP guessing: Red and Green lights indicate CAPS LOCK and NUM LOCK state
- STOP the "surprises": LOCK-LITE beeps to tell you a LOCK key was hit, even if by accident!
- STOP hitting the wrong key: The keys around the shift and return keys 'beep' to warn you that you missed the key you wanted!
- STOP going "OOOOPS...": LOCK-LITE beeps a warning when you get unintentional lower case by shifting while CAPS LOCK is on!
- STOP worrying about "special" keys: Programmable Amber light beeps and shows the state of any key, even Control or Alt-plus-key combinations
- STOP the cord problems: LOCK-LITE adds
 4 feet of extension to your keyboard cable for greater mobility

Easy to install: just plug it in, put the unit wherever you like, and that's all! And LOCK-LITE is completely external—no software is required.

Why throw away \$200 on a new keyboard? LOCK-LITE *really helps* on spreadsheet and word processing programs!

Use LOCK-LITE for 3 weeks—if you don't love it, return it for a FULL REFUND!

\$39.95 INTRODUCTORY PRICE FOR A LIMITED TIME!

ORDER TODAY! Send Check or Charge it to VISA or MasterCard. Calif. Res. add 6% sales tax. Include \$4 per unit for shipping and handling!

LOCK-LITE, Dept. 105 513 WILSHIRE BLVD., SI SANTA MONICA, CA 904 Phone Order (213) 395-	401
Please Send L \$4 shipping and handling	LOCK-LITE units@\$39.95 plung per unit
Card No.	Exp. Date
Name	

Quantity discounts on orders of 10 or more

City, State, Zip ..

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-30 DAY SOFTWARE RENTALS[†]...

Every few months, *The NETWORK* saves its members more than \$24,000 and processes over 100,000 orders.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns including some of the most important names in the computer industry:

General Motors

Barclays Bank Gillette Bell & Howell **Hewlett Packard Hughes Aircraft** Citibank Columbia University IBM Data General ITT Exxon Kodak Farm Bureau Insurance Multimate Frontier Airlines **United Nations** General Mills Yale University General Electric Veteran's Administration

ATET

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and valuewise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE 1-800-621-S-A-V-E

In Illinois call (312) 280-0002 Your Membership Validation Number: W2X5

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 service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.

PERSONAL COMPUTER NETWORK 320 West Ohio Chicago, Illinois 60610

Call now . . . Join the PC NETWORK and start saving today!

FEATURED PRODUCTS!

10MB PC TAPE BACKUP	\$495.00
The same unit as used on COMPAQ's Des	skPro!
Configured for internal mounting	
EPSON PRINTERS (Unbelievable	Low Prices!

AST SIX-PACK PLUS w/64k	199.00*
FX-185 132 COL/160CPS	. 429.00*
FX-85 80 COL/160CPS	299.00*
LX-80 80 COL/100CPS	199.00*

AMDEK V310A IBM TTL AMBER 130.00*

Full Six Pack Features with Networking Capability
Outstanding Price!!!

TALLGRASS TG-5025 2,375.00* 25MG Hard Disk with 60MG Tape Backup

IBM Logo Full Height Drive 93.00*
Genuine IBM DS/DD-Not Equivalents!

IOMEGA 20MB Bernoulli 2,200.00*

*Members pay 8% above this wholesale price plus shipping.

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES!

	nipping an	d handl	TIONAL SOFTWARE ing for each title ordered from below.)	un.	
Bluebush Chess (Your Toughest Opponent) Bluechip Millionaire/Oil Baron or Tycoon	Wholes \$ 34.	00*	Microsoft Flight Simulator Mouse Systems PC Paint-Turn your	Whole \$ 2	7.00*
	19.	25° 75°	PC into A Color Macintosh!		9.95*
CBS Goren-Bndge Made Easy CBS Mastering the SAT CDEX Training for Word Star Comprehensive Intro to Personal Computing	45. 81.	00.	Scarborough Mastertype Sierra On-Line King's Quest	2	7.00
CDEX Training for Word Star	37.	25*	Sierra On-Line Crosstire Sublogic Night Mission Pinball	1	8.00*
	26.	50*	▶ Spinnaker Alphabet Zoo, Kinder Comp.	1	5.97*
Hayden Sargon III Individual Professor DOS	32.	.75° .50°	Story Machine, Face Maker, Hey Diddle Did Ryhmes & Riddles		
Individual The Instructor Infocom Zork Lor Witness	24.	50*	► Spinnaker Delta Drawing	2	0.77
Infocom Deadline, or Suspended	27.	.00*	➤ Spinnaker Most Amazing Thing Virtual Combinatics Micro Cookbook	2	1.00*
			SOFTWARE		
ATI How to use Multimate	shipping a \$ 42.		Micro Pro Wordstar 2000	\$22	2.00*
ATI How to use Microsoft Word	42	OO*	Micro Pro Wordstar 2000 MicroRim ABase 50xxi	32	25.00
ATI How to use Lotus 1-2-3 Ashton-Tate DBase III	42. 330.	00.	Microsoft C Compiler Microsoft Word—Latest Version 2 0	20	5.00*
Ashton-Tate Framework	330.	00.	Microsoft Multiplan Monogram Dollars & Sense	10	2.00
Borland Side Kick (Protected) Borland Turbo Pascal	25.	75*	Monogram Dullars & Sense Mosaic The Twin Multimate Multimate (Latest Version)	7	5.50*
Borland Turbo Pascal 8087 Borland Superkey Central Point Copy II PC	34.	75° 75°	Oasis The Word Plus	9	0.00
Concentral Instruments Clerk Close to	157	00*	Open Systems PIO Sales AIR INV GIL AIP Team Power Base Power Base	Mgr 31	0.00° e
Digital Research CP/M-86 Digital Research DR Logo	49.	00.	Real World G/L A/P A/R P/R or OE/INV	32	5.00°e
Digital Research Gem Desktop	75. 28.	00.	Rosesoft Prokey Version 4 Ryan McFarland RM COBOL (Dev. System) Sames Sames + Word Processor	52	0.00
Digital Research Gom Draw	73.	00,	Samna Samna + Word Processor Satelite Software Word Perfect	27	0.00° 5.00°
Enertronics Energraphics with Plotter Option Funk Software Sideways Harvard Prayed Project Manager Harvard Harvard Total Project Manager	235. 34. 185.	00.	Softcraft Fancy Fonts	12	5.00*
Harvard Harvard Total Project Manager	185. 225.	.00*	Softeraft Fancy Fonts Software Arts TK! Solver	20	5.00*
Hayes Smartcom II — New VT100 Emulator Human Edge The Management Edge Human Edge The Sales Edge Human Edge Mind Prober	68. 137.	.00*	Software Group Enable Software Publishing PFS File, Write, Graph	32	0.00*
Human Edge The Sales Edge	110.	.00*	Software Publishing PFS Report Sorcim Supercalc III	6	4.00
Lifetree Volkswriter Delux	135.	.50°	Sorcim Supercalc III Verbatim Disk Drive Analyzer	2	9.00° 5.00°
Lifetree Zolkswriter Delux NDBS Knowledgeman	225.	.00	Xanaro Ability	25	2.00*
			DWARE		
COMPLETE SYSTEMS	and n	andling	charges found in Italics next to price.) MULTIFUNCTION CAR	DS	
And the state of t	CALL		Apparat 256K Memory Board with 64K \$	81.00	(1.7
Apple Apple Its COMPAG Hard Lina Portable IMME Hard Diexit Einspur 3558 \$22	CALL		Apparat Combo II wiser/partigamei clock/stwr		12.4
Columbia Desktop & Portable Systems COMPAQ Hard Usk Portable 52	CALL ,255,00*	(48.70)	Apparat AT Ram Expansion card ► AST Six-Pack Plus with 64K	210.00° 199.00°	(2.5
10MB Hard Diski1 Floppyi256K			AST I/O Plus II	120.00*	(25
COMPAQ DeskProlTape Backup System 2 w/640K/1 Floppy/10MB Hard Disk/	,951.94"	63.70)	■ AST Advantage for AT ■ EVEREX Magic Cardi64K Full Six Packs features	375.00° 160.00°	12.5
wi640Ki1 FloppyI10MB Hard Diski 10MB Tape DrivelMontor IBM PC Base System 2DSDDFDC:256K IBM PC Professional Hard Disk	495.02*	72 55)	► ORCHID BLOSSOM W/OK	149.00*	
IBM PC Professional Hard Disk	,495.02* ,749.00* CALL	(32.55) (37.78)	Quadram Improved Quadboard W/0K	170.00°	(25
IBM PCIAT Reselled 1 2MR Florew 255K 2	CALL CALL	64 71)	➤ Tecmar Captain Multifunction Card IOK	146.00*	(25
IBM PC/AT All Configs IBM PC/AT Base Unit — 1.2MB Floppy/256K 2. Sanyo MBC 775 Color Portable IBM Clone 1. 2. Drives/Color Monitor/256K	,775.00°	38.00)	► Citizen MSP-10 NEW PRINTERS		15.7
Texas Instruments Professional	CALL		160CPS/80COL/Fric + Trac	265.00*	(5.7.
DISK DRIVES & CONTROL			► Citizen MSP-15 NEW 160CPS/132CQU/Fnc + Trac	390.00*	(8.4.
10mega Bernoulli Box Dual 10MG Drives \$2. Waynard WS-2 same as WS-1 but with		47.52) 20.30)	160CPS/132CCL/Fnc + 1rac ► Citizen MSP-20 NEW	390.00*	(8 4
Sandstar Floppy Controller (uses 1 slot)			200CPS/80COUFric + Trac ► Citizen MSP-25 NEW	510,00*	(110
Autoboot Drive: New lower price Drives by Shugart or Tandon	350.00*	(7.56)		315.00*	(6.8
PC Network 20MB INTERNAL 1/2 Height	440.00°	(9.50)	C. Itoh Prowiter 8510 AP + Epson LX-80 100CPS 80 CGL LG Made — New Model ⁽¹⁾	199.00	14.3
Drive—Drives by Tandon or Seagate			► Epson FX-85 ► Epson FX-185	299.00*	(6.4
Same Unit used in Compag's DeskPro!	495.00* (10 69)	Epson LQ1500	429.00°	(8.5
Same Unit used in Compag's DeskProl Panasonic Half Height DSDD Drive Pair PC Network Half Height Drives Our Volume	145.00° 69.00°	(3.10)	Epson LO1500 NEC 2030 20CPS LO Parallel NEC 2030 20CPS LO Parallel NEC 2050 3CPS LO Parallel NEC 2050 3CPS LO Parallel	605.00°	(13.0
Lets us Import These Brand Name Drives	69.00	(1.49)	NEC 3530 33CPS LO Parallel	960.00	120 7
Directly from the Source Tandon TM 100-2 Full Height DSDD Drive	93.00*	(2.20)	► NEC 3530 33CPS LO Parallel ► NEC 3550 33CPS Letter Quality Printer ► NEC 8850 55CPS Printer	960.00° 960.00°	(28.7
Tallgrass 25MB External Hard Disk 2 with 60MB Tape Backup	.375.00°	51 301	► Okidata Mi 182 New 120CPS/LD	200 00*	(43
Teac FD 55-8 Half Height DSDD Drives Teac 1 2MB Half Height Disk Drive for AT		(1.94)	Mode/FRIC/IBM Graphics + more ► Okldata ML 192 NEW Sleek Design 160CPS/	325.00	173
	110.00*	(2 40)	► Okldata ML 193 Steek Design 160CPS	455.00*	(9.8
MEMORY CHIPS			I TO Morris French BM Grandiers		100
64K Memory Upgrade Kits 19 corps) \$	5.40*	(1 00)	➤ Okidata NEW! Color 20 BOCPS:100 + Colors: LO Mode IBM Graphics: + More !Requires	Interface	(23
64K Memory Upgrade Kits // crips) \$ 64K Dynamic Ram Chips (Each) 256K Dynamic Ram Chips (Each) 126K AT Mother Board Chips (Each)	3.00	(1.00)	Okidata NEW! IBM Interface for Okimate	65,00*	115
	5.00*	(1.00)	Okidata ML84P 200CPS 132 COL	599.00*	(12.9
MODEMS	215 25	15 mm	Okidata 2410P Pacemark 350CPS 1 Oume Sprint 11/40 40CPS Letter Quality 1	,620.00° ,155.00°	(35.0)
Haves Smartmodem 300	125.00°	(5 00) (5 00)	Oume IBM Cable and Interface (required)	72.00°	(1.0
LATEST IN COMMUNICATION TECHNOLOG	568.00°	(5.00)	Star Micronics Powertype 18CPS LQ Texas Instruments 855 DP/LQ w/Tractor	300.00° 679.00°	(6.4
Hayes Smartmodern 1200B with new Smartcom II VT100 Emulator	317.00°	(2.50)	Toshiba P1340 80 COL/144 CPS	530.00*	(21 6
Hayes Smartmodem 1200B Alone	265.00°	(2.50)	VIDEO CARDS		
Prometheus Promodem 1200	355.00° 276.00°	(5 00) (6 00)	Hercules Color Card w/Parallel Port 5	142.00	(3.2
External 100% Hayes Compatible			 Hercules Monochrome Graphics Cards Paradise New Modular Graphics Card 	263.00° 235.00°	(2.5 (2.5
External 100% Hayes Compatible U.S. Robotics Password LOWEST PRICE 1200BPS Modern U.S. Robotics Couner 2400BPS Modern	195.00*	(4 00)	Persyst Bob Card Ultra High Res Color Card with Mone Quality Text in Color	365.00*	(2 5)
	450.00°	(5.00)	➤ STB Graphix Plus II NEW! (Simultaneous Mono Graphics & Color)	227.00	15.00
MONITORS Amdek Video 300G Composite Green \$	110.00*	(3.00)	ACCESSORIES AND SUP	PLIES	
Andek Video 300A Composite Art ber Andek Video 310A IBM Type Amber Andek Color 300 (NEWI) Composite	120.00°	(3.00)	► Brand Name DS DD Diskettes		17.0
Amdek Color 300 (NEW!) Composite	215.00*	(3.00)	Guaranteed for Life!! Not General DS/DD Bulk Pack Special	.79*e	
Amdek Color 600 (NEW!) High Res RGB Amdek Color 700 (NEW!) Ultia High Res Amdek Color 710 (NEW!) 700 wiNon	455.00°	(7 88) (9 83)	Packaged in 50 with sleeves and labels		
Andek Color 710 (NEW!) 700 w Non	485.00° /	10 48)	Guaranteed for Life!! ➤ PC Network Replacement 130 Watt IBM-PC	82.00°	(2.70
Princeton HX-12 RGB Manitor	CALL		Power Supply — Gives your PC (Old or New)	the same	
Princeton MAX-12E Supports Fither Moon or RGB Cards	CALL		for a piggyback unit) and large capacity dis SMA PC Documate, Keyboard Templates for	drives.	
Princeton SR-12 Ultra High Res RGB Guadram Quagetionie il NEW	CALL	(B 21)	Lolus DBASE/Mullimate and olners (Each)		(1.00
640x200 RGB w/14" Screen/	370.00*	(8 21)	Sony DS/DD Distatles	19.95° 39.95°	(1.00
Black Phosphor Mask/IBM Casii	89.50*	(5.00)	Sony AT High Density Diskettes WP Printer Paper 2600 Sneets	17.00	1100
Samsung 12" TTL IBM Type Amber A great looking/performing monochrome from the manufacturer of IBM's own		,_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Microfine Perfs (invisible when forn)		
color monitor	out of a		*PC NETWORK Members pay just 8% above price, plus shipping. All prices reflect a 3% or Minimum shipping \$2.50 per order. Internation	the who	iesale
Taxan 440 Highest Res RGB (720x400) Currently Available Works With Persyst Bob (Zenlth ZVM-123 Green High Res	525.00° (11.34)	Minimum shipping \$2.50 per order. Internation shipping & handling charges. Personal checks	al orders	call for
					THE PARTY

†RENT BEFORE YOU BUY — Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 14 (Regular) or 30 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services — JUST 20% OF THE MEMBER WHOLESALE PRICE. We feature over 1,000 available titles in IBApple/MAC and CP/M Formats. Hardware prices highlited by reflect recent major price reductions

COMPLETE SYSTEMS

IBM PC BASE SYSTEM

IBM PC w/256K

Floppy Drive Controller 2 Double Sided Double Density Disk Drives





IBM PC HARD DISK SYSTEM

IBM PC w/256K

Floppy Drive Controller 1 Double Sided Double Density Disk Drive Half Height 10MB Disk Subsystem

\$1,749.00*

CALL FOR LATEST IBM ANNOUNCEMENTS

COMPAG

PORTABLE HARD DISK SYSTEM

w/256K/1 Floppy/Hard Disk



\$2,255.00* w/10MB

\$2,429.00* w/20MB

DESKPRO SYSTEM WITH TAPE BACKUP

640K CPU/1 Floppy/Hard Disk 10MB Tape Drive/Monitor



\$2,951.94* w/10 MB

\$3,151.94* w/20MB

holesale Prices Change Rapidly…if you ever see a lower price advertised anywhere lease call! You will find the Network's Price will always be the best!

64K IBM PC MEMORY EXPANSION KITS

Quantity Discounts Available.

Guaranteed for Life!









Quantity of 100 Sets \$3.96* per set Set of 9 Chips \$5.40*

BRAND NAME DISKETTES

DS/DD Box of 10 Guaranteed for Life! Not Generic

\$8.95*

DS/DD Bulk Pack Special

Packaged in 50 Guaranteed for Life! Each

79*

1/2 HEIGHT DS/DD **DISK DRIVES**



The Network buys direct and makes fantastic deals with manufacturers like Tandon/CDC/Shugart/Qume/ TEAC/Hi-Tech and others to bring you fantastic prices on Name Brand drives for your PC/AT/XT/jr/or Compatible.

\$69.00*

Quantity Discounts Available



INTERNAL PC HARD DISK

Low Power/Automatic Boot, Works on standard PC's Compatibles. Includes drive/controller/cables/ mounting hardware and instructions.

> Full one year warranty! **10MB**



\$350.00* \$440.00*

Quantity Discounts Available

MultiMate[™]

Professional **Word Processor**

\$200.00*

*Members pay 8% above this wholesale price plus shipping.

CALL TOLL FREE 1-800-621-S-A-V-E (orders and memberships)

In Illinois call (312) 280-0002 Validation code: W2X5 TM-Registered trademark of IBM and COMPAQ

- NETWORK

. . . WITH THESE 15 UNIQUE BENEFITS

COST + 8% PRICING — The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available and all at just 8% above published dealer wholesale price.

2 OUR 600 PAGE WHOLESALE CATALOG — Members receive our 600 page wholesale catalog containing over 20,000 hardware and software products for the IBM PC, APPLE and over 50 other popular computer systems. THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY, NOW UPDATED QUARTERLY!

3 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a glant multi-million dollar inventory of most popular products, allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.

4 10 DAY RETURN POLICY—If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.

MEMBERSHIP SATISFACTION GUARANTEE—If for 5 any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS—The NETWORK nires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND. **EXPERIENCED CONSULTANTS**—The NETWORK hires

7 FREE TECHNICAL SUPPORT— The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!

†8 OPTIONAL BUSINESS RENTAL LIBRARY—All mem-bers can join our BUSINESS RENTAL LIBRARY featuring over 1000 available titles for just \$25 PER YEAR above the base over 1000 available tilles for just \$25 PER YEAR above the base membership fee. This entitles you to rent business software AT JUST 20% of the DISCOUNT PRICE FOR A 14 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 30 DAYS for just \$30 above the V.I.P. base fee. This also includes the game library privileges for a \$5 combination

† 9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY—
The Game Rental library is available to members for just \$10
PER YEAR and permits evaluation (or just enjoyment) of any
game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS—THE PRINTOUT
The Printout contains all the New Product listings and price
changes you need to keep your Catalog up to date. Also, we buy
excess dealer inventories, and store bankruptcy closeouts, which
we turn around and make available to our members at fantastic
savings via THE PRINTOUT. savings via THE PRINTOUT.

1 1 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users (see opposite page left). The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

4 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION—The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up but are mostly down!!! THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!

Circle 460 on reader service card

ZeroDisk ZeroDisk ZeroDisk

Run Protected Software from a Hard Disk.

ZeroDisk lets you run dozens of popular business software packages without floppies. Call us for the latest list of software it handles. ZeroDisk needs an IBM PC or XT or AT or compatible, running under DOS version 2.0 or higher. It occupies 10k bytes of memory. ZeroDisk is not copy-protected.

ZeroDisk is revised monthly. You may get revisions for an \$18 US trade-in fee.

To order ZeroDisk, send a check for \$75 US, or call us with your credit card. We will ship the software within a day.



Quaid Software Limited

45 Charles Street East, Third Floor Toronto, Ontario M4Y 1S2 (416) 961-8243 goodwill," Allen explains. But there's also a practical reason for running the board—adapting the wealth of public domain software for use within the company. Allen's board currently contains over 1500 MS-DOS public domain programs and maintains over 800 subscribers. "With our electronic library, we're not forced to make phone calls to someone else's system to hunt down a program."

The biggest problem Allen and other Fido SYSOPs face is familiarizing users with the FidoNet mail service. Most of the operators enthuse over the mail capabilities and lament the meager use made of the mail service. Tony Clark (314/441-9297) of St. Louis pinpoints the problems: "First, you have to get the user to notice the mail service. Most people assume that it's just for local messages and don't investigate further. Second, since we don't have an extensive directory like The Source, users don't know who to address their mail to."

The equipment Allen has access to would make most SYSOPs green with envy—an IBM PC AT with two hard disks totaling 55MB. The system has been adapted to receive calls from two phones; if one line is busy, the system automatically transfers the caller to the other. In addition, Allen maintains a PC at home to communicate with the board at work.

(continues)

LIKE DEC VT-52 AND VT-100, IBM 3101-MOD 10/20, DG DASHER 210/211 AND MORE.

The Magnum MCS-A (Multifunctional Communications System-Asynchronous) gives your IBM PC or compatible something quite unheard of.

Unlimited terminal emulation capability. And total application flexibility.

So, not only are you able to talk with the popular terminals we've just mentioned, you're able to implement those additional emulations you need now. Or may need later on, even if they don't exist yet.

That's more than unlimited terminal emulation, come to think of it. That's the end of upgrade costs and reaction times, too.

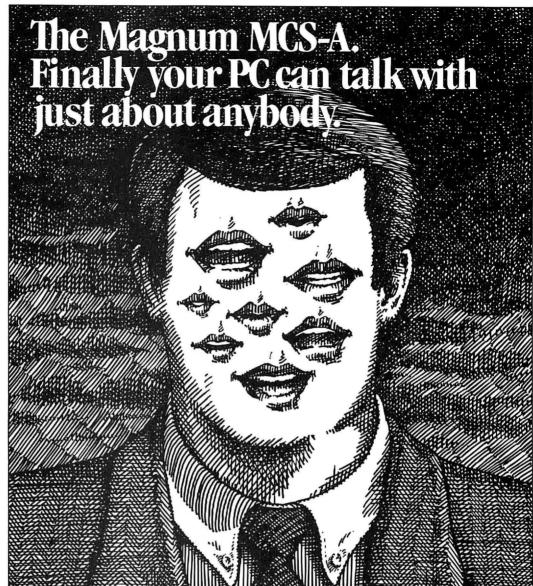
The MCS-A incorporates
TurboCom[™], our innovative software package with proprietary
translation mechanism. And it's
TurboCom that delivers MCS-A's
unlimited emulation capability
and allows you enhanced file
transfer control.

SPEAKING OF UNLIMITED EMULATION.

Let's take one example. With the MCS-A, your PC is now able to emulate a VT-100 standard terminal and receive a data file. Then, thanks to TurboCom, you can immediately change your emulation to another type terminal—say a 3101—and send the received file locally or via the phone system.

AND A WORD OR TWO ABOUT FILE TRANSFER APPLICATIONS.

Now, with the MCS-A on board. you'll be able to update a central, unattended PC's "old" data files with "new" data from either a local or remote user without jeopardizing other files on the unattended PC. On the flip side, vou can transmit a predetermined file from an unattended PC to a designated remote or local user. The MCS-A's asynchronous system also allows you to exit TurboCom while maintaining a telephone line connection, locally process a just-received file, then reenter TurboCom and transmit that processed file back to the source computer.



WHO'D BELIEVE ALL THIS IN ONE EXPANSION SLOT?

Our talk of the MCS-A's asvnchronous telecommunications features (Bell 212-A modem standard) has just begun. You'll have support of COM 1/COM 2, plus COM 3. 200-number telephone directory with built-in editor and a library of enhancements such as on-screen call status reporting and single stroke adaptive dialing. There's a user applied "macro" control language. Error-free data exchange using XMODEM protocol. Optional touch-tone reception for database query and data entry. And it all comes with extensive help screens and messages, documentation, factory support and local servicing.

Enhancements include standard multifunction features (I/O ports, memory expansion, clock), plus TurboRam™ electronic diskette emulation and TurboSpool™ print spool program.

Yet, with all this exceptional enhancement to your PC, the MCS-A requires only one expansion slot. That's right, one!

WE'VE ALREADY SAID A MOUTHFUL.

But there are many more good reasons and some helpful data to consider about the MCS-A. Contact us now. Call 800-824-2748. (In Texas, call 800-833-8391). Or send us the coupon; attach your card if you prefer. Let's talk about how your PC can talk with just about anybody.

Magnum MCS-A, TurboCom, TurboRam and TurboSpool are Trademarks of American High-Tech Industries XT-52 and VT-100 are Trademarks of Digital Equipment Corp. 3101-MOD 10/20 is a Trademark of International Business Machines. DASHER 210/211 is a Trademark of Data General.

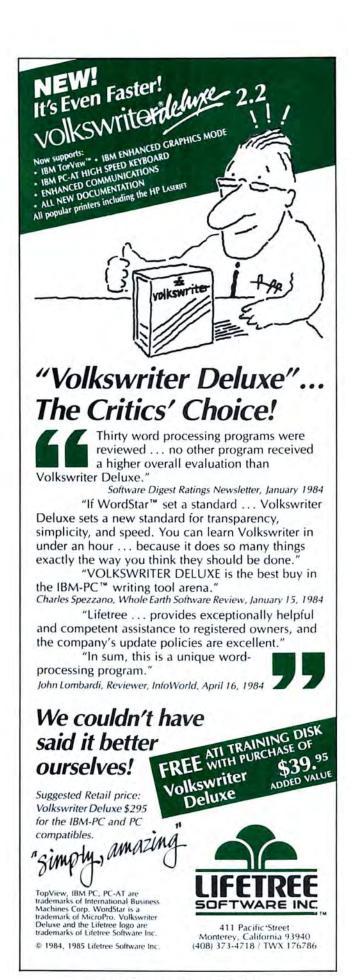
NAME	TITLE
FIRM	PHONE
ADDRESS	
CITY	STATE ZIP

AMERICAN HIGH-TECH

American High-Tech Industries, Inc. Eleven-One-Eleven Wilcrest Green Dr., Suite 201 Houston, TX 77042 (713) 952-7332

VISA and MasterCard accepted.

Circle 779 on reader service card

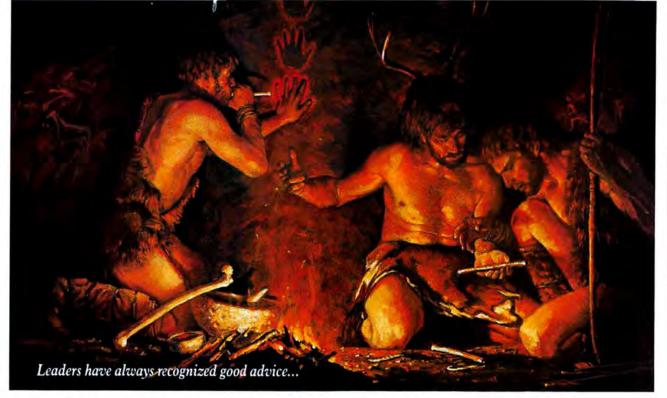


Like any bulletin board, Allen's requires attention—about an hour a day. At 8 a.m., before the business day begins, Allen hunches over his computer to perform housekeeping functions. Only twice has he had to remove profanity. That's probably because the board operates without charge to the subscriber. It's amazing how ornery and vile users can become when a SYSOP announces a modest \$10 fee to help defray expenses.

Fido's creator is Tom Jennings, who works for Phoenix Software and dwells at FidoNet1 in San Francisco (415/864-1418). In 1983 Jennings placed Fido in that hackers' heaven known as the public domain. The curious name of the program originated with one of Jennings' co-workers, who playfully referred to the motley assortment of components Jennings had assembled as a mongrel.

On Thanksgiving in 1983, Jennings and John Madill (301/484-2831) established the first two Fido boards. By May 1984 the two boards had multiplied to 20, by September to 50. Now the network comprises almost 200 bulletin boards, each with approximately 200 members, indicating a total membership of 40,000.

(continues)



Bring your company's presentation graphics into the computer age with the best recommendation you can make: Hewlett-Packard.



Hewlett-Packard's Graphics
Plotters introduce professional-quality
graphs and charts to the office...
quality that, quite frankly, makes the
competition look stone-age by
comparison.

Combine our brilliant color capability, precise line quality, and proven reliability—and HP becomes the obvious choice for your presentation graphics needs. When it comes to plotters, it's easy to see why HP has become the world's Number One recommendation.

Compare the quality of an HP Plotter...

Before making *your* graphics plotter recommendation, find out how HP stacks up against the competition. Here's a quick checklist:

Are the lines sharp and bold? Do they meet precisely? Are the diagonal lines smooth? Is the text easy to read? In a chart, is the area fill uniform? With HI? the answer is always yes, yes, and...yes.

Runs with leading PC's and software packages.

HP Graphics Plotters are compatible with most of the personal computers in your office, including IBM, Compaq, and AT&T-as well as a host of HP computers. You even have a choice of many off-the-shelf software packages, such as Lotus 1-2-3" and Symphony,"** that give you "first-day" productivity.

Send today for your FREE sample plots and see exactly what we mean.

Return the coupon—or call us tollfree at (800) FOR-HPPC. We'll send you a detailed brochure, a list of available software, plus sample plots from both an HP Graphics Plotter and a leading printer. Don't resort to stone-age methods before seeing the difference an HP Graphics Plotter can make. Call Hewlett-Packard today.

*1-2-3 and Symphony are trademarks of Lotus Development Corporation.

Leadership in Business Graphics. For Leaders in Business.





YES, I'd like to make the most informed business graphics recommendation I can. Please send me your detailed brochure, plus sample plots so I can see exactly what my company's presentations have been missing. I understand I will receive this information without cost or obligation.

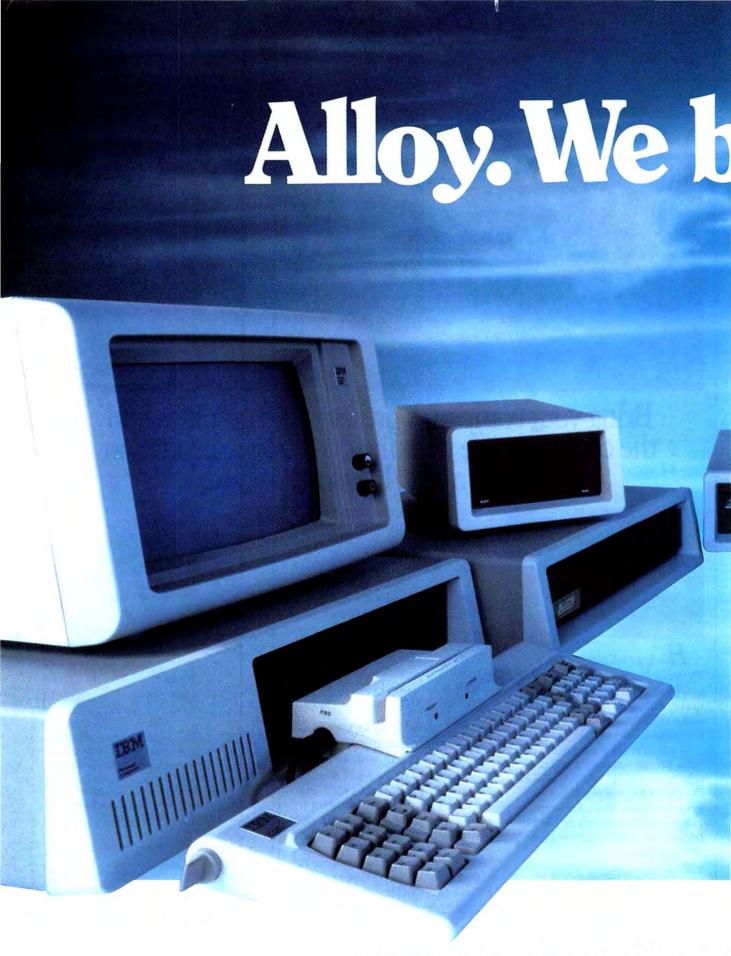
Name	
Title	
Company	

City State Zip

Mail to: Howlett-Packard 16399 W Bernardo Dr

Mail to: Hewlett-Packard, 16399 W. Bernardo Dr. San Diego, CA 92127-1899. Attn: Marketing Communications. 11502 PWO

Circle 810 on reader service card



And AT&T, Columbia, Compaq, Corona, Eagle, TI Professional, QICSTOR-PLUS, PC-DISC, PC-BACKUP, PC-CARD, and PC-9 TRA



nith. With PC-QICTAPE, PC-STOR, PC-SLAVE/16, PC-QICSTOR, e Alloy's full line of innovative products in action at your local dealer.

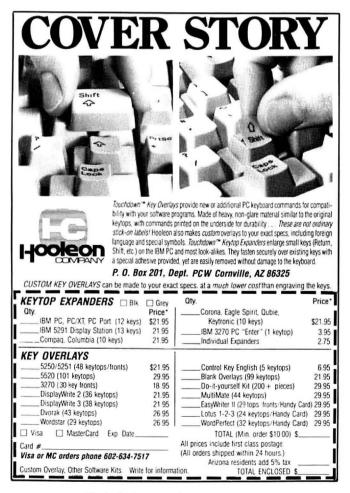
Computer Products, Inc.
Circle 315 on reader service card

Fido has become so successful that Jennings is now attempting to extricate himself as project guru. "Last week I answered 400 messages for help. It left me numb. Thank God for Ken Kaplan and Ben Baker of St. Louis, who handle the administrative details."

How large Fido can grow is anyone's guess, but if you've a mind to add your own SYSOP voice to the Fido chorus, it's easily done. Any member of the network can supply you with the software on request. Once you have the system operational, contact Ken Kaplan (314/576-2743) at node 51 in St. Louis to be listed. Then you and Fido can be off and barking. -Stan Sulkes

Judy Getts is a freelance science writer in Wauwatosa, Wisconsin. Stan Sulkes is a freelance writer and professor of English at Raymond Walters College in Blue Ash, Ohio.

Password: Communicate welcomes contributions from readers, and we'll pay up to \$50 for the items we use. Please include your name, address, and phone number with your contributions: send them to Password: Communicate, PC World, 555 De Haro St., San Francisco, CA 94107.



PRINTERS USED TO BE BLA BLA **NOW IT'S BLAHA!** FOR EASY TO USE LASER PRINT

A complete document creation tool for the HP LaserJet. Lets you access all features with easily learned commands. It works with any word processing editor on IBM PC's and PC word processing editor on IBM PC's and PC Compatibles. NOT COPY PROTECTED.

Over 100 Simple Commands.

Easy Font Selection and Formatting.

Quickly Adapt Documents for Printing. Do All Your Printing In-House.

Works With Spreadsheets, Database Report Generators, and Other Software. Easy Design Of Logos, Fonts, Diagrams.

ENHANCED GRAPHICS VERSION Offers All the Above Plus Form Generation With Boxing & Shading (11 Types of Shades). Graphic Features for Creating Artwork, and Diagrams with Simple Commands for Circles, Disks, Ellipses, and Ovals in Varying Thicknesses And Shades. Simple Commands for Circles, and Ovals in Varying Thicknot Exploit the Full Capabilities of The LaserJet.

NEW CANON LASER BEAM VERSION \$199 Offers Complete Access to All the Page Typesetting Features of the Canon Laser Printer. Laser Print can Generate Forms with Boxing, Shading, Page Overlays, Character Enlargement, Easy Font Selection, White on Black Printing, and Shaded Printing.

BLAHA SOFTWARE - JANUS ASSOCIATES Suite 701, 50 Commonwealth Ave., Boston, MA 02116. (617) 236-1892 MC/Visa.

Circle 507 on reader service card

EASY COME.



EASY GO.



THE VERSATILE ARK 24K **Everything You Want in a Dial Modem**

With a flash of its front panel control, the ARK 24K can make simultaneous transition from low-speed applications to 2400 bps. And it's the only full-duplex dial modem on the market with separate Synchronous and Asynchronous connectors.* It's fast, versatile, easy to install, and very easy to use. ARK engineers designed the 24K to bridge the gap between yesterday's terminal requirements and the PC requirements of the future. The ARK 24K...we've got you covered coming and going!

- · Complete front-panel operation with help commands, continuous visual and audible monitoring of call progress, command, and online modes of operation as well as complete terminal and front-panel monitoring of both local and remote modem status.
- · Full menu of automated dial services including auto dial from front panel or terminal, telephone directory, and tandem dialing.
- · ARQ error-free transmission based on MNP**.
- HayesTM "AT" Mode Compatible.
- · Universal Compatibility.
- Stand alone or rack mount. Nationwide on-site service available.

