Home Accounting With PCjr

PC WORLD

December 1984 $3.00
$3.75 Canada

The Comprehensive Guide to IBM Personal Computers and Compatibles

Top of the Line:

IBM's Powerful New Personal Computer

Reviews: Microsoft Chart & the New dBASE III

Getting Started With CompuServe's Executive Information Service

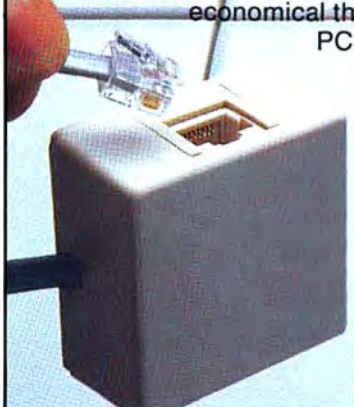
Hewlett-Packard's Briefcase PC With 1-2-3 on a Chip

Introducing AST-PCnet II.

Now PC networking is as easy as plugging-in your phone.

The advantages of Local Area Networks (LANs) are well known. Existing personal computers can be tied together to share information and expensive peripherals such as disks and printers.

Now AST makes networking easier and more economical than ever before. With AST-PCnet II, you simply insert the PCnet II board into an I/O slot in your IBM PC or XT. Then connect the PCnet II "twisted-pair" cable to the main network cable using a standard modular "telephone jack."



The same kind of jack that's used on your telephone. To move your PC from one point to another on the network, simply plug in at the desired location. It's that easy.

With AST-PCnet II, anywhere from 2 to 160 PCs can be interconnected. Standard PC-DOS commands are used to access remote drives and printers. And dedicated file and print servers are not required, because shared PCs also function as standard workstations.

We're AST, the world's leader in communications and enhancement products for the IBM PC. To find out how AST-PCnet II can expand your IBM PCs and XTs into a reliable, versatile LAN, call or write AST Research, 2121 Alton Avenue, Irvine, California 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

AST-PCnet II is a development of AST Research Inc. Software protocols are based on technology licensed from Orchid Technology Inc.

AST-PCnet II Local Area Network

Now You Can Use Your IBM PCs as Smarter Smart Terminals in the IBM3270 World.

More and more, people in your company want to access data from the mainframe. And since IBM PCs are in (while dumb terminals are on their way out), you need one good source for a complete family of micro-to-mainframe communications products.

That's where we come in. AST is the leading supplier of IBM PC-compatible products. With over 200,000 board-level PC enhancements already on the job. And now we're offering a full line of 3270-compatible products that will fit a variety of connections and protocols. Without forcing you to reconfigure your mainframe hardware or software.

For starters, there's our new AST-SNA family. Hardware and software that let your PCs talk to your mainframe (and let the mainframe talk back) via the SNA/SDLC protocol. Giving you all the facilities of a 3270 terminal. And with the computing power of your stand-alone PC maintained!

Plus, the basic hardware can support multiple protocols. And you can support a variety of emulations from a single PC. Or support additional PCs by using one as a cluster controller. An arrangement (with up to four PCs) that can save you a lot of money. You can even attach low-cost ASCII CRTs to a PC and emulate 3278 Model 2s.

What's more, our AST-BSC package lets you work in a 3270 BSC environment and still migrate to 3270 SNA/SDLC without hardware upgrades. Another way to save money and aggravation.

Still, there's more. For example, if you have an IBM 3274/3276 Cluster Controller, our coaxial connection hardware is your answer. Once installed (via coax-A), it lets your PC retain its stand-alone processing capabilities and emulate a 3278/9 terminal. With no performance degradation!

You can even use our AST-3780 to support 3780 RJE batch communications. Which gives your PC the ability to operate unattended. And transfer program, data or text files between your PCs and an IBM host at very high speeds.

AST is the only supplier that can give you a complete line of PC-compatible products. Communications hardware and software for 3270, 3780 and 5251 environments. I/O and memory expansion cards. And utility programs.

Find out how thousands of users have benefited from AST's communications products. To get detailed product and configuration data, call us today at (714) 863-1333. Or write AST Research, 2121 Alton Avenue, Irvine, CA 92714. TWX:753699ASTR UR.

AST RESEARCH INC.

IBM PC is registered trademark of IBM Corp. AST-3780 is a product developed by AST Research, Inc. and Wilmot Systems, Inc.

1
AST

AST brings you the perfect 4-5-6 for your Lotus™ 1-2-3.

Introducing the MonoGraphPlus™ Graphics Card.

Lotus 1-2-3™ is probably the most-used productivity software around. The trouble is, you can't display 1-2-3 graphs on your IBM monochrome display.

That's why AST developed MonoGraphPlus™ for the IBM PC and XT. It replaces IBM's monochrome card, permitting high-resolution bit-mapped graphics and text on the monochrome display.

But our MonoGraphPlus gives you much more. While Lotus offers three useful programs (1-2-3) in one software package, MonoGraphPlus gives you three additional hardware features (4-5-6) on a single card: a printer port, a serial port, and a real-time clock-calendar. Our comprehensive documentation will even show you how to get an extra two lines of text on your screen.

So now you can produce high-resolution, flicker-free graphics without giving up the high-quality text display that makes IBM's green monitor so popular. You can also expand your PC's memory with our MP series of memory cards, turning your PC into an even more powerful workstation capable of producing very large spreadsheets with instant charts and graphs.

Leave it to AST to offer yet another state-of-the-art enhancement product for the PC. You see, we're the world's leading supplier of enhancement products for the IBM PC, offering a complete family of multifunction cards, communications emulators, and local area network products.

To get the perfect 4-5-6 for your PC see your local computer retailer, or contact AST Research Inc., 2121 Alton Ave., Irvine, CA 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

IBM is a trademark of International Business Machines Corp.
Lotus and 1-2-3 are trademarks of Lotus Development.
MonoGraphPlus is a trademark of AST Research, Inc.

MonoGraphPlus Graphics Card

Circle 18 on reader service card

PC WORLD

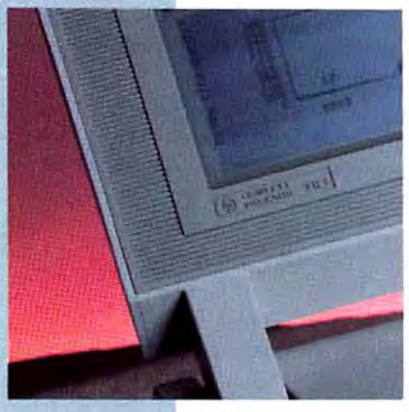
The Comprehensive Guide to IBM Personal Computers and Compatibles
December 1984

234 Cover:
AT: The PC's Powerful Partner

IBM's new top-of-the-line personal computer combines three approaches to computing–single-user, multiuser, and network–in a fast, powerful computer.

96 Community:
Hollywood PC

"Listen, baby–this one's hot, really hot, a natural success story: The PC invades Hollywood, puts a stranglehold on chaos, and turns the industry upside down. What do you think?"



152 Review:
HP's Desktop in a Briefcase

Where else can you find *1-2-3* in ROM and 292K of RAM in an 8½-pound package that can exchange data with a PC? Hewlett-Packard pulls a rabbit out of the hat with its HP 110 Portable.

Getting Started

56 **CompuServe Means Business,** ***Kirk Bottomly***
CompuServe has augmented its new business-oriented information service with a quick and easy communications program that takes the complexity out of communicating.

68 **The First Five Functions,** ***Seth Novogrodsky***
Switch from local to express with DOS's special editing keys, which let you issue operating system commands faster.

Community

96 **Hollywood PC,** ***Eric Brown and John Faulkner***

118 **The Ten-Second Commute,** ***Anita Micossi***
The PC has made it possible to move your office to your home. Four profiles illustrate the pluses and perils.

Review

152 **HP's Desktop in a Briefcase,** ***Danny Goodman***

167 **dBASE III,** ***David Jenkins***
dBASE for beginners? Ashton-Tate comes up with a substantial upgrade that tries to please advanced programmers and novices alike.

180 **The Graphics Gallery,** ***Steve Lambert***
If it's business graphics you're after, *Microsoft Chart* offers an impressive collection of chart styles and formats that serve as building blocks for vivid presentations.

PCjr World

210 **Holding Yourself Accountable,** ***Jaime Nahman***
Two home accounting programs can help straighten out your personal finances.

216 **Scene One, Take One,** ***William Claxton***
The PCjr teams up with your video tape recorder to create dynamic demonstrations.

State of the Art

234 **AT: The PC's Powerful Partner,** ***Ken Greenberg and Karl Koessel***

256 **PC in the Sky,** ***Jonathan Littman and Mary Friedland***
The merger of aerospace technology and personal computing to create PC-based digital image processing promises major boons to fields as diverse as medicine and farming.

Hands On

272 **Brilliant Deduction,** ***Ralph Soucie***
Congress recently made writing off your PC a taxing proposition. A former IRS auditor shows how you can still claim benefits under the new law.

286 **Formulas for Profit,** ***Donald Hunt***
Cost-volume-profit analysis, a technique for monitoring a business's bottom line, can easily be fashioned into a *1-2-3* template that makes short work of protecting profit margins.

Departments

11 **David Bunnell**

19 **REMark,** ***William Rodarmor***

29 **Letters**

40 **PC World View,** ***Katie Seger***

77 **The Help Screen,** ***Karl Koessel***

132 **Compatibles Update,** ***Ken Greenberg***

195 **From the Software Shelf**

301 ***.*, *Edited by Steven Cook***

319 **Just Announced,** ***Seth Novogrodsky***

Indexes

360 **Products**

362 **Advertisers**

PC World Directory

345 A classified guide to products and services.

Photo/illustration credits: David Bishop, cover, 97; John Hersey, 286; Ed Kashi, 99, 103, 235, 214; K. Mercedes McDonald, 118; Stevan Nordstrom, 156, 158; Susan Ogrocki, 40; Marc Rosenthal, 299; George Steinmetz, 11; Fred Stimson, 42, 44, 68, 153, 210, 272; Rudy Vanderlans, 257; Mick Wiggins, 56.

PC WORLD

Volume 2, Number 13
December 1984

David Bunnell
Publisher

Andrew Fluegelman
Editor-in-Chief

Herbert Linden
Production Director

Jacqueline Poitier
Associate Publisher

Cheryl Woodard
Associate Publisher, Circulation

Harry Miller
Editor

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

Art
Designer: Marjorie Spiegelman
Art Director: Mick Wiggins
Associate Designer: Monica Ames
Design Associates: Leslie Barton, Donna Sharee, Molly Windsor-McLeod
Assistant to the Art Director: Nan Cassady

Production
Senior Production Mgr.: Frances Mann
Production Mgr.: 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

Advertising Sales
National Account Mgr.: Roderick B. Conklin
Marketing Services Mgr.: Charles Abrams
Account Managers
Northern California (San Francisco): Meredith Powers, J. Mark Doss
Northwest (San Francisco): Patricia Navone
Southwest (San Francisco): Linda Crawford
Southern California (Los Angeles): Robin Mozak
New England (Boston): Larry Hilderbrand
Midwest (Chicago): Richard Arzaga
Mid-Atlantic (Philadelphia): P. J. Boatwright
Action Ad/Directory Sales Reps.: Niki Stranz, Carol Watson
Marketing Services: Rodney Brooks

PC World Books
Editor: Jeremy Joan Hewes
Editorial Production Mgr.: Betsy Dilernia
Assistant Editor: Joanne Clapp

Circulation
Circulation Director: Penny Ertelt
Fulfillment Manager: Russell Smith
Services Coordinator: Phil Semler
Promotion Coordinator: Laurie King
Corporate Sales: MaryAnn DePietro
Single Copy Sales
Director: George Clark
Single Copy Sales Mgr.: William B. Cox
Dealer Sales Mgr.: Mary Ruth Kristoff
Account Mgrs.: Elaine McMahon, Jo Muilenburg

Corporate Development
Special Projects: Susan R. Keller
Publishing Assistants: Karen G. Dowell, Randi Glaser
Sales: Jeffrey S. Glines

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
President & CEO

Andrew Fluegelman
Vice President

Herbert Linden
Vice President

Jacqueline Poitier
Vice President

Cheryl Woodard
Vice President

Manufacturers wishing to have their products reviewed should contact:
Product Review Editor
PC World
555 De Haro St.
San Francisco, CA 94107
415/861-3861

PC World™ (ISSN 0737-8939) is published monthly except semimonthly in June and December at $24 for one year (14 issues), $43 for two years (28 issues), $60 for three years (42 issues) by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107. Additional postage outside the US and Canada $25 per year surface mail, $110 per year airmail. For questions regarding subscriptions and to place subscription orders call toll-free 800/247-5470 (in Iowa: 800/532-1272). Second-class postage paid at San Francisco and at additional mail offices.
POSTMASTER: Send address changes to PC World, Subscription Dept., P.O. Box 6700, Bergenfield, NJ 07621. Editorial and Business Offices: 555 De Haro St., San Francisco, CA 94107, 415/861-3861.
CompuServe 74055,412
The Source STE908
PC World™ is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. Entire contents Copyright 1984, 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 53 computer publications in 24 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 Micro Computerworld Magazine, Australian PC World and Directories;* Brazil: *DataNews, MicroMundo;* China: *China Computerworld;* Denmark: *Computerworld/Danmark, MicroVerden;* Finland: *Mikro;* France: *Le Monde Informatique, Golden* (Apple), *OPC* (IBM); Germany: *Computerwoche, Microcomputerwelt, PC Welt, Software Market, CW Edition/Seminar, Computer Business, Commodore Magazine;* Italy: *Computerworld Italia;* Japan: *Computerworld Japan, Perso ComWorld;* Mexico: *Computerworld/Mexico, CompuMundo;* Netherlands: *CW Benelux, Micro/Info;* Norway: *Computerworld Norge, MikroData;* Saudi Arabia: *Saudi Computerworld;* Spain: *Computerworld/España, MicroSistemas;* Sweden: *ComputerSweden, MikroDatorn, Min Hemdator, Svenska PC World;* United Kingdom: *Computer Management, Computer News, Computer Business Europe;* United States: *Computerworld, Hot CoCo, In-Cider, InfoWorld, Macworld, Micro Marketworld, Microcomputing, PC World, Run, 73 Magazine, 80-Micro.*
Printed in the United States of America.

A PUBLICATION OF CW COMMUNICATIONS

"MANAGING YOUR MONEY™ alone is enough reason for many, many people to buy a computer."

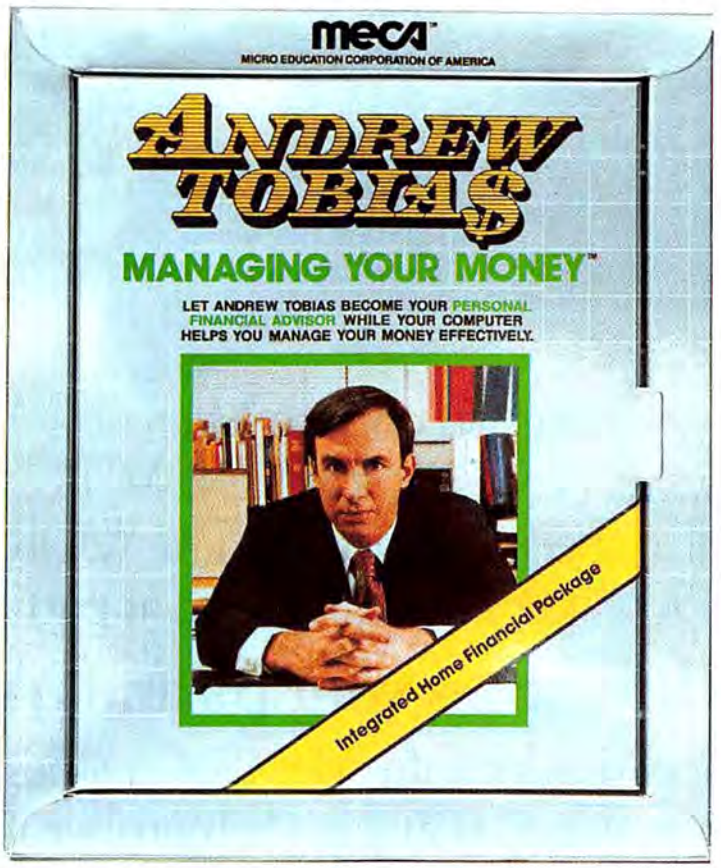
HENRY KISOR, CHICAGO SUN-TIMES, SEPTEMBER 9, 1984.

"MANAGING YOUR MONEY is, simply, the finest personal financial management program on the market."

PERSONAL SOFTWARE MAGAZINE, JULY, 1984.

"The first fully-integrated financial program that really makes a computer for the home worth the money."

SEYMOUR MERRIN
COMPUTER WORKS OF CT.



Disk version for IBM PC, XT, Compaq and now for PCjr with 256K. Cartridge version available for PCjr at IBM authorized dealers.

"What the home computer market needs most is software good enough to make people use the machines they buy. A new program by Andrew Tobias may well be one for the money."

FORBES, APRIL 9, 1984.

"It's a joy to use and deserves to be in every household that owns a personal computer."

COMPUTERS & ELECTRONICS, NOVEMBER, 1984.

The only financial software you'll ever need. The easiest financial software you'll ever use.
It's seven programs in one. It prepares your budget and balances your checkbook. It calculates your net worth. It helps manage your stock portfolio. It calculates your taxes. It estimates your life insurance needs. It analyzes loans and helps you do retirement planning. It reminds you of important dates. No need for a big, bulky manual. With MANAGING YOUR MONEY™ all the help you need is constantly on-line, on the computer. And everything is integrated so you only need to enter data once.

Other fine software products from MECA

For Atari, Apple and IBM

For IBM

Available where fine software is sold.

meca™

Software that makes your personal computer worth having.™

©1984 • MICRO EDUCATION CORPORATION OF AMERICA • 285 RIVERSIDE AVENUE, WESTPORT, CT 06880 • (203) 222-1000

Circle 657 on reader service card

Buy now.

Because now when you choose Microsoft® Word, the high performance word processor for the IBM® PC, you get Microsoft Spell, a special version of The WORD Plus™ spelling corrector. A $150 value. Absolutely free at participating dealers.

It watches your p's and q's.

Microsoft Spell is a proofreader that catches your typos and misspellings. When you can't remember if it's *i* before *e*, Spell remembers for you.

And you can customize it to spell your favorite technical words, from *aepyornis* to *cryptococcosis*.

Spell is just one of many extras you get in this package.

For example, Microsoft Word includes the most advanced mail merge, for all your multiple correspondence. Plus a free 'Learning Microsoft Word' disk that brings you up to speed immediately.

And Word works with the very latest printers—even laser printers—to produce manuscripts of nearly publication quality.

Spell free.

The critics loved it.

When *Softalk IBM* reviewed Word, they were delighted to discover that Word was "fun to use."

PC Magazine called it "a well thought out, finely-executed product" that is "twice as productive" as WordStar.®

And *Time*, which also featured Microsoft in a recent cover story, was impressed that Word was "loaded with extras."

Word is a natural match for IBM PCs and their compatibles for a very natural reason: We wrote the MS-DOS™ operating system that tells the whole IBM PC family how to think.

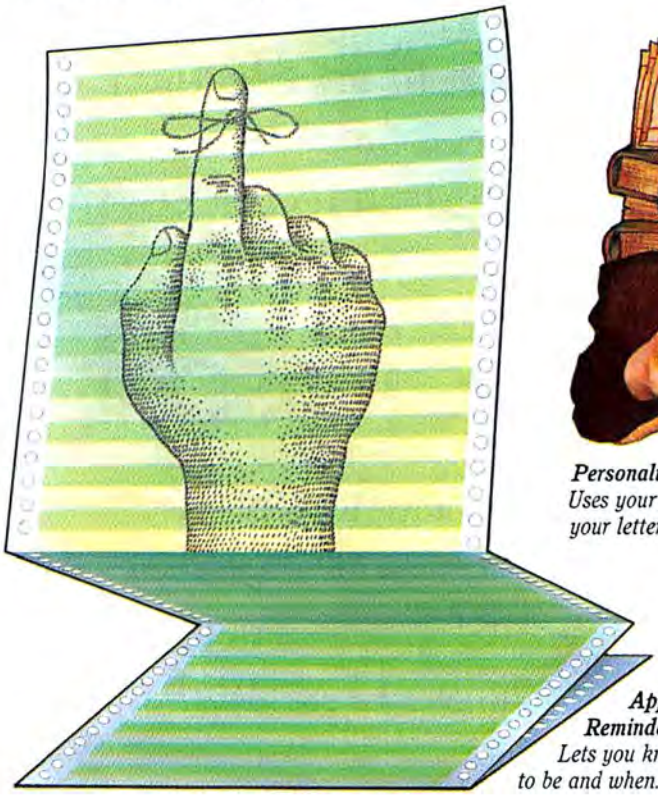
MICROSOFT®
The High Performance Software™

So if you want to make your writing letter perfect, call (800) 426-9400. Ask for the name of your nearest Microsoft dealer. In Washington State, Alaska, Hawaii and Canada, call (206) 828-8088.

Microsoft is a registered trademark and MS-DOS and The High Performance Software are trademarks of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. The WORD Plus is a trademark of Oasis Systems. WordStar is a registered trademark of MicroPro International Corp. The $150 value of Microsoft Spell is based on the current list price for The WORD Plus.

Clock/Calendar
Automatically inserts the date and time when you turn on your computer.

Encode/Decode
Ensures the security of your files.



Appointment Reminder
Lets you know where to be and when.

Personalized form letters
Uses your file to personalize your letters and make labels.

Calculator
Does your figuring in background mode so you won't have to change programs.

Memo
Writes memos and keeps a written record of each one.

Tecmar thinks your PC

As your business grows, so should your computer. Only Tecmar offers you this unique package of hardware and free software. With it your PC can grow to its full potential.

Tecmar Multifunction Boards...

"extremely powerful."—PC World

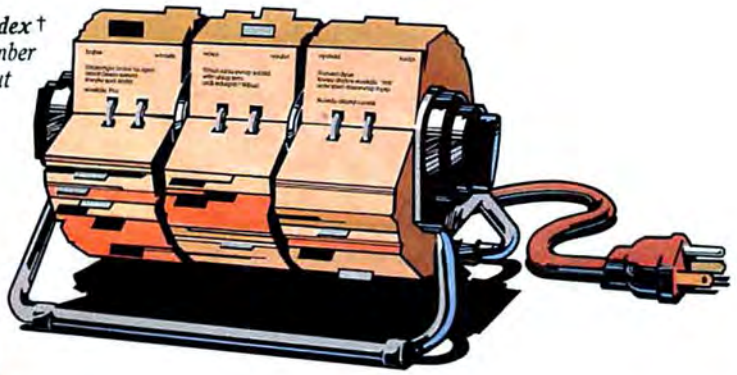
A Tecmar board will expand your computer's memory and increase its speed and efficiency. It will give you additional ports to accommodate a wide range of peripherals from modems and plotters to dot matrix and letter quality printers.

With a Tecmar board you can run powerful programs like Lotus 1-2-3™* and WordStar®†† on a PCjr. The RamSpooler makes printing a background task and frees your PC for other jobs. A built-in clock/calendar automatically inserts the date and time at power on and is independently powered by an easily replaced battery.

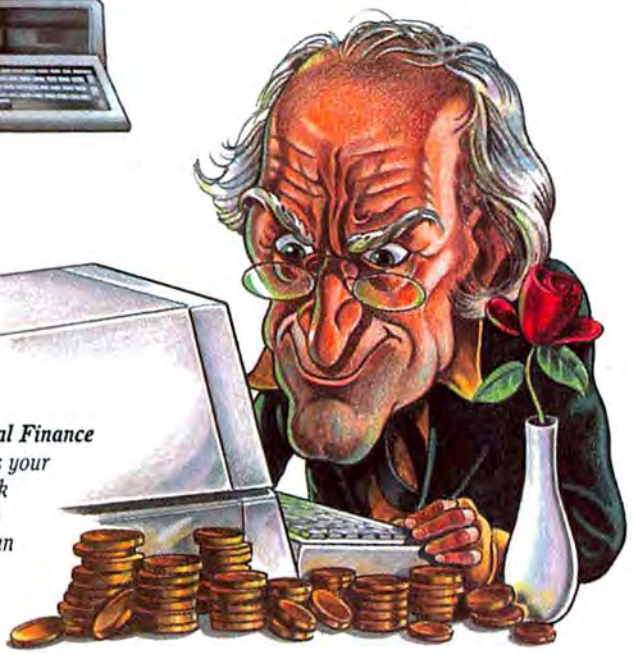
Every Tecmar multifunction board is run through a series of rigorous tests to ensure quality. Our incredibly low failure rate (0.4%) is unparalleled. All boards are additionally backed by a full one-year warranty.

Banner
Allows you to print in a variety of type sizes. Even large banners!

Rolodex†
Finds the name and number you need instantly without changing programs.



Hardware Diagnostics
Tests your PC's memory and parallel ports to stop problems before they happen.



Personal Finance
Balances your checkbook and helps you keep an inventory.

should do all of the above.

Free Software *"...a chest of Jewels."—PC Week*
Great hardware deserves great software. So, if you buy a Tecmar board we'll give you our Treasure Chest™ of Software at no extra charge. The Treasure Chest consists of 24 programs that include business applications, a calculator, a security system, hardware diagnostics, even games! Most of these can be run in background mode with programs like Lotus 1-2-3 and WordStar. Using these features is as easy as a couple of keystrokes, and without changing disks. No other company offers you such an extensive array of software with their multifunction boards.

So, ask your dealer for a demonstration of any of Tecmar's multifunction boards. And check out the free software while you're there. Or call 216-349-0600 for the dealer nearest you.

Tecmar
THE POWER BEHIND THE PC

Circle 190 on reader service card

*Lotus 1-2-3 is a registered trademark of the Lotus Development Corporation. †Rolodex is a registered trademark of the Rolodex Corporation. ††WordStar is a registered trademark of the MicroPro International Corporation.

NOW. INTEGRATED SOFTWARE, BY THE PEOPLE, FOR THE PEOPLE.

Until now, most personal computer software was designed by engineers. Which is great, if you think like an engineer.

But thanks to a revolutionary new product from Alpha Software, you only have to think like a person.

It's called Electric Desk,™ and it's the first integrated business software developed in close association with people like you. People with jobs to do, deadlines to meet, and more important goals in life than mastering the mysteries of software.

Electric Desk gives you all the functions and features you're ever likely to need. Word processing, spreadsheet, data base management and communications, all on a single floppy disk, with one set of instinctive commands.

But it's also easy to learn, use, and grow with. So it's the one software package that's right for everyone in the office.

In short, Electric Desk gives you the same power and productivity of complex computer software. But now it's on your terms.

And the best part may be the price. Electric Desk for the IBM® PC and XT costs only $345, and just $295 for the PC*jr.* Neither one needs a lot of expensive memory like the best known, complex integrated packages.

Electric Desk™

An American Revolution in Software

Send $3 for a full-function demo disk to try out at home or the office. Or call us at 1-800-451-1018 (in MA 1-800-462-2016) for the name of the Alpha Software Dealer nearest you. With Electric Desk, you can throw off the tyranny of high-technology once and for all. And finally get down to business.

ALPHA SOFTWARE CORPORATION

30 B St., Burlington, MA 01803

Electric Desk is a trademark licensed to Alpha Software Corp. by Electric Software, Inc.
Alpha Software Corp. is a [illegible] trademark. © 1984 Alpha Software Corp. Tel. (617) 229-2924. TELEX: 466168 Alpha Burl Cl. IBM is a registered trademark of International Business Machines Corp.

Circle 6 on reader service card

David Bunnell

Winter: Here at Last!

The personal computer industry and the publishing market that has grown up around it have survived the summer slump; now they are a little leaner but still strong.

In the personal computer industry, summer has always been bad for business. People spend more time at the beach and less time in computer stores or in front of their computer screens, and businesses make fewer purchases of hardware and software. The result of the fun-and-sun months is an inevitable slump in the industry.

The summer of 1984 was particularly bad. The overall growth of the personal computer market suddenly leveled off, well below most projections. Software sales plummeted, and talk of "the shakeout" intensified. Of course, this merely reflects the ecology of the personal computer industry—when fewer computers are sold, fewer software programs are sold; the decrease in hardware and software sales leads to fewer hardware and software companies; and all these factors lead to fewer advertisers, which means fewer computer magazines.

The pressure on computer magazines increased when several large software companies decided to switch their advertising dollars to television and the general-business press. The software magazines were the first to suffer. Just when *Personal Software* was given a new editorial slant and an appealing redesign, the shakeout undertow caught it. Hayden Publishing pulled the surfboard out from under the magazine, and suddenly its editors and writers were in over their heads.

Shortly thereafter the waves got very rough. Ted Leonsis, publisher of *List,* received a call from parent company International Thompson Business Press, saying that if *Personal Software* couldn't stay above the surface, *List* couldn't either as a monthly. The upshot: *List* dropped from 12 to 2 issues a year. While there were many reasons to maintain that the software business would turn around in the fall when computer sales picked up, some publishers didn't have enough commitment to ride it out—the combination of the shakeout scare and the increased TV ad competition was too much to handle.

The summer magazine shakeout was intensified by other factors, such as IBM dragging its feet to enhance the PCjr. Unfortunately, the PCjr wasn't improved in time to save *Jr* and *Peanut* magazines. Without public interest in a machine, product-specific publications die. To its credit, Ziff-Davis managed to hang in there with *PCjr.*

Personally, I felt that the saddest "wipeout" was *Digit,* a lively, well-conceived computer magazine for kids. Published by Lassie Benton out of her San Francisco garage, *Digit* had the same wholesome, yet revolutionary, spirit that has been vital to both the birth and the growth of personal computing. Several other kids' magazines also went under. Ironically, these publications could have played a central role in the spread of computer literacy and the renaissance of education. Apparently, the educational vision was blurred when the tides washed away.

Computer-specific magazines that are aimed at the IBM PC market seem to be doing well. Although sales of PCs and PC compatibles have slowed, they haven't dropped as drastically as have sales of other personal and home computers. Neither *PC World* nor *PC* grew in pages as they have in the past, but both stayed nice and fat. However, *PC Age* and *Softtalk* just couldn't stay afloat–both sank just when the shore seemed reachable.

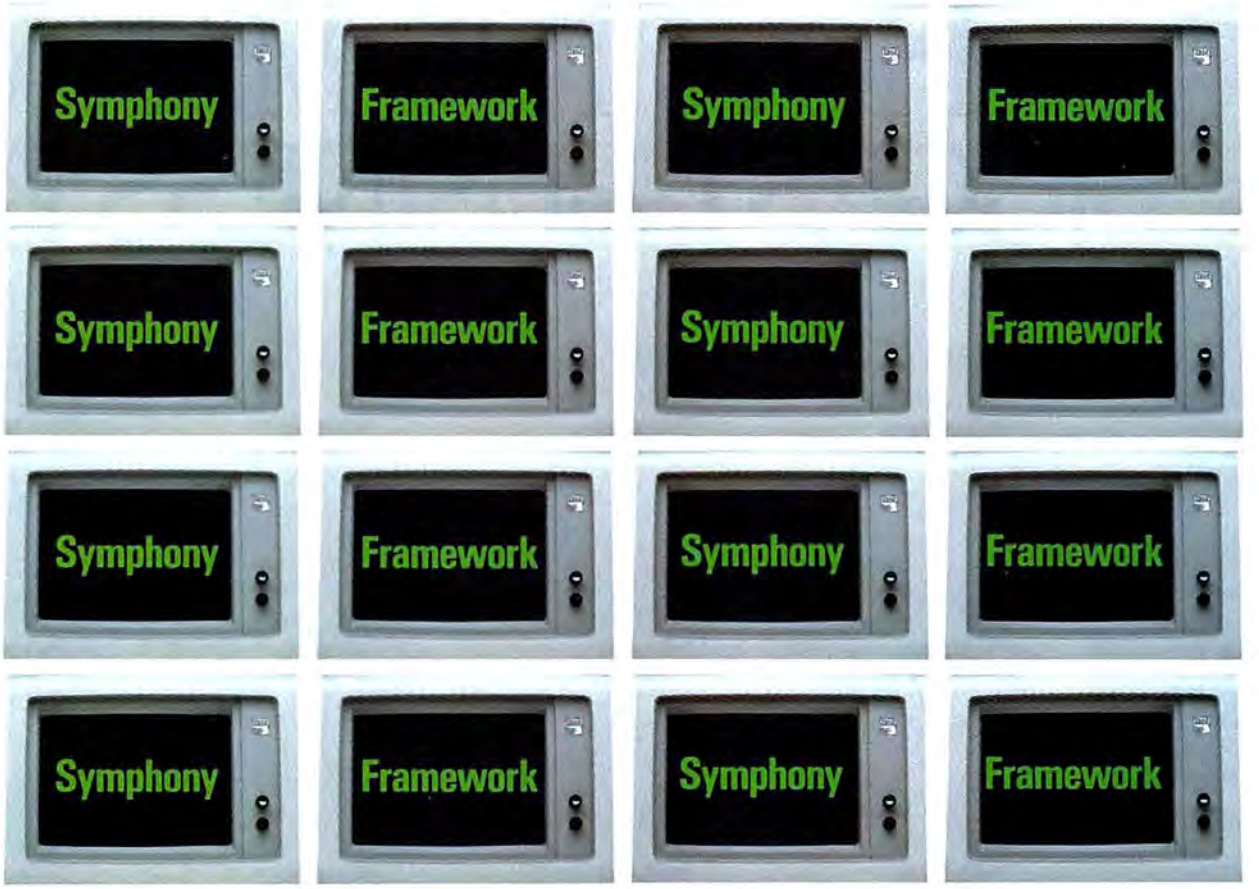
Even though we're all competing, we have mutual respect, and it's regrettable to see others drown. *Softtalk* was one of *PC World*'s favorites. We often heard it applauded for its technical excellence, and most of our editors and writers read it regularly. In fact, the few readers who said they liked a magazine better than *PC World* turned out to be fans of *Softtalk.* We'll miss this publication as well as its Apple version.

As sentimental as I am about magazines, I realize that this shakeout was destined to occur. Dynamic markets behave this way: the tide inevitably rushes in and crashes against the rocks. Beginning in the fall of 1983, publishers seemed to be tossing computer magazines onto the newsstands as fast as they could dream them up and hire a couple of editors to churn them out. Of the more than 200 computer magazines generated during this period, many were editorially weak and deserved to die. Alas, the shakeout gods have no mercy. In the process of sealing the fate of the unworthy, the gods also destroyed several good publications.

Now that winter is here, personal computer sales are blooming. As Apple likes to remind us in its advertising, "Of the 235 million people in America, only a fraction can use a computer." There are more than 200 million potential users to attract. With the addition of the PC AT and the enhanced PCjr, the IBM-compatibles personal computer market will continue its fantastic growth–giving us plenty of news to investigate and write about.

The shakeout scared us, and we don't want to tempt fate and gloat about our competitors' misfortunes. While other computer magazines rode the waves, *PC World* established itself as the number one magazine in the PC and PC-compatibles category. While others hit the reefs, we were busy launching foreign editions. To date, we have launched editorially independent editions of *PC World* in seven foreign countries–France, Germany, England, Canada, Australia, Sweden, and Japan.

Naturally, our success relies on our ability to continue publishing a highly useful magazine, one that you find worth subscribing to or buying on the newsstand. At *PC World,* we are dedicated to helping people understand and get more out of their personal computers. We hope our dedication shows, because we depend on the continued growth and support of our readers. Don't be shy about telling us what you think we are doing right and wrong; we're not too proud to listen. Thank you reader, and thank you winter. It's nice to have you back–I hope you agree that snow skiing (like computing) is a lot more fun than surfboarding.



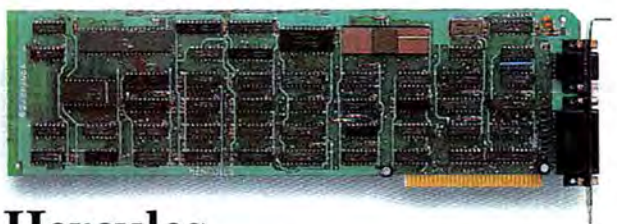
And you thought we only ran 1-2-3.

Hercules™ is famous for being the only high resolution graphics card authorized by Lotus™ to run 1-2-3.™ Now we are the only graphics card authorized to run a couple of other programs you may have heard about —Symphony™ and Framework.™

When these hot new programs wanted hot graphics, they chose to support the undisputed leader, Hercules. When you've sold over 100,000 graphics cards, the world takes notice.

At Hercules, we believe that the most important feature in a graphics card is that it should run lots of software —with true full-screen, high resolution graphics on the IBM® PC Monochrome Display. So when you buy a Hercules Graphics Card, you can rest assured that it will run more high-res graphics software than anyone else. Even on the new AT.™

Call **800 255-5550 Ext 401** for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.



Hercules.
We're strong on graphics.

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** IBM Monochrome Display graphics resolution of 720 × 348; parallel printer port; full text mode software compatibility; free programming software; 2 year warranty. **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia; Holland Info Products/Holland; DataTeam/Scandinavia **Trademarks/Owners:** Hercules/Hercules Computer Technology; Lotus, 1-2-3, Symphony/Lotus Development; Framework/Ashton-Tate; IBM, AT/International Business Machines.

Circle 77 on reader service card

HOW THE MANAG BIGGEST BUSINESS PU

"With four billion customers and the world's biggest inventory, it's a wonder I'm out the door on time each Christmas Eve.

"But this year, I'll have time to spare. That's because I've got Clout™—the new software program from Microrim® that lets me conveniently get at information from every department in my company.

"How conveniently? By letting me ask questions of my personal computer in my own words. Just like I'm talking to you now."

"IT WRAPS UP FILES FROM LOTUS 1-2-3,™ PFS:FILE,™ DBASE II,™ OUR MAINFRAMES AND MORE."

"Besides the shop up here at the Pole, I have to oversee manufacturing plants all over the world. And at each facility, they keep track of their work by using the leading productivity packages on the market today. Including Microrim's own R:base™ DBMS software.

"In the past, it used to be near impossible to pull

ER OF THE WORLD'S LLS IT ALL TOGETHER.

information together from different sources, without re-entering every bit of the data. But the new Clout takes data files directly from these programs—plus ASCII, DIF, and SYLK files, too. So I can get information from other PCs by sharing floppy disks. Or being part of a LAN. Clout can even read files which have been transmitted from the company mainframe or another PC.

"Anytime I have a question, all I have to do is ask. Clout will scan up to forty of these files automatically, cross-reference five simultaneously, and there's my answer. I don't have to know exactly how the data is organized. Or even in which file it's stored."

"'WHICH WAREHOUSES SHIPPED MORE RED AND GREEN ARGYLE SOCKS THAN PLANNED?'"

"Try typing <u>that</u> into any software package you know. Using exactly those words. Likely all you'll get is a blank stare from the screen.

"But with Clout, I get a clean, crisp list. No computer jargon. No need to check it twice. Just straightforward answers.

"I also use Clout on the corporation's financial files. For example, my elves enjoy a well-deserved bonus as much as the next elf. So I entered, 'Which departments were over quota last quarter?' I was happy to find that there were plenty. But they were even happier to get the bonus."

"BEAT THE CHRISTMAS RUSH. GET A DEMO TODAY."

"Want to see how easy it is to pull *your* business together? For only $14.95 (plus shipping) Microrim will send you a demo/tutorial of Clout. Just call 1-800-547-4000, Dept. 907. In Oregon, or outside the U.S., call 1-503-684-3000, Dept. 907. Or drop by your nearest software store.

"It could be the best present you'll ever give yourself."

CLOUT™
FROM MICRORIM®

Requires 256K of memory. Runs on MS-DOS and PC/DOS operating systems. Hard disk recommended.

YEAR 5 WARRANTY

And Make One IBM PC™ Worth Nine

TASCMASTER™ SOFTWARE does that by converting PC-DOS to CONCURRENT PC-DOS thus enabling you to create up to 9 tasks and run up to 9 programs simultaneously.
TASCMASTER™ DOES THE WORK OF NINE.
While you are working with a task on the screen other tasks are working for you.
To give you every board you may ever need for your IBM PC we include with TASCMASTER™ SOFTWARE a powerful MULTIFUNCTION board **FREE!**
TAKE YOUR CHOICE OF:

ADDRAM ELITE™ FEATURES
- asynchronous (Serial–RS232C) communication adapter
- real time clock/calendar
- parallel printer adapter
- 64K to 512K memory with parity "no piggyback" and—all on one board

With 64K memory installed

ADDRAM PLUS™ FEATURES
- two asynchronous (Serial–RS232C) communication adapters
- real time clock/calendar
- 64K to 512K memory with parity "no piggyback" and—all on one board

With 64K memory installed

With RAMDISK™ and RAMSPOOL™ SOFTWARE, TOO.

Optional MULTI-TASCMASTER™ SOFTWARE enables the addition of MULTI-USER capability to the IBM PC by connecting additional terminals to the serial ports, and integrates with TASCMASTER™
YOU NEED TASCMASTER™ SOFTWARE with the *free* multi-function board to make ONE IBM PC worth nine.

Available through personal computer dealers. For further information or name of local dealer call:

Profit Systems, Inc.

30150 Telegraph Rd. • Birmingham, MI 48010 • (313) 647-5010

See us at COMDEX™

IBM is a trademark of IBM Corporation
(TM) indicates trademark of Profit Systems, Inc.
PC-DOS is a trademark of IBM Corporation
Copyright 1983 Profit Systems, Inc.

Circle 141 on reader service card

COMPAQ PRESENTS

How To Do More With Less

It used to be that when you wanted personal computers to do more, you added peripherals. A fixed disk for storage. A second monitor for graphics. A backup system for data protection. And slowly the octopus devoured your desk.

But now everything you wanted in a personal computer is *in* a computer. The new COMPAQ DESKPRO™ is here.

There's room *inside* for up to four storage devices. For instance, you could insert two diskette drives, a 10-megabyte fixed disk drive, even an exclusive tape backup system. The new COMPAQ DESKPRO can grow *inside* instead of *out*, saving your desktop.

Plus internal expansion slots will let you add even more functions like local area networking. A mouse. And more.

All that makes COMPAQ DESKPRO the most expandable PC you can buy. And thanks to some ingenious engineering, the COMPAQ DESKPRO displays high-resolution text *and* graphics on one monitor, not two.

It also runs thousands of business programs made for the IBM® PC and *XT* straight off the shelf—a full two to three times faster than older, slower computers. So you can run the most complex software this side of mainframes quicker than you can say, "1-2-3."

We designed the new COMPAQ DESKPRO around the same philosophy that made us the best-selling portable business computer in the world. We simply offer more in less space. For a free brochure or the location of your nearest Authorized COMPAQ Dealer, call toll-free 1-800-231-0900.

COMPAQ DESKPRO™

It simply works better

COMPAQ® is a registered trademark and COMPAQ DESKPRO™ is a trademark of COMPAQ Computer Corporation. IBM® is a registered trademark of International Business Machines Corporation. © 1984 COMPAQ Computer Corporation.

The next investment in your PC should be a small one.

Free software catalog direct from IBM.

The people who brought you your personal computer now bring you a catalog of programs to make it even more useful. It's *The Directory of Personally Developed Software* and it's direct from IBM.

You'll find new programs for business, personal productivity, education, entertainment, and graphics. There are scientific and engineering programs. Even programs for programmers. All the software was written by IBM people or members of their families. People who go about their programming with a special kind of enthusiasm.

Half the programs are under $20. Some are as little as $14.95. But even the $150 programs are exceptional values. And although the catalog itself carries a $4 cover price, it's yours free if you order before December 31, 1984. Just fill out the coupon below or call:

1-800-IBM-PCSW

In Alaska or Hawaii, 1-203-237-4504.

One of the best investments you make in your PC may be the smallest.

Personally Developed Software
Post Office Box 3266
Wallingford, Ct 06494

IBM®

Please rush me my copy of *The Directory.*

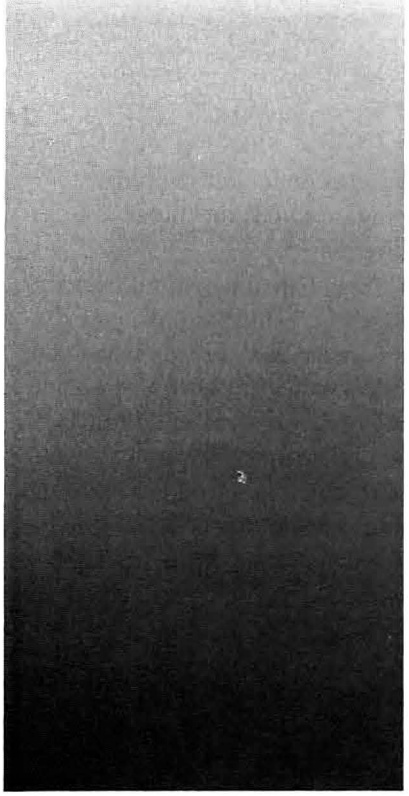
Name _____

Address _____

City _____

State _____ Zip _____

Circle 830 on reader service card



REMark: The Luddite Legacy

William Rodarmor

A perfection of means and a confusion of ends seem to characterize our age.
–Albert Einstein

If you want to be pushed around by a machine, try cooking macaroni. A microwave oven that's on the market today comes with a personal name and is pretty touchy about its moniker. To get the oven to heat something up for lunch, you have to say, "Bob, cook the macaroni." If you say, "John, cook the macaroni," it replies, "My name is not John, my name is Bob."

Being corrected by a microwave oven is annoying, but dealing with machines that talk back is actually nothing new–I devote a major part of my creative efforts to composing punchy messages for my telephone answering machine. Most of us accept high technology and its trade-offs as a natural part of American life in the eighties. But there are unreconstructed Luddites among us, and they are making themselves heard.

In the early 1800s the followers of Ned Ludd earned enduring fame by wrecking industrial machinery, accurately sensing that the Industrial Revolution would lead to the replacement of individual craftsmen and an increase in unemployment. A nineteenth-century Monkey-Wrench Gang, the Luddites employed a favorite tactic of jamming industrial looms with their wooden shoes–*sabots* in French–thereby giving us the word *sabotage.* Their modern-day heirs pass the word that the best way to "do in" a computer keyboard is to douse it casually with sweetened coffee.

"I used to really hate computers," said an otherwise perfectly modern young woman, "and I refused to use those automatic teller machines, because I thought they were really alienating." The woman, Audrey Godell, is the program information manager for the California office of The Nature Conservancy. Ironically, she now uses computers to track and identify vanishing parts of the natural world, but Godell still harbors ambivalent feelings about modern technology.

Godell's attitude reflects feelings that are more widespread than most PC fans would like to

admit. Computerphobia and utility bill errors aside, people have fundamental gripes about the new silicon gods. Many people believe that computers cheapen human creative effort.

Stan Pesick, a high school teacher in Oakland, California, has doubts about the current emphasis on computers in the school system. People in education look to computers as some sort of panacea, he said. They think that if you hook up students to these machines, the students will automatically learn. "I think that that's simplistic, to say the least."

Pesick's students often say they want to be computer programmers, but he thinks they don't have the slightest idea of what that really means. "People tell these students, 'Learn how to use computers–that's where the job market is,'" he said. "Actually, most of them are being trained for simple data entry, and in lots of ways that's a dead-end street." People often find that kind of work boring, Pesick added.

Among artists, feelings are mixed. Some, like performance artist Darryl Sapien and choreographer Betsy Erickson, embrace new technology. Last year, Sapien and Erickson joined forces to produce a stunning computer-animated set for the San Francisco Ballet's *Pixellage* (the name comes from *pixel*), and audience applause was deafening.

Other artists, however, like writer Thaisa Frank, reject computers. Frank, who teaches creative writing at the University Extension of the University of California, Berkeley, has found that writing on a computer produces manuscripts whose only virtue is impeccable printing. She thinks that word processing bypasses a laborious part of the craft that is essential to a quality piece of fiction. "The process of revising a manuscript by hand seems to let the writer hear the spirit in the story," Frank said. She claims that if a computer does the work instead of a writer, the piece suffers.

"When you revise a story by taking out paragraph A and putting in paragraph B, it's almost as though you're doing an organ transplant. A story has automatic antibodies that often reject a transplant," she said. "In my writing classes, I find that the stories that have the most transplants are the stories that were written on computers."