Order today. Call toll free: 800-228-0914

For free brochure, call (305) 724-5260, or write ARK Electronic Products, Inc., Dept. C, P.O. Box 2169, Melbourne, FL 32902-2169.

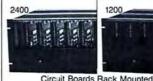
*U.S. patent pending "MNP is a proprietary product of MICROCOM, Inc.

*** IBM is a registered trademark of International Business Machine Corp.

THE FIRST FAMILY OF DIAL MODEMS











"...ABOUT AS EASY AS BOOKKEEPING WILL EVER

READY TORUNACOUNTING
ACCOUNTING
IOTUS
123
SYMPHONY
SYMPHONY
by William Urschel
by William Urschel
accounting Software

GET. Ricardo Birmele, LOTUS MAGAZINE

TURN LOTUS 1-2-3 OR SYMPHONY INTO A PROFESSIONAL ACCOUNTING SYSTEM

Alfred's Ready to Run Accounting is a powerful, automated accounting software package that runs on either Lotus 1-2-3 or Symphony. It is designed for any sort of small or medium-sized business that writes 500 or fewer checks a month. It is easy enough for a complete computer novice to use, but allows experienced Lotus user the flexibility to expand and change.

INTRODUCING

TWO NEW MODULES THAT INTEGRATE WITH THE GENERAL LEDGER, OR STAND ALONE!

GENERAL LEDGER

The core of the Ready to Run system, this module allows you to keep track of cash receipts, cash disbursements, accounts receivable, accounts payable, and journal entries. It provides 7 different reports: chart of accounts, trial balance, journals, billing statements, detained general ledger, balance sheets, and profit/loss statements.

- Fully-adjustable chart of accounts
- Over 1500 possible accounts
- · Over 1000 transactions per month
- Accrual or cash based
 13 periods
- · Audit trail
- · Double-entry, menu-driven input
- · Allows multiple-postings per month

ACCOUNTS PAYABLE (with check writing)

This professional AP system lets you create and update a vendor file (with addresses, phone numbers, key contacts, and account histories); input invoices; create an AP journal; and select items for automatic check printing. Used with the general ledger module, all transactions are automatically updated to the general ledger at your request.

- · Over 1000 possible vendors
- Two-part check printing allows multiple-postings for each check
- · Allows multiple checking accounts
- · Detailed payables and check journals
- Custom checks available separately

ACCOUNTS RECEIVABLE (with invoice writing)

This complete AR system greatly expands the power of the general ledger or can run by itself. It enables you to create and maintain a customer master file (with addresses, phone numbers, key contacts, and sales histories); create and print invoices; print monthly statements; and post payments.

- Over 1000 possible customers
- Customer aging reports
- · Detailed journal reports
- · Either open item or running balance systems
- · Prints invoices and statements
- · Custom forms available separately

... only \$49.95 each

General Ledger - \$49.95

REQUIRES: Lotus 1-2-3 (version 1A) or Symphony; any IBM PC, PCjr, XT, AT, or any MS-DOS or PC-DOS computer (please specify model and disk type); two disk drives (floppy or hard); printer: 256K RAM for 1-2-3, 448K for Symphony.

ORDER TOLL-FREE!

For Visa & MasterCard orders only, call toll-free Monday-Friday, 8 AM - 5 PM (Pacific Time). 800 - 292 - 6123 (Continental USA) 800 - 821 - 6083 (California)

For additional information: 818 - 995-8811, Available at many computer and book stores nationwide. Dealer & Distributor inquires welcome.

READY-TO-RUN ACCOUNTING

All orders shipped UPS. No COD or Purchase Orders. Allow 3 weeks for delivery.

Accounts Payable - \$49.95

Accounts Receivable - \$49.95

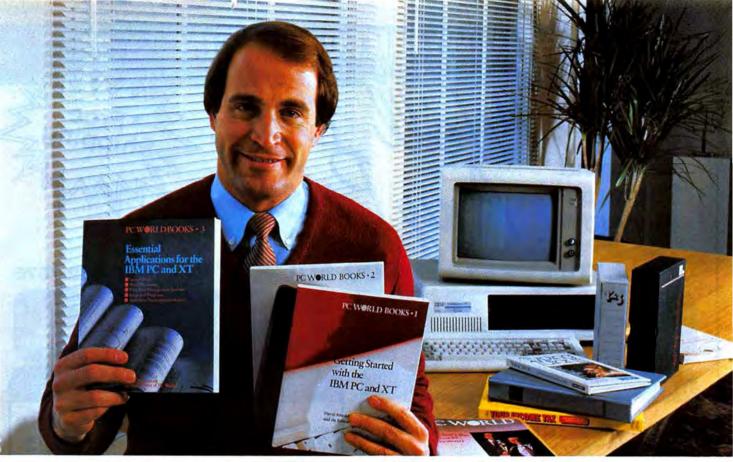
Shipping & handling \$5.00

CA residents add 6% tax

TOTAL

NameAddress	□ Visa □ MasterCard Card #	☐ Check ☐ Money Order Expiration Date		
City/State/Zip	Signature		Dapration Date	
Phone (day) ()	Type of computer		Disk size: □ 3½" □ 5¼"	

ALFRED PUBLISHING CO., Inc. 15335 Morrison Street, P.O. Box 5964, Sherman Oaks, California 91413



There Are Times When Having The Right Name Really Counts For Something.

Today's computer world is a jungle. With so much to choose from, you have to be wary. Computers in all sizes, priced for any budget. And enough accessories and software to make your head spin.

Then there are the books that are supposed to help you through all this. About 3,000 of them at last count. If you have time, you could check them all. But there is a better way. Look at the name. That's what smart buyers do. They go with a name that's been around. One with a reputation for excellence. One they can trust. A name like **PC WORLD BOOKS**, written by the editors of PC WORLD, a standout in the computer field.

All three books are reader friendly, each taking you step by step through every area of PC operation.

Book 1, GETTING STARTED WITH THE IBM® PC AND XT, is a total guide covering keyboard, disks, and operating systems (DOS 1.10 and 2.00). It shows you how to set up electronic files, work with BASIC, determine software needs, maintain your machine, plus a lot more.

Book 2, HOW TO BUY AN IBM PC OR COMPATI-BLE COMPUTER, will help you through the computer jungle by making sense out of the many choices you have when buying a PC, saving you days trying to decide which PC configuration is for you. It will also help you choose disk drives, displays, printers, and software of every kind.

Book 3, ESSENTIAL APPLICATIONS FOR THE IBM PC AND XT, is an introduction to the full range of business applications for the PC: disks, spread sheets, word processing, data base management, integrated programs, and other productivity software.

1BM is a Registered Trademark of International Business Machines Corp.

All three PC WORLD BOOKS are on sale now at book and computer stores. The price is low for a safe journey through a jungle.

PC W\RLD BOOKS

To order call TOLL FREE: 1-800-437-4400. Ext. 807. American Express, Visa, MasterCard only. Add \$2.00 per order for postage and handling. Or use this coupon.

my check, money order, or credit card information. # of copies
Getting Started (49277-2)
Essential Applications (49279-9) @ \$16.95 =
Add Sales Tax Where Applicable Postage and Handling Total \$
Name
Address
City State Zip
Tel. #
Credit Card Orders: []Visa []MasterCard Exp. Date:
Signature



We Welcome Corporate **Accounts**

DISCOUNT MICRO SALES, INC.

CALL TOLL FREE

-800-MICRO SL /1-800-642-7675

BORLAND SIDEKICK \$29

r:BASE 5000

PFS: FILE, GRAPH, PLAN

THINK TANK

MODEM: HAYES 1200B \$329

PRINTER: PANASONIC 1090-\$199 1091-\$299

BOARDS: HERCULES. COLOR-\$159 GRAPHICS \$299

Coltware

30/000		
	LIST	OUR
ASHTON TATE, dBASE III	695	364
BORLAND INTERNATIONAL		
Sidekick (Protected)	55	29
Sidekick (Non-protected)	85	49
BRODERBUND SOFTWARE Bank Street Writer	80	49
BPI SYSTEM		
Job Cost Accounting, Inventory General Acct., AR, AP or PR	595	485 365
Funk Software, Sideways	60	39
Fox & Geller, Quickcode II or Quickcode III	295	154
dGraph II or dGraph III	295	154
dUtil III	99	59
Harvard Total Project Manager	495	264
SORCIM/IUS, Easy Writer	350	198
GL, AR, AP, OE, Inventory	595	298
LIFETREE, Volkswriter deluxe	295	159
LOTUS, 1-2-3	495	CALL
LOTUS, Jazz	595	375
MECA, Managing Your Money	200	114
MICROPRO, Wordstar 2000	495	255
Wordstar 2000 +	595	295
MICRORIM, rBASE 5000	700	379
MICROSOFT, Word	375	229
Multiplan	195	119
MICROSTUFF, Crosstalk	195	94
MONOGRAM, Dollar & Sense	180	104
MULTIMATE	495	239
PEACHTREE SOFTWARE, all systems	CALL	CALL
PETER NORTON, Utilities	100	58
SOFTWARE ARTS, TK Solver	400	244
SOFTWARE GROUP, Enable	695	369
SOFTWARE PUBLISHING		
PFS: Report	125	74
PFS: File, PFS: Plan, PFS: Graph, or PFS: Write	140	82
PFS: Proof	95	59

Hardware

	LIST	OUR
ACCESSORIES		
CH PRODUCTS, Mach III w/Fire Button	55	36
KOALA, Touch Tablet w/Software		94
KENSINGTON, Masterpiece		94
PC Saver Line Cord w/Filter		34
MOUSE SYSTEMS, PC Mouse & Paint		139
MEMORY CHIPS, CABLES, POWER BACKUPS, CLEANING KITS, COVERS, PAPER,		127
PROTECTORS, FLOPPIES, etc.	CALL	CALL
BOARDS	TO CONTRACT	- 74.77
AST, Mega Pak (256k)	495	349
AST, Advantage (128k)		409
HERCULES, Color		159
HERCULES, Graphics		299
QUADRAM, Quadboard (256k)		349
PARADISE, 5 pack		164
TECMAR, Captain Multifunction (64k)	289	199
COMPUTERS		
IBM, APPLE, COMPAQ others,	CALL	CALL
HARD DISKS		
MAYNARD, 20 mb int. w/Cont Roller	1400	894
IOMEGA, TALLGRASS, CORVUS, others,		CALL
MODEMS		
HAYES, Smartmodem 1200b	489	354
Smartmodem 1200b (w/Smartcom II)	549	369
Smartmodem 2400	899	629
PROMETHEUS, Promodem 1200b		259
Promodem 1200	495	329
MONITORS		
AMDEK, 310a (Amber)	230	149
Color 300	349	244
Princeton Graphics, Taxan, Quadram, etc	CALL	CALL
PRINTERS		
PANASONIC, P1090	349	209
P1091		299
TOSHIBA, P1340 (144cps)		619
P351 (288 cps)		1369
EPSON, OKIDATA, NEC, many others		CALL

Call For Over One Orders 24 Hours **Thousand Additional Items**

Products listed for IBM PC only. Call for Apple and other Micro Systems.

Low Prices, Fast and Friendly Service.

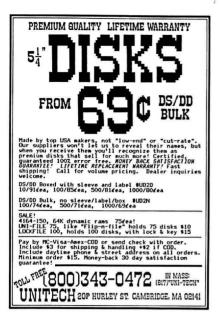
*Free UPS shipping on all orders over \$700(printers and monitors may be extra, call for details) ORDERING INFORMATION AND TERMS:

Prompt UPS service ● No surcharge for credit cards ● Visa, Mastercard and American Express orders processed same day ● Price guarantee — We'll beat any price in this magazine with same terms — call toll free ● Allow 2 to 3 weeks for checks to clear ● Full guarantee against manufacturers defects ● Prices may change ● Authorized purchase orders and C.O.D. accepted

Discount Micro Sales, Inc. 6900 East Indian School Road Scottsdale, AZ 85251

For Faster Service Call Toll Free 1-800-MICRO SL or 1-800-642-7675

Arizona Resident or for Customer Service Call 602-947-2808



Circle 599 on reader service card



Circle 850 on reader service card





Circle 721 on reader service card





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 and many others, Send \$29.95, check, M.O., Visa & MC include exp. date. Specify computer type. Dealer inquiries invited. Free brochure avail.

Merritt Computer Products, Inc. 2925 LBJ Fwy. #180 / Dallas, Texas 75234 (214) 942-1142

Circle 639 on reader service card



Circle 684 on reader service card

64K • 128K • 256K DRAMS 80287-8 80287-3

8087-3 8087-2

BITTNER **ELECTRONICS**

899 SOUTH COAST HIGHWAY LAGUNA BEACH, CA 92651 (714) 497-6200

PLEASE CALL FOR FACE CATALOG

Circle 622 on reader service card

LIONHEART

BUSINESS & STATISTICAL SOFTWARE

late a problem correctly and to determine what type of analy will be most valuable."	Sis
BUSINESS STATISTICS\$14	5
EXPERIMENTAL STATISTICS	5
MULTIVARIATE ANALYSIS15	0
QUALITY CONTROL & INDUSTRIAL	
EXPERIMENTS12	5
FORECASTING AND TIME-SERIES	5
• SALES AND MARKET FORECASTING 14	5
• DECISION ANALYSIS TECHNIQUES 11	0
. LINEAR & NON-LINEAR PROGRAMMING 9	15
PERT & CRITICAL PATH TECHNIQUES 9	15
MONTE CARLO SIMULATION	25
• OPTIMIZATION11	0
PC/MS-DOS, Macintosh, some CP/M	
VISA, MasterCard, AMEX, Check	1
P.O. Box 379, ALBURG, VT 05440	

Circle 733 on reader service card

(800) 628-2828 Ext. 505

DO EVDANCIONO

(514) 933-4918

PC EXPANSIONS
AST SixPakPlus (64k) \$259 SixPakPlus (384k) \$299 MegaPlus (64k), \$269 Advantage (128k), \$419 Advantage (1.5M), \$679 I/O Plus \$129 PCnet - starter kit \$809 Quadboard (384k), \$199 Quadboard (384k), \$249 Quadmeg-AT (128k), \$319 Quadmeg-AT (2M), \$669 Quadport-AT, \$105 HERCULES graphics board, \$319 Color Card with PP, \$159 HAYES Modems: 2400, \$5call
State
VLM Computer Electronics 10 Park Place ● Morristown, NJ 07960 (201) 267-3268 Visa, MC, Check or COD.

OPT-TECH SORT™

SORT/MERGE Program for the IBM-PC, XT, AT & Compatibles **Btrieve Files Now Supported**

- Written in assembly language for high performance Example: 4,000 records of 128 bytes sorted to give key & pointer file in 30 seconds. COMPAREI
- · Sort ascending or descending on up to nine fields
- Ten input files may be sorted or merged at one time
- Supports many file structures & data types
- Filesize limited only by your disk space Output file can be full records, keys or pointers
- Can be run from keyboard or as a batch command
- · Can be called as a subroutine to many languages
- Easy to use Fully documented
- \$99 VISA, M/C, Check, Money Order, COD, or PO Quantity discounts and OEM licensing available

To order or to receive additional information write or call

OPT-TECH DATA PROCESSING

P.O. Box 678 Zephyr Cove, Nevada 89448 (702) 588-3737

Circle 950 on reader service card

Lotus™ User?

Free Mail Order Catalog for Lotus Software users, includes:

- Lotus Programs
- Lotus Enhancement Software
- **Books and Training Aids**
- Hardware and Utilities

We are a unique mail order company specializing in Lotus related products.

4-5-6 WORLD P.O. Box 22657 Dept. A-101 Santa Barbara, CA 93121 (800) 524-5678 Toll Free (805) 564-2424 In California



Your definitive Lotus enhancement source

Circle 854 on reader service card

Softerm PC emulates over 30 popular terminals including the:

- DEC VT102, VT220
- Data General D200, D410
- IBM 3101-20 (block mode)
- Hewlett-Packard 2622A
- Honeywell VIP7801, VIP7803

Guaranteed Compatibility Call for free product brief \$195 MC-VISA-COD For the IBM PC/XT/AT, DG1, NEC, Wang PC, TI Pro, Gridcase, Tandy

SOFTRONICS

3639 New Getwell, Suite 10 Memphis, TN 38118 901-683-6850

Circle 792 on reader service card

IBM AT 3Mb COMBO CARD



The AT Multifunction Card that can give you up to 3Mb of added memory plus added I/O features.

Expandable from 128K to 3Mb. Add memory as you need it. • IBM AT Compatible · Parallel Port · Serial Port · Spooler · Supports IBM VDISK · User Upgradable . Parity Checking Standard . Split Memory Addressing.

Complete with 128K RAM, Serial and Parallel Port . \$109 AT RAM Expansion Card (ØK). Additional RAM available at our low prices. OTHER ADD ONS 384K

RAM/ Clock, 512K RAM Card, Spoolers, RAM Cards for PPCs and more.

Apparat,Inc. ND ON AND ON AND ON AND ON

4401 So. Tamarac Parkway / Denver, CO 80237 / 303/741-1778 ORDERING AND DEALER INFORMATION

800/525-7674 Stores in Denver & Chicago / *On all cards sold after June 1, 1984

Circle 10 on reader service card



- Easy to use. Menu driven. Full-screen data entry, editing. Transformations. Help screens.
- Cross plots, histograms, time series plots.
- Basic statistics, cross tabs, ANOVA.
- Multiple regression with residual analysis.
- Curve fitting, exponential smoothing, autocorrelation, seasonality.
- Interface with Lotus 1-2-3, VisiCalc. dBase II and ASCII files

THE FUTURES GROUP

76 Eastern Boulevard Glastonbury. CT 06033 (203) 633-3507

Circle 532 on reader service card



CALL! Sampler Pack of **Project Management Software** on its way in 24 hours!

The wisest phone call you'll ever make! Includes: PMS-II, RMS-II, MMS-II, HARVARD TOTAL PROJECT MANAGER, PERTMASTER, HORNET, TIMELINE, SORCIM SUPER PROJECT, MORE. PLUS! Staff of Project Managers & Microcomputer pros provide CUSTOMER SUPPORT! One call does it all!

P.O. Box 8405 Ahal, Inc. Santa Cruz, CA 95061-8405

Circle 41 on reader service card

TOPVIEW SPOOLER

TV SPOOL is a TopView specific program which provides printer spooling capabilities normally found on large operating systems.

TV SPOOL incorporates the same user-friendly menu style as TopView and enhances the TopView environment with a flexible mechanism for printing files.

- Previous Page Buffer
- Backup and Advance
- Banner Processor
 OOS 31 Separator Format

INTRODUCTORY PRICE IS \$60.00 Visa, M/C Accepted

RIX Softworks, Inc. 17971-E Skypark Circle • Irvine, CA 92714

(714)261-0440

Circle 469 on reader service card

EMULATE HP TERMINALS WITH YOUR IBM PC

Now your IBM Personal Computer can be used as a Hewlett-Packard 26XX family terminal. Instead of just a terminal, you'll have a general purpose microcomputer. VDTE 2.1 is the powerful, easy to use terminal emulation program that provides the features you need!

HP2624, HP2648 and DEC VT52 modes Block/format mode

Eight displayed softkeys (program controlled) Subset of HP2648 vector graphics

Supports both serial ports simultaneously Fourteen pages of off-screen scrolling memory Ten speeds include 300, 1200 and 9600 baud ASCII file transfer between PC and host

Price: \$200. Visa and MasterCard welcome



Inner Loop Software 5456 McConnell, Ste 120 Los Angeles, CA 90066 (213) 822-2800

Circle 624 on reader service card

PC-WRITER T.M.



IBM PC GRAPHICS LETTER QUALITY Enhancement for Okidata ML82A/83A Dot Matrix Printers

- Plug-in module easily installs in printer.
 Draft (120 cps) & Letter Quality (30 cps)
- Elite character pitch
- Front panel access to all features
 Full emulation of IBM PC graphics printer

- printer
 Superscripts / subscripts
 Foreign / scientific characters
 Works with print screen key in graphics and text
 Prints all 228 display screen characters and box drawing symbols exactly as they appear on display (double line as well as single line box symbols)
 Many other features

RAINBOW TECHNOLOGIES, INC.

17971-E Skypark Circle, Irvine, CA 92714 (714) 261-0228 Telex 386078

Circle 328 on reader service card



Circle 506 on reader service card



Circle 989 on reader service card



Circle 288 on reader service card

MEMOREX FLEXIBLE DISCS

WE WILL NOT BE UNDER-SOLD!! Call Free (800)235-4137

for prices and information. Dealer inquiries invited and C.O.D.'s accepted



Circle 576 on reader service card

FLOWCHARTER

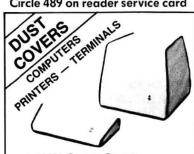
Interactive EasyFlow is a full-blown, on-screen flowchart processor with advanced features. This is a program dedicated to flowcharts & organization charts, not a general-purpose graphics program that makes you do most of the work.

automatic line routing . automatic text centering within shapes • charts up to 16 shapes wide by 16 shapes high • three levels of zoom (close-up, normal, wide-angle) • horizontal & ver-tical scrolling within the chart • 18 standard flowcharting shapes included • user defined shapes easily added • wide charts can be printed in strips • complete, well written manual • works with all printers • requires a PC-DOS or MS-DOS machine with IBM compatible graphics adapter

Only \$149.95 + \$2.00 s & h.

HavenTree Software Limited P.O. Box 1093-C Thousand Island Park, NY 13692 (613) 542-7270 Extension 81

Circle 489 on reader service card



- 100% Cotton Canvas.
- . Beige with Grey Trim.
- Embroidered Emblem. Custom logo in quantity!

For: IBM, Wyse, Wang, Televideo, Epson, Okidata, NEC, Compaq, Apple.

Contemporary ComputerWear 1320 - 36th Ave./San Francisco, CA 94122 (415) 759-1466

Dealer inquiries Welcome.

Circle 276 on reader service card

$OH\rightarrow WINDOWS[for(C)]$

OH->WINDOWS is a complete program library of window presentation and manipu-lation functions for use in C programs.

- Over 60 powerful primitives available to create, fill, move, save and print windows with single calls as simple as using Printf and Scanf Full color control and conversion for B&W

- 65 windows on four pages Detailed manual which fully describes all of the
- available functions (examples provided)
 Runs on IBM, PC, XT, AT and all Compaq
 models under DOS.1.1, 2.X, and 3.0
- Minimum system overhead (4K-10K bytes) Works with Microsoft, Lattice, and C86 C

\$74.95 (Visa, MC accepted) Demo available \$5.00

Call or Write

SofTron, Inc. 109 E. Scenic Dr. Pass Christian, MS 39571 (800) 824-3609

Developed by CAB Concepts

Circle 250 on reader service card

Scroll & Recall™

Screen and Keyboard Enhancement for the IBM-PC XT AT & Compatibles

Allows you to conveniently scroll back through data that has gone off the top of your display screen. Up to 27 pages of data can be recalled or written to a disk file.

Allows you to recall, edit and re-enter your previously entered DOS commands and data lines, without retyping.

Very easy to use, fully documented. Compatible with all versions of DOS. monochrome & graphic displays.

\$69 - Visa, M.C. Check, COD. POs

Make Your Work Easier!

To Order or to Receive Additiona Information, Write or Call

Opt-Tech Data Processing PO Box 678 . Zephyr Cove Nevada 89448 •(702) 588-3737 Dealer Inquiries Welcome

Circle 894 on reader service card



Circle 146 on reader service card

PCATPERFORMANCE FOR A FRACTION OF THE COST. GUARANTEED.

10MHz 8086 processor with full 16-bit data path

10MHz 8087 math co-processor (optional)

> Print spooling, RAM disk and disk caching software included

> > Normal IBM spec

emulation switch

Comes standard with 512K RAM, expandable to 640K

> 300% performance increase

> > Compatible with IBM Basica programs

That's right, guaranteed performance. The Univation Turbocharger will triple the processing speed of your IBM PC, PC/XT, or 100% compatible.

Just think, the data processing speed and performance of a PC/AT without the expense. Plug it in, and your PC will do everything it did before, only 300% faster.

Best of all, the Univation Turbocharger works with all

your existing PC software automatically. Nothing to learn, nothing to change. Speed spreadsheets, databases, graphics, even IBM Basica programs. The Turbocharger will spark each and every program you use.

To ensure complete reliability, our Turbocharger is extensively tested. It's available for immediate delivery. And, best of all, it's guaranteed. Guaranteed to work exactly as promised

and to provide all the processing power you'll ever need.

So why not make your life a little easier and do your work a lot quicker with the Univation Turbocharger.

See it at your local computed dealer today. For the dealer in your area call: (408) 745-0180.

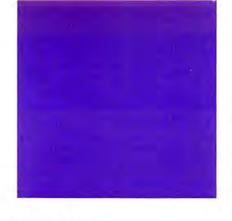
UNIVATION

YOUR EXPANSION COMPA

1037 North Fair Oaks Ave. Sunnyvale, CA 94089 (**408) 745-0180**

Dealer and distributor inquires invited.

IBM PC, PC/XT and PC/AT are trademarks of International Business Machines Corp.



• Star-Dot-Star

A global exchange of personal computer discoveries

Letters from readers this month include tips for using 1-2-3, Symphony, dBASE III, and WordPerfect, as well as a useful function for BASIC programmers and an exercise for academics.

Edited by Steven Cook

1-2-3 Screen Colors

Lotus's 1-2-3, version 1A, comes with a screen driver for color monitors, but it does not provide a way to alter the default color selections. If you're tired of those drab cyan borders and pale white worksheet entries, you can change them by using the DEBUG.COM program (supplied on the DOS Supplemental Programs disk) to modify 1-2-3's screen driver, TD.DRV.

Check Table 1 to determine the offset address of the worksheet feature you'd like to change. Each feature has a 2-digit default value. The first digit controls the background color, the second its foreground color. Only colors 0 through 7 are allowed for the background.

Select new color values from Table 2 and copy TD.DRV from the 1-2-3 system disk onto a separate disk and put it away for safe-keeping. Put the 1-2-3 system disk into drive A: and a disk that contains DEBUG.COM into drive B:. At the A> prompt, type B:DEBUG TD.DRV < Enter > . DEBUG will load TD.DRV into memory and display a hyphen prompt.

At DEBUG's prompt, type E followed by the appropriate offset address, then press < Enter > . DEBUG will display the offset address and its current value. Make sure the current value matches the default value shown in Table 1. If it doesn't, you may have an incompatible version of 1-2-3 and shouldn't attempt these changes.

If the current value matches the default value, type the desired color value, then press < Enter > . For example, to make the border color and cursor green, type E 17E < Enter > and then 20 < Enter > . You can repeat the E command to change another feature's color. When you are through changing

colors, type **W** < Enter > at the hyphen prompt to write the modified TD.DRV to disk. At the next hyphen prompt, type **Q** < Enter > to return to DOS.

That's it. The next time you run 1-2-3, it will display the worksheet using the colors you prefer.

Albert Bleakley Fort Belvoir, Virginia

Editor's note: This information is for use with 1-2-3 configured for the standard IBM Color/Graphics Adapter, not the Enhanced Graphics Adapter or other nonstandard devices.

Two More on 1-2-3

Here are a couple of tips that should be helpful to advanced 1-2-3 users. First, when writing macros remember that many users are accustomed to pressing the <Esc> key to back out of a menu. However, when <Esc> is pressed within a macro, 1-2-3 goes to whatever follows the /XM statement, causing the macro to overwrite a cell with the macro menu labels. This can be a serious problem if the cursor was over an important cell. To avoid this situation, leave a blank line between the cell containing the /XM statement and the first menu item.

My second tip involves the use of long addition formulas such as +A1+B5+C8+F9+H17+I15 +P46+Q55+AA15+AB15. Writing these formulas using the @SUM function is much more efficient. For example, the formula @SUM(A1,B5,C8,F9,H17,I15,

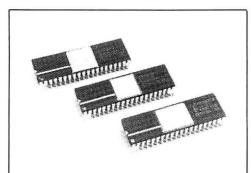
(continues)

MICROWAY'S 8087 RUNS 1-2-3™!

MicroWay is the world's leading retailer of 8087s and high performance PC upgrades. We stock a complete selection of 8087s that run at 5 and 8mhz. All of our coprocessors are shipped with a diagnostic disk and the best warranty in the business – one year! We also offer daughterboards for socketless computers such as the NEC PC and PCjr, and a board which increases the clock speed of the 80287 from 4 to 8 mhz. Our NUMBER SMASHER" includes 512K ram. It will run the IBM PC at clock speeds up to 10mhz and achieves a throughput of .1 megaflops

with 87 BASIC/INLINE, Intel Fortran, or Microsoft Fortran. Software reviewers consistently cite MicroWay software as the best in the industry! Our customers frequently write to thank us for recommending the correct software and hardware to meet their specific needs. They also thank us for our same day shipping! In addition to our own products which support the 8087 and 80287, we stock the largest supply of specialized software available anywhere. For information call us at

617-746-7341



Micro Way® 8087 Support

For the IBM PC, PC XT, PC AT and Compatibles.

NUMBER SMASHER^{1*} The World's Fastest Accelerator Card for the IBM PC, XT, and Compatibles! Includes an 8086 and 8087 pair tested to 10mhz, and 512K bytes of high speed ram. Compatible with all software, operating systems and hardware! Your program speed is increased by a factor of 2.5 to 4.0. Floating point programs run up to 2.8 times faster on the PC than on an 80287 equipped PC AT.......\$1590

87FFT™ Written in assembly language, performs Forward and Inverse FFTs on real and complex arrays which occupy up to 512K bytes of RAM. Also does convolutions, auto correlations, hamming, complex vector multiplication, and complex to radial conversions. Callable from MS Fortan, 87MACRO, C, TURBO PASCAL or 87BASIC/INLINE....\$200

87FFT-2[™] performs two-dimensional FFTs. Ideal for image processing. Requires 87FFT \$100

GRAPHICS PACKAGES

DFixer[™] - Eliminates the AT hard disk problem! A disk which thoroughly checks PC or AT hard disks for bad sectors and updates the MS DOS file allocation table accordingly.....\$149

87DEBUG* - a professional debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace features which include the ability to skip tracing through branches to calls and software and hardware interrupts. Breakpoints can be set in code or on guarded addresses in RAM...........\$150

P.O. Box 79
Kingston, Mass
02364 USA
(617) 746-7341

87BASIC/INLINE" converts the output of the IBM Basic Compiler into optimized 8087 inline code which executes up to seven times faster than 87BASIC. Supports separately compiled inline subroutines which are located in their own segments and can contain up to 64K bytes of code. This allows programs greater than 128KI Requires the IBM Basic Compiler and Macro Assembler. Includes 87BASIC\$200

87BASIC™ includes patches to the IBM Basic Compiler and both runtime libraries for USER TRANSPARENT 8087 support. Provides super fast performance for all numeric operations including trigonometrics, transcendentals, addition, subtraction, multiplication, and division...\$150

87MACRO™ - our complete 8087 software development package. It contains an object library of numeric functions including transcendentals, trigonometrics, hyperbolics, encoding, decoding and conversions which take full advantage of the 8087's capabilities. 87MACRO will save you man years in development time!. For the IBM or MS Macro Assembler, Version 1.0, 2.0, or

OBJ→ASM™ - a multipass object module translator and disassembler. Produces assembly language listings which include public symbols, external symbols, and labels commented with cross references. Ideal for understanding and patching object modules and libraries for which source is not available \$200

RTOS - REAL TIME OPERATING SYSTEM RTOS is a multi-user, multi-tasking real time operating system. It includes a configured version of Intel's iRMX-86, LINK-86, LOC-86, LIB-86, OH-86, and MicroWay's 87DEBUG. Runs on the IBM-PC, XT, PC-AT and COMPAQ......\$400

The World Leader in 8087 Support!

0007 5	
KIK/5mn7 C	100
Including DIACNICCTICS and annual	103
8087 5mhz\$1 Including DIAGNOSTICS and one-year wa For IBM PC and compatibles.	rranty
For Ibivi FC and compatibles.	
8087-3 5mhz \$1	75
For the Tandy 1200.	
	175
8087-28mhz \$1 For Wang, AT&T, DeskPro, NEC, Leading E	1/5
For Wang, AT&T, DeskPro, NEC, Leading E	dge.
80287-3 5mbz \$1	100
80287-3 5mhz \$1 For the IBM PC AT and Compaq DeskPro	296
Tor the Ibivi FC AT and Compaq DeskFlo	200.
287Turbo™ 8 mhz\$3	395
With Reset Button.	
64K RAM Set	67
OAK DAIN SEL	\$1
256K RAM Set	\$35
25014 01100 01110	400
256K CMOS RAM Set	\$49
100K DAM Cot po at	150
128K RAM Set PC AT \$	150
AST Advantage [™]	\$439
JRAM-2™ (ØK)	\$160
IDARE AT (OK)	\$103
JRAM™ AT (ØK) MAYNSTREAM™ 60 meg\$	\$229
MAYNSTREAM 60 meg\$	1695
FORTRAN, C and BASIC	
Microsoft Fortran Version 3.3	\$220
IBM Professional Fortran	545
Ryan-McFarland Fortran	399
Ryan-McFarland FortranFORLIB+ or STRINGS and THINGS	65
Lattice C or Microsoft C Version 3.0	
C86	. 279
C86FLOAT87	. 279
FLOAT87IBM Basic Compiler Version 2.0	. 279 . 150 . 445
FLOAT87IBM Basic Compiler Version 2.0	. 279 . 150 . 445
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC*	. 279 . 150 . 445 89 . 175
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module	. 279 . 150 . 445 89 175 87
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic.	. 279 . 150 . 445 89 175 87
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic MACRO ASSEMBLERS	. 279 . 150 . 445 89 . 175 87 . 105
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic.	. 279 . 150 . 445 89 . 175 87 105
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic. MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01	. 279 . 150 . 445 89 . 175 87 105
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01 PASCAL and APL Microsoft Pascal Version 3.3	.279 .150 .445 89 .175 87 .105
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01 PASCAL and APL Microsoft Pascal Version 3.3	.279 .150 .445 89 .175 87 .105
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic. MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01 PASCAL and APL Microsoft Pascal Version 3.3 Borland Turbo with 8087 Support. STSC APL	.279 .150 .445 89 .175 87 .105 .155 .125 85 450
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic. MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01 PASCAL and APL Microsoft Pascal Version 3.3 Borland Turbo with 8087 Support. STSC APL±PLUS/PC. Pocket API.	.279 .150 .445 .89 .175 87 .105 .155 .125 85 .450 .85
FLOAT87 IBM Basic Compiler Version 2.0 Microsoft Quick Basic Summit BetterBASIC* Summit 8087 Module True Basic. MACRO ASSEMBLERS IBM Assembler with Librarian V. 2.0 Microsoft Assembler Version 3.01 PASCAL and APL Microsoft Pascal Version 3.3 Borland Turbo with 8087 Support. STSC APL	.279 .150 .445 89 .175 87 .105 125 125 85 450 85 750

FASTBREAK and NUMBER SMASHER are trademarks of MicroWay, Inc Lotus and 1-2-3 are trademarks of Lotus Development Corp.

Compuc		101/			400
		NICY WEEK			
	$\Omega \Delta$				239.00
11/7					
				POFT	250.00
/ KANNU "	_			MICROSOFT	200 00
			-	Word	יבט ווט
			299.00		159.00
Wall Wall			793	Multiplan C Compiler Fortran Compiler	
			- 00		99.00
		LIFEBOAT Lattice C Compiler	149.00	Drillico	125.00
		Lattice C Compiler Lattice C Compiler LifeTREE SOFTWARE LIFETREE Deluxe		Chart	125.
	-0	Lattice SOFTWAIN	119.00	-nostui	-00
	170.00	LICET NE DELUXO	110	Crosstalk Infoscope MULTIMATE INTERNATIONAL MULTIMATE	249.00
	189.00	Volkswriter Door Volkswriter Door Living VIDEOTEXT	00	Crossiane CNATIONAL	
ALPHA SOFTWARE ALPHA BASE MANAGER II			309.00	INFOSCOP INTERIOR	249.00
ALPHA SOFTWARE Data Base Manager II Data Base Manager II	289.00	Thinktank	435.00	MULTIMAT	349.00
Data Base W				MAIIL	343
Data Base Electric Desk Electric TON TATE	369.00	LOTUS 1-2-3	119.00	AMA . III	-00-
	305.0	Lotus 1-2-3 Lotus Symphony Lotus Symphony MECA Andrew Tobias—Managing Your Money Andrew Tobias—Systems	1	SAMNA Samna Word III	249.00
	nn nn	10113	00	Samna + Samna + SATELITE SOFTWARE SATELITE SOFTWARE	
	30.00	Manay Manay	275.00	Samme	69.00
dBase III dBase III	50.00	MEDIAN TODIAS	130.00	SATELITE	on Uu
France INTERIOR	35.00	MECA Andrew Tobias - Managing Andrew DATE BASE SYSTEMS MICRO DATE BASE SYSTEMS	59.00	SATELITE SOFTWARE PUBLISHING SOFTWARE PUBLISHING SOFTWARE PUBLISHING	on UU
sidekick (unprotected) Sidekick (unprotected) Sidekick (unprotected)	59.00	MICRO DATE Knowledge Man	99.00		60.00
Sider. Wildia	30.00	Kuowlead		SOFTWAND PFS Report PFS cile	60.00
Sidekick (Cal			249.00	PFS HEP	80.00
	82.00	O Dallis	245.5	PFS File PFS Write	80.00
Turbo Pascal Toolbox CONTINENTAL SOFTWARE CONTINENTAL SOFTWARE	42.00	v Text	-0	PFS TOOL	
Toolbox SOFTWARE	42.0	CONGRAFA	189.00	PFS Proof PFS Access	199.00
CONTINENT AL SOFTWARE CONTINENT AL SOFTWARE Home Accountant Plus Home Advantage CONTINENT AL SOFTWARE HOME ACCOUNTINENT		MICROGRAFX PC Draw MICROPRO INTERNATIONAL MICROPRO PROPERTIONAL		DFS AUT TH	~74 00
CONTACCOUNTAIN	230.00	PC DIAM	~4Q UU	חבל טוייו	- 40 110
Home Account Home Advantage Tax Advantage DECISION RESOURCES DECISION RESOURCES		MICROPHO	100 00	SORCIM II.U.S. Supercalc III Supercalc III SUPERCALCOUNTING Modules I.U.S. Payroll I.S. Payroll S window)	59.00
Tax Advan gESOUHCE	360.00		299.00	Surcalc III Module	30
CISIUM	209.00	Wordstar 2000 Wordstar 2000	20	Supercounting I.U.S. Accounting I.U.S. Payroll I.U.S. Plus (I.U.S window) Easy Plus (I.U.S	
DECISION Chartmaster Chartmaster RESEARCH	209.00	wordstar 200	00	1.U.S. Payroll & window	
CHAI RESEARCE		Wordstar + Infostar + Infostar 2000 +	265.00	1.U.S. plus (1.U.S	
C Basic Compiler	155.00	Infostar 2000 + Wordstar 2000 +	ou uv	Easy Plus	
C Hasie -a	100	Wordstal INC. MICRORIM INC. MICRORIM SACON	145.00		
C Language FOX AND GELLER FOX AND GELLER	- 00	MICRORIM INC. MICRORIM INC. MICRORIM INC. A 4000 R Base Series 4000 Extended Report Writer Extended III as 5000	369.00		479.00
AND THE	245.00	B Base Seport Will			479.00
FOX AND BUILD OUICKCODE III		Extended		PHICS	185.00
HARVARD Harvard Total Project Manager Harvard Total Project Manager Harvard Total Project Manager	79.00	Extended Victorian Street South R Base Series 5000	٠	PRINCETON GRAPHICS HX12 Color Monitor HX12 Amber	
HARVARD Harvard Total Project Maine Harvard Total Project Maine Harvard Processor Hard Processor Haring Edge Software Hard Processor Haring Haringere + Spell		a Base Series		PRINCE IO MONITO	1330.00
Harvard Total Harvard Total Harvard Total Harvard Total Harvard Frocessor Word Processor W Mailmerge + Spell W M Mailmerge + Spell W M M M M M M M M M M M M M M M M M M	79.00		and the same of th	HX12 Color Mo HX12 Amber Max 12 Amber	1330.00 529.00
CADING EDGE	13		359.00	Max 12 Allies	
Hard Processor W Main			359.00	Max 12 TOSHIBA TOSHIBA 351	
Word Processor		The last of the la	359.00	Toshiba 351 Toshiba 1340	1
Word		annR		Toshiba 331 Toshiba 1340	1749.00
Word Processor Word Processor Word Processor Word Processor Nutshell		HAYES Smartmodem 1200B	315.00	1031	11.
	100	HAYES Smartmodem 1200 Smartmodem 1200	165.00	arsk	
		smartmou	10-	18 no rives - 250 h	00
	er 00	HERCULES HERCULES	00	PC-2 UIII	179.00
	165.00	HERCULES Graphic Card Graphic Card	325.00	IBM PC-2 Drives-256k	
7		Graphic Card	TAN UC	ar JUNION	57.00
	265.00	Colo		a ok	
AMDEK	255.00	OKIDAINOSA	645.00	Electric Desk Electric Desk etant plus	THE STEEL
310A SEARCH	200	AICTUIT OAA		Electric Desk Wordstar Home Accountant Plus	
AT RESERVE	00	WILLO DAL	270.00	Wordstar Wordstar Home Accountant Plus SHIPPING SHIPPING SA per reem ups surface (\$8 for Blue Label): TO URDER CALL: TO URDER (\$2.28-4473)	orinters \$25
AST RESEARCH Megaplus 64k Megaplus 64k Six Pac Plus 64k	355.00	Microline 03P	159.00	nuire Label):	
Wedge blus	265.00	Microline 93P Microline 93P	100.	MG tore (\$8 for Blue	
SIX	325.00	PADISE NICS CARD	1	SHIPPING UPS SUITAN	
BIZCOMP XL	100	PANNA Graphio	SCHOOL ST	SHIPPIN UPS SULLE SA PER REIN UPS SULLE SA P	SE STATE FOR
	365.00	Microline PARADISE Modular Graphics Card 5 Pack (w OK) Corporale accounts welcome Corporale accounts MasterCard We accept VISA MasterCard, We accept VISA, MasterCard, Output MasterCard Output Mas	17/18	SHIPPING UPS SUPANDES	1
Intellimodem ST Intellimodem ST		5 rate Well Card	ATTEN S	1 (000) 237-09MATION CA	
intellimous	550.00	to accounts Masterbar	THE STATE OF		STEP TO A
TOH TO	200.	corporate VISA & sterCalo, C.O.D.	FIETE V	COR ADDITION 705-1054	Sept 1
C ITOH Prowriter 1550 Prowriter 100 CPS		Corporate accounts MasterCard, We accept VISA & MasterCard, We accept VISA, MasterCard, No charge VISA, MasterSard, Property of the Charge State o	The state of	4 (818) suite lu	anack MO Bain
Prowriter 1550 Prowriter 20 CPS	.:th	ato chary can Express	17 20	Canby Street	ers Chevanal cheva
Prowriter 20 Ur	S WILL	20/0 AMERICA CHARGE	13901	6934 da, CA 9100 We honor Campan	y or return au
Prowriter 1550 Prowriter 20 CPS Starwriter 20 CPS	onort!			1 (800) 321-6603 CAL 1 (800) 231-6603 CAL 1 (800) 231-6603 CAL 1 (818) 705-1895 (CA 1 (818) Street Sulte 104 1 (818)	ill be replaced
recredible al Su	hh.	The tocilling	200	All prices suprediately. All prices immediately add safetive w	
Prowriter 1550 Prowriter 20 CPS Starwriter 20 CPS Incredible Price Professional Su		2% Americal CHARGES NO HIDEN CHARGES NO HIDEN CHARGES NO HIDEN CHARGES Free technical support open: HOURS Order desk & technical support open: 8 a.m. to 6 p.m. Monday 10 a.m. to 2 p.m. Saturday 10 a.m. to 2 p.m. Saturday		FOR ADDITIONAL IN-1893 1 (818) 705-1893 1 (818) 705-1893 1 (818) Street Suite 104 6934 Canby Street Reseda CA 91335 RESERVATION TERMS All prices subject to change. We honor Cashir TERMS All prices subject to change. We honor Cashir TERMS Transfers immediately. Allow time for company to change calliornia residents add sales tax. Calliornia residents add	
Proiss		HUUI desk & Te Monday		to clear, Software	
THE RESERVE OF THE PARTY OF THE		Older to 6 P. m. Salulos		thorization. immediately.	
		g 3, III . to 2 0.III		mediate	

SIGMA DESIGNS



\$495

The best color graphics card on the market today! Enjoy a 640x400 non-interlaced display, 16 vibrant colors, monochrome quality text and automatic double resolution on standard 200 line software. Package includes Paintbrush 400.

COLOR 400	W/SR-12	\$1050
	W/TAX 440 .	
PC MOUSE.		\$ 110

IMAGE-PLUS NEW! \$549 10 MB TAPE BACKUP

This low power internal tape unit runs off your floppy controller. Fully DOS compatible & accessible like a floppy. Includes drive, 2 tape reels, software & manual.

RAM-PLUS NEW! \$145

Creative Micro's new multifunction board comes with a par, ser, clk, cal, up to 384K, RAM disk & spooler.

RAM-PLUS w/384K \$199

Creative Advantage 5 MB REMOVABLE HARD DISK

\$895

Ideal for storage & backup! Includes drive, cartridge, controller, cables & manual. (Additional cartridges \$85)

Creative Edge \$695

Boot DOS 2.0-3.1 directly from your hard disk. Includes drive, controller, cables, & manual.

HARD DISK	INT.	*EXT.
5Mb Removable	895	1045
10Mb Half-hgt	569	745
20Mb Half-hgt	695	845
20Mb Full-hgt * *	995	1045
30Mb Full-hgt * *	1495	1645

* Externally mounted with fan and power supply
"Includes ext. power supply

SIGMA DESIGNS \$695 EXPANSION CHASSIS

The #1 exp. chassis! Includes 100W power supply. 9 card slots, 2 drive slots, 2 interface cards & cable.

MINI EXP. CHASSIS	\$595
45MB TAPE BACK-UP	\$995
HAYES 1200 Modem	\$399
HAYES 1200B Modem	\$365

Creative Micro

(415) 945-1201 (800) 321-3324



3339 Vincent Rd., Pleasant Hill, CA 94523



Circle 110 on reader service card

Table 1: Features set by 1-2-3's color display driver

Features controlled	Offset address	Default value
Worksheet cells, menus, and help screens	17D	07
Border and cursor	17E	30
Unprotected worksheet cells and headings on help screens	17F	0A
Cursor on help screens and cursor on unprotected worksheet cells	180	28

Table 2: Screen color values

4 Red	8 Gray	C Light red
5 Magenta	9 Light blue	D Light magenta
6 Brown	A Light green	E Yellow
7 White	B Light cyan	F Bright white
	5 Magenta6 Brown	5 Magenta 9 Light blue 6 Brown A Light green

P46,Q55,AA15,AB15) uses less memory as well as less disk space than it does when entered as a string of addition.

Patrick McMahon Aurora, Colorado

Symphony and 1-2-3 Graphs If you use both 1-2-3 and Symphony, you may not be aware that the PrintGraph functions of the two programs are nearly identical. This means that you can use Symphony to display and print graphs created with 1-2-3. If you keep both programs on a hard disk, you can save disk space by removing 1-2-3's GRAPH.EXE program.

Dan Domzalski Buffalo Grove, Illinois Editor's note: Of course, you should make an archive copy of the GRAPH.EXE program and store it in a safe place before deleting it.

dBASE III on the Run

I was surprised to discover that the *dBASE III* RUN command can be used to execute programs and DOS commands. For example, the command RUN CD\ will make the root directory the current directory. The command RUN DIR will display the names of the files in the current directory. Even more powerful is the RUN command's ability to execute other

(continues)

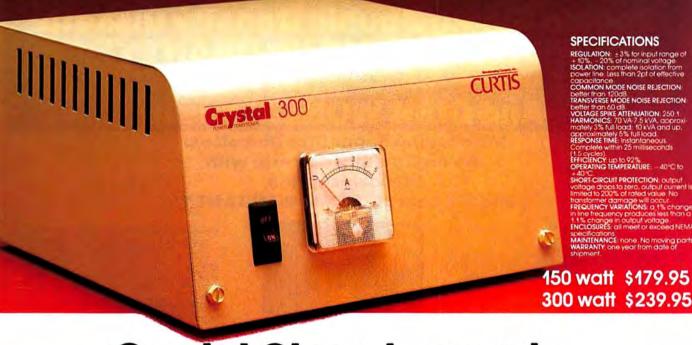
SPECIFICATIONS

REGULATION: ±3% for input range of +10%, -20% of nominal voltage. ISOLATION: complete isolation from power line. Less than 2pt of effective. capacitance COMMON MODE NOISE REJECTION:

better than 60 dB.
VOLTAGE SPIKE ATTENUATION: 250.1
HARMONICS: 70 VA.7.5 kVA. approximately 3% full load: 10 kVA and up. approximately 5% full load: RESPONSE TIME: Instantaneous.
Complete within 25 milliseconds.

transformer damage will occur. FREQUENCY VARIATIONS: a 1% change in line frequency produces less than a 1.1% change in output voltage. ENCLOSURES: all meet or exceed NEMA





Crystal Clear Answer to 99% of Computer Power Problems

Whether it's a short-term electrical brownout sag, surge or spike, or EMI-RFI interference, Curtis' new Crystal power conditioners are the answer to 99% of your computer's power problems. Erratic fluctuations are threatening the performance and lifespan of unprotected computer hardware and software with ever-increasing regularity (Wall Street Journal, 6/17/85). This damaging condition will only increase in the future.

At Curtis we've solved this power mystery and more, with the new Crystal power line conditioner. Our Crystal's sophisticated ferroresonant technology conditions AC power to a constant 120V. The Crystal offers complete protection against both brownouts and overvoltages, plus the affordably priced Crystal is even EMI-RFI filtered!

Your computer will be protected against everything but full power outages, which are only one half of one percent of power pollution occurences according to an IBM study.

To keep your computer's power crystal clear, and your hardware and software fully power conditioned, visit your nearest computer dealer and try the new Crystal by Curtis.

Crystal available in 150 Watt or 300 Watt models for most microcomputers. Features four rear panel plug receptacles, safety meter, 7 ft. power cord and front panel power switch. The Crystal is IBM color-compatible and blends with any modern office or home decor.

Curtis products are available nationally from leading Dealers, Distributors, and Retail Chains. In Canada: Micro-Computer Products, P.O. Box 235, Ajax, ONT, Canada L1S 3C3, (416) 427-6612

For the Curtis dealer nearest you call (603) 924-3823

Parallel Printer Cable: 9 ft. IBM to Centronics or compatible, Totally shielded, Lifetime

Retail\$29.95

Serial Modern Cable: 9 ft. IBM to Hayes, Novation or compatible, Totally shielded, Lifetime Warranty.

Retail\$29.95

Static Mat: "Touch Me First" protects computers from potentially harmful static discharge. Prevents data loss and/or system failure. Size 171/2" x 231/2".

Retail









AT System Stand: Holds IBM PCAT system unit vertically, occupying less space. Unit can be placed on floor, freeing desk top space.

Vertical positioning reduces disk drive wear. Lifetime

. \$49.95 Retail

Curtis Surge Protectors:

Leading surge protectors in the micro-computer market-place. Lifetime Warranty, 6 ft. power cable, EMI-RFI filtering available, Four styles. Retail \$49.95-\$89.95



305 Union Street, Peterborough, New Hampshire 03458

What the world really needs is a 69 cent **Double Sided, Double Density Diskette** with a LIFETIME WARRANTY!

And DISK WORLD! has it.

Introducing Super Star Diskettes: the high quality diskette with the lowest price and the best LIFETIME WARRANTY!

In the course of selling more than a million diskettes every month, we've learned something, higher prices don't

necessarily mean higher quality.

In fact, we've found that a good diskette manufacturer simply manufactures a good diskette...no matter what they charge for it. (By way of example, consider that none of the brands that we carry has a return rate of greater than 1/1,000th of 1 percent!)

In other words, when people buy a more expensive diskette, they aren't necessarily buying higher quality. The extra money might be going toward flashier adver-

tising, snazzier packaging or simply higher profits But the extra money in a higher price isn't buying better

quality All of the good manufacturers put out a good diskette.

Period

How to cut diskette prices ...without cutting quality.

Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

There are about 85 companies claiming to be "diskette" manufacturers

Trouble is, most of them aren't manufacturers

Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product

The new Eastman Kodak diskettes, for example, are one of these. So are IBM 514" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole

or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices.. without lowering the

We would go out and find smaller companies to manufacture a diskette to our specifications, specifications which are higher than most ... and simply create our own 'name brand" diskette

Name brand diskettes that offered high quality at low

SUPER STAR DISKETTES 51/4" SSDD 55 ea. Qty. 50 Qty. 50

Super Star diskettes are sold in multiples of 50 only. Diskettes are shipped with white Tyvec sleeves, reinforced hubs, user ID labels

Boy, did we get lucky. Our Super Star Diskettes are the same ones you've been using for years...without knowing it.

In our search for the low priced, high quality diskette of our dreams, we found something even more interesting.
We found that there are several manufacturers who

don't give a hoot about the consumer market for their diskettes. They don't spend millions of dollars in advertising trying to get you, the computer user, to use their

Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and

sell them for much higher prices to you!

After all, when a software publisher or computer manufacturer or diskette marketer puts their name on a diskette. they want it to work time after time, everytime. (Especially software publishers who have the nasty habit of copyprotecting their originals!)

Super Star Diskettes. You already know how good they are. Now you can buy them...cheap.

Well, that's the story.

Super Star diskettes don't roll off the boat from Pagoor emerge from a basement plant just east of Nowhere

Super Star diskettes have been around for years. you've used them for years as copy-protected software originals, unprotected originals. Sometimes, depending on which computer you own, the system master may have been on a Super Star diskette. And maybe more than once, you've bought a box or two or more of Super Star diskettes without knowing it. They just had some "big" company's name on them

Super Star Diskettes are good. So good that a lot of major software publishers, computer manufacturers and other diskette marketers buy them in the tens or hundreds of thousands.

We buy them in the millions. And than we sell them to you.

Cheap

When every little bit counts, it's Super Star Diskettes.

You've used them a hundred times...under different names

Now, you can buy the real McCoy, the same diskette that major software publishers, computer manufacturers and diskette marketers buy...and call their own.

We simply charge less.

Super Special!

Order 50 Super Star Diskettes and we'll be happy to sell you an Amaray Media-Mate 50 for only \$8.75, shipping included...a lot less than the suggested retail price of \$15.95



Regular DISK WORLD! price: \$9.69 ea. + S2.00 Shpng.

The Super Star LIFETIME WARRANTY!

Super Star Diskettes are unconditionally warranted against defects in original material and workmanship so long as owned by the original purchaser. Returns are simple: just send the defective diskettes with proof of purchase, postage-paid by you with a short explanation of the problem, and we'll send you the replacements. (Incidentally, coffee stained diskettes and diskettes with staples driven through them don't qualify as "defective".)

WE WILL MEET OR BEAT ANY NATIONALLY ADVERTISED PRICE
ON THE SAME PRODUCTS AND QUANTITIES
SUBJECT TO THE SAME TERMS AND CONDITIONS.

629 Green Bay Road Wilmette, Illinois 60091

DISKETTE STORAGE CASES

DISK CADDIES

The original flip-up holder for 10 51/4" diskettes. Beige or Grev \$1.65 ea. + .20 Shpng.

DISKETTE 70 STORAGE

Dust-free storage for 70 51/4 diskettes. Six dividers included. An excellent value

\$9.95 ea. +\$3.00 Shpng.





HOURS:

Human: 8AM-6PM Central Time, Monday through Friday Answering Machine: 6PM-8AM, All Times MCI MAIL: 24 hours a day.

HOW TO ORDER:

ORDERS ONLY: 1-800-621-6827 (In Illinois: 1-312-256-7140) INQUIRIES: 1-312-256-7140

FOR FASTEST SERVICE. USE NO-COST MCI MAIL Our address is DISKORDER. It's a FREE MCI MAIL letter. No charge to you. (Situation permitting, we'll ship these orders in 24 hours or less.)

Ship these orders in 24 hours or less.)

SHIPPING: 514" & 315" DISKETTES—Add \$3.00 per each 100 or fewer diskettes. OTHER ITEMS: Add shipping charges as shown in addition to other shipping charges PAYMENT: VISA. MASTERCARD and Prepaid orders accepted. COD ORDERS: Add additional \$5.00 special handling charge. APO, FPO, AK, HI & PR ORDERS: Include shipping charges as shown and additional \$5% of total order amount to cover PAL and insurance. We ship only to United States addresses. except for those listed above. TAXES: Illinois residents, add 7% sales tax.

MINIMUM ORDER: \$35.00



What would you call a desktop software package that Q. can Pop-Up Anything—spreadsheets, databases, or even DOS-over another application? What if it also offers a Pop-Up Standard Calculator and Financial/Statistical Calculator, Pop-Up Word, Alarm Clock, Calendar, plus PopDOS and Pop-Up Voice to dial your phone automatically? What would you call a single package that does all this, is non-copy protected and sells for \$69.95?

 ${f A}_{ullet}$ Beautiful! New Pop-Up DeskSet from Popular Programs.

CRITICS AGREE:

"DeskSet has taken the Sidekick idea a step further." Infoworld, 1/14/85

USERS AGREE:

"Much better than competition (know anyone who wants to buy a 'Sidekick?')" Ivan Myers, Cummins Engine Co.

"This is an Excellent Package. (Thanks)" James Bondurant, ComputerLand Corporate

New Pop-Up DeskSet includes Standard and Financial Calculators, Pop-Up Anything, PopDOS, Pop-Up Word, Calendar, Alarm Clock and Pop-Up Voice; \$69.95.

New Pop-Up DeskSet Plus includes all the above plus Pop-Up TeleComm, a telecommunications program; \$129.95.

telecommunications require a PC or XT and a Hayes compatible modem. Pop-Up, Pop-Ups, DeskSet are trademarks of Popular Programs, Inc. Sidekick is a trademark of Borland International.

System requirements: IBM PC, XT, AT, 3270 PC, PCjr. or compatible. Phone dialer and

ONLY DESKSET OFFERS ALL THESE FEATURES:

POP-UP™ DESKSET™ SIDEKICK™

"Pops-Up" any kind of application		
while running another	YES	No
Entirely RAM-resident	YES	No
Alerts you to scheduled appointments	YES	No
Gets DOS commands while running another program	YES	No
Financial calculator with printable on-screen tape display	YES	No

DESKSET

Available at leading software dealers. Or for a limited time you may order direct by mail or phone. Call 1-800-44-POP-UP (1-800-447-6787). Or mail this coupon to Popular Programs 2820 Northup Way, Bellevue, WA 98004.

Please send the following:

☐ DeskSet; \$69.95 ☐ DeskSet Plus; \$129.95

+ \$5 shipping

Company Name:

Mailing Address:

State: Zip:

☐ My check is enclosed. ☐ Visa; ☐ American Express; ☐ MasterCard

Name on card:_

Exp. date:

Card #: Signature:

> **POPULAR** PROGRAMS, INC. (206) 828-7282

formerly Bellsoft, Inc.

Circle 230 on reader service card

files, including batch files. Thus, the command RUN ABC will execute the batch file ABC.BAT, which can contain a list of commands to be executed in sequence.

Donald Holmes New York, New York

Perfect Underlining

If you have a color monitor and use Satellite Software International's *WordPerfect* word processor, you have a limited choice about the way underlined spaces appear when you design forms or

similar documents. Using the underline key displays a solid underline on screen but prints a dashed line on some printers. If you press the <F8> key and then type spaces, the program prints a nice solid underline, but you cannot see the line on screen. If you select the first single-color monitor choice of Set Colors for Color Monitor from the Set-up menu, the program displays inverse video spaces after you have pressed the <F8> key, but you lose all color from the display, leaving white text on a black background.

My solution gives me solid underlines both on the printer and on screen. [Editor's note: Make the following changes on your working copy of WordPerfect, not on your archived originals.] First, run the PRINTER.EXE program provided on WordPerfect's supplementary programs disk and select Printer Definitions (option 3) from the menu. Select your printer from the printer menu, then select the Character Tables option (option A) from the menu that follows.

(continues)

Before this happens, call SAFEWARE

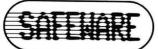
800/848-3469

(In Obio, call 614/262-0559)

Protects your computer against theft, fire, power surges and other accidental losses. Insures your entire system for as little as \$39 a year — depending on the value of your hardware, software, and media. Full replacement after a low \$50 deductible.

We're SAFEWARE, [®] the first name in computer insurance. Tens of thousands of satisfied customers. Call toll-free for rates or immediate coverage.

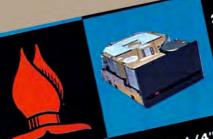
SAFEWARE, The Insurance Agency Inc. 2929 N. High Street P.O. Box 02211 Columbus, Ohio 43202



Circle 609 on reader service card



Circle 426 on reader service card



20MB FULL HEIGHT DRIVE FOR IBM AT

Access time is 2 x's faster than any other 1/2 height drive



5795



Software includes Sollware includes image backup/restore and file by file Internal - \$865 External - \$965





- by Microscience
- Half height Low power consumption
 - Controller, software, cables included. 10MB \$535

20MB \$660



20MB STREAMING TAPE DRIVE by MEMTEC

- Backup 10MB in under 4 minutes
 - Software included 5725

ALSO AVAILABLE Mounting bracket for COMPAO DESKPRO and IBM AT

- Data cable





300/1200 MODEM

- 100% Hayes Smart Modem and Bell 103/ 212 compatible
- Internal \$225







- Also supports COM 3 and COM 4
 - External 5325

COLOR/MONO GRAPHIC DISPLAY CARD

- 720 x 350 resolution in monochrome
- 640 x 200 resolution
 - Color/Mono \$280 in color Hercules Compatible Mono - \$255



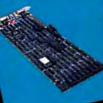
EXPANSION CHASSIS

- Various I/O slots/ models to choose
- Supports all IBM controllers and memory expansion. 5665

10MB FLOPPY TAPE BACKUP

- Uses regular (loppy controller
- External unit also available.

Irwin - \$525 Interdyne - \$659



MEMORY EX-PANSION CARD

Serial, parallel game ports and clock/ calendar



A AT & T AND . MPAQ ARE GISTERED ADEMARKS.

SA OR MC D 3% PRICES



HALF-HEIGHT FLOPPY DRIVE 100% IBM compatible

- - 360K byte capacity and 48 TPI



3ars we have been selling our products through outors hoping that they will provide better technical ort and services to our customers. Lately, we find that of them are not really technical and sensitive enough to our customer needs. In order to provide quality icts and services at factory prices, we have decided to you direct by passing distributors. Each of our products s standard with an easy do-it-yourself installation guide. still have problems, our highly trained technical staff is a phone call away to answer any of your questions.

IN CANADA 416-842-3177 912 Barton Street, East, Suite 26 Hamilton, Ontario, Canada L8L3C2

's Your Move To Improve To further back up our commitment for high quality and 30-day no-questions-asked money back guarantee on

Remember. No loss. No stalemate. Make your move to improve. Call us at our hotline.

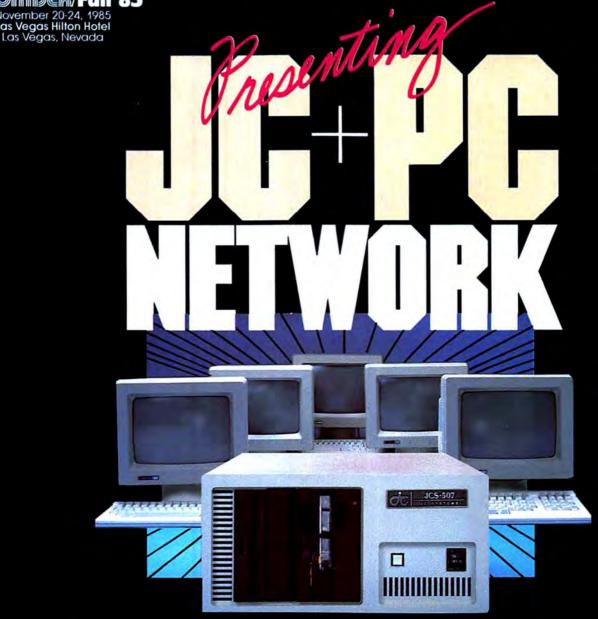
IN USA CALL: 800-JEDEN US IN CALIFORNIA CALL: 800-JEDEN CA For a free catalog, call 714-545-8108



See us at

COMPEM/Fall '85

November 20-24, 1985
Las Vegas Hilton Hotel



WHAT YOU SHOULD, WHAT YOU SHOULD NOT, NOW AND LATER

You don't want to buy a multi-user system without a PC file server capability. You don't want to buy a PC file server without a multi-user capability. The Multi-User File Server (MUFS) is what compliments your needs in performance, growth, and cost.

Selecting the right computer system is the most crucial requirement for your company





growth, because of everincreasing demand in computer performance and capacity. The computer you purchase now should not be a bottleneck later.

JC Multi-User, Multi-Processor, File Server is the only computer system you can afford to speculate. And Nothing else. . .



IC INFORMATION SYSTEMS

469 Valley Way Milpitas, CA 95035

408/945-0318 TLX: 910-381-7041

In Australia: Synax Systems, Ctr. Pacific Hwy & Beaconsfield, Lindfield N.S.W. Australia 2070, Tel: 467-1166 TLX: (790)25468
In The United Kingdom: Interam Corporation 62 Weir Road Wimbledon, London SW19 8UG, England, Tel: 879-1888 TLX: (851)8954072
In Europe: COSTEC Gmbh Hollandische Strasse 19, 3500 Kassel, West Germany, Tel: 56147268 TLX: (841)99695
ARECTA System AB Ekensbergsvagen 117, 5-171 41 Solna, Sweden, Tel 898-6790 TLX: (854)08986790

The program will list the character tables used for your printer's fonts. [Editor's note: If your printer has more than one character table, you should make the following change to all the character tables of the fonts you use.] For most printers, one character table will be used for all fonts. Remember that table's name, then select option 9 from the menu. When the list of tables is displayed, select the character table you noted earlier. Use the cursor keys to position the cursor over the underline character (<95>). Select option A from the menu, delete the underline character. press the < Space > bar, and then press < Enter > E < Enter > . Finally, press < Enter > several times to exit the program.

Start WordPerfect as usual, then select your revised printer. From now on, whenever you want to create a blank underline in a document, press the <F8> key, then use the underline character as you would on a typewriter. When you finish the line, press <F8> again to turn off underlining. It's as simple as that. In effect, what you are doing is sending space characters to the printer but displaying underlines on screen. That's why you must turn on underlining when you create the line. Otherwise, the printer will only receive spaces.

Mark Kramer Provo, Utah

(continues)



orodit cord	-		304				Illite,
credit card.	-					Maria Vit	Illin
				Taken V			day
	MOD	EMS -		BUSINE	22	SOFTWARE	
D.C. Hayes		Pro 1200B w/sc	259.95	W - 40 - 10 - 10 - 10 - 10 - 10 - 10 - 10	.00		
Smartmodem 1200 Smartmodem 1200B w/sc	384.95 354.95	Racal-Vadic Maxwell 1200 w/sw	239.95	dBase III	379.95	Nantucket Clipper	429.9
Smartmodem 2400	594.95	Maxwell 1200B w/sw	239.95	Framework Compuserve	379 95	Peachtree A/R	329 9
Fransit 1000 w/128K Prometheus	289.95	Maxwell 2400 w/sw Maxwell 2400B w/sw	449.95 449.95	Starter Kit	27 95	G/L	329.9
ro 1200	309.95	Waxwell 2400B W/SW	449.95	Subscription Consumers	44.95	I/C Back to Basics	329.9 219.9
PERIP	HER	AL CARDS	-	Auditor 2.1	89.95	Real World	389.9
		The state of the s		Dow Jones Market Anal. +	199.95	G/L	389.9
	CE	SSORIES -		Market Mng + Sprsh Lnk. +	149.95 149.95	I/C O/E	389.9 389.9
AST Advantage w/128K	389 95	Paradise 5-Pac w/64k	169.95	GNP CPA +		Sales Analysis	209.9
Advantage Pgy. w/0k	119.95	5-Pac w/384k	209.95	Harvard	369 95	Software Group Enable	344.9
6 Pac + w/SK w/64K 6 Pac + w/SK w/384k	249.95 399.95	Mod. Graphic's Multi Display	264 95 199 95	Harvard Project	194.95	Software Publishin PFS:File	ng 79.9
Curtis Mfg.		Persyst Combo	's	Harvard Total PM Infocom	264.95	PFS:Report	74.9
Diamond Emerald	34.95 39.95	Mono w/384k Color w/384k	379.95 379.95	Cornerstone Lotus	269 95	PFS:Graph Sorcim/IUS	79.9
Ruby	59.95	Quadram		1-2-3	299.95	SuperCalc III v 2.0	194.9
PC Pedestal System Stand	34.95 18.95	AT Quadmeg w/128k Quad Sprint	324.95 454.95	TK Solver Meca	239 95	SuperProject v 2.1 IUS/AR	194.9
Univ. Tilt	34.95	Microfazer w/128k	154.95	Mng Your \$	104.95	IUS/GL	294.9
Command Cnt	114.95	Quadboards		Microrim R Base 5000	359 95	IUS/Inventory IUS/Order Entry	294.9 294.9
Static Mat Disks	39.95	New Exp. w/64k New Exp. w/384k	204.95 244.95	R Base 4000 UG	134 95	Thoughtware	
Bonus SS/DD	12.95	Gold w/64k	379.95	Microsoft Chart	149.95	Trigger United	269.9
Bonus DS/DD Maxell MD 1 SS/DD	19.95 19.95	Gold w/640k Silver w/64k	469.95 234.95	Project	149 95	In House Acct	109 9
Maxell MD 2 DS/DD	26.95	Silver w/384k	284.95	Multiplan	119.95	Xanaro Ability	269.9
Hercules Color	159 95	Liberty w/64k STB Products	289.95				
Graphic's	289.95	RIO + 2 w/64k	199.95			LANGUAGE	
lomega Bernoulli 10mb	1719.95	RIO + 2 w/384k Chauffeur	254.95 249.95	S	OFT	WARE -	
Bernoulli 20mb	2319.95	Tallgrass		Addison Wesley	· .	Quick Code III	149.9
Bernoulli 40mb Bernoulli 10mb Cart.	Call 49.95	TG 5025 TG 6135	2499.95 3209.95	True Basic	89.95	Funk	
Memory		TG 6180	5209.95	Borland Sidekick CP	34 95	Sideways GNP	37 9
54k Set (9) 256k Set (9)	8.95 34.95	TG 4060 Tape TG Interface	1449.95 139.95	Sidekick NCP	49.95 39.95	Macro + Password +	34.9 34.9
Mouse Systems		Tall Tree		Superkey Turbo Pascal v 3.0	39 95	Recalc +	64 9
PC Mouse w/Paint Orchid	124.95	Jram II w/64k Jram II w/2mb	184.95 479 95	Turbo Tool Turbo Graphics	34 95 34 95	PC Paintbrush	89.9
AT ECCELL wiecc	469 95	Jram III w/256k	294.95	Central Point		Lotus	30
PC Turbo 186 PC Net	619.95 359.95	Jram III w/2mb Tecmar	569.95	Copy II PC Decision Resource	28.95	Spotlight Microsoft	49 9
PC Net w/Blossum	529.95	Captain w/64k	179.95	Chartmaster	224.95	Basic Inter	219 9
PC Net Daughter	359.95	Captain w/384k	244.95	Signmaster Diagram Master	159.95 229.95	Compilers C	274.9
Blossum w/64k Blossum w/384k	199.95 239.95	Graphics Master AT Maestro w/128k	449.95 364.95	Digital Research		Fortran	219.9
	DIN	TERS -		Gern Collection Gem Desktop	144.95 34.95	Basic Cobol 2.0	249.9 404.9
Citizen MSP 10	284 95	Gemini Sr 15	599 95	Gem Draw	99.95	Pascal	184.9
Citizen MSP 15	424 95	NEC P2-3	519.95	C Pascal/MT+	209.95 239.95	Macro Assem Microstuff	94 9
Citizen MSP 20 Citizen MSP 25	424 95 544 95	NEC P5	1049.95	PL/1	439.95	Crosstalk	99.9
Epson LX 80 F/T	27995	NEC 2050 NEC 3550	639.95 1009.95	C Basic Comp. Fortran 77 4 1	339.95 239.95	Remote Norton Utilities	99.9
Epson FX 85	369 95 499 95	NEC 8850	369.95 499.95	Dr Draw	179 95 179 95	Norton Util. v 3.0	59.9
Epson FX 185 Epson LQ 1500	929.95	Okidata 192 Okidata 193	929.95 1579.95	Dr Graph Enertronics Research	ch	Rosesoft Prokey v 4 0	79.9
Epson SQ 2000 Ink Jet	1579.95	Okidata 84	654.95	Energraphics w/Plot Fox & Geller	274.95	Summit Better Basic	124.9
Gemini SG 10 Gemini SR 10	239.95 499.95	Toshiba P1340 Toshiba P351	559.95 1099.95	dGraph III	149.95	Unisom	
				dUtility III	54.95	Print Master	37 9
WORD	PR	OCESSING		- CAME	ED	UCATIONAL	
S	OFT	WARE -		- GAIVIE O	CD	UCATIONAL	
Broderbund	0	Satellite Softwar	re	S	OFT	WARE -	
Bank St Writer	49 95	Wordperfect 4.0	234 95	Davidson Assoc.		Spirine Ace	24 9
Living Videotext	99.95	Sierra On Line Homeword	44 95	Math Blaster	34 95	F 15 Flight	24.9
Micropro		Homeword Speller	34 95	Speed Reader II Speli It	45 95 34 95	Solo Flight Microsoft	24 9
Eazy Wordstar Pro	94.95 254.95	Software Publishi PFS:Write	84 95	Word Attack	34 95	Flight Simulator	34.9
Vordstar 2000	254.95	PFS:Proof	64 95	Hayden Holy Grail	34.95	Scarborough Mastertype	27.9
Wordstar 2000 + Microsoft	294.95	Sorcim/IUS Easywriter II	189 95	Sargon III	34 95	Run for \$	27.9
Word	229.95	Easywriter II Sys	209 95	Human Edge Mind Prober	34.95	Boston Diet Songwriter	49.9 27.9
Multimate Int'l. Multimate 3.3	239 95			Microprose		Songwriter Net Worth	59.9
numinate 5.5	203 33			Helicat Ace	24 95		

BUSINESS COMPUTERS
OF PETERBOROUGH

FREE SHIPPING CONTINENTAL USA/UPS ONLY



766 RT. 101 W. • P.O. Box 772 • Peterborough, NH 03458

ORDERS ONLY: 800-845-3003 QUESTIONS 603-924-9406

DISK WORLD! is proud to introduce the lowest-priced, L

diskettes ever!