Taking a broader view, critics are increasingly afraid that people will rely on technology to fill a void in their lives. "I worry that machines are replacing the creative function in people," said psychologist Carol Ellis. "People who would once have sat home and either talked to each other or made an incredible quilt will instead plug into little machines to meet different needs.

"Some people will take advantage of machines to enhance the creativity they already have," said Ellis, "but I think a lot of people will just use them to dull their senses further. I went to a park with a young friend the other day and saw a mother listening to her Sony Walkman while her baby was playing. I'm convinced that having something stuck in her ear made the woman a little less there."

Computerphobia and utility bill errors aside, people have fundamental gripes about the new silicon gods.

I suppose we ought to be tolerant of those misguided folks who think that PC stands for "Poetic Consciousness" or imagine that fingers are made for something other than tapping on a keyboard. Quaint though their ideas sound, some of them are worth listening to–especially if we care about staying human. We always have the option of cooking macaroni the old-fashioned way; it tastes just as good, and it doesn't talk back.

William Rodarmor is a Bay Area journalist and radio reporter.

For personal computers that have been very, very good this year...

Fun and games from IBM.

Just in time for the holidays, IBM presents a batch of entertaining software programs for every IBM personal computer (and every IBM personal computer person) on your gift list.

If it's pure fun and games you're after, or educational programs cleverly disguised as fun and games, you've come to the right ad. (If, on the other hand, your only interest is a spreadsheet or database manager, just remember what they say about all work and no play.)

Except for IBM PC*jr* ColorPaint, all the programs here cost less than $50.* And all are available through IBM Product Centers and authorized IBM Personal Computer dealers. For the location of the store nearest you, just call 1-800-447-4700. In Alaska or Hawaii, 1-800-447-0890.

Arcade Games

Jumpman™
You have to defuse hundreds of bombs to save the Jupiter Command Center; but be careful. The bad guys are shooting live ones. Requires color display or TV, joystick optional.

Mine Shaft
You have a little problem. Floodwaters have short-circuited your robot miners, and now they're running berserk. PC*jr* only. Requires color display or TV, joystick optional.

SHAMUS™
Find and eliminate the evil Shadow. 128 rooms and all manner of ill-mannered creatures stand between you and your goal. Requires color display or TV, joystick optional.

Crossfire
The streets are crawling with giant spiders. Your city is counting on you. Good luck. PC*jr* only. Requires color display or TV, joystick optional.

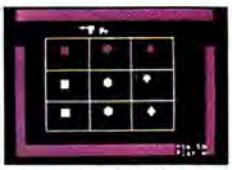
ScubaVenture
Dive for sunken treasure and live to tell about it. Maybe. PC*jr* only. Requires color display or TV, joystick optional.

Adventure Games

King's Quest
Save the Kingdom of Daventry from certain doom. An adventure game with advanced graphics, plus music and sound effects. PC*jr* only. Requires color display or TV.

Zyll
Explore the castle of a wicked sorcerer as a warrior, a wizard or a thief. A text adventure game for 1 or 2 players.

Education Programs



Gertrude's Secrets™
Progressively challenging games that stress logical thinking. Ages 4 to 10. Requires color display or TV.

Gertrude's Puzzles™
A series of exercises to sharpen a child's powers of deductive reasoning. Ages 8 to 13. Requires color display or TV.

Rocky's Boots™
39 interrelated games that teach the basics of computer logic and circuitry. Ages 9 to adult. Requires color display or TV.

Turtle Power
A music and drawing program that introduces the fundamentals of programming with Logo turtle graphics. Preschool and up. Requires color display or TV.

Monster Math
Solve math problems and slay dragons. Or else. Requires color display or TV.

Adventures in Math
Roam through a castle and find hidden treasure. Your math skill opens the doors. Requires color display or TV.

Bumble Games™
Six colorful programs that teach children to plot number pairs, a basic math skill. Ages 4 to 10. Requires color display or TV.

Juggles' Butterfly™
Reading and math for the uninitiated. Ages 3 to 6. Requires color display or TV.

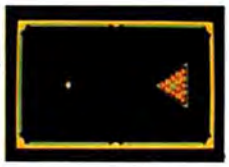
*Prices apply at IBM Product Centers.

Rocky's Boots, Gertrude's Puzzles, Gertrude's Secrets, Bumble Games, Bumble Plot and Juggle's Butterfly are trademarks of The Learning Company. Jumpman is a trademark of EPYX, Inc. SHAMUS is a trademark of SynSoft.™ Little Tramp character licensed by Bubbles, Inc., s.a.

Circle 830 on reader service card

Bumble Plot™
Geometry made fun. Yes, fun. Ages 8 to 13. Requires color display or TV.

Serious Fun



PC Pool Challenges
If you don't have room for a pool table, this is the next-best thing. 1 to 4 players. Requires color display or TV.

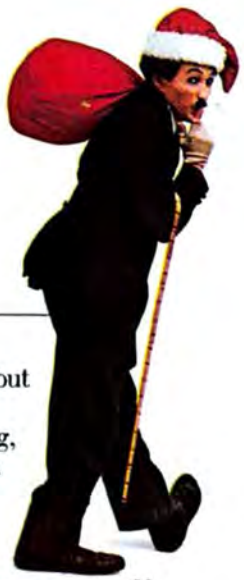
Touchdown Football
Realistic football action. Call your own plays against an opponent or the computer as the crowd cheers you on. PC*jr* only. Requires either color display or TV, and joystick.

Trivia 101: The Introductory Course
5,000 trivial questions in more than 200 trivial categories. Up to 14 players (or teams) compete against each other and the clock. Requires color display or TV.

TV and Cinema 101: Trivia from Talkies to Trekkies
"What was the name of Pancho's horse on The Cisco Kid?" and 4,999 other infuriating questions. Requires color display or TV.

Casino Games
Try your luck at blackjack, poker or the slot machines with $500 in "computer" chips. 1 to 4 players. Requires color display or TV.

Strategy Games
Computer versions of four popular board games: Checkers, Elusion, Battleship and Reversi. 1 or 2 players. Requires color display or TV.



Graphics Programs

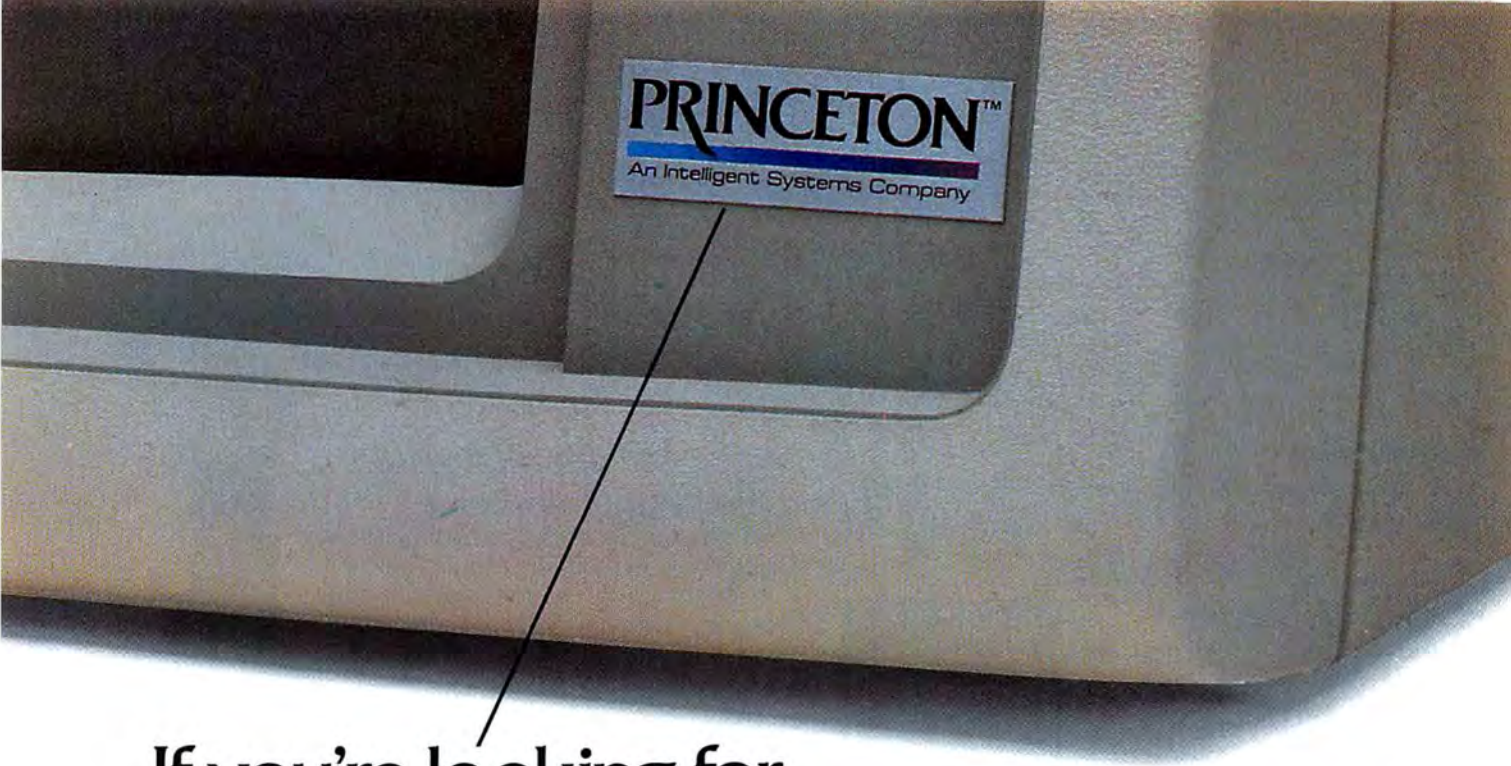
IBM PC*jr* ColorPaint
A program that helps you draw just about anything you can think (including the Christmas tree pictured below) in living, sparkling color. Very sophisticated, but very easy to use. PC*jr* only. Requires color display and mouse.

Animation Creation
Create colorful moving pictures on your computer. No knowledge of programming necessary. Requires color display or TV.

IBM®

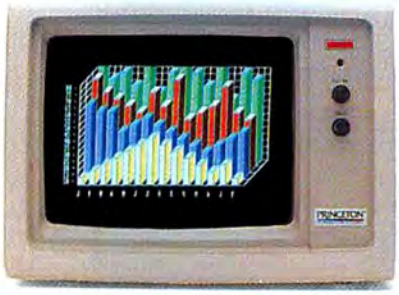
Personal Computer Software

This is NOT a simulated picture. It's a real, live picture created with PC*jr* ColorPaint (see "Graphics Programs" above).



If you're looking for a quality monitor, look for this symbol.

HX-12. A high resolution monitor at a medium resolution price.



HX-12 is a high resolution RGB color monitor that's colorful enough for all your graphics needs and sharp enough for word processing.

With its own cable that plugs directly into the IBM PC, the HX-12 delivers a rainbow of 16 colors on a non-glare screen. All that includes clean whites without red bleed. In fact, all the colors are clean and crisp thanks to the HX-12's .31mm dot pitch and 690 x 240 (non-interlaced) resolution.

Shop around. Nothing else compares to the HX-12 priced at just **$695.**

The SR-12 delivers even better resolution color for a better-than-ever price.

At first glance, the SR-12 might appear similar to the HX-12 with a non-glare screen and .31mm dot pitch supporting 690 horizontal resolution. But take a closer look. SR-12's scan frequency is 31.5 KHz, allowing the SR-12 to support 480 vertical resolution in non-interlaced mode. That means a high-quality, flickerless image with text that's up to monochrome standards. What's more, you get all that quality for **$799.**

For full compatibility with all IBM software, get the **Princeton Scan Doubler.** Priced at **$249,** it allows you to run the SR-12 from a standard IBM or IBM equivalent color card in the IBM PC.

You can't beat the SR-12 for resolution or price.

MAX-12. You won't find a better monochrome monitor for a better price.

PGS combines easy-on-the-eyes amber phosphor and exceptional 800 x 350 resolution to give you the MAX-12, the best monochrome monitor for your money.

Check the non-glare screen. Dynamic focusing circuitry keeps the image sharp, not only in the center, but around the edges and in the corners. Then check the price. At **$249** the MAX-12 is less expensive than the leading green-on-black competitor. And there's more. The MAX-12 works with the IBM PC and other IBM compatibles.

For clarity, performance and price, your choice is clear. Make it the new MAX-12.

IBM® PC are registered trademarks of International Business Machines Corporation.

©Copyright 1984 Princeton Graphic Systems. All rights reserved.

PRINCETON™
An Intelligent Systems Company

Princeton Graphic Systems
170 Wall Street, Princeton, N.J. 08540
(609) 683-1660/(800) 221-1490 Ext. 30
Telex: 821402 PGS PRIN

Circle 296 on reader service card

Compared to this, other 3278/79 emulators aren't much to look at.

Look closely.

This isn't your everyday 3278/79 emulator. Ours gives you much more to work with. Namely, a host session, a PC DOS session and two notepads. All on the same screen. At the same time.

We call it the CXI 3278/79 PLUS PC connection.

Fortunately, it's easier to use than it is to say.

There's no toggling back and forth between sessions. No shuffling floppies to move information.

The 3278/79 PLUS turns an IBM® PC, XT or compatible into a 3278 or 3279 terminal. Plus a lot more. So now everyone can have the most current data at their fingertips. In a format they all can use.

It comes in two versions. Either a coaxial or modem connection. And both versions provide fast, easy file transfers between a PC and a CMS or TSO host. There's even a batch file generator that serves up multiple files with just a few keystrokes.

And for your colleagues overseas, international keyboard mapping comes standard.

But perhaps the biggest advantage of our emulator board is its small size. It's just five inches long. (Or short, depending how you look at it.) Which means it fits conveniently into a PC's short expansion slot. Leaving the long slots for the rest of the world.

For those who need additional host sessions, we also offer the CXI 3270 PC connection. It displays five host applications, a PC DOS program and two notepads—simultaneously.

A custom gate array lets us fit our 3278/79 emulator on a 5" board and still offer more capability than all the rest.

All our CONNECTWARE™ products are available on a 30-day free trial basis. So for a closer look, call 800/221-6402. In California, call 415/424-0700. Or write CXI, Inc., 3606 West Bayshore Road, Palo Alto, CA 94303. Telex 821945.

Because compared to our 3278/79 emulator, there is no comparison.

CXI

CONNECTWARE is a trademark of CXI, Inc. IBM is a registered trademark of International Business Machines Corp. © 1984, CXI, Inc.

The best IDEA

We're IDEA. The best IDEA since the IBM PC. We have a full line of peripherals that are compatible with the IBM PC. But, more importantly, they're compatible with each other.

The Product Integration IDEA

If you try combining lots of different companies' pieces into one system, you'll discover that the pieces don't fit. Combining one company's boards with another's disk drives and still another's network can cause you a lot of aggravation. And besides, who do you call for support?

With IDEA, you won't have these problems. We develop our product line in-house and design the pieces to work with one another. We guarantee it. And more importantly, we support it.

Quality IDEAs

Every IDEA product is subjected to rigorous testing.

IDEAmax 384

The Multifunction Card with the unique backplane

• Serial, parallel and game ports cabled directly from the back of the board. • Up to 384KB of parity checked memory. • Includes disk emulation, printer spooler, printer selector, perpetual calendar and diagnostic software. • IDEA multifunction family includes IDEAmini I/O card, IDEAplus disk host adapter card. • Purchase only as many options as you need.

From $269

IDEAcomm 1200

Internal modem for 300/1200 baud communications

• Slim profile construction uses only one slot in the IBM PC or IBM PC/XT. • Easy-to-use, menu driven software for your communications applications. • Runs Smartcom®, Crosstalk®, PC Talk and most other software. • Extra serial port for COM1 or COM2 configuration.

$495

IDEAcomm 3278

The performance leader for PC-to-mainframe communications

• Unique dual-ported memory design enables 20 % –40 % faster file transfers. • Includes file transfer (upload/download) software for VM/CMS, TSO. • Software configurable keyboard for customizing your application. • 3278 Emulation, Bisync and SNA/SDLC support; coax connection to IBM 3274/3276 controllers.

$995 includes board and software

IBM and the IBM logo are registered trademarks of International Business Machines Corporation. IDEAmax 384, IDEAmini, IDEA Minimax, IDEAplus, IDEAcomm 3278, IDEAcomm 1200, IDEAdisk, IDEAdisk Plus, IDEAshare, IDEAnet and IDEAgraph are registered trademarks of IDEAssociates, Inc.

since the IBM PC.

Piece by piece and as a subsystem. Our one-year limited warranty on all products, even disk drives, is your assurance of quality and reliability.

The IDEA Upgrade Plan

No matter what IDEA product you buy today, our unique buy-back policy lets you trade up tomorrow. We give you credit for your initial purchase when you're ready to upgrade your system. You only pay for what you need.

Where to Get the IDEA

You'll find IDEA products at all Math Box, Computer Depot, Amerisource, and Schaak Electronics stores, as well as many Computerland and MicroAge locations. Call **800-257-5027** for the IDEA store nearest you.

You'll see why the best IDEA *since* the IBM PC is the best IDEA *for* the IBM PC.

IDEAdisk

The high capacity disk system with built-in backup

• Removable Winchester cartridge: Faster, more reliable, easier to use than tape backup. • Wide range of storage capacities: 5, 10, 15, 25 and 45 megabytes. • Internal or external mounting versions. • Includes high performance software for disk caching, dynamic partitioning, public or private files, self booting. • **IDEAdisk Plus** version lets you add memory, serial and clock options without using another expansion slot.

From $1695

IDEAnet and IDEAshare

Cost-effective networking products for the IBM PC

• IDEAshare software for up to four users. • Fully upgradable to IDEAnet hardware and software for up to 20 users. • All PCs on the system remain fully operational. • No dedicated file server required. • Security features include User ID's, passwords, file and record locking. • Includes software for remote printing, print spooling, disk and file sharing. • IDEAnet and IDEAshare are totally integrated with IDEAdisk.

From $275 to $475 per node

IDEAgraph

High resolution, high speed color graphics card

• Transforms the IBM PC into a powerful graphics workstation for CAD/CAM, medical imaging, broadcasting, graphic arts. • 256 colors displayable at one time; up to 1024x1024 resolution. • Analog, digital TTL and composite video outputs.

From $995

See us at
COMDEX™/Fall '84
November 14-18, 1984
Las Vegas Convention Center-West Hal
Las Vegas, Nevada

IDEAssociates

The best IDEAs for personal computers.

IDEAssociates, Inc., 35 Dunham Rd., Billerica, MA 01821 (617) 275-4430 Telex 94-8245.
IDEAssociates S.A., 5, Route de Chêne, CH1207 Geneva, Switzerland (22)86.11.19 Telex 428 388 KBSCH

Circle 153 on reader service card

Here's a tax preparation software system we're practically giving away.

$58.00

It's our annual post-tax season sale! A Micro-Tax 1983 professional tax preparation system... regularly $1,000 during the current tax year... is yours for only $58.

Prove to yourself how your in-house microcomputer can eliminate the drudgery of manual tax preparation and generate more profits for your business. A $58 investment in a 1983 Micro-Tax software system will convince you.**

Micro-Tax is compatible with your IBM PC*, IBM XT*, DEC Rainbow*, and most other personal computers with CP/M*, PC DOS*, or MS DOS*. For specific hardware and software requirements, contact us at 1 (800) MICROTX or 1 (214) 934-7000.

Look what this system can do:

- Computes and prints over 30 Federal Individual schedules and forms for multiple clients.
- Provides several print options—including laser, for in-house creation of forms identical to IRS forms.
- Computes tax depreciation by individual asset items or groups, as well as handling the accelerated cost recovery system.
- Automatically computes underpayment penalties, self-employment and alternative minimum taxes, and income averaging.

There are more time- and cost-saving features to Micro-Tax. Our recently introduced Micro-Tax 1040 Planner is fully integrated with our Professional Individual package.

You have the options of our full Federal Individual, Partnership, Corporate, or integrated State package, each for the same low price. You can also order the Planner as well.

Refer to chart for systems available, then send in the coupon with your check, Visa, or MasterCard today for immediate delivery or call 1 (800)-MICROTX.

1983 SCHEDULES AND FORMS INCLUDED

FULL FEDERAL MICRO-TAX* MICRO-COMPUTER SYSTEMS	1040,1040A,1040ES	1065	1120,1120S	A, B, C, E, G, SE, W	D	F	K	K-1	R, RP	1116	2106	2119	2210	2220	2440	2441	3468	3903	4136	4137	4255	4562	4626	4684	4797	4835	4952	4972	6695	6251	6252	Transmittal Letter	ACRS	BATCH	PRINT Substitute forms	IRS Forms	Continuous Pre-printed Forms	Blank Paper For Use w/overlays	Laser Print
PROFESSIONAL/ INDIVIDUAL PACKAGE	•			•	•	•			•	•	•	•	•		•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
PARTNERSHIP PACKAGE		•			•		•	•									•				•	•		•	•						•	•	•	•	•	•	•	•	•
CORPORATE PACKAGE			•		•	•		•						•			•				•	•	•	•	•	•					•	•	•	•	•	•	•	•	•

•Integrated State Tax Returns available. •Orders taken for yearly update packages.
•All forms and schedules subject to IRS changes for 1984 tax year.

MICROCOMPUTER TAX SYSTEMS, INC.

A wholly owned subsidiary of Computer Language Research, Inc.

*CP/M: a trademark of Digital Research Inc.; DEC Rainbow: a trademark of Digital Equipment Corp.; MS DOS: a trademark of Microsoft Corp.; PC DOS, IBM PC, and IBM XT: trademarks of IBM.
**Does not include updates or revisions.

Circle 292 on reader service card

Mail to: **Micro-Tax CLR,** P.O. Box 111012, Carrollton, TX 75011-1012
Phone: 1 (800) MICROTX or 1 (214) 934-7000

Please send me the 1983 Micro-Tax microcomputer tax preparation packages (Reg. $1,000 each) checked below for $58 each. California residents add 6½% sales tax.

☐ Professional Individual Package . . . . . $ 58
☐ Partnership Package . . . . . $ 58
☐ Corporate Package . . . . . $ 58
☐ State Package (Where available) . . . . . $ 58
☐ Micro-Tax 1040 Planner (IBM PC or PC XT only) . . $295*

Name of State_____ Total_____

☐ CP/M ☐ PC DOS ☐ MS DOS

Make of your computer:_____ Disk size:_____

Name:_____
(Please Print)

Street:_____

City/State/Zip:_____

Phone:(_____)_____

Check for: $_____ made out to **Micro-Tax,** enclosed.

☐ VISA ☐ MASTERCARD Expiration date:_____/_____/_____

Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ PCWC-5

Signature:_____

ORDER BY MAIL OR CHECK WITH YOUR LOCAL SOFTWARE DEALER.
*Add $10.00 for shipping & handling—Planner only.

Letters

Reactions and responses from the PC World community

Dialog on Dialog

As a frequent user of Dialog and as a fan of the *In-Search* software, I feel obligated to correct a couple of implications made in the *In-Search* review that appeared in the August issue [*From the Software Shelf, PCW,* Vol. 2, No. 9].

First, the reviewer states that "professionals will find *In-Search* more thorough and faster than spending an afternoon in their local card catalog. . . . " This is not necessarily so. As wonderful as Dialog is, and as convenient as *In-Search* is, they are not a substitute for manual research. It is incorrect and self-defeating to assume that the only information worth having is in machine-readable form or indexed in machine-readable data bases. While it is true that many scientific disciplines require only the most current data, the study of the humanities, for example, still relies on relatively old sources that are not completely covered by on-line data bases. There will never be a total substitute for manual research in art, literature, and philosophy. Anyone who assumes that such a substitute already exists has crippled his or her ability to do effective research.

Second, the reviewer suggests that before *In-Search,* Dialog was usable only by "libraries, institutions, or wealthy Ph.D. candidates." Although *In-Search* simplifies the Dialog commands and reduces on-line time, users still pay the data base royalties and print charges in addition to the $399 for *In-Search.* For the casual user–namely any user other than libraries, institutions, and Ph.D. candidates–the cost of the software may not be outweighed by the reduction in Dialog charges.

In-Search, while an excellent product, will probably not expand the universe of Dialog users as greatly as the reviewer has implied.

Wendy W. McLean
Paoli, Pennsylvania

Maligned and Misunderstood

Regarding David Bunnell's column from the September issue [*PCW,* Vol. 2, No. 10], I believe the PCjr is still the most maligned and misunderstood computer on the market.

I owned a PC and bought a PCjr for backup and for home use. After seeing what a PCjr could do, I recently sold my PC and use an enhanced PCjr instead.

I have a 128K disk system with the 128K Tecmar jrCaptain board and the Key Tronic 5151jr keyboard. I use a Panasonic monochrome display with the speaker so I can utilize the three PCjr voices. The entire system cost about $1400, discounted from a local retailer before the price decreases. For the price, you can't beat the features of integrated adapters, cheap modem upgrade, and compatibility.

The only inconvenience is the single disk drive. Consequently, I use one-load software like *VisiCalc* or *PC-Write* (the Tecmar board gives a 207K contiguous work space). Copying a disk requires only two swaps, which is endurable. Plus I can even run *VisiWord,* version 1.0, giving me access to all my old PC test files.

Now that the add-ons are out and working, I can't imagine any user buying a PC unless two disks are absolutely necessary and RAM disks aren't feasible. Otherwise, the PCjr is the best IBM buy for most individuals' needs. The PCjr has been fixed–by other vendors, even before IBM added its own enhancements.

Kenneth C. Cooper
Ellisville, Montana

Putting Multiplan Links Asunder

"Linking Worksheets With Multiplan" [*PCW*, Vol. 2, No. 10] provided excellent insight into one of the more powerful and useful features of *Multiplan*.

However, anyone who intends to delve into complex linkages and who is prone to making mistakes (is anyone out there perfect?) will most certainly face the problem of how to unlink a worksheet that has been "permanently" linked. Therefore, no discussion of linking can be complete without a mention of how to dissolve links.

To dissolve a link, one must proceed through the external Copy menu as if to create a link, entering the supporting sheet name and the name of the cell(s) on that sheet to be unlinked. Then, moving the cursor to the 'to:' field, the user should enter blanks (or simply hit <Del> on the 10-key pad), which is a "null" response and thus deletes the link. How much simpler it would be if the eXternal command had a subcommand called Delete or Dissolve.

So all you *Multiplan* users, take comfort; if you find that a link turns out to be wrong just when you thought you had it all together, you can take it apart.

David L. Edwards
Garland, Texas

No Ethics

Roland M. Brown's letter [(*Letters, PCW*, Vol. 2, No. 10) which places part of the responsibility for software piracy at the manufacturers' door because they haven't provided the end user with "a solid product at a reasonable price and with adequate documentation"] expresses common complaints about a new industry–but I feel he has a limited point of view. Let me give you another one. I work for a company that specializes in providing production services to the software industry. From this vantage point, we watch many software firms research and develop quality programs. In five short years programs have gone from a limited 4K to over 200K. This type of software requires much more than a "junior programmer let loose for a couple of months."

Concurrent with program development is documentation development. Less than five years ago it was common to sell the end user a Zip-Loc bag with one disk and little more than folded line-printer output. Today the kit usually contains more than one disk, plus a tutorial, a reference manual, a quick reference, and templates. Additionally, these materials are designed with the input of end users; [the printed materials] are typeset, are printed on good paper and in color, and include many pictures and screen representations.

Developing, manufacturing, and supporting quality programs is not an inexpensive proposition. Talented people concerned with these products or services deserve to be paid for their efforts. The price paid for a software program is governed largely by these salaries and expenses.

I cannot accept the premise that the software industry is somehow responsible for piracy. An individual's lack of ethical standards is no excuse for piracy–yesterday, today, or tomorrow.

L. Damon Crumb
Bedford, Massachusetts

More Word Wars

The September 1984 issue of *PC World* contained a letter from Anthony V. Pace, Jr., concerning my article "War of the Words." It also contained a response from the Editor. Several issues require further comment.

I am in full agreement with Mr. Pace about the quality of *Word*'s documentation. I wish to make it clear that the version of the program sent to me by the magazine was a beta-test version that was

Draw Your Way to the Top

PC-Draw Will Increase Your Office Productivity. And Upward Mobility.

Imagine. You now have the capability to graphically depict your best ideas, plans, designs and proposals. *In color or black & white*. Accurately. Completely. Dramatically. Concepts presented so forcefully—yet so simply—that you leave that critical meeting with upper management... *totally* confident of success.

10 DAY TRIAL PERIOD

And you win. Your secret weapon? PC-Draw. A powerful interactive graphics program for the IBM PC or XT™—*unlike anything else* on the market. Using PC-Draw you create virtually anything that can be drawn with pencil and paper. Quickly. Easily. With far greater detail.

PC-Draw is ideal for presentation graphics, proposals, systems design, forms, diagrams... and an endless variety of charts, graphs and illustrations. PC-Draw allows you to produce drawings *up to 99 pages* long. Several templates come with PC-Draw including Flowcharting, Electrical Design, Office Layout, and Alternate Text. In addition you create and store your *own* unlimited supply of user defined symbols.

PC-Draw includes an *easy-to-follow* interactive tutorial. Requires IBM PC or XT™ or compatible, graphics adapter and graphics monitor. Version for PCjr available. Graphic boards, plotters at competitive prices.

Shhh! Don't tell your office competition about PC-Draw. They'll catch on soon enough. For free brochure or to order call 800/2PC-DRAW. In Texas or for customer service call 214/234-1769. Micrografx, Inc., 1701 N. Greenville Ave., Suite 305, Richardson, Texas 75081.

MICROGRAFX

(Most popular plotters and printers supported.)

The Picture of Success.

Circle 332 on reader service card

supplied without the final documentation. Had I seen this documentation I would certainly have commented on it.

On the other hand, the program itself is a top-quality product. It has become my word processor of choice. I have just completed a book-length manuscript with it, and I found it extremely powerful and easy to use. It's a shame that the current documentation hides these facts from users. My understanding is that Microsoft intends to rectify this situation.

Burton L. Alperson
Contributing Editor, PC World
Los Angeles, California

His and Hers

I believe your magazine is one of the finer personal computer publications available today. Worthy of particular praise is your reference to a nonspecific person in all of your articles as "he or she" as opposed to the all-too-common male pronoun. Since women make up more than half the population of the planet, it seems fitting to include them anywhere it may be appropriate.

Joseph T. Finnivan
North Billerica, Massachusetts

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, or The Source STE908. We reserve the right to edit letters. Letters should not exceed 300 words.*

Circle 589 on reader service card

READ ONLY

A review of the IBM Personal Computer Family. Vol. 1, No. 2

HARDWARE NEWS

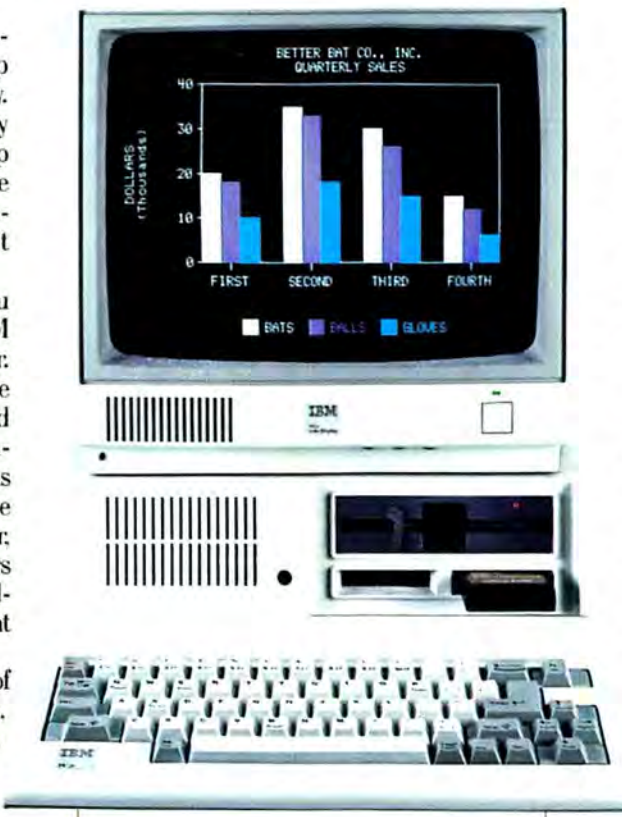
Progress. Even for a youngster with unusual potential, the IBM PC*jr* has made a lot of progress in its first year.

Consider memory for example. The IBM PC*jr* comes with up to 128KB of internal user memory. You can also add external memory expansion units of 128KB each, up to a total of 512KB. That's far more potential memory than other computers of its price range and weight class (10 pounds).*

Increased memory allows you to take full advantage of the IBM PC*jr*'s powerful 16-bit processor. With up to 512KB of available memory and PC*jr*'s double-sided diskette drive, you can run thousands of best-selling programs that have been developed for the IBM PC. If you're a programmer, the PC*jr* joins the other members of the IBM PC Family as a full-fledged application development tool.

There is also a variety of plug-in cartridge programs, which work faster than diskettes and don't take up any user memory. Three popular examples are Lotus 1-2-3™, PC*jr* Color-Paint, and Managing Your Money™ by financial expert Andrew Tobias. And every PC*jr* comes with cassette BASIC built into the system board.

PC*jr* makes it easy and affordable to start small and grow at your own pace. The $599 PC*jr* Entry Model, for example, comes with 64KB of memory, runs cartridge programs, and can easily be expanded into a diskette model. The PC*jr* Enhanced Model at $999** offers 128KB of memory—enough to run many programs from the IBM PC software library—and a 360KB diskette drive.



*Cartridge-based programs for PC*jr* include Lotus 1-2-3™.*

No matter which model you choose, the IBM PC*jr*'s 13 ports for plug-in options make it easy to add to your system, from more memory, to a modem, joysticks (PC*jr* can accommodate two), color monitor, or other peripherals.

Keys and colors. The IBM PC*jr* now comes with a new typewriter-style cordless keyboard that frees you to work up close or across the room from the system unit.

While PC*jr* can be connected to just about any display, including your TV set, the IBM PC*jr* Color Display offers some real advantages at a very reasonable price.

It has a built-in speaker and an earphone jack for educational and entertainment programs that feature music and sound effects. The non-glare RGB screen gives you better character definition and clarity than a color composite monitor. And since the PC*jr* Color Display is designed to be placed on top of the system unit, it's a space-saving addition to your PC*jr* system.

Whatever monitor you decide to add to your PC*jr* system, there's no extra expense for an additional interface card. Ports for both monitors and serial printers are built in.

*Weight does not include power pack and monitor.

**Prices shown apply at IBM Product Centers.

Lotus 1-2-3 is a trademark of Lotus Development Corporation.

Managing Your Money is a trademark of MECA.

UP AND RUNNING

First String. It didn't take the IBM PC*jr* long to make the team. In its first year of eligibility, PC*jr* was picked by coach Grant Teaff to play a key position for the Baylor University football team.

Coach Teaff has a practiced eye for players with potential. He's coached the Baylor Bears to two Southwest Conference championships, been named Southwest Conference Coach of the Year five times, and was National Coach of the Year in 1975.

The Bears' coaching staff has used computers to help analyze scouting reports and playing patterns of opposing teams for nearly ten years. In the beginning, though, there was a lot of competition for a limited amount of computer time.

Coach Teaff and his assistant coaches had to write up all their game and player information and then have it keypunched. After that came a wait for processing time on Baylor University's mainframe computers, time that had to be shared with other departments and the university administration. Analysis of a game often wasn't available until a week after it had been played.

PC*jr* helped change all that.

Winning Tendencies. Coach Teaff calls the IBM PC*jr* "the ideal football coaching tool." With up to 512KB of available memory, it's powerful enough to make his staff independent of the University's central computers. And PC*jr* and the PC*jr* Color Display are inexpensive and compact enough to be used in offensive and defensive staff meeting rooms.

Using software developed by Coach Teaff, PC*jr* enables the Bears' coaches to enter information as they view game film of an opposing team and to see results immediately. When play-by-play statistics of several games are compiled and analyzed on PC*jr*, the coaches are able to identify tendencies of a team in given situations. They're then able to adjust their own game plan accordingly.

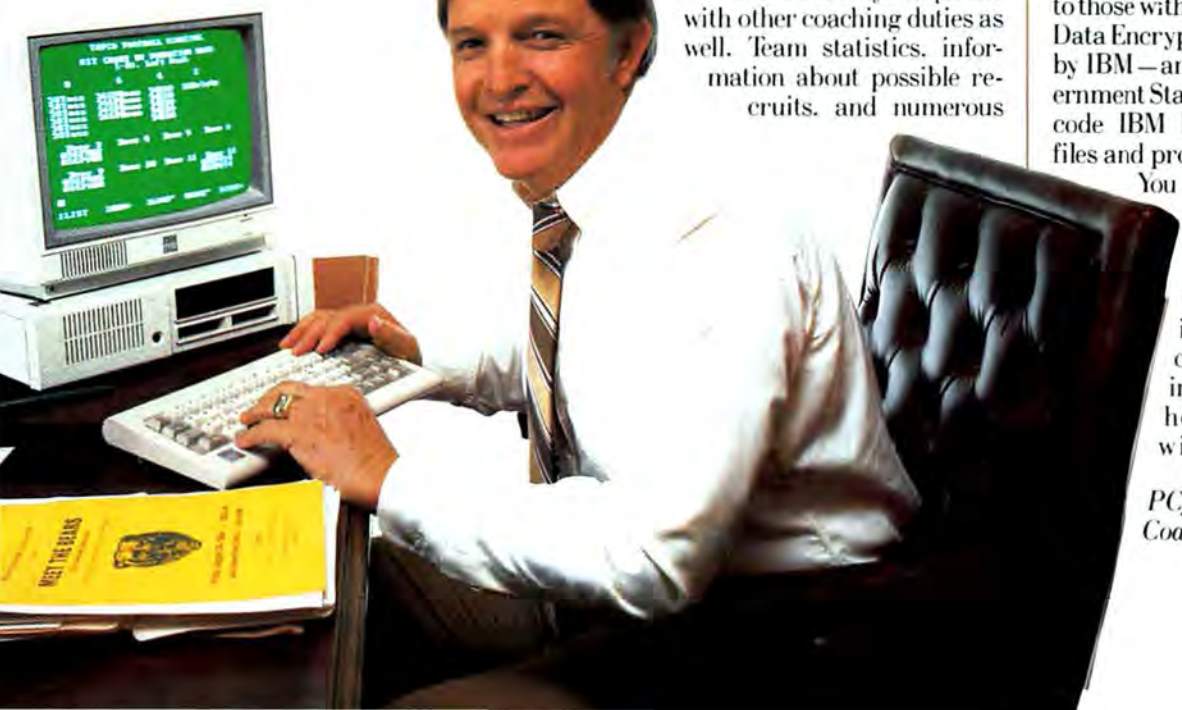
When Baylor plays new opponents, for instance, the two teams exchange films of past games. PC*jr* is used to analyze variables such as down, distance, and type of play. The Baylor coaches enter the game with much the same level of knowledge as if they'd played the new team for years.

The IBM PC*jr* helps out with other coaching duties as well. Team statistics, information about possible recruits, and numerous business and financial chores are all part of its workload.

Other coaches around the country had a chance to see the benefits of computerized coaching techniques this summer when members of the Baylor coaching staff demonstrated their programs at the nationwide football and basketball clinics sponsored by The Coaches, Inc.

Coach Teaff points out that a PC*jr* could make the difference between winning and losing to teams—small high schools, for example—with a limited budget and coaching staff. Using the PC*jr*, he says, "is like adding two or three men to the staff."

Not bad for a 10-pound, first-year player.



*PC*jr *is a team player for Coach Grant Teaff.*

WHAT'S THE PROGRAM?

Maximum Security. Some information belongs under lock and key. But the rapid growth of personal computing and computer networks makes it increasingly difficult to keep it there.

Data Encoder software from IBM can help ensure that sensitive information—personnel and payroll records, for instance—is available only to those with a need to know. It uses the Data Encryption Algorithm developed by IBM—and adopted as a U.S. Government Standard—to encode and decode IBM Personal Computer data files and programs.

You don't have to be a master cryptographer to use Data Encoder. For members of the IBM Personal Computer Family with 192KB of memory, there's a full screen interface with menus and help screens. Systems with 128KB use easy

DOS-like commands. You designate the key that triggers encoding and decoding procedures.

Files protected by Data Encoder can still be sent through IBM Personal Communications Manager or any other communications program with a text transparency feature. Without Data Encoder software and the proper security key, however, the information remains unintelligible.

So much for prying eyes.

In the clear. While some people are determined to keep things confidential, others want nothing less than perfect clarity. The following new members of IBM's growing family of programming productivity tools can help remove that unwanted element of mystery from your application programs.

The IBM Professional Debug Facility can help make short work of improving your assembler language programs. It includes a Resident Debug Tool for full function, full screen interactive debugging, a Disk Repair Program, and a Non-maskable Interrupt card for access to a system that's locked because of program error.

The IBM Personal Computer Application Display Management System (ADMS) simplifies creation of clear, informative screens for application programs. Since screen development is one of the most time-consuming programming tasks, ADMS can help dramatically increase your application development efficiency and productivity.

ADMS consists of two parts. The Application Display Designer is a screen building program that significantly reduces the program coding required for an application. The Application Display Manager is a run-time program that interprets the screen design code.

Screens defined with ADMS remain independent of the application program, so they can be modified or redefined without affecting the logic of the application.

The view from the top. It's worth noting that programs developed with the help of ADMS can run under TopView, IBM's new multitasking operating environment.

TopView's multitasking capabilities allow you to work quickly and efficiently with a wide range of application programs. You can switch rapidly from one program to another without reloading diskettes and can copy information from one application to another. Sales figures from a spreadsheet program and a document from a word processing program, for example, can be used concurrently to produce a sales report combining financial information and text.

In addition, the TopView operating environment supports advanced windowing facilities, data transfer among different applications, and pointing devices such as a mouse. All are features that enable you to work easily with a variety of applications.

Data Encoder software from IBM.

There's also an IBM TopView Programmer's Toolkit available that contains the routines, utilities, and systems related information necessary to develop applications that run under TopView.

FUN AND GAMES

Medieval adventures. The ideal game is easier to define than to find: it should be entertaining *and* enlightening. There are new programs from IBM that manage wonderfully to be both.

King's Quest from IBM, for example, is chiefly for fun but does impart a few important lessons. The hero of this colorful three-dimensional adventure game, the valiant Sir Grahame, is sent by the King of Daventry to search the countryside for three magical items that will prevent the

King's Quest software from IBM.

kingdom's collapse. Along the way, he encounters dangerous creatures, makes new friends, and avoids—or tries to avoid—treacherous terrain.

King's Quest is unusually enjoyable because you interactively control Sir Grahame's wanderings, helping him duck, jump, or swim his way through the quest. Many tasks can be solved in different ways, and more creative solutions are awarded higher scores.

Hence also the educational value. Cleverness and imagination are rewarded. And a few valuable practical lessons are reinforced along the way. Looking, for instance, before one leaps into alligator-filled moats and deep, dark holes.

King's Quest runs on the IBM PC*jr* and makes good use of some special PC*jr* capabilities. Sir Grahame's movements, for example, are unusually smooth and realistic because multiple video buffers in main memory are used instead of a single chip to create the animation effects. PC*jr*'s three voice sound creates an impressive variety of sound effects, such as a fanfare of horns when the castle door opens. And PC*jr*'s ability to produce 16 colors lends a touch of realism to an imaginary kingdom.

Modern machines. But can a program with more serious didactic intent be as enticing as Sir Grahame's rough and tumble lessons? Yes, if it's Rocky's Boots™, winner of *Learning* magazine's Software of the Year award and of high praise from *The New York Times*.

In fact, Rocky's Boots from IBM is also a quest for creative solutions to a series of different games. Along the way, both children and adults can learn the basics of electronic circuitry and of the Boolean logic that drives computer operations.

Lest that sound too intimidating, remember that the learning is a by-product of games in which you build various simulated machines on your display screen. Early sections of Rocky's Boots guide you through basic instructions about building and activating simple electronic devices.

You're also introduced to the various "spare parts" and "tools"—such as clackers, boppers, alligators, and alligator detectors—that may come in handy. Later in the program there are more challenging games to play using the machines you've built.

All in all, Rocky's Boots is as thoroughly engrossing as King's Quest. And on one point, at least, it's easier: Sir Grahame has to make do without an alligator detector.

Christmas cheer. Rocky's Boots and King's Quest are part of a special Christmas collection of entertainment and educational software from IBM.

Some others in the Christmas collection come from the same series of IBM learning games as Rocky's Boots. They include Bumble Games™, Bumble Plot™, Gertrude's Puzzles™, Gertrude's Secrets™, and Juggles' Butterfly™. See your authorized IBM Personal Computer dealer, IBM Software dealer, or IBM Product Center for complete details.

The Learning Company reserves all rights in the Juggles, Bumble, Gertrude, and Rocky characters and their names as a trademark and under copyright law.
Bumble Games, Bumble Plot, Gertrude's Puzzles, Gertrude's Secrets, Juggles' Butterfly, Rocky's Boots, and The Learning Company are trademarks of The Learning Company.

HARDCOPY

Full Disclosure. If business applications or entertainment programs aren't what you're after, there's a new software listing available from IBM, one with a long title but a specific purpose: the directory of *Engineering and Scientific Programs for IBM Personal Computers Available from Non-IBM Sources.**

It lists programs in a wide variety of engineering/scientific categories, from Computer Graphics to Lab Automation and Statistical Techniques. The *Engineering and Scientific* directory includes program descriptions, minimum configuration requirements, initial availability dates, and vendor information.

If your department or laboratory is suffering a backlog in application development

Directory of engineering and scientific programs for IBM Personal Computers.

work, one of these programs—in original form or with a little modification—may be the answer.

For information about where to get the IBM *Engineering and Scientific* directory, see the box at the end of this issue of *Read Only*.

*IBM has not evaluated these programs and makes no comment, warranty, or guarantee as to their functions, quality, or performance.

TIPS AND TECHNIQUES

Living Dangerously. Diskettes lead dangerous lives. When they're not being folded, stapled, or otherwise rendered unfit for service, you might think they could at least spend a quiet evening in front of the TV set.

But no. Danger lurks there, too. All color TV sets and many color monitors have a degaussing coil around the face of the tube that demagnetizes the shadow mask inside the tube when the set is turned on.

If you keep your diskettes anywhere near (within a foot or so) the front of your color monitor or TV set, they may be exposed to a large shot of AC magnetic field every time you turn on the power. This could have a fatal and irreversible effect upon the data stored on the diskettes.

Don't degauss your diskettes.