And they're BRAND NAME PRODUCT to boot!

5.25″SSDD→.69 ea. 5.25″ DSDD→.79 ea. 5.25" DSDD-HD→\$2.25 ea.

Based on multiples of 100 each.
Boxed in 10's with heavy-duty cardboard sleeves, user ID labels, reinforced hubs (where appropriate) and write-protect tabs.

3.50" SSDD→\$2.09 ea. 3.50" DSDD→\$2.55 ea.

Introducing Wabash Pinnacle Series Diskettes.

Two years ago, if you'd told me I'd be writing this ad, I would

have laughed.
At that time. Wabash diskettes were synonymous with

Just saying that quality control was poor would be charitable

So much was wrong that DISK WORLD wouldn't sell them

That was yesterday.

Kearney-National Inc., a \$202-million division of a much larger company, came into Wabash. Out went the old management, the old methods, the old production techniques...and in went a lot of new people, ideas. production lines and some really imaginative thinking.

The end result.

Today, I'm proud to offer you the Wabash Pinnacle Series of diskettes at the prices shown

This isn't evolution in diskette manufacturing: it's revolution

Here's what you get.

Wabash Pinnacle diskettes are

certified 100% Error Free are coverd by a LIFETIME WARRANTY

meet or exceed all industry specifications (by quite some distance)

and are simply the best value in diskettes available today.

The torture test.

Considering Wabash's earlier dubious reputation, I wasn't exactly a true believer when their Director of Marketing came into my office with samples.

So I took a box at random, selected a disk, bent the thing every which way and slipped it into my IBM-PC. It formatted. It booted. It stored and retrieved data.

That wasn't enough.

I gave samples of the diskettes to Curt Rostenbach and, in turn, to Tom Streit, both hackers of long experience and mem-bers of the Waukegan (Illinois) Apple Users Group. Tom really went at it.

He took a quartz-halogen lamp, aimed it at the diskette until it started to smoke (and melt)...and then formatted, booted the diskette and stored and retrieved data!

The same terribly (and intentionally) mutilated diskette ran on an ITT, Corona and IBM.

Curt was nicer

He simply bent the diskette every which way...and it still formatted, booted and ran on his Apple

The best buy I've ever seen.

DISK WORLD!, Inc. sells more flexible magnetic media by mail-order than anyone else in the world.

I, as President of the corporation, won't tolerate a product with a failure rate of more than 1/1000th of 1 percent.

I also don't like companies who try to milk a "quality" or remium" image for a higher price like Dysan and Verbatim d...until they failed. As President of DISK WORLD!, Inc., my motto is simple: "the

best diskette for the least amount of money

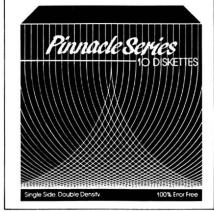
Wabash is it.

Right now, there is no better value than the Wabash Pinnacle Series of diskettes.

Granted, you have to buy a hundred at a time, but so what? Split the order with friends, relatives, co-workers or even your worst enemies

The key thing is to get the most diskette for the money.

(Incidentally, as a corporation, we put our money where our



mouth is. Our first order for Wabash Pinnacle Diskettes was 1.5-million units.)
That's an awful lot of faith and confidence

But, then again, I have the diskette that Tom Streit literally melted...and kept on running.

The truth about \$1.00 or less diskettes.

More and more ads are popping up offering diskettes for \$1,00 or less

By the same token, more and more people who were selling used cars a few months ago are now selling diskettes by mail.

We did a little survey of current ads for diskettes advertised for a dollar or less and did some analysis of the market and here's what we found as it applies to 5.25" DSDD diskettes "supposedly" selling for a dollar or less.

VENDOR:	ADVERTISED LOW PRICE:	PRICE PER 100:	ACTUAL MFGR.:
Unitech	.89 ea.		Unspecified.
Datatech	.99 ea.		Unspecified.
Computer Club	.95 ea.	.98 ea.	Unspecified.
	.99 ea.	1.02 ea.	Unspecified.
Communications			10 S181 S1 11 11
& Electronics	.49 ea	80 ea.	Unspecified.
Precision Data	89 ea	93 ea.	Unspecified.
Diskette Connec.	.93 ea.	93 ea.	Unspecified.
Comp Soft Serv.	.77 ea.	.77 ea.	Unspecified.
		+ shpg.	
Computer/Computer	.99 ea.	.99 ea.	Unspecified.
DISK WORLD	.89 ea.	.92 ea.	Wabash
			Datatech

The real truth about \$1.00 or less diskettes.

It costs all diskette manufacturers about the same to produce a diskette. Some may charge more because they want to project a "premium quality" image, ala the late, lamented Dysan who bought their basic media from 3M.

Some charge less because they sell a sub-standard prod-t, and we're not foolish enough to name names here. But here's the truth about the \$1.00 or less diskette market. It falls into four categories:

 The DISK WORLD's of the universe who simply are so big that they can buy first quality product in massive quantities and choose to pass on the savings to you. (Precision Data and Diskette Connection on BRAND NAME products also fall into

2. The people who buy "cosmos" ... stuff from major manufacturers that usually hits quality control standards, but is cosmetically blemished and thus can't be packaged and sold under the manufacturer's own name.
3. "Duplicator Quality". Uncertified media, usually below

manufacturer's own standards and frequently below ANSI and IBM standards. Sold on an "as-is" basis with the understanding that the manufacturer's name will never be divulged. Usually about a 20% reject rate... as compared to DISK WORLD's standard of less than 1/1000th of 1% reject/return ate. Next to garbage, this is the source of most diskettes advertised at a dollar or less.

They may work...and then again they may not. (Frankly, the odds at the Blackjack table in Las Vegas are more in your favor.)
4. Garbage. Stuff that shouldn't be sold at all. But some

4. Gardage. Stuff that shouldn't be sold at all, but some manufacturers are hurting for cash, so they sell it anyway. (After all, they want to meet their payroll. Look what happens when you don't, you become a Dysan or Verbatim. Lots of history, but no money.) More and more garbage is being dumped into the market as manufacturers become pressed for each and a remotivated into selling another and exerciting. cash and are motivated into selling anything and everything they can manufacture. (Read the article in FORBES about Verbatim and its "Bonus" brand.)

Finally, the Taiwanese counterfeiters are moving into the act.

Perfect duplicates of the packaging of major manufacturers

with one exception: the quality isn't there.

The Critical Factor.

Only DISK WORLD!, Inc. offers fully brand-identified, LIFETIME-WARRANTY product for less than a dollar. Every one else offering 5.25° product for less than a buck doesn't tell you who makes it.

And that ought to tell you a lot right there.

Ordering & Shipping Instructions

SHIPPING: Wabash Pinnacle Diskettes are sold in mul-tiples of 100 only. Shipping charges are \$3.00 per 100.

regardless of type or size.

PAYMENT: VISA, MASTERCARD and PREPAID orders accepted. Corporations rated 3A2 or better and govern-ment and quasi-government open accounts are accepted on a NET 15 basis

C.O.D. orders are subject to a \$5.00 special handling c. O.D. orders are subject to a \$5.00 special handling charge. (Sorry for the increase, but too many people have been refusing C.O.D. orders or using bad checks. It's a classic example of a few "bad eggs" making life more expensive for everyone else.)

APO, FPO, AK, HI & PR ORDERS: Include shipping as shown and an additional 5% of the total amount of the order to cover PAL and insurance.

No other non-continental U.S. orders are accepted.

TAXES: Illinois residents only, add 7% MINIMUM ORDER: \$35.00

All orders subject to acceptance. Not responsible for typographical errors. ORDERS ONLY

1-800-621-6827 (In Illinois: 1-312-256-7140) **INQUIRIES & INFORMATION**

1-312-256-7140 FOR FASTEST SERVICE, USE MCI MAIL: Just address "DISKORDER"

(24-hour shipping on any item in stock if you order via MCI MAIL.)

629 Green Bay Road Wilmette, Illinois 60091



Thinking of the C Language?

THINK COMPUTER INNOVATIONS



C86 VERSION 2.3 with Source Level Debugging Support

The C language has rapidly become the development language of choice for applications ranging from Operating Systems to Accounting Packages. WHY? Its structured approach and extreme portability make it perfectly suited to today's fast-paced environment.

Of all of the C Compilers available for PC/MSDOS, more programmers choose COMPUTER INNOVATIONS' C86. WHY? Because it's part of a COMPREHENSIVE family of C products with an unparalleled reputation for performance, reliability, and stability.

C86 2.3 C COMPILER

C for PC/MSDOS began with C86 and today it remains perhaps the most solid, stable C Compiler available. Even competitor's ads show C86 as a consistent top level performer in benchmark testing.

Version 2.3 offers a host of new features including source level debugging support and a 40% boost in compilation speed. Call for complete specifications.

COST: S395 UPDATE TO 2.3: S35 w/old diskettes NOT COPY PROTECTED

CALL ABOUT VOLUME DISCOUNTS

LEARN C INTERACTIVELY WITH <u>INTRODUCING C</u>

Intimidated by rumors about the difficulty of learning C? Need to train your staff quick-ly? INTRODUCING C can help. INTRODUCING C combines a thorough, self-paced manual with a unique C interpreter to provide a fast, efficient method of learning C. Designed for both professional and casual programmers, it provides a comprehensive understanding of important C concepts such as standard K&R syntax and operators, full structures and unions, arrays, pointers, and data types. Requires IBM PC, XT, or AT with one disk drive and 192K bytes of memory.

COST: S125 - NOT COPY PROTECTED

CI PROBE SOURCE DEBUGGER

Take advantage of C86 2.3 source level debugging support with CI PROBE. Cut down program development time and save money! CI PROBE is highly economical yet has the leatures of debuggers costing far mor-COST: S225 - NOT COPY PROTECTED

C-TERP C86 COMPATIBLE INTERPRETER

The C-TERP INTERPRETER is a full K&R implementation that allows you to write code and execute it immediately without the compile and link steps. Once you have your program running with C-TERP you can compile the code (without alterations) with C86 for last, efficient executable liles. C-TERP requires 256K, 512K is recommended. COST: C86 version - List Price: S300, Special Computer Innovations Price S250. Combined C86 & Lattice version - List Price: S400, Special Computer Innovations Price S350.

Start With Us, Stay With Us

Computer Innovations offers a complete range of products that let you enter the C environment and create applications with the most advanced set of development tools available. Unparalleled tech support assures that you're always at the height of productivity.

To order call: 800-922-0169



980 Shrewsbury Ave., Tinton Falls, NJ 07724 • (201) 542-5920

C-TERP is a trademark of Gimple Software. Prices and specifications subject to change without notice

New BASIC Functions

When programming in BASIC, I have often needed two functions that aren't available in either BASIC or BASICA: the MIN function, which returns the lesser of two values supplied, and the MAX function, which returns the greater.

For example, if you set variable A to 3 and variable B to 7, executing the statement X = MIN(A,B) sets the value of X to 3. The statement X = MAX(A,B) would set X to 7.

The two lines of BASIC shown in MINMAX.BAS are BASIC statements to create user-defined functions for MIN and MAX. Due to the design of the PC's BASIC, the letters FN must precede the name of each function. Also, the lines must be executed before the functions are used, so it's a good idea to put them near the top of your program.

Greg Perry Tulsa, Oklahoma

Learning to Paint

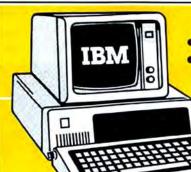
The listing PAINT.BAS is a BASIC language routine similar to the paint command provided by Advanced BASIC. Filling a figure with color was a procedure that always amazed me. Recently I learned the logic behind such a routine when I developed a drawing program. (I intend to offer the drawing program, Free Draw, in exchange for contributions.) The

(continues)

Save

1-800-231-9842

WESTERN REGIONAL ORDERS



Low Low Prices

 No Surcharge for MasterCard and VISA

1-800-237-4048

EASTERN REGIONAL ORDERS

· COMPUTERS ·

IBM ENHANCED AT 5355
IBM ENTRY LEVEL AT 3647
IBM PC, 1 DSDD DR,
256K 1595 IBM PC, 2 DSDD DR,
256K 1705
IBM PC, NO DRIVES,
6-lK 1293
IBM PC, 2 HALF/I-IYTES,
256K
DR/10MB, 256K 3355
IBM XT, 1DSDD DR/ TANDON
HD, 256K 2108
COMPAQ, 2 DSDD,
256K 2153

MONITORS

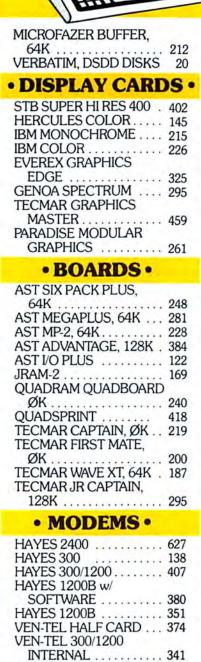
AMDEK 300G 116
AMDEK 300A 132
AMDEK 310A 143
AMDEK 600 RGB
COLOR 407
AMDEK 710 SUPER
HI RES COLOR 523
IBM COLOR 605
IBM MONOCHROME 231
PRINCETON MAX-12 154
PRINCETON HX-12 RGB
COLOR 446
PRINCETON SR-12/SCAN
DOUBLER 572
QUADRAM
AMBERCHROME 171
QUADRAM
QUADCHROME II 424
Q0, 10 01 11 101 11 11 11 424
PROCEST ANDONO

MISCELLANEOUS

MEMORY, 64K CHIPS	8
MEMORY, 256K CHIPS	39
PRINTER CABLE	10
MICROFAZER BUFFER,	
8K	131

SETS SACTOR DOOR





• PRINTERS •

OKIDATA 83A, WIDE
CARRIAGE 545
CARRIAGE 545 OKIDATA 84P, WIDE
CARRIAGE 660
OKIDATA 92P 385 OKIDATA 93P, WIDE
OKIDATA 93P, WIDE
CARRIAGE 602
OKIDATA 2410P 1782
OKIDATA 182 215
OKIDATA 192 363
OKIDATA 182S 259
OKIDATA 184 660
EPSON FX-80,
TRACTOR 382
EPSON LX-80 248
FPSON FX.185 WIDE
CARRIAGE 417
LI SONT A-100, WIDE
CARRIAGE 531
EPSON JX-80 COLOR
PRINTER 531
EPSON LQ-1500
PARALLEL1042
NEC 2050 682
NEC 3550 1045
NEC 8850 1458
JUKI 6100 362
JUKI 6300 695

· ACCESSORIES ·

OKIDATA 82/92	
TRACTOR 44	
NEC BI-DIRECTIONAL	
TRACTOR 151	
NEC CUT SHEET GUIDE . 63	
JUKI 6100 BI-DIRECTIONAL	
TRACTOR 105	,
JUKI 6300 BI-DIRECTIONAL	
TRACTOR 124	l

"For All Your Computer Needs"

COMPUTER

1200 362

AST REACH HALF CARD

1901 S, TAMIAMI TRAIL, VENICE, FL 33595 2820 W. CHARLESTON, LAS VEGAS, NV 89102 Call for Non-Advertised and Lower Current Prices. IBM is a registered Trademark of International Business Machines. Prices subject to change. We accept MasterCard, VISA, American Express, Diners Club, Money Orders, certified and personal checks 2% surcharge for shipping and handling. S5 minimum. Returns are subject to a 15% restocking fee.

IN FLORIDA CALL 813-493-2736 IN NEVADA CALL 702-877-3988

RETURNABLE SOFTWARE FOR THE IBM-PC®

(AND AT 25% TO 50% OFF MANUFACTURERS' LIST)

Eliminate the risk of buying software that doesn't meet your needs.

With Computer Inventory Control, you get EXTRA LOW PRICES and eliminate the risk of buying software that doesn't meet your needs. Buy any of the most popular IBM-PC® software programs at our discount prices of 25% to 50% off manufacturers' list. If it doesn't meet your needs, return it within 15 days for a refund of your purchase price less a restocking fee of only 20% of the manufacturer's list price. (Copyright and licensing requirements of the software package manufacturers MUST be observed.)

COMPUTER INVENTORY CONTROL OFFERS

- In-stock availability
- Full technical support
- · Friendly helpful service
- · Same day shipment for orders received by 1 PM
- Free UPS ground shipping for orders over \$500.
- · Call for Corporate rates and terms
- · Government purchase orders accepted
- Dealer inquiries welcome

BELOW IS A SAMPLE OF OUR EVERYDAY DISCOUNT PRICING.											
COMI	PARA							DIN OUR FREE CATALO	G.		
		DISCOUNT	RESTOCK			DISCOUNT	RESTOCK			DISCOUNT	RESTOCK
	LIST	PRICE	FEE		LIST	PRICE	FEE		LIST	PRICE	FEE
WORD PROCESSING				BUSINESS ACCOUNTING	G			COMPILERS/LANGUAGES	3		
WordStar 2000	\$495	\$249	\$ 99	State of the Art	\$595	\$399	\$119	BASIC (MicroSoft)	\$395	\$259	\$ 79
MicroSoft WORD 2.0	375	239	75	BPI Systems	595	369	119	Morgan Prof BASIC/8087	149	99	30
MultiMate (limited quantity)	495	229	99	IUS Business Acct	595	299	119	FORTRAN (MicroSott)	350	239	70
Volkswriter Deluxe	285	159	57	Open Systems	695	399	139	Better Basic	199	149	40
Word Perfect 4 0	495	249	99	Real World Accounting	695	399	139	True Basic	149	119	30
WordStar	375	198	75	Real World 4 in 1	995	699	199	Turbo Pascal 3 0 (Borland)	70	54	15
WordStar Propak	495	249	99	In House Accountant	180	129	38	Cobol (MicroSoft)	700	459	140
Samna III	550	299	110	UTILITIES				Macro Assembler 3 0	150	99	30
Samna Plus	700	399	140	SuperKey	65	49	15	C PROGRAMING			
DATABASE				Norton Util 3 0	100	59	20	C-86 Compiler (Compilinov)	395	299	79
Power-base	595	299	119	PROKEY 4.0 (NEW)	130	89	26	Digital Research C Compiler		279	70
Cornerstone	495	349	99	Sidekick (Borland)	85	59	17	Lattice C (Lifeboat)	500	299	100
Knowledgeman 1 07	500	259	100	COMMUNICATIONS				Lattice C (Lattice)	500	319	100
R BASE 5000	695	419	139	Crosstalk XVI	195	99	39	C Compiler (MicroSoft) NEW	395	299	79
R BASE 5000 Upgrade	245	179	49	Relay	149	99	30	RUN/C Interpreter	150	109	30
Btrieve	245	169	49	Remote	195	139	39	Greenleaf Functions	185	149	37
R BASE Clout 2	245	149	49	Transporter	295	199	59	Multi-HALO	250	179	50
dBASE II	495	279	99	PFS Access	95	76	19	Lattice C Sprite	175	139	35
dB Compiler	750	549	150	SPREADSHEETS/INTEG	RATED			Lattice dB-C	250	199	50
Clipper (dBASE III Compiler)	695	499	139	ABILITY	495	319	99	C POWER PACKS (Softwar	e Hor	izons)	
Quick Report	295	159	59	ENABLE	699	379	140	Building Blocks #1	149	111	30
dBASE III	700	359	140	MultiPlan (MicroSoft)	195	139	39	Building Blocks #2	149	111	30
Quickcode III	295	159	59	Desa	199	159	40	Communications	149	111	30
Infoscope	225	159	45	CPA PLUS	695	499	129	Data Base	399	299	80
PFS Report	125	89	25	SMART Software System	895	649	179	Mathematics	99	75	20
PROJECT MANAGEMENT	Г			Open Access	695	399	139	Utilities	99	75	20
Harvard Proj. Mgr	395	219	79	SuperCalc ³	395	198	79	HARDWARE			
Harvard Total Proj. Mgr	495	279	99	PERSONAL ACCOUNTIN	NG/FINA	NCE		AST Advantage! (for AT)	595	399	
MicroSoft Project	250	159	50	Home Accountant +	150	79	30	AST 6 Pack-0K	340	229	
SuperProject (Sorcim)	395	219	79	Managing Your Money	199	119	40	AST 6 Pack-OK w/Game	390	259	
GRAPHICS				Dollar & \$ense w/Fore	180	129	36	AST 6 Pack-64K	395	249	
Chart-Master	395	249	79	Desk Organizer	99	79	19	AST 6 Pack-64K w/Game	445	279	
Sign-Master	245	179	49	OTHER SOFTWARE				Haves 1200	599	399	
PFS Graph	140	89	28	SPSS/PC (XT Regid.)	795	599	159	Hayes 1200B	549	369	
MicroSoft Chart	250	169	50	Think-Tank	195	119	39	Hayes 2400	899	619	
Dr HALO	100	79	20	Property Mgr (Cont.)	495	319	99	Hercules Color	245	179	

To place your order call TOLL FREE (800) 647-1200 (outside PA) For more information and our FREE catalog call (412) 687-2000



Above prices represent a 2% CASH discount.





University Technology Development Center, 4516 Henry Street, Pittsburgh, PA 15213

Introducing R:base 5000

Because you'd rather be using your applications than building them.

t makes sense: The faster you build your applications, the more productive you are. And new R:base™ 5000 can increase your productivity like no other DBMS program on the market. No matter if you're a veteran programmer, a complete rookie, or anywhere in between. Because new R:base 5000 lets you develop custom, heavyweight applications—while saving hours, even days of development time. Its unique, menudriven Application Express[™] feature actually generates programming code for you, while guiding you through the entire development process. So you don't have to spend your time writing line after line of code. Instead, with new R:base 5000, you just answer a series of simple questions. Then, the Application Express does the rest in a flash. And if you want to speed things up even more, it can build your own forms and reports for you.

Whether you need R:base[™] 5000 or other popular business software, we urge you to call now for your *free* copy of "A Buyer's Guide to Discount Software."

It's filled with important information about 800 SOFTWARE's National

Account Program and how it can go to work for volume software purchasers.

Why?

Because our National Account Program offers volume software purchasers more than just low prices. It also offers fast delivery, technical support, full training capability, and the personal service that has made us one of the nation's largest suppliers of business software.

No matter what software *your* company needs, give us a call and get your free buyer's guide.

We want to show you why some hard headed business people buy their software from us.



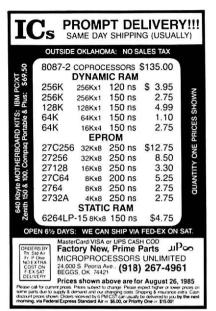






CALL TOLL-FREE
800-872-2667 or 800-225-9273
(Outside California) (Inside California)
(415) 644-3611

940 Dwight Way, Berkeley, CA 94710 Circle 214 on reader service card



Circle 103 on reader service card



PC/TEK 4010

■ EM100-4010 for IBM PC, XT, AT

- · Tektronix 4010 emulation
- VT102 emulation
- Picture files
- High resolution hardcopy
- Supports IBM, IBM Enhanced, Hercules and Tecmar

■ EM100 for IBM PC, XT, AT

- · VT102 emulation
- File Transfer
- \$149

\$249

132 Column modesColor Support

FREE VT220 UPDATE



Diversified Computer Systems, Inc.

3775 Iris Ave., Suite 1B Boulder, CO 80301 (303) 447-9251

Trudemarks: VT100 - Digital Equipment; IBM PC, XT - IBM Corp

Circle 199 on reader service card

```
10 DEF FNMIN(A,B)=-B*(B<A)-A*(A<B)
20 DEF FNMAX(A,B)=-B*(B>A)-A*(A>B)
```

MINMAX.BAS: User-defined MIN and MAX functions for BASIC

```
2000 'BASIC language graphics paint routine
2010 'Input: X,Y (coordinates of a point within area to paint)
2015 'Output: To screen only
2018 '
2020 DIM STACK(200)
                                                 reserve memory for a stack
2025 MAXX=640:MAXY=200
                                                 set maximum limits of screen size
2030 SP=0
                                               ' zero the stack pointer
2040 GOSUB 2440
                                                 push original x and y onto stack
2050 IF SP=0 THEN RETURN 2060 GOSUB 2500
                                                ' return when done painting
                                                 pop x and y off stack
2070 V=POINT(X,Y) 'look at point at that location 2080 IF (V<>0) OR (Y<0) OR (Y>MAXY) GOTO 2050 'if occupied goto next point
2090 V=POINT(X+1,Y)
                                                 look at the point on the right
2100 WHILE (V=0) AND (X<MAXX+1)
                                                  continue looking
2110
         X=X+1
                                                 at points on the right until a filled point or boundary
2120
         V=POINT(X+1,Y)
2130 WEND
                                                ' is found
2140 Y=Y-1
                                                 now move up one line
2150 V1=POINT(X,Y)
                                                ' and examine point at that location
2160 IF (X<0) OR (X>MAXX) OR (Y<0) OR (Y>MAXY) THEN V1=1 ' off screen is limit
2170 IF V1=0 THEN GOSUB 2440
                                                 push this point onto the stack
2180 Y=Y+2
                                                  now move to line below
2190 V2=POINT(X,Y)
                                                  and examine point at that location
2200 IF (X<0) OR (X>MAXX) OR (Y<0) OR (Y>MAXX) THEN V2=1 ' off screen is limit 2210 IF V2=0 THEN GOSUB 2440 ' push this point onto stack
                                                 push this point onto stack
2220 Y=Y-1
                                                  move back to current line
2230 X2=X
                                                  save rightmost point to fill
2240 Y2=Y
                                                 and its y coordinate move back to line above
2250 Y=Y-1
2260 V=POINT(X,Y)
                                                ' and look at that point
2270 IF (X<0) OR (X>MAXX) OR (Y<0) OR (Y>MAXY) THEN V=1 ^{\circ} off screen is limit 2280 IF V=0 THEN IF V1<0 THEN GOSUB 2440 ^{\circ} save above point if it's fillable
2290 V1=V
                                                 save status of above point
now move to line below
2300 Y=Y+2
2310 V=POINT(X,Y)
                                                  and examine point at that location
2320 IF (X<0) OR (X>MAXX) OR (Y<0) OR (Y>MAXY) THEN V=1 ' off screen is limit 2330 IF V=0 THEN IF V2<>0 THEN GOSUB 2440 ' save point if it's fillable
2340 V2=V
                                                 save status of this point
2350 Y=Y-1
                                                  move back to current line
2360 X=X-1
                                                  and over one point horizontally examine point at that location
2370 V=POINT(X,Y)
2380 IF (V=0) AND (X>0) AND (X<=MAXX) AND (Y>0) AND (Y<=MAXY) THEN GOTO 2250
2390 X=X+1
                                                  continue if OK, otherwise move over
2400 X1=X
                                                ' and save the point
2410 Y1=Y
2420 LINE (X1,Y1)-(X2,Y2),,BF
                                                  draw line between saved points
2430 GOTO 2050
                                                ' loop to get next point on stack
2440
      'push x then y onto stack
2450 STACK(SP)=X
                                                  put x onto stack
2460 SP=SP+1
                                                  increment stack pointer
2470 STACK(SP)=Y
                                                  put y onto stack
2480 SP=SP+1
                                                  increment stack pointer
2490 RETURN
2500 'pop y then x off the stack
2510 SP=SP-1
                                                ' decrement stack pointer
2520 Y=STACK(SP)
                                                get y off stack
2530 SP=SP-1
                                                  decrement stack pointer
2540 X=STACK(SP)
                                                get x off stack
2550 RETURN
```

PAINT.BAS: Graphics filling algorithm written in BASIC

Bulldog's Fall Specials

IBM PC SYSTEMS		IBM PC HARD DRIVE SY	STEMS	IBM XT HARD DRIVE SYSTEMS			
IBM PC 256K 2 360K Drives \$1639		IBM PC 256K		IBM XT 256K			
w/Manachrome Monitor, Mon-	0-	w/10mb internal hard drive, 3	50K	w/360K drive, 10	mb hard drive _2495		
chrome Card/Printer Adaptor.	1925	DS/DD floppy disk drive	2095	360K dave, 20 mi	b hard drive2695		
w/Color Mantar, Hercules Co.	lese.	w/20 mb internal hard drive, 3	60R	w/360K draw, 10	mh hard drive, Mono-		
Card/Printer Adaptor		DS/DD disk drive			schrone Monitor 2795		
IBM AT SYSTEMS		360 kb DRIVES FOR w/color coordinated Face Plates		GRAPHIC	CS CARDS		
IBM AT Basic	3050				169		
IBM AT Enhanced	3995	PRINTERS			259		
		EPSON			s II249		
BULLDOG'S SOFTWA	ARE	LX 80	\$229	Everex Graphics I	349 329		
PRICES ARE HARD TO	BEAT!	FX 85			499		
		FX 185			289		
WORDSTAR 2000		LQ 1500	899	Hercules Color	159		
WORDSTAR 2000 Plus		Interface for 1500					
WORD PERFECT 4.0	239	JX 80		MULTI FUNC	TION BOARDS		
LOTUS 123	299	OKIDATA		ACT 6 Pagle w/64	K 229		
LOTUS SYMPHONY	409	182	229		K179		
D BASE II		83 A			169		
D BASE III		192 P	349		28K 635		
		92 P	359	Irma Board	769		
FRAMEWORK		84 P	649	Advantage w/128	K 365		
R BASE 5000		193		Everex Magicard I	1.70		
IBM Display Writer III	269	93		w/256K	179		
SUPERCALC III	195		1729	MOI	DEMS		
MICROSOFT WORD	239	IBM IBM	1250	MOL	JEMS		
VOLKSWRITER Deluxe	159	Pro Printer	479	Ventel half card	369		
		TOSHIBA		HAYES 300	159		
HARD DRIVE	e	1340	555	HAYES 1200	399		
HAND DRIVE	3	351	1075		339		
IOMEGA BERNOULLI		NEC		comes w/Smart	Com 639		
10 mb	1875	P 2	549	HATES 2400	039		
20 mb		P 3	759		merica is making the right		
20 1110	2473	2050		chaica ch	oice by switching to the Γ& T 6300 PC. Now you		
MICROSCIENCE		8850 3550		ca	in get all the features and		
10 mb w/controller	549	COMREX	1023	sp	eed you need at the right		
20 mb w/controller		CR220 II for Commodore			ice. All AT & T Systems clude Keyboard, Bit		
		no interface needed	119	In	nage Graphics, Green		
_		CR420			onitor, 256K, DOS, and n-Board Clock Calendar.		
		CR II		Samunite Se	ii-Doard Clock Calendar.		
- Clum		PROTUER		(A)			

Call Toll 1-800-438-6039

2 Drive System 10 mb System...

IN GEORGIA 1-404-860-7364

3833-A Washington Road / Martinez, Georgia 30907

Bulldog Computer Products

Incorporated as Georgia Mic

NEW DISKETTE PRICES **OKLAHOMA** West 1-800-654-4058 East **NEVADA DELAWARE** 1-800-621-6221 1-800-451-1849 Dysan Verbatim maxell **BONUS** Disks 10 pk Datalife 5¹ Disks 5¹ Disks \$95 ber \$95 ber 5^{1}_{4} Disks 5½ Datalife S-SIDE 1495 S-SIDE 1245 S-SIDE 1395 S-SIDE 1425 D-SIDE 1695 D-DEN. 1695 D-SIDE 1995 ATHANA D-SIDE 1745 D-SIDE 1745 95 per box S-SIDE 2595 S-SIDE 2195 S-SIDE 2065 S-SIDE 2165 D-SIDE 3195 D-SIDE 2595 D-SIDE 2575 D-SIDE 2675 HIGH 4195 *DEN. 3695 BULK PACK 50 DISK 3½ Disks 3½ Datalife 3 Disk 3 Disks S-SIDE 2495 S-SIDE 2495 S-SIDE 2695 S-SIDE 2395 8" Disks 8" Disks 8" Datalife D-SIDE 3395 S-SIDE 1995 S-DEN. 1995 SSIDE 2095 S-SIDE 1995 8"Disks S-SIDE 2295 S-SIDE 2395 S-SIDE 2195 SSIDE 2495 Media Mate \$895_{ea} D-SIDE 2695 D-SIDE 27 95 D-SIDE 2495 DISIDE 2795 *Delaware 1.800.451.1849 Diskette *Oklahoma 1.800 654.4058 onnection * Nevada 1.800.621.6221 TERMS: Minimum 20 disks or \$35% — VISA or MasterCard accepted COD orders add 2% for special handling. SHIPPING: 3½ 5½ Diskettes; Add 3% for every 100 Diskettes or any fraction thereof. 8 Diskettes; Add 4% for every 100 Diskettes or any fraction thereof. We ship UPS; orders requiring other delivery methods add shipping, plus 2% of total order.

Circle 691 on reader service card

MEMO FROM THE PRESIDENT

JIM- FIND OUT ABOUT THE PC/PROPESSIONAL PERSONNEL MANAGER -Let's Get those reports out ONTIME CALL BEST PROGRAMS TODAY.

祖皇帝——《古典教教》		
	=	
Name:		
Title:		1
Company:		
Address:		
City:		
State: Zip:		L .
Call 800-368-2405		
BEST PROCRAMS PROCRAMS Propries 22302	!	['
5134 Leesburg Pike, Alexandria, Virginia 22302		
5134 Leesburg Pike, Alexander		

Circle 202 on reader service card



KEYPATCH™ -10 - A full travel mini-keyboard. Plugs between keyboard connector and CPU. Automatically activates NUM-LOCK placing your IBM™ keyboard into the number pad mode while KEYPATCH™ -10 provides separate cursor and screen control functions without the use of the NUM-LOCK key. Saves time — eliminates errors. KEYPATCH™ -10 requires no software. A must for spread sheets; word processing; graphics; etc.

For Immediate Shipment

Genest Technologies, Inc. 1331 E. Edinger Ave. Santa Ana, Calif. 92705

(714) 547-0880

"Patents Pending
KEYPATCH" is a trademark of Genest Technologies, Inc. IBM" is a trademark of International Business Machines Corp

IBM PC/XT......\$84.95 Compatibles*....\$89.95

'Zenith - ITT - Columbia - NCR Leading Edge - Sperry - Desk Pro — PLEASE SPECIFY SYSTEM— (Cal. Res. Add 6% Sales Tax) Visa, Master Card, Check, Money Order Plus \$250 Shipping

Circle 78 on reader service card



3M DISKETTES

Everything that goes into a 3M diskette is manufactured and/or controlled by specifications set by 3M. From unique substrates and oxides, to hole punching and jacket fabrication, 3M does it all and does it well. With confidence in your complete satisfaction, 3M diskettes are certified to be error free and have an unlimited warranty against defects in workmanship or materials. And to help introduce you to the quality of 3M, we're

running a special on their full range of information processing products including-

- 3M Diskettes
- 3M Mag Tape
- 3M Data Cartridges

PLUS! Specials on many other products in our full range discount catalog of computer supplies. Call, write, or utilize reader service to obtain your FREE catalog with special offer coupon enclosed. If it's worth remembering, it's worth 3M.

COMPUTER SYSTEMS

EN Simply #1 in Service and Reliability.

1050 E. Maple Rd. Troy, MI 48083 Phone (313) 589-3440

Circle 942 on reader service card

Incredible value!

C ea. 5%"SSDD ea.

51/4" DSDD

These are poly-bagged diskettes packaged with Tyvek sleeves, reinforced hubs, user identification labels and write-protect tabs NASHUA Corporation is a half-billion dollar corporation and a recognized leader in magnetic media
SOFT SECTOR ONLY! Sold in multiples of 50 only!

FOR ORDERS ONLY 1-800-621-6827

INFORMATION & INQUIRIES: 1-312-256-7140

(In Illinois: 1-312-256-7140) 1-312-256-714 HOURS: 8AM-5PM Central Time, Monday-Friday WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc. 629 Green Bay Road • Wilmette, Illinois 60091

DISK **WORLD!**

Authorized Distributor

ATHANA DISKETTES The great unknown!

G ← 51/4" SSDD

You've used these diskettes hundreds of times...as copy-protected originals on some of the most popular software packages. They're packed in poly-bags of 25 with Tyvek sleeves, reinforced hubs, user identification labels and

LIFETIME WARRANTY!

SOFT SECTOR ONLY! Sold in multiples of 50 only.

1-800-621-6827 Illinois: 1-312-256-7140)

INFORMATION & INQUIRIES: 1-312-256-7140

HOURS: 8AM-5PM Central Time, Monday-Friday WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc. 629 Green Bay Road • Wilmette, Illinois 60091

DISK

Authorized Distributor

ËŤIC

DISKETTE STORAGE CASES

AMARAY MEDIA-MATE 50: A REVOLUTION IN DISKETTE STORAGE



Every once in a while, someone takes the simple and makes it elegant! This unit holds 50 5¼" diskettes, has grooves for easy stacking, inside nipples to keep diskettes from slipping and several other features. We like it!

\$2.00
\$9.69

ea. Shpng

DISKETTE 70 STORAGE: STILL A GREAT BUY.

Dust-free storage for 70 5% diskettes Six dividers included. An excellent value. DISK CADDIES \$9.95 Shpng

The original flip-up holder for 10 5% diskettes. Beige or grey only \$1.65 ea.

FOR ORDERS ONLY: INFORMATION 8
1-800-621-6827 INFORMATION 8
(In Illinois: 1-312-256-7140)
HOURS: 8AM-5PM Central Time, Monday-Friday

INFORMATION & 1-312-256-7140

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES! DISK WORLD!, Inc. 629 Green Bay Road • Wilmette, Illinois 60091

The value leader in

FANTASTIC LOW PRICES ON

Buy in bulk and save. 150 to the carton with envelopes, write-protect tabs and user ID labels. Boxed product is the same, except in cardboard boxes of 10

	Qtv. 50	Qtv. 150
5.25" SSDD	83 ea	.80 ea
5.25" DSDD	.94 ea	.92 ea
5.25" DSDD-HD	2.13 ea.	N/A
5.25" SSDD-96TPI	.94 ea.	N/A
5.25" DSDD-96TPI	1.06 ea.	N/A
3.50 SSDD-135TPI	1.84 ea.	1.68 ea
3.50 DSDD-135TPI	2.40 ea.	2.28 ea
NOTE: 3.50" diskettes in	Quantity 50 are nacker	in plastic

library cases. That's why they seem to be a better buy. But there are only 5 diskettes to a case...so the bulk diskettes are really a better deal, unless you like expensive little library cases.

FOR ORDERS ONLY: 1-800-621-6827 (In Illinois: 1-312-256-7140)

INFORMATION & INQUIRIES 1-312-256-7140 HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

Authorized Reseller Information Processing BASF WORLD! Media

DISK WORL **Ordering & Shipping**

Instructions

Shipping: 5%* & 3.5" DISKETTES—Add \$3.00 per each 100 or fewer diskettes. Other Items: Add shipping charges as shown in addition to other shipping charges. Payment: VISA and MASTER-CARD accepted. COD Orders: Add additional \$5.00 Special Handling blood. dling charge. APO, FPO, AK, HI & PR Orders: Include shipping charges as shown and additional 5% of total order amount to cover PAL and insurance. Taxes: Illinois residents only, add 7%

Prices subject to change without notice. This ad supercedes all other ads.
Not responsible for typographical errors
MINIMUM TOTAL ORDER: \$35.00

FOR ORDERS ONLY: 1-800-621-6827 (In Illinois: 1-312-256-7140)

INFORMATION & INQUIRIES: 1-312-256-7140

HOURS: 8AM-5PM Central Time Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc. en Bay Road • Wilmette, Illinois 60091

DISK WORLD!

PRINTER RIBBONS:

at extraordinary prices!

Brand new ribbons, manufactured to Original Equipment Manufacturer's specifications, in housings. (Not re-inked or spools only)

LIFETIME WARRANTY!

Epson MX-70/80 . . \$2.70 ea. + 25¢ Shpng. Epson MX-100 . . . \$4.08 ea. + 25¢ Shpng. Okidata Micro83 . . \$1.37 ea. + 25¢ Shpng. Okidata Micro84 . . \$2.98 ea. + 25¢ Shpng. INFORMATION & OR ORDERS ON INQUIRIES

1-800-621-6827 (In Illinois: 1-312-256-7140) 1-312-256-7140 HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc. 629 Green Bay Road • Wilmette, Illinois 60091

DISK WORLD!



The best deal on 3M diskettes you've ever seen!

FLIP 'N FILE 15 with every order for 5.25" SSDD and DSDD.



\$1.36 ea. 5.25" SSDD with FREE Flip 'n File 15 5.25" DSDD with FREE Flip 'n File 15...\$1.67 ea.

MINIMUM ORDER: 50 Diskettes (Orders less than 50 are \$1.39 and \$1.70, respectively.)

100% LIFETIME WARRANTY!

This is a Super Special Promotion. It was supposed to end May 31, 1985.

But we decided to buy more than 1,000,000 3M diskettes packed in the FREE Flip 'n File 15...and give you the benefits of this terrific value.

One word of warning: this offer is limited only to supplies on hand. Once this inventory is gone, that's it. The prices stay the same...but there's no FREE Flip 'n File.

The last time we ran an offer like this, everything sold out in about six weeks.

So don't wait. Order now

Other 3M diskettes

	Qty. 20	uty. 50
5.25" SSDD-96TPI	\$2.07 ea.	\$2.04 ea.
5.25" DSDD-96TPI	\$2.51 ea.	\$2.48 ea.
5.25" DSDD-HD FOR AT	\$3.18 ea.	\$3.14 ea.
3.50"SSDD-135TPI (Mac)	\$2.29 ea.	\$2.26 ea.
120		

DATA CARTRIDGES

100% certified 3M data cartridges

DC-1000 DC-300XLP DC-600A

\$12.62 ea. \$19.38 ea. \$20.61 ea.

Sold in cases of 10 only Add \$5.00 shipping per 10.



FIRST TOUCH KEYBOARD STRIP

The best way we've ever seen to avoid static danger. Adheres to the front ledge of your keyboard. Overprised at \$19.95, so we cut the price to \$10.95 + \$1.50 Ship-



A VERY SPECIAL OFFER

A VEHT SPECIAL OFFER

3M POST-IT NOTES & DISPENSER

Suggested Retail: \$20.95. Includes dispenser, 12
pads of 3" x 5" Post-It notes and Pilot Ball Point Pen.

Order it with 50 3M diskettes or 10 data cartridges and it's only \$9.75 + \$3.00 Shipping.



CopyWrite

BACKS UP IBM PC SOFTWARE

Hundreds of the most popular copy-protected programs are copied readily. CopyWrite needs no complicated parameters. It needs an IBM Personal Computer, or an XT or an AT, 128k bytes of memory, and one diskette drive. CopyWrite will run faster with more memory or another drive.

CopyWrite is revised monthly to keep up with the latest in copy-protection. You may get a new edition at any time for a \$15 trade in fee.

CopyWrite makes back up copies to protect you against accidental loss of your software. It is not for producing copies for sale or trade, or for any other use that deprives the author of payment for his work.

To order CopyWrite, send a check for \$50 U.S., or call us with your credit card. We will ship the software within a day.



Quaid Software Limited

45 Charles Street East Third Floor Toronto, Ontario M4Y 1S2 (416) 961-8243

Ask about ZeroDisk to run copy-protected software from a hard disk without floppies.

' Initialize, set screen mode 100 DEFINT A-Z:SCREEN 1:CLS 110 FOR I=0 TO 3:READ L(I):NEXT then draw a shape to fill 120 LINE (L(0),L(1))-(L(2),L(3)) using a point-to-point 130 L(0)=L(2):L(1)=L(3):READ L(2),L(3) ' description of the shape 140 IF L(2)>0 THEN 120 150 DATA 50,50,100,50,125,75,150,50,200,50 160 DATA 200,75,175,100,200,125,200,150 170 DATA 150,150,125,125,100,150,50,150 180 DATA 50,125,75,100,50,75,50,50,-1,-1 ' Pause ' Set fill point ' Call fill routine 200 GOSUB 260 210 X=125:Y=100 220 GOSUB 2000 230 GOSUB 260 Pause 240 WIDTH 80:SCREEN 0,0,0:END 260 'Pause routine 270 LOCATE 25,1:PRINT "Press any key: "; 280 IF INKEYS="" THEN 280 290 LOCATE 25,1:PRINT " "; ' Display message ' Wait for keystroke ' Erase message 300 RETURN

PAINTDMO.BAS: Demonstration program for use with PAINT.BAS

routine I use in Free Draw is written in assembly language, but I've converted it to BASIC so readers may understand the general technique and convert it to other languages as they desire.

As published here, PAINT.BAS will work in either medium- or high-resolution graphics mode. You may wish to change the program so it will check for a specific boundary color instead of just look for occupied points.

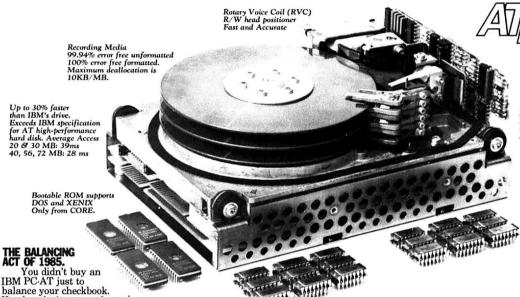
Steven Leventer Potomac, Maryland

Editor's note: Combine the program PAINTDMO.BAS with PAINT.BAS to demonstrate the PAINT.BAS routine. PAINT.BAS is incredibly slow, but it does serve as a useful tutorial and guide for programmers. Readers interested in Mr. Leventer's Free Draw program may write to him at 10919 Candlelight Ln., Potomac, MD 20854.

Join the *.* global exchange.
We'll pay \$25 to \$100 for each item published. Send your personal computer discoveries to Star-Dot-Star, PC World, 555 De Haro St., San Francisco, CA 94107, or electronically to CompuServe 74055,412 or The Source STE908. All published submissions become the property of PC World and are subject to editing for length and style. Due to the volume of mail, we cannot return any submitted materials.

■

BEFORE YOU GET ON THE WRONG TRACK, READ THIS ABOUT THE ONLY ROM-BOOTABLE, PLUG-COMPATIBLE, XENIX SUPPORTING, HEAD-CRASH PROTECTED, HIGH-PERFORMANCE HARD DISK UPGRADE KIT FOR YOUR IBM PC-AT.



ATplus drives are CONTROI are manufactured for CORE by

Full one year warranty. Service available worldwide. (drive shown with cover removed)

Automatic Park & Lock (AP&L) Senses power interrupt, retracts heads to safe landing-zone. Heads never land on data, virtually eliminating risk of data loss.

Memory option.
18 - 128 Kilobit (150ns) D-RAM
chip set. Adds 256 KB to PC-AT
basic model making 512KB PC-AT.
With an ATplus drive, you can
build the PC-AT IBM should have
built in the first place.

balance your checkbook. You bought it to crunch lots of numbers and words, in the shortest possible time. A labor saver. A time saver. Hence, a money saver.

So, do your part for effective money management; hard disk storage is no place to be penny-wise and pound foolish.

TELL 'EM YOU NEED HIGH SPEED AND DATA PROTECTION.

These and other important features do add cost, but that makes a premium drive.

Anything that can be made, can be made cheaper, sell for less, offer lower performance, and probably die young.

Remember, usually you get what you pay for, and you ALWAYS get what you don't.

ALL HARD DISKS ARE NOT CREATED EQUAL.

There are vast differences in the speed and reliability of Winchester hard disks. Since the IBM PC-AT is an incredibly fast machine, a slow drive can make an AT run like an XT.

So, before you get stuck with a slow drive in your

AT, save your boss two grand and buy an XT. Or better yet, buy the AT and avoid any drive with Access Times over 40 milliseconds.

Now tell 'em the drive must have a data protec-tion scheme. One that's easy to use and reliable.

Winchester heads read and write while "flying" a few microns above the data surface. If the heads contact the recording media, you risk a head crash, and significant or total data loss.

So, even a fast drive without data protection is virtually worthless. Frankly, we'd rather sleep at night.

BEWARE OF USER-DEPENDENT PROTECTION SCHEMES. Some drives have a

safe landing zone for the heads, but you need to call a separate program to send 'em there. If you don't call that program and most folks won't, the heads in these drives ALWAYS land on data

when powered down.

The slightest bump or vibration can move the heads, wiping out those data tracks. And the R/W heads can become contaminated, thus increasing the error rate, slowing down average ac-cess until the whole drive

Consequently, those drives offer a very high risk of head crashes, a false sense of security, and

little else.
What's your data
worth? \$200? \$400?
Specify AUTOMATIC data protection. ATplus has it. And it doesn't cost, it pays.

PEACE OF MIND.

Specify AUTOMATIC park and lock of the heads on power down.

This system provides unparalleled head crash protection, by sensing power loss to the drive, and retracting the heads to a dedicated landing zone before they can land

on your data.
Since this is 100%
automatic, user-dependent risk is eliminated.

OUR DRIVES HAVE ALL BEEN TO BOOT CAMP.

Avoid drives that CLAIM PC-AT compatibil-ity but can't BOOT the AT. By the time you juggle the

INTERNATIONAL

diskettes necessary to use one of those drives, the phrase "user-hostile" will have deep personal significance. We believe that

computers ought to serve people, not the other way around.

BEWARE OF THE BARGAIN BAND-SCHLEPPER.

Avoid drives with in-expensive Band-Stepper positioner technology.
These were pretty good
way back in 1980, considering that's all anyone
had. But by today's standards, they're inaccurate

and very mechanical.

They waste time looking for the right track to read or write. And they're worth no where near the price you'll pay for 'em -in more ways than one.

THE HIGH TECH SOLUTION,

Specify state-of-the-art ROTARY VOICE COIL (RVC) head positioner and CLOSED LOOP SERVO technologies.

This system uses a DEDICATED SERVO SURFACE (DSS) for continuous head location

information.
The RVC and DSS use a large scale microprocessor to translate new track-seek commands into current that is applied di-rectly to the RVC. This moves and holds the R/W heads at the exact track intended.

Speed is dramatically increased since head movement is created electronically, with minimal mechanical interfacing.

BESIDES BEING THE SOLE SOURCE.

Specify names you know and can trust. Like Control Data Corporation, a world leader in hard disk technology. And CORE INTERNATIONAL, a growth company with over ten years in computer technology, design and manufacturing.

ATPLUS: IDEAL FOR THE SPECS MANIAC. ATplus High

Performance Hard Disk Upgrade kits, available in 20, 30, 40, 56, and 72 MB capacities.

They have ALL the above features and none of the shortcomings of "bargain" drives. And your AT will

And your AT will accept any two ATplus drives, for up to 144MB of bootable, reliable, DOS and XENIX supporting high-performance on-line storage, all inside the box.

TELL YOUR DEALER...

That only ATplus Hard Disk Upgrade Kits from CORE will do.

If he or she doesn't have 'em, we'll gladly set them up as ATplus authorized dealers.

542 S.E. 5th Avenue · Delray Beach, Florida · 305/276-3929

NOW GET THE TOP NAME DISKETTES AT THE LOWEST PRICES EVER.

	5.25'' SSDD 48 TPI	5.25'' DSDD 48 TPI	5.25'' DSDD-HD PC/AT	3.5'' SSDD	3.5'' DSDD
Dysan.	\$1.65	\$2.20	\$4.75	\$3.05	\$4.30
Verbatim. DataLife	\$1.49	\$1.85	\$4.25	\$2.95	\$4.20
3M	\$1.42	\$1.74	\$3.93	\$2.86	\$3.86
maxell	\$1.49	\$1.85	\$4.25	\$2.95	
XIDEX	\$.85	\$.99		\$2.79	

These diskette brands represent the vast majority of all diskette sales. And for good reason. They're simply the highest quality and most reliable diskettes on the market. Now with one simple toll-free call you can buy them at the lowest prices around. So why settle for a brand you never heard of when you can have the best for less?

TOLL FREE 800-848-FAST

TO ORDER

EXPRESS MICRO SUPPLIES INC. • DEPT. L-557 • COLUMBUS. OH 43260

WHEN ORDERING ASK ABOUT OUR FALL SPECIALS

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 \$891 (\$297 per issue). We offer a six-time insertion, 15 percent discount contract for a total of \$1500 (\$250 per issue). Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, VISA, and MasterCard are acceptable.

DEADLINE: For copy deadlines, contact a PC World Directory sales representative at 415/861-3861 or 800/872-7808 (CA), 800/872-7800 (nat'l). Please send copy and prepayment to PC World Directory, 555 De Haro St., San Francisco, CA 94107.

Accessories

Supplies

Keytops/Key Overlays
Touchdown™ full size keytops
enlarge major control keys on
IBM lookalikes: state model &
color: black or IBM grey.
\$21.95. Touchdown™ key overlays avail. for 5251, 5520, DisplayWrite 2 & 3, WordStar,
WordPerfect 3.2/4.0, & most
popular software, plus do-ityourself kits. \$6.95-\$29.95.
U.S. orders postpaid. Hooleon
Company, Dept. WD, P.O. Box
201, Cornwille, AZ 86325,
602/634-7517

Bar Code

Bar Code Readers/Printing
Print Bar Codes on PC/MSDOS with Epson/Okidata.
Code 39–\$49. UPC, Code 39,
2 of 5, Cdbar w/disk data—
\$129. AIAG-\$299. LOGMARS
& HIBC-\$199. Linkable
(BASIC) \$299. Demo disk—\$10.
Read bar codes thru keyboardinterface to any program on
PC, XT, jr, or AT; no slot/serial
port—\$595. Visa/MC. Data Solutions Systems, 130 Crespi
Court, Santa Cruz, CA 95060,
408/458-9938

Books

Operating System Shell Tom Sheldon, author & writer for PC World Magazine, has written a step-by-step guide that helps readers create & assemble an automated menudriven directory structure for hard disk systems from DOS commands & batch files. Password schemes & multiple user systems discussed. Excellent tutorial & supplement to DOS manual. 80 pgs-illustrated. \$9.95 + \$1 ship. Visa/MC. Tom Sheldon, 789 Casiano Dr., Santa Barbara, CA 93105, 805/687-0865/964-2480

dBASE II/III in English I **NEW! BIGGER! BETTER!** Absolutely the clearest, simplest, most coherent tutorial you can find on dBASE, 312 Pages of Real World Examples done in both dBASE II & III. Will teach any novice to program in dBASE. Reader's Comments: "A truly excellent work of art," "Outstanding," "It is the finest manual I have found." Order your copy today. Send \$19.95 or MC/Visa to: English I Computer Tutorials, 1617 N. Troy St., Dept. B, Chicago, IL 60647, 312/489-1588

Business Opportunities

Medical/Dental Franchises Software development company looking to establish new dealers. Franchises will include exclusive territory, source code, system documentation, advertising material & testimonials from end users. Over 200 end users nationwide. End user cost: \$4500-\$5000. Franchise cost \$10,000-\$25,000 plus a \$100 royality per system. MTA Medical Systems, 4825 Heffield Circle, Syracuse, NY 13215, 315/488-1518

Computer Repair

IBM Circuit Board
Repairs for PC, XT & PPC. An alternate source of professional circuit board & subassembly repair available through PC dealers & maintainers. Lower prices & faster turn-around, utilizing Automatic Test Equipment(ATE), typically 5 days in house. From keyboards to power supplies. Have your dealer or maintainer contact: Unitrace Incorporated, 3350 Scott Blvd. #20, Santa Clara, CA 95054-3106, 408/727-7573

Consultants

California

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, 415/929-8780 (No. CA)

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,

Call or write: David Jenkins, Midway Software Inc., 1609 Bancroft Way, Berkeley, CA 94703, 415/644-2369

Data Conversion

Don't Rekey-Convert!

We use the latest disk, tape, scanning, & telecommunications technology to reformat data. Quickly & Accurately. Usually at one tenth your current cost. We transfer data between word processors, typesetters, micros, minis, mainframes, & software packages. Full range of consulting services includes Data Customization & Data Base Development. Data Conversion Laboratory, 67-27 168 St., Fresh Meadows, NY 11365, 718/939-4921

Disk Copy Service

Superior Disk Copying Allenbach created the industry, & we've since been imitated-but never duplicated. What sets us apart from the crowd is the feeling you'll get that Allenbach is working exclusively for you. Whether you need 100,000 copies or just 100, we're here to serve you. Give us a call today & experience the confidence in dealing with the leader. Allenbach Industries, Inc., 5957 Landau Court, Carlsbad, CA 92008, 800/854-1515, in CA call 800/468-2627

9 Track Tapes to IBM PC Convert mailing lists or other mainframe data on 1600 BPI 9-track tapes to PC-DOS 5¼" disks. New automated process guarantees data verification. Easy instructions for loading to your data base (dBASE III, R:base 4000, etc.) or hard disk. Only \$60 per million chars (\$95 min). Bernoulli box \$30/M. A.S.I. Inc., 1259 El Camino #260, Menlo Park, CA 94025, 415/323-6338

Duplication Solutions

The answer to software duplication needs, no matter what the vol. Choose control of duplication—your facility, ours, or both. We supply autoloaders, desk-top copy equip., disks & technical support. We provide duplication; technical assistance w/copy protection, serialization & proprietary formats; pkg. assembly, shrink wrapping & distributive shipping. MegaSoft, Inc., P.O. Box 1143, Freehold, NJ 07728, 800/222-0490, 201/462-7628 (NJ)

BLANKET SERVICES

- Diskette duplication
- Packaging
- Stocking/Drop Shipping Place a BLANKET ORDER with releases as you need them for any quantity at a fixed price
- 48 hour delivery
- PROLOK copy protection
- Lifetime guarantee
- No "mastering" charge
- No charge for standard labels Star-Byte, Inc., A Div. of Robinson-Halpern Co., 2564 Industry Lane, Norristown, PA 19403, 800/243-1515, 215/539-4300

Each A Perfect Original

Specialists in quality-controlled duplication for all formats on 3.5", 5.25", or 8" media. New copy protection for hard disk for IBM PC & compatibles. Labeling, packaging, shrink-wrapping. Downloading for over 200 formats & dedicated word processors. Competitive turnaround. Personal service. DisCopyLabs, 1600 Wyatt Dr. #10, Santa Clara, CA 95054, 408/988-0438

Hardware

Add-on Boards

µP/Pal/Prom Programmer
PC compatible PROM-2000
card can program 2716, 32,
32A, 64, 128, MCM 68764
EPROMs & also 8748/49/51
processors. The software
(CP/M-86, MS-DOS) can read,
verify & program EPROMs &
uses FAST programming algorithm. The zero-insertion
socket is mounted on an external box. The external box for
BI-POLAR proms & PAL is
also avail. Advanced Microcomputer Systems, Inc., 2780 S.W.
14th St., Pompano Beach, FL
33069, 305/975-9515

\$200 Per Megabyte

Memory expansion for your IBM PC, XT, or AT at \$200 per megabyte. All the memory you've dreamed of at a price you can live with. JRAM-2 & JRAM-AT hold up to 2 megabytes per board with Ser/Par/Clks also available. Megamemory & I/O ports all in one slot! Tall Tree Systems, 1120 San Antonio Rd., Palo Alto, CA 94303, 415/964-1980

Videotape Graphics

PC-VideoGraph is a single-slot board that installs in IBM PC, XT, or AT. Runs all std. software such as Lotus 1-2-3 & Microsoft Flight Simulator. Dual outputs for display on IBM monitor & for videotaping. Price: \$695. Optional graphics overlay on video: \$1,295. New Media Graphics Corp., 279 Cambridge St., Burlington, MA 01803, 617/272-8844

BIOS

Fixed Disk BIOS/Boot

FiXT boots from most popular Hard Disks—DAVONG, TEC-MAR, IOMEGA, GT LAKES, etc. Adds XT-like BIOS interface to your disk for PC. Security, multiple volumes, removable media support optional. No-slot plug-in installation. Specify controller & computer with order. \$80-\$95 + \$3 shpg, CA tax. Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349

Disk Drives

1.2M PC-AT Disk Drives

AT your PC by replacing your diskette controller & adding a high density disk drive.

JDISKETTE handles 1 to 4 diskette drives plus an I/O module. \$249 for JDISKETTE-SA; \$250 for Teac 55GF (1.2M); \$200 for Teac 55B (360K); \$180 for Ser/Par/Clk module. Tall Tree Systems, 1120 San Antonio Rd., Palo Alto, CA 94303, 415/964-1980

Printers

Printer Control Program!

For IBM PC & compatibles. Get out of your printer what the manufacturer built into it. No switches! No mysterious hexadecimal codes. Simple to operate. No risk warranty. Only \$29.95! All major credit cards. Micro Alliance Corporation, to order call 800/824-8754; in CA call collect 408/375-2802

Security

Secure AT/XT/PC

Control system access, data access! FiXT/S controls system boot for most popular XT/PC hard disk controllers. Vfeature for AT & XT–compatible HD controllers segments hard disk by volumes, controls access with passwords, supports hard

disk expansion. \$80-\$95 + \$3 shpg, CA tax. Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349

Insurance

Safeware

If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media & purchased software. As little as \$39 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 a.m. to 8 p.m. Mon. thru Fri. Call Sat. 9 a.m. to 5 p.m. Safeware, The Insurance Agency Inc., 2929 North High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469(Nat), 614/262-0559(OH)

Leasing

PC•XT•COMPAO Rental

Quick delivery within US. All configurations including new AT, modems & printers. Attractive rates & flexible terms. Lease 1 month & longer. Custom leases to fit budget requirements. A portion of your lease payment can apply to purchase. Trade old PCs on new AT. Purchase/lease back available. Use 'r Computers, Inc., 12800 Industrial Park Blvd., Minneapolis, MN 55441, 800/624-2480, 612/559-7096

Mailing Lists

IBM Mailing Lists

Now over 855,000 micro owners: 219M Apple, 179M IBM PC, 156M TRS-80, 80M Commodore & more! 9 phoneverified reseller lists including 6,211 stores, VARs, chains & more! 14,000 computer firms. Modem owners. UNIX users. Over 75 different micro lists. Call/write for FREE catalog. Include phone & type of business. Irv Brechner, Targeted Marketing Inc., Box 5125, Ridgewood, NJ 07451, 201/445-7196

Software

Accounting

Accountants Software

Finally! A software source for the practicing accountant with programs designed especially for the professional practitioner. Depreciation, After-The-Fact Payroll, Form #1099 Generator, Account Analysis & Client Information System are just a few of many. Call or send for our complete catalog. Omni Software Systems, Inc., 146 N. Broad St., Griffith, IN 46319, 219/924-3522

CPA Exam Preparation
NEW-IBM multiuser office
package takes work out of
preparation. Questions with
referenced solutions generated
by AICPA exam weights. Study
single, multiple or all categories. Times, scores, updates,
provides progress report with
study recommendations. Individual program sold by section.
Micro Mash, P.O. Box 6512,
Huntsville, TX 77340, 800/

241-9700, 409/295-1597 (TX)

Earn CPE Credits

Computerized study/assessment program makes updating professional competence fun & easy. Both multiuser office packages, & individual programs available. Select subjects, earn from 1 to 20 hours. Certification of completion included. Written, administered by accounting professionals. Micro Mash, P.O. Box 6512, Huntsville, TX 77340, 800/241-9700, 409/295-1597 (TX)

G/L Accounting Power
Now, the same financial reporting power used by offices of all of the "Big 8" is available to corporate controllers. AMI's DATAWRITE™ Corporate
General Ledger gives complete flexibility for custom reports.
Fixed Asset Management & The TAX MACHINE™ are available too. Nationwide support. Accountants Microsystems Inc., 3633 136th Place SE, Bellevue, WA 98006, 800/426-8201, 206/643-2050

Custom Payroll

All systems support multiple pay categories, calculation of all taxes, user-defined deductions, exceptional item handling, a variety of necessary reports, paychecks and W-2 forms. Written in PC BASIC with full source included for easy maintenance. Prices start at \$695 for basic system and manual. DATASMITH, Inc., Box 8036, Shawnee Mission, KS 66208, 913/381-9118

Open Systems, Inc.
BUSINESS & ACCOUNTING
SOFTWARE—fast becoming
#1 with 60,000 businesses installed. Superior products plus
superior service. • Accounts
Payable • Accounts Rec.

 Fixed Assets • General Ledger • Human Resource Mgt. • Materials Mgt.

Payroll • Purchase Order
 Sales Order • Report Writer.
 Open Systems, Inc., 6477 City
 West Pkwy., Eden Prairie, MN
 55344, 800/328-2276

Accounting Solutions

For CPAs & growing businesses: software for both, with optional link between the two. For CPAs: Client Ledger System, the leading write-up program for PCs. Reporting, passive payroll, more. For small business: Total Accounting System. 12 integrated accounting programs, built-in DBMS, networkable. TCS Software, Inc., 6100 Hillcroft #600, Houston, TX 77081, 800/231-6454, 800/392-5973(TX)

Joe Lynn's Payroll

Complete menu-driven user-friendly payroll. Calculates FWT, SWT, FICA, 4 misc. deductions. Prints paychecks, W2s, 941. Hourly & salary, manual or automatic. IBM PC & most compatibles. \$49.95 + \$3 shipping. Visa/MC/chk. 30 day money back guarantee. Joe Lynn Computer Services, 23501 W. Gagne Lane, Plainfield, IL 60544, 815/436-4477

Myte Myke™ Business Sys Commercial grade, integrated business application software. Order Entry, Inventory Control, Sales Analysis, Accounts Receivable, Accounts Payable, General Ledger, Purchase Orders. Pro-Time–time & billing. Install & support avail. PC-DOS, MS-DOS, NOVELL Networks, XENIX & UNIX. M & D Systems, Inc., 3885 N. Buffalo Rd., Orchard Park, NY 14127, 716/662-6611

Agricultural

Feed Blending Programs MIXIT-2 (\$595) finds least-cost rations for all animals. Hundreds of ingredients & 57 user-chosen nutrients. PRICE-IT (\$595) is a feed-pricing & inventory program. MIXIT-4 (\$1895) is a complete & integrated feed formulation, pricing & inventory package for a feed mill. Demo disks available. Agricultural Software Consultants, P.O. Box 32, Dept. P, Kingsville, TX 78363, \$12/595-1937, Telex 757375

Assemblers

Cross Assemblers

Operating on IBM PC & PC compatibles under MS-DOS, re-locatable assemblers are:

- Intel compatible for 8080,86,186,286,80
- Motorola compatible for 68010, 6809, 6800
- Manufacturer compatible for Z80, 6502 & others
- Relocatable meta assemblers Full product line includes linkers, librarians. \$600-\$1800.
 Microtec Research, Inc., 3930
 Freedom Cir., Santa Clara, CA 95054, 408/733-2919

Backup Restore

10 Megabytes/8 Minutes That's how fast FASTBACK™ can back up your hard disk. Makes a fully file-oriented backup of ANY PC/XT/AT compatible hard disk on your present 5¼" disk drive! 10 day unconditional guarantee. \$149 Visa/MC/chk/MO/COD. Free literature. Fifth Generation Systems, 7942 Picardy #B-350, Baton Rouge, LA 70809, 504/767-0075

Fast, Smart XT Backup BAKUP™ does daily backups in less than 5 min; a full (10M) backup in less than 30 min. Uses floppy disks, cartridge disks, etc. on XT, AT or compatible. Unique catalog of backed-up files speeds restoration & prints backup reports. Includes 50 diskette labels. 30day money-back guarantee. \$179.95; Visa/MC/PO/COD. Software Integration Inc., for more info: 415/388-1383; to order: 800/538-8157, ext 801 (USA), 800/672-3470, ext 801 (CA)

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 (\$30) includes a Beginner's Guide and 70-page manual with 7 examples from business & industry. Agricultural Software Consultants, P. O. Box 32, Dept. P. Kingsville, TX 78363, 512/595-1937. Telex 757375

MILP88-Mixed Integer LP

A general-purpose system for solving mixed integer linear programs w/up to 45 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, P.O. Box 15328, Alexandria, VA 22309, 703/549-5469

LP88-Linear Programming

A powerful menu-driven system for solving linear programs w/ up to 255 constraints & 2255 variables. Features include interactive & batch operation, spreadsheet-style input & editing, storage of problems & bases, Simplex Algorithm restart, report generator, sensitivity analysis. Req. 192K. \$99 w/8087 support, user's guide. Visa/MC. Eastern Software Products, P.O. Box 15328, Alexandria, VA 22309, 703/549-5469

dBASE II/III Software

- GENERAL LEDGER Integrates w/dInvoicer
- dINVOICER Billing & A/R
- SALES ANALYSIS Works with dInvoicer
- JOB COSTING for Contractors
- JOB ESTIMATING Works with Job Cost ONLY \$99 each including source code. MC/Visa/Chk/ COD. dATAMAR Systems, 1152 Albion St., San Diego, CA 92106, 619/584-2727

Business/Home

Users Group Shareware Our Users Group Library features a wide selection of Shareware for your PC/PCjr. Order programs from us, then register w/authors if you find them useful. • SAMPLER DISK-One get-acquainted disk, \$9.95. SHAREWARE SIX-PAC-Includes PC-File III v2, PC-Write, PC-Calc, PC-Dial, PC-Code & Personal Finance Mgr., \$49.95. Catalog incl. Catalog alone \$4. Add \$2 s/h. CA res. add 6.5%. Central California Users Group, P.O. Box 8404,

Santa Cruz, CA 95061

¢heapware®	
*Label Maker w/3000 labels	\$45
*GRAMARCY-Word Game	\$35
Draw Poker	\$35
*5-Year Diary	\$35
Letter/Manuscript Writer	\$30
*Tax Record	\$30
*Draw Poker Odds Calculator	\$25
*BASIC CREF	\$23
*Word List	\$20
*BASIC Program Printer	\$20
(*DEMO available) Write for	or
details or call the cheapwar	
sales/support line. Robert L	
Nicolai, 4038 N. Ninth St.,	St.
Louis, MO 63147, 800/642	
6524 = = > 800/NICOLAI	,
314/621-7618 (MO)	

Calendar

Time-Keeper (Calendar) A calendar/scheduler featuring

a weekly or monthly graphic display: multiple calendars, conference locating, copy or move appts. within or between calendars, search, tickler reminder, print selected appts., on-line help, user configuration files. PC/XT/AT or compatible. 192K PC-DOS 2.0. Mono/ color-any printer. \$195. Demo-\$15. DuraSoft, 7210 Washington Ave., New Orleans, LA 70125, 504/486-6081

Checking

LEDGER DOMAIN®

Super! Feature-packed, Menudriven Checkbook System for 1-2-3. Prints checks, one-key entry of recurring bills, auto statement reconciling. Access to data functions through menus: extract by dates, check numbers, categories, etc.; print any result. Tutorial & Utilities. Simple, intuitive, flexible. Req. 1-2-3 ver. 1a, 256K. \$45 ppd. MCNisa. Richard Rapfogel, Ph.D., 6219 Washington Ave., St. Louis, MO 63130, 800/222-4747, ext. 3001, 314/768-0448

Church Applications

Parish Data System™

Comprehensive church program, menu-driven, extremely easy to operate. Family, Member, Financial info & all reports integrated into one package. Ability to get selective listings, mailing labels; contribution, tuition statements; personalized letters. User able to create own reports & letters. \$950. Parish Data Systems, Inc., 3140 N. 51st Ave., Phoenix, AZ 85031, 602/247-3341

Collectors

"THE COLLECTOR"™

Organize your collectibles (stamps, coins, dolls, antiques, trains, you name it) all on one disk. Single disk holds 2000 + items. Has unlimited capacity.