IBM CREDIT CARD

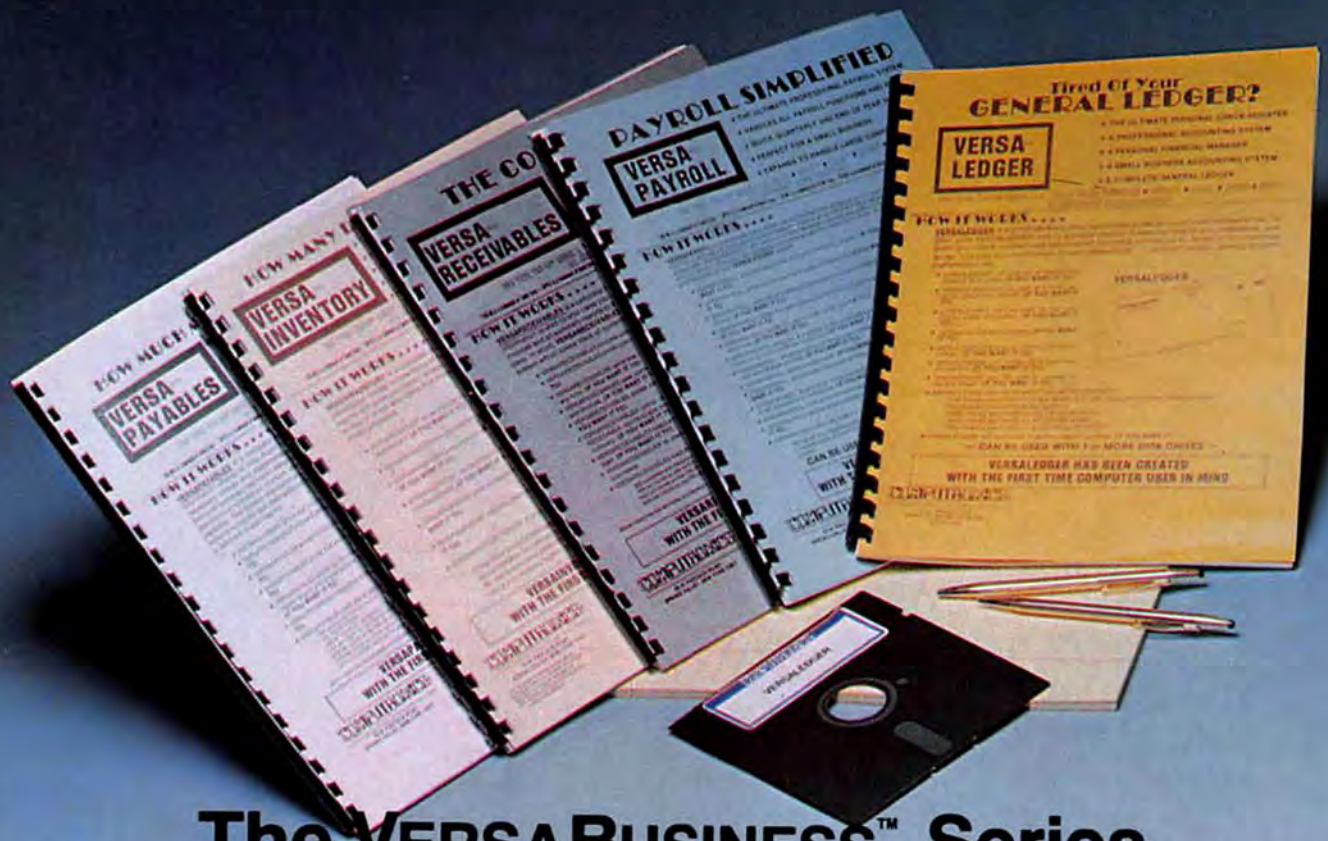
The new IBM Credit Card gives you a convenient way to get started in personal computing or to add hardware and software to your IBM Personal Computer system. It's available with any purchase of $300 or more. You can apply for the card and make a purchase with it on the same day. See your IBM Product Center or participating authorized IBM Personal Computer dealer for details.

For more information about IBM Personal Computer products discussed in this issue of *Read Only*, see your authorized IBM Personal Computer dealer or IBM Product Center. To learn where, call 800-447-4700. In Alaska and Hawaii, 800-447-0890.

© 1984 International Business Machines Corporation
Little Trump character licensed by Bubbles Inc., s.a.

Introducing the Most Powerful Business Software Ever!

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



The VERSABUSINESS™ Series

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

VERSARECEIVABLES™ $99.95

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

VERSAPAYABLES™ $99.95

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

VERSAPAYROLL™ $99.95

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

VERSAINVENTORY™ $99.95

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

VERSALEDGER II™ $149.95

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

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

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

SATISFACTION GUARANTEED!

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

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

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

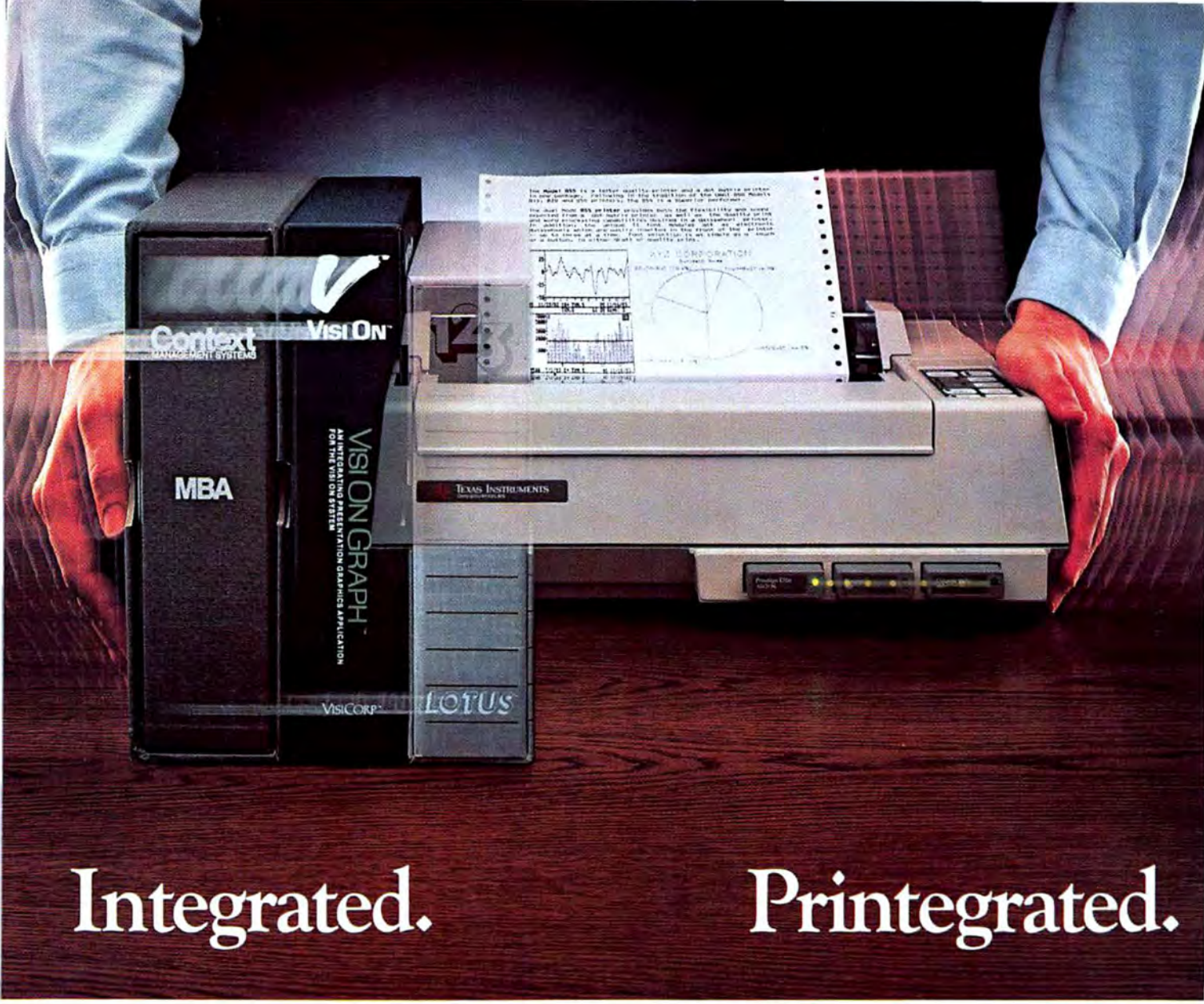
DEALER INQUIRIES WELCOME
All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS

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

*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).

Circle 891 on reader service card



Integrated. Printegrated.

Now, translate your integrated software into integrated hard copy, with the TI OMNI 800™ Model 855 printer. So versatile, it combines letter-quality print, draft-quality print and graphics as no other printer can.

It prints letter-quality twice as fast as comparably priced daisy wheel printers, yet gives you characters just as sharp, just as clear.

It prints rough drafts ten times faster than daisy wheel printers... faster than most any other dot matrix printer.

Only the TI 855 has snap-in font modules. Just touch a button; change your typestyle. The 855 gives you more typestyles to choose from than ordinary dot matrix printers. It makes them quicker, cleaner, easier to access than any other dot matrix or daisy wheel printer.

The 855's pie charts are rounder... all its graphics are sharper than on other dot matrix printers, because the TI 855 prints more dots per inch. As for daisy wheel printers... *no* graphics.

The TI 855 Printer

The printer for all major PC's

For under $1,000 you get twice the performance of typical dot matrix printers. Or all the performance of a daisy wheel printer, and then some, for half the price.

So get the best of all printers, and get optimum results from your integrated software. With the TI 855. See it at your nearest authorized TI dealer. Or call toll-free: 1-800-527-3500. Or write Texas Instruments Incorporated, P.O. Box 402430, Dept. DPF-183P7, Dallas, Texas 75240.

TEXAS INSTRUMENTS

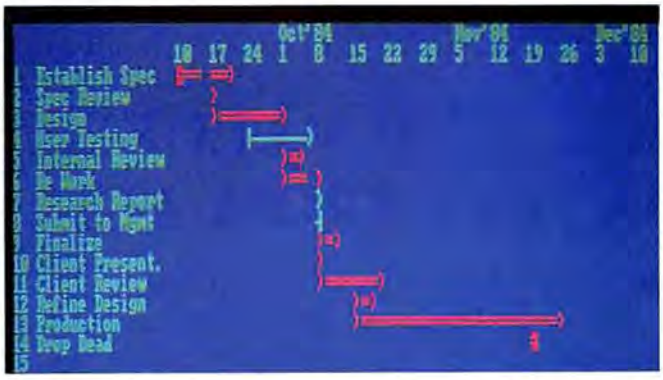
Creating useful products and services for you.

™OMNI 800 is a trademark of Texas Instruments Incorporated

Copyright © 1984 Texas Instruments Incorporated. 2763-36

Now there's no excuse to drop dead.

Producing a brochure. Introducing a new product. Moving your entire company across town. Every project has a start date, a completion date, and a date beyond which you absolutely, positively cannot go. The drop dead date. Blow that date and you've got positively, absolutely no excuses.



Better to arm yourself with Microsoft® Project, the new software tool for business managers and their IBM® PCs. Microsoft Project tells you which activities are essential to keeping your schedule. And which you can let slide.

Microsoft Project keeps you on a healthy track.

What a spreadsheet does for financial planning, Microsoft Project does for start-to-completion scheduling. Give it your best to worst "what-if" scenarios. It tells you what must be accomplished. By whom. By when. At what cost.

When management needs detailed status or budget reports, it prints them out. In text and bar charts. And it can also send budgeting information to programs like Multiplan,® Microsoft Chart, or Lotus™ 1-2-3.™

Get Microsoft Project. No excuses.

Microsoft Project is easy to use. Especially if you're familiar with electronic spreadsheets. It saves your company time, work, money. Makes you an on-time, on-budget manager. Not to mention it's from Microsoft. We're the people who designed the MS™ DOS operating system that tells the IBM PC how to think. And our BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT®
The High Performance Software

For the name of your nearest Microsoft dealer, please call 800-426-9400. In Washington State, Alaska and Hawaii 206-828-8088.

Should you decide you can face another drop dead date without Microsoft Project, tell us where to send the flowers.

Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation.

INTRODUCING QUALITY, PERFORMANCE, AND VALUE... SYNCO'S PC1600 FOUNDATION FROM ACI

Choosing the right microcomputer for your needs can be a real headache.

If you're new to computing, you don't know what your future requirements will be. If you're experienced, you won't settle for anything but a quality system you can expand, and who's software can meet any of your needs.

Meet Synco's new PC1600 Foundation Micro-Computer.

Featuring IBM-PC software and hardware compatibility, the PC1600 is the price/performance value in the micro computer industry. Features like—

Software Compatibility: the PC1600 runs most popular software like: Lotus 1-2-3, Multiplan, Supercalc, Visicalc, MBA, PFS software, flight simulator, and dBASE II. In fact, a library of nearly 5000 commercially available programs are available.

Expansion: 5 expansion slots will accept most PC compatible add-on board or system. Included is a color graphics adapter with light pen interface, serial and parallel ports, and RAM sockets on the motherboard allowing up to 256kb of onboard memory.

Quality: Synco products are manufactured by Shinlee Corp., Taiwan All PC1600's are manufactured and tested under a dual Q.C. system - doubly insuring reliability, and if anything does go wrong, service is available at a depot near you.

Should you need another reason to buy a PC1600, try a price tag of only **$2295.00.**

Dealer, Distributor, and OEM inquiries welcome.

For more information call or write:

ACi

Articulate Computers Inc.
17921 Sampson Ln.
Huntington Beach, CA 92647
(714) 849-1950

Circle 15 on reader service card

STANDARD SPECIFICATIONS

CPU:	8088 (8087 socket)
ROM:	48K (8K BIOS, 40K user definable)
RAM:	128K (expandable to 256K on M/B)
Floppy Drives:	Dual 5.25", DS/DD, half-height, 360K per.
Expansion Slots:	5 on standard PC bus.
Power Supply:	100W (60W used by system, 40 available).
Standard Hardware:	Floppy disk controller. Color Graphics board featuring - alphanumerics mode, APA (all points addressable) mode, 320x200 color resolution (16 colors), and 640x200 monochrome. Also included is RGB or NTSC composite switchable, plus a light pen interface.
Standard Software:	MS-DOS 2.0 and GW Basic (included)
Major Components:	FDD's from TEAC, keyboard from Keytronics, and power supply from Astec.
Optional Equipment:	TM1230 monochrome monitor

1. IBM-PC is a trademark of International Business Machines.
2. 1-2-3, PFS, Wordstar, dBASE II, Supercalc, and Visicalc are trademarks of Lotus Development, Software Publishing, Micro Pro, Ashton Tate Sorcim, and Visicorp respectively.
3. MS-DOS 2.0 and GW Basic are trademarks of Microsoft Corp.
4. SYNCO is a trademark of Shinlee Corp., 2nd floor, No. 372 Lin Sen North Road, Taipei, Taiwan, R.O.C. Tel: (02)521-0282, Telex: 11154 and Articulate Computers Inc. is the sole U.S. distributor

I fell 20,000 feet and lived.

There I was flying Microsoft® Flight Simulator over Chicago's O'Hare Airport, having the time of my life. Suddenly my carburetor started icing. My RPMs started falling. My altimeter spun backwards. The Sears Tower loomed ahead.

I was behind the controls of a Cessna 182. As an experienced Microsoft pilot, I had taken off and landed at 80 different airports. Created different flying challenges (using my Microsoft Mouse and my joysticks). Altered the weather, time and season. Even flown the World War I dogfight mode and successfully battled enemy aircraft.

Whether you're using an RGB, composite or monochrome monitor, nobody flies the IBM® PC and PCjr like Microsoft. Because Microsoft's MS-DOS™ operating system tells them how to think. And Microsoft BASIC is the language spoken by nine out of ten microcomputers worldwide.

The next time I flew they had repaired the Sears Tower. My next stop? The World Trade Center.

Sound fun? Then fly Microsoft. Call (800) 426-9400 for the name of your nearest Microsoft dealer. In Washington State, Alaska, Hawaii and Canada (206) 828-8088.

MICROSOFT®
The High Performance Software

Microsoft is a registered trademark and MS-DOS is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines. Microsoft Mouse and joysticks are not required.

Available for the IBM PC, AT, XT, jr., and true compatibles*

CLEAR THE DESK, SIDEKICK'S HERE! *The Super Organizer*

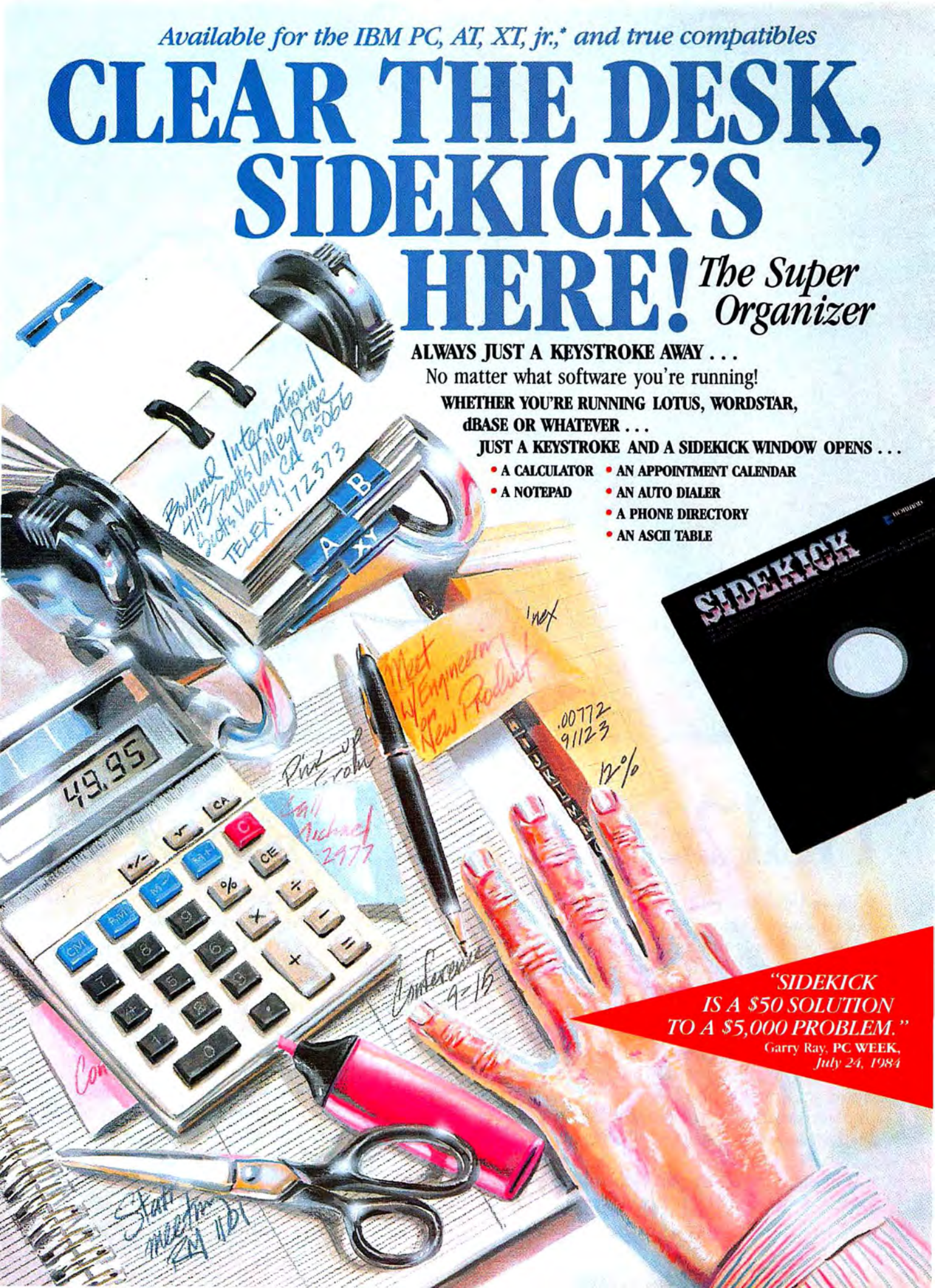
ALWAYS JUST A KEYSTROKE AWAY . . .

No matter what software you're running!

WHETHER YOU'RE RUNNING LOTUS, WORDSTAR, dBASE OR WHATEVER . . .

JUST A KEYSTROKE AND A SIDEKICK WINDOW OPENS . . .

- **A CALCULATOR**
- **A NOTEPAD**
- **AN APPOINTMENT CALENDAR**
- **AN AUTO DIALER**
- **A PHONE DIRECTORY**
- **AN ASCII TABLE**



"SIDEKICK IS A $50 SOLUTION TO A $5,000 PROBLEM."
Garry Ray, **PC WEEK**, *July 24, 1984*

INTRODUCTORY OFFER

$49.95

Copy Protected Version

Here's Sidekick in action. That's Lotus 1-2-3 running underneath. In the Sidekick Notepad you can see data that's been imported from the Lotus screen. On the upper right, that's the Sidekick Calculator.

30 DAY MONEY-BACK GUARANTEE

NOW . . . Whether you're working in dBase, Lotus, Wordstar or whatever . . . you can unleash the full power of your computer . . . and make a lot of extra space on your desk at the same time.

Whenever you're using your computer . . . from start to finish of your session . . . Sidekick™ will be there . . . ready to serve. And it's as lightning-fast and compact as only Borland knows how to make it.

There's a notepad that has a full-screen editor that can time and date stamp your notes, and then save them to disk. You can even pull information into the notepad directly from the screen of your "underlying" software.

Suppose you're working in Lotus and the phone suddenly rings. Give your Sidekick a call and it pops right up over Lotus with the notepad you need. Or an appointment calendar . . . one you can never misplace.

What if you need to do a quick calculation? A keystroke instantly brings up the calculator. And the results of your calculations can even be transferred to your "underlying" software.

Need to make a phone call? Up pops your personal phone directory. Type in the name you want . . . and Sidekick jumps right to the phone number. Another keystroke, and the phone is automatically dialed for you.†

There's lots more, too. You can move the Sidekick windows anywhere on the screen you like. And you can have as many on screen at a time as you need. There's even an on-line help window for each of Sidekick's features.

We designed it because we needed it. If you've ever been writing a report and needed to do a quick calculation, or jot down a note, then you need Sidekick, too.

†Only with Hayes Smartmodem and compatibles.

GOT *YOUR* SIDEKICK YET?

YOU CAN ORDER YOUR COPY OF SIDEKICK™ TODAY!

For VISA and MasterCard orders call Toll Free **1-800-255-8008** in California **1-800-742-1133**
(lines open 24 hours, 7 days a week) Dealer Distributor Inquiries Welcome 408-438-8400

SIDEKICK™ $49.95 ☐
Non-copy protected Version: $79.95 ☐
(Plus $5.00 shipping and handling.)

Check ☐ Money Order ☐
VISA ☐ MasterCard ☐
Card # _____

Expiration Date _____

**PC jr. runs non-copy protected version only.*

Please be sure your computer is an IBM PC, AT, XT, jr., or true compatible!

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

TELEPHONE _____

California residents add 6% sales tax. Outside U.S.A. add $15.00. (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders.

THE SOFTWARE CHAMPIONS

BORLAND INTERNATIONAL

Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX: 172373 #5H23

Circle 760 on reader service card

PC WORLD

Reserving the Function Keys

One man's uphill fight on behalf of the visually impaired

Seven years ago a rare eye disease took Ron Hutchinson's sight. Hutchinson soon discovered that hardware and software designed for the blind was inadequate for his needs and too expensive, so he started writing his own programs. His current program for the IBM PC, *The Enchanced PC Talking Program*, works with most voice synthesizers to turn the PC into a functional talking computer. The program, which runs with popular programs such as *1-2-3*, *WordStar*, and *Multiplan*, has options for spelled speech, total speech, identification of uppercase and lowercase letters, and the reading or spelling of an entire page.

Ron Hutchinson at his computer.

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

View

News and notes for the computing community

While converting his program for the PC (his first versions were for Radio Shack computers), Hutchinson discovered that certain key combinations–particularly the <Alt> key combined with one of the ten function keys–are very easy for blind people to find on the IBM keyboard. So Hutchinson began a one-man campaign. "I've made hundreds of dollars worth of phone calls and written many letters to software manufacturers in an attempt to get them to reserve a standard set of keys for blind users."

Despite repeated phone calls to companies like Microsoft and IBM, Hutchinson has had "little or no luck," he said. "It seems that nobody wants to make a decision that might upset corporate planning." Hutchinson noted that small companies like Quicksoft have been very supportive, but large software firms have apparently ignored the issue.

"Through the computer, the visually impaired have more access to jobs than ever before," Hutchinson said. He vowed to continue his fight for a new standard. He asked that people who support his idea write to large software firms and urge the companies to adopt the standard.

Grapevine

* * * * * * * * * * * * * * * * * * * *

Hard Driving Times

In August of this year (*PCW*, Vol. 2, No. 9) *World View* wrote that IBM had diminished orders for 10MB hard disks from Seagate Technology, MiniScribe, and International Memories. We reported that IBM would continue to purchase units from Seagate, but other hard disks would be supplied by IBM Japan and an IBM manufacturing unit in Rochester, Minnesota.

Industry watchers did not think that the IBM purchase reduction would greatly hurt Seagate, but the Scotts Valley, California, firm apparently is weathering the marketplace storms even better than expected. According to an industry source, Seagate has been chosen as a second source supplier of 10MB hard disks for the AT&T PC 6300.

* * * * * * * * * * * * * * * * * * * *

Two Equals One?

IBM units in both Arizona and Vermont are working on 3½-inch floppy disk drives, according to industry sources. Why would IBM have two R and D units working on the same product? One explanation is that one unit is doing the research while the other is manufacturing disk drive prototypes. The units' efforts will presumably be realized in IBM's long-rumored lap-size computer.

One Bad Apple

The IBM public relations people must have been wincing the day of the PCjr expansion announcement. Big Blue also unveiled several educational programs–including the Writing to Read system–for its personal computer family, and the company brought in some children who had participated in Writing to Read pilot programs to demonstrate the software.

New York Times reporter Stuart Diamond wrote that a 6-year-old participant, Melinda Gardner, from Burlington, North Carolina, said that her parents have promised her a computer for Christmas. The make? "I want an Apple," she said.

A New Low in Software

(Former *PC World View* Editor Miriam Medom recently surfaced with this opinion of a new development in the software business.)

The programs aren't too awful, but the hype and the concept behind a new line of software has gone too far. The company responsible: Neon Software, of Middletown, Connecticut. The product: *Women's Ware.*

This series of programs has all the clichés–an electronic checkbook, a budget, a calendar, and, yes, a recipe file. But wait! Coming soon from the folks at Neon will be *Home Decorator, Diet/Nutrition Planner,* and *Beauty/Fashion Designer.* Never mind how a computer can teach you to dress or apply makeup, the point is that this software is for you, the women of America. One wonders if Neon's next product line will be *Ethnic Ware!*

As if these programs weren't sufficiently embarrassing, Neon has chosen to package *Women's Ware* like pantyhose–suspended from a pint-size coathanger (see photo). In this woman's opinion, at least, the notion that women need separate, condescending, hand-holding software is an insult to sensible computer users of both sexes. Neon, hang it up.

Neon Software's questionable packaging for Women's Ware.

Mail-Order Disks

If anybody doubts the permanence of personal computers, it is not the Book-of-the-Month Club. The mail-order club issued its first *BOMC Guide: Best Computer Books & Software* this summer. The 20-page guide features a wide variety of computer and programming books and several word processing, home, and game software packages. BOMC plans to issue the guide quarterly.

Down on the Computerized Farm

The Eastern Computing Farmers Association (ECFA) has been established for farmers who use or are planning to use a personal computer for their farm operation. The association provides members with free agricultural computer consultation by phone, maintains an extensive agricultural software library, and offers group discounts on computer supplies. ECFA also publishes a monthly newsletter, *Eastern Computing Farmer,* for members.

Association membership is $35 annually. For membership information write to ECFA, P.O. Box 336, State College, PA 16804.

Stamp of Approval

Correspondent and philatelist Raymond Schuessler wrote to say that the proliferation of computer systems is being matched by the release of postage stamps. "It isn't often that a new topic springs upon the stamp scene, and this one is already growing by leaps and bounds," he said.

According to Schuessler, the first stamp showing a computer was issued by Israel 20 years ago; since then more than 200 stamps celebrating computers, electronics, and telecommunications have been issued worldwide. Stamps honoring scientists and mathematicians, such as Blaise Pascal, Joseph Marie Jacquard, and Albert Einstein, are also popular additions to the thematic collection of computer stamps, he said.

Schuessler noted that computer enthusiasts who become stamp enthusiasts have an advantage over old-fashioned philatelists—the hackers can organize and keep track of their collections with their computers.

A 1962 French stamp honoring philosopher and mathematician Blaise Pascal and a United States stamp issued in 1973.

Computer Reservations

The Society for Information Management (SIM) is asking companies to donate new and used microcomputers to its Computer Education Project. The project's goal is to place computers in Native American schools at reservations throughout the country. The organization hopes to have pilot programs at two reservations by the end of December. In addition to hardware, SIM is accepting software, training materials, and cash contributions.

SIM is a nonprofit organization made up of data processing and computer executives who work for large companies. Donations should be sent, postage paid, to SIM, 111 E. Wacker Dr., Chicago, IL 60611.

Social Study

Computer networks aren't always electronic. Many formal and informal social networks have grown up alongside the personal computer boom. A two-year study, funded by a National Science Foundation grant, began in August to study the social interaction among personal computer buyers and users. Researchers at The Graduate School and University Center of the City University of New York are conducting the study under the direction of sociology professor Dr. Charles Kadushin.

The study will examine the kinds of problems computer buyers and users encounter and how users help one another to solve problems. "It has been said that computers are isolating and alienating," Kadushin remarked, but he thinks that user groups, electronic mail systems, and bulletin boards prove the opposite is true. "The darker side of all this interaction is the illegal copying of software that is protected by copyright," he said.

Kadushin thinks that the findings of the study will help hardware and software manufacturers develop and market products that will match consumer desires.

Different Peripherals

Hoping to cash in on the computer market, some enterprising folks are busy marketing a variety of "peripheral" products that may find their way into a few Christmas stockings.

The people at Zick Productions are selling the manual *Computer Gardening Made Simple,* by Charlie DeJardin. The manual promises "to put computers back in the garden next to the tomatoes and peas." The book comes with two integrated circuit chips–"computer seeds"–that will sprout into calculators and then into full-grown computers if suspended in jars of fresh water. To order, send a check for $3.75 to Zick Productions, c/o Triad Publishing Co., 1110 N.W. 8th Ave., Gainesville, FL 32601.

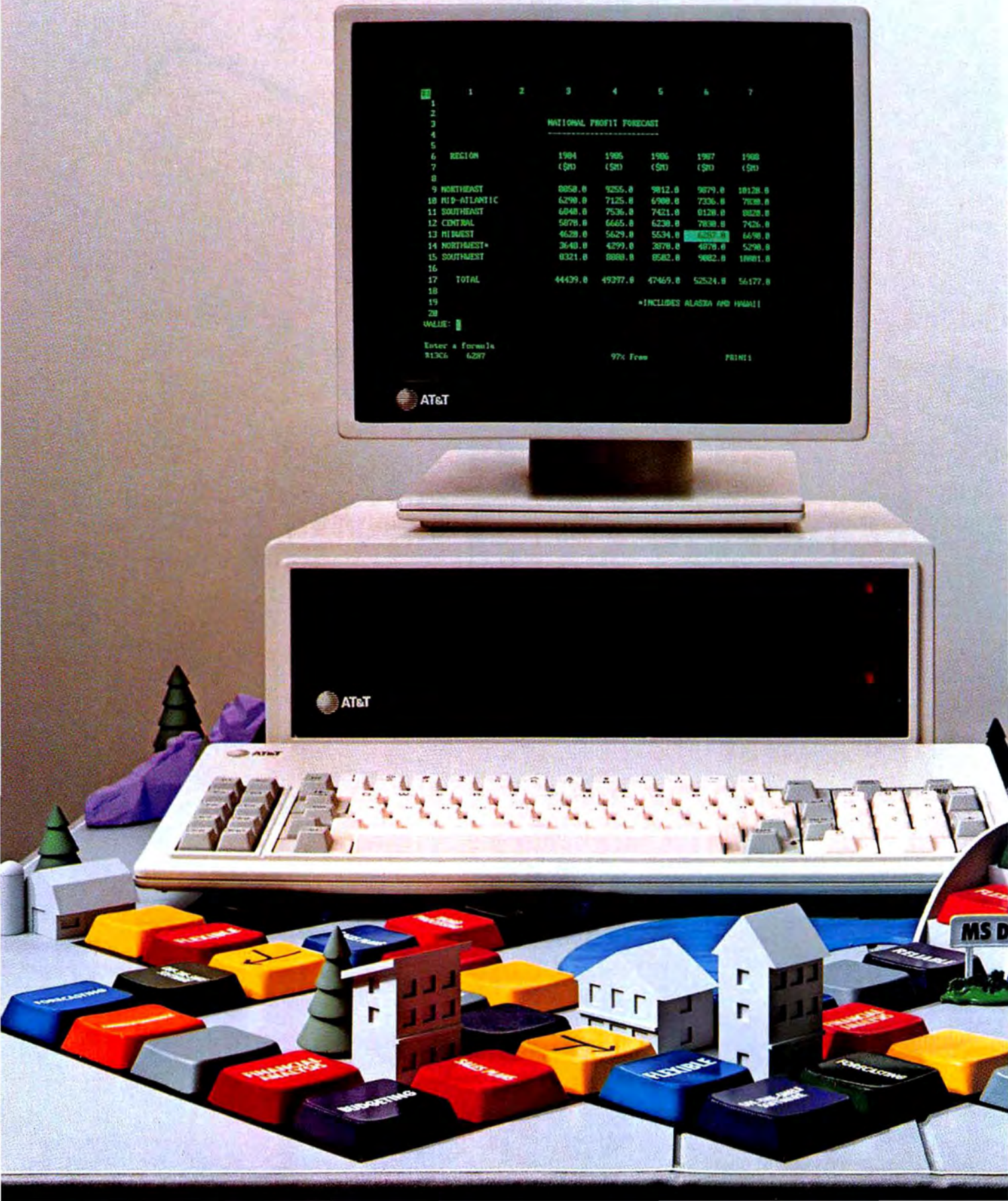
Chocolatek, a San Diego company, has designed a computer board that weighs 54 grams, is ¼-inch thick, and measures 4 inches by 2½ inches. The Chocolate Chip is made out of Belgian chocolate and manufactured at Hooper's Candies in Oakland, California.

The chocolate board is the brainchild of two San Diego artists, A. Wasil and Bob Kerstetter. The two men have formed a partnership with San Diego businessman and lawyer Si Coleman. Chocolatek's first batch of 10,000 Chips was shipped in early July. The Chips are packed in shiny gift boxes and will sell for $6 to $8.

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 contributions; send them to* PC World View, PC World, *555 De Haro St., San Francisco, CA 94107.*

AND NOW THE GAME BEGINS

INTRODUCING THE AT&T



PERSONAL COMPUTER.

The personal computer game is ready for business—and now it's your move. To win the game your company needs a fast, flexible, reliable personal computer that enables you to call the shots.

Go directly to the new AT&T Personal Computer.

The AT&T Personal Computer is more than just a superior piece of hardware. Behind it is a commitment to a better way of managing information and communications. One that can pay off handsomely in increased productivity and profits.

Because our AT&T PC is designed to be flexible enough to meet all your business needs—today and in the future.

Whether you use it as a stand-alone workstation or as a team player in a fully integrated system, you'll find our PC a high-performance machine. And a hard-working addition to your office.

Its fast processing and high-resolution graphics will help make any computer task a computing pleasure. In addition, you can expect more standard features. More expansion slots. More options for future growth.

OFF-THE-SHELF SOFTWARE DOES THE JOB

Driven by the MS-DOS* operating system, the AT&T PC runs the most popular off-the-shelf software for a wide range of business applications. Financial analysis. Forecasting. Budgeting. Word processing. Inventory. The AT&T PC does it all.

And its flexibility means that when it's time to expand, our PC will actually make your computer growing pains painless.

With our unique PC Interface it can be linked to the more sophisticated, higher capacity world of the UNIX** System V Operating System—the AT&T Computer "brain" that is emerging as the operating system standard for multi-user, multi-tasking machines.

THE AT&T TRADITION CONTINUES

Some things about our PC cannot be measured in bits and bytes, but are of immeasurable value.

For instance, the unmatched service and support of AT&T. The built-in reliability—and outstanding quality—of our products. The century-long tradition of technological innovation and personal attention to detail.

Think about it. Then make your move—to the AT&T Personal Computer, from AT&T Information Systems.

To get in on the game, call your AT&T Account Executive, visit an Authorized AT&T PC Dealer, or call 1 800 247-1212.

AT&T INFORMATION SYSTEMS.
WHEN YOU'VE GOT TO BE RIGHT.

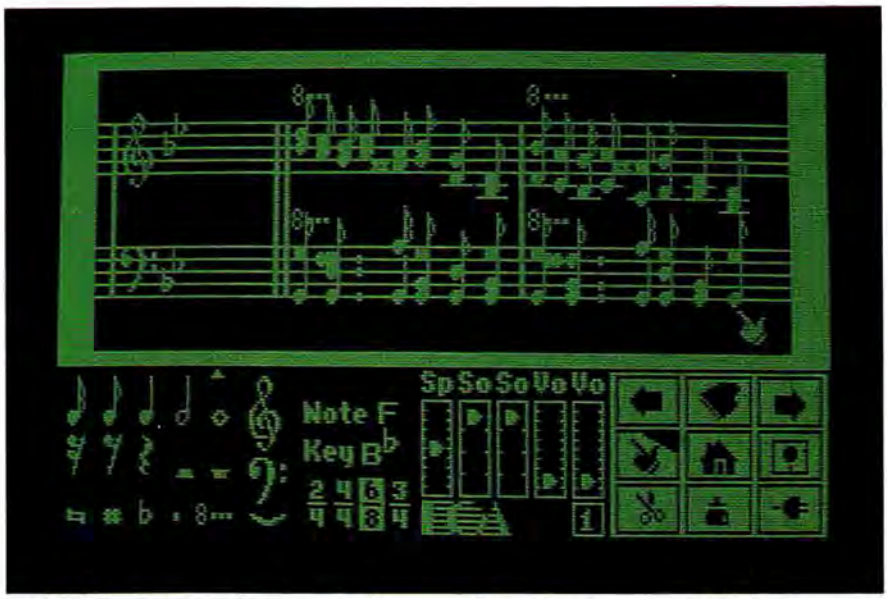
AT&T

*MS-DOS is a trademark of Microsoft Corporation.
**UNIX is a trademark of AT&T Bell Laboratories.
©1984 AT&T Information Systems

Now Available for the IBM-PC and PCjr

The END *of* DINKETY-DINK.

Announcing the first computer music program that actually sounds like music.



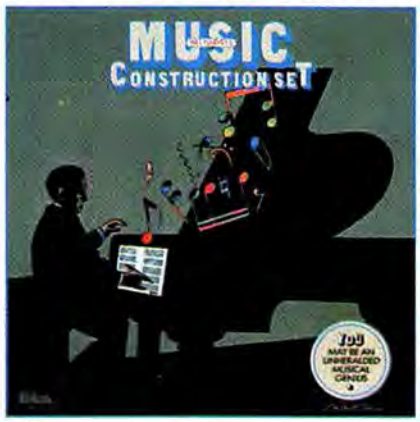
LET'S FACE IT. Up till now, music programs for your home computer have all sounded, well, pretty lame. There were the ones that resembled little electronic music boxes, remember? And then there were those that sounded like so many burps.

Enter Music Construction Set.™ It's the first music program that really makes use of the power of that machine you've got. If you're a serious student, this means you'll be able to work with an intricacy and range of sound quality you've never heard before on a computer. And if you know nothing about music, you'll find something even more important. Namely, that this thing is simple enough to be a lot of fun.

Take a good look at this screen because it, you, and a joystick are the whole story here.

That's you at the right end of the staff of notes – the little hand. Move the joystick, and you move the hand. Use it to carry notes up to the staff. Lay in rests, signatures, clefs, then point to the little piano in the lower right and listen, because you'll hear the whole thing played back.

Move those little scales in the middle up and down to vary the music's speed, sound quality, and volume. Use the scissors to cut out whole measures, then use the glue pot to paste them in somewhere else. Got a printer? Great. Print the score out and show it off to your friends.



But what if you're not up to writing your own stuff yet? No problem. There are twelve pieces of music already in here, from rock 'n roll to baroque. They're fun to listen to, and even more fun to change. (Apologies to Mozart.)

The point is, the possibilities are endless. But if you're still skeptical, visit your nearest Electronic Arts dealer and do the one thing guaranteed to send you home with a Music Construction Set in tow.

Boot one up. Point to the piano. And listen.

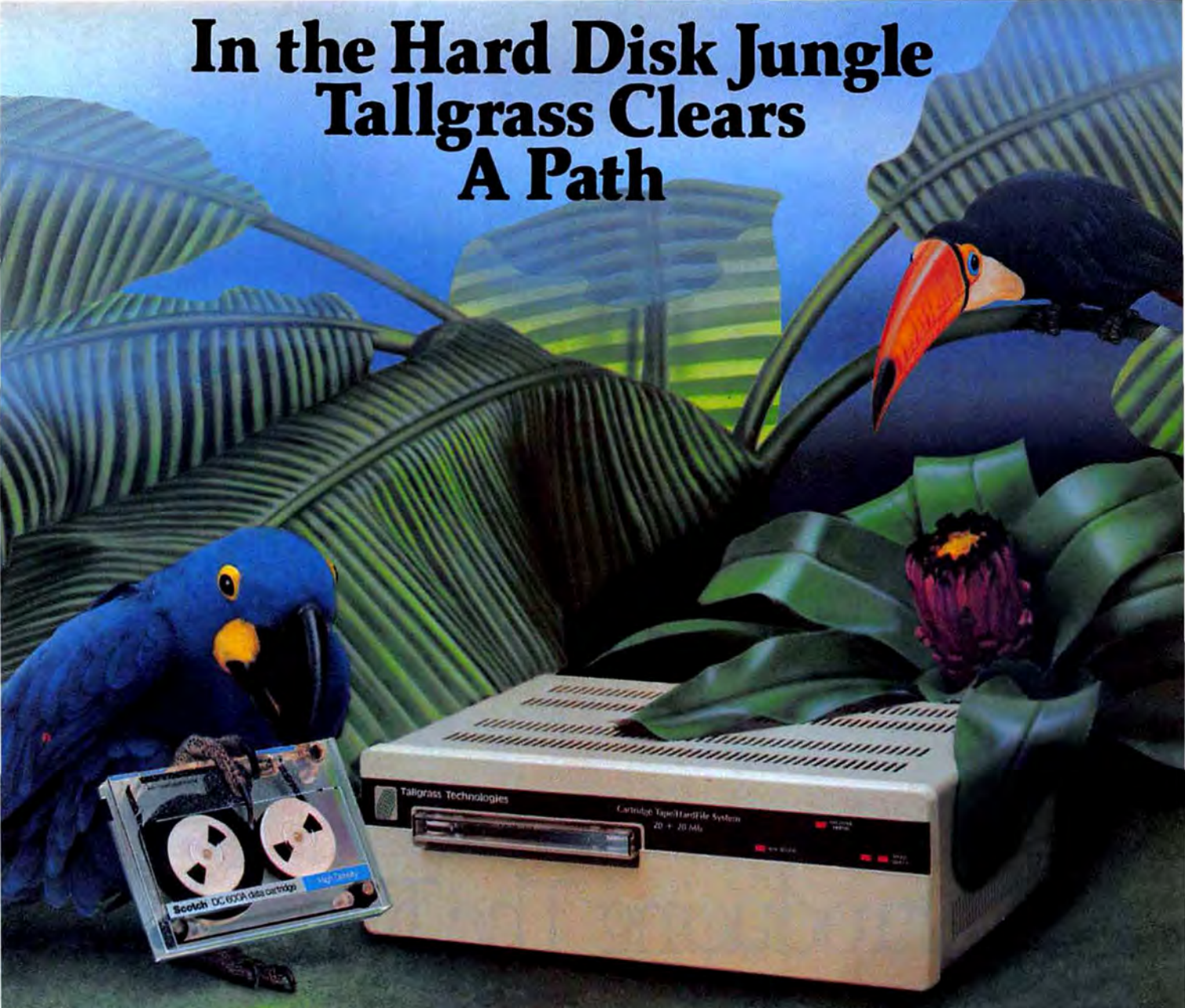
MUSIC CONSTRUCTION SET

from ELECTRONIC ARTS.™

MUSIC CONSTRUCTION SET is now available for Apple II, II+, IIe and IIc, IBM-PC and PCjr, Atari and Commodore 64 computers. The Apple IIc and Atari versions play chords of up to four notes each. The PCjr and Commodore play chords of up to three notes each. Music Construction Set is a registered trademark of Electronic Arts. Apple is a registered trademark of Apple Computer Corp. Commodore is a registered trademark of Commodore Business Machines, Inc. Atari is a trademark of Atari Computer Corp. IBM-PC and PCjr are trademarks of International Business Machines, Inc. For a free product catalogue, send a stamped, self-addressed #10 envelope to Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403.

Circle 840 on reader service card

In the Hard Disk Jungle Tallgrass Clears A Path



In today's hard disk jungle, Tallgrass clears a path by offering high performance, integrated mass storage solutions for the IBM® PC/XT, the T.I. Professional and related computers.

TALLGRASS INNOVATIVE FEATURES

MASS STORAGE SYSTEMS with formatted HardFile™ capacities of 6, 12, 20, 35 and 70 Mb, all with built-in tape backup.

CONVENIENT INTEGRAL TAPE BACKUP SYSTEM allows rapid tape "image" streaming, or incremental file-by-file backup and restore on ANSI standard inexpensive data cartridges, instead of the usual floppies, video cassettes, or low-capacity removable Winchester devices.

NETWORK READY and fully compatible with networks such as PCnet® and EtherShare.™

HIGH RELIABILITY with dual directory and read-after-write verify options. A dedicated landing zone, where the read/write heads reside when the disk is idle, provides data protection during powerdowns and transportation.

Follow the Tallgrass path to your local computer dealer and watch your personal computer transform into a powerful data processing system.

Available from COMPUTERLAND,® Entré® Computer Centers, MicroAge® Computer Stores and other participating computer dealers.

New!
IBM-XT Cartridge Tape Backup

World Headquarters: Tallgrass Technologies Corp. / 11100 W. 82nd St. Overland Park, KS 66214 / 913/492-6002 / Telex: 215406 TBYT UR

Canadian Headquarters: Tallgrass Technologies (Canada), 1775 Meyerside Drive Mississauga, Ontario, Canada L4V 1H2 / 416/673-3244

European Distributor: CPS Computer Group, LTD Birmingham, England B276BH / (021) 7073866

Australian Headquarters: Tallgrass Technolgies (Australia) / Five Dock Plaza, Suite 12/50 Great North Road / Five Dock / Sydney, N.S.W. 2046 / (02) 712-2010

Circle 188 on reader service card

Tallgrass Technologies Corporation

IBM® is a registered trademark of International Business Machines Corp. PCnet® is a trademark of Orchid Technology EtherShare™ is a registered trademark of 3Com Corp.

Introducing The Two Advantag

C·I·P Is Visibly More Powerful Than PFS.®

Until now, if you wanted database software that was easy to use, you had to settle for PFS.

And PFS is fine. If you don't have very much to do. Or if your business has very simple needs. But whose business is simple these days?

Now there's C·I·P. The first and only visual file manager for your IBM PC,® XT or compatible.

C·I·P simply lets you do more. You see, with C·I·P you can customize forms and reports right on the screen. Quickly and easily. Before your very eyes. And when you print your information, you get exactly what you see on the screen. No surprises.

C·I·P also gives you the power of date arithmetic for real business needs such as agings, schedules and tickler files. You can't count on PFS for that.

Plus, with C·I·P all fields can be "keyed" for faster access and reporting. With PFS, your choice of "key" fields is limited to just one.

So why settle for PFS? Especially when there's so much more to see with C·I·P.

IBM PC and PC XT are registered trademarks of International Business Machines Corporation. PFS is a registered trademark of Software Publishing Corporation. dBASE is a registered trademark of Ashton Tate. © Concentric Data Systems, Inc., 1984

Circle 658 on reader service card

s Of C·I·P™ Database Software.

It's Easy To See Why C·I·P Is Easier To Use Than dBASE®

Until now, if you wanted to perform serious file management applications, you had to unlock the mysteries of dBASE.

But that could take weeks, months, even years of deciphering obscure, nerve-racking code. And who could survive that?

C·I·P to the rescue. The first and only visual file manager for your IBM PC, XT or compatible.

C·I·P is no dBASE. And thank goodness for that. It's the powerful choice for people who want to avoid dBASE overkill. C·I·P lets you perform important file management applications.

C·I·P

And all without lifting a finger to program.

Using easy-to-understand menus and keyboard icons, you can see your way to doing most anything. Managing customer files, tracking sales leads, scheduling inventory. And all in the blink of an eye.

So why waste time with dBASE? When you can show your business who's boss with C·I·P.

Now for the best part. If you're already using PFS or dBASE, no problem. You don't have to re-enter your data. Just transfer your files to C·I·P. It's that simple.

I like what I see in C·I·P!

☐ Please send me a trial size version of C·I·P. Enclosed is my ☐ MasterCard ☐ VISA
☐ check for $9.95 payable to Concentric Data Systems

☐ Please send me more information on C·I·P.

Save time! Call **1-800-325-9035.** Between 9–5, Monday through Friday, Eastern Time.
In Massachusetts call **617-366-1122.**

NAME _____

COMPANY _____ TITLE _____

STREET _____ PHONE _____

CITY _____ STATE _____ ZIP _____

CARD # _____ EXPIRATION DATE _____

SIGNATURE _____

Concentric Data Systems, Inc., 18 Lyman Street, Westboro, MA 01581 PCW 12

The right network isn't a matter of choice. It's a matter of fact.

Fact: You can't buy smarter than an OMNINET™ Network.

Whether you have 2 microcomputers or 200, you bought them to handle information. If each micro has to handle it separately, both your equipment and your people are working inefficiently.

Because they could network with OMNINET. Sharing information—as well as the printing and data storage equipment that really puts information to work.

Add CORVUS' SNA Gateway, and you can link your entire network directly to your mainframe.

That's why an OMNINET Network uses simple, telephone-type line. Even relocating the system to a whole new building is just a move. Instead of a construction project.

Fact: OMNINET Networks offer unmatched compatibility.

From Apples to Zeniths, OMNINET handles more varieties of computers than any other network.

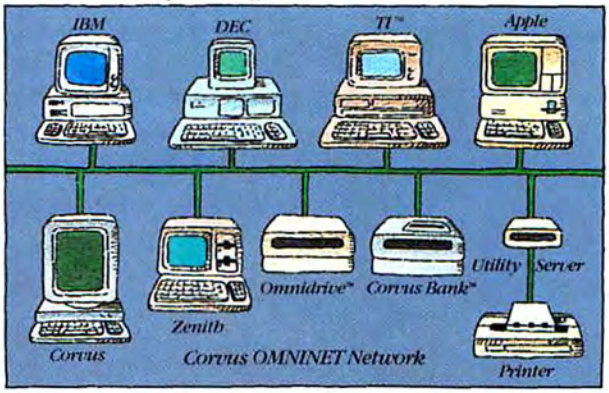
So keep the DEC's in Data Processing and the PC's in Purchasing. OMNINET will keep them all on speaking terms.

The price? At under $500 per hookup, OMNINET is the most cost-effective network you can install. Or expand.

Fact: This network was designed for microcomputers.

Micros get moved. Businesses expand.

Your network should be able to grow and change just as fast as your business does.



Fact: The experts network with OMNINET.

Over 30 of the major computer companies have licensed OMNINET for networking their micros. So you don't have to worry about support tomorrow for the system you pick today.

And OMNINET already has the most software options around—over 500 programs to choose from, according to your people's needs. Not their network's limitations.

Fact: The facts have made us #1.

CORVUS pioneered local area networking for microcomputers, and we've never stopped working on ways to improve it.

Just give us a ring at 800-4-CORVUS to find out more.

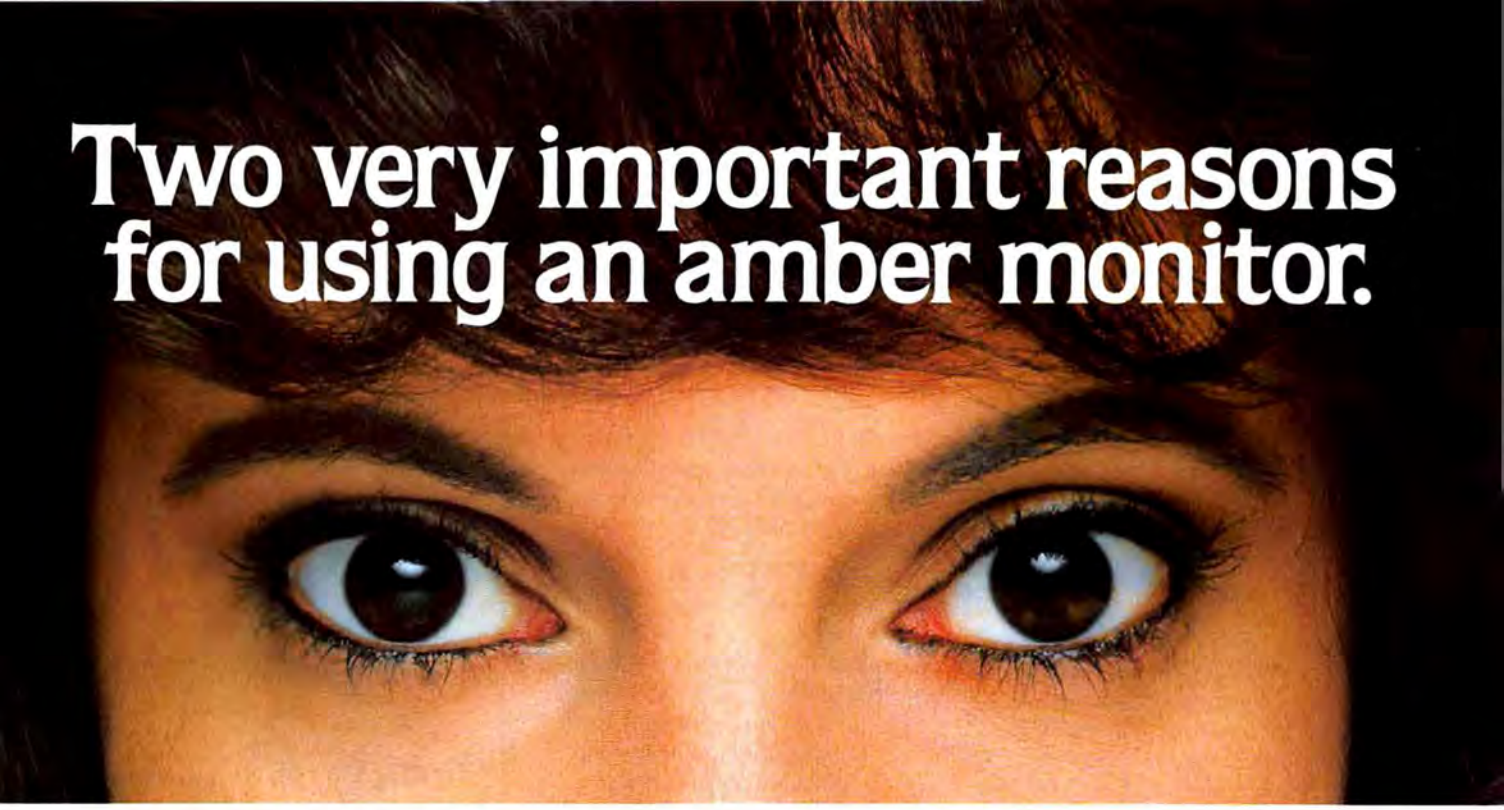
Because while calling ourselves the best is a matter of opinion, telling you that 3 out of every 5 locally networked micros work on a CORVUS network is something else.*

It's a matter of fact.

CORVUS
The Networking Company.

*59% of all locally-networked micros operate in a CORVUS network, according to *InfoCorp.* CORVUS, THE NETWORKING COMPANY, OMNINET, OMNIDRIVE and CORVUS BANK are trademarks of CORVUS SYSTEMS, INC. IBM PC is a trademark of International Business Machines. APPLE is a trademark of APPLE COMPUTER INC. DEC is a trademark of DIGITAL EQUIPMENT CORPORATION. Zenith is a trademark of Zenith Corporation.

Circle 49 on reader service card



Two very important reasons for using an amber monitor.

Amberchrome.™ The "easy viewing" amber monitor from Quadram.

Working in front of a PC can be tough on your eyes. But now you can get your work done without giving your eyes a workout. With Amberchrome, the "comfortable" monochrome monitor from Quadram.

Amberchrome combines a soft amber-tone display with sharply focused characters for a no-smearing, no-ghosting, state-of-the-art screen image that's easy on the eyes. Amberchrome lets you spend more time at the computer, reducing irritating eye strain caused by other monitors.

Amberchrome. More than just a sight for sore eyes.
Amberchrome gives you more than just easy viewing. Like a 12" high resolution (720 × 350) screen image that's perfect for any data processing task. Word processing to complex business graphics. Plus Amberchrome features a special dark glass, anti-glare tube; full IBM compatibility; and low power, stay-cool operation.

The Comfortable Choice in personal computer displays.
All this adds up to one lesson that's easy to learn. Visit your local authorized Quadram dealer today and ask to see Amberchrome in action. One look and you'll agree: Amberchrome is the comfortable choice in personal computer displays.

QUADRAM QUALITY™
Look for this seal. It's your assurance that you're buying the best in personal computer enhancements.

QUADRAM™
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

INTERNATIONAL OFFICES
Interquadram Ltd. 442 Bath Road Slough England SL16BE Tel 6286-63865 Tlx 847155 Auriema G **Interquadram GmbH** Fasanenweg 7 6092 Kelsterbach West Germany Tel 6107-3089 Tlx 417770 Seva G **Interquadram s.a.r.l.** 41 Rue Ybry 92522 Neuilly Tel 758-1240 Tlx 630842 Iso Bur **Chevco Computing** 6581 Kitimat Road Mississauga Ontario Canada L5N-2X5 Tel 416-821-7600

IBM® PC, XT are registered trademarks of International Business Machines Corporation. ©Copyright 1984 Quadram Corporation. All rights reserved.

Circle 149 on reader service card

HOW TO RULE

ADMIT IT. You've always wanted control. It was there in your daydreams as you drove to work. The ones in which there's a subtle change in your boss's tone of voice. Your office begins a steady march toward the corner. And suddenly, you're C.E.O. with six phones and the world at your feet.

What was it that kept getting between you and that goal?

We suggest you were disorganized. No more than most, to be sure. But then, things did sometimes get lost, confused, forgotten.

You can't rule the world *that* way.

A TINY AD FOR PEOPLE WHO LIKE FACTS AND FIGURES.

Machine requirements:

IBM-PC, XT, COMPAQ, or other 100% IBM compatible personal computers with 256K min. RAM and 1 double-sided disk drive. Color or monochrome display.

Performance data

2 keystroke mail merge. 1 keystroke express between all applications. Cut & paste between all applications. Word processor features include bold face, underline, headers & footers, print preview, quick-set margins, full justification, visible page breaks, templates and much more. Less than ½ sec. to perform all word processor editing functions. Accepts ASCII files from other popular software. Window locations, sizes and colors customizable by user. One key auto phone dialing.

WE CAN FIX THIS. We have a personal computer program called *Get Organized!* It will organize your life. Quickly and painlessly.

To be exact, *Get Organized!* is 7 different business programs integrated on one floppy disk. It puts everything most managers keep on their desks into your computer. And it does this in such an organized, instinctively easy-to-use way that you'll be using it and benefiting from its power and precision as little as ½ hour after paying for it.

Sound interesting?

A COMPETITIVE ANALYSIS. Compared with *Symphony* and *Framework*, the price of *Get Organized!* is dramatically low—almost $500 lower on a straight list-price to list-price comparison. And *Get Organized!* will run on far less expensive machine configurations. In fact, what you'll save on disk drives and memory alone could pay for a decent printer.

Perhaps the best way to summarize the significance and value of *Get Organized!* is by telling you the following story:

When we exposed IBM-PC owners to *Get Organized!* in secret marketing tests this summer, a good number of them offered to pay us 5 times the list-price for an advance copy.

What do you think *they* had in mind?

THE $4.99 TRIAL OFFER. If some of you feel that the claims we've made for *Get Organized!* sound too good to be true, we have a cure.

Call us. Our number is (800) 227-6703. (In California call (800) 632-7979.) Give us your VISA or MasterCard number. For a $4.99 handling fee, refundable upon purchase of *Get Organized!*, we'll speed a demonstration copy your way (on Verbatim disks, no less). At which point your skepticism will go the way of the morning dew.

Now then. Armed with your own copy of this remarkable value in business software, go forth, think straight, and you will surely rule whatever it is you wish to rule.

If not, you have hereby lost one of your best excuses.

1 A Full-Featured Word Processor. *You're Julius Caesar. You'd like to rule the world, but first you have to write a book about how all of Gaul is divided into three parts and so forth. You do not have Get Organized! Your writing becomes slow, mistake-ridden and arduous. The Senate becomes impatient. You know the rest.*

2 The Address & Telephone File. *If you were Adlai Stevenson and you had Get Organized! you'd have compiled a mailing list of wealthy and influential supporters. Merging this with the Word Processor would have given you a hard-hitting, personalized direct mail campaign. Your budget would have ambushed Ike. And, with the Russians oblivious of the ambitions lurking beneath your liberal exterior, you could have plucked the world like a ripe plum.*

3 The Handy Notepad. *You're Napoleon. You're in the study when your wife Josephine comes in and tells you, "Ze pipes are broken and zere is water in ze loo." "Ah weel feex that thing," you tell her, but since you don't have Get Organized!, you scribble down a note to yourself on the nearest paper which, unfortunately, turns out to be the Order of the Day. Nine hours later your army is clobbered in a Belgian village you never heard of.*

GET ORGANIZED!™

The personal work manager from ELECTRONIC ARTS™

Get Organized! is a trademark of Electronic Arts, Inc. IBM is a trademark of International Business Machines, Inc. Compaq is a trademark of Compaq Computer Corp. CompuServe is a trademark of CompuServe, Inc. Dow Jones is a trademark of the Dow Jones Comp
MCI and MCI Mail are trademarks of MCI Communications.

THE WORLD for $199.

4 The Calendar And Appointments Book.

You're Hannibal. You have this idea of taking elephants over the Alps to conquer Rome, but being from Carthage, you're a little fuzzy on dates and seasons in Europe. If you had Get Organized! you'd have known better, been able to plan for recurring events (like winter) and won the day. It would have been right there on the screen: "January 1... Invade Rome, Rule World."

5 The TeleComm Package.

You're Queen Victoria. An excited young man arrives with Get Organized! and a curious metal box. He claims they will instantly connect you with the Empire by means of something called "electronic mail" and "a terminal emulator." He promises wealth and knowledge through "The Source," "Dow Jones," "CompuServe," "MCI," and "MCI Mail." His name is H.G. Wells. You decide he is quite mad and dismiss him. A century later, you're lucky to still have the Falkland Islands.

6 The Index Card File.

You're Joan of Arc. You're on a roll, but certain people are threatening to make things too hot for you. Get Organized! would've let you keep up-to-date info on your friends and foes. Like resumes, statistics, or even birthdays. Who knows? The right birthday card to the right Inquisitor at the right time could have made all the difference.

7 The Calculator.

Imagine how useful this would have been if you were John Maynard Keynes. Simple arithmetic would have revealed the terrible flaw in your economic theory. Governments the world over would not be printing worthless money to cover their debts. And this program would be a lot cheaper.

Source is a trademark of Source Telecomputing, Inc. Symphony is a trademark of Lotus Development Corp. Framework is a trademark of Aston-Tate, Inc. $199 is the suggested retail price for Get Organized! Prices may vary.

Circle 840 on reader service card

CompuServe Means Business

Gaining access to CompuServe's new family of business data bases can be a snap with The Professional Connection.

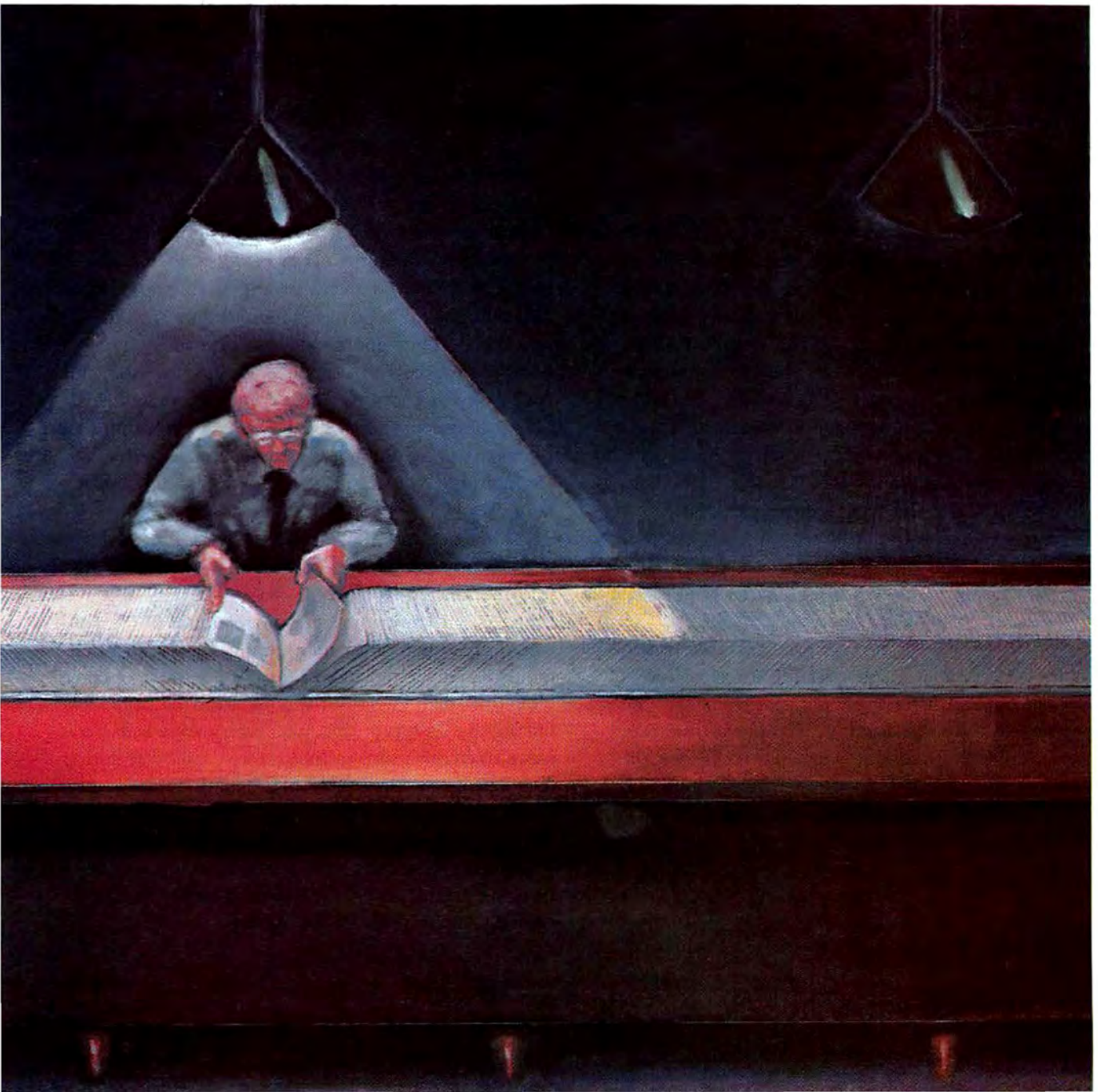
Kirk Bottomly

Imagine possessing a volume that, when opened, could become any book, newspaper, or journal in your city's business library. The PC by itself doesn't have that kind of magical ability, but it can use phone lines to connect to a mainframe computer that does.

With a simple link to a commercial information utility, a PC can function as an electronic window on the encyclopedic data bases of a mainframe. Currently, one of the most popular of these information utilities is CompuServe, which has recently packaged an impressive array of business and financial data bases for managers. The service is called the Executive Information Service (EIS), and CompuServe has made it easy to access with a program called *The Professional Connection.*

Information for Business

Since 1979 CompuServe has been offering the Consumer Information Service (CIS), a portfolio of services that includes electronic mail, access to national news wires, electronic magazines from *Popular Science* to *Business and Law Review,* a national electronic bulletin board, IRS taxpayer information pub-



lications, interactive games such as *Adventure* and *MegaWars,* and an on-line encyclopedia. To build on its subscriber base of 100,000 (more than twice that of its nearest competitor), CompuServe introduced the Executive Information Service, a network information service that works in much the same way as the CIS, its consumer counterpart, but is geared to the information needs of the business professional.

The EIS consists of a vast electronic business library that includes Standard and Poor's, National Business Wire, Moody's, Dow Jones, a daily commodities report, several dozen other financial information services, as well as the news services of the Associated Press and the *Washington Post.* A decision-support module puts a set of sophisticated demographic and statistical analysis tools in managers' hands. Weather, airline, travel, and shopping information are also available. In addition, CompuServe throws in its Consumer Information Service as part of the EIS package.

Making the Connection

Any basic communications program, such as *Crosstalk* or *Smartcom,* can connect you to the EIS, but users of such software already know how to access network services. To capture a larger share of the business market that includes those potential users who have little or no familiarity with communications programs, CompuServe designed *The Professional Connection.* Augmented by DOS 2.00 and a modem, the software enables you to connect a PC to CompuServe's network and access any of its data bases–but it also does much more.

As an entry point to CompuServe's EIS, *The Professional Connection* is a powerful communications program that offers simplicity without sacrificing flexibility.

By purchasing the package, you effectively become a CompuServe subscriber. Calling a customer service number listed in the kit gets you a user ID and a password. Charges for hourly connect time vary from $6 for evenings and weekends to $12.50 for weekday business hours. Accessing many of the data bases (such as the *Washington Post* and the Official Airline Guide) costs extra.

The Professional Connection comes in a small white binder and consists of two disks and a 50-page manual. The documentation summarizes the procedures necessary to hook a PC and modem to the EIS mainframe in Columbus, Ohio, and thoroughly explains how to use the software to navigate data bases and perform basic functions (such as printing or storing information in a separate disk file that will enable you to view or print later). Documentation also includes manuals for both the EIS and CIS that explain all of the data bases and any special procedures. An alphabetical list of data bases and services accessible on the EIS runs nearly 15 pages.

> The Professional Connection *is a powerful communications program that builds in simplicity without sacrificing flexibility.*

When you first run *The Professional Connection,* you are automatically prompted for some basic information–the type of modem, its data transmission speed in bits per second (bps), the local phone number for access to CompuServe, your user ID, and your password. Once you have specified these fields, the program dials up and automatically logs on to the EIS network. (CompuServe can also be accessed through the Tymnet, Telenet, and Canadian DialPac networks.)

Indexes and information from data bases are presented on screen-size "pages." As you read along, information scrolls onto the screen one page at a time. As with any nonelectronic reference book, you can flip readily to any other section (by typing a page number or a section title), return to the table of contents (the main menu), or simply "turn the page" (by hitting the <Enter> key). You can quickly learn to move from one information service to another and to locate precisely those parts of a data base that you want. You can even automate access to the data bases you use most often. *The Professional Connection* makes use of the PC's <Alt> and function keys to turn the printer on or off, switch to earlier menus, capture data to a buffer, and so on.

Moderns, Anyone?

In San Francisco, local public television station, KQED-TV, was holding its annual on-the-air fund-raising auction. Always a popular affair in the Bay Area, the auction inspires generous donations from the community. There is the usual spate of theater, opera, and baseball tickets. A wealthy friend of the station was putting her Mercedes on the block. Countless sauna and massage offerings were up for bid, as well as a spectacular series of six signed Ansel Adams prints. Viewers, in turn, bid generously. What price, after all, can one put on a television week blessed by Louis Rukeyser, Alistair Cooke, and Kermit the Frog?

There, tucked between a set of whitewall tires and an ivory and opal Playboy bunny pendant were *The Professional Connection* and the Executive Information Service, CompuServe's latest offering. "The most accurate, comprehensive package of financial data, current news, decision-support research, and communications options currently available," went the pitch. None of this was very clear, however, as the auctioneers read capsule summaries of the product.

"This program requires an IBM PC," said the announcer, squinting to read a handwritten note, "with DOS 2.00 and a modern." Modern? He gave the note a quizzical look and turned for verification to his on-screen colleague, who looked hard at the card and nodded reassuringly. "DOS 2.00 and a modern," he affirmed.

Yes, public television, otherwise known for its literate programming, is afflicted with computer illiteracy. (Modems may be modern, but the connection ends there.)

The confusion was unfortunate for the businesspeople in the viewing audience: CompuServe is pitching its product precisely at business executives who lack computer experience. KQED's two perplexed auctioneers did little to enlighten that group.

CompuServe's San Francisco office had donated four such packages to the auction. None of them attracted very enthusiastic bidding, and all went for less than half of their $139 value. This is difficult to understand, since anyone offering $140 also received a box of chocolates. You can usually sell anything if you add chocolate to it.

```
                                CompuServe

                                Main Menu

1-CEIS Main Menu    11-Stocks (no log)   21-Directory A:   31-
2-InfoPlex          12-Mail (no log)     22-Directory B:   32-
3-Ticker Retrieve   13-                  23-               33-
4-Quick Quotes      14-                  24-               34-
5-Airline Guide     15-                  25-               35-
6-Comp-U-Store      16-                  26-               36-Reserved
7-Weather           17-                  27-               37-Terminal Mode
8-IBM Forum         18-                  28-               38-Help
9-AP Viewdata       19-                  29-               39-Maintenance
10-                 20-                  30-               40-DOS Command

                                              Use ARROW KEYS to select

Execute   Add   Delete   List               Press ENTER to EXECUTE the
                                              selected entry

Enter selection:
```

Figure 1: The Professional Connection main menu serves as the starting line from which you can run remote job scripts.

```
CompuServe            Page EIS-1

EXECUTIVE INFORMATION SERVICE

1 Communications                6 Shopping
2 Investments & Quotations      7 Weather
3 Decision Support              8 Professional & Technical
4 News                          9 Consumer Information Service
5 Travel                       10 User Information


Enter your selection number,
or H for more information.
```

Figure 2: The Executive Information Service main menu acts as a table of contents for CompuServe's battery of business data bases.

```
LOGIN                !Automatically logs into the service
MATCH "!"            !Wait for this prompt
SEND "go twp"        !Go to the Washington Post
MATCH "!"            !Wait for this prompt again
SEND "8"             !8 is the menu number for World & U.S. News
SEND "1"             !Display story £1
```

Figure 3: This sample Professional Connection script accesses the Washington Post in a few simple steps.

Write Your Own Scripts

The real power of *The Professional Connection* lies in its ability to execute a series of routines automatically–logging on, accessing one or more data bases, printing or storing the desired information, and logging off–with a keystroke or two.

Imagine arriving at your office in the morning, flipping on the PC, loading a program, and by pressing a single key, initiating a routine that automatically

- Logs on to CompuServe;
- Prints the lead stories of today's *Washington Post;*
- Pulls all the messages from your electronic mailbox, prints them, and saves a copy of each;
- Prints a report on the day's top 20 gainers and losers in the stock market;
- Prints ticker quotes for the six major stocks in your portfolio; and
- Logs off.

You must define such a routine. If the prospect of writing your own program gives you chills, relax. These programs are nothing more than step-by-step procedural lists (e.g., first dial a number, then wait for a message, then enter a word, and so on). After creating a routine, you explain the steps to the mainframe, via your PC, using a simple set of commands. CompuServe prefers to call such miniprograms, which are roughly equivalent to macros, "remote job scripts."

Writing a script involves nothing more than telling the PC to execute the steps. When you call up the EIS, you immediately see its main menu, from which you can access any of the EIS data bases. The scripts are executed from *The Professional Connection*'s main menu (see Figure 1); you are not yet on line to CompuServe. When you type one of the menu numbers (such as **4** for Quick Quotes) and press <Enter>, *The Professional Connection* executes a command script linked to your menu selection that automatically logs on to the EIS, moves from the EIS main menu (see Figure 2) to the stock quotation data base, and prompts for the name of a security. The sample script in Figure 3 accesses the *Washington Post.* (The script commands are on the left; explanations are on the right.) The CompuServe prompt is an exclamation point (!), which indicates that the service is ready to receive your input. In a script, the command Match delays execution of the script until the service issues the matching string of characters (such as "Company:"). The script command Send dispatches a string of characters as if you had entered them yourself. It is difficult to imagine how a communications package could be made any easier.

If you're a more experienced user, you can rely on *The Professional Connection*'s scripts to access other networks, such as your bank's home banking service, Western Union's Telex network, or ITT's Dialcom. You simply define the terminal parameters for these networks (phone number, bps rate, parity, and so forth) on a special menu and then indicate the terminal definition to use in the Login command for any given script.

The flexibility of these scripts is *The Professional Connection*'s big advantage. The program can execute logon, log off, and print commands within a

```
rem  script DAILY.RJS for daily routine


rem  - This script will obtain two reports for review
rem  - by a business executive.  It is a morning routine
rem  - that may be easily executed by an executive or a secretary.



rem  - STEP ONE: STOCK GAINS & LOSSES


MATCH "!"              !Where to?
SEND "go iq-200"       !Go to the Stock & Investment Service
MATCH "!"              !Wait for prompt
SEND "mqurep"          !Select particular S&I service
MATCH "!"              !Which stock exchange?
SEND "!"               !Select New York
MATCH "!"              !Which reports?
SEND  "1,2,3,11,12"    !Select  20  most active, largest gains, largest losses



MATCH "!"
SET PRINTER ON
SEND "S"               !Scroll the reports
MATCH "!"              !Reports are done
SET PRINTER OFF
SEND "go eis"          !Back to main menu



rem  - STEP TWO: STOCK QUOTES


MATCH "!"          !Select from main menu
SEND "go iq-100"
MATCH "Company:"   !Stock quote for which company?
SET PRINTER ON



SEND "ibm"         !Get the current IBM quote
SEND " "           !No more info, thank you
MATCH "Company:"   !Next company?
SEND "mer"         !Stock quote for Merrill Lynch
SEND " "           !No more info on Merrill Lynch
MATCH "Company:"   !Next stock quote?
SEND "c"           !Stock quote for Chrysler Corporation
SEND " "           !No more info on Chrysler


 MATCH "!"         !Any more info?
 SEND "off"        !No more info; log off CompuServe
```

Figure 4: This sample script, which illustrates a morning data-gathering routine, enables you to keep tabs on Wall Street.

script without human intervention–something *Crosstalk* and *Smartcom* cannot do. Although preparing scripts is a straightforward process, you should become familiar with the CompuServe service before attempting it.

You can save yourself from rewriting scripts if you first list the information you will routinely want and construct your script accordingly. The system assumes that you will usually follow the same routine in the same sequence. I found this to be *The Professional Connection*'s major drawback. You are bound by the script's logic, which is best suited to routines that do not vary from day to day.

Figure 4 illustrates a sample script that executes a morning data-gathering routine. The program reports on the stock market's top 20 winners and losers, then obtains stock quotes for three securities.

Averting Trouble

If this sounds like a service you can hardly live without, be aware that *The Professional Connection* and EIS will take some time to learn and that your installation may not be problem-free.

Becoming proficient with *The Professional Connection* will take about two days (I cannot think of any useful software that requires less time to learn). Set aside four to eight hours to read the documentation, then set the system up on the PC and play with it until you feel comfortable. On day two, study the script commands and create and execute your own scripts. This may take only two hours or a whole day, depending on how fast you are and how much fun you want to have.

No installation is complete without a few problems. Although the program is menu-driven and fairly straightforward, the documentation assumes that you're an intermediate-level computer user. If you're a typical executive, you know this assumption is well meaning but misguided. You may not know what an ANSI screen driver or a capture buffer or a log file is, why you might want to create new terminal definitions, or whether an error-free file transfer is possible in this lifetime. Persevere anyway. The manual is well structured and will reward your patience with an abundance of helpful information.

The Professional Connection is excellent for going into a selected part of a data base, getting a chunk of information, and getting out. There is no easy way, however, to jump from one script to another without having to log on to the service again. The best solution is to design one or two master scripts using the Login command and then write a handful of "generic" scripts that assume you are already logged on. Any combination of these–which in effect become submenus–can be inserted within a larger script and set up on the main menu for efficient execution. Running the master script then triggers each of the subscripts in turn.

Overall, *The Professional Connection* is a well-designed program that offers just the right trade-offs between flexibility and ease of use to suit its audience–the business professional who is most likely a computer novice. He or she is really looking for access to the various EIS data bases, and an executive can hardly ask for a better key.

Kirk Bottomly is a consultant for PA Computers and Telecommunications in Berkeley, California.

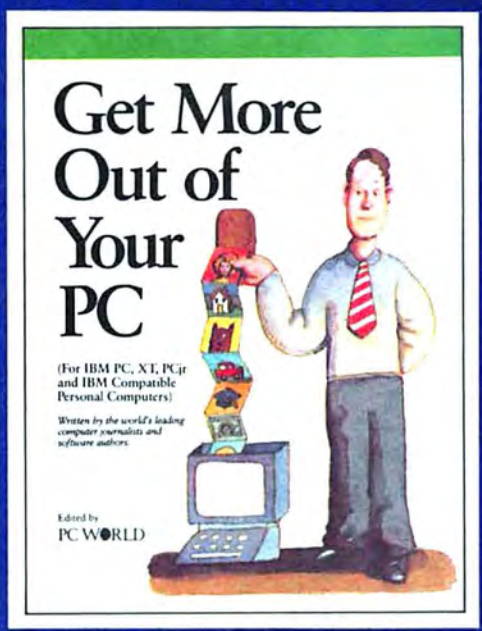
The Professional Connection and Executive Information Service (EIS)
CompuServe, Inc.
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
800/848-8199, 614/457-8600
List price: The Professional Connection and EIS $139.95, EIS only $89.95
Requirements: 128K, DOS 2.00, one disk drive, modem (either nondialing or Hayes compatible)

Subscribe to

PC WORLD

- **Save $26 off the newsstand price**
- Have *PC World* delivered right to your desk
- **Get a free book to help you get started**

Save $26 and get this book free . . .



. . . when you subscribe to *PC World*!

YES Enter my subscription for the term checked below and rush my FREE copy of *Get More Out of Your PC*. I'll save 58% off the newsstand price and 21% off the regular subscription rate.

☐ 14 issues/$18.95 ☐ 28 issues/$33.50
☐ 42 issues/$47.00

☐ Bill me ☐ Payment enclosed

VISA and MasterCard accepted—call TOLL-FREE: 800/247-5470 (in Iowa 800/532-1272)

Name _____

Company _____

Address _____

City, State, Zip _____

Please allow 6-8 weeks for shipment of your first issue. Outside the U.S., orders must be prepaid in U.S. funds. Outside the U.S. and Canada, add $25/year for surface mail or $110/year for air-mail. **Offer expires June 30, 1985**

PC WORLD

J12D015

YES Enter my subscription for the term checked below and rush my FREE copy of *Get More Out of Your PC*. I'll save 58% off the newsstand price and 21% off the regular subscription rate.

☐ 14 issues/$18.95 ☐ 28 issues/$33.50
☐ 42 issues/$47.00

☐ Bill me ☐ Payment enclosed

VISA and MasterCard accepted—call TOLL-FREE: 800/247-5470 (in Iowa 800/532-1272)

Name _____

Company _____

Address _____

City, State, Zip _____

Please allow 6-8 weeks for shipment of your first issue. Outside the U.S., orders must be prepaid in U.S. funds. Outside the U.S. and Canada, add $25/year for surface mail or $110/year for air-mail. **Offer expires June 30, 1985**

PC WORLD

J12D015

GET MORE OUT OF YOUR PC

SEE OTHER SIDE FOR DETAILS

NO POSTAGE NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 63 BERGENFIELD, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 6700
Bergenfield, New Jersey 07621

NO POSTAGE NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 63 BERGENFIELD, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 6700
Bergenfield, New Jersey 07621

ALL YE NEED KNOW.

Like:

"How many boxes of 'Trivial Pursuit' we got left in the West Coast warehouse?"

"Mr. Jones, your expense account just set an IRS record. Can you explain how, where, and with whom you managed to spend $12,648 on 'client entertainment'? In one week?"

"Listen, Eddie, we own 1,400 stores, and you're telling me you can't find one lousy Cabbage Patch doll?"

"We got any dealers in New England with a new Chevy Citation on the lot in metallic silver, blue interior, and stereo with cassette deck?"

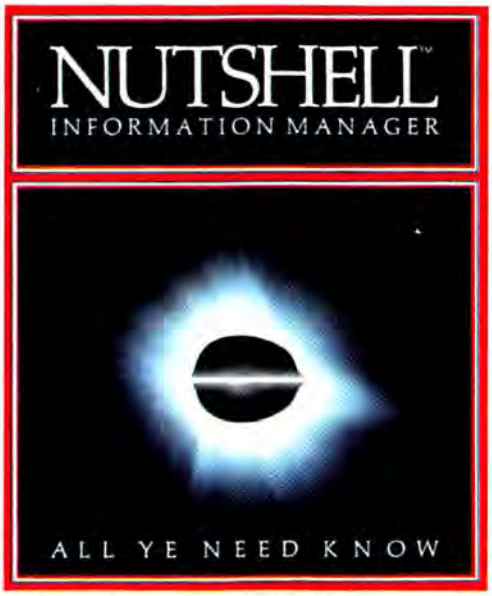
"Of all the furniture we sell, how many pieces in the $600 to $800 range haven't turned over this month?"

"I met this distributor in Chicago who wants to order a million units, and his name is McTavish or McCormack or McMurphy or McCarthy or something, and silly me, I lost the napkin I wrote his name on . . ."

And so on.

And so . . .

THE NUTSHELL™ INFORMATION MANAGER.



It stores and cross references any data your business depends upon—once an hour or once in a lifetime—and lets you get at it and use it in an instant.

It's an information-management software package created to take full advantage of all the power inherent—but until now never tapped—in sophisticated personal computers like an IBM® PC (upgraded to 256K) or a Leading Edge™ PC.

And it spans a major gap: Between toys that act like glorified file cabinets, on the one hand; and costly, complicated database management systems, on the other.

Now, the Nutshell™ doesn't pretend to give you all the information in the world. Just all the information you need, in any form you need it: inventory lists, invoices, sales reports, salary summaries, customer histories—with fields of virtually unlimited length—on the screen, or in printed reports.

To be sure, it's similar to a giant file cabinet. (In fact, depending upon your computer, its paper equivalent could be some 2 billion separate records, or 2 miles of printed information.) But there the similarities cease. Because you can access any data in any of those files by the most incredible cross-indexing system ever conceived for a PC. You can call up information by file name, date, prices, part number, manufacturer, description (like "red"), and a dozen other different ways in seconds.

Even if you forgot you had it.

Remember the incident concerning McTavish, McCormack, McEtc?

All you have to do is type in the first few letters of any name you want to recall (like "Mc") and every word in every file that starts with "Mc" pops up on the screen.

So you find "McGuire" and, along with his name, his million-unit order.

Where were you on that weird week of March 5, 1984 when you managed to expense $12,648? Type in 3/5/84 (or "$12,648" or "Polo Club"), and . . . here's your answer, Mr. Tax Man.

You can even selectively withhold certain information for display. (For example, you could show a customer every house your real-estate agency has for sale, without showing the owner's very lowest acceptance price.)

EASY TO DO. HARD TO DO WITHOUT.

Thanks to an instruction disk that leads you through practice lessons, and on-screen menus that let you choose what you want and tell you how to get it, the Nutshell is one of the easiest-to-learn programs ever designed.

And once you learn it, you'll never want to be without it.

LEADING EDGE™

Call or write now for your FREE Nutshell™ demo disk.
The only thing we'll need is the serial # of your IBM or IBM compatible machine.

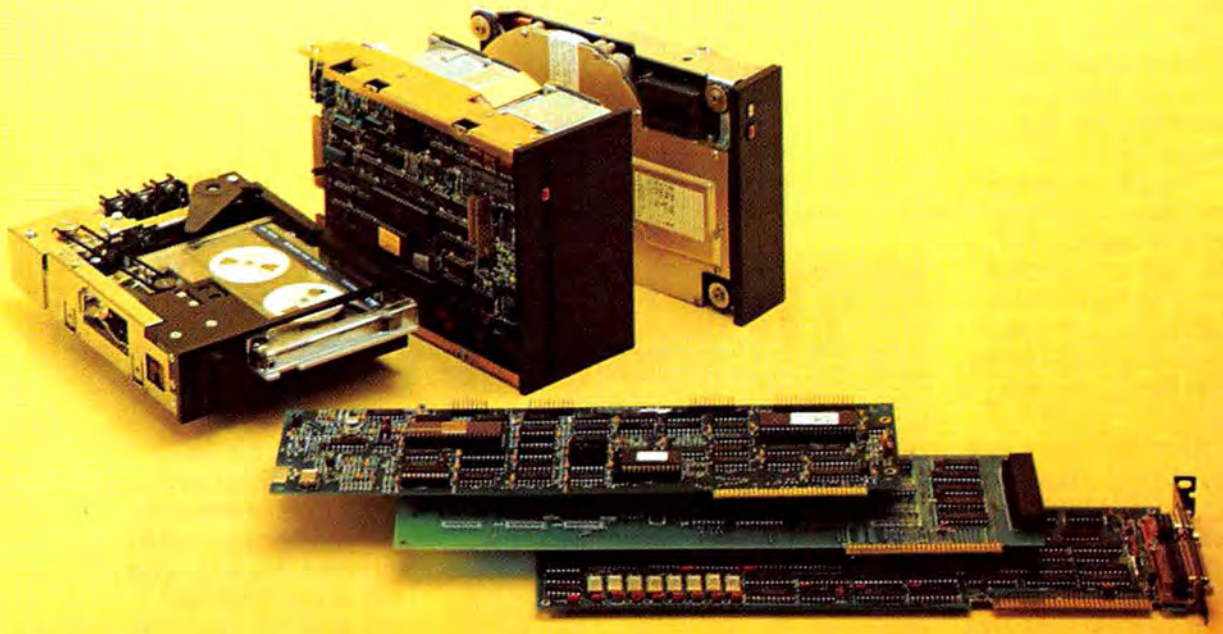
Leading Edge Products, Inc.
Software Division, 21 Highland Circle, Needham Heights, MA 02194, 800-343-3436, (617) 449-4655.

Nutshell is a trademark of Nashoba Systems, Inc. IBM is a registered trademark of International Business Machines Corporation.

Circle 91 on reader service card

The Innovation That Makes High Capacity Data Backup Simple and Affordable

AVAILABLE NOW!



Introducing the ***first*** high capacity 1/4-inch Streaming Tape backup systems that plug right in to your PC, XT and AT — the EXCEL series. No other backup system can match the space-saving size, high speed, and flexibility of the revolutionary EXCEL series.

Capacity To Meet Your Needs
EXCEL tape systems meet the high capacity needs of business. You can backup nearly 20,000 pages of information (up to 60 megabytes!).

Backup Information in Minutes, With the Flexibility You Want
EXCEL tape systems backup information faster than any other 1/4-inch backup system. Your ten megabyte hard disk drive can be backed up in just over *two minutes*!

You can backup two ways. For flexibility, use the file-by-file backup to select the files you want. Or, to save time, use the faster "mirror image" backup for a complete backup of your hard disk in minutes.

Here's the best part. You can backup your hard disk with a fast "image," then retrieve either file-by-file or the entire hard disk image. No other backup system lets you do this. This gives you the flexibility you want while saving you hours of time!

And EXCEL tape systems give you the largest selection of file selectable options available — choose from name, date, time, time interval, global, qualifier and more.

Choose the System That's Right For You
EXCEL tape systems are available in a wide selection of models: internal mount, external, slim, half and full sizes. Our slim-size expansion models let you add more drives or tape systems and give you more slots for adding accessories.

Visit your local Everex dealer today and ask to see the EXCEL tape system in action. You'll be amazed at how simple, flexible and affordable high capacity backup can be.

For the name of your nearest Everex dealer, call (415) 967-1111.

EVER for EXcellence

See us at
COMDEX™/Fall '84
November 14-18, 1984
MGM Grand Hotel
Las Vegas, Nevada Booth 1210

esi

Dealer Hotline (800) 821-0806. In California (800) 821-0807

Everex Systems Inc.

891 Maude Avenue, Mountain View, CA 94043

IBM, PC, XT and AT are registered trademarks of International Business Machines Corp.
EXCEL is a trademark of Everex Systems Inc.

Circle 699 on reader service card.

Find text information in seconds with our librarian-in-a-box™

- *Searches thousands of files on hard disk or diskettes.*
- *No more tedious databases.*

If you're a typical word processing or information service user, you're probably very frustrated. You've created dozens, even thousands of files. And now you can't find that important contract on your hard disk. Or that stock information from Dow Jones you saved to a floppy.

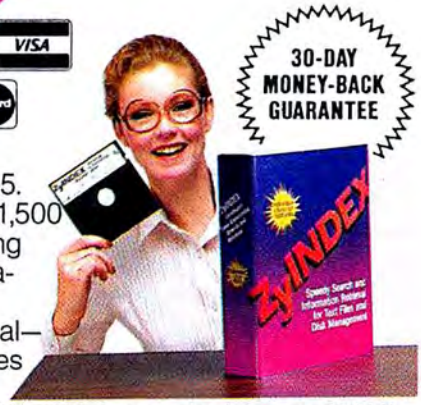
Now there's a solution: ZyINDEX. Our unique librarian-in-a-box. Forget inflexible database management systems that force you to enter everything in rigid fields. ZyINDEX lets you find any word, phrase or number—or combination of these—wherever they appear—in seconds...*not just in one file, but in thousands.* To ZyINDEX, your entire hard disk or collection of floppies is like one big file.

Imagine you're looking for that electronic mail you saved last April from Cyrzbzniski. Or was it from Cyrbranowski in November. Relax. Just type in "cyr*" and it's there. You can also use combinations of ANDs and ORs and NOTs. You can even specify a range—how far apart words or phrases can be.

ZyINDEX works on the IBM PC, XT, compatibles, and other MS-DOS computers. It operates with ANY word processor, including WordStar, pfs:WRITE, Microsoft Word, WordPerfect, MultiMate, and Volkswriter. And other programs, including Lotus 1-2-3. Ask your local dealer to order a copy of ZyINDEX, or call 800-54INDEX.

VISA

MasterCard



- ZyINDEX Standard—$145. Searches 500 to 1,500 documents, depending upon the search capabilities you choose.
- ZyINDEX Professional—$295. Offers ten times greater capacity.

(Both require DOS 2.0 or higher, and minimum 192K.)

ZyLAB™ Corporation
233 East Erie, Chicago, IL 60611

800-544-6339
(In Illinois, 312-642-2201)
Call for the dealer nearest you.

Copyright 1984. ZyINDEX and Librarian-in-a-Box are trademarks of ZyLAB Corporation. All Rights Reserved.

Circle 704 on reader service card

The First Five Functions

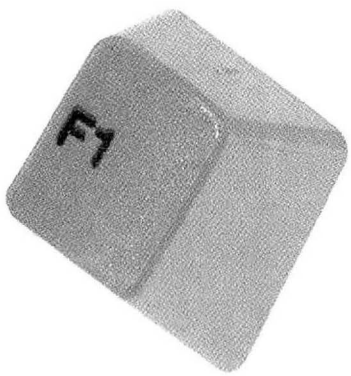
DOS turns function keys <F1> through <F5> into special command-editing keys that eliminate some retyping and can help you fix typos.

Seth Novogrodsky

Application programs such as *WordStar* and *1-2-3* take advantage of the PC keyboard and assign commands to the computer's ten function keys. Although DOS (disk operating system) is probably the most popular program for the PC, many people are unaware that DOS also assigns functions to these same keys.

Some DOS commands, such as DIR, are quick and easy to type, but others are slow and cumbersome, such as

```
COPY CHAPTER1 +
CHAPTER2 B:BOOK /V
```



Such long command sequences can be even more tedious if you have to type them frequently. Worse still is typing a long command and then realizing that you made a typographical error at the beginning of the line. Fortunately, the special DOS editing keys (see Table 1) can alleviate such problems.

Editing the Command Line: <F1> and <F3>

Normally, if you see a typographical error in a DOS command that you are entering, you press the <Backspace> key, <Ctrl>-H, or the <CursorLeft> key on the numeric keypad until you have erased both the error and any correct characters along the way; you then correct the mistake and retype the rest of the command line. If your mistake was at the beginning of the command, you are forced to retype the entire line. There is, however, an easier way.

Let's say, for example, that you have a DOS disk in drive A: and you want to give the command

```
CHKDSK B:FILE?.TXT /v /f
```

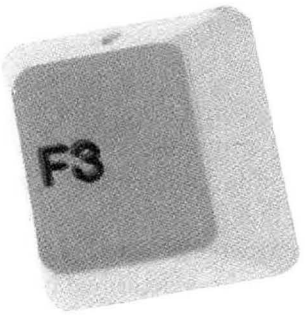
but you inadvertently transpose characters and type

```
CKHDSK B:FILE?.TXT /v /f
```

DOS, of course, won't find the CKHDSK.COM file and will dis-

play an error message. Rather than retype the whole command to correct the spelling of CHKDSK, you could press <F1>, type HK, press <F3>, and then press <Enter>.

Whenever you type a DOS command and press <Enter>, the command is stored in a special area of the PC's memory called the input buffer. Certain function



keys allow you to manipulate characters stored in this buffer. Pressing <F1> copies one character at a time from the buffer–in this case the C–and displays the character(s) on the command line. (Pressing the <CursorRight> key on the numeric keypad has the same effect.)