Sorts alph/numeric with cost/ cur val at touch of key. For PC/ PCjr/XT or similar (128K-DOS 2.00, 2.10). Write/Call for free brochure, or \$65 + \$3 s/h. Visa/MC. The Third Rail, P.O. Box 143, O'Fallon, IL 62269, 618/632-7424

Compilers

Professional Pascal

Serious software developers:

- · Full ANSI Standard with extensions
- Cross compiler generates optimized MS-DOS code for 8088, 80186, 80286
- 8087 native code or emulation
- Separate compilation & communication with other languages
- Five memory models
- Produces ROMable code \$895. Microtec Research, Inc., 3930 Freedom Cir., Santa Clara, CA 95054, 408/733-2919

Culinary Arts

Diskette Cookbook Series ATTENTION GOURMET COOKS! VANILLA publishes 25 popular printed cookbooks transcribed to disk. Search, scale & print recipes from the thousands available. Create your own cookbooks, too. Hard disk search/storage supported. No user manual needed. Software \$40; cookbooks \$12 & up. Send for free catalog. Vanilla Software, 3345

Lakeshore Ave., Dept. W, Oakland, CA 94610, 415/835-1953

MICRO-GOURMET™

A complete culinary guide for the IBM PC. Create a personal recipe library, shopping list, create portion to portion comparisons. Micro-Gourmet has over 90 continental recipes, culinary terms, calorie guide, herbs & spices, & more. Home & restaurant use. Req. 128K, DOS, Disk Drive. Check or

money order. \$40. DeAmicis Software Development, 4193 Galbar St., Oceanside, CA 92056, 619/758-4766

The Cooking Revolution NOW! The program that tells you how to stock your kitchen with kengredients so yo're never at a loss for exciting meal ideas. Offers quick & delicious recipes based on what you have on hand. Interactive consultation on menu planning. Automatic shopping lists. MS-DOS, 128K. \$40. Decker Systems, 3926 Tracy St., Los Angeles, CA 90027, 213/667-3230

Data Base

Call Costing Data Base Customized data base for call costing. Intra & inter-lata, interstate, & international based on Federal & State tariffs & V&H coordinate system. Utilities included to create special rate tables. First year updates free. Complete data base \$595. OEM discounts. Demo sample \$49. JCL Associates, P.O. Box 335, Contoocook, NH 03229, 603/746-4865

Demographic Data Base A general purpose data base on 32 diskettes that covers all US counties and most cities. Includes data on agriculture, banking, crime, climate, education, government, housing, income, poverty, vital statistics, and much more. Manual and storage cases included. Ideal for market and sales research. \$295 MC/Visa. Melissa Data Co., 12 Balboa Coves, Newport Beach, CA 92663, 714/650-1000

Data Entry

RODE/PC Data Entry RODE/PC is unmatched for power & ease of use. Menudriven; pop-up help; headsdown speed; extensive input validation; automatic reformatting; conditional processing; operator stats; user exits; 129 keyboard & barcode options, much more. \$40 demo. \$595 first license, \$395 each additional. Volume discounts. DPX Inc., 20823 Stevens Creek Blvd., P.O. Box 656, Cupertino, CA 95015, 408/973-9292, TELEX 701111

Data Entry System

Heads-down data entry for PCs will allow fast & accurate preparation of batch data files. Features: auto-dup, two-pass verification, constants, format chaining, table lookups, range checks, batch totals, & much more. Easy format generation. 30 day trial period. Only \$395. Computer Keyes, 6519–193 SW, Lymwood, WA 98036, 206/776-6443

S1DES/PC

Replace your 029, 129, 3741/3742, 5280, etc. Versions: Extended keypunch to comprehensive, full function for high volume, heavy editing. Features include standard keypunch + verify, table lookup, search, insert/delete, format chain/select, balance, stats & much more. Prices start at \$195–30 day trial. Software Consulting Service, Inc., 8930 Fourwinds Dr. #231, San Antonio, TX 78239, 512/656-6484

Entrypoint

Most widely installed data entry system for PC/XT/AT.
Heads-down speed, sophisticated multi-screen applications.
Features: paint the screen form design, data validation, table & file lookups, Help keys, logic processing, reformatting, batch totals, verification, 129 KB remapping & more. Demo \$24, Operator \$545, Developer \$845. Volume pricing. Datalex, 650 5th St., San Francisco, CA 94107, 800/962-8888, 415/541-0780

Data Management

PC World Directory

The PC World Directory is a highly cost-effective way to advertise in PC World. This section provides a direct link with buyers of IBM PC and PC-compatible hardware and software. Finally, a simple way to target your product to the right buyer. For more information contact: PC World Directory, 555 De Haro St., San Francisco, CA 94107, 415/861-3861

PC-FILE III™

New for 1985, version 3.00 is faster than ever. Enhancements: 32767 record capacity, field size up to 1665 bytes, instant "snapshot" mailing labels, much more. Exchange data with 1-2-3, Word, WordStar, etc. Over 100,000 copies of PC-File in use. Printed manual. \$49 chk/MC/Visa. Toll free 24 hour order line: 800/JBUTTON. ButtonWare, P.O. Box 5786, Bellevue, WA 98006, 206/746-4296

askSam

A simple-yet powerful-end user text oriented dbms. Retrieve on any combo of words, parts of words and/or field values. Sort output to printer, screen, or disk. Update with full screen text editor or batch operations. For IBM PC, PCjr, AT, XT, & compatibles with PC-DOS 2.00 or later, 128K min. \$149.95, + \$5 s/h. Visa/MC. Seaside Software, 538 Parade, Corpus Christi, TX 78412, 800/3askSam (orders only); 512/991-2019

Development Tools

For COBOL Programmers

Assembler routines! Open windows, scroll/up/down, draw boxes, keyboard input with bracketing, menu pointer routine, log screens to disk, control caps—lock, beep, clock & timer, full printer control. You get source, object, demonstration program. Price \$99. Joseph Leonard Associates, Inc., P.O. Box 1925, Edmond, OK 73083, 405/340-0545

Edit

PQfEDIT

Full-screen editor, the EDLIN alternative. Includes: 4-way cursor, char. insert/delete/replace, 4-way scroll, split/join lines, add/copy/move/delete lines, search/replace strings, get/put to disk, help screens. Edit multiple files at same time. Needs 80 column display, 128K, DOS. \$45 + \$2 shipping. ADAM Systems Corp., 5919 Munson Court, Dept. 101, Falls Church, VA 22041, 703/379-0669

Super Screen Editor

(SSE) is a full-featured screen editor including split-screens, 4 way scrolling, definable keyboard, macros copy/move/delete blocks of data (by line or column), file backup, line numbering, search/replace/undo, print utility, help screens: \$99 + shipping. Binary Corporation, 4091 126 Dr. N, Royal Palm Beach, FL 33411, 305/798-3100

Educational

PC/Pilot

Language for education & training. Now offered also by IBM as IBM Pilot. Support for color, graphics, fonts, windows, files, video control. We offer upgrades, advanced feature library (\$300), tutorial (\$125), authoring prompter. Single use license (\$200) & unlimited campus/site license (\$2000). 20% ed. discount. Washington Computer Services, 3028 Silvern Lane, Bellingham, WA 98226, 206/734-8248

Teacher Turned Author!

Create great instructional courseware in minutes. No programming! Mix text, color graphics & questions on any page. Built-in drawing system or optional graphics tablet. Student recordkeeping, instant editing, & page playback. No royalties-produce unlimited courseware. PC, XT, & all compatibles; Color: \$699; Mono: \$399; Both: \$850. Demo disk: \$15. Raster Technology, Inc., P.O. Box 3477, Longwood, FL 32779, 305/862-2859

Mr. Math

Four programs tutor basic math skills in arithmetic, money, and fractions. Programs feature optional step-by-step tutoring, annotated step-by-step solutions & a report card summary. All answers worked out directly on the screen-no pencil or paper needed! Req. 1 DD, 64K (96K for 2.X) \$34.95 ea., 2 for \$65, 3 for \$90, all 4 for \$113. Term Computer Services, P.O. Box 725, New Providence, NJ 07974, 201/665-0923

Educational/Games

Mastercolor

Similar to the popular board game of MASTERMIND.
Challenges, entertains & tests deductive reasoning ability.
Stimulates children's logical thinking. A new puzzle each time played or play against a live opponent. Provided in BASICA source for color or b/w PCs, PCjrs or clones. Send \$17.95 plus \$2 p/h to TFH & Associates, 6755 No. Corie, Canoga Park, CA 91307, 818/347-3460

Engineering

Structural Design

NEW-Fast, efficient, versatile structural analysis & design programs in spreadsheet format-BEAMS, COLUMNS & FRAMES of any material. Friendly input & output with data storage & COLOR graphics. Specify PC, XT or AT & send \$25 for demonstration diskette to: C-Squared B-Squared Software Design, Inc., 763 27th Ave., San Francisco, CA 94121, 800/621-0851, ext. 330, 415/751-1337

Mech./Elec. Design
Programs for HVAC Loads,
Building Energy Analysis, Faser
Energy Acctng., Duct Sizing,
Lighting, Short Circuit, Voltage
Drop, Pipe Sizing, Critical Path
Analysis, Life Cycle Costing, &
more avail. for CP/M, CP/M86, & MS-DOS computers. All
disk formats supported. Demo
disks avail. on each program
for \$33. Send/call for literature.
Elite Software, P.O. Drawer
1194, Bryan, TX 77806, Bus.:
409/846-2340, By Modem:

smARTWORK®

409/775-0760

Printed-circuit artwork editor for double-sided boards up to 10" by 16"; runs on an IBM PC. Color display allows complete interactive control over the placement & routing process. 2X artwork can be made on a dot-matrix printer or penand-ink plotter. \$895. Write or call for a brochure. WINTEK Corp., 1801 South St., Lafayette, IN 47904-2993, 317/742-8428

Eng./Sci. Graphics

Engineering/scientific graphics.

OMNIPLOT [S] (screen graphics) & OMNIPLOT [P] (plotter driver) provide integrated eng./sci. 2D & 3D graphics w/NO PROGRAMMING! Menudriven, flexible, professional.

Choice of formats: tabular/line, contour, 3-D wire frame & more! \$195 each. Both \$295.

Microcompatibles, 301 Prelude Dr., Silver Spring, MD 20901, 301/593-0683

Simulation

GPSS/PC is a full-power version of GPSS, the most popular mainframe simulation language. Using GPSS/PC it is possible to predict the effects of managerial or engineering decisions on complex real-world systems. More than just a language, it is a simulation environment specifically designed for interactive use on today's high-speed microprocessors. Minuteman Software, P.O. Box 171/W, Stow, MA 01775-0171, 800/343-0664, ext. 4800 (U.S.), 800/322-1238, ext. 4800 (MA)

Estate Planning

Will-Planner™

Use your PC to write a personalized will! Educational, easy to use program; powerful dictionary function; info on probate & using lawyers. Create typed will/trust document, asset inventory & estate tax estimate. Save money! Written by lawyers for non-lawyers. For IBM PC & compatibles. Price: \$79.95. Will-Planner by Noetic Technologies Corp., P.O. Box 3085, Englewood, CO 80155, 303/770-2380

Financial

Bookkeeping Made Easy

Fast, single-entry checkbook accounting system in "C". Allows multiple checkbooks, charge cards, & departments. Option to print checks, bank reconciliation, flexible sorting & reporting. Exports to Lotus format or dBASE format. MICRO-ONE-WRITE demo \$10, complete program \$95. Lotus tax template \$75. Permar & Associates, 1125 Sumyhills Rd. Dept. W, Oakland, CA 94610, 800/443-0100, ext. 644

Run LAPP Around Loans

LAPP is a completely flexible Loan Amortization Printout Program. Payments may be periodic or irregular for fixed or varying amounts. Wide variety of interest compounding intervals. Excellent documentation. Satisfaction guaranteed or full refund. Order now! Send \$95. MC/Visa. Dealers welcome. Mountain Software Inc., 1104 Fennell Ave. E., P.O. Box 4364, Hamilton, Ontario L8V 4L8, Canada, collect: 416/385-3214

Commercial Credit Matrix

How do you analyze financial statements? Half the Fortune 500 have the CCM. Used with your Lotus spreadsheet, the Matrix is fast & objective. It calculates the liquidity, leverage, & earnings ratios of most firms & rates them 0-20. Booklet & disk for 1-2-3, \$69. For Symphony, \$79. Free brochure. Books On Business, Box 313-F, Buena Park, CA 90621, 714/523-0357

1-2-3 Template Series

Financial Evaluation System. 37 highly detailed, menu-driven modules, featuring Lease/purchase, Depreciation, Cost-Volume-Profit, Regression, Loan Anal. & Sched., Annuities, Stock & Bond Anal., Financial Ratios, EOQ, Cap. Assets Pricing, & MUCH MORE. \$39.95 (+\$2 in TX); Visa/MC acc. Requires 1-2-3 1A & 256K. AVS Development, P.O. Box 741, Cypress, TX 77429-0741, 713/859-8532

Forecasting

1,2,3 FORECAST!

Menu-driven template programmed in Lotus 1-2-3 macros. Forecasts time series data in existing 1-2-3 files. Fast & easy with little Lotus or forecasting experience. Linear & non-linear trends, regression, smoothing, decomposition, seasonal indices, diagnostics, more. 50 page manual includes tutorial & documentation. \$75 chk/MO ppd. USA, more info: 1,2,3 FORECAST!, P.O. Box 12582, Salem, OR 97309, 503/585-8314

Gambling

GRIDSTAR 85™

Beat your bookie or office pool with world's most sophisticated NFL analysis package. Verifiable 10-yr. track record 64% vs. spread. Exciting, easy to use, 7-10 picks, 20 report pages weekly. \$150. We'll rush demo disk with Gridstar manual \$10. NBA Strategist™ inquire. Visa/ MC. Call 7-11 EST. Summit Research, 65 High Park Ave. #806, Toronto, Ontario M6P 2R7 Canada, 416/767-7798

Card-Counter BlackJack

Master the technique of card counting without risking real money.

- 1-6 decks in shoe
- · instant review of count
- · calculates odds of busting
- up to 7 real or dummy players
- customize to your own counting system
- double down & split like real BJ
- \$25 + \$2 shipping, Visa/MC CORE Decision Products, P.O. Box 3412, OakBrook, IL 60521-3412, 312/789-8772

Games

Icon: Quest for *The Ring* Electronic Literature—Unique Graphics—Real Time Action. ICON alone lets your IBM PC display 16 colors at 320×200 on a standard color card. An adventure based on Wagner's operatic epic *The Ring*. Monsters, dwarves, Rhine maidens, dragons, an authentic plot & more. All in 16 colors! Visa/MC/COD \$49.95. Demo \$5. *Macrocom Inc.*, 151 Sixth St. NW #127, Atlanta, GA 30313, 800/622-8086 or 404/874-6448

Cribbage Master

The best card game graphics you have seen! Color or IBM mono. For experienced cribbage players & beginners. Five play options, three games plus two to improve your discarding strategy: Solitaire, Duplicate, Discard Master, Discard Query, Game Challenge. Any DOS, 128K. \$34.95. 7-day return privilege. Silversoft, 2150 Spruceway Ln., Ann Arbor, MI 48103, 313/994-5398

Mc\$OFTWARE

12 classic games ... Blackjack, Moonbase Alpha, Startrek, Chess, Othello, Alien, Maxit, Yahtzee & more. Some developed on mainframes, updated to use color, sound & graphics on your IBM PC. On-screen documentation, menu-driven. Action, strategy, adventure. All for only \$24.95. Visa/MC. Mc\$OFTWARE, Ltd. Division, M.B.A. Communications, 2055 North Druid Hills Rd. #201, Atlanta, GA 30329, 404/373-3770

Chess • Rummy

You against the computer. PLUS source code in BASIC. CHESS program (.exe & code) \$35. Chess technical overview with listing \$30. Chess programming projects \$20. Computer Thinking—Chess Style \$10. RUMMY Card Game (.exe & code) \$30. Rummy technical overview with listing \$25. Rummy projects \$20. Visa/MC/cash/chk + \$3.50 s/h. Geminy SW, Dept. P, P.O. Box 192, Belmont, CA 94002, 415/595-3001

Is Your Mind Fast?

For excitement, fun & high speed word game entertainment–try MEGAWORD, the new word game. Flexible & challenging for all ages, MEGAWORD leaves Scrabble™ & Jotto™ in the dust! For 1 or 2 players. A MUST for word game buffs! For IBM PC/jr/XT/AT/COMPAQ, 128K; color or mono. \$19.95. Firefly Laboratories, 109 Liberty St., San Francisco, CA 94110, 415/641-9211

Genealogy

Family Reunion III

For home or professional use for beginning level to advanced genealogists. Keeps track of living, relatives as well as genealogical research. Prints address labels, pedigree charts, family group sheets, descendant charts, text data & more! PCDOS 1.1 or above, 128K, PC, PCjr, PC XT, PC AT. \$159.95 + \$5 s/h. Personal Software Company, 1580 East Dawn Dr., Salt Lake City, UT 84121, 801/943-6908

ROOTS II™

Powerful organizer for family historical info. Lightning fast searches & sorts. Print cameraready paginated books with pedigree, descendant & ahnentafel charts, family group sheets, text & index. Display maps w/graph adapter. Any PC or compatible. Satisfaction guaranteed. \$195 (+ tax in CA). COMMSOFT, 2452 Embarcadero Way, Ste. B, Palo Alto, CA 94303, 415/493-2184

Graphics

Grafmatic/Plotmatic

Grafmatic (screen graphics): 70 MS FORTRAN/Pascal (3.10, 3.20) IBM 2.00; ss, Prof. FORT callable graphics routines. 100 page user manual. General utility, 2D interactive, total 2D plot support, 3D plots & solid models. \$135. HP, HI plotter? Try Plotmatic for complete plotter capabilities. Use with Grafmatic. \$135. Both, \$240. Microcompatibles, 301 Prelude Dr., Silver Spring, MD 20901, 301/593-0683

HALO

The most powerful library of subroutines under MS-DOS. Extensive functions include point, line, arc, circle, ellipse, hatch styles, pattern fills, clipping, dithering, world coordinates, image compression, multiple viewports, rubberband mode, etc. Compatible with multiple devices & languages. Media Cybernetics, Inc., 7050 Carroll Ave., Takoma Park, MD 20912, 301/270-0240

PLOTOGRAPHY™

Now PLOT your graphic drawings on paper or transparencies. Great for overhead presentations. Make them any size anywhere on the page, either direction. Will PLOT drawings from most graphic editors. Requires IBM PC, XT or PCjr. 128K, color board, floppy or hard disk, PC-DOS. Call to see if we support your plotter. Only \$49.95. Cactus Software Inc., P.O. Box 880, Peoria, AZ 85345, 602/242-7953

MetaWINDOW™

Advanced graphics toolkit provides Xerox Star/Apple Macintosh style graphics on your IBM PC. Supports most popular graphics cards. Create popup menus, windows & icons; use proportionally spaced fonts; rubberband & drag lines, text or bitmap images; supports mouse/cursor tracking. Tightly optimized for use w/Turbo Pascal, IBM Pascal, C, Fortran & BASIC. Metagraphics Software Corp., 444 Castro St. #400, Mountain View, CA 94041, 415/964-1334, Telex: 4998586 METAGRAF

Fast, Free-form Graphics MONOGRAFX™ FOR PCs WITH OR WITHOUT **GRAPHICS BOARDS! Quickly** draw forms, org/bar/flow/Gantt charts, block diagrams & much more. Freely mix text & graphics on 11 × 14 page. 3 type sizes. PULL-DOWN MENUS. UNDO. FULL-SCREEN EDI-TOR. Supports over 50 printers. RAVE REVIEWS. \$69.95. Money-back guarantee! MC/Visa. Analytics International Inc., 1365 Massachusetts Ave., Arlington, MA 02174, 800/992-0085, 617/641-0400

Plot 90

3 Dimensional vector graphic program capable of drawing any 3 dimensional object. Isometric & perspective views, any angle or viewpoint. On screen tilt, rotate & zoom. Mirror image for symmetrical objects. Supports screen, printer & plotter. For IBM PC or Tandy 2000. \$99 PPD. Demo \$15. Architects, engineers & yacht designers. Full yacht design software available. Write for free brochure. CoastDesign, Box F110-201, Blaine, WA 98230, 604/584-6118

SOFTPLOT/BGL

GRAPHICS BASIC, the only advanced 2D & 3D graphics library for interp. & comp. BASICA. Adds WINDOW, VIEWPORT, CLIP, ROTATE, LABEL, PLOT3 & more for screen AND plotters, printers. 3D hidden surface too. Works like GKS, HP AGL BASIC. The easiest way to create advanced graphics programs. Programs for science/engineering/education, etc. \$99 + \$5/ship. Mosaic Software, Inc., 1972 Massachusetts Ave., Cambridge, MA 02140, 617/491-2434

EGA Paint

Take full advantage of IBM's Enhanced Graphics Adapter. This paint program, designed specifically for the EGA, provides all of the normal paint program features in a 640x350 window with 4 or 16 colors. Requires EGA (128K option for 16 colors) & Enhanced Display. A mouse is recommended. \$79. Visa/MC. RIX Softworks, Inc., 17971 Skypark Circle, Ste. F, Irvine, CA 92714, 714/261-0440

Hard Disk Expansion

AT/XT HD Expansion

Replace hard disk with a bigger one, or add a second drive!

Vfeature supports high-capacity drives on standard AT, XT, & compatible hard disk controllers. Includes multiple volumes, security features, selectable clusters, keyboard lock. \$80 + \$3 shipping, CA tax. Golden Bow Systems, P.O. Box 3039, San Diego, CA 92103, 619/298-9349

Home Use

Shop Cheap-Eat Smart

- COUPONOMIZER—Save more money with your discount coupons & rebates.
 64K.
- DIET ANALYZER-Lose those extra pounds! Tracks calories + 23 nutrients. Ideal for menu planning. 128K. Immediate shipment, 2 week money back trial. \$49.95 ea. + \$2.50 s/h. AmEx/MC/Visa. Call for free brochure. Natural Software Ltd., 7 Lake St. #7E, White Plains, NY 10603, 800/626-2511, 914/761-9329

Inventory Control

Mr. QuarterMaster

Features: receipts & issues updating; inventory, reorder, usage and other reports; file maintenance; issue slips/invoices; reorder points adjusted automatically or manually. Price: \$123. Manual alone: \$23. Also available: Sales reporting, pricing, and purchase order systems. RJL Systems, 106 New Haven Avenue, Milford, CT 06460, 203/878-0376

Inventory Manager II
Ideal stand-alone program perfect for retailers, wholesalers or
any business involved with merchandise sales. Up to 9999
items. Generates numerous reports including ave. cost & ave.
sale, gross profit, margins,
stock on hand, on order, sug. &
actual P.O.s & more. Sort utility. Floppy (vers.) \$199. XT
\$299. Satori Software, 5507
Woodlawn N., Seattle, WA

98103, 206/633-1469 dFeller Inventory

A business inventory program written in dBASE II source code, so you can modify the program to fit your particular needs. The menu-driven program lets you locate items by inventory name or number. It keeps track of reorder points, vendors, average cost, & other information. List price, \$150. Requires dBASE II or dBASE III. Feller Associates, 550 CR PPA, Route 3, Ishpeming, MI 49849, 906/486-6024

Investment

The Mutual Fund Investor

Compares performances of funds over any time period. Displays graphs, moving averages, buy/sell signals, records investments. Data entered manually, automatically over modem via CompuServe, or obtain from us. Allows haphazard entry. Free data supplied for 20 issues. Tracks up to any 50 funds. \$125. Demo \$10. American River Software, 1523 Kingsford Dr., Sacramento, CA 95608, 916/483-1600

Legal

Legal Billing

Complete time billing package for firms with up to 18 lawyers. Features exclusive "video timeslip" for "magic quick" entry. Prints detailed client statements, lawyer time & client aging reports plus more. Large record capacity. Trust accounts & automatic interest. Very friendly. \$450. Satori Software, 5507 Woodlawn N., Seattle, WA 98103, 206/633-1469

Law Practice w/1-2-3 Perform common law office tasks with lightning speed: 1) Real Est Closings w/HUD-1 2) Estate Planning Analysis 3) Bus. Valuations per IRS rules 4) One-Write Chkbk Control 5) Client Costs Collector ONLY \$95 each (PA res. add 6% tax). 2 or more on one disk, \$85 each. All 5, \$350. Visa/MC/chk. The Lackner Computer Group/Advisors to the Legal Profession, 4618 Henry St., Pittsburgh, PA 15213, 412/681-5548

Lotus

1-2-3 Statistics

Complete Statistical Package designed to process data from 1-2-3; Menu-driven; T-Tests, Correlations, Cross-tabulation, Powerful Multiple Regression routine, ANOVA/ANCOVA (with Repeated Measures), Nonparametric Statistics, Bar graphs, Scatterplots; Super fast (8087 Support); for 256K PC; \$99. StatSoft, 2831 East 10th St. #3, Tulsa, OK 74104, 918/583-4149

End NumLock Madness

Kursor software eliminates switching back & forth with the <NumLock> key. Kursor moves the cursor keys on your IBM PC, XT or AT to the function keys. Function keys are accessed by shift + function key. Speeds data entry & reduces errors. Regain control of your ten keypad for only \$35. Kursor Software Company, 1340 West Irving Park #126, Chicago, IL 60613

Lotus Without Floppies
THE FIX lets you run both
1-2-3 & Symphony on your
XT, AT, or compatible hard
disk system without using the
Lotus "System" disk in the A:
drive (not an alteration or slow
dance). Any version DOS.
FREE SHIPPING! The original,
THE FIX, \$24.95! MC/Visa/
chk. Blue Heron Publishing
Co., R.R. 1, Box 128E, Maple
Park, IL 60151, 815/895-5602

Mail List Programs

Pony Express XL

For commercial & large lists. Fast machine code multisort. Prints labels 1-5 across, single line or user-defined format. Also CHESHIRE FORMAT. Multi file merge. Records can be selected by user-defined codes, zips or zip ranges. Auto repeat for ease of record entry, corrections & deletions. Phone list option. \$238. Computech, 975 Forest Ave., Lakewood, NJ 08701, 201/364-3005

Bulk Mailer

This is the most sophisticated mail list program available, & the only one to offer these features: Duplication elimination, up to 32,000 name capacity, coding capability, multi-label formats, zip & alpha sorts, easy to use plus much more. Floppy version (5400 names) \$99. XT version (32,000 names) \$350. Satori Software, 5507 Woodlawn N., Seattle, WA 98103, 206/633-1469

Label Master

All menu-driven. Auto-sorts by name, zip, user-code, etc. Prints labels (1-4 across), Rolodex cards, lists, etc. Interfaces dBASE II/III, 1-2-3, etc. Finds duplicates, etc. Many useful features. Maintains 65,000 records. Only \$49, including User's Manual. Try free for 30 days. Fact sheet available. RKS Associates, 3820 N. Dittmar Rd., Arlington, VA 22207, 703/532-1877

MAILMATE®

The only true mailing system for IBM PC compatibles . True bulk mail sorts for 2nd & 3rd class mail. Sorts to bundles & prints separater label between bundles . Creates word processing merge files for most popular word processing programs • User defined profile fields allows end user to define up to 16 additional fields of info · Features: sorts, selection on any field, lists, directories, 3x5 cards, rolodex cards, more. \$199.95. Computer Specialists, Inc., 2224 Main St., Little Rock, AR 72206, 800/527-1818, 501/376-1300

MY - T - MAILER™ \$30

Our users love this sturdy menu-driven worker. Secretaries say "Terrific!" Print labels, 3 × 5 cards, envelopes, any format. Customize labels with line-by-line printer fonts. Sort, Search & Select with powerful, flexible, easy user-interface. EZ Browse, Edit & Delete. Print up to 5000 copies of one label. PCir too! Requires 128K. \$30. Johnson Software Company, P.O. Box 16507, Dept. 6, Seattle, WA 98116, 206/935-4861

FlowMail

Special Offer! — \$49
Add, Update, Delete records.
Create/name multiple files.
Merge files. List a file to screen or printer. Sort by company name or zip code. Eliminate duplicates. Menu & prompt driven. We also do customized programming. Call or Write TODAY for more info.
FLOWSOFT custom programming, 875 Franklin Rd. #1635, Marietta, GA 30067, 404/433-3590

Auto-Zip Your List!

48,000 + zip codes w/cities, states & counties on floppy disk set. Table allows your programs to automatically lookup city, state & county info based on zip. Reduce errors by up to 35%; keystroking by 20%. Requires hard disk. DOS 2.0 & other popular formats \$149. Write or call for free brochure. DCC Data Service, 1990 M Street NW #610, Washington, DC 20036, 202/452-1419

Manufacturing

Manufacturing Inventory Integrated Inventory Control, Bills of Material, & Purchase Orders with direct accounting interface. Designed for small & medium-sized manufacturing firms. IBM PC/XT/AT version costs only \$995. Special money-back guarantee. Explore MISys yourself & print sample reports using our demo (\$5 ppd). Microcomputer Specialists, Inc., 18 Lyman St., Westboro, MA 01581, 800/833-1500, 617/366-1200

Twin Oaks mrp2

- Inv Control 128K PC or XT
- Purchasing
 DOS 1.10, 2.00
- Phys Inventory Multiuser
- Std Costing Acctg Interface Tivin Oaks Inc., Box 136, Cottage Grove, MN 55016, 612/458-1604

MFG. Control System

A comprehensive system for repetitive or job shop type manufacturers consisting of: B/M, Inventory, Order Processing, Purchasing, Mat. Req. Planning MRP, MPS, Shop Floor Ctrl. & CRP, Cost devel., Job & W/O Costing, Accounting. 1 yr. warranty included. Train & consult avail. Compare our system & prices for best value. Production Systems Inc., 410 Macklyn Ave., Santa Rosa, CA 95405, 707/526-1294

CONCEPT Software

CONCEPT is an on-line, integrated system with mainframe capabilities. CONCEPT, written in RM/COBOL, runs on such micros as the IBM AT, Altos & AT&T systems; & mini's including the NCR 8200 series & IBM 36. The system includes: Bill of Material, Inventory Control, Order Entry, Purchasing/Receiving, Product Cost, Capacity Planning, Shop Floor Control. Newport Technology, Inc., P.O. Box 356, Newport, RI 02840, 401/846-5806

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

Mathematics

Optimization

MAXMIN is a nonlinear optimization program useful for locating extrema of functions, financial & process modeling, curve-fitting, etc. Supplied with explanation of mathematical techniques & illustrative examples of constrained & unconstrained problems (IBM APL, STSC APL). \$100 U.S. Nexus Scientific Software Corp., 9824 Rathburn Dr., Burnaby, British Columbia V3J 7L1 Canada, 604/421-2160

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); 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, Indi-anapolis, IN 46241, 317/248-0357; 800/428-3515 (Nat); 800/792-3525 (IN)

Menu Systems

Menu System Manager Professional system management via USER CREATED MENUS. Invoke any DOS command or file (.EXE .COM .BAT) with PASSWORD SE-CURITY. AUTOMATIC LOG for any menu entry stores Date, Time, User ID, Command Invoked, Purpose of Access. Menus contain no commercial information (makes YOU look good). \$129. Mc/Visa/chk. Gurdak Software Development, 158-B Mereline Ave., West Paterson, NJ 07424, 2011 785-2498

BACKBONE™

Give PC/XT/AT BACKBONE!

- Custom linked menus provide structure, sophistication, & a simple user interface
- Pass to any program, batch process, or submenu by a single keystroke
- Ideal hard disk organizer for corporate or home use
- Supports multiple users
- Compact, Fast. \$39.95 + \$4 s/h. MC/Visa/chk.
 Synchrony Systems, 4191 San Juan Ave., Jacksonville, FL 32210. ORDERS: 800/237-6360 ext. 314, 800/282-1152 ext. 314 (FL)

Workstation Manager WORKSTATION MANAGER: window based menu system w/ integrated menu design facility for IBM PC/XT/AT, 3270 & 99% compatibles. Over 150 sample & help menus supplied to execute DOS functions & application programs. Quickly creates & modifies menus w/ full screen editor. Very fast display & execution. \$125/copy. corporate site license & 30-day trial avail. Software Technologies and Research (STAR, Inc.). 160 West St., Cromwell, CT 06416, 800/258-STAR

Mutual Funds

FUNDGRAF®

GRAPH & find best performing mutual funds or stocks with IBM PC, PCjr, & compatibles, 128K min. 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 \$100. MC/Visa/chk. Parsons Software, Dept. C, 118 Woodshire Dr., Parkersburg, WV 26101

Nutrition

Diet and Exercise

Turn your computer into a valuable ally to achieve permanent weight control. Creative Computing (V.l. 1, No.3) says, "... as much an educational experience as it is an entertaining program to use." Master Control—A Diet & Exercise Program, only \$39.95; Demo diskette \$6, deductible from purchase. MC/Visa/chk. PC, XT or jr. Healthware, 2300 Round Rock Ave. #209, Round Rock, TX 78681, 512/863-6910

Organization Charts

Organization Map

ORGANIZATION MAP automatically creates organization charts for up to 1500 people at a time, graphically displays work force demographics & much more. Working demo with complete documentation \$99.50 (\$85 pre-paid).

Pacesetter Software, P.O. Box 5270, Dept. T, Princeton, NJ 08540, 609/737-8351

Presentations

PYXEL Visuals 2.0

Word charts with NO GUESS-WORK! Bullets, line/box draw, hi-res text ¼"-1" high.
Prompted & automatic slide shows. Hor. & vert. printing. Use with BATCHPRINT for highest resolution. A + in value. See PC Magazine 6/11/85 p. 204 for review, PYXEL Visuals-\$98; BATCHPRINT-\$75. Call/write for gen. & printer info. PYXEL Applications, 2917 Mohawk Dr., Richmond, VA 23235, 804/320-5573

Printers

PrinScil

PrinScil is a user-friendly, menu-driven system which enables users to quickly tailor the appearance of their output on IBM, Epson, & other dot matrix printers without knowledge of printer codes. User selections can be saved for later use without having to go back into the menu system. \$29.95 for single printer version. Visa/MC. SofScil™, P.O. Box 5712, Kent, WA 98064-5712, 206/631-4212

Project Management

MicroGANTT®

Control your project! You describe the work. MicroGANTT calculates the schedule & budget. Optimize the schedule interactively. Customize the reports. Sub-tasking, fixed & variable costs, multi-project resource allocation, unlimited size & scope. GANTT, PERT, CPM, DOD-7000. Call or write for free catalog. Earth Data Corporation, P.O. Box 13168, Richmond, VA 23225, 804/231-0300

Real Estate

Property Management +

A new easy-to-use system for single or MultiFamily properties. Print checks, rent statements & receipts reports—late rents, expired leases, vacancies, income/expenses & operating statements. Includes a bank reconciliation feature & graphics capabilities. Up to 70% reduction in management time. \$675. Realty Software Co., 1926 S. Pacific Coast Hwy. #229 Redondo Beach, CA 90277, 213/372-9419

Management & Analysis

"Real Property Management"
\$395 to \$595, for apts., offices
... Records and budgets income/expenses by month/
account/unit. No retyping of recurring monthly data. "Real
Analyzer" \$195, is 5 programs
in 1 for analysis of Income
Property and the Residence.
Easy WHAT IF. PC/XT/jr. 30
day money back guarantee.
Visa/MC. Real-Comp Inc., P.O.
Box 1263, Cupertino, CA
95015, 408/996-1160

EZ-RE Investor Templates Real Estate Investor Templates.

Equity Share, Houses, Apartments, Warehouses, Office Bldgs. 10 year projection of cash flow, deduction, tax at sell, after tax IRR. Expenses, int., rent & apprec. adjustable annually. Mortgage types—ARM, FHA 245, amort, deferred int., int. only. Professional report. Req. 1-2-3. \$ back guar. \$50 ppd. Visa/MC. LB Associates, 8817 Skokie Lane, Vienna, VA 22180, 703/938-9093

Property Managers

Two systems to match your exact property management needs. Rental Manager handles all tenant activities; features built-in general ledger. Flexibility allows multiple properties per owner. Condo Manager is designed for community associations. Handles member payments, charges, & generates accounting reports. Coleman Business Systems, 3654 Arcadian Dr., Castro Valley, CA 94546, 415/581-7125

Property Management
Comprehensive program for
managing residential & commercial properties. Many management reports including operating statement, delinquent
rent, lease expiration & transaction register. Provides check
writing, check reconciliation,
posting of late fees, recurring
expenses-\$395. Investment
analysis-\$245. Yardi Systems,
3324 State St., Ste. "O", Santa
Barbara, CA 93105,
805/687-4245

Sales/Marketing

Sales Forecasting Software CompuCast is a common sense, graphically oriented 1-2-3 template designed to aid in making sales forecasts & tracking sales results. An extensive background in statistics or mathematics is not required! Standard version: \$49.95. Enhanced version: \$89.95. CompuCast Software, 5328 Fulton St., San Francisco, CA 94121, 415/386-6153

Personal Sales Manager
A MUST for every Salesperson!
Manages prospect/customer
data. Keeps over 60 data fields
per prospect. Rolodex & Telemarketing features. Tickler Reports. Communication log.
Does Sales Forecasts. Makes labels, MailMerge files. Design
your own reports. Onscreen
Help at every data field. Only
\$49. MC/Visa. Computer Software Corp., 19102 Detroit Rd.,
Cleveland, OH 44116,
216/333-9080

Sales Prospecting

Give yourself a raise. Organize your leads & customers with an easy to learn program that generates ticker & prospect reports, letters, labels, market analysis reports, etc. You can customize it to suit your sales style. \$195, 30-day money back guarantee. Excellent support. Visa/MC/COD. Gilbey & Associates, P.O. Box 22631, Louisville, KY 40222, 800/223-5637, ext. 35, 502/895-0774

Scientific

Matrix Computation PC-MATLAB is the world's leading program for matrix computation. Blazingly fast with the 8087, carefully integrated with graphics, jampacked with hundreds of analytical commands, painstakingly accurate with stable algorithms, & extensible to your needs. Used at most major universities. \$695. The Math-Works, Inc., 124 Foxwood Rd., Portola Valley, CA 94025, 415/851-7217

Search/Retrieval

Multikey Boolean Search
Fast general-purpose search.
Two variable-width fields: object code, & (key)-value. ANY
NUMBER OF SEARCH KEYS.
User enters lists of key values. A
list's matching objects are its
LIST SET. Program evaluates
UNION or INTERSECTION
of ANY NUMBER of LIST
SETS, or their COMPLEMENTS. dBASE III, \$55. Tom
Lewinson, 392 Central Park
W., Apt. 12X, New York, NY
10025, 212/222-5050

Sort

Opt-Tech Sort/Merge Extremely fast Sort/Merge program for the IBM PC. Can sort or merge multiple files containing fixed or variable length records. Run as a DOS command or call as a subroutine, plus many other features. Now also sorts dBASE II files! Compare before you buy any other. Write or call for more info. \$99. Opt-Tech Data Processing, P.O. Box 678, Zephyr Cove, NV 89448, 702/588-3737

Statistics

Statistician's Mace 2.00 A full-feature program. Calculate multiple regression, correlations, several ANOVAs, nonparametric tests, descriptive stats, data transformations & much more. Read data from keyboard or files created by spreadsheet, data base, WPs. etc. For IBM PC, XT, AT, PCjr & compatibles. Buy direct or from dealers. \$255. The MAtrix Calculating Engine (MACE) Inc., 2313 Center Ave., Madison, WI 53704, 608/244-3331

BMDPC Stat. Software BMDPC is the most comprehensive statistics package, supported by experts with 20 years experience developing statistical software. 29 programs to choose from, starting at \$450 for 6. Featuring data description, ANOVA, regression, time series, multivariate, non-parametric, cluster & survival analyses. BMDP Statistical Software, 1964 Westwood Blvd. #202, Los Angeles, CA 90025, 213/475-5700

RATS!