In the example, when you type the letters HK, you are actually typing over the next two characters in the input buffer. If you need to insert or delete characters in a line, you could use the <Ins> or <Del> keys. Pressing <F3> copies all the remaining characters in the buffer to the display. The correctly typed command CHKDSK B:FILE?.TXT /v /f can then be given by pressing <Enter>.

Pressing <F3> at the DOS prompt copies the last command issued to the screen, providing a quick way to issue the same command two or more times in succession.

Editing With <F2> and <F4>

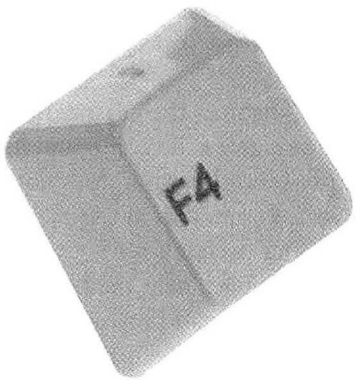
The <F2> and <F4> keys make it easy to modify large chunks of a command line. For example, let's say that you need to compare files on a disk. If you want to compare FILE1 with FILE2, you could type:

COMP FILE1 FILE2

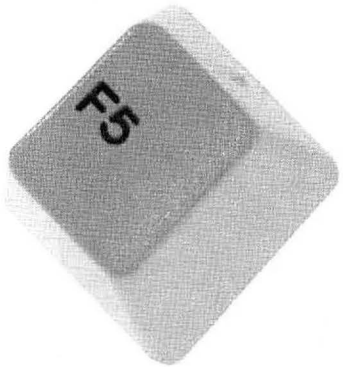
If you want to compare FILE1 with FILE3, you could type:

COMP FILE1 FILE3

However, you can conserve keystrokes if, after you compare FILE1 with FILE2, you type <F2> 23 <Enter>. <F2> copies and displays all characters in the



buffer up to but not including a specified character. Since you want to preserve the command line up to the number 2, you type 2 to tell DOS that the number 2 is the specified character. The screen displays 'COMP FILE1 FILE'. To complete the command, type 3, and press <Enter>.



<F4> skips over all the characters in the buffer up to but not including a specified character. <F4> is similar to <F2> in that the command should always be followed by a character. Using the <F4> key is generally more convenient than using the <Del> key to skip over characters in the buffer. For example, let's say that you enter the following command:

COPY B:PCWORLD.TXT MYFILE.TXT

If you then want to copy MYFILE.TXT to the disk in drive B: and rename it IBMFILE.TXT, you could type:

COPY MYFILE.TXT B:IBMFILE.TXT

But to save some keystrokes you could press <F2> and type B to restore everything up to the *B*. Then you'd press <F4> and type M to delete the text up to the *M* in MYFILE (that is, to delete B:PCWORLD.TXT). Then you would press <F3> to display the rest of the line, 'MYFILE.TXT'. Finally, you would press the <Space> bar, type B:IBMFILE.TXT, and press <Enter> to complete and execute the revised command.

TAKE CARE OF YOUR LUNGS. THEY'RE ONLY HUMAN.

Now, honey, you listen to Pearl. This year, do yourself and your friends a real favor. Support Christmas Seals. They help fight lung disease, and remind everybody to take care of their lungs. When you support Christmas Seals and use them on your holiday cards and packages, it *really* shows you care.

Love Pearl Bailey

AMERICAN LUNG ASSOCIATION®
The Christmas Seal People®

Space contributed by the publisher as a public service

Table 1: A description of the DOS editing keys

Key	Description
<F1>	Repeats previous command, character by character
<F2>	Repeats previous command up to a specified character
<F3>	Repeats last command in entirety
<F4>	Skips over characters in previous command up to a specified character
<F5>	Saves currently displayed line for editing and advances to next line

Fixing Typos With <F5>

Have you ever noticed a typographical error at the beginning of the command line just as you were about to press <Enter>? If you made a number of typos, the best thing to do would be to press the <Esc> key. This key cancels your misspelled command line, restores the previous contents of the buffer, and advances you to the next line. If, however, you made only a few errors, you should press <F5>.

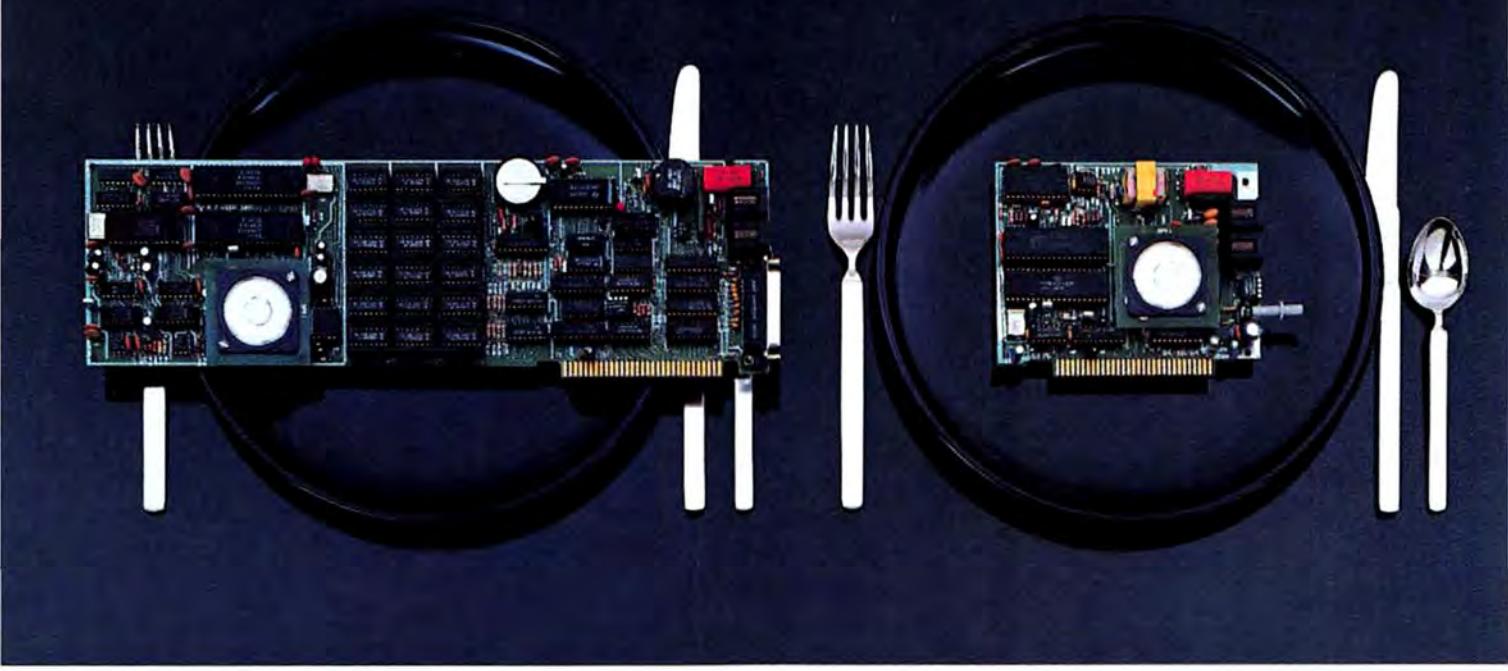
<F5> advances the cursor one line and preserves the command in the buffer even though it does not display the command on the screen. After pressing <F5> you can make changes near the beginning of the command by overtyping or using any of the other editing function keys or the <Ins> and <Del> keys. When you finish making the corrections, simply press <F3> to redisplay the remainder of the command line, and press <Enter>.

You may wonder whether the DOS editing keys described here are worth all this trouble. If you use your PC regularly, the answer is a resounding yes. With a little practice you can master the special DOS editing keys and conserve many keystrokes. Once you start working with these special DOS keys, you will be surprised at how much time you save.

Seth Novogrodsky is a Contributing Editor for PC World *and PC World Books.*

MODEM À LA MODE

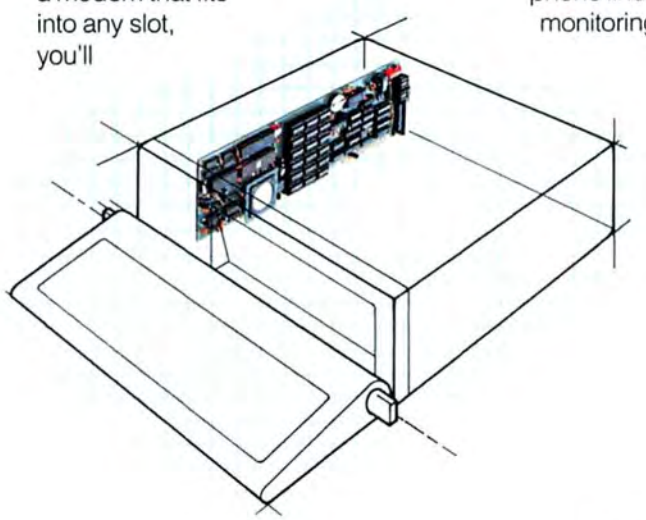
MODEM À LA CARTE



THERE'S A PC BOARD TO SUIT YOUR TASTE.

It's an appetizing choice—no matter which space-saving modem you choose for your IBM PC, XT, Portable, or any other compatible computer.

If you're looking for a modem that fits into any slot, you'll like our 5¼" mini-board. It transmits and receives data at a maximum speed of 1200 baud (120 characters per second), and features auto-dial, auto-answer, and audio phone line monitoring.



Or, select our 'à la mode' 13" slot board. You'll enjoy the same quality performance that's available on our 5¼" model, topped off with extra features that would normally take three extra slots. These include a real-time clock/calendar, a printer interface, and either 64K or 256K of additional RAM.

And with each modem, U.S. Robotics includes Telpac™ the feature-filled telecommunications software package that is everything you need for error-free, automatic data transmission.

So, whether you order à la mode or à la carte, you'll get the most out of every byte.

U.S. Robotics, Inc.
1123 W. Washington
Chicago, IL 60607
Phone: (312) 733-0497
Outside Illinois: 1-800-Dial-USR

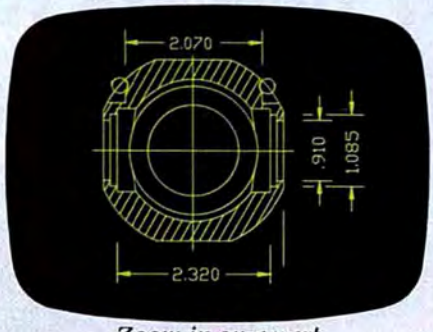
Circle 405 on reader service card

Our $2,000 CAD softwa

Task Force TIPS of Indiana needed to design an Automatic 50-350 GPM fire hose nozzle. They might have used a quarter million dollar computer-aided design system, but they used AutoCAD™ instead.

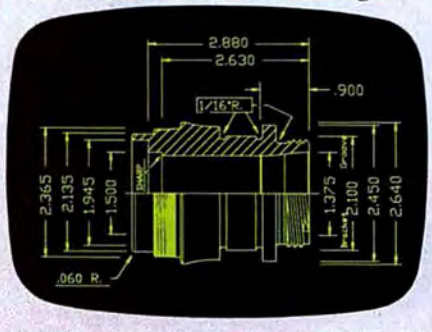
Mainframe CAD capability at 5% of the price.

If you have an IBM PC, NEC, NCR, DEC, TI, WANG, or one of over 17 desktop computers AutoCAD supports, you *already own* the most expensive part of a CAD system. AutoCAD, combined with a pointing device and plotter (the choice is yours, we support over 40 peripherals), puts the power of CAD on your desktop at a price you can afford. A complete system can cost less than $10,000.

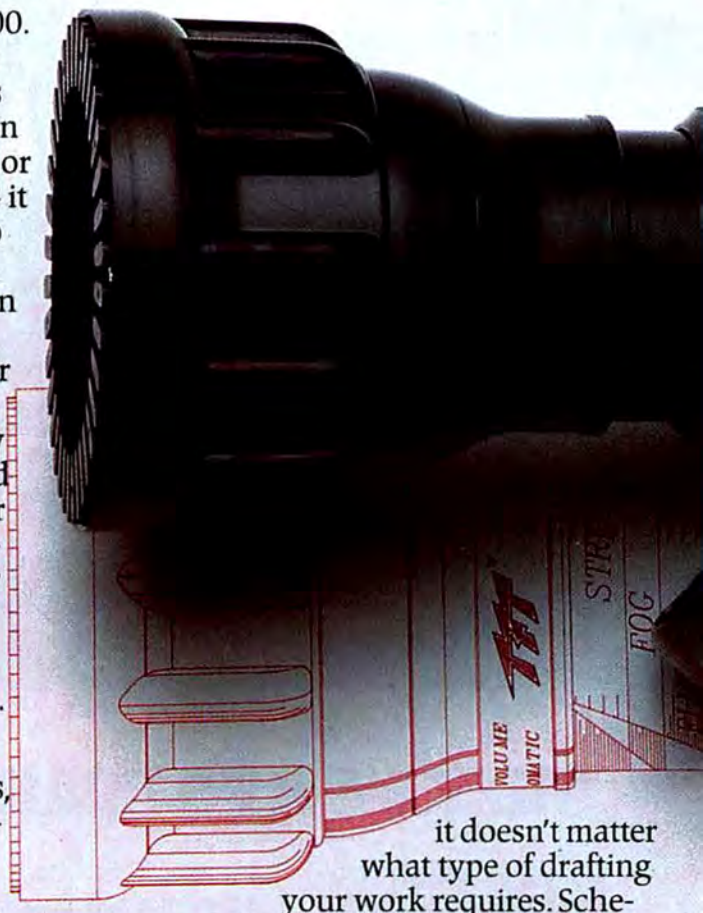


Zoom in on a part to focus on the details

AutoCAD automatically dimensions distances and angles



AutoCAD's editing facilities let you DRAW an object, ROTATE or SCALE it, DRAG it on the screen to any position, STORE it away in a parts library for recall in other drawings, FILL an area with any of our 38 defined patterns or 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.



Quick to learn, easy to use.

The beauty of AutoCAD 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 too good to be true? A simple one-touch menu structure points you in the right direction. On-line HELP keeps you on track.

Schematics, skyscrapers, and everything else.

Since AutoCAD is general-purpose and user-customizable, it doesn't matter what type of drafting your work requires. Schematic design, building plans, PC board layout, archeological site documentation, wheelchair design, chemical plant piping diagrams, and stained glass layout have all been done with AutoCAD.

Would the Pantry be better where the stove is? Use the MOVE command

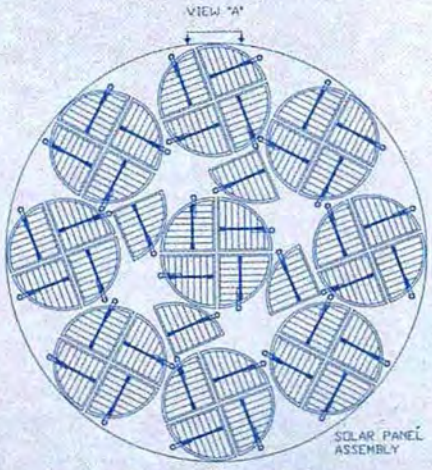
Architectural layout courtesy of Lansing Pugh, Architect Solar Panel Assembly plot courtesy of Future Technology, Inc.

re ends budget burnout.

Fire nozzle and nozzle designs provided courtesy of TASK FORCE TIPS, Inc.

The heart of your CAE system.

Drawings are only part of the story. Predefined standard symbols, translators to allow AutoCAD to exchange drawings with mainframe CAD systems, database analysis programs for bill of materials lists and job costing, and drawing distribution by telephone are only some of the capabilities available with AutoCAD. These capabilities make AutoCAD the central component in your desktop computer-aided engineering (CAE) system.



Circles, arrays and area fills are easy with AutoCAD

Whether you're in a two-person 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 will never be obsolete.

See for yourself.

Let us show you why AutoCAD is rapidly becoming the worldwide standard for computer-aided drawing. Call or write us today for the name of your local dealer who will show you hands-on how AutoCAD can save you time and money.

AutoCAD: for designers, it's why the personal computer was invented.

AUTOCAD™

AUTODESK, INC.
2658 BRIDGEWAY
SAUSALITO, CA 94965
(415) 331-0356
TELEX 756521 AUTOCAD UD

Circle 596 on reader service card

MicroStuffer™ PrinterBuffer

64K Printer Buffer

- Works with any computer. With standard Centronics parallel interface.
- Works with any printer. Centronics parallel - standar RS232 Serial - optional

Only **$149.95**

- Clear button
- Multiple copy repeat function
- Auto diagnostics
- Self test

MICROBITS PERIPHERAL PRODUCTS

225 Third Avenue,SW
Albany, OR 97321
(503) 967-9075

The MicroStuffer Printer Buffer works with any computer with standard Centronics parallel interface, and with any printer (Centronics parallel - standard; RS232 Serial - Optional). Computers and printers listed in this ad are only a partial listing. Registered trademarks: Apple, Apple Computer, Inc.; Atari, Atari Corp.; AT&T, AT&T Information Systems; Commodore, Commodore Business Machines; Compac, Compac Microelectronics, Inc.; Epson, Epson America; IBM, International Business Machines; Kaypro, Kaypro; NEC, NEC Information Systems, Inc.; Okidata, OKI America Co.; Smith-Corona, Smith-Corona Marchant. MicroStuffer PrinterBuffer is a trademark of Microbits Peripheral Products, Inc.

Circle 864 on reader service card

Like father, like son.

Thanks to Microsoft® PCjr Booster with Mouse, the IBM® PCjr has grown up.

It gives jr enough memory (an extra 128 K) to run the same programs as PCsr. Programs like Lotus™ 1-2-3,™ dBASE II® and Microsoft Word.

Or you can turn your mouse into a paintbrush with IBM PCjr ColorPaint.

PCjr Booster with Mouse. More than compatibility.

The Booster just plugs into your jr and substantially improves the usefulness of programs like Lotus 1-2-3, Multiplan,® Microsoft Word and others, because the mouse software makes them easier to use.

Since Microsoft designed the MS-DOS™ operating system for the entire IBM PC family, it figures we'd be the one to bring high performance to the PCjr.

So if you'd like to improve jr's achievement call (800) 426-9400. And ask for the name of your nearest Microsoft dealer. In Washington State, Alaska, Hawaii and Canada, call (206) 828-8088.

MICROSOFT®
The High Performance Software™

Free Flying Lessons

Boost jr and get a free Flight Simulator.

Now when you buy the PCjr Booster, get a bonus worth $50 from your dealer: a free Microsoft Flight Simulator. And become a jr birdman.

Microsoft and Multiplan are registered trademarks and MS-DOS and The High Performance Software are trademarks of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. dBASEII is a registered trademark of Ashton-Tate

IF IT ISN'T ONE OF THOSE BRAND-NEW C. ITOH 7500 PRINTERS THAT COSTS A MERE PITTANCE... FORGET IT.

A new C. Itoh isn't exactly a stocking stuffer. But as printers go, the new ProWriter™ 7500 dot matrix goes for very little money.

Yet, it's C. Itoh quality through and through. A gift fit for a king. Tested. Proven. So doggone reliable it will be around for many a Christmas to come.

It gives you IBM® PC compatibility, and it's perfect for your basic printing needs.

The 7500 delivers 105 characters per second, 54 lines per minute throughput. It has bi-directional printing, graphics, and a 2-Kbyte buffer.

It has a very low profile design, only 4.3 inches high. And it is extremely quiet and lightweight, less than 14 pounds, making it ideal for office or home.

Like all C. Itoh printers, the 7500 comes with a full 12-month warranty, backed by over 400 Authorized Service Centers coast to coast.

C. Itoh and your C. Itoh dealer wish you and your PC the best Christmas ever. (And you can print that.)

C. Itoh printers since 1973, from a $60 billion world-wide company that began making better products over 125 years ago.

For more information, just call toll free 1-800-423-0300. In Massachusetts, call 1-617-769-8770. Or write C. Itoh Digital Products, Inc., 19750 South Vermont Avenue, Suite 220, Torrance, CA 90502.

© 1984 News Group Chicago, Inc.

C. ITOH
DIGITAL PRODUCTS

™ ProWriter is a Trademark of C. Itoh Digital Products, Inc.
® IBM is a Registered Trademark of International Business Machines Corp.
© 1984 C. Itoh Digital Products, Inc.

Circle 777 on reader service card

The Help Screen

PC World offers answers and advice at every level.

When is BASIC not BASIC? Why is DOS distributed on single-sided disks? How can you dim WordStar's bright text characters? How does a batch file test for an empty DOS variable?

Karl Koessel

This month's column begins with a look at why calling IBM's BASIC.COM does not bring up the language on compatible machines even though they seem to run everything else. Then a reader asks why IBM distributes PC-DOS, which can write to both sides of a disk, on two single-sided disks. Another reader wants to turn down the intensity of *WordStar*'s text. And the last item demonstrates how a batch file tests for an empty DOS variable.

BASIC Misunderstanding

Q. Recently I purchased a Compaq computer with the understanding that it was 100 percent IBM compatible. Now I am having difficulty with a BASIC program written especially for the IBM PC. This program was created to allow my company's insurance carriers to do in-house preparation of group major medical illustrations on either the IBM Monochrome or Color Display.

The program works fine on the PC but not on the Compaq. When I place the program disk in drive A: and turn on or reset the Compaq, the disk spins and the DOS A> prompt appears. The disk continues to spin, and after a moment the words 'BASICA MEDICAL' automatically appear next to the DOS prompt. In another moment the screen goes blank and the disk stops spinning. At that point the Compaq feigns death; characters typed do not appear on the screen, and <Ctrl>-<Alt>-<Del> does not reset the machine. The Compaq must be shut off and restarted.

Why does this disk, which works in the PC, fail to run in the Compaq? Can you advise me how to make this program work on a Compaq?

Harvey Zimmerman
Rockville Centre, New York

A. There are two possible reasons why a BASIC program that runs on a PC might not work properly on a Compaq or other PC-compatible machine. First, if a program "writes" directly to the monochrome screen buffer (a section of memory on the video board that holds the characters for the monochrome display), the program will not work properly on the Compaq or any other machine that does not have a monochrome screen buffer. That includes any PC without a Monochrome Display Adapter or its equivalent. MEDICAL works on either display, so this is not the problem.

The difficulty you're having is due to the difference between the method used by the PC and that used by the Compaq to engage the BASIC language. The PC has a 32K read-only memory (ROM) chip that contains most of the BASIC language interpreter. When you issue the DOS command BASIC (or BASICA for the larger, more powerful, "advanced" version), DOS adds the PC-DOS disk file BASIC.COM (or BASICA .COM) to the PC's random access memory (RAM). BASIC.COM and BASICA.COM contain instructions that supplement the PC's ROM BASIC kernel–they do

not replace ROM BASIC nor can they function without the ROM BASIC kernel.

The Compaq does not have BASIC in ROM (nor does any PC compatible currently on the market). Instead, the entire BASIC language interpreter is combined in a disk file. When this file is called, the BASIC language interpreter is loaded into the computer's RAM, typically occupying from 50K to 60K of memory. Despite the differences in form, the BASIC contained in a disk file is very compatible with the BASIC that the PC uses when its disk file BASIC supplement is appended to its ROM BASIC. When you try to run MEDICAL on the Compaq, the automatic start-up file (AUTOEXEC.BAT) calls BASIC before loading MEDICAL. The BASIC file on that disk, however, contains the IBM PC BASIC supplemental instructions, not the full BASIC language interpreter that the Compaq needs to run BASIC. Therefore the Compaq "dies."

To correct this problem, place the Compaq DOS disk in drive A:, place the MEDICAL disk in drive B:, and turn on the Compaq. When asked, enter the date and time. Then type the command **COPY A:BASIC*.* B:** and press <Enter>. You should receive the message '3 File(s) copied'. Remove the Compaq DOS disk, place the MEDICAL disk in drive A:, and reset the computer by pressing <Ctrl>-<Alt>-<Del>.

Single-Sided DOS Disks

Q. File Command, *one of the programs in the IBM PC Computer Language Series, is particularly useful for letting a user know the degree to which a particular disk is filled. It also uncovers and reports the amount of space taken up by hidden files. Something that has me puzzled, however, is my PC-DOS 2.10 disk.*

File Command *indicates that this disk has a maximum of 179,712 bytes. This seems odd, as the total capacity should be twice that. In addition, there is an unusual hidden file, VENDOR-#.DA1, on the disk. The PC-DOS 2.10 Supplemental Programs disk shows the same size limitation and contains the same hidden file. By any chance, is IBM distributing these disks in a single-sided format? If so, why? Could the VENDOR-#.DA1 file be some sort of control?*

In "An Important Exercise: Backing Up Your DOS Diskette" in the chapter "Using DOS" in "Section 3. Operations" of the IBM Guide to Operations manual, users are instructed to issue the command DISKCOPY A: B: to make a backup of the DOS disk. Is there any reason not to use the command FORMAT B:/S to format both sides of a new disk and then, using the command COPY A:.* B: twice, transfer both the PC-DOS 2.10 files and the PC-DOS 2.10 Supplemental Programs files onto the new double-sided backup disk?*

A. L. Henrichsen
Arlington, Virginia

A. The function of the file you ask about is indicated by its name: VENDOR-#.DA1 tells IBM the identification number of the vendor, i.e., the disk-duplicating company responsible for producing that disk. The directory entry for VENDOR-#.DA1 consists of the name, a date, and a file size of 0. The entry also indicates that the starting cluster number for this file is 0, the invalid file cluster number used for a dummy file directory entry such as a volume label. Other than the date, this entry has no significance.

IBM distributes DOS on single-sided disks so that single-sided drives can read the files. It is a common misconception that DOS fills one side of a double-sided disk before writing to the second side. Actually, on a double-sided disk DOS first writes to the outermost track (farthest from the center) that has free sectors, then writes to the free sectors of the same track on the other side of the disk, then writes to the free sectors of the next track toward the center on the first side, and so on. Thus, DOS writes to a double-sided disk on the outer tracks of both sides before writing to the next inner track.

In "An Important Exercise: Backing Up Your DOS Diskette," you are instructed to use the command DISKCOPY so that you can then use the single command DISKCOMP to compare all the

files on the backup with those on the original. There is no reason not to put all the DOS files on one disk if the PC you use has double-sided drives. The only drawback to using the command COPY A:*.* B: is that if you want to compare all the copied files, you must use the command COMP repeatedly, because COMP compares only one pair of files at a time.

Bright or Light WordStar

Q. In "Another Set of WordStar Patches" (.*, PCW, Vol. 1, No. 7), contributor Alan Fridlund mentioned that he had patched his* WordStar *to present normal type in normal intensity and marked blocks in high intensity, but he didn't explain how to do it. This modification would make* WordStar *a lot easier on the eyes, especially during long sessions of slaving over a hot keyboard.*

Walter Malanga
Mobile, Alabama

A. Personally I prefer my word processor to present text in high intensity. I find the brighter characters easier to read. Maybe you should adjust the brightness and contrast of the monochrome display. If you still want to change intensities for *WordStar*'s normal and block text, you will need a copy of WSCOLOR.BAS, the BASIC program that comes with your original purchase, or a copy of the DOS utility DEBUG.COM.

The character attribute value *WordStar* uses for characters within a marked block or in menus is stored in the 389th byte of the file WS.COM. The character attribute value for normal, unmarked text is stored in the 396th byte. On a color display, character attributes determine the color of the characters and the rectangular cell in which the characters are displayed. On the monochrome display, the attributes may specify normal, underlined, blinking, high-intensity, or inverse characters. For your purposes you need an attribute value of 0F hexadecimal (which specifies high-intensity characters) for marked blocks and an attribute value of 07 hexadecimal (which specifies normal-intensity characters) for unmarked text.

WSCOLOR frees you from having to know file offsets or character attribute values. Although this BASIC program is intended for use with a color display, it can be used to specify the type of character *WordStar* will use on the monochrome display. To run WSCOLOR, load DOS (you should see the DOS A> prompt), then place a disk containing a copy of BASIC in drive A:, type **basic**, and press <Enter>. Now replace the disk in drive A: with the disk containing WSCOLOR, type **run "wscolor"**, and press <Enter>. When the disk in drive A: stops spinning, replace it with a copy (you should never modify an original) of *WordStar* and answer WSCOLOR's preliminary questions (two *y*'s and an <Enter> should do). When the screen entitled 'IBM WordStar COLOR INSTALL' appears, use the cursor keys to move the flashing asterisks to the lower left foreground and background "color" combination. Now press **M** for menu (this is also the "color" of *WordStar*'s marked blocks), **Y** for highlighting, **T** for text, and **N** for no highlighting. Your choice of text and menu "colors" appears under the heading 'NEW'. Now press <Enter>, then press **Y** twice, and the patch is complete.

To use DEBUG to place the character attribute values in WS.COM, load DOS, then place a copy of *WordStar* into drive B:, and place a copy of DEBUG.COM (the original can be found on the IBM DOS Supplemental Programs disk) in drive A:. Now type **DEBUG B:WS.COM** and press <Enter>. When the DEBUG prompt (a hyphen) appears, type **E 248** (which means "edit the byte at offset 248") and press <Enter>. A 4-digit hexadecimal number, a colon, the hexadecimal number 0248 followed by a space, the current attribute value for marked blocks, and a period will appear. (The attribute value should be 07 for your current *WordStar*.) Type **0F** and press <Enter>. The hyphen prompt will reappear. Type **E 24B** and press <Enter>. This time the program will display the current value for unmarked text, in your case 0F. Type **07** and press <Enter>. Now type **W** <**Enter**> **Q** <**Enter**>, and the patch is complete.

If you use WSCOLOR, you'll notice that inverse characters are available for menu (and marked block) or unmarked text. I find

NOW, THE LOWEST PRICES EVER ON

3M Scotch® DISKETTES

$1.58 ea. 5¼" SSDD Qty. 50
$2.10 ea. 5¼" DSDD Qty. 50
$2.33 ea. 5¼" SSDD-96TPI
$2.94 ea. 5¼" DSDD-96TPI

SOFT SECTOR ONLY!
MINIMUM ORDER: 20 DISKETTES
These are factory-fresh 3M diskettes packed in boxes of 10 with Tyvek sleeves, reinforced hubs, identification labels and write-protect tabs.

Add 5% for orders less than 50 on 5¼" only.

LIFETIME WARRANTY! ON ALL 3M SCOTCH DISKETTES!

SUPER SPECIAL!

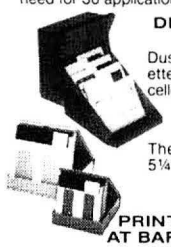
Order 50 3M Scotch Diskettes on this special offer and you can get an Amaray Media Mate 50 for only $9.99 (shipping included). Normally, a $14.95 retail value, this is one of the best designed disk storage units we've seen. Special slots and ridges for stacking. A great buy.

With 50 3M Scotch 5¼" Diskettes $9.99
Ordered alone: $10.95 + $2.00 Shpng.

8" 3M Scotch Diskettes
8" SSSD $2.05 ea. 8" SSDD $2.50 ea.
8" DSDD... $3.10 ea.

SOFT SECTOR ONLY!
MINIMUM ORDER 8" DISKETTES: 20

3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. $18.00 + $1.50 Shpng.



DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value. $11.95 + $3.00 Shpng.

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes. Beige or grey only.
$1.65 ea. + 20¢ Shpng.

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs.

Epson MX-70/80	$3.58 ea.	+ 25 Shpng.
Epson MX-100	$6.99 ea.	+ 25 Shpng.
Okidata Micro 83	$1.48 ea.	+ 25 Shpng.
Okidata Micro 84	$3.66 ea.	+ 25 Shpng.

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes. 8" DISKETTES—Add $4.00 per 100 or fewer diskettes. **Other Items:** Add shipping charges as shown in addition to diskette shipping charges. **Payment:** VISA and MASTERCARD accepted. COD orders only, add $3.00 handling charge. **Taxes:** Illinois residents only, add 8% sales tax.

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois: 1-312-944-2788)
INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS: 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products 3M

Circle 780 on reader service card

marking blocks in inverse video to be more distinctive than simply changing the intensity–I can see whether a leading or trailing blank is included in a marked block. Column-mode marked blocks are also much better defined. If you are patching with DEBUG, the attribute value for inverse video is 70 hexadecimal (enter this number instead of the 0F in the previous procedure).

Batch Test for Empty DOS Variable

Q. *I developed a "no frills" online help system for people in my office who are reluctant to use the DOS manual. It consists of several ASCII files, each containing up to a full screen of information on a particular command. These screens are called up via a batch file called HELP.BAT.*

The ASCII files themselves are straightforward. Each has been given the name of the corresponding command and the extension .HLP; for example, COPY.HLP gives information about the COPY command.

HELP.BAT is also straightforward. Its only instruction (other than coloring the screen to identify a "help" screen) is TYPE %1.HLP. HELP.BAT works fine except that I don't like the way users must call HELP.HLP, which tells how to use the help facility. Typing HELP HELP works, but I would like to get the same result by just typing HELP. I tried IF %1="" and IF %1=" ", but neither worked.

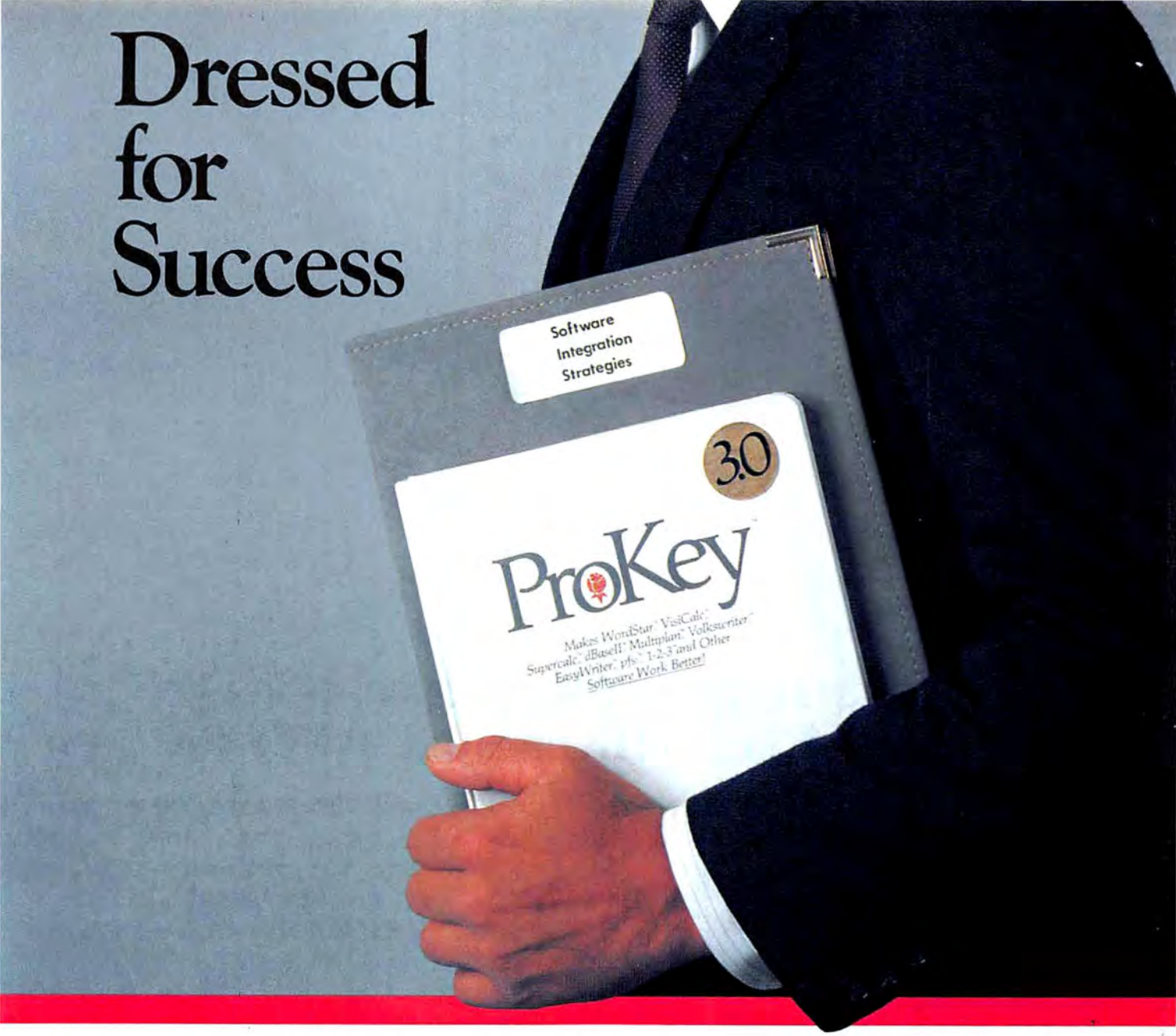
Leo Lefkowits
Houston, Texas

A. Only two minor errors stand in your way. First, a batch file conditional test (the IF command) for string equivalency is requested by the use of two equal signs. Second, batch files use the space, not the quotation mark (as does BASIC), to delimit a string. So how do we represent an empty string and avoid the syntax error generated when the double equal signs are followed by a blank? The answer lies in the way DOS concatenates strings and DOS string variables (%0, %1, %2, etc.). Simply add a dummy character (for example, the *x* in the second line of the following listing) to both sides of the double equal signs–IF '%1x==x' is only true when the DOS string variable %1 is empty. The listing that follows demonstrates the techniques you want for HELP.BAT:

```
if exist %1.hlp goto does
if %1x==x goto help
echo Help unavailable for %1
goto end
:does
type %1.hlp
goto end
:help
type help.hlp
:end
```

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.*

Dressed for Success



Custom tailor your software with ProKey™!

Off-the shelf software is like an off-the-rack suit. It never fits your needs exactly.

Which is why RoseSoft created ProKey.

ProKey is a powerful software tool that lets you tailor fit ordinary off-the-shelf software to the one-of-a-kind needs of your business.

It makes available over 300 'user definable function keys'—abbreviations for text or command sequences.

And when one keystroke can do the work of dozens, you increase your productivity and dramatically reduce errors.

Now your spreadsheet works as though it were designed for your business. Your word processor is set up for writing your memos (or screenplays). And your communications package knows your passwords and how to log onto the company mainframe.

Your software understands how *you* work and remembers the commands *you* use most frequently!

You can try ProKey on for size at computer stores everywhere. And send for our free 16 page booklet, "Boost Your Productivity with ProKey."

RoseSoft™

4710 University Way N.E.
Seattle, WA 98105
(206) 524-8595

To run ProKey, you'll need an IBM PC, XT or jr., or any compatible, and DOS (any version including 2.1.) Corporate and OEM discounts are available.

Circle 162 on reader service card

THE HARDEST WORKING TOOLS ARE OFTEN THE EASIEST TO WORK.

For years, people have used ledgers and calculators to help plan and analyze their businesses.

These are hardworking tools yet they're quite easy to work.

Now there's a way to make doing your business planning and financial analysis even easier. And a lot faster.

It's called PFS®:PLAN. It's an extremely hardworking spreadsheet software program that's surprisingly easy to work.

PLAN was designed for people without computer experience. So all instructions are easy to understand and you can be productive quickly.

PLAN gives you everything you'll need to analyze your financial records in record time. Like simple words to replace complicated mathematical formulas, automatically adjusted column widths and a quick entry key for headings.

Since PLAN is fully integrated with the PFS Family of Software, you can do the whole job from start to finish without complications. You can create worksheets with information stored with PFS:FILE, graphically illustrate this information in line, bar and pie charts with PFS:GRAPH, then put it all in printed documents with PFS:WRITE.

PFS—it's the powerful software that's simple to learn. It's the power of simplicity.

See your computer dealer for more details.

PFS SOFTWARE
The Power of Simplicity

PFS:PLAN currently works on IBM® and selected MS-DOS computers. © Software Publishing Corporation.

SOLOMON III

It's easy to recognize SOLOMON III as the choice accounting software for the IBM PC/AT . . .

. . . ***but upon a closer look, you'll also discover a powerful management information system.*** The CEO, controller, marketing director, purchasing director and payroll manager will think SOLOMON III was designed specifically for them (even if they all happen to be the same person).

The truth is SOLOMON III is a series of eleven accounting modules built around a true central data base. Wise business decisions are the natural by-product of accurate and up-to-date information. SOLOMON III includes over 120 standard reports plus the ability to create an unlimited number of user-defined financial reports. In addition SOLOMON III's Database Reporter allows you to generate Ad Hoc reports which can link directly to your spread sheet and word processing programs. Powerful reporting in tandem with over 800 pages of on line help-text make SOLOMON III the easiest software *to use.*

That's why it's quickly becoming the software that business counts on. Small businesses, Fortune 500 companies, Federal agencies, contractors, wholesalers, and banks across the country, are installing and raving about SOLOMON III. Almost every major accounting firm is placing it on their suggested or recommended list.

The 16 and 32 bit microcomputers of today are naturals for accounting programs . . . but not so when they run programs for older generations of computers . . . not so until TLB invested over $2.5 million and 35 man-years to develop the first truly mature and professional accounting software package for microcomputers. SOLOMON III has the accounting features found on large machines coupled with the ease of installation and use you've come to expect from microcomputer software.

The good executive is a skeptic. And computer software claims often promise you the world. However, SOLOMON III is for real. We could list all of the many features of SOLOMON III. But by the time you'd finish reading them, you could have visited an authorized SOLOMON dealer and received an actual demo. So use the electronic coupon and find out who are your closest authorized SOLOMON dealers. We've put in 35 man-years. Why don't you invest a few seconds right now?

Solomon III Specifications

- Runs on IBM PC, IBM XT, IBM AT, DEC Rainbow, Texas Instruments PC, COMPAQ+, and AT&T 6300.
- Requires 256K RAM, 132 Column Printer, 1-320K floppy with hard disk.
- Built around MDBSIII database management system
- Solomon III modules available:
  - General Ledger
  - Accounts Payable
  - Accounts Receivable
  - Payroll
  - Purchasing
  - Inventory
  - Order Entry/Invoicing
  - Fixed Assets
  - Sales Analysis
  - Job Costing
  - Address & Mail List
  - Solomon Database Reporter
  - Tutorial & Support Plan

ELECTRONIC COUPON

Contact your authorized PC dealer or call us today toll-free to locate your nearest authorized SOLOMON dealer to arrange for a demonstration

1-800-633-2252, Ext. 960

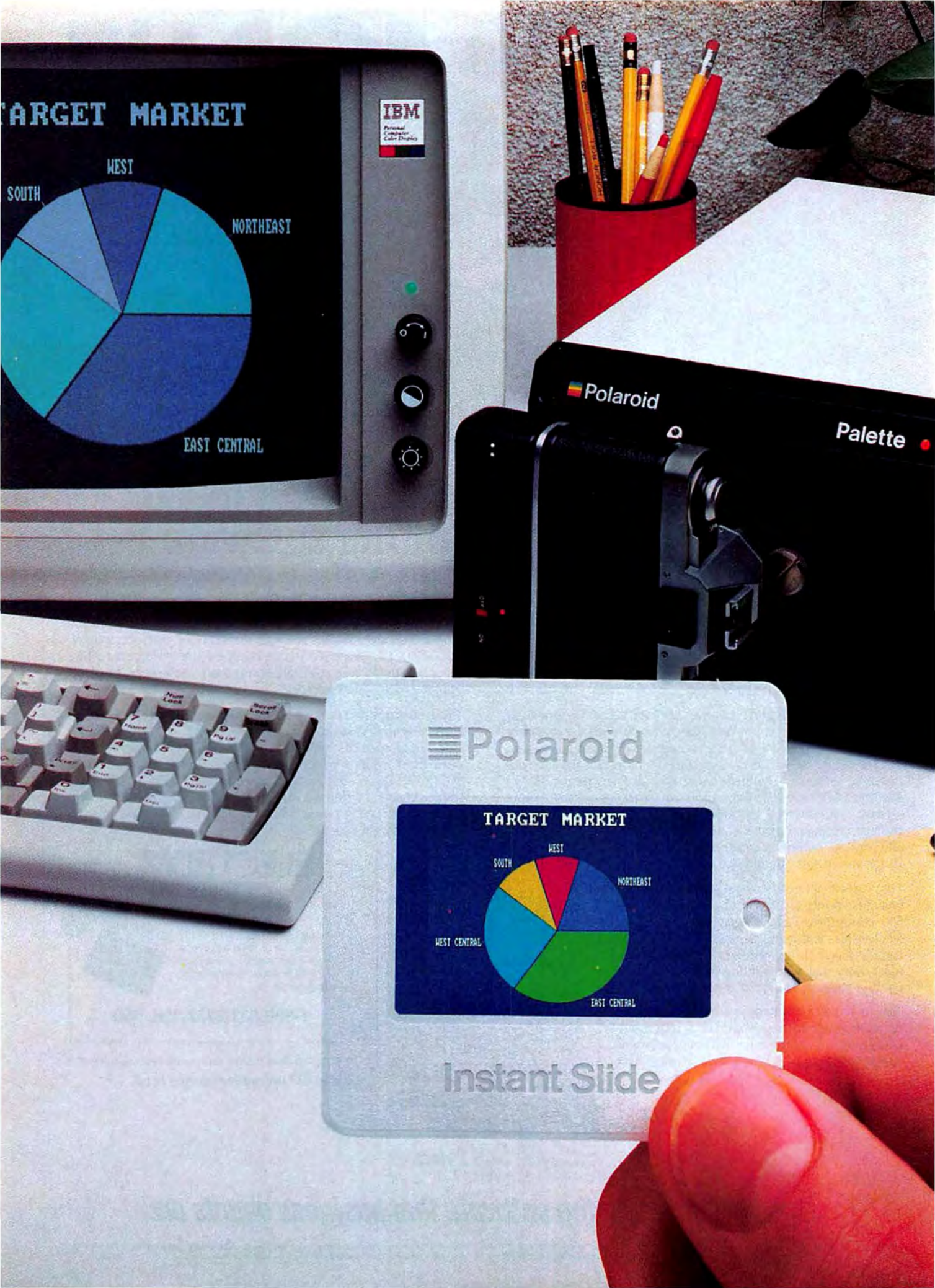
TLB, Inc. P.O.Box 271, Main Line Industrial Park, Frazer, PA 19355

Circle 819 on reader service card

Solomon Series® Software
For Wise Business Decisions™

Quickly becoming the software that business counts on.

© 1984 TLB Inc. IBM PC, XT and AT are registered trademarks of IBM. DEC Rainbow is a registered trademark of Digital Equipment Corporation. Texas Instruments PC is a registered trademark of Texas Instruments. COMPAQ+ is a registered trademark of COMPAQ Computer Corporation. AT&T 6300 is a registered trademark of AT&T. MDBS III is a registered trademark of Micro Data Base Systems, Inc.


ARGET MARKET
WEST
SOUTH
NORTHEAST
EAST CENTRAL
IBM
Polaroid
Palette
Polaroid
TARGET MARKET
WEST
SOUTH
NORTHEAST
WEST CENTRAL
EAST CENTRAL
Instant Slide

Now last minute presentations can be made from your personal computer. In color. In house. In minutes.

Introducing Polaroid Palette.

Whether your presentation is in 30 minutes or 30 days, the new Polaroid Palette Computer Image Recorder will make it easier. Priced at under $1800*, it lets you make Polaroid instant 35mm slides or prints from personal computer-generated data. Right at your desk. So now you can create a presentation in minutes. Without sending out for processing, paying premiums for rush service or risking the security of your confidential information.

Works with the graphics packages of the IBM PC or XT, DEC Rainbow, Apple IIe and II+ as well as other pcs.

The Polaroid Palette is designed to work with many graphics software packages. In fact, when using such popular programs as Graphwriter, Chart-Master, Sign-Master, DR Draw and DR Graph, Palette can virtually double both the horizontal and vertical resolution of your monitor. Plus, a "backfill" feature reduces raster lines for a smoother, more finished appearance. The result—presentation quality slides. On-the-spot.

Color 35mm slides, even from a black and white CRT.

Think of it as an artist's palette. Because Palette "paints" your graphs, charts and text. You're choosing from up to 72 colors. If you don't want red, press a few keys—it's green. And if you're not the artistic-type, Polaroid has developed a menu of color sets: combinations of colors that have been specially coordinated to complement your presentations. And all of this is yours, even if you have a black and white monitor.

Lets you make last minute changes or add up-to-the-minute information.

The Polaroid Palette is the fast, convenient, low-cost way to prepare slides for your presentation. And perhaps even more important, Palette allows you to keep confidential information confidential. You won't have to send your work out to anyone again.

So why wait until the last minute to find out about Polaroid Palette? Call this toll-free number or return this coupon. Because with Palette you'll make your deadlines, in no time.

For a demonstration, call toll-free, or mail the coupon to Polaroid Corp., E.I. Marketing, Dept. 604, 575 Technology Sq., Cambridge, MA 02139.

CALL 1-800-225-1618

☐ Send information. ☐ Have representative call.
PCW-12/84

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone ( ) _____

PC make and model _____

Polaroid

*Suggested list price. Polaroid®

Circle 241 on reader service card

Now Available for the IBM-PC and PCjr

SOFTWARE ARTISTS?

How we got this year's hottest sports game out of two rather inexperienced designers.

TO MAKE THE FIRST BASKETBALL PROGRAM that feels like the real thing, it helps to start with two guys who know what the real thing feels like.

Enter Larry Bird and Julius Erving. Bird – the hustler, the strong man, deadly from outside. Erving – The Doctor, maybe the most explosive player in the history of the game.

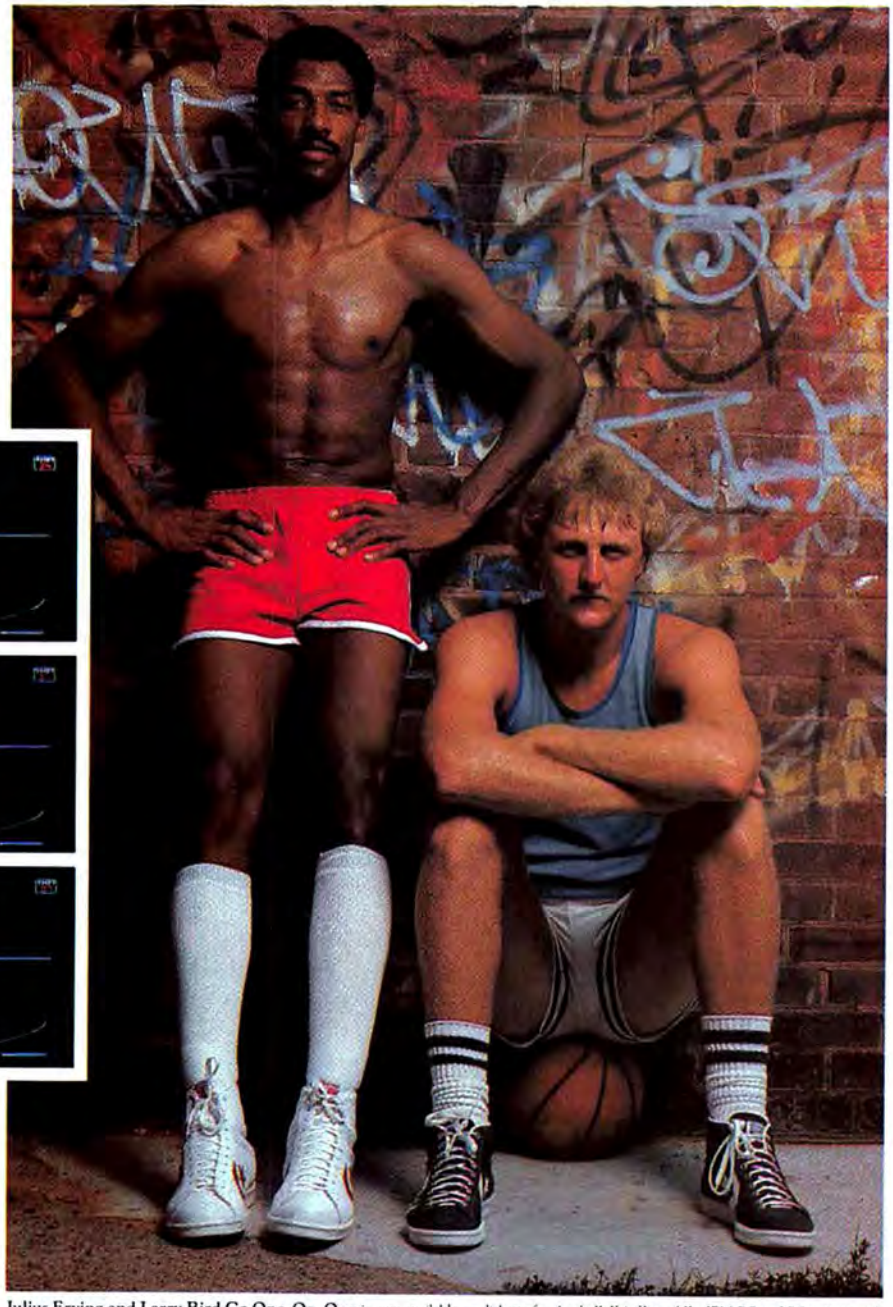
We talked to them, photographed them in action, studied their moves and their stats and their styles. Then we set out to create on computer disc an event which may never happen in real life. We put the two of them together on a dream court of light, for an electronic afternoon of one-on-one.

It wasn't easy. When they talked, we listened. When they criticized, we made big changes. When they gave suggestions, we took them.

And it shows. This thing is absolutely uncanny. You actually take on all the skills and characteristics of Bird or The Doctor – their own particular moves, shooting abilities, even strength and speed.

You'll meet with fatigue factors, hot and cold streaks, turnaround jump shots, and 360-degree slam dunks. But there's some whimsy in here, too – a funny referee, a shattering backboard, even instant replay.

It's called *Julius Erving and Larry Bird Go One-on-One.*™ You're Bird. Or you're The Doctor. And that's the last decision you'll have plenty of time to make.



Julius Erving and Larry Bird Go One-On-One is now available on diskette for Apple II, II+, IIe and IIc, IBM-PC and PCjr, Atari and Commodore 64 computers. For a free product catalogue, send a stamped, self-addressed #10 envelope to Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. Julius Erving and Larry Bird Go One-On-One is a trademark of Electronic Arts. Apple is a registered trademark of Apple Computer Corp. Commodore is a registered trademark of Commodore Business Machines, Inc. Atari is a trademark of Atari Computer Corp. IBM-PC and PCjr are trademarks of International Business Machines, Inc.

JULIUS ERVING *and* LARRY BIRD GO ONE-ON-ONE

from ELECTRONIC ARTS™

Circle 840 on reader service card

Dynamic Software™

FOR IBM PC/XT/jr, AT&T, and other IBM compatibles with 128K and 2 disk drives

A Bulletin from H & E Computronics, Inc., 50 N. Pascack Rd., Spring Valley, NY 10977

NO MANUALS!

Dynamic Software Introduces a New Family of User Friendly Software Packages

DYNAMIC SOFTWARE spent *five years* developing a software package with one very important unique feature: it doesn't include a manual. Most businessmen are not computer programmers, and don't have the time to decipher long technical manuals. Dynamic Software is so user-friendly that it doesn't have a manual . . . Oh yes, each DYNAMIC SOFTWARE package does come with a quick reference pac containing all of the information needed to get started!

Dynamic Ledger $149.95

DYNAMIC LEDGER is a complete General Ledger based on the DYNAMIC CHECK REGISTER system. DYNAMIC LEDGER stores all check register and account information forever, gives an instant cash balance at any time, and prints 17 customized reports (including check registers, balance sheets, income statements, transaction reports and account listings). Capacities include 6-digit account numbers and 2400 transactions per month, making the DYNAMIC LEDGER the ideal choice for a small-to-medium sized business. DYNAMIC LEDGER includes the complete DYNAMIC CHECK REGISTER SYSTEM.

Dynamic Payroll $99.95

DYNAMIC PAYROLL is a powerful payroll system that keeps track of all government-required information and prints all required payroll reports. All payroll calculations can be performed automatically or the user may enter individual payroll deductions manually. It may be used for an "after-the-fact" payroll, with the employee's payroll deductions entered at the end of each payroll period. Checks may all be printed automatically, or just one check at a time. The system may be used in any of the 50 states by any business with one to 350 employees. DYNAMIC PAYROLL can be used as a stand-alone program, or can interface with the DYNAMIC LEDGER.

Dynamic Receivables $99.95

DYNAMIC RECEIVABLES is a complete accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money and can provide automatic billing for past due accounts. DYNAMIC RECEIVABLES prints all necessary statements, invoices, and summary reports to give the user complete control over both current and historical accounts receivable activity. Capacities are virtually unlimited, depending on available disk space (for example, if you have 500 customers, you can store over 16,000 transactions on a floppy disk system). DYNAMIC RECEIVABLES can be used as a stand-alone program or can interface with the DYNAMIC LEDGER.

Dynamic Payables $99.95

DYNAMIC PAYABLES is a complete accounts payable system that helps you stay in touch with exactly how much money you or your company owes. DYNAMIC PAYABLES provides up-to-the minute information that will help you pay your bills on time, track the discounts available to your, and allow you to take advantage of credit terms. DYNAMIC PAYABLES has a virtually unlimited capacity, depending on available disk space (for example, if you have 500 vendors, you can store over 14,000 transactions on a floppy disk system). DYNAMIC PAYABLES prints nine different user-defined reports plus accounts payable checks (with payee addresses). DYNAMIC PAYABLES can be used as a stand-alone program or can be interfaced with the DYNAMIC LEDGER.

Dynamic Inventory $99.95

DYNAMIC INVENTORY is a comprehensive inventory control system that keeps track of descriptions, pricing, and vendor information for every item in stock, what is being sold (and removed from stock), what stock has been depleted to a user-defined reorder point, and what items are actually out of stock. DYNAMIC INVENTORY has a virtually unlimited capacity, depending on available disk space (up to 1,000,000 inventory items). DYNAMIC INVENTORY can be used as a stand-alone program or can be interfaced with the DYNAMIC LEDGER.

Dynamic Accountant $99.95

DYNAMIC ACCOUNTANT is a complete business accounting system that has been specially developed for small businesses with ten or fewer employees. The DYNAMIC ACCOUNTANT keeps track of all income and expenditures and prepares monthly, year-to-date and annual summaries, generates balance sheets, check register summaries, payroll register summaries and profit and loss statements. The DYNAMIC ACCOUNTANT stores all information necessary for income tax forms and government-required payroll forms. DYNAMIC ACCOUNTANT prints checks and automatically stores check information.

At anytime, the touch of a key will display a "Help Window" in the center of the screen, giving the user all information needed to run the program.

Dynamic Check Register $99.95

DYNAMIC CHECK REGISTER stores every check detail necessary for your home or small business needs. All information is stored permanently. The system allows for automatic monthly bill payments, gives access to an instant account balance at any time, permits multiple account categories for each check, prints complete names and addresses of payees on your checks, and stores a 255 character comment for each item in your check register. DYNAMIC CHECK REGISTER is an excellent income tax preparation aid which provides you with monthly and yearly totals of all tax deductible and non-deductible transactions by category. DYNAMIC CHECK REGISTER has a virtually unlimited capacity, depending on available disk space (up to 2400 checks per month and the availability of multiple check registers).

Dynamic Mail $99.95

DYNAMIC MAIL is a mailing list program that allows the user to store, modify and sort up to 1,000,000 names and addresses (depending on available disk space). DYNAMIC MAIL allows up to a 5-line address (or 4-line address plus an optional line for comments such as a telephone number or user-assigned code). DYNAMIC MAIL will print on any tractor-feed labels (1, 2, 3 or 4 across — even labels with a pre-printed return address can be used). Mailing labels or a mailing list directory can be printed in your choice of zip code, numerical or alphabetical order.

To order, call **800-431-2818** — N.Y.S. Residents call **914-425-1535**
VISA, MasterCard and American Express cards are accepted.

All prices & specifications are subject to change
delivery subject to availability

30 Day Money Back Guarantee
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

Circle 97 on reader service card

In the 92 seconds it
find any file you need

Ampex 20 MB hard disk with 25 MB tape backup.

™PC Megastore is a trademark of Ampex Corporation. *IBM-PC is trademark of International Business Machines. †Apple II and IIe are trademarks of Apple Computer.

takes to read this ad, on our backup streamer.

In the 1 hour, 4 minutes other streamers take, you could call your broker. Linger over coffee. Wade through the Wall Street Journal. And read this PC Megastore™ ad too. So take the time. You'll more than make it up with a PC Megastore hard disk and tape hooked to your IBM-PC* or compatible, Apple II or IIe† because all the files you need–both current and archive–will always be right where you need them. Just a keystroke away. The secret? Only Ampex backs up a 20 MB hard disk with another 25 megabytes* of addressable storage–a unique, bootable streamer with cache memory. That not only means you can address a file in 92 seconds, you can backup files offline just by touching a couple of buttons. Without tying up your computer. Your time. Or a small fortune in floppies. (In fact, our 45 megabytes of available storage cost about half the price per MB of other hard disks.) So consider your time, money and convenience. And our quality. The PC Megastore system is backed by a full year warranty from Ampex, a company known for manufacturing quality computer peripherals for over 20 years. Take a moment. Call 800 421-6863, or 213 640-0150 in California. Or write: Ampex Computer Products Division, 200 N. Nash St. MS M-11, El Segundo, CA 90215. We'll give you a dealer's name so you can buy a PC Megastore system. Then in no time at all, you'll make up for the 92 seconds you spent reading this ad.

AMPEX

Ampex Corporation • One of The Signal Companies

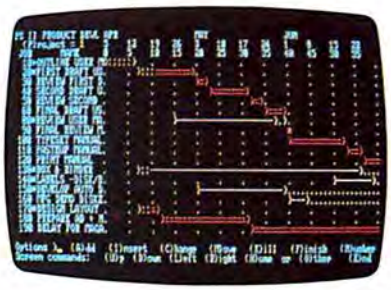
*PC Megastore is upgradeable and comes in four models: 20 MB with 25 MB tape, 10 or 20 MB disk, or 25 MB tape.

Circle 17 on reader service card

Project Scheduler 5000™ the best solution to effective project management

Help! The demands of managing a project have you frantically juggling people and resources.

Successfully managing one project can be difficult. Successfully managing two or three projects can be overwhelming. But now, help is here for you. With Project Scheduler 5000 you can precisely forecast, schedule, control and track large projects easily and quickly.



Mainframe Power — Personal Computer Simplicity

Project Scheduler 5000 brings mainframe capabilities to your personal computer. You can schedule over 5000 activities spread over 10,000 time periods. What this means is that you can manage the largest projects with ease. While you probably don't need this power on a daily basis, it's nice to know that you have room to grow.

On Time On Target

Project Scheduler 5000 gives you all the information you need when you need it. Instantly, you know the status of your project. At a glance, unique plot symbols will let you know whether or not the project is on time and if not, why.

Project Scheduler 5000 keeps you constantly informed through its partial complete capabilities. Partial complete status is displayed, reported and used to calculate "value earned".

Accurate Resource Assignment

Extensive resource categories allow you to schedule more efficiently. Using these categories, you can assign to an activity an almost limitless amount of resources. In addition, these resources can be assigned at any point within the activity timeline providing the accuracy you need to build realistic resource profiles by person, labor grade, or other types.

Integration Of Multiple Projects

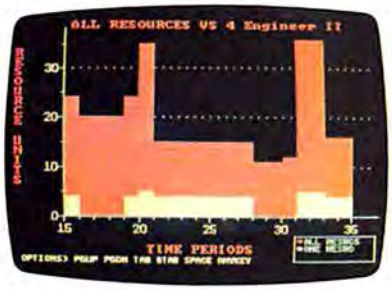
Keeping track of how a resource is used from project to project can be extremely difficult. Not with Project Scheduler 5000. The program can combine projects to give you a complete overview of where and when resources are used. Think of it! You can simultaneously manage several projects and be on time and meet or beat cost projections on each one.

Fast Comprehensive Reporting

Communicating project information is no longer the time consuming task it used to be. An enhanced report generator synthesizes project information into reports on resource allocation, status, schedule and cost at both the project and the detailed activity level. You can interactively define special reports to give you all the detail you need. Reports and Gantt plots can be printed on hard copy, plotted, or stored on disk for future use. Additionally, a spreadsheet interface provides labor and cost transfers for further analysis.

Integrated Graphics Power

Project Scheduler 5000 plus Graphics complements the outstanding scheduling and reporting features provided by Project Scheduler 5000. Using presentation quality financial line graphs, resource histograms, resource bar graphs and other high impact displays, Project Scheduler 5000 plus Graphics provides additional insight as you study in depth the



effects of resource allocation, distribution, and cost. With this control tool you can also track your original cost estimates against updated forecasts and expenditures.

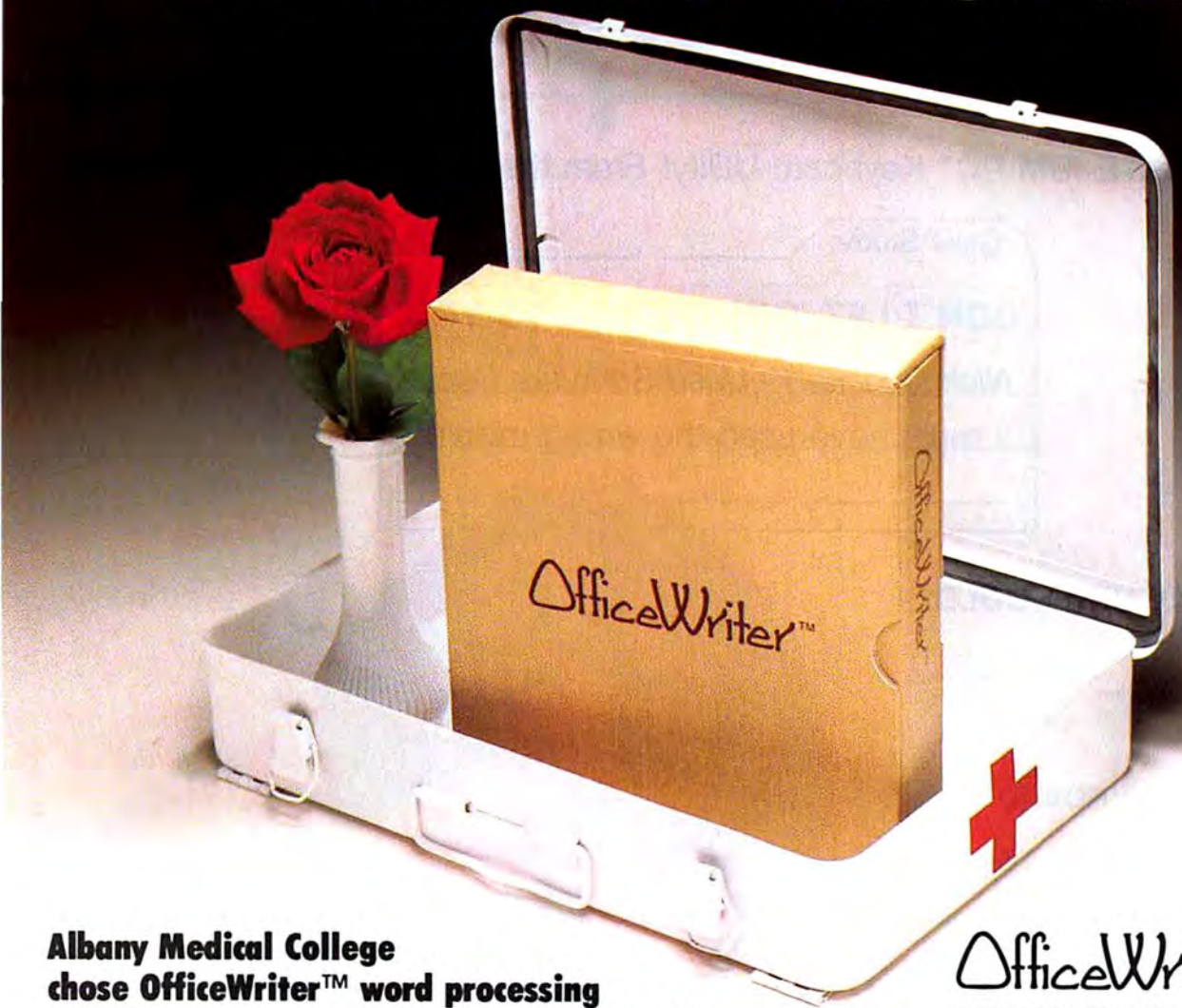
Available for PC or MS DOS:

IBM PC or XT	Grid Compass
TI Professional	DEC Rainbow
Wang PC	

SCITOR

SCITOR CORPORATION
256 Gibraltar Drive
Sunnyvale, CA 94089
(408) 730-0400

PAINLESS CHOICE.



Albany Medical College chose OfficeWriter™ word processing software for good reason: It was the most effortless PC word processing they tried.

And they aren't alone. Frito-Lay, Wisconsin Power & Light and many other companies across the country have discovered OfficeWriter's Wang-like similarity to dedicated word processing.

Software Digest evaluators gave it a four-star rating — their highest commendation in a comparison of 30 IBM PC word processing software systems appearing in the January 1984 issue of *The Ratings Newsletter.*

Our 30-minute on-screen tutorial puts OfficeWriter at the top of its class for easy start-up.

No other system is easier to use.

Our new OfficeSpeller feature integrates the Proximity/Merriam-Webster electronic dictionary with our newest release for goof-proof text every time.

And a complete set of editing features get high marks for speed, productivity, versatility and performance.

So when you're faced with the problem of which word processing software to choose, take the painless route.

Ask us about our free 30-day trial. (Return the coupon or call **1-800-228-0747**. In Wisconsin call **1-608-274-5047**.) It could mark the end of your word processing software selection headaches once and for all.

IBM is a trademark of International Business Machines Corp. Wang is a trademark of Wang Laboratories Inc.

OfficeWriter™

FREE 30-DAY TRIAL

Please send me more information about a free 30-day trial of OfficeWriter!

Name/Title _____

Company Name _____

Address _____

City _____

State _____ Zip _____

Telephone # _____

Return coupon to:
OFFICE SOLUTIONS INC.
5708 Odana Road, Dept. PCW94
Madison, WI 53719
Or telephone: 1-800-228-0747
(1-608-274-5047 in Wisconsin)

VISA

SEE US AT COMDEX, BOOTH #C922

Circle 533 on reader service card

NEW from the makers of Keyswapper™ and Keyswap 1.4™

Keyswap 3.0

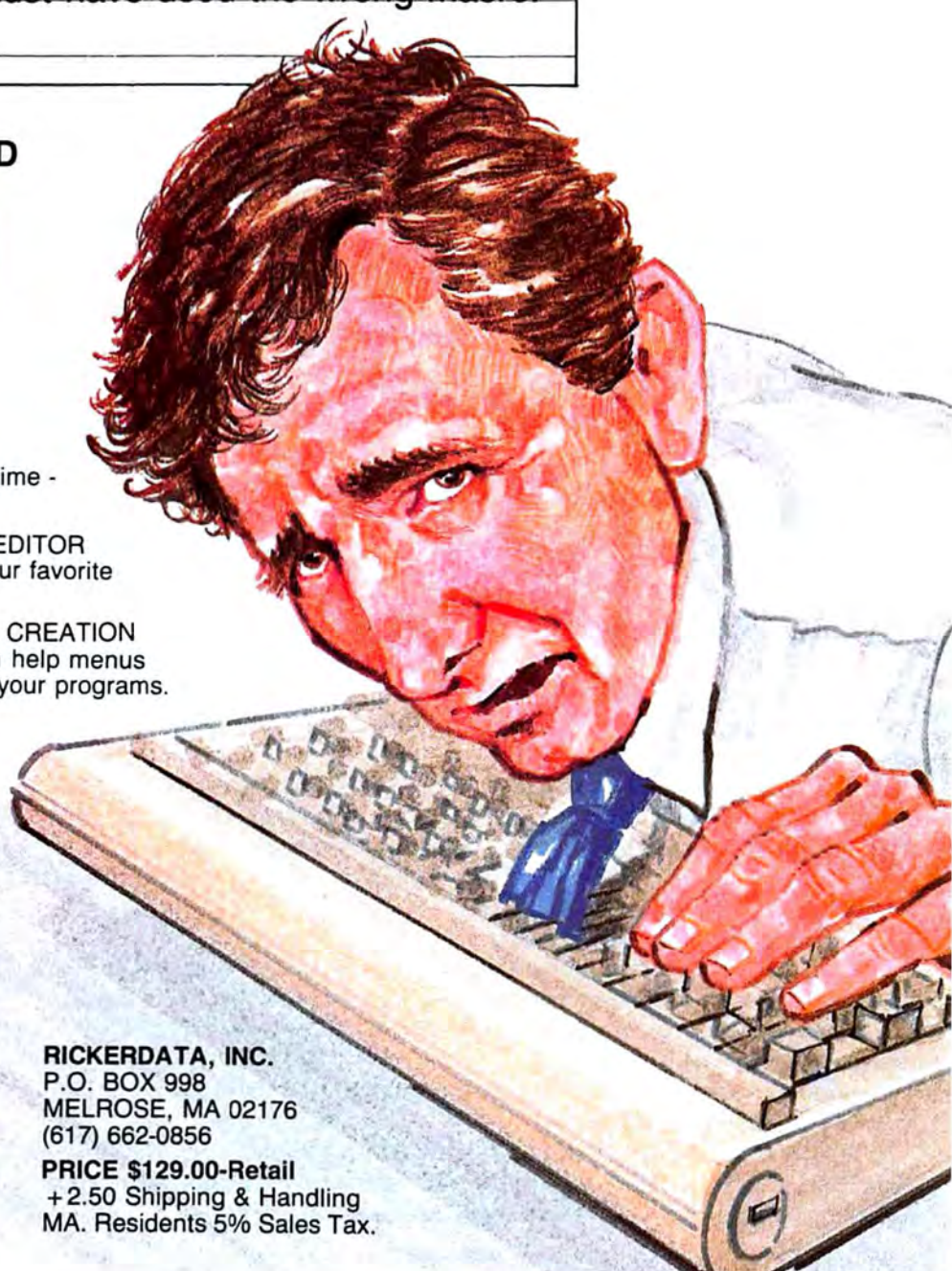
The **ULTIMATE IBM PC*** Keyboard Utility! From the Designer Software Series

Case Study:

DON'T LET THIS HAPPEN TO YOU!

Nick Coolman - Used Software Dealer

"I must have used the wrong macro!"



POOR NERD! HE SHOULD HAVE USED

Keyswap 3.0

THE UNIQUE KEYBOARD UTILITY WITH:

- ONLINE MACRO LISTING
  (See a listing of your macros any time - instantly!)
- ONLINE FULL SCREEN MACRO EDITOR
  Modify your macros from within your favorite software programs.
- USER DESIGNABLE HELP MENU CREATION
  Quickly and easily create your own help menus that can be displayed from within your programs.

AND MANY MORE FEATURES

FOR THE IBM PC*, XT* AND COMPATIBLES

SPECIAL OFFER:
Trade in your old macro programs: KEYSWAP (PER), PROKEY*, etc. (Call or write for details.)

RICKERDATA, INC.
P.O. BOX 998
MELROSE, MA 02176
(617) 662-0856

PRICE $129.00-Retail
+2.50 Shipping & Handling
MA. Residents 5% Sales Tax.

*KEYSWAPPER AND KEYSWAP ARE TRADEMARKS OF RICKERDATA, INC.
*IBM PC is a registered trademark of International Business Machines.
*ProKey is a registered trademark of RoseSoft.

Circle 160 on reader service car

Manufacturing Company, Inc.

CURTIS

THIS DIAMOND IS FOREVER

Curtis Electronic Surge Protection costs less and is warranteed for a lifetime of protection, which should make you and your computer very happy.

With our Diamond's advanced circuitry and semiconductor technology, we promise to honor the laws of electricity.
To protect your computer hardware and software from dangerous overvoltage "surges, spikes and glitches" that can create disk read/write errors, destroy data and create instant hardware failure or drastically shorten system life. Diamond's color also blends perfectly with any modern office or home environment. If the Diamond is just not your type, come over some time and meet our other precious jewels — Ruby, Emerald, and Sapphire.

Available at all ComputerLands, Entre Computer Centers, Inacomp, Micro Age, Eczel, or your local microcomputer dealer. Over 1000 locations nationally! 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) 924-7803

Curtis Manufacturing Co. Inc.
305 Union Street
Peterborough, N.H.
03458

DIAMOND SP-1

Switched surge protector; adapts duplex outlet; six outlets.

SPECIFICATIONS: •6 Outlets, 15 Amps Total •125 Volts, 1875 Watts •Operating Temperature: −40°C to +85°C •Peak Pulse Power Dissipation @ 25°C, 585,000W for 100 Sec. •Maximum Clamping Voltage @ Test Current 50A (8/20 sec.) 340V Clamping Occurs Line to Line (normal mode) and Line to Ground (common mode) •Clamping Response Time: 1 Nanoseconds (1 × 10/−9 sec.) •Dielectric Test: 3000VAC 60 Sec. •Forward Surge Rating @ 25°C, 1440 Amps For 1/120 Sec.

$49.95

UL/CSA pending

EMERALD SP-2

Switched surge protector; plugs into duplex outlet; 6 ft. power cord with built-in circuit breaker/switch; six outlets.

$59.95

SAPPHIRE SPF-1

Switched surge protector; EMI-RFI filtered; adapts duplex outlet; three outlets.

$79.95

RUBY SPF-2

Switched surge protector; EMI-RFI filtered; plugs into duplex outlet; 6 ft. power cord with built-in circuit breaker/switch; six outlets.

$89.95

A1-11

IT RUNS THO PROGRAMS AS

If you have to plan, figure, write, organize, predict or communicate, the NCR PC 4 can help you do it easier and better.

Because the NCR PC is compatible with thousands of off-the-shelf programs available through your local PC dealers.

From the best-selling 1-2-3™ by the Lotus™ people to all sorts of other programs for business, education or just plain fun.

But besides getting more software to choose from you get more computer to work with.

For instance, you can get all the memory you need—all the way up to 640K.

An enhanced keyboard with separate cursor keys and separate numeric key pad that make it easier for you to work with spreadsheets and data base programs.

A special program called a RAM-DISK that acts as a super fast disk drive. It allows you to access information up to 15 times faster than a floppy disk.

And a rugged, compact cabinet that looks great on any desk.

© 1984 NCR Corporation
Lotus and 1-2-3 are trademarks of Lotus Development Corporation. GW-BASIC is a trademark of Microsoft Corporation.

USANDS OF EASY AS 1-2-3.

Plus extras others charge extra for. Like built-in serial and parallel ports. Disk and video controller boards. Plus the standard operating system, GW™ BASIC and self-teaching programs to get you started.

The NCR PC is also compatible with industry standard hardware. So you can attach all kinds of fun things to it. Like a mouse, a modem, a printer, a hard disk, a graphics board, etc.

In short, the NCR PC is exactly the personal computer you'd expect from a company that's been doing business with business for 100 years.

See your Authorized NCR Personal Computer Dealer. He'll be glad to show you how easily the NCR PC can make things easier for you.

For the name of your nearest dealer call toll-free 1-800-544-3333.*

NCR

A BETTER PERSONAL COMPUTER. IT'S EXACTLY WHAT YOU'D EXPECT FROM NCR.

*In Nebraska call 1-800-343-4300.

Circle 834 on reader service card

Hollywood PC

The entertainment industry is fast-paced and chaotic. Yet, like other businesses, film and television studios have budgeting, scheduling, and production problems that can be lessened with the help of PCs. Software aimed at the motion picture industry is appearing for script writing, budgeting, scheduling, and tape editing, and most of it is written for the IBM PC.

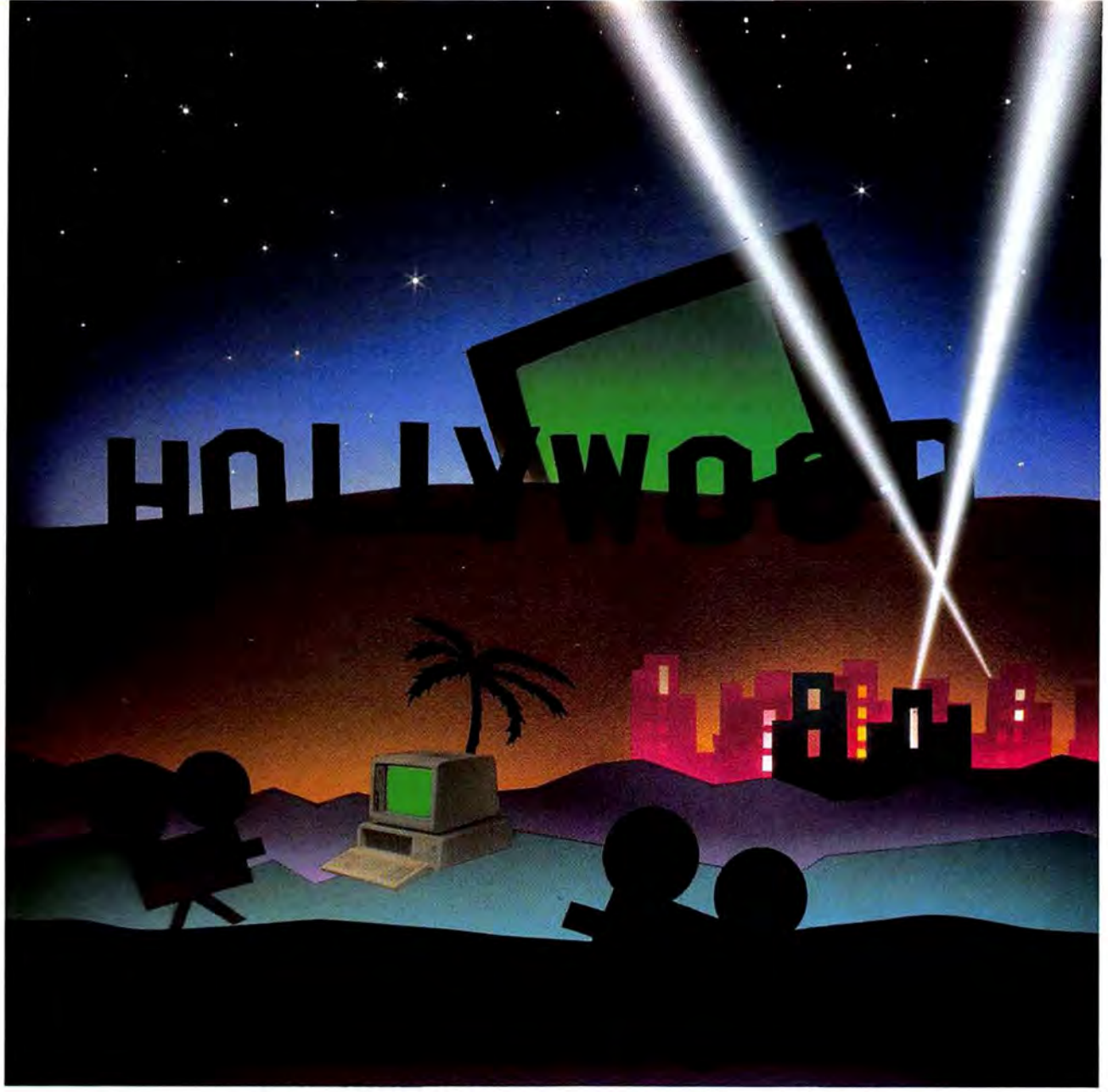
Eric Brown and John Faulkner

Sid Swizzlestick waded through the smoggy parking lot to the front office of Swizzlestick Productions. In his briefcase he carried three scripts he had flipped through the night before. Maybe the female stunt driver story had a chance, but the rest just didn't read. When he entered the office, his secretary followed him to his desk, blandly rattling off the bad news: the directors' union was threatening to strike, the new Compu-Grandma detective series was taking a Nielsen nosedive, some tapes had come back from location with the audio missing, and there was an urgent message from the network. Sid looked up from Variety *and smirked. "Beautiful . . . total madness . . . I love it."*

Making pictures has always been risky, but the recessions of the seventies and eighties brought economic reality home to roost in Hollywood. Enormous cost overruns have become difficult to tolerate. As greater attention is focused on the bottom line, increasing numbers of computers are used to monitor that line.

Most of the major studios and networks have used mainframe computers for years, but smaller production companies are only now getting a taste of computing power with personal computers. Meanwhile, the big studios are finding PCs a welcome supplement to their mainframes.

Yet, running counter to the PC wave is a formidable undertow—the temporary nature of Hollywood makes computerization difficult. A network usually orders only six episodes of a show at a time, and whether or not the show will be renewed is far from certain. A television production team may assemble for a couple of months and then disband. Even if the show is picked up, the staff can change frequently. In a business where chaos is the norm, the task of setting up the training and organization necessary for the effective use of computers is often postponed indefinitely. Yet the breakneck pace and



complexity of production beg for the use of fast and portable computers. The ability to know at any given moment whether the production is staying within budget is vital.

IBM PCs are popping up all over Hollywood. For example, Lorimar Productions, which produces "Dallas," is now in the process of automating every department with IBM PCs and NBI PCs tied into a mainframe. Lorimar uses telecommunications to link all its offices around the country.

Twentieth Century Fox has been using mainframes for years and was one of the first studios to see the benefits of connecting PCs into its IBM 4341 mainframe. Fox's top management uses Lotus Development's *1-2-3* for analyzing production costs and creating corporate financial statements; *dBASE II* and *R:base 4000* are used for inventory and other data management needs. In production, Fox uses a computer-aided design (CAD) package from Personal Systems to design stage sets. For script writing and other word processing, Fox relies on an IBM 5520 dedicated word processor and on PCs equipped with IBM's new 5520-compatible word processing program, *PC Writer.*

Fox was also the first motion picture company to take PCs on location to update budget and accounting information. PCs have hit the road for such shows as "Trapper John, M.D.," "The Fall Guy," and "AfterMash." Appropriately enough, PCs were heavily involved in the production of the Fox movie *The Revenge of the Nerds.*

A Show Is Born

The first step in developing a television show is coming up with an idea. The producer consults with scriptwriters, story editors, and other key creative people to hone the idea into a pitch the networks will like. If a network shows interest, the approval ritual begins and scriptwriters are hired (see "Script Writing Software").

The network usually makes major revisions based on cost, moral standards, and actors and actresses they have under contract. The story goes back and forth for a number of revisions, and finally the network inks the deal.

During the approval ritual, the production company comes up with a budget. The first budget is used to negotiate the licensing fee–the money the network will pay for a certain number of episodes. A lengthy negotiating period ensues in which budget after budget is churned out.

> *'The computer won't save you any time. It's a little like moving into a larger house . . . you suddenly have more things to fill it with.'*

Once the budget is approved, the production company jumps into action. When the buyer or network gives the go-ahead on a show, everything has to be done yesterday. In this preproduction phase, schedules are hammered out, the cast and crew are hired, and sets are designed and built. If other shows are being produced at the same time, enormous logistical problems must be ironed out.

When shooting begins, the best-laid plans can turn into scheduling nightmares. Inevitably, problems develop with sets, props, weather, talent, unions, and other variables. After shooting is wrapped up, the postproduction phase begins. The videotape or film is edited, and music and special effects are mixed in. When the show is finally in the can, the production company staff shrinks, as most of the freelance employees fade away.

Sid's fat red fist grabbed the cigar out of his mouth just before he choked on it. "You can't do this to me!" Sid's face turned crimson as he shrieked over the phone, "You gave us story approval three months ago!" The network monotone at the other end of the line had a few more things to say before Sid erupted again. "You're crazy! We changed that character four times for you guys already, and now you want me to change the sex? As if that won't change anything else in the story? Listen, Fred, these last-minute 'minor' changes are going to put me in an early grave. Let's get together at six for a pop and talk about this sex-change thing. Yeah, right. Ciao."

The Producers

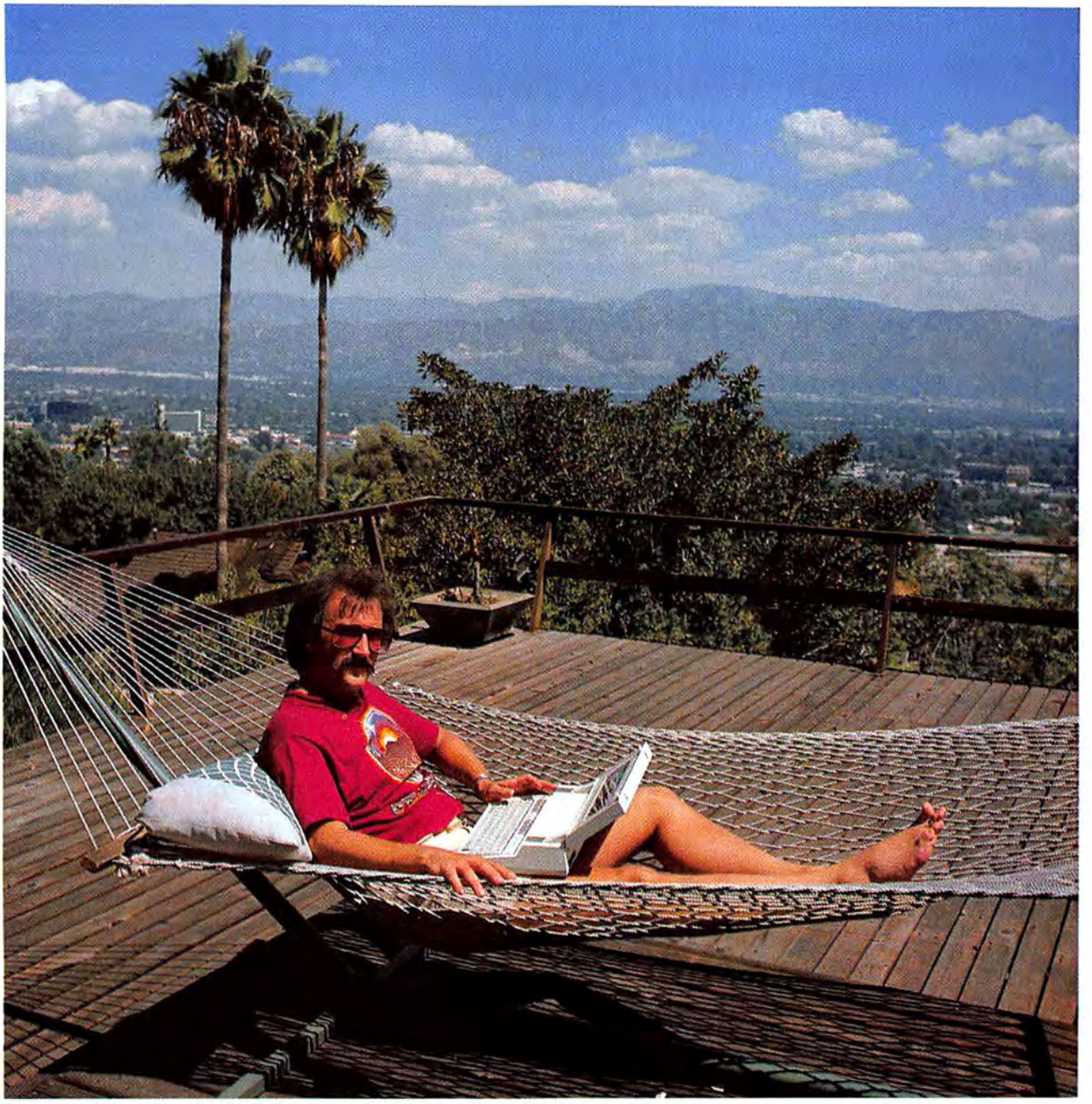
The phenomenon of the PC in Hollywood became apparent this summer at The Micro Show, an exhibition and conference on personal computers in the entertainment field held in Los Angeles. The Micro Show was the first trade show to focus on the special problems of using personal computers in the television, film, commercial, and music industries. A second Micro Show is planned for June 12-15, 1985, at Santa Monica Civic Auditorium.

Phillip DeGuere, keynote speaker at The Micro Show and executive producer of "Whiz Kids" and "Simon and Simon," was one of Hollywood's microcomputing pioneers. A few years ago a writers' strike gave him time to play around with his Apple II and fantasize about how computers could revolutionize the industry.

"I started thinking, Wouldn't it be great if I had a computer program that could tell the difference between exterior and interior scenes?" relates DeGuere. "It could identify a car as a vehicle, a name as an actor, and a fall as a stunt. It could generate a budget and a shooting schedule, and it would appear on all the connected terminals."

DeGuere's dreams are possible today. Many of the 52 exhibits at The Micro Show were dedicated packages written by and for people in the industry. These entertainment software packages are usually easier to use than generic programs, an important consideration in a business with many freelancers and little time to train them.

Although DeGuere owns 12 computers, he cautioned newcomers not to expect too much from their PCs: "The computer won't save you any time; work expands to fill the available space or time. It's a little like moving into a larger house . . . you suddenly have more things to fill it with."



Producer Philip DeGuere at home with an HP 110 Portable from Hewlett-Packard. DeGuere was one of the first to see the advantage of using personal computers in TV productions.

Script Writing Software

Along with accountants, scriptwriters are leading the PC charge in Hollywood. Especially in television, where a script can change several times in a few hours, a word processing system brings immense time savings to a professional screenwriter or teleplay writer. Scriptwriters who use computers form a kind of subculture in Hollywood. Many share word processing tips in a newsletter published in Burbank, California, called *Word Processing News.*

Once scriptwriters began to take word processing for granted, they wanted more. Trying to get a script into the rigid style required by the Writers Guild of America is no easy task. Variable indents, headings, and page breaks have to be inserted manually in most word processing programs.

"With *WordStar* it takes about ten keystrokes to change margins," says Stephen Greenfield, the co-owner of Screenplay Systems of Burbank and the programmer of a screenplay formatter program called *Scriptor.* "If you change margins frequently, you're going to go absolutely up the wall. If you spend $4000 on a computer and software, you don't want to still have to do things by hand."

There are several ways a screenwriter can automatically set up these formats. One solution is to enhance a word processing program with keyboard macro programs, such as *ProKey* or *SmartKey II,* that can insert character names and formats into a script automatically. *FeatureFormat,* a macro program from PowerSoft of Burbank, comes equipped with macros that rearrange scripts into standard screenplay formats.

The new generation of word processing programs that provide macros and style formats has also been welcomed by scriptwriters. With *Microsoft Word,* for example, you can create a "style sheet" that takes care of many of these problems. (See "Getting the Word," *PCW,* Vol. 2, No. 4, for a sample screenplay style sheet for *Microsoft Word.*) However, neither *Microsoft Word* nor the other macro programs contain the logic necessary to make the "interactive" page breaks required by Hollywood custom. The rules say that a character's name cannot be severed from his or her dialogue, and action slugs (narrative descriptions) must not be separated from the scenes they describe.

The problem of interactive page breaks has spawned several formatting programs such as *Scriptor.* To use *Scriptor,* you save the finished script as an ASCII file and run the format program on it. *Scriptor* knows where to break a page and also adds indents, *CONTINUED*s, and other formatting requirements.

Perhaps the simplest solution is to buy a word processor specifically programmed for screenwriting. A script writing program called *Powerscript,* from Beaman Porter, not only provides a number of typical screenplay styles but can also generate a script in the two-column "videoscript" format used in commercials, corporate and industrial films, and videos. The videoscript style calls for two matching columns, one for the video and one for the audio. Both columns can be scrolled independently on the screen.

However, even *Powerscript* hasn't solved the problem of interactive page breaks. Hollywood's writers will have to wait a while longer for the perfect script writing program.

Sid slammed down the receiver. "Jane!" he screamed, bypassing the usual office intercom with sheer lung power. On the third downbeat, associate producer Jane Justly rushed into the room, just as Sid's blood pressure was reaching critical levels. "It's the network again," he snapped, "mucking up a perfectly good story just as we're polishing the second episode." Sid was sucking air in short gulps. He loosened his tie.

Jane looked concerned. "S.S., do you feel okay?" Sid didn't hear her. His blood pressure had peaked, and his asthma kicked in from all the stress of the morning. He clawed through his top drawer for his inhaler. It was wedged in the back right corner behind the publicity shots of the latest muscleman the network was trying to shove down his throat.

Producers are usually hesitant to waste their precious time learning about and using computers. They have other people around–usually the associate producers–to provide the information they want. An associate producer's primary responsibility is to keep track of scripts, accounting, and scheduling and to report everything to the producer.

Jerry Jaskulski, associate producer of "General Hospital," uses a Radio Shack TRS-80 for budgeting and long-term scheduling. He also uses the computer to track the development of the labyrinthine plots in this interminable soap. Jaskulski uses a data base management program called *Query* to search through a data base of past shows.