RATS is a fast, accurate & comprehensive regression package with unsurpassed POWER. Has both time-series & cross section analysis. Includes Box-Jenkins, logit, & probit. Spectral analysis & graphics available as options. Requires 256K RAM, IBM PC or compatible. Base program: \$200. MCVisa. VAR Econometrics, Inc., 134 Prospect Ave. S, Minneapolis, MN 55419, 612/822-9690

P-STAT®

Combines data & file management, data display, statistics, report-writing & survey analysis capabilities in a single package. Full mainframe package runs on the PC/XT, PC/AT & compatibles. Online HELP & EDITOR. Reads DIF & ASCII files. Multiple copy & site licenses are available. P-STAT Inc., 471 Wall St., P.O. Box AH, Princeton, NJ 08542, 609/924-9100

Statistics for 1-2-3 SUPER STATGRAF for 1-2-3, featuring linear regression (±95% limits), t-testing, ANOVA & more. Entirely menu-driven load & transform data, print, graph. Built-in significant levels & p-values. 256K \$80. MultiFit: Fourier smoothing, mult. regression. 256K \$70. Both \$120! \$5 s/h. Dealers invited. ABACUS Scientific Software, 4521 Campus Dr. #111, Irvine, CA 92715, 714/786-6264

Survey

Do Surveys With Your PC People Facts: The Opinion Processor. Find out what people think about your company, products, services. Create survey questionnaires, process results. Easy to use, all essential statistics. \$395. Full-feature preview \$25. Call or write for details. Shamrock Press, Division of Karl Albrecht & Assoc., 1277 Garnet Ave. #206-P, San Diego, CA 92109, 619/272-3880

FEEDBACK: Data Base FEEDBACK provides the ability to create & analyze up to 1000 active surveys from a data base which includes all survey questions & individual responses. FEEDBACK features flexible question format/answer type creation & a wide range of statistical reports. Full Featured Demo w/manual: \$25. Dealer Inquiries Welcome. CSS Associates, Inc., 11739 Bowman Green Dr., Reston, VA 22090, 703/435-9884

Systems

Multiuser PC-DOS

MultiLink Advanced turns PC-DOS into an efficient multi-user multi-tasking operating system. Additional users are supported by attaching inexpensive CRT terminals or modems to serial ports on the PC, and can run normal applications designed for PC-DOS. Includes host communications software for public dial-in. Software Ink, Inc., 8601 Dunwoody Place #632, Atlanta, GA, 30338, 404/998-0700

TAXTIME for 1-2-3

IRS approved. Used by many CPAs, Detailed catalog. Indiv. 1040 (320K) Calif. 540 (256K) \$95 Corp. 1120 (320K) \$195 P'ship. 1065 (256K) \$195 Trust 1041 (320K) \$195 Estate 706 (320K) \$195 NEW 5-yr planners include estate & new Reagan Reform. 5 Yr. 1040 (320K) \$195 Req. Lotus 1-2-3 (1A). Austin Scientific Inc., 1259 El Camino #260, Menlo Park, CA 94025, 800/227-3900; 800/632-2122 (CA)

Deduct Your PC

DeductPC records & times computer sessions including date, time & purpose. Keeps totals & percentages of business, investment & personal use; prints detail & summary reports. \$18.88 + \$2 s/h. KEY-PAD-ten-key test/train program \$12.22 + \$2 s/h. Both \$29.98 POSTPAID. IBM PC, AT, Compaq. DOS 2.0 + . Jeff Busch, 3510 Longfellow Ave. S, Minneapolis, MN 55407, 612/722-5485

Templates

1-2-3/Symphony Templates

Make Instant Use of Your Lotus Spreadsheet Practical Applications 1, 1985 Fed Tax Calculator

2. Personal Acct. System

3, Personal Mailing System \$35 ea. 2 or more On One Disk \$30 ea. Visa/MC. 30 day money back guarantee.

Easy-As ... Inc., 36 S. Charles St. #402, Baltimore, MD 21201, 301/539-5540

Terminal Emulation

VT-102 & 4010 Emulation PC 102 turns an IBM PC/XT/ AT/jr to a VT-102/100/52 terminal with printer/file transfer support. Optional: 132 col., 4010 graphics support. Guaranteed compatibility with all VT-100/52 applications including EDT, WORD11, All-In-One, DEC-CALC, & UNIX. Exceptionally easy to use. 3000 + sold. From \$89. Visa/ MC/COD. Call for free info package! General Micro Systems, P.O. Box 5330, Hopkins, MN 55343, 612/944-0593

HP/DEC

PC 2622 workstation management system provides HP 2622 block mode & VT 102 terminal emulation; file transfer software for HP 3000 & DEC VAX along with X modem support & powerful command language. Available for WANG, IBM, HP, DEC, TANDY & DATA GENERAL ONE computers, \$295 or \$395 depending on version. Walker Richer & Quinn, Inc., 1914 North 34th #201, Seattle, WA 98103, 2061634-0503

Top View

TV Spool

Take full advantage of Top-View's unique characteristics. This printer spooler provides many features normally found only in mainframe spoolers: Delete after, Multiple copies, Bannering (ala DOS 3.1), page buffer, & a disk resident queue. All menu-driven! \$60. Visa/MC. RIX Softworks, Inc., 17971 Skypark Circle, Ste. F, Irvine, CA 92714, 714(261-0440)

Typesetting

Font Editor and Fonts

Fonts for the Corona Laser Printer, design your own or use ours. Use FontGen, Font Printer & Landscape Utility to edit or design fonts. VS also offers a variety of fonts in serif, sans serif & display type faces. 6pt to 24pt, light to extra bold. FontGen, \$250. Fonts sold separately. VS Software, P.O. Box 6158, Little Rock, AR 72216, 501/376-2083

Utilities

PEEKS 'N POKES

Our customers say, "Opened up new programming doors for me," "Couldn't live without it!" Access/modify PC status; perform DOS/BIOS function calls from BASIC & Pascal; unprotect BASIC programs; find peeks & pokes; & MUCH more! PEEKS 'N POKES disk (58 programs w/source) & manual \$30. Ask about our other packages for programmers. \$2.50/ship. MC/Visa. Data Base Decisions, 14 Bonnie Lane, Atlanta, GA 30328, 800/722-7006, 404/256-3860

Padlock/Padlock II Disks PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS com-

mands. \$99. PADLOCK II disks come preformatted with finger-print & serialization.
PADLOCK II disks offer superior protection. Ask about our fast data encryption product.
All work w/hard disk, EXE/
COM files & all DOS versions.
MC/Visa. Glenco Engineering,
3920 Ridge Ave., Arlington

Simple Text Formatting

Hts., IL 60004, 312/392-2492

Easy menu setup for creating BROCHURES, BOOKLETS, GREETING CARDS & more. DigiCon Print Package for graphics printers sections text files for printing. Choose character style, size, margins, etc. Prints sideways too. Includes interactive char. editor to create your own fonts. \$49.95 (PA + 6%), chk/mo. Digital Concepts, Inc., P.O. Box 8345, Dept. C, Pittsburgh, PA 15218, 412/823-8314

Cogitate Dump/Restore-XT Seven programs make hard disk backups quick & easy. COGBKUP supports multiple positive & negative wildcards & runs up to 50% faster. COGTREE gives an interactive graphic or hardcopy display of directory trees. Other programs make this a complete backup system. Only \$90. Visa/MC. Cogitate, Incorporated, 24000 Telegraph Rd., Southfield, MI 48034, 313/352-2345, Telex

#386581

Copy II PC

Copy II PC is the backup insurance you need to protect your software investment. Copy II PC makes floppy backups of most protected software quickly & easily, & even allows several to be run from a hard disk without a floppy in drive A! (Call for current list.) For IBM PC, XT, AT, 256K jr. Also available for Apple //, Mac, C64. \$39.95 + \$3 s/h. Visa/ MC/chk. Central Point Software, Inc., 9700 SW Capitol Hwy. #100, Portland, OR 97219, 503/244-5782

dWINDOW™ for dBASE 9K assembly language program adding 25 NEW WINDOW-

adding 25 NEW WINDOW-ING SYNTAX statements to dBASE II—User defined inmemory & disk-based, tree-structured WINDOW files
• Executable DOS command at prompt • CAPTURE full/part screen • Create Menus w/
READ BAR capable • Fully compatible w/dBII .PRG files. Spec: IBM PC, XT, AT; dBII (2.40 or 2.41). \$165 (\$4 ship), chk/MC/Visa. Liberty Bell Publishing, P.O. Box 69306, Dept. E, Portland, OR 97201, 503/221-1806

IBM Uses CP/M Disks! UniForm lets you use CP/M

disks in your IBM while running any PC/MS-DOS program. Read & write to the CP/M disk directly or transfer files to IBM format. 100 formats, also 8" and 96 TPI. IBM PC, XT, AT. Next day shipping. Dealers invited. UniForm by Micro Solutions. \$59.95 plus \$3 s/h. The BEST! Blue Heron Publishing Co., RR 1, Box 128E, Maple Park, IL 60151, 815/895-5602

ZeroDisk

Run dozens of copy-protected business packages from your hard disk without floppies. Call for the latest list of software it handles. Needs IBM AT/XT/PC or compatible, DOS 2.00 or higher. ZeroDisk is revised monthly & is not copy-protected. \$75 US. Check or credit cards accepted. Quaid Software Limited, 45 Charles St. E, 3rd Floor, Toronto, Ontario M4Y 1S2 Canada, 416/961-8243

Adapta-Print Software

Printer utility software lets you use the full range of features of your dot matrix printer. Provides pop-up printer control menu, a print spooler, optional sideways printing module. Translator makes non-IBM printers compatible with the IBM. Adapta-Print supports almost all dot matrix printers. Computational Systems, Inc., Dept. PCD, 1900 N. Winston Rd., Knoxville, TN 37919, 615/693-0551

Hard Disk Stretcher

MCFORMAT software adds 15% to 50% to hard disk capacity by allocating space in smaller units than PC-DOS, thus wasting less space. PC/XT users get at least 1M, PC/AT users get 2M, & larger disk users get up to 10M more useful storage with compatible PC-DOS 3.0 up. Only \$50 prepaid. Visa/MC. Microcomputer Concepts, Inc., 9715 S.E. 43rd St., Mercer Island, WA 98040, 800/722-8088, 206/236-2300

DutchTreat Files 2.0

Fast & Powerful! The complete file manager. Simultaneous, dual, independent listings. Single key commands. Optional banner pg/msg when printing. Overwrite option for copy & rename. Attribute control. Sort 4 ways. More!! IBM PC, PCjr, XT, AT, compatibles w/128K, 2.0 + . \$49.50. Visa/MC. Dutch Treat Software, Inc., P.O. Box 1668, Woodbridge, VA 22193, 703/670-2622

HP LaserJet Setup

SETHP: a simple menu-driven and/or batch utility that allows full control over your HP Laser-Jet printer. Supports 7 font cartridges. Control margins, number of copies, characters per inch, lines per inch, lines per page, etc. Over 125 commands. Only \$49.95 + \$4 s/h. Visa/MC/chk. Orbit Enterprises, Inc., P.O. Box 2875-L, Glen Ellyn, IL 60138, 312/469-3405

Word Processing

PC-Write™ 2.30

Fast, friendly, flexible. On screen, justify, page break. Fast scroll, save, search. Keyboard macros. Split screen. Footnote. Standard files. Tutorial, 120 page manual, 9 help screens. Software, manual on disk \$10. Register for bound manual, support \$75. Visa/MC. Ok to copy & share with others! Quicksoft, 219 First Ave. N. #224, Seattle, WA 98109, 206/282-0452

MY WORD!™ Just \$35

Full-featured word processor for IBM PC/jr/AT or most compatibles. Features: merge-print, calculator, sort, macros, color, word wrap, search/replace, block ops, all 256 characters, 100+ operations. 30-day money-back guarantee. Includes printed 100 page manual. Source code: add \$35. C.O.D. add \$3. T.N.T. Software, Inc., 34069 Hainesville Rd., Round Lake, IL 60073, 312/223-8595

TEXTRA® Now \$995!

A dream come true! Easy as pfs:write, but faster, more features. As fast as Xywrite II, but easy to learn/use. Unique subscription (update) policy, modest fees. First update (3.1A) is ready now (spelling corrector, much more on the way). You will be stunned with the quality of Textra! Add \$4 sh. Ann Arbor Software, 407 N. Main, Ann Arbor, MI 48104, 313/769-9088

Hebrew/English/Greek

Russian/European ... Type all languages on your PC with Gamma Language Writer. Full featured multi-language word processor does not require hardware modifications. Req: 256K, 2 drives, color graphics card, B/W or color monitor, Okidata, IBM, Epson, C. Itoh printer. Price, \$249.95 (\$15 demo). To order program or receive brochure: Gamma Productions, 817 10th St., Santa Monica, CA 90403, 213/451-9507

Tape/Disk Conv.

Conversion Services Mag tape to disk conversion. Any 9 track 1600 BPI MAG-NÉTIC TAPE converted to: 8" CP/M VYDEC DISPLAY WR. WANG IBM SYS/?? IBM PC APPLE ZENITH MORROW TELEVIDEO KAYPRO **ALTOS** XEROX MACINTOSH TRS80 NORTHSTAR Disk to disk & disk to tape conversions avail. on 300 formats. Pivar Computing Services, Inc., 47 W. Dundee Rd., Wheeling, IL 60090,

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,

312/459-6010

Typesetting

IL 60601, 800/621-9155,

312/726-6455

High-Tech Typesetting
Transmit your text via toll-free lines to our fully automated typesetting system. \$2 per K characters with a \$5 minimum. Same day service. 200 typefaces in sizes up to 72 point. Send \$15 + \$3 shipping for our 220 page guidebook, or call toll free &c use your MC/Visa/AmEx. Intergraphics Inc., 106 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 \$891 (\$297 per issue). We offer a six-time insertion, 15 percent discount contract for a total of \$1500 (\$250 per issue). Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, VISA, and MasterCard are acceptable.

DEADLINE: For copy deadlines, contact a PC World Directory sales representative at 415/861-3861 or 800/872-7808 (CA), 800/872-7800 (nat'l). Please send copy and prepayment to PC World Directory, 555 De Haro St., San Francisco, CA 94107.



Free Product Information Service

Just return the card—
to get more facts on the products that interest you!

(Fold on this line)

PLACE FIRST-CLASS POSTAGE HERE.

(POST OFFICE WILL NOT DELIVER WITHOUT STAMP.)



Product Information Service P.O. Box 92843 Rochester, NY 14692



Get more data on products you're interested insimply return this card today. There's no cost. And no obligation.

Please print or type all information.

It's easy to get more information on products advertised in PC World. Here's how:

- Print or type your name and address in the spaces provided, and answer the questions that apply to you or your company. (These questions help us to better meet your needs and the needs of our advertisers.)
- Circle the number(s) on the card that correspond(s) to the reader service number(s) for the product(s) in which you're interested. For your convenience, the reader service number appears in the ad and in the Advertisers Index.
- Detach the card from the magazine, fold, seal with tape (please do not staple), apply first-class postage, and mail. Literature on the products you're interested in will be mailed to you directly from the manufacturer, free of charge.

5. For how many IBM PCs and compatibles do

-		T C		
HTPP H	PAMPI	· Intorn	nation	Service
IICC IN	cauci	IIIIOIII	lation	OLI VILL

	(A) Corporate or general management you buy products? (Include both corporate or general management personal units, please.)	
Name	☐ (B) Department manager ☐ (C) MIS manager ☐ (D) Professional	(A) 1 (C) 5-9 (D) 10 or more
Сотрапу	2. Number of employees in your company:	6. How much do you expect to spend in the next 12 months for peripherals and other add-ons?
Address	(1) 25 or less (4) 500-999 (5) 1000 or more	☐ Less than \$250 ☐ \$500-\$999 ☐ \$250-\$499 ☐ \$1000 or more
	(3) 100-499	7. How much do you plan to spend in the next 12
City, State, Zip (Zip code needed to ensure delivery)	3. Information requested for:	months for software?
	(A) Business applications (B) Home applications	\$250-\$499 \$1000 or more
Phone: Area code/Number	4. Reason for inquiring:	8. How much do you plan to spend in the next 12
PLEASE NOTE: This card is for your convenience in	(1) Plan to buy-next 3 months	months for personal computers?
obtaining information on products advertised in <i>PC World</i> . Please send editorial comments or inquiries to: The Editor, <i>PC World</i> , 555 De Haro St., San Francisco, CA 94107. Thank you.	(2) Plan to buy—4-6 months (3) Plan to buy—7-12 months (4) Plan to buy—beyond 12 months (5) Reference only	(1) Less than \$2500 (3) \$5000-\$9999 (2) \$2500-\$4999 (4) \$10,000 or mo
☐ Please bill me \$23.75 for a 1-year (12-issue) subscription	n to PC World (U.S. and Canada only).	Valid through 12/31/85 W Oct. 1985
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 <td< td=""><td>337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 588 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 636 636 638 638 639 640 641 642 643 644 645 646 647 648 649 660 650 651 652 633 654 655 656 657 658 669</td><td>673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 770 771 772 773 774 775 776 777 78 779 78 78 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 878 789 890 801 802 803 804 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 877 878 879 890 801 802 803 804 804 805 806 807 808 809 810 811 812 813 814 815 816 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 891 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 957 977 978 979 980 981 982 983 984 985 996 981 982 983 984 985 996 981 982 983 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 9</td></td<>	337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 588 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 636 636 638 638 639 640 641 642 643 644 645 646 647 648 649 660 650 651 652 633 654 655 656 657 658 669	673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 770 771 772 773 774 775 776 777 78 779 78 78 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 878 789 890 801 802 803 804 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 877 878 879 890 801 802 803 804 804 805 806 807 808 809 810 811 812 813 814 815 816 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 832 833 854 855 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 891 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 957 977 978 979 980 981 982 983 984 985 996 981 982 983 984 985 996 981 982 983 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 986 987 984 985 9
325 326 327 328 329 330 331 332 333 334 335 336	661 662 663 664 665 666 667 668 669 670 671 672 Dle), apply postage, and mail. Manufacturers will mail you liv	997 998 9991000

1. Your primary job function:



Advertiser Index

Reader Service Number

AST Research, 254

19 AST Research, 8-9

Adax, 266

944 Advanced Digital Corp., IFC

41 Aha, 308

Alfred Publishing Co., 304 664

Alloy Computer

Products, 300-301

930 Alpha Omega, 246

6 Alpha Software Corp., 15

779 American High-Tech, 297

American Training Int'l., 79

American Small Business 543 Computers, 258

961 Apex Resource, 22

Apparat, 308

Ark Electronic Products, 303

Arlington Computer Products, 279

368 Atari Corp., 60-61

Autodesk, 74-75

B. Dalton Bookseller, 159

BP-10 Int'l. Corp., 66

317 Barr Systems, 155

Best Programs, 330

Bible Research Systems, 244

Bittner Electronics, 307

Blaha Software - Janus

Associates, 302 Borg Industries, 307

Borland Int'l., 41

760 Borland Int'l 43

Brown Disc, 232

865 **Bulldog Computer**

Products, 329 **Business Computers of**

Peterborough, 321

397 CXI, 73

642 Cableco Int'l. Corp., 280 450 Central Point Software, 106

Central Point Software, 244

339 Central Point Software, 80

935 Chorus Data Systems, 156

Codex Corp., 83

Comark, 266

Command Technology

Corp., 14

765 Companion Software, 265

Companion Software, 265

90 Compuclassics, 313

Service Number

Compumail, 350

856 CompuServe, 42, 241

406 Computer Innovations, 324

951 Computer Inventory Control, 326

420 Computer Mail Order, 351

600 Computer Mart, 325

210 Computer Plus, 102

146 ComputerAid, 309 276 Contemporary

Computerwear, 309 646 Control Data, 82

322 Core Int'l., 333

49 Corvus Systems, 277

110 Creative Micro, 314

Curtis Manufacturing Co., 315

33 Dac Software, 17

488 Davidson & Associates, 259

973 Davna

Communications, 100-101

342 Decision Resources, 46-47

Diamond Software, 109 58

330 Discount Micro Sales, 306

Disk World, 316, 322, 331

691 Diskette Connection, 330

288 DiTron Corp., 309

Diversified Computer

Systems, 328

Dow Jones News/

Retrieval, 67

Eastman Kodak, Co., 203

493 Ecosoft, 276

800-Software, 327

Electronic Software Publishing, 257

527 Elite Software Development, 36

243 Emulex/Persyst, 34-35

699 Everex Systems, 10

Express Micro Supplies, 334

Fox & Geller, 157

4.5.6 World, 308 854

Futures Group, The, 308

78 Genest Technologies, 330

996 Gould Electronics, 274

891 H & E Computronics, 27

495 Hammerlab Corp., 242

314 Handic Software, 283

489 HavenTree Software Ltd., 309

815 Hayes Microcomputer Products, 58

. 77 Hercules, 110, 269

810 Hewlett-Packard, 299

242 Hewlett-Packard, 57, 59

206 Hooleon Co., 302

Hypergraphics, 206 234

684 I.C. Express, 307

294 I2 Interface, 37

IBM, 153

200 IDEAssociates, 30-31

Infocom, 94-95 949

67 Information Builders, 267

512 Inmac, 263

Inmac, 263 224

Inner Loop Software, 308

Intercontinental Micro Systems, 18

Irwin Magnetics, 282

JC Information Systems, 320

Jeden Computer Peripherals, 319

Reader Service

627 Juki Office Machine

Corp., 68

Kamerman Labs, 1 Kensington Microware, 45

Kimtron, 271

Lifetree Software, 298

733 Lionheart, 307

Lock-Lite, 293

Logicsoft, 260-262

Lotus Development Corp., 84-85

942 Lyben Computer Systems, 330

Magnacom, 291

Mannesmann Tally, 50-51

Mark Data Products, 309

Maynard Electronics, 5

McGraw-Hill, 81

657 Meca, 33

Megasoft, 328

Merritt Computer 639

Products, 307 Micro Data Base Systems, 240

Micro Design Int'l, 154

Micro Direct Int'l. Corp., 248

Micro Focus, 108

Micro Manufacturing

Systems, 250

Micro Marketing, 239 Micro Mart, 352-353

Microrim, 24-25

40 Micrografx, 28 Micromission, 268

103 Microprocessors

Unlimited, 328 Microsoft Corp., 6-7

275 Microstuf, 48

Microway, 312 118 835 Micro-Z Co., 72

120 Mountain Computer, 236-237

Nec Information Systems, 252

Northeastern Software, 292 88 Norton Utilities, The, 247

Office Solutions, 207

Okidata, 249

Opt-Tech Data Processing, 308

Opt-Tech Data

Processing, 309 Orchid Technology, 202

136 PC Connection, 112-115

PC Network, 294-295 PC Software Interest

Group, 276

PC Source, 204-205

Pacific Exchanges, 309

Pacific Micro Systems, 243

Panasonic Industrial Co., 107 694

Paperback Software, 286

286 Peachtree Software, 270

142 Persoft, 23 575 Photon Software, 56

359 Polaris Software, 272

Popular Programs, 317

426 Precision Data Products, 318

230

574 PreCursor, 63 Prentice-Hall, 245

148 Primavera Systems, 290 Princeton Graphic

Systems, 19-21

Reader Service Number

68 Progressive Micro

Distributors, 348-349 Public Domain Software, 307

QIC Research, 275

Quaid Software Ltd., 296,

907 Qubie', 70-71

328 Rainbow Technologies, 308

643 Random House, 44

Rapidware, 323

Relational Database

Systems, 65 Rix Softworks, 308

Rolodex Corp., 256

162 RoseSoft, 93

431 SBT Corp., 104 844 SPSS, 273

SSI Software, 233 165

Safeware, 318

Sakata U.S.A. Corp., IBC 80 Sam Wilson &

Associates, 309

Scitor Corp., 62

Secure-It, 238 886

225 Sigma Designs, 39 Simon & Schuster, 305

850 Soft/Plus Research, 307

587 SoftStyle, 102 250 SofTron, 309

Softronics, 308

Software Bottling Co., 77 862 Software Dimensions, 22

526 Software Link, The, 289 Sony Information 579

Products, 54-55

Spies Laboratories, 272 SubLogic Corp., 16

Summagraphics Corp., 103,

890 Summit Software Technology, 32

Symantec Corp., 238, 239 Sysgen, 231

Tall Tree Systems, 264

Tallgrass Technologies, 12-13 190

Tecmar, 49 262 Telebyte Technology, 251

921

Telemart/Telasoft, 354 Telescan, 158

701 Televideo Systems, 76 Texas Instruments, 64

Thomson Consumer Products

Corp., 78 Timeworks, 38

405 USRobotics, 26

Unitech, 307 640 Univation, 310

VLM Computer Electronics, 307

Variant Technologies, 106 Variant Technologies, 106 61

193 Ven-Tel, BC 135 Walonick Associates, 263

45 Watcom Products, 97

Writing Consultants, 40

438 Wyse Technology, 284-285

XOR Corp., 98 540 Zedcor, 253

HOW TO LOAD

BO EVETENE
PC SYSTEMS
IBM PC 256K, 2 drive monochrome system \$2' 256K, 2 drive color system \$2' 256K, 2 drives & 10MB \$2'
IBM PC/XT
IBM PC/AT 256K, 1.2MB floppy \$3 512K, 1.2MB & 360K floppies, 20MB \$4
AT&T PC 6300 \$1 256K, 2 drive monochrome system \$1 256K, 2 drive color system \$2 256K, 1 drive, 10MB, monochrome system \$2
These systems are brand new, shipped fully tested and burned in, fully warr teed for 90 days AND ARE ALWAYS IN STOCK!
Ask about our full line of system accessories to keep your system up running indefinitely and trouble free. Choose from names like Kensing Microware, Tripplite and Curtis.
PRINTERS
EPSON FX-80 + (160 cps narrow carriage dot matrix)
ML 192 (NEW 160 cps narrow carriage dot matrix)

Microware, Tripplite and Curtis.	
PRINTERS	
EPSON X-80 + (160 cps narrow carriage dot matrix) X-185 (160 cps, wide carriage, near LQ, dot matrix) X-80 (100 cps, near LQ, select type controls) X-100 (100 cps wide carriage dot matrix) IX-80 (160 cps narrow carriage color dot matrix) Q-1500 (LQ dot matrix w/ parallel interface)	\$275 \$275 \$425 \$575
OKIDATA ML 192 (NEW 160 cps narrow carriage dot matrix) ML 193 (NEW 160 cps wide carriage dot matrix) ML 84 (200 cps wide carriage dot matrix) PACEMARK 2410 (350 cps wide carriage dot matrix)	\$519
CANON LBP 8A-1 (Better than HP, Diablo compatible)	\$2795
TOSHIBA P-1340 (120 cps narrow carriage LQ dot matrix)	\$595
TEXAS INSTRUMENTS TI-855 (150 cps narrow carriage LQ dot matrix)	\$699
BROTHER HR-15 + (17 cps narrow carriage letter quality) HR-25 (23 cps wide carriage letter quality) HR-35 (32 cps wide carriage letter quality). 2024L (New high speed dot matrix)	\$395 \$650 \$895
C.ITOH Starwriter (40 cps letter quality)	*
Printmaster (55 cps letter quality) Ask about C. ITOH's Hot New Line at New Prices!	*
DIABLO 630 API & ECS	
NEC Pinwriter P-2 & P-3 Spinwriter 2050, 3550, 8850	***
PRINTER ACCESSORIES	S
O Cut Sheet Feeders for NEC, DIABLO, C. ITOH. Quadram Microfazer Printer Buffer (P/P, P/S, S/P, S/S, 8K & up) Way & 4 Way Switch Boxes (serial or parallel) BM Parallel Printer Cable Ring King Printer Stands Special Make Printer Cables Ribbons & Printwheels for most printers	from \$395 from \$135 from \$59 \$25

PLOT	TERS
AMDEK Amplot II (6 pen Lotus compatible plott	er) \$595
HEWLETT-PACKARD	*
HP-7470 & 7475 (2 pens/6 pens) HOUSTON INSTRUMENT DMP 29, 40, 40-2, 41, 42, 51, 52 in st	rs
EL OPPY DI	SK DRIVES
TANDON TM 100-2 (Double sided/double	
CONTROL DATA (Double sided/double HALF-HEIGHT (PC/XT/AT/PORTABLE CCHOOSE FROM NAMES LIKE SHUGAR	density 360K)\$149
HARD DIS	K DRIVES
PEACHTREE PERIPHER	ALS
P-10i/e (10MB internal/external hard di P-20i/e/AT (20MB internal/external hard P-30 AT (30MB internal AT compatible 10 MB internal & external removable W 45 MB tape back-up	sk with auto boot) from \$595 d disk with auto boot) from \$795 hard disk) from \$995
INTERDYNE Microreel tape back-up	\$549
EMERALD SYSTEMS PC & AT compatible, up to 280MB, with	
SYSGEN Quickfile 60MB Streaming Tape Back-U	n *
Image XT cassette tape back-up XL (External 20 MB hard disk w/60MB	tane back-un) **
BERNOULLI TECHNOLO 20MB removable media subsystems	/G I
CIPHER DATA XT tape backs up off FDC	\$895
	and the same of th
	TTES
VERBATIM Single sided/Single density:	
Double sided/Double density:	
	TION BOARDS
	ION BOANDS_
AST RESEARCH Advantage (AT compatible memory exp Six Pak w/64K (64-384K, serial, paralle MegaPlus w/64K (64-512K*, parallel I/O Plus II (Serial, C/C, opt. serial, par ORCHID TECHNOLOGY	vansion with options) ** el, C/C, opt. game) \$259 , C/C, opt. p,s,g) from \$269 allel, game) from \$135
Blossom w/64K (64-384K, serial, para Orchid PC Turbo (adds 8 mhz processo QUADRAM	Ilel, C/C, opt. PC Net)
Quadboard w/64K (64-384K, serial, pa QuadMeg (AT memory expansion up to QuadPort (AT serial and parallel, opt. 4 MICROLOG	
Baby Blue II w/64K (64-256K, Z80, 2 s Little Red Ram (256K memory expansi TALLTREE J-RAM II & III Multi	serial, parallel, C/C)
	IPS
64K (nine chips) \$10 8087 (coprocessor) \$125	128K (AT RAM) * 256K (jr & AT boards) *

OUR POLICY

- WE ACCEPT VISA, MC, AMEX; No surcharge for VISA or MC.
- COD requires cash or certified check; Company check when approved.
- Allow 1 week for personal and company checks to clear.
- 4. Wiring information available upon request.
- Corporate, Government and Institutional volume purchase agreements available.
- Call for exact shipping charges; air shipments take priority.
- If we must split shipment, you incur no additional shipping charges.
- 8. All orders shipped insured No additional charge.
- 9. All products fully warranteed; Some up to 5 years.
- All items subject to availability; Prices subject to change without notice.

UP FOR LESS.

GI	RAPHICS CARDS	
SIGMA DESIC Color 400 (high res c	GNS color card for PGS SR-12)	\$549
TSENG LABS	nono graphics, serial, parallel, C/C)	
ColorPAK (Ultra hi res	, UltraSERIAL (options for UltraPAK)	*
PERSYST BoB Board (beautifully HERCULES	ly clear text on a color monitor)	*
Graphics Card (Lotus Color Graphics Card (compatible monochrome graphics)	\$319 \$179
PARADISE Modular Graphics Car AST	rd & Multi-Display Card from	\$299
Preview & MonoGrap	hPlus (Monochrome Lotus graphs, parallel, C/C)	*
	ome w/parallel port) nochrome & color w/ parallel, software)	\$169 \$299
Quadcolor I & II (Upg TECMAR	gradeable color cards) from	\$189
POLAROID	res Lotus compatible color & mono)	*
	slides from your PC's screen)	\$1395
PROT	OCOL CONVERSION	
	ICH ISC, SNA (always in stock)	*
Irma (3278 Terminal E Irmaline, Irmalette, Ir TECHLAND	Emulation)	\$895
	el 12 & 3276	*
	MONITORS	
AMDEK		
310A (Amber TTL inp COLOR 600 (13" 640 COLOR 700 (13" 720	or Amber, composite video monitors)	\$169 \$425 \$475
QUADRAM		*
Quadchrome HX-12 (I	r TTL input, non-glare tube)	*
PGS MAX-12 (Amber PGS HX-12 (690 X 48	TTL input, non-glare tube)	\$189 \$449 *
TAXAN RGBvision 425 & 440	Section of the sectio	
11001131011 420 & 440	MODEMS	-
HAYES	MODEMS	_
Haves Smartmodem 3	300 (external 300 baud, auto answer/dial) 1200 (external 300/1200, auto answer/dial) 1200B (internal 300/1200, w/Smartcom II). 2400 (external 2400 baud).	\$199 \$419 \$379 \$675
Signalman Mark XII (TOMATION 300/1200 baud at 300 baud price)	
	0/1200 baud w/CROSSTALK, self-test)	
RIXON 300/1200	nal & external)	*

NETWORKING

We carry all the best names including AST RESEARCH and ORCHID TECHNOLOGIES. Call our Networking Applications experts to design a cost-effective device-sharing networked layout for your office!

SOFTWARE

SOFTWARE
INTEGRATED AND RELATED PACKAGES
ENABLE(Reviewed as "the Package Symphony should have been") *
ASHTON-TATE Framework\$369
LOTUS Symphony \$429 SOFTWARE PUBLISHING Pls Write, File, Graph, Report from \$79
WORD PROCESSING
SAMNA WORD III & PLUS. *
SAMNA WORD III & PLUS. * MULTIMATE comes w/spelling checker and tutorial \$269 MICROPRO WordStar 2000 & 2000 plus. \$245/295 MICROSOFT Word Version 2.0
MICROPRO WordStar 2000 & 2000 plus
MICROSOFT Word Version 2.0 * LIFETREE Volkswriter Deluxe w/Textmerge \$169
WORDPERFECT 4.0
LEADING EDGE Word Processor
SPREADSHEETS
LOTUS 1-2-3
LOTUS 1-2-3 \$309 SORCIM/IUS Supercalc 3 \$195 MICROSOFT Multiplan w/templates \$139
DATABASE MANAGERS
ASHTON-TATE dBase II & III
MICRORIM RBase 5000
GMS SYSTEMS Power-base \$259 DAYFLO (Free-form database with opt Reportflo) *
DAYFLO (Free-form database with opt Reportflo)
CIP Concentric Information Processor * MICROSTUF Infoscope *
LEADING EDGE Nutshell
COMMUNICATIONS PACKAGES
MICROSTUF Crosstalk YVI
PERSOFT SmarTerm 100, 125, 400 * * HAYES SmartCom II \$95
SOURCE The Source
SOURCE The Source * DOW JONES All products. *
ACCOUNTING PACKAGES
STATE OF THE ART (G/L A/R A/P INV Others) *
SORCIM/IUS Complete accounting modules from \$289 BPI ACCOUNTING Complete accounting modules *
REAL WORLD Accounting*
OPEN SYSTEMS Accounting *
MONOGRAM Dollars and Sense w/Forecasting
GRAPHICS AND CAD PACKAGES
DECISION RESOURCES Signmaster/Chartmaster
BPS Business Graphics \$259 AUTODESK AutoCAD with or without extensions *
IMSI PC Paint Brush
PLANNING PACKAGES
PLANNING PACKAGES MECA/TOBIAS Managing Your Money. \$129 HARVARD Total Project Manager. * MICROSOFT Project *
HARVARD Total Project Manager
MICROSOFT Project * LANGUAGES & COMPILERS
BORLAND Turbo Pascal & Toolbox. ea \$39
MICROSOFT All products *
DIGITAL DECEADOU All products
WORDTECH dBASE COMPILER * LIFEBOAT Lattice C compiler and C-food Smorgasborg \$299/*
UTILITY PROGRAMS
RORI AND Sidekick & Superkey
PRINTWORKS by Softstyle
PRINTWORKS by Softstyle * NORTON Utilities (by Peter Norton) \$59 QUAID Copywrite, Disk Explorer & Zero Disk * CENTRAL POINT Copy II PC copies protected software \$35
UUAID Copywrite, Disk Explorer & Zero Disk
ATI Training (for many popular packages)
the many popular packages/t

Call for quantity pricing!

FOR ORDERS ONLY

1-800-446-7995

FURTHER INFORMATION CUSTOMER SERVICE TECHNICAL

SUPPORT

1-404-446-7995

1-404-446-7995

1-404-446-7995

HRS: 9AM - 9PM EST, SAT 12N - 5PM EST.