"What show did Sue get murdered in? I could go in and pull out the information," relates Jaskulski. "If I want to know what happened in Show 85, I can punch it up and find out what happened to all of the characters in that show."

Although executive producers today often refuse to use computers, their successors will probably be more motivated. Eventually some associate producers will become executive producers, and many will bring their PCs with them.

"I'm fine, I'm fine," Sid gasped. "It's the show that's in trouble. If those guys push this thing in too many more directions, they'll be flushing a hit right down the proverbial tubes."

"Let me guess," Jane said. "They want to change Norman back into Norma again."

Sid looked up from his scattered papers in surprise. "That's right, kid. How'd you know?"

"When they changed Norma to Norman the last time, I just assumed they'd change him . . . er, her . . . back," Jane said calmly. "But then they signed for the fee and everyone assumed we were writing the show with these major decisions out of the way. Well

One advantage PCs have over mainframe systems is that they can generate budgets and cost reports in standard studio formats.

I've still got the old story versions on disk, and I went ahead and worked out three stories in case we changed Norman back to Norma."

"Yeah, that's fine, but now the budget's shot to hell."

Jane handed him several sheets of paper. "I thought of that and got back on the spreadsheet. I've already roughed out several 'what-if' situations for this eventuality."

"Well, it's about time you got that damn machine to work," Sid sneered, a clear sign to Jane that her boss was impressed. Even though Sid had authorized the purchase of the PC and was constantly asking her to show it off to visitors, Jane had the distinct impression that Sid felt it was a waste of time.

A Budget That Looks Like a Budget

Not surprisingly, accountants and auditors are the most enthusiastic users of personal computers. Gig Rackauskas, an independent auditor who currently works for Twentieth Century Fox, was the first to use a PC on location. Rackauskas tested an on-location auditing package written expecially for Fox called *Constant C,* and then demonstrated it to Warner Brothers, MGM, and Universal.

When Rackauskas is on location, she sends budget, accounting, and payroll information back to Fox on a floppy disk. Now she is venturing into telecommunications. "That's the ultimate," says Rackauskas, "sending back daily cost information from location to the studio."

Jolie Kramer is another freelance auditor hooked on the PC. She recently used a dedicated budget program called *DotZero* (from DotZero, Inc., of Los Angeles) to produce cost account reports on location in Colorado.

"The associate producer never had to come to location," says Kramer. "We brought the show in under budget, and the reason we were able to do that was because of accurate decision making."

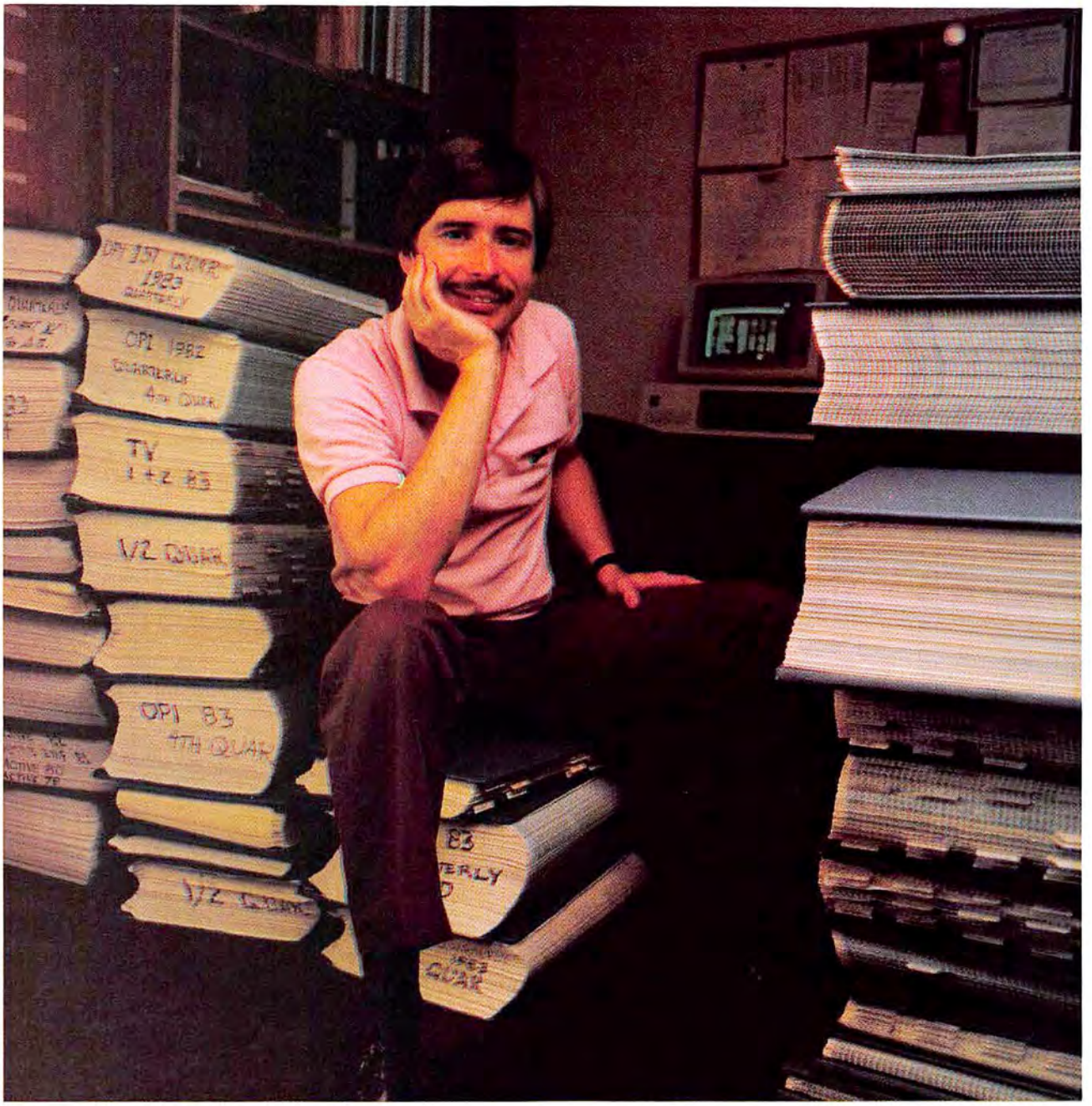
One advantage PCs have over mainframe systems is that they can generate budgets and cost reports in standard studio formats. Mainframes don't have that flexibility, but spreadsheets do. Adds Kramer: "A producer wants to see a budget that looks like a budget."

Kramer prefers industry-specific packages like *DotZero* over general-purpose PC software, because she finds them easier to learn and use. "You don't know what circumstances may come up when somebody else might use the machine," she noted.

Like other auditors and accountants, Kramer wonders how she ever got her job done without the PC. "I could never go back to doing it manually," says Kramer. "The computer leaves you more time to analyze the work and see how you can save money. It lets you use your brain."

Orion Goes PC

We visited accounting associate Kevin McLaughlin at Orion TV Productions, an independent production and distribution company that handles films and television shows. The cramped accounting office was equipped with several PCs and PC XTs. As we interviewed McLaughlin, the printer was running off the latest ratings sent via modem from an on-line service run by the A. C. Nielsen Company. Nielsen also sells a custom data base management system, *MicroNode,* for use with its on-line service. With *MicroNode* a user can easily pinpoint and cross-reference ratings by such market variables as station, time period, and program and then generate the appropriate report.



Accounting Associate Kevin McLaughlin at Orion TV Productions. Accountants have spearheaded the micro movement in Hollywood.

"ANY PICTURE" MAJOR MOVIE MAKER BUDGET
2 HR TV MOVIE 20-May-84
20.00 DAYS PHOTOGRAPHY @ 12 HOURS
5.00 DAY WEEK LOS ANGELES SHOOT
15.00 % OVERTIME

ACCOUNT	DESCRIPTION	RATE	PREP & WRAP 10.00 hrs = 11.00 pay hrs	SHOOT 12.00 hr= 14.25 pay	ACCOUNT TOTAL
		ABOVE-THE-LINE			
01	PRODUCER	page 2			181,500
02	DIRECTOR	2			75,768
03	SCRIPT	2			59,000
04	CAST	2,3			271,793
06	RESIDUALS	3			92,218
09	PAYROLL TAXES	4			78,056
TOTAL	ABOVE-THE-LINE				758,335
		BELOW-THE-LINE			
10	PRODUCTION STAFF	4			100,727
11	CAMERA	4			38,771
12	SOUND	4			22,699
13	SET DESIGN	5			13,421
14	CONSTRUCTION	5			34,619
15	GRIPS & STANDBY LABOR	5			34,176
16	TRANSPORTATION	5,6			125,945
17	ELECTRICAL	6			33,711
18	WARDROBE	7			50,865
19	SET DRESSING	7			72,176
20	PROPS & SPECIAL EFFECTS	7			41,244
21	MAKE-UP & HAIR	8			20,968
22	PICTURE & SOUND DAILIES	8			72,202
25	LOCATION	8			158,620
27	EQUIPMENT	9			42,775
29	PAYROLL TAXES	9			156,987
TOTAL	PRODUCTION COSTS				1,019,905
30	LABORATORY	9			23,400
31	MASTER PRINTS	9,10			18,139
32	FILM EDITING	10			80,342
33	STOCK SHOTS	10			3,000
34	POST PRODUCTION SOUND	10			36,380
36	MUSIC	11			40,000
TOTAL	POST PRODUCTION				201,261
42	INSURANCE	11			16,500
43	OTHER EXPENSES	11			4,000
TOTAL	OTHER COSTS				20,500
TOTAL	BELOW-THE-LINE				1,241,666
TOTAL	ABOVE/BELOW-THE-LINE				2,000,000

Figure 1: Typical movie budget from a 1-2-3 template written by Kevin McLaughlin of Orion TV Productions. Note that much of the cost is split between above-the-line (fixed) costs and below-the-line (variable) costs.

Although Orion continues to send the bulk of its general ledger accounting to an outside data processing service equipped with a mainframe, the PC has become indispensable for creating cost reports and budgets. McLaughlin introduced personal computers to the company when he brought in his Apple II to show the staff. That was only the beginning. Now Orion generates budget revisions with the help of a *1-2-3* template that McLaughlin wrote himself (see Figure 1).

"Our chart of accounts may have several hundred line items," says McLaughlin. "It was impossible to handle that with the Apple II. It was sort of possible using the IBM PC with *VisiCalc,* but with the PC running *1-2-3* we have no problems."

McLaughlin chose *1-2-3* instead of a dedicated budgeting program because of its flexibility. "I shy away from dedicated programs. You can only look at one account at a time. With *1-2-3* you're able to match the format you create to your particular budgeting philosophy."

The PC is particularly helpful during license fee negotations with the networks. A seemingly endless series of budget revisions must be generated on short notice. "You need to be able to play those 'what if' games," says McLaughlin. "Now we can change the budget in an instant and have it immediately updated."

During production of a show, McLaughlin can use his *1-2-3* template to create a cost report and see where money has been spent on a daily basis. He can report what percentage of money was spent on various phases of the production and how many hours a day the union crew worked. "I've tied all the labor items into a fringe factor on the template. When I change the number of days or add crew members, the budget is updated automatically."

Scheduling Headaches

In Hollywood, there is no such thing as a production completed on schedule. Imagine you are an assistant director in charge of scheduling the shooting of a soap opera. It's been a trying day, and as you spill into overtime you look around the set and calculate the extra labor costs. Suddenly you realize you're going to have to bring in two new makeup people because you've already worked the day crew 12 hours. And you'd better get that kid off the set, because the teacher and the social worker are beginning to complain. You've got all these permits to sign and you remember that Suzy's house burns down at the end of the scene, so the pyrotechnician has to come on when there are not a lot of people on the set. But now that the break-up scene is running late, you need some of those people on the set after all, and maybe you could schedule the fire scene for tomorrow instead. But then the hospital scene would have to be bumped.

To cap it all off, the leading man of the show has a nervous breakdown, and the day's taping has to be rescheduled. At this point you, the assistant director, may be ready to join him in the padded room.

'I've tied all the labor items into a fringe factor on the template. When I change the number of days or add crew members, the budget is updated automatically.'

Although the PC can't solve all of these problems, it can keep the random variables from becoming overwhelming. New production scheduling software is giving assistant directors, production coordinators, line producers, and unit managers control over their constantly changing schedules.

The key to managing this scheduling monster has traditionally been a chart called a stripboard. First a script is broken down into exterior and interior scenes, day and night scenes, locations, materials needed, cast, and other critical data. This information is then mounted on a stripboard. Most studios still extract this information manually, but now dedicated indexing programs can search and cross-index a word-processed script by key words and page numbers to create the breakdown automatically (see Figure 2).

With scheduling software, you can generate a number of production lists from the script breakdown. For example, a "day out of days" shows each

```
DATE:07/02/84
    TITLE:THE BIG PICTURE
    COMPANY:RIGHT-NOW PROD.
    PRODUCER:JERGIN LANDSDOWN
    DIRECTOR:MINION MINOR
    1st ASST DIR:RALPH K. DAVIES
    PROD NO.:001
                        ONE-LINE SCHEDULE              Page  1
=========================================================================
#    DAY   SET/SCENE NO.                          D/N PAGES
=========================================================================
#1   MON      MAIN CABIN OF THE FREIGHTER        (D)  7/8
08/01/84   Sc: 1,2
           Loc: BAR HARBOR          MAINE
-------------------------------------------------------------------------
#2   TUE   INT ARTHURS CABIN                     (D)  1 1/8
08/02/84   Sc: 4
           Loc: BAR HARBOR
-------------------------------------------------------------------------
#3   WED      MAIN HANGAR                        (D)
08/03/84   Sc: 51,52
           Loc: ALAMEDA NAVAL AIR  STATION, CA
              MAIN HANGAR                        (N)  1
           Sc: 23,24
           Loc: ALAMEDA NAVAL AIR  STATION, CA
-------------------------------------------------------------------------
```

Figure 2: Sample script breakdown from the AD/80 production scheduling package. AD/80 searches and cross-indexes a word-processed script and generates strips, which are mounted on a board.

actor and actress's shooting schedule, with the cast names and character names running down the page vertically. The day and date of each shoot runs across the horizontal axis of the page.

A shooting schedule can also be made from the script breakdown. This is a Gantt, or time, chart of each shooting day that gives a brief scene description followed by specific information pertaining to location, time, actors involved, transportation, and props.

Tom Lofaro, assistant director of a film called *The Sure Thing,* used a script breakdown program from Alnitak Computing Company of San Francisco called *AD/80.* After creating the stripboard, he was able to generate a full shooting schedule and other standard production forms.

"If you do a stripboard yourself from the script, it might take you a couple of hours," says Lofaro. "With *AD/80* it takes us 20 minutes to create it and 6 minutes to print it out."

The updated charts and lists can be rapidly disseminated throughout the production so everyone can keep up to date on the latest scheduling changes. "If your various departments know what's going on and know what your intentions are, they can support you better," says Lofaro.

Post Production

Razor blades haven't been used to edit videotape since the early seventies, but the software to interface electronic editing systems with personal computers has been slow in coming. Using a PC, an editor today can link a record log that describes each shot and take with the corresponding images on the

videotape itself. If there is a change in the scene sequence, the editor changes only the text portion of the record log. The PC automatically rearranges the takes on the videotape. (For more information on PC logging systems, see "PC-TV," *PCW,* Vol. 2, No. 2.)

Although videotape editors can now take advantage of the PC, no software for film editors yet exists. Film productions must either use old methods or buy expensive dedicated film editing systems such as the Editdroid from Lucasfilm Ltd. or Montage's Picture Processor. These computerized editing systems gang a number of microprocessors with a multitude of monitors in an attempt to speed up editing without sacrificing the intuitive nature of the editor's craft.

Before the Thread Snaps

The PC has made inroads into Hollywood in most facets of production, but the freelance nature of the business remains an obstacle. It's hard to fit computer training into production budgets that are already stretched to the limit.

"We can't get the production department to use the PC," says Kevin McLaughlin. "They say, 'Gee this is great,' and then they go back to their old ways. Everybody's always busy and thinking about the next show. It takes somebody who is already hooked on the computer to make the switch."

"Cost is a big factor," says McLaughlin. "Computer training is a hefty investment in an industry where you don't know who is going to be employed tomorrow." Yet this hefty investment may be mandatory if Hollywood wants to kick the cost overrun habit.

"In the entertainment business the prevailing mode of operation is chaos," says Phillip DeGuere. "The computer points to fiscal responsibility. If we all want to continue to make money in this capitalist society, we can't have cost overruns of $50,000 a production."

As production companies strive to become more competitive, the computer becomes a necessity. The chaos won't disappear–and maybe it shouldn't–but with a PC, decisions can be made as quickly as the problems arise. As Tom Lofaro says, "It always amazes me how many times we seem to be making movies on a thread, and the last piece of that thread is about to snap. I'll tell you something... they'd better get used to this technology."

Jane watched Sid's expression change from a scowl to a smile as he scanned the budget revision. Then she plunged ahead. "See, I've already put down the possible set changes and adjusted the budget for the critical rewrite."

The color was coming back to Sid's cheeks. "Yeah, yeah, I see what you mean. Why should we have to eat these writing costs when they're yanking us around with the distribution clause?" Sid was grinning from ear to ear. "We'll make these network guys look like chumps when their accountants ask them about this rewrite fee. But it's right there in black and white."

Sid unwrapped another illegal Corona and lit up with a smug look of assurance. "Looks like this little screw-up is going to turn into a windfall for us. Let Uncle Sid buy you a treat. Just name it."

Jane thought a second and said, "How about a RAM disk emulator?"

"No, no, nothing kinky like that.... "

"No, S.S.," Jane interrupted. "It's a circuit board for the PC that makes your–"

"Save the speech," Sid barked as he grabbed his sunglasses off the desk. "Just add it to the budget. Now come on.... Let me buy you a pop."●

Eric Brown is an Assistant Editor at PC World. *John Faulkner is a freelance writer and photographer living in San Francisco.*

For a catalog of entertainment software packages send a self-addressed stamped envelope to:

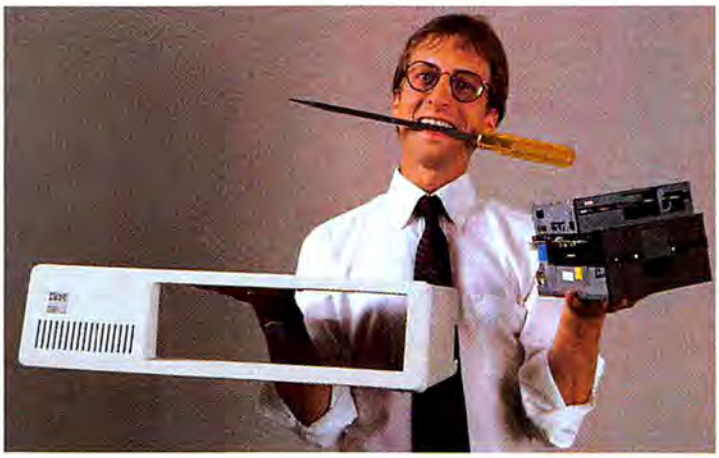
The Micro Show
Live Times Productions
3747 Arbolada Rd.
Los Angeles, CA 90027
213/668-1811

"I'll show you how to make disk drives, your IBM,

Fear of frying.

It's a known fact. You can save over $200 buying disk drives from us and installing them yourself. All you need is a screwdriver, and we give you one when you buy the drive from us.

But many people find themselves gripped by a strange terror at the thought of opening up their IBM-PC. Listen, I felt the same way until I separated the truths from the misconceptions.



Misconceptions

1. You'll get confused and panic.
2. Your computer will blow up.
3. You'll blow up.
4. You're better off with an IBM warranty.
5. Drives without an IBM sticker don't work.

Truths

1. It's easy. (If you do panic just call our special PC Connection Tech Support Team.)
2. Your computer will neither blow up nor suffer permanent brain damage.
3. *You* won't blow up (unless you install your drives in the bathtub with the water and power on.)
4. Our warranty is better than IBM's. IBM gives you 90 days. We give you up to a year. (See price section.)
5. We sell the same drives as IBM sells.

What do you call a PC with no drive?

You call it a deal. Because we can sell you drives *and* drive controllers for far less than you can get them from IBM. We're not talking cheap imitations. *We're talking about the same drives.*

IBM buys their drives from Tandon and CDC (Control Data Corporation). We buy the same drives in a full-height version from Tandon, and even better drives in a half-height version from TEAC. McGill University, bastion of Canadian excellence in both engineering and hockey, has examined many of the drives on the market and buys TEAC drives from us.

IBM buys these drives as raw drives, configures them for the PC, sets them as either Drive A or B and tests them. We follow exactly the same procedure with our raw drives.

IBM or the IBM dealer installs the drives—if you buy drives from them. You install the drives if you buy them from us. It will take you 15 to 30 minutes. *You'll save nearly $200 per drive.*

Glossary

The following is a guide to disk drive terminology for people annoyed by jargon.

Hard disk drive. a.k.a. rigid disk, hard drive, mass storage device. The hard drives we sell can hold from 10 megabytes to 30 megabytes of information. That's 30 to 90 times more than a floppy. And a computer can read from, and write to, a hard disk much faster.

Half-height. Just what it says. A skinny disk drive that works just as well as a regular one. You can put two of them into one drive slot in the PC.

Double-sided (DS). A double-sided disk drive can read data from, and write data to, both sides of the disk.

Double-density (DD). The tracks on double-density disks are twice as close together as the original microcomputer floppies. (Someday they could be 20 times closer together and we'll have double-deco density disks. And then, of course, there are art deco disks—the square disks in the round jackets. . .) The important thing is that all IBM floppy drives, and all our drives, run double-sided double-density disks now.

Drive controller. a.k.a. drive adapter, IBM diskette adapter. You have to buy a special circuit board to boss that drive around on the PC. We sell floppy drive controllers. IBM sells them. Ours are less expensive and your computer will never know the difference.

Raw drive. A drive that doesn't know what it's doing, or where it belongs, or how to talk to disks or computers, or anything a self-respecting drive should know.

Configure. To set up a raw drive so it knows what kind of computer it's inside of, and which drive it is (A drive, B drive etc.). We do it for you.

Pluggable terminator module. A small chip-type gadget on every drive. Take it off and the drive is a B drive. Leave it on and it's an A drive.

Jumpers. There are jumpers on every drive. They're like fuse wires. By either breaking or removing the right ones, we configure the drive for IBM.

DIP switches. a.k.a. dual in-line package switches. When you set these switches on the motherboard correctly it understands what's hooked up to it. All you need is a ball point pen and the illustrations we send with your drive.

DOS. a.k.a. disk operating system. Rhymes with "sauce". Blank disks are not very smart. They don't know how to be disks, or how to act around different computers. They worship this one disk called DOS. A DOS disk knows just about everything there is to know about being a disk and will gladly share that wisdom with any blank disk.

Format. You format a blank disk by putting your DOS disk in one drive and a blank disk in the other.

Spindle speed test. We test the spindle speed of all drives and get a readout within ±0.1 RPM.

Random sector read test. Then we write data to certain locations and send the read head out after it. Your basic search and locate mission test.

Centering test. Floppies can flop but not wobble. This test makes sure your disk gets centered when you load it.

Radial test. A double-sided drive has two heads. This test checks their alignment.

The drives you get from us are as good in every way as the drives you get from IBM. Some companies sell raw drives—as is, unconfigured, untested. Raw drives are a raw deal. You can spend days just trying to get the information you need to install and configure these drives. So when you compare prices, make sure you only look at drives ready to install in an IBM. Like drives from us.

But I already have a disk drive!

Most IBM dealers insist you get at least one floppy drive when you get your PC. But we can still save you a lot of money when it's time to fill that second drive slot. And we can really save you money when it's time to add a hard disk. Here are just a few of your options for those two drive slots in your PC:

1. Two full-height floppy disk drives.
2. A full-height floppy/two half-heights.
3. Three half-height floppies.
4. Four half-height floppies.
5. A full height floppy/a half-height floppy/a half-height *hard* disk drive.
6. A full-height floppy/a full-height hard.
7. Two half-height floppies/a full-height hard.

Get the picture? Okay. Now repeat that list three times real fast, spin on your head, and moonwalk. If that doesn't help you figure out which option is right for you, call us. Our sales people have seen it all, and know how to do it all.

We make hard choices easy.

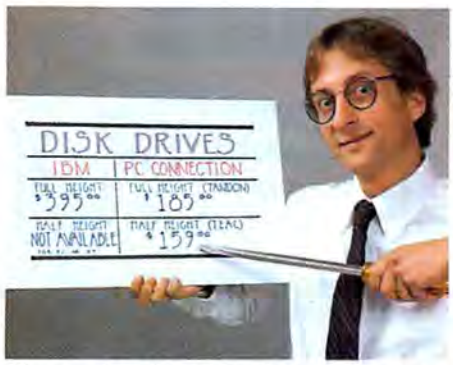
Gone are the days when you'd get a computer with a drive or two and be happy.

We test every floppy drive.

©Copyright Micro Connection, Inc. 1984. Prices and specifications are subject to change without notice. All items subject to availability. 120 day guarantee on Tandon full-height drives. One year guarantee on all TEAC half-height drives and Maynard hard drive systems. Micro Connection is a trademark of Micro Connection, Inc. PC Connection is a division of Micro Connection Inc. PC Connection is a registered trademark. IBM is a registered trademark of IBM Corporation. IBM suggested retail prices effective June, 1984.

$200 in ten minutes with our and a screwdriver."

—DAVID HALL, C.E.O.
PC CONNECTION



When you buy drives from IBM you pay more for their name than you do for their drives.

Many serious users eventually find they need a hard drive. And the availability of half-height floppy and hard drives lets you upgrade to a hard disk system, *internally.*

Half heights are, by the way, just what they sound like. You put two of them into one drive slot, and get twice the action. We supply all of the cables and mounting brackets you need for free.

Our hard drive systems come from Maynard Electronics. You see a lot of companies selling hard drive systems now. Maynard has been around for a long time and we've found them to be superior in terms of product reliability, value, and customer support.

Maynard hard drive systems are available in both 10Mb and 30Mb versions. (The PC-XT has a 10Mb drive). *However,* the 30Mb versions only come in a full-height model. Every Maynard hard drive package comes complete with internal hard drive, and drive controller board. On WS-1 packages, the controller board handles just the hard drive. On WS-2 packages, the controller board handles the hard drive plus floppy drives. WS-2 packages are more expensive, but *they let you run all of your drives out of just one expansion slot on your PC.* (You can always sell your old floppy controller card to your kids.)

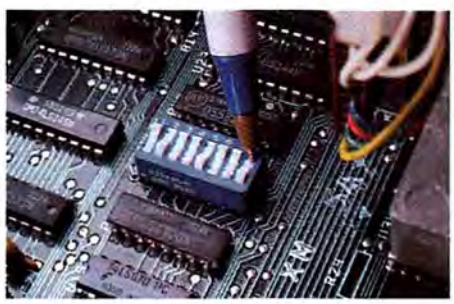
Every Maynard package also comes with a ROM chip which plugs directly into an empty socket on the 256K motherboard. *This allows your PC to behave just like an XT, when running DOS based programs.* PC's with a 256K motherboard can boot off the hard drive. PC's with 64K must boot off a floppy first.

Moving parts.

You have them. We have them. Disk drives have them. Moving parts—a bunch of them. And they do tend to get a little funky as they get older. Now we can't offer you a one-year warranty on *your* moving parts. But we can offer you a one year warranty on all of our half height and hard disk drives.

Because while IBM gives you a 90 day warranty on their drives, all of our TEAC half-heights, and Maynard hard drives *are covered for a full year.* And we even extend the typical 90 day coverage of Tandon full-heights to 120 days.

Remember, all of the floppy drives we sell are standard, 5¼", double-density, double-sided drives, and fully IBM compatible. When formatting disks with DOS 1.1 you'll have 320K per disk, and when formatting with DOS 2.0 or 2.1 you'll have 360K.



A flick of the DIP switches and your motherboard knows how many drives there are.

We test them with a state-of-the-universe tester, performing a spindle speed test, a random sector test, a centering test, and a radial test. If the drive passes, we box it up with the test results and ship it to you. Just take the cover off your PC. Install the drive. Plug it in. Connect it to the drive controller. Set the DIP switches. It's easier than you think. And we include a set of very thoughtful, step-by-step instructions.

We're happy. You're happy. Your computer's happy. You saved money. We made money. It's the American Dream.

Leader of the pack.

PC Connection was selling disk drives when a lot of other computer companies were still selling calculators. When you buy from us, you get all the cost benefits of direct sales, along with some very intelligent PC experts who can discuss your storage requirements.

If you've never ordered from us before, drives are a good place to begin. Because storage is one of the most crucial and expensive aspects of your system. And the price and one year warranty breakthroughs from TEAC and Maynard make this a great time to add drives to your system. Give us a call.

Products and Prices

All disk drive shipments include a free super-deluxe plain old PC Connection screwdriver for use in installing drives.

TEAC FD-55B (5¼") *half-height* drive (DS, DD) . . . . . ea. $159
("y" cable & bracket free with each pair)

Tandon TM100-2 (5¼") *full-height* drive (DS, DD) . . . . . ea. 185

Maynard
Floppy drive controller 135

Maynard 10Mb Internal Drives
WS-1 pkg. *full height* 879
WS-1G pkg. *half height* 879
WS-2 pkg.* *full height* 1079
WS-2G pkg.* *half height* 1079

Maynard 30Mb Internal Drives
WS-1A pkg. *full height* 1999
WS-2A* pkg. *full height* 2199

**WS-2 packages include a floppy drive controller on the same board with the hard drive controller.*

1-800/243-8088

For the IBM-PC exclusively. 297W

PC CONNECTION®

PC Connection, 6 Mill Street, Marlow, NH 03456, 800/243-8088 or 603/446-3383.

Circle 201 on reader service card

THE FIRST FAMILY OF PRODUCTIVITY FROM CREATIVE SOFTWARE

The best costs only $49.95, why pay more?

***VERBATIM MINIDISK TEN-PACK OFFER IN EVERY BOX.**

Creative Writer™, Creative Filer™, and Creative Calc™ – three low-cost, yet powerful personal productivity programs designed to give you the most for your software dollar.

HASSLE-FREE WORD PROCESSING.

Creative Writer is a word processor you can start using in just 15 minutes. Now anything you do with your typewriter, you'll do better and faster with Creative Writer. It lets you concentrate on the words, not the processing.

Arrange and rearrange words or paragraphs at the touch of a key. Compose, edit, save, retrieve and print documents almost effortlessly. $49.95.

CREATIVE WRITER

- Preview entire document
- Search and replace
- Headers and footers
- Help screens
- Move text

CREATIVE FILER

- Unrestricted format
- Change format after creation
- Report writer included
- Automatic alphabetizing

CREATIVE CALC

- Adjustable column width
- 12 digit accuracy
- Menu of commands
- Mix text and numeric data
- Within cell editing
- Flexibility of design

EACH PROGRAM IS FULL-FEATURED WITH INTEGRATED CAPABILITIES. COMMODORE 64™, IBM PC,™ PCjr™, AND APPLE™ VERSIONS AVAILABLE.

PUT YOUR FILING CABINET ON DISK.

Now there's Creative Filer – the simplest way to organize and access all your files.

You can set up and maintain virtually any file with Creative Filer – all on a computer disk and automatically filed in alphabetical order for instant access. $49.95.

A SPREADSHEET PROGRAM THAT REALLY ADDS UP.

Creative Calc automates any mathematical process.

It lets you ask the "what if" questions of financial analysis more easily than any other spreadsheet program in its class. $49.95.

ALL THREE PROGRAMS ARE INTEGRATED FOR MORE COMPUTING POWER

Creative Filer and Creative Calc work together with Creative Writer, allowing you to customize documents combining text, data, and numeric tables.

Now you can get the power of expensive productivity programs at a very economical price.

CALL AND ORDER TODAY!

Use your Visa, MasterCard or personal check. Toll Free 1-800-331-7990 (outside Calif.) or 1-800-448-1001 (in Calif.).

MONEY BACK GUARANTEE. If not completely satisfied, return within 10 days for full refund.

*Limited time only.

C R E A T I V E S O F T W A R E

230 East Caribbean Drive, Sunnyvale, CA 94089 ©1984 Creative Software

Circle 20 on reader service card

When a big story breaks, you'll hear about it faster thanks to the new UPI 1 Computer System, which utilizes the Zenith Z-150 PC as its central hardware component. UPI chose the Zenith Z-150 only after testing and even "roughing up" dozens of leading microcomputers, because it delivers the total performance that helps radio and TV stations report the news as quickly and accurately as possible.

ZENITH COMPUTERS MAKE NEWS WITH UPI!

WHEN TOTAL PERFORMANCE IS THE ONLY OPTION.

The IBM PC-Compatible Zenith Z-100 PC's.

Desktop Z-150 PC

Total performance. It's a must for United Press International, in reporting news that changes the face of the world. And for you, in handling information that changes the face of your business.

The IBM PC-compatible Zenith Z-100 PC's deliver that total performance, with enhanced features that include greater internal expandability. Storage that can expand up to 11 megabytes. The ability to run virtually all IBM PC software. A detached keyboard with a "smarter" key layout. And much more.

When total performance is the only option for you, call 1-800-842-9000, ext. 1, for your free Z-100 PC information kit and the name of your nearest Zenith Data Systems dealer.

ZENITH | data systems

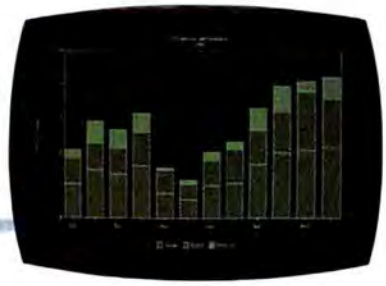
THE QUALITY GOES IN BEFORE THE NAME GOES ON.

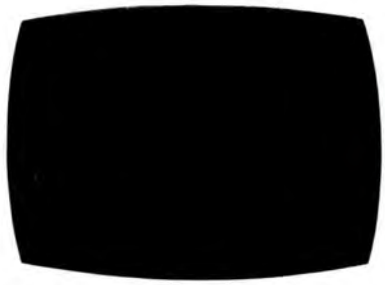
1984, Zenith Data Systems

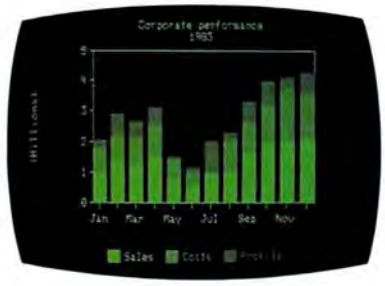
For the Zenith Data Systems dealer nearest you, call **1-800-842-9000**, Ext. 1

Circle 75 on reader service card

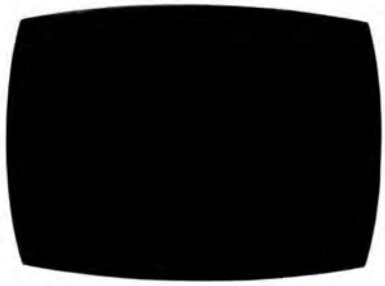
IBM MONOCHROME GRAPHICS. NO COMPROMISE.





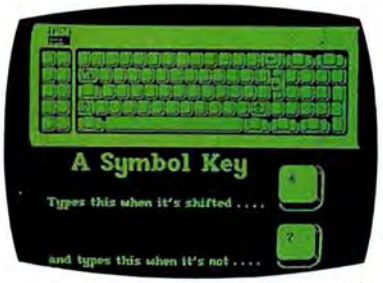


Lotus™ 1-2-3™



Flight Simulator®

Mouse Systems™
PC Paint



IBM PC Tutorial®

The Hercules Graphics Card™ $499

The IBM® Monochrome Adapter $250

The Paradise Modular Graphics Card™ $395

The Paradise Modular Graphics Card is the *only* video card that runs all popular IBM color/graphics software—full-screen—on an IBM (or equivalent) monochrome monitor. *Unmodified.*

Right off the shelf.

And not just ordinary monochrome: Crisp, full-screen, flicker-free monochrome graphics translated in up to 16 shades.

- Includes IBM-compatible color graphics on an RGB or composite video monitor.
- Optional memory (up to 384Kb), clock calendar or floppy disk controller, and parallel, serial or game ports available.

All in a single PC or XT slot.

This may be the only card you'll ever need.

Call today for more information:
1-800-527-7977, In CA: 1-800-822-2020 (Dept. 125)
150 North Hill Drive, Brisbane, CA 94005, 415-468-6000

PARADISE

You can measure it.

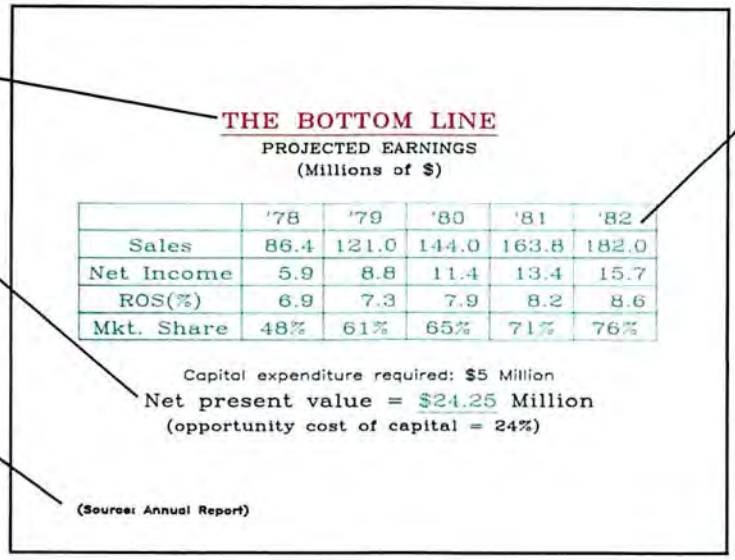
Trademarks: Paradise Modular Graphics Card–Paradise Systems, Inc.; Hercules Graphics Card–Hercules Computer Technology. 1-2-3, Lotus–Lotus Development Corporation; Mouse Systems, PC Paint–Mouse Systems Corporation. Registered trademarks: IBM, PC Tutorial–International Business Machines Corporation; Flight Simulator–Microsoft Corporation.

SIGN-MASTER™
Number 1 in word charts for presentations and reports

Create powerful headlines using SIGN-MASTER's color, size, and font options. Here we chose Bold Roman font.

Highlight a single character, word or an entire line at the touch of a button. Here we focus attention on one number with color and underline.

Indicate source, date, author, etc. with SIGN-MASTER's footnote option. Bold Standard font was used in this example.



THE BOTTOM LINE

PROJECTED EARNINGS
(Millions of $)

	'78	'79	'80	'81	'82
Sales	86.4	121.0	144.0	163.8	182.0
Net Income	5.9	8.8	11.4	13.4	15.7
ROS(%)	6.9	7.3	7.9	8.2	8.6
Mkt. Share	48%	61%	65%	71%	76%

Capital expenditure required: $5 Million
Net present value = $24.25 Million
(opportunity cost of capital = 24%)

(Source: Annual Report)

Develop professional tables quickly and easily. Once data and text is entered, SIGN-MASTER determines the spacing and layout.

Produce SIGN-MASTER word charts on paper, overheads or slides.

With SIGN-MASTER, the possibilities are limitless:

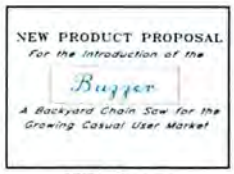
Proposals

Summaries

Exhibits

Schedules

Tables



Title Pages

SIGN-MASTER is the first program designed to allow everyone from top management on down to produce colorful, attention-gaining "word charts" and tables for presentations and reports.

Created on a PC with a compatible plotter or printer, SIGN-MASTER word charts are superior in quality to typing and less expensive than typesetting or printing.

Professional Word Charts Made Easy

In just minutes, this unique menu-driven program lets you create impressive, easy-to-read documents using words, numbers, lines and SIGN-MASTER's simple-to-master Table Mode.

Number 1 in Quality Text

SIGN-MASTER offers the greatest variety of text options. In addition to 6 fonts, 16 sizes and 8 colors, you can justify text, underline, italicize, set margins, spacing, and more.

An Important Presentation Tool

With SIGN-MASTER and any one of over 40 plotters, you can produce full color originals on paper and overheads. The program also works with over 10 printers to create the highest quality printer graphics available.

Make Super Slides Quickly and Economically

Presentation-quality 35mm slides can be created in-house and inexpensively using the Polaroid Palette in conjunction with SIGN-MASTER.

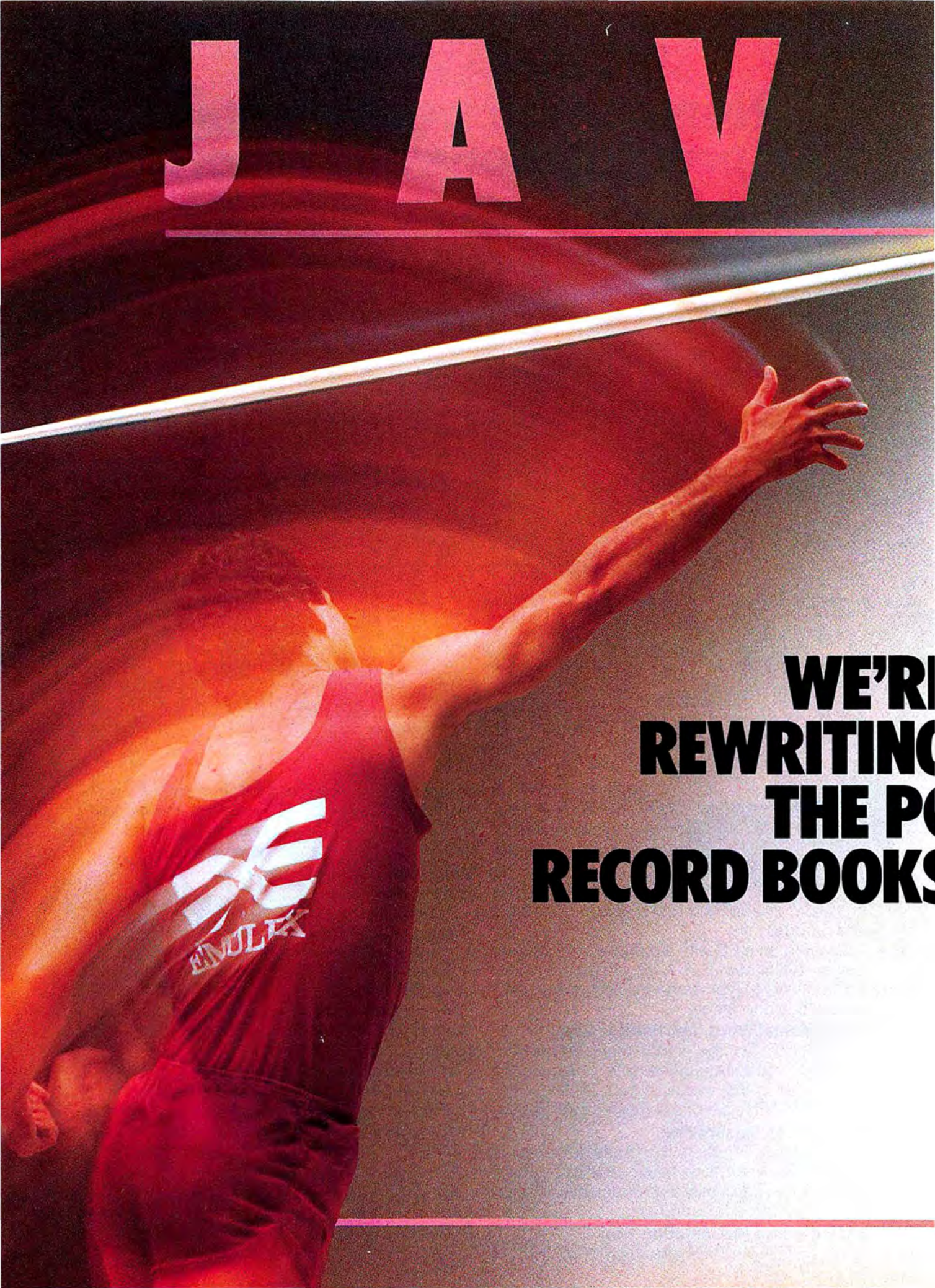
For reports and presentations that get noticed, get SIGN-MASTER — Number 1 in word charts.

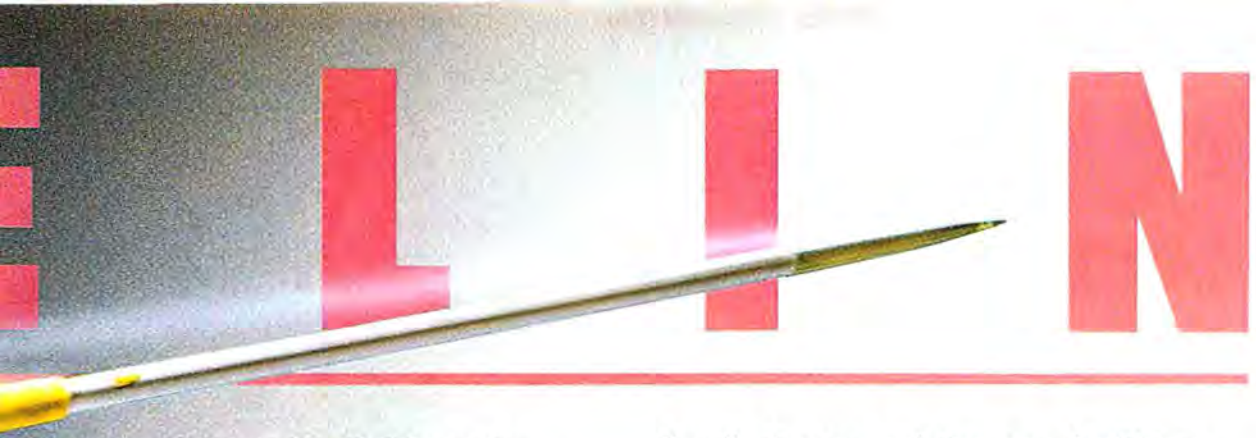
The retail price is $245.00. Call or write today for a complete information kit and a demonstration at your nearest dealer. Decision Resources, Inc., 25 Sylvan Road South, Westport, CT 06880 (203) 222-1974

SIGN-MASTER is a trademark of Decision Resources, Inc.

Circle 342 on reader service card

DecisionResources
Software Designed for Decision Makers


J A V
WE'R
REWRITIN
THE P
RECORD BOOK
EVOLUTION



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 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.