PROGRESSIVE MICRO DISTRIBUTORS

7000 Peachtree Industrial Boulevard Norcross, Georgia 30071 Circle 68 on reader service card



MULTI-FUNCTION CARDS



384k

384k

384K

INSTALL RAM & test brd for PC/AT COMPANY POLICY: Mrn. order \$100. Press & availability subject to change. We ship LPS only. Shipping/handling charges vary. Phoes reflect cash discount on prepaid orders. Add 1% for 000 orders, 3% for MC/VISA & 5% for AMEX. C00 requires cashers check. All merchandles sold is new and all sales are final. Publised shipments subject to 20% charge (Mm \$50). Products shipped in factory carbos come with manufacturer warranty. For others, including IBM systems, call tech support for return auth. # for warranty repairs. Non-detective terms returned as detective subject to 10% service charge (Mm \$50). Not responsible for hardware or software compability of any product. No open acid PO's or foreign orders. No showroom, demonstrations or walk-in stepsoral or company checks take 3 weeks to clear. FOR ADVANCE PAYMENTS or PICKUP. PLEASE CALL FIRST FOR WORKORDER #.

\$199

\$219

CALL

CALL

CALL

CALL

\$20/\$40

80287-3 for IBM AT

ORCHID PCturbo w/128k 4 \$5



Call for the latest prices for your custom configuration. All systems are configured and tested at no extra cost and come only with Compumail's 90 day warranty. $L\Delta$

-590

: \$99

\$449

\$649

\$599

\$799

\$849

\$1049

21049

51249

CALL

CALL

CALL

CALL

CALL

\$40

\$499/\$669

5500/5740

\$2599/\$3399

\$4299/\$5499

\$579/\$699

\$949/\$999

3569/3749

\$1399

CALL

CALL

CALL

CALL

CALL

\$89/\$109

REDUCED

REDUCED

REDUCED

'REDUCED'

REDUCED

REDUCED

REDUCED

REDUCED

'REDUCED

CALL US

COMPAQ IBM AT 20 + 20 DESKPRO 10 MB 512k, 1 or 2 floppies 20MB HD & 20MB Backup

640k, 1 or 2 floppies IBM AT 30 + 60

512k, 1 or 2 floppies 30MB HD & 60MB Backup IBM AT 40 + 60

512k, 1 or 2 floppies 40MB HD & 60MB Backup COMPAG PORTABLE

256k, 1 or 2 floppies COMPAG

PORTABLE 10 MB 256k. 1 or 2 floppies

COMPAQ **DESKPRO 10 + 10** 10MB HD & 10MB Backup

COMPAG DESKPRO 20 MB Backup Available

COMPAG **DESKPRO 30 MB** Backup Available

COMPAG DESKPRO 40 MB Backup Available

COMPATIBLE Custom Configura IBM AT

COMPAQ

COMPAQ

IBM XT

PORTABLE 2

Custom Configura

DESKPRO 28

Custom Configura

COMPATIBLE Custom Configura IBM COMPATIB ARE YOUR LOW

ALLTERNATIV

WITH YOUR BEST QUOTES

MONITORS PGS MAX-12/HX-12/HX-12E \$169/\$419/\$499 HX-9/HX-9E/SR-12 \$419/\$499/\$549 SR-12 w/Scan Doubler \$699 SR-12 w/Sigma 400 \$999 TAXAN COMPOSIT 115 Green/116 Amber MONO 121 Gr/122 Amb \$139/\$149 COLOR 411 COLOR 410 \$289 \$299 COLOR 420L COLOR 420 \$359 \$369 COLOR 425 \$369 COLOR 440 \$489 COLOR 440 w/TAXAN 555 RGB Card \$749 COLOR 440 w/Persyst BoB Brd \$799 COLOR 440 w/Sigma 400 \$939 COLOR 440 w/Sigma 400 & PC Mouse \$1039 AMDEK 300G/300A/310A(M). \$139/\$149/\$159 \$239/\$349/\$419 COLOR 300/500/600 710. . . \$489 w/Tecmar Graphics Master QUADRAM AMBERCHROME . . . CROO \$159 ROLAND MB-142 14" Mono B/W Best Price TECMAR Color \$529 w/Gra TILT/SWIVEL Monitor Pedestal w/Graphics Master \$939 \$30

DISPLAY CARDS

HERCULES MonoGraphics \$279 Color \$149	
HERCULES COMPATIBLE MonoGraphics \$199	ı
EVEREX The Edge Best Price Ever	
Graphics Edge Even Better Price	
AST Monograph Plus \$339/\$369	
Preview for Mono Graphics \$279	
Graphpack w/64k \$549 I	
PERSYST Short Color/Mini Mono \$159/CALL	
Color Combo: Multifunction & Color from \$299	
Mono Combo: Multifunction & Mono from \$299	
PERSYST BoB Board \$339	
PERSYST w/TAXAN 440 \$799	
Gold Quadboard: Multifunction & Color CALL	
Gold Quadboard: Multifunction & Color CALL	
STB Chauffer REDUCED \$299	
STB Chauffer REDUCED \$299 PARADISE Modular Brd from \$259	
ORCHID Turbo Graphics Controller CALL	
TECMAR Graphics Master \$429	
G Master w/TECMAR Color Monitor \$939	
G Master w/AMDEK 710 Color Monitor \$899	
GENOA Spectrum Best Price	
MYLEX Chairman \$399 1	
SIGMA COLOR 400 (specify Monitor) \$479	
COLOR 400 w/PGS SR-12 \$999 \	
COLOR 400 w/TAXAN 440	
3 Button PC Mouse w/PC Paint Add \$100	

CHIPS ETC.



REDUCED

640k

QUADRAM QUADsprint REDUCED MICROWAY'S Fastbreak / # Smasher CALL

MODEMS

EasyData 12B 300/1200 Bd Int w/PCTalk III SmarTEAM 212A 1200 Bd Ext w/o sft HAYES 1200 B w/SmartCom II HAYES 1200 Ext. w/o Software \$89 NEW 2400 Bd Ext Smartcom II. HAYES Transet 1000 REDU POPCOM C-150 Int w/PFS:Access "REDUCED" POPCOM X-150 Ext w/PFS:Access AST Reach! 1200 Bd short card w/Crosstalk PROMETHEUS PROMODEM 1200 Ext w/Modem \$89 Options Processor Alphanum Display \$89 w/Modem PROMODEM 1200 Ext + Both Options
PROMODEM 1200 B Int w/MITE software QUADMODEM II shortcard w/Crosstalk XVI 2400 Bd Upgrade Kit for Quadmodem II Ven-Tel Half Card w/Crosstalk XVI 1200 Plus Ext w/o software BIZCOMP IntelliModem EXT ST/XL/XT \$289/\$319/ WATSON Integrated Voice Data Modem RIXON Complete Line

SPECIAL ITEMS DCA: IRMA, IRMAlette, IRMAline, IRMAprin Emulates 3278, 3279 CXI: PCOX Emulates 3274, 3278, 3279 FORTE: PJ Card Emulates 3278, 3279, 328 3270PC, 278RJE, 3780RJE (Specify) AST 3780, 5251/11, 5251/12, BSC, SNA, I ORCHID PCnet Plus Complete Line
OBERON OMNI READER Optical Character Re w/IBM Interface Software **POLAROID** Palette General Parametric's VideoShow CHORUS PHOTOBASE/PC-EYE MISC. ADD ONS

U.S. ROBOTICS Complete Line

CABLE Paralle!, 6ft Serial, 6 ft Keyboard Extension, 6 ft FLOPPY Drive Controller FLOPPY Controller w/P,S,G & Clock/Cal FLOPPY & HD Controller REDUCED HAYES Transet 1000 REDUCED MOUSE SYSTEMS PC Mouse w/PC Paint MICROSOFT MOUSE w/PC Paintbrush \$129/ Bus/Serial KEYTRONIC KB 5151. \$165 KB 5153T w/Touch Pad AB/ABC/ABCD Switch Boxes AT Upgrade Kit COMPUTER ACCESSORIES P 1-2-3 POWER DIRECTOR P2(5) \$89 P12 KENSINGTON Master Piece (5 outlets) \$89 P12(6) PC Keyboard Storage Drawer STANDBY PWR SUPPLY w/surge protection 800 Watts (Sine Wave) TILT/SWIVEL Monitor Pedestal PWR SUPPLY 130/150 Watts

CALL FOR OUR WEEKLY UNADVERTISED SPECIALS





\$20

\$329/CALL

\$239/\$389

\$349/\$459

\$499/\$599

\$499/\$699

\$350/\$420

\$190/\$790

\$230/\$470

\$299/\$449

\$439/\$589

\$1199/\$1299

\$2299/\$2569

\$150/\$950

\$419

\$499

BT6 Plus w/64k

MF-100 O-K \$1/9
Par, Ser & Game Ports, Clock/Cal

Silver Quadboard: 0-K to 640k Gold Quadboard: Multifunction & Color Quadmeg-AT (up to 4 MB) Quadport-AT/Expansion Kit

\$1799

\$229

\$259

\$1399

CALL

CALL

\$649/\$999/\$1399

630 ECS-IBM

1200

\$189/\$269/\$379/\$669

\$199/\$219/\$259/\$319

WHEN ORDERING PLEASE REFER TO AD #W

\$239

£400

STAR Power Type/SB-10 SG-10/SG-15 (120cps)

SD-10/SD-15 (160cps)

SR-10/SR-15 (200cps)

SPINWRITER Trac/Sht Fdr

Trac/Mech Single Bin Sht Fdr

MSP-10/15 (160/40cps)

MSP-20/25 (200/50cps)

Sht Fdr (Specify Model)

ANADEX 9620B/9625B-PLUS

Anadex Tractor/Sht Fdr

AB/ABC/ABCD Switch Boxes

TELEVIDEO 750 Daisywheel-50 cps

KENSINGTON Universal Printer Stand

880/1080/1380/1385

LEGEND CP-VII

9725B COLOR

WP6000/DP6500

CITIZEN: 18 months manufacturer warranty

\$899

SILVER REED Daisywheel - Parallel Models 400/500/550/770 \$189/\$269/\$379

NEC PINWRITER P-2/P-3

Sht Fdr for P-2/P-3

ELF 360 Par (16cps)

DIABLO Advantage D-25 630 API \$1599

2050/3550/8850

PKINTEKS	MULTIFUNCTION CARDS	LC COMPATABLES	SPECIAL	
Canon PRINTERS CALL	Six Pack PlusSEE SPECIAL	IBM PC	THIS MONTH'S	6
A40CALL LBP-8A1 LaserCALL	Six Pack PlusSEE SPECIAL Mega Plus II\$269.00		SPECIAL!	
CITIZEN	I/O Plus II\$139.00	SYSTEMS	B. B. B. B.	
MSP-10 (80 col)\$299:00	Advantage - AT	SISILINIS	PARADISE	
MSP-15 (132 col)\$429.00 MSP-20 (80 col.)\$469.00	MonoGraph Plus\$399.00	Configured to your	Multi Display Card	
MSP-25 (132 col.)\$599.00	Preview Mono	specifications.	\$199.00	
стон	5251/11 On-line\$799.00		· 199.00	
Prowriter 8510P \$299.00 Prowriter 8510 NLO \$329.00	5251/12 Remote\$579.00 3780\$639.00	Call for Best	/ 	
F10-40P Starwriter \$869.00	BSC\$489.00	Price!	AST	
F10-55 Printmaster \$1049.00	dea	PC Compatibles from:	Six Pak Plus	
Lazer LP-300 \$2799 00	IRMA 3270\$879.00 IRMA Print\$999.00	ITT, Sanyo, Zenith	5000 00	
DIABLO	==EVEREX-	& Corona	\$ 209. 00	
D25 Daisywheel\$549.00 630-109 Daisywheel\$1749.00	Color Card (Graphics Edge)\$299.00	MONITORS	ORDER LINE	- W
D801F DaisywheelCALL	Magic Card IICALL			=i=i=
d * isywriter	HERCULES	300 Green\$129.00	1-800-233-8950	
2000 \$749.00	Graphics\$299.00 Color\$159.00	300 Amber\$139.00	In PA 1-800-242-4215	
EPSON RX-100, LX-80CALL	IDEAssociates	310 Amber IBM-Plug\$169.00 Color 300 Composite\$179.00	CUSTOMER SERVICE	
FX-85 . FX-185CALL	IDEAmax - ZPR, 64K, C, S, P\$229.00	Color 500 Composite/RGB\$389.00	AND	
LQ 1500, JX80 Color	IDEAmini - YPR, C, S, P\$189.00 IDEAminimax - MPR 128K\$229.00	Color 600 Hi-Res (640x240)\$399.00 Color 700 Hi-Res (720x240)\$499.00	TECH SUPPORT	
NEW! LX-90, SQ-2000, DX-10,	IDEAshare Software\$219.00	Color 710 Long Phosphor\$579.00	1-717-327-1450	
DX-20, HS-80CALL	IDEA 5251\$699.00	Color 722 IBM Enhanced\$579.00	Dept. B210	
6000 Letter QualityCALL	MYLEX	(RAD)	MAILING ADDRESS	
6100 Letter QualityCALL	The Chairman\$479.00	12" Amber/Green TTL (ea.) \$119.00	MAILING ADDITION	
6300 Letter Quality	Bob Board\$389.00	NEC	Computer Mail Order	
8027 Transportable	PARADISE	JB 1260 Green\$59.99	Dept. B210	
2000 Series\$699.00 3000 Series\$1099.00	Modular Graphics Card\$279.00	JB 1201 G/1205A(ea.) \$99.99 JB 1270\$139.00	477 East Third Street	
8000 Series\$1499.00	Multi Display CardSEE SPECIAL	JB 1275	Williamsport, PA 17701	
ELF 360 \$449.00	Five Pack C, S	JB 1280 G TTL/1285 A TTL(ea.) \$149.00 JC 1460 Color\$269.00	(a)	
OKIDATA	SIGMA DESIGNS Color 400\$579.00	JC 1410 RGB		
84, 92, 93, 182, 192, 193 2410, Okimate 20CALL	TECALAR	PRINCETON	MEMBER DIRECT MARKETING ASSOCIATION	(0,)
OLYMPIA	Captain - 64\$199.00	MAX-12E Amber\$189.00	CREDIT CARDS	
Needlepoint Dot Matrix\$299.00	Captain Jr. 128K\$279.00 Graphics Master\$469.00	HX-9 9" RGB\$469.00		
Compact RO\$339.00 Compact 2\$369.00	8	HX-9E Enhanced\$519.00 HX-12 12" RGB\$469.00	V/SA' MosterCard	77 (1)
Panasonic	QUADRAM S	HX-12E Enhanced. \$559.00 SR-12 Hi-Res \$599.00	(August)	
KX1091\$259.00	Ouadport-AT	SR-12P Enhanced	DMERS QUE	
KX1092 \$389.00 KX1093 \$479.00	The Gold Quadboard\$449.00 The Silver Quadboard\$239.00	* TAXAN	0.111501110	- 10
QUADRAM	Expanded Quadboard\$219.00	121 Green TTL\$139.00	SHIPPING	- fi
Quadjet \$399.00 Quadlaser CALL	Ouad 512 +	122 Amber TTL\$149.00 420 Hi-Res RGB (IBM)\$429.00	Add 3%, minimum \$5.00 shipping and handling on all orders. Larger	
SILVER-REED	QuadSprint\$499.00	440 Ultra Hi-Res RGB\$589.00	shipments may require additional	
500 Letter Quality\$279.00	QuadLink	QUADRAM (A)	charges. All items subject to availability and	
550 Letter Quality\$419.00 770 Letter Quality\$759.00	QuadJr. Expansion Chassis\$469.00	8400 Quadchrome\$479.00	price change.	
sitoir	Expansion Chassis Memory\$199.00 Chronagraph\$79.99	8410 Quadchrome II\$469.00	Returned shipments may be subject	
SB/SD/SG/SRCALL	Parallel Interface Board\$64.99	8420 Amberchrome\$179.00 8500 Quad Šcreen\$1499.00	to a restocking fee.	
Powertype Letter QualityCALL	DEST DRICE COSTWARE		CANADIAN ORDERS	
Texas Instruments	BEST PRICE SOFTWARE	ZENTH		
T1855\$799.00	LOTUS 1-2-3 \$299.00 WORD PERFECT \$229.00	ZVM 1220/1230(ea.) \$99.99 ZVM 1240 IBM Amber\$149.00	1-800-268-3974 Ontario/Quebec	
TI865\$1049.00	CHARTMASTER \$239.00	ZVM 131 Color\$249.00		
TOSHIBA 1340 (80 Column)\$599.00	ASHTON-TATE dBase III\$369.00 THINK TANK\$109.00	ZVM 133 RGB	1-800-268-4559 Other Provinces	
P351 (132 Column)\$1149.00	INTUIT Intergrated \$69.99	ZVM 136 RGB/Color\$599.00		
DRIVES	MOI	DEMS	1-416-828-0866 In Toronto	(90
BRIVES				
ALLOYCALL	Volksmodem 300/1200 \$189 99	Smartmodern 300\$139.00	TELEX: 06-218960	
EVEREXCALL	Mark XII (1200 Baud). \$259 00 Signalman Express. \$299 00	Smartmodem 1200\$389.00	2505 Dunwin Drive,	
IDEASSOCIATESCALL	Lightning 2400 Baud. \$399.00	Smartmodem 1200B\$359.00 Smartmodem 2400\$629.00	Mississauga, Ontario	
IOMEGACALL	Novation	Smart Com II\$89.99	Canada L5L1T1	
TALLGRASS CALL	J-Cat	Chronograph\$199.00 Transet 1000\$309.00	All prices shown are for U.S.A. orders.	
TANDON TM-100-2\$119.00	Smart Cat Plus\$319.00	AST	Call The Canadian Office for	- 1
MINDUIN TIME 100-2	Novation 2400CALL	Reach 1200 Baud Half Card \$399.00	Canadian prices.	<u>5</u>
	ner 4	@AA 3	22 00	
		(a) (J) (J) = <u>(</u> 2	33 = 6 3 B	



CHIPS

sale. Call us!

64K-256K

RAMCHIPS

for your AT.

All our chips are tested

and priced for quick

INTEL 8087, 80287,

high speed coproc.

From \$125

Call for Market Price.

Call for Market Price.

128K Piggy-back chips



COMPUTERS

AT&T Color and Mono Systems in stock ______Start at \$1995 COMPUTER SPECIAL OF THE MONTH Call for details!_

NETWORKING/ PROTOCOL CONVERSION

SNA & BISYNC 3780, 5251.

Mod 11 & 12, 3274, 3278

PC TURBO 186/187 board,
128K, 8087 Serial Board
attached
\$875







Micro Mart has financing options available. Ask for a Micro Mart Blue Chip Credit Card, today.



TECHLAND Blue Lynx. Complete line ______ Call! IRMA Complete line From \$829 HARD DISCS

PEACHTREE TECHNOLOGIES
10 & 20 Meg. internal &
external _____ From \$549
IRWIN/TANDBERG Tape
back-up systems ___ From \$495
SEAGATE Fast 10, 20, 75 Meg.
for PC & AT _____ From \$495
SYSGEN Complete line ____

New Low Prices. Call!
BERNOULLI TECHNOLOGY
Hard disc Subsystems___\$2595
PRIAM Superfast 40 & 60
Meg. for AT_____ Call!

PRINTERS & PLOTTERS

We have thousands in stock.
PRINTER SPECIAL OF THE
MONTH Call for details!
HOUSTON INSTRUMENTS
Plotters and Digitizers in stock

DOT MATRIX
EPSON FX85/185______NEW
EPSON LX80/100, LQ1500____
COMREX 420, Epson compatible, 400cps _______\$1695
OKIDATA 192 & 193, ML84,
Pacemark 2410______
OKIDATA Color printers,
complete line_____
TOSHIBA P-351 & 1340_____

New Low Prices!
TEXAS INSTRUMENTS 855 ___
From \$729

LETTER QUALITY

NEC Spinwriters 2050, 3550, 8850 ______ New Low Prices!
COMREX CR II E, CR III & CR IV ______ Start at \$369
We carry a full range of form handling options.



© Copyright 1985 Micro Mart, Inc. Technology Corporate Campus 3159 Campus Drive Norcross, Georgia 30071

IBM is a registered trademark of International Business Machines Corporation.

Prices are subject to change without notice and are similar, but may vary at over 20 Micro Mart Retail Stores.



MULTIFUNCTION BOARDS

We have a complete line of Multifunction Boards compatible with the Portable, XT/AT.

THE BOARD SPECIAL OF THE MONTH __ Call for details! SIX PAK 64-384K, multifunc. __ I/O MINNIE I/O shortboard for Portable & AT ____ New Law Brief.

New Low Price!

ADVANTAGE 128K-3Mb,
expansion for AT

QUADRAM QUADBOARD
Loaded, 384K \$279

TECMAR CAPTAIN, 0-384K,
multifunc. \$175

TALLTREE J-RAM II

New Low Price!

GRAPHIC CARDS

PREVIEW Mono Graphics/
Hercules look-alike _____\$269
HERCULES Mono & Color
Graphics cards New Low Prices!
TECMAR Graphics Master,
HiRes Color & Mono supports
Lotus ______\$449
QUADRAM Quadcolor I & II
color cards







1/2 HEIGHT Disk
Drives from Shugart,
Mitsubishi & TEAC.
PC, XT & AT Compatib
From \$11



TANDON TM 100-2, DD/DS, 360K ______New low, low pric SPECIAL! Two 1/2 Height Drives, "Y" cables & brackets _ \$2!

MISCELLANEOU

MAXELL Diskettes in a FREE flip N' file box \$2 DYSAN Diskettes at the lowest price in the USA ______ Cal MOUSE SYSTEMS PC Mouse, optical

w/software _______\$13 MICROSOFT Mouse, bus or serial mechanic: KEYTRONICS 5151 & 5152 keyboards ______

From \$14
KENSINGTON MICRO
WARE MasterPiece_\$9
CURTIS Accessories,
Pedestals, cables, etc._
HAYES Mach II & Mac
III Joysticks ___\$39/\$4
QUADRAM Microfazer
print buffer 8-128K ____
From \$12

TRIPPELITE ISOBAR surge protectors, 4 & 8 plug _____ From \$4





MICRO MUSIC New synthesizer system for PC, incl. keyboard & digitizer_____\$1895 POLAROID Palette \$1195 PTI Back-up power supplies_New Low Prices!

SOFTWARE

OFTWARE SPECIAL OF THE MONTH. Call for details!

ACCOUNTING SORCIM/IUS Complete

ine including Windows.
From \$289/each
SPREADSHEETS &
INTEGRATED PACKAGES

MICROSOFT MultiPlan, w/templates______ SORCIM SuperCale 3,

vers. 2.0 New Low Price!
ENHANCEMENTS &
UTILITIES

FOX & GELLER Complete line for dBase II/III, Rbase 4000______ NORTON Utilities 3.0__

ROSESOFT ProKey 3.0.

CENTRAL POINT
SOFTWARE Copy II
PC______\$
SOFTSTYLE Set FX+

BORLAND SideKick and SuperKey____From \$40

COMPILERS & LANGUAGE TOOLS

ATTICE C-Compilers_____\$299
MICROSOFT Complete

BORLAND Turbo Pascal, furbo Toolbox & more_ From \$35/each



GRAPHICS

UKAPHICS
Z-SOFT PC Paintbrush, mouse
graphics\$95
DECISION RESOURCES
ChartMaster_Latest version \$239
MICROPRO ChartStar
MICROSOFT Chart \$169
COMMUNICATIONS
MICROSTUF Crosstalk XVI.
Latest version\$99
HAYES Smartcom II\$85
WORD PROCESSORS
MULTIMATE w/spelling checker
& tutorial New Low Price!
SAMNA +
MICROSOFT Word. New
version New Low Price!
LIFETREE Volkswriter Deluxe
\$169
SSI WordPerfect, version 4.0_

office & PROJECT
PLANNING

MICROPRO WordStar Profes-

HARVARD Total Project

Manager \$299

SORCIM/IUS Super Project \$175

MICROSOFT Project \$175

DATA BASE MANAGERS
Call for unadvertised Data
Base Managers.
MICRORIM 4000 or 5000.

Report Writer & Clout_____ New Low F

New Low Price!
WARNER SOFTWARE The
Desk Organizer_____\$145
MICROSTUF Infoscope__\$149

MODEMS

HAYES Smartmodem 300, 1200, 1200B & 2400. We have the best stock in the USA_Call! VEN-TEL 1200 Baud Half Card w/Crosstalk____\$399 POPCOM Int. & ext. w/voice & data____

MONITORS AND CRT'S

PGS Max 12 (E) amber, HX12, HX12 (E), & SR-12 New Low Prices! QUADRAM Quadchrome, 690 dot RGB _______\$429 AMDEK Color 300, 500, 600, 700, 710, 725 _____ AMDEK 300A/300G/310A ______ \$129/\$119/\$165

Circle 112 on reader service card

WELCOME TO THE WORLD OF MICRO MART.

A world of friendly microcomputer experts. And your window to the world of computer products, information, service and support. Or just good microcomputer advice.

Micro Mart presents the latest and best-selling PC products at some world-beating prices. And with our 15 million dollar inventory on-line to our IBM mainframe, we quickly



know what's in stock. And how to get it to you fast. You'll find Micro Mart Service to be world class, too. Highly trained technicians repair and replace any product we sell. On-site, depot and customized Micro Mart Service can fit your business needs. No question. But if you have any questions about any aspect of microcomputers, Micro Mart will give you the answers.

So for all your PC needs, call on the people at Micro Mart. They make all the difference in the world. "We're America's PC Specialists."

1-800-241-8149. (404) 449-8089.

MICRO MART







SOFTWARE ADVISOR'S



Address: 2222 East Indian School Road Phoenix, Arizona 85016

- Order Line Hours: Mon-Fri. 8:30-5:30 Saturday 9:00-1:00
 Order Processing: 602-224-9345
 10:00 a.m. 3:00 p.m. Monday Friday

- · Due to Copyright Laws No Returns on Software Purchases. Call
- on Defectives for a Return Authorization Number Add 2% for C.O.D. Orders
- · Call on Purchase Orders





No Charge for VISA and Mastercard

- · Free Air applies ONLY to orders up to 10 lbs.

- Shipping and Handling Add \$6.00
 Personal and Company Checks Will Delay Shipping 2 weeks
 Prices & Availability Subject to Change Without Notice
 We Do Not Guarantee Machine Compatibility

Gem Desktop\$ 29 Gem Draw \$ 85 Word Perfect (Ver. 4.0) \$209 Supercalc 3 (Ver.2) ... \$159

DEST Proof Statice Compiler Statice			THE RESERVE OF THE PARTY OF THE
Leading Edge Word Processor S S Basic Compiler (Microsoft) S239 Cornerstone S269 S239 Cornerstone S269 Cornerston	WORD PROCESSORS		DATA BASE MANAGEMENT
Basic Interpreter (Microsoft) 209 Cornerstone \$269			Clout 2
Compiler (Microsoft) 239 dBase II Call Ca		Basic Interpreter (Microsoft) 209	Cornerstone
Constitution Cons	Leading Edge WP with Spell & Mail 139		dBase II Call
Concurrent PC DOS	Microsoft Word 2.0 225		
Multimate 3.3 215	Microsoft Buss Mouse 109		Evlanded Depart Writer 00
Multimate 3.3 215 September Septem	Microsoft Serial Mouse 129		Vacadadassas
## Acro Assembler 89 PFS: File 79 79 79 79 79 79 79 7	Multimate 3.3 215		Knowledgeman 249
PFS: Write 79 Macro Sections 9 Macro Sec	PFS: Proof 55		Nutshell Call
Volkswriter Deluxe			PFS: File 79
Pascal Compiler (Microsoft) 179 Powerbase (New Ver. Req. 320K) 245			PFS: Report 71
Turbo Pascal 3.0 36 Ouickcode 139			Powerbase (New Ver. Reg. 320K) 245
UTILITIES	Wordstar Dre Dool		
DIFLICATION State		Turbo Pascal w 8087 3.0 55	
DIR	UTILITIES		
PC	1 DIR \$ 49		
Mastertype 25			PROJECT MANAGEMENT
Morton Utilities 3.0 49 Mind Prober 29 Microsoft Project 149	Desk Organizer 55		Harvard Project Manager \$199
Printworks 36	Norton Utilities 3.0	Mastertype	
Typing Instructor 30	Drintworke 26		Microsoft Project 149
Variety Vari			Super Project 199
Typing Tutor 30 INTEGRATIVE SOFTWARE	Clarkiet		Timeline 2.0 209
MONEY MANAGEMENT 279	Sidekick 29	Typing Tutor III	
Dollars & Sense w Forcast S 95 Electric Desk S189		MONEY MANAGEMENT	
Name Accountant Plus 79 Enable 329			Flactric Deek C100
Tobias Managing Your Money 96 Framework Call			
COMMUNICATIONS SPREADSHEETS Smart Software System 459 CompuServe Starter Kit \$ 18 Lotus 1-23 Call Symphony Call Crosstalk XVI 95 Multiplan \$115 DISKETTES PFS: Access 79 PFS: Plan 79 Maxell MD-2 (Gry, 100) \$159	Superkey 36		
CompuServe Starter Kit S 18 Lotus 1-2-3 Call Symphony Call Crosstalk XVI 95 Multiplan \$115 DISKETTES PS: Access 79 PS: Plan 79 Maxell MD-2 (Otv. 100) \$159	COMMUNICATIONS	Tobias Managing Your Money	Framework Call
CompuServe Starter Kit \$18 Lotus 1-2-3 Call Symphony Call Crosstalk XVI 95 Multiplan \$115 DISKETTES PFS: Access 79 PFS: Plan 79 Maxell MD-2 (Otv. 100) \$159		SPREADSHEETS	
Crosstalk XVI 95 Multiplan \$115 DISKETTES PFS: Access 79 PFS: Plan 79 Maxell MD-2 (Orv. 100) \$159	CompuServe Starter Kit \$ 18	Lotus 1-2-3 Call	Symphony Call
PFS: Access	Crosstalk XVI 95		DICKETTES
			Mayell MD-2 (Oty 100)
	Remote 99	Spreadsheet Auditor 2.0	Sony MD-2 (Oty. 100)

Clout 2	19
Cornerstone	59
dBase II Ca	ılı
dBase III	ıli
	30
Knowledgeman 24	19
Nutshell Ca	II
	79
	71
Powerbase (New Ver. Reg. 320K) 24	15
	39
	39
	99
PROJECT MANAGEMENT	
Harvard Project Manager	99
Harvard Total Project Manager 24	15
Microsoft Project 14	19
Super Project 1!	99
	09
INTEGRATIVE SOFTWARE	
	79

												199
												209
				5								
												279
								è				\$189
												329
												Call
												459
										٠		Call
	ú	i	d	r	÷	è						
١												\$159
	ı				i.				Ŀ		ŀ	169

ACCOUNTING	
Chartmaster	2
Diagram Master	ì
Dr. Halo	5
Energraphics 18	3
Energraphics w Plotter Option 2:	3
Microsoft Chart 1	
PC Draw	ì
PC Draw Light Pen 1	1
PC Paint w/Mouse 1:	2
PC Mouse w Paintbrush 1	۱
PC Paintbrush	7
	7
	3
Signmaster	4
Turbo Graphix Tool Box	3

GRAPHICS

Accounting Partner \$209
Accounting Partner II 515
BPI - G'L, A'R, A'P, Payroll 325 ea.
In-House Accountant
One Write Plus 159
Open Systems - G.L., A.R., A.P., Payroll . 399 ea.
Peachtree - G/L, A/R, A/P, Payroll 329 ea.
Real World - G.L. A.R. A.P. Payroll 399 ea.
Sorcim IUS - G.L. A.R. A.P 329 ea.
State of the Art-G'L,A'R,A'P,Payroll 339 ea.

PRINTERS	12.0
Anadex Printers	
Brother Printers	
Canon Laser Printer	\$2599
C.Itoh Printers	
Citizen Printers	
Data South Printers	
Diablo D-25	
Diablo 630 ECS IBM	4050
Epson Printers	
Juki 6000	
Juki 6100	355
Juki 6300	689
NEC 2050	619
NEC 3550	
NEC 8850	
Okidata Printers	
Panasonic Printers	
Silver Reed Printers	
Star Micronics SG-10	
Star Micronics Other Models	
Texas Instruments Printers	. Call
Toshiba 1340	529
	4000

MODEMS	
Anchor Modems	. Call
Hayes Smartmodem 300	\$ 129
Hayes Smartmodem 1200	
Hayes Smartmodern 1200B	319
Haves Smartmodem 2400	609
Novation Smartcat Plus	279
Prometheus 1200B	209
US Robotics Password 1200	195
US Robotics Courier 2400	399
BOARDS	
AST Six Pack	\$ 219
AST Advantage	389
Hercules Color Card	145
Hercules Graphics Card	289
Paradise Modular Graphics Card	259
Desertion C Death	

	Alpha Omega Turbo Disk Drives	Call Call
	MONITORS	
	Amdeck Monitors Princeton Graphic HX-12 \$ Taxan Monitors Zenith Monitors	445 Call
	COMPUTERS	
	Sanyo Zenith	Call
þ	PLOTTERS	
	Enter Sweet-P S Epson HI-80	759 339

Paradise Modular Graphics Card Quadlink Tecmar Graphics Master Tecmar Captain (No Memory) KEYBOARDS



Wordstar 2000 \$239 Wordstar 2000 Plus ... \$289 Masterpiece \$ 89 R:Base 5000 \$339

NEW Monochrome Monitors for IBM-PC and Compatibles

Our first move was in 1896.

Now you can put your "X" in the right square by moving to SAKATA Green and Amber Monochrome Monitors. SAKATA has built into all of its products a promise of performance backed by SAKATA's outstanding reputation since 1896. SAKATA also manufactures a full line of color monitors, as well as printers and peripherals.

Make sure that you make the right move by purchasing from a source that will be here tomorrow...make the winning move to SAKATA today!



SA-1500

The SAKATA Model SA-1500 is a precision-engineered, high resolution Monochrome Amber Monitor, featuring 800 x 750 dots, 12" screen, and non-glare faceplate. The SA-1500 is designed specifically for IBM-PC and compatibles.

SAKATA U.S.A. CORPORATION

651 Bonnie Lane / Elk Grove Village, IL 60007 / 312-593-3211



SG-1500

This New SAKATA 12" 800 x 750 high resolution Monochrome Green Monitor is ideal for IBM and a host of IBM compatibles. This SAKATA monitor displays brilliant green text and graphics on a non-glare screen and is ideal for personal or professional use.

SAKATA computer products are available at selected dealers, or write for technical and illustrated literature and prices.



"Serving industry worldwide since 1896"
Visit our booth at Comdex Fall in Las Vegas

Ven-Tel's Half Card[™] modem is in all the best computers Here's why....

Ven-Tel gives you lots of reasons to buy our Half Card™ modem for your IBM PC or compatible. The Half Card™ is a complete system that lets you communicate with other PCs, mainframes, and databases effortlessly. It includes Crosstalk-XVI® software. It's reliable. It's got all of the features you want. And it's a good value.

Do You Own One of These Computers?

Chances are you do. And if you're thinking of buying a modem, consider the Half Card™. Because of its small size, the Half Card™ fits in more computers, including all of the models we've listed here. The Half Card™ is small, so it fits in short slots or long. That means you can save your long slots for other expansion uses.

Effortless Communication

Each Half Card™comes with Crosstalk-XVI® communications software, by Microstuf. It's the easiest to use, whether you're a beginner or an old hand, and the most powerful. A full on-line help menu makes using Crosstalk® for the first time a snap. It can turn your PC into a terminal on a mainframe computer with its powerful terminal emulation feature. It will even operate your PC when you're not there. You can call into an information service such as The Source or Dow Jones News Retrieval, or transfer files and electronic mail, all at the touch of a button. The Half Card™ connects your computer to the world.

More Modem for Your Money

When you buy the Half Card, you don't need anything else. The Half Card is a complete communications package that includes a full-featured modern and the best known software on the market. Complete easy-to-understand instructions with full technical support on installation and use. And a very competitive price. The Half Card, with Crosstalk-XVI® software, retails for only \$549.

Features

- 1200/300 baud auto-dial, auto-answer.
- Uses the industry standard "AT" command set.
- Runs with virtually all communications software, including Smartcom II and PC Talk III and integrated packages such as Symphony and Framework.
- Includes Crosstalk-XVI® software.
- On-board speaker and extra phone jack for easy switching from voice to data mode.
- Selective tone or pulse dialing; full or half duplex.
- Automatic answer on any ring.
- True ring or busy signal detection.



Portable Plus Deskpro

XIIa

1000

Reliability

Ven-Tel has been making modems for 10 years. Our experience shows. Ven-Tel's Half Card™ only has about 70 parts, compared to almost 300 on other modems. We reduced the parts by building the first LSI modem chip using advanced

by building the first LSI modem chip using advanced switched capacitor technology. What that means to you is greater reliability and lower power consumption, so you can load up your PC with expansion boards and not worry about heat or power problems. And we back the Half Card with a futwo-year warranty on parts and labor.

You Can Buy the Half Card™ Anywhere

You can get the Half Card™ at Comput Land, Businessland, the Genra Group, Entré Computer Centers, Macy's Compu Stores and other fine dealers nationwid Also from Ven-Tel: the 1200 Plus,™ an external modem and the PC Modem 1200,™ an IBM internal with V.22 international capability.

Effortless Communicatio

2342 Walsh Avenue Santa Clara, CA 95051

(408) 727-5721

Crosstalk is a registered trademark of Microstuf, Inc. Smartcom II is a trademark of Hayes Microcomputer Products. Symphony is a trademark of Lotus Development. Framework is a trademark of Ashton-Tate