EMULEX

PERSYST

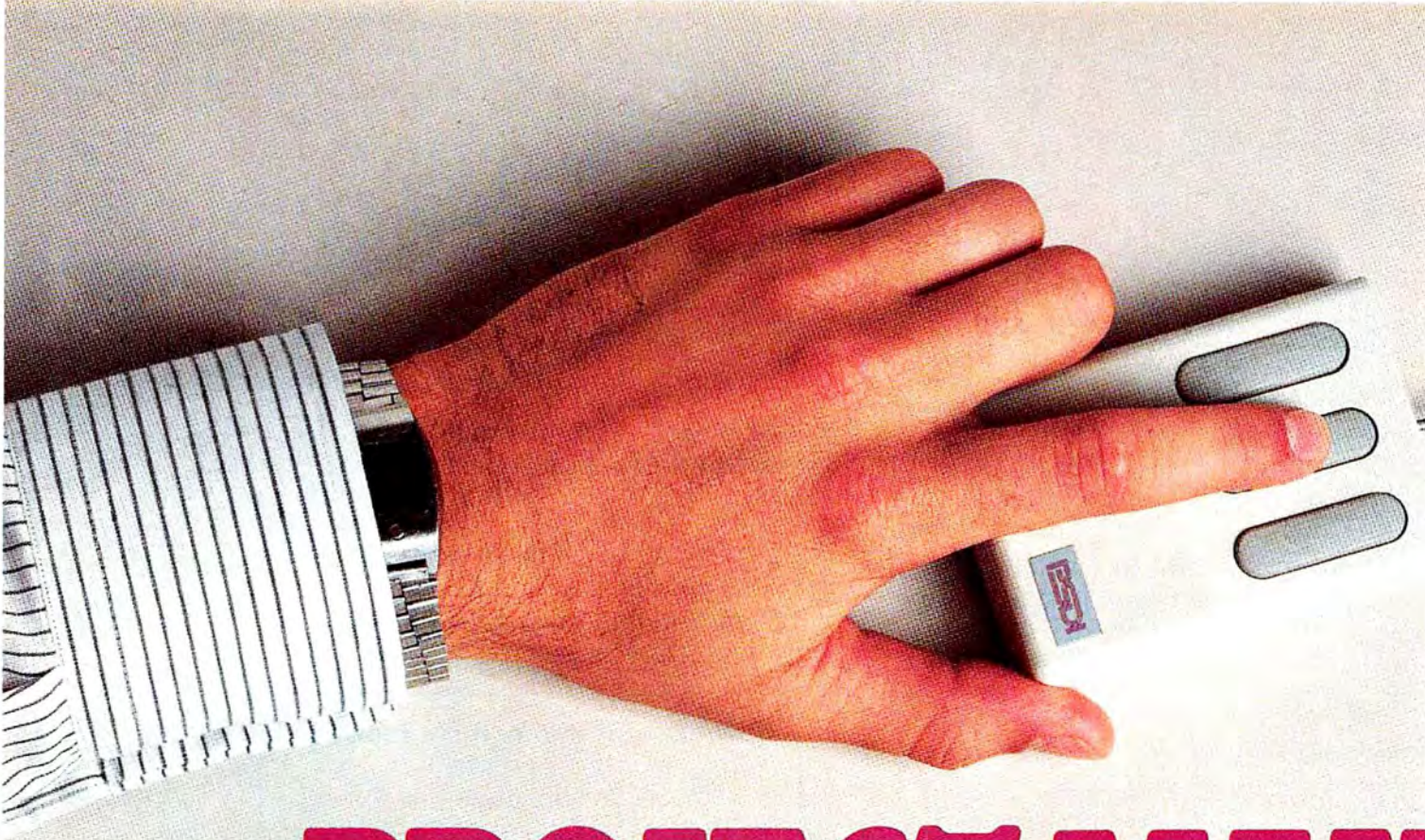
PERSYST

PERSYST

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

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

Circle 243 on reader service card



PROJECT MAN NEVER GET OUT

"What do you mean, the printer's on vacation!"

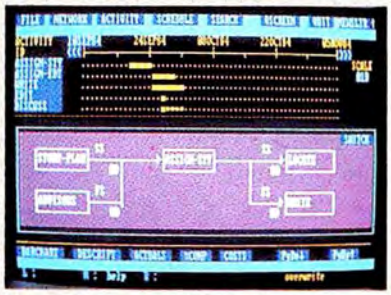
"Those prima donnas in development say the prototype will be a month late."

"Concrete just went up 20%!"

"The boss wants to make it blue."

If you're managing any kind of project today, you've got your hands full. Whether it's bringing a new product to market. Picking the best telephone system. Constructing an office building. Planning a convention. Or doing the annual report.

No matter what, someone important expects you to finish on time. And on budget. And if that doesn't seem humanly possible, you're right.



A picture of the project plan.

That's why you need QWIKNET:® a remarkable new bit of software magic for your IBM* PC.

With QWIKNET, and its optical mouse, you can push-button your way to figuring the time, money, and resources

See us at Booth M1010
COMDEX™/Fall '84
November 14-18, MGM Grand Hotel

*IBM is a registered trademark of International Business Machines

AGEMENT WILL OF HAND AGAIN.

you need to complete a project. And when changes threaten your best-laid plans, QWIKNET analyzes the effects on your deadlines and budget. Then it helps you make the necessary adjustments to keep on track.

QWIKNET is an idea that could only have come from PSDI. We created the world's most respected family of project management software for mainframes and minis: PROJECT/2®. And 16 years of experience have given QWIKNET more savvy, more power, and more usable features than any other product.

Features like easy, pop-down menus. Window management. CPM analysis. Network graphics. And a report writer.

For the name of your nearest QWIKNET dealer, or a free copy of the "Project Management Primer," call us at 617-661-1444.

With QWIKNET, project management won't be a project any more.

QWIKNET®
PC Project Management Software
From PSDI

Project Software & Development, Inc., 14 Story Street, Cambridge, MA 02138.

Circle 889 on reader service card

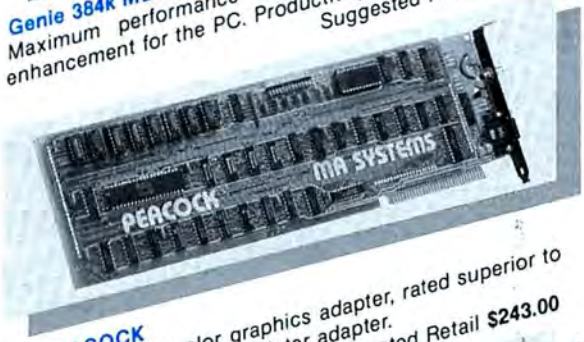
For Your Peace of Mind . . .

Why not buy the products from the manufacturers with the longest Warranty?

Single Source for No. 1 Hardware and No. 1 Training Software for the No. 1 computers, IBM PC/XT and compatibles.

Service, Support, Reliability and Quality, second to none and the lowest list prices.

Genie 384k Multi Function Adapter
Maximum performance tool. The most cost effective enhancement for the PC. Productivity software included.
Suggested Retail **$289.00**



PC PEACOCK
Most compatible color graphics adapter, rated superior to IBM color card. Includes printer adapter.
Suggested Retail **$243.00**

No. 1 Self and Home Tutor
A superior training program for new users, a must for everyone.
Suggested Retail **$59.95**

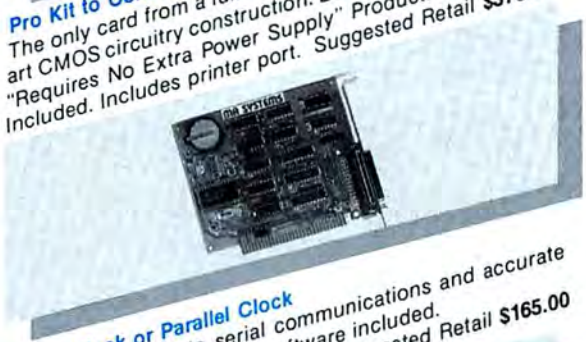
MonoMagic + Graphics
High resolution Graphics on IBM Monochrome monitor. Operates Lotus 1,2,3, in full graphics. Beats Hercules Card.
List **$329**

Magic Modem
300/1200 baud, Auto Answer, Auto Dial, Direct Connect, Hayes compatible with Com1 to Com4 addressing capability plus cross talk XVI software.
List **$399**

Magic Modem Jr.
300 baud for PC jr. Hayes and IBM compatible.List **$169**
with crosstalk XVI software **$249**

In addition to the above products, we make floppy drives FD-35 for Apple IIe ($199) and Apple IIc ($220) systems, and Omnigraph ($99), an intelligent graphics printer adapter providing dazzling selection of graphics for Apple IIe.

Pro Kit to Convert PC JR into IBM PC
The only card from a full line company to offer state of the art CMOS circuitry construction. Low power consumption. "Requires No Extra Power Supply" Productivity Software Included. Includes printer port. Suggested Retail **$379.00**



Serial Clock or Parallel Clock
The shortest way to serial communications and accurate time keeping. Productivity software included.
Suggested Retail **$165.00**

384k Memory Expansion + Game
System card, perfect for enhanced systems needing that extra push. Productivity Software included.
Suggested Retail as low as **$259.00**

10MB or 20MB Magic
Internal half height hard disk fits inside IBM PC. Requires no external power.
List **$995**

Magic Tape
Streaming Tape Drive Subsystem. 20MB to 45MB half height version available.
List **$1085**

See us at COMDEX®/Fall '84

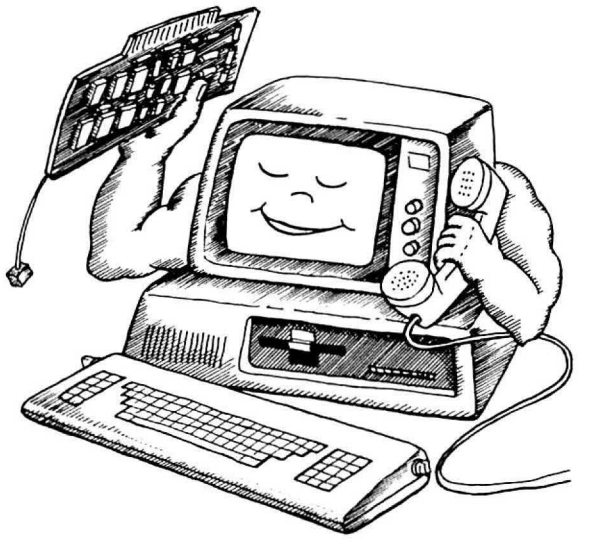
MA SYSTEMS
INCORPORATED An Enconi Company

2015 O'Toole Avenue • San Jose, CA 95131 • (408) 943-0596/Telex: 346485

Circle 593 on reader service card

GIVE YOUR PC A $149 MODEM

Special Offer
To introduce
PC users to
CERMETEK MODEMS



A 1200 bps modem, complete with software!

The INFO-MATE 212PC modem is a complete data communications solution for your IBM® or compatible computer. Simply plug into any of the computer's expansion slots, boot up MODEM-MATE, communications software included with the modem, and you're ready to communicate with all commonly used 1200 or 300 bps modems.

Cermetek, a pioneer in the modem and modem component business, now offers a complete line of advanced communications products. We want to make our name known with PC users and believe no one could forget this tremendous buy! So, act now! Send in your order today. You'll never get an offer like this again.

*IBM is a Registered Trademark of International Business Machines

Offer expires: January 31, 1985
Limited to quantities on hand

ORDER TODAY

Dealer inquiries invited.

INFO-MATE 212 PC Features:

- 1200/300/110 bps, full duplex
- Bell 212A and 103 compatible
- MODEM-MATE software included
- Auto-dial, Auto-answer
- Tone or rotary dialing, auto-selected
- Call progress monitoring
- 8 Diagnostic test modes
- Asynchronous data format
- 1 year limited warranty

YES! Send me an INFO-MATE 212PC

___ I have included a check for $149.00
(CA residents must add $9.69 for sales tax.)

___ Please charge my modem on my:

___ VISA ___ MasterCard

Account No. _____ Exp. Date _____

Signature _____

SEND TO:

Name _____

Address _____

City _____ State ___ Zip _____

Daytime Phone _____

Sorry No COD's. Please allow 4 weeks for delivery.

Cermetek
microelectronics
1308 Borregas Avenue
Sunnyvale, CA 94088-3565
(800) 862-6271 (In California call 408/752-5055)

SUDDENLY IT'S EASY TO GET YOUR WHOLE MESSAGE ACROSS... WITH Dr. HALO

Dynamic Software...Sophisticated Graphics...Simple to Use

Dr. HALO is a simple to use software program, friendly to both the greenest computer-newcomer and the high-tech professional. It performs beautifully as your graphics helper, software enhancer and all around graphics integrator. High resolution monochrome or color graphics are professionally rendered by the good Doctor. All for a price that's designed to pique your interest: $99.95.

Sources of Per Capita Income
(Constant 1980 Dollars)

	1980	1982	1984
Wages and Salary	68.2	64.2	64.2
Other Labor Income	4.2	5.2	6.2
Proprietors' Income	8.1	6.9	6.8
Rental Income	2.3	1.8	1.5
Dividends	2.9	2.5	2.7
Interest Income	8.0	9.2	9.5

A Colorful Performer

How does it work? Point and Pick. Simply select the "icon" you want to use to create each part of the picture. What are your choices? Pencil, Paint Can, Type Styles, Airbrush, Line Styles, are only a few. Pop-up menus add power and flexibility to the main icons for sketching, painting, cutting and pasting, drawing curves, etc.

Dr. HALO's symbol library lets you store any symbol you've created and retrieve it to use in future programs/reports/ presentations/ floor plans/ circuit design. Should you want to use that symbol as a logo, paintbrush or hatch pattern, it's always there to use again.

Dr. HALO's eight high quality type faces give you a broad choice of styles with which to shape your ideas—italic, serif, sans serif and greek in virtually any size that fits on the screen. You determine line width, type path, colors, and pattern fills.

Dr. HALO can support all the colors your graphics card has to offer. Colors can be changed, interchanged and reversed. And with Dr. HALO any image can be rotated, flipped or mirrored.

All Things to All People

Dr. HALO's unique flexibility hails from the most widely used library of graphics functions under MS®/ DOS today—HALO.

With its GRAB and SHOW programs, Dr. HALO allows you to capture graphics from other applications including LOTUS 1-2-3,® SUPERCALC,® and even CAD packages and assemble them as a slide show.

If you have an IBM® PC, XT, AT, PC Jr., Texas Instruments Professional® or any IBM compatible computer, you're ready to run with Dr. HALO. A mouse, joystick, digitizer, touch-pad or keyboard will bring your screen to life. And Dr. HALO supports the most popular monochrome and color graphics boards, and dot matrix, color and inkjet printers.

So if you want dynamic graphics that clearly put your whole message across, send for the software that paints the whole picture. Dr. HALO.

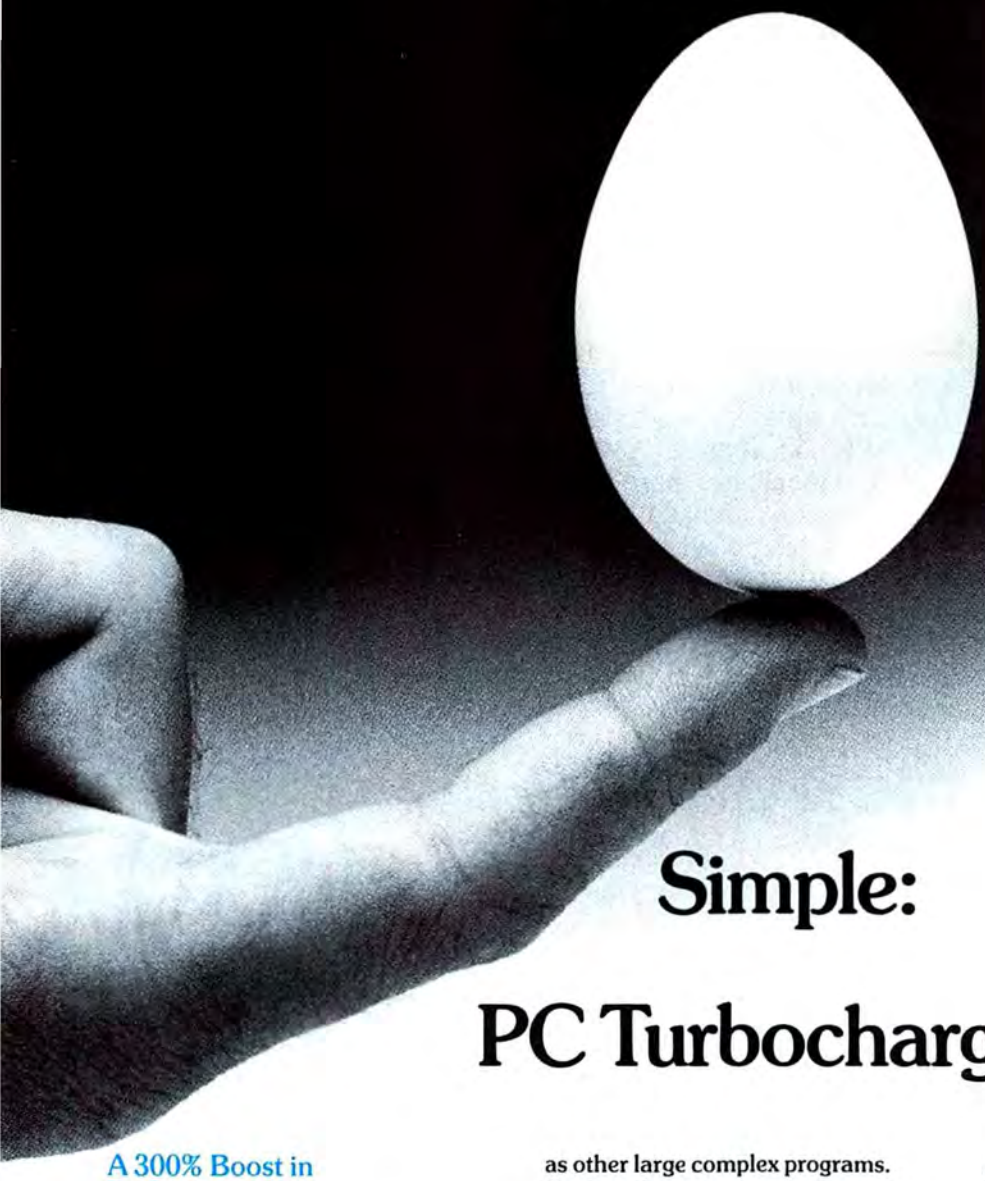
To order or receive information: Call Media Cybernetics, Inc., at (301) 270-0240 or Lifeboat Associates at (212) 860-0300. For dealer information and pricing call (800) 847-7078.

media cybernetics

MS, LOTUS 1-2-3, SUPERCALC, IBM, Texas Instruments Professional are all registered trademarks of Microsoft Corporation, Lotus Development Corporation, Sorcim Corp., International Business Machines, and Texas Instruments Incorporated respectively.

Circle 92 on reader service card

How Do You Increase Your PC's Performance?



Simple:

PC Turbocharger™

A 300% Boost in Performance!

When Univation's PC Turbocharger is added to your IBM PC or PC/XT, you'll get a 300% increase in processing speed. Its 8086 engine boosts PC performance yet, unlike co-processor boards, requires no special configuration software.

The PC Turbocharger is compatible with all your existing PC applications. Spreadsheet and database applications are accelerated as well as other large complex programs. On-board memory expansion up to 640Kbytes is optional. The PC Turbocharger can access this memory twice as fast as a standard IBM PC!

Turn Your PC into an XT!

Univation manufactures a whole family of IBM PC exapansion systems, including removable and fixed Winchester disk systems. A 5.5Mb model has the unique feature of removable media – providing the data security and transportability as only a removable can. 10 and 20Mb disk drives are available for storage intensive applications. All Univation disk systems can be completely installed in the IBM PC's second floppy drive space.

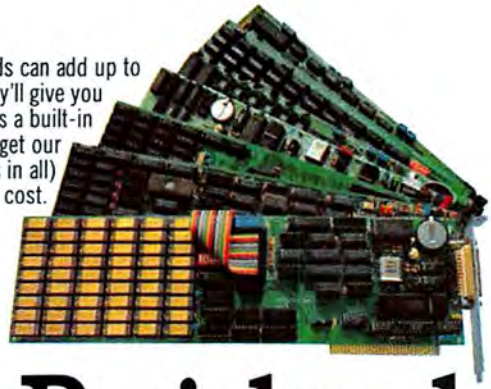
For more information about Univation's family of IBM PC and DEC Rainbow expansion products, give us a call at (408) 745-0180.

UNIVATION
Your expansion company

1037 North Fairoaks Avenue Sunnyvale, CA 94089 (408) 745-0180 Telex 171627

Circle 261 on reader service card

Our Captain™ or other multifunction boards can add up to 384K bytes of memory to your IBM PC. They'll give you additional serial and parallel ports as well as a built-in clock/calendar. With each board, you'll get our Treasure Chest™ of Software (24 programs in all) at no extra cost.



Tecmar's Lab Master™ is ideal for process control and the tracking of laboratory experiments in industrial and scientific applications. It converts analog data to digital data, and back again. Sophisticated timing is accomplished throughout this process by Lab Master's timer/counter circuitry (AMD 9513). The Lab Master has 24 digital I/O lines. 12-bit resolution is standard while 14- or 16-bit resolution is optional. Additional A/D and D/A channels are also available.

For your graphics needs, Tecmar offers the Graphics Master.™ With it, your PC gets graphics support for most popular software packages like Lotus 1-2-3,™ Open Access,™ Auto CAD,™ and all IBM color software. Graphics Master works in high resolution color (640 x 400) or Monochrome (720 x 700).

Peripheral Vision

When your computer needs peripherals, it pays to go with the company that has the peripherals and the vision. Tecmar.

In all, Tecmar has more than 150 peripherals and add-ons for your computer. So, when you're ready to expand, ask for Tecmar. Or write for our brochure.

Tecmar, Inc., 6225 Cochran Road, Solon, OH 44139 USA, Tel. (216) 349-0600, Telex 466692.

Tecmar International, Inc., Avenue de la Tanche, 2, B1160 Brussels, Belgium, Tel. (02) 660-44-51, Telex 25387.

Tecmar

THE POWER BEHIND THE PC

For large memory storage, Tecmar offers your PC a variety of Hard Disk Drives with capacities up to 74 megabytes. These include Removable Disk Drives for unlimited hard disk storage.

And Tecmar also makes the MacDrive,™ Removable or Fixed Hard Disk Drive for the Macintosh.

Circle 190 on reader service card

Capable COBOL.

For over twenty years, COBOL has proved it can handle the most awesome data handling requirements of the business world.

And Microsoft® COBOL brings this power to the MS™-DOS environment in an even more flexible version. It's the ideal choice for transporting and adapting the thousands of mainframe and minicomputer programs now on the market.

Microsoft COBOL was designed after the ANSI COBOL standard. Its quality and performance has been fully certified by the GSA.

Microsoft COBOL includes a complete set of file handling facilities including support for sequential, line sequential, relative and B+ tree indexed sequential (ISAM) files.

MICROSOFT®
The High Performance Software

The advanced screen handling features, compatible with Data General,® make it easy to create forms and menus for interactive user programs. Direct cursor positioning, highlighting, automatic format conversion, projected fields, and automatic field skip are just some of the capabilities.

An interactive source code debugging tool allows you to step through your program in symbolic form. There is no need to wade through object code and addresses in memory to see what is going on. It's a complete development package.

Applications developed with the compiler can be distributed without a runtime support charge.

Like all Microsoft languages, the standard linking interface makes it easy to combine assembly language subroutines.

Call 800-426-9400 to order the capable COBOL. $700.*

In Washington State, call 206-828-8088. Ask for operator I6, who will rush you your order, send you more information, or give you the name of your nearest dealer to see Microsoft COBOL in action.

*Price exclusive of handling and Washington State sales tax.

Microsoft is a registered trademark and MS is a trademark of Microsoft Corporation.
Data General is a registered trademark of Data General Corporation.

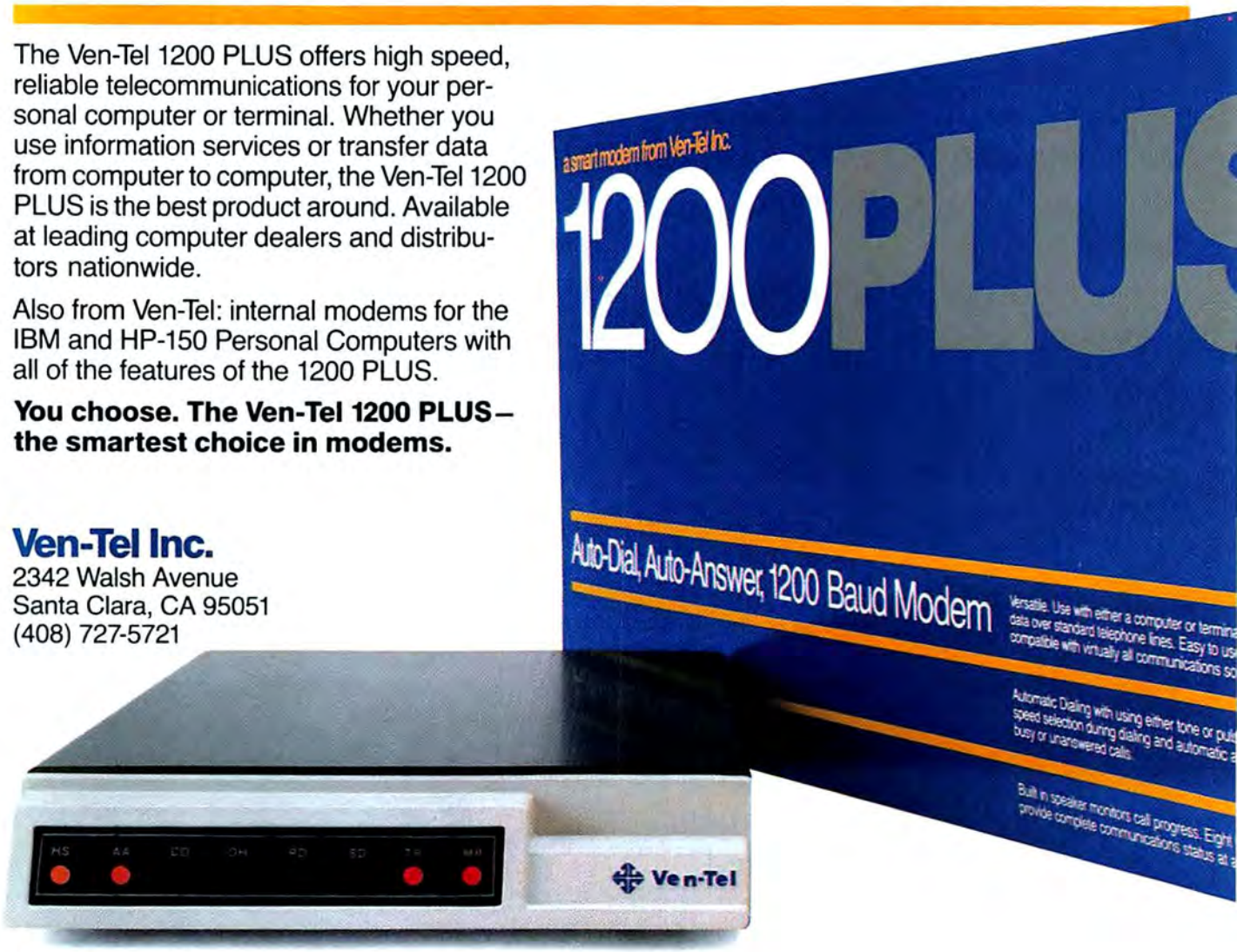
A few smart reasons to buy our smart modem:

Features	Ven-Tel 1200 PLUS	Hayes
1200 and 300 baud, auto-dial, auto-answer	Yes	Yes
Compatible with "AT" command set	Yes	Yes
Can be used with CROSSTALK-XVI or Smartcom II software	Yes	Yes
Regulated DC power pack for cool, reliable operation	Yes	**No**
Eight indicator lights to display modem status	Yes	Yes
Speaker to monitor call progress	Yes	Yes
Attractive, compact aluminum case	Yes	Yes
Two built-in phone connectors	Yes	**No**
Compatible with The Source and Dow Jones News Retrieval	Yes	Yes
Unattended remote test capability	Yes	**No**
Phone cable included	Yes	Yes
Availability	Now	
Price	**$499**	**$699**

The Ven-Tel 1200 PLUS offers high speed, reliable telecommunications for your personal computer or terminal. Whether you use information services or transfer data from computer to computer, the Ven-Tel 1200 PLUS is the best product around. Available at leading computer dealers and distributors nationwide.

Also from Ven-Tel: internal modems for the IBM and HP-150 Personal Computers with all of the features of the 1200 PLUS.

You choose. The Ven-Tel 1200 PLUS— the smartest choice in modems.



Ven-Tel Inc.
2342 Walsh Avenue
Santa Clara, CA 95051
(408) 727-5721

Crosstalk is a trademark of Microstuf; Hayes and Smartcom II are trademarks of Hayes Microcomputer Products.

Circle 193 on reader service card

The new HERCULES™ Color Card gives you the parallel port IBM® forgot-for $1 more.

The new Hercules Color Card gives you these five important features in a color graphics card.

1. Full IBM color card compatibility.[1] Any program that runs on IBM's color card will run on the new Hercules Color Card at the same resolution.

2. A parallel printer port—standard on the Hercules Color Card, but forgotten by IBM on theirs.

3. It's short. The pint-sized Hercules Color Card fits in the short slot in an XT or *Portable*.[2] And it's AT™ compatible.

4. It can work in your system at the same time as the famous high resolution Hercules Graphics Card.[3] And it will continue to work backed by our 2 year warranty.

5. Low price. At a suggested list price of $245, the Hercules Color Card is only $1 more than IBM's card.[4] And our Graphics Pak™ saves you even more money when you buy both Hercules cards at the same time.

Call **800 255-5550 Ext 421** for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.

	IBM Mono Display Compatible	IBM Color Display Compatible	Hi-Res Text	720×348 Hi-Res Graphics	320×200 Color Graphics	640×200 B&W Graphics	Parallel Printer Port
Hercules Color Card		▪			▪	▪	▪
Hercules Graphics Card	▪		▪	▪			▪
IBM Mono Card	▪		▪				▪
IBM Color Card		▪			▪	▪	

Hercules. We're strong on graphics.

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph:415 540-6000 Telex:754063 **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia; Holland Info Products/Holland; DataTeam/Scandinavia **Trademarks/Owners:** Hercules, Graphics Pak/Hercules Computer Technology; IBM, AT/ International Business Machines **Notes:** (1) An adapter is supplied for composite video. (2) The IBM Color/Graphics Monitor Adapter must be removed from the *Portable* before the Hercules Color Card is installed. (3) Model GB101 or later. (4) Based on the list price as of 7.1.84 for the IBM Color/Graphics Monitor Adapter.

Circle 77 on reader service card

The Ten-Second Commute

Working at home no longer means leaving big business behind. With the help of personal computers, a cottage industry could become multinational.

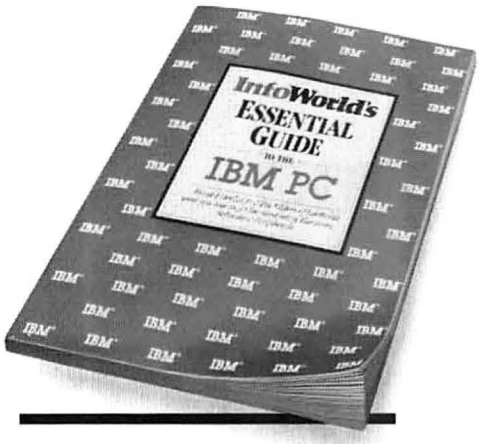
Anita Micossi

Once most people earned their livelihoods in and around the homestead. All able-bodied members of the household worked, and everyone's labor had a recognized economic value. Then the Industrial Revolution induced the great migration of labor out of the home and into the factory. After that, men went "out into the world" and were paid for their work, and women stayed at home and were not. One by one, "outside" institutions–schools, hospitals, social welfare agencies, police departments, recreation centers–took over the tasks of family and tribe, and the home became a refuge from economics instead of the economic center it had been.

The Industrial Revolution evolved into the information age, and the gathering and dispensing of information became a critical service. Then the personal computer was introduced. Because the computer is so adept at handling information, it's become increasingly important in the marketplace. Through communication with sources such as bulletin boards, mainframe computers, and commercial data bases, the personal computer can quickly gather data from around the world. This compact tool can do the repetitive work of many people, and, most significantly, it can do it all with you at the helm, close to your family and your coffee cup.

Working at home–the domain of the economically marginal ever since the Industrial Revolution–is suddenly attracting a whole new

© 1984 Harper & Row
IBM is a registered trademark of
International Business Machines



TOOL UP YOUR IBM® FOR MODERN TIMES. $16.95.

Here's the indispensable source on the choice, care and feeding of your IBM PC and XT. Everything you'll ever need to know about your computer: inside, up-to-date advice on the hardware, critical reviews of the software, and even an exhaustive look at peripherals.

InfoWorld's Essential Guide to the IBM PC has been written by Frank Derfler, Jr., an authority on IBM computers, and the editors of InfoWorld, the respected voice of the industry.

Now you can tool up your IBM for modern times with InfoWorld's Essential Guide.

Please send InfoWorld's Essential Guide to the IBM PC. I enclose $16.95 + $1.50 postage & handling (and any sales tax).

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

☐ MasterCard ☐ Visa ☐ AmEx

Card #:_____ Exp.___

Send to: Harper & Row
10 East 53rd Street, 20th floor
New York, NY 10022

Or call toll free 800-638-3030.
(In MD, call collect 301-824-7300.) Or see your local bookseller or computer store.

Harper&Row

group of people from an unprecedented variety of trades and professions. Five million Americans work at home, and this number is expected to double by the end of the decade, due largely to the personal computer.

There's much to be said about home computers and home-based work as individual topics. But the sparks really start to fly when you put them together.

The Road Home

Four years ago, Lucilla Barth was a high school teacher. Then she decided that there were more profits and fewer headaches in bookkeeping. After two years her freelance bookkeeping service, LDB Associates, expanded to the extent that she was spending most of her time away from home.

The mother of three teenagers, Barth decided it was time to make some adjustments. "I wanted to bring my work back home," she says, "and have flexible hours so that I could be with my children." She had little experience working at home and was a computer novice. But after playing with a friend's IBM PC, Barth bought her own and set up an office in her den.

Working at home is suddenly attracting a whole new group of people from an unprecedented variety of trades and professions.

Jessica Lipnack and Jeffrey Stamps were not computer novices when they brought their work home. In 1960 Stamps won a high school science fair prize for his homemade computer. The two met in 1968 at Oxford where Stamps was studying on a Fulbright Scholarship. Lipnack was a newspaper reporter. They married and, combining their skills in journalism and social science, set up an independent social research foundation.

Looking for a tool to help with a state-funded research project, Lipnack stumbled across the Sharp programmable calculator. It was 1970, and "they didn't call them computers in those days." She bullied the store manager into letting her buy the Sharp on credit. The calculator was followed in 1971 by a Wang 600 and later by a Wang 2200. In 1978 Lipnack and Stamps decided to move their work back home. Managing an outside office with a half dozen employees was eroding their productivity, and the two were expecting their first child.

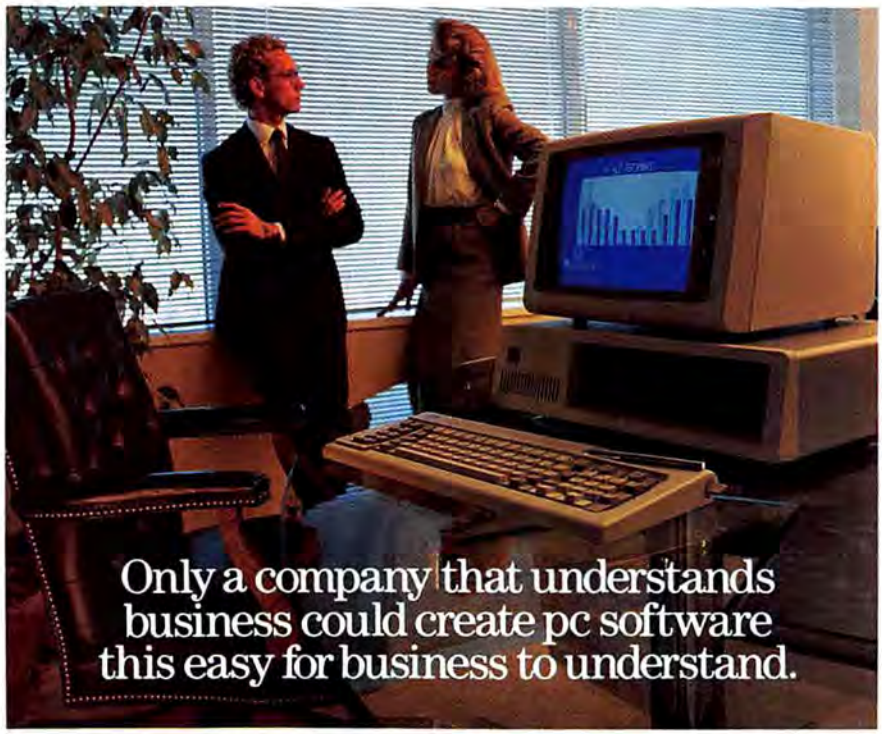
Cameron Hall and Alex Randall haven't yet had time to start a family. The two have spent four of the last ten years trotting around the globe and putting their advanced degrees in economics and education to use—teaching, re-

searching, and hustling such "odd jobs" as producing a documentary on the green revolution in Thailand and conducting personal financial management seminars for the American military in Germany.

Randall has an unusual link with the computer revolution. While an anthropology student at Columbia University, he was urged by his tutor, Margaret Mead, to abandon the usual concerns of the anthropologist and take on "the whole planet" for study. Specifically, Mead introduced Randall to the concept of "appropriate technology," the use of knowledge for appropriate—that is, beneficial—purposes.

When Hall and Randall came to rest in Boston in 1981, they set up shop at home. They bought their first IBM PC to help with their writing and lecturing tasks. When they acquired the computer, Randall used it to publish a newsletter for the International Business Center of New England. But Randall knew that computers could do more than cut and paste text efficiently. His education and work abroad had taught him that "computers manage information better than people do" and that, as he puts it, computers are "developing the cortex of the world by electromechanical means." He became convinced that computers were the linchpin of the "appropriate technology" he had been searching for.

Late one night on the New Jersey Turnpike, it struck him that Boston had more computers per square mile than perhaps any



We're Cullinet, the acknowledged leader in mainframe software. Our customers include some 2,000 of the world's biggest and best-run companies.

So when we set out to develop a superior integrated *personal computer* software package, we didn't have to guess what business wanted. We simply had to ask.

The combination of our technical skills and business experience and the input and feedback of our client community has resulted in GOLDENGATE,™ integrated pc software for business people intent on doing business, not fussing with software programs.

Each GOLDENGATE function—spreadsheet, database, word processing, graphics and telecommunications—is designed to provide an optimum working environment. And as powerful as the program is, specific attention was paid to making GOLDENGATE truly easy to use.

The fact is, anyone can begin to use GOLDENGATE in a matter of minutes. A single command set operates each and every function, so a GOLDENGATE user enjoys a single learning experience, rather than several. Tutorials and complete on-line help screens allow the novice user to become productive *without training.*

To top it off, GOLDENGATE provides micro-to-mainframe integration that makes accessing corporate data indistinguishable from accessing data on a diskette.

For more information about GOLDENGATE, phone Cullinet toll-free, 1-800-551-4555.

Cullinet

We understand business better than any software company in business.

© 1984 Cullinet Software, Inc., Westwood, MA 02090-2198. GOLDENGATE is a trademark of Cullinet Software, Inc. IBM and AT are registered trademarks of International Business Machines, Inc.

Circle 884 on reader service card

25 Pack Complete*

BEST BUY!

$1.74 Single Sided Double Density

Soft sector 5¼" flexible diskettes

$2.24 Double Sided Double Density

*Complete with hub reinforcing rings, Tyvek sleeves, color coded user labels, and write protect tabs.

Quality you expect at a price you don't.

Proven quality at a great price. BECK offers you a full satisfaction money-back guarantee – you can't lose! If you like the quality of 3M, Dysan, Verbatim, et al, you'll like BECK.

- Satisfaction, Money-Back Guarantee
- 100% Certified, 100% Error-Free
- Full 7-Year Warranty
- Tested and Retested 21 Times to 42 Rigid Specifications
- Meets or Exceeds ANSI Standards

For IBM, Apple, TRS, and 97% of popular computers.

Order Toll Free 1-800-232-5634.
Available in 25-Pack only plus freight.
Bulk product inquiries welcome.

COD's CASH ONLY
Corp. Accts Welcome

MasterCard VISA

Order Now Toll Free Door to Door in 48 hrs.

1-800-BECK MFG

(In New Hampshire call 924-3821)

other place in the world, and that the community turned them over at an incredible rate. Randall felt that such a stockpile of used computers could "fill that unfilled demand I had seen all over the world." His entrepreneurial instincts were engaged again, and the Boston Computer Exchange–a brokerage firm dealing in used hardware–was born.

Another computer-based home office is run by Dr. Herbert Greenwald, an experimental psychologist. Greenwald decided 20 years ago that his family came first. Although he teaches at a nearby college, Greenwald has always spent most of his time in a small home office where he does research and runs a therapeutic practice.

Greenwald needed a tool to help him with writing, filing, and coding data from patient interviews and questionnaires. He bought his first computer, a Seequa Chameleon, in 1983 for word processing and data management. Greenwald hopes to use the computer and his word processing, spreadsheet, and data base management software to map the psychological profiles of his patients and to develop programs to detect and analyze patterns. The potential for computer application to his therapeutic practice is, he feels, limitless.

The Productivity Effect

In the first six months after the PC was installed in her home in San Rafael, California, Lucilla Barth's income doubled while her work hours remained the same. The computer enables her to offer her clients far more than a standard financial statement. "We coordinate, consolidate, and advise," she explains. "One company had hired three different people to take care of billing, routine bookkeeping chores, and complex financial reports. Now LDB Associates can do it all for them at a savings of $700 a month."

It's hard to break emotionally and psychologically from work and flee to the refuge of home when the two are in the same place.

Barth's experience–being able to do more work in less time–is typical. Jessica Lipnack and Jeffrey Stamps use *Mist+*, an integrated word processing, data base management, and telecommunications package from New Era Technologies. "We can have an idea," says Lipnack, "and get an article out the same day." Since the copy can go directly to the typesetter's computer, a whole phase of labor is also cut out.

With little more than two people, three phones, and a half-dozen computers in a living room, Alex Randall's computer brokerage business went from con-

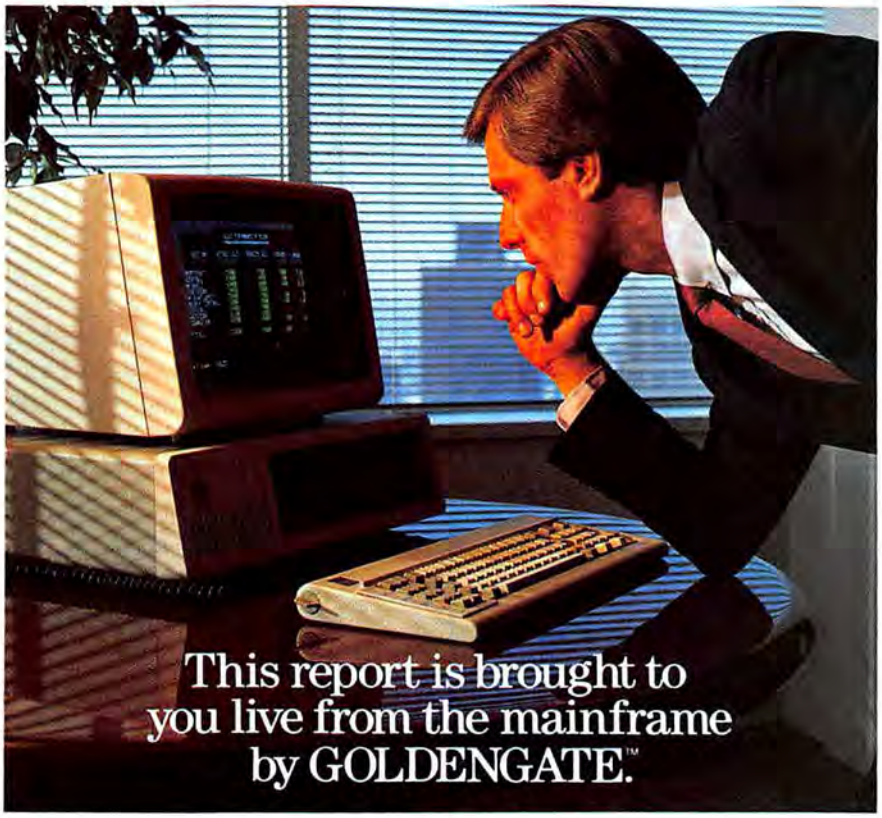
ception to profitable operation in a matter of months. Originally confined to matching computer buyers with sellers in the Boston area, the Boston Computer Exchange is ready to go national after less than a year.

The speed and accuracy with which computers crunch numbers increases the quantity of the work accomplished. But the real marvel, according to Herbert Greenwald, is the way the technology enhances the quality of effort. Greenwald claims that "the computer opens up the possibility of new solutions while helping to clarify my ideas and make them more concrete. As a result my thinking has improved."

Networking

The computer has helped Barth and Greenwald discover new paths in their traditional occupations and has allowed them to pursue those paths at home. But for Randall and Hall and Lipnack and Stamps, computers not only facilitate their work–computers make their work possible.

After Lipnack and Stamps moved their work home, they wrote *Networking* (Doubleday, New York, 1982), the first definitive book on networking–a concept cited in John Naisbitt's best-selling book *Megatrends* as one of the ten most important trends that are restructuring the way we live. It's a term familiar to PC users. Now Lipnack and Stamps (and five personal computers) run The Networking Institute out of their suburban home, publishing a newsletter, lecturing, organizing seminars, overseeing international



Managers know that a critical decision is only as timely as the information that goes into making it. The promise of personal computers has always been to deliver information to corporate managers in time to act upon it.

Only one software company can make a claim for integrating the two things that deliver that promise: the mainframe, from which all information flows, and the microcomputer, where someone has to make sense of that information.

GOLDENGATE™ from Cullinet is not only an exceptional integrated software package. It is the only microcomputer software that creates an environment for the corporate pc user which makes accessing information in the company mainframe *indistinguishable* from accessing information on a diskette.

The benefits are obvious: "what-if's" on live data, reports that are current as of this moment, and most important, the ability to act on today's problems today. And all accomplished independently right at the pc.

Cullinet is the recognized leader in mainframe software, which makes the introduction of GOLDENGATE significant. The singular ability of GOLDENGATE to provide easy-to-use, yet sophisticated, micro-mainframe integration makes it as timely as today's news.

For more information about GOLDENGATE, phone Cullinet toll-free, 1-800-551-4555.

Cullinet

We understand business better than any software company in business.

© 1984 Cullinet Software, Inc., Westwood, MA 02090. GOLDENGATE is a trademark of Cullinet Software, Inc. IBM and XT are registered trademarks of International Business Machines, Inc.

Circle 884 on reader service card

MICROTRIVIA
is
Macro Fun!

For Family Entertainment
Music • Graphics
Over 1000 Questions

- sports
- history
- science (includes computers)
- geography
- music, movies, television
- literature & art
- grab bag

Requires 64K, DOS, double-sided disk drive
Color Graphics adapter optional.

1-800-638-2000
Inside Md. call 1-800-831-4300

IBM PC Microtrivia Games @ $29.95 _____
Postage & handling $2.50 (outside U.S. $5.00) _____
Md. residents add 5% sales tax _____
Total _____

☐ Payment Enclosed
☐ MasterCard ☐ Visa ☐ Am. Exp.

Acct. # _____
Exp. Date _____
Please Print
Name _____
Address _____
City _____
State _____ Zip _____

Owl Software Corp.
P.O. Box 809
Greenbelt, Md. 20770

Circle 866 on reader service card

translations of their book, and generally exploring the concept of networking.

In its broadest sense, a network consists of the lines of communication that link people who have common interests. The Greenpeace movement is a network; international terrorist organizations form a network; and your circle of friends and family is a network.

Networks and personal computers complement each other perfectly. Computers allow the exchange of information that creates networks, through a medium that is potentially accessible to everyone. Such networks replace physical communities with communities of shared ideas and values, cutting across such barriers as age, income, and distance. Lipnack and Stamps are convinced that as private citizens gain access to ever-widening pools of information, networks linked by PCs will become Davids challenging the Goliaths of centralized, concentrated power. "You can't see our importance and social impact just by looking at this office," says Stamps, waving his hand across a homemade worktable. "But with computers people can play a profound role in the world while working out of their homes. In the information age, growth is accomplished via networking, and that's not limited by physical location."

For such a modest organization, Lipnack and Stamps are making lots of waves, socially and politically—their book is being published by the Japanese government this year. They're also making a good living.

A PC on the Hearth

For many people who've moved their work home and automated it with a PC, the increase in productivity has been greater than they ever imagined. But finances were not the only reason they moved home. For many the real payoff is a personal one.

In Barth's household the family is rediscovering togetherness around—of all things—a computerized bookkeeping business. Barth explains, "I have a thriving business where I can be available to my kids; they like having me at home when they get back from school. Also, I can get up in the morning and go to work in my bathrobe. And when I get all dressed up and go out, I can enjoy those challenging meetings with my clients. I've really got the best of both worlds."

The computer has had more of an impact on the family than just letting the kids see more of their mother. The kids are taking to the business too. "We have a deal," says Barth. "If they each take one year of typing and one year of computer science in high school, I've promised to hire them on to do some of the data input." Her oldest son, John, has taken up the offer. He's decided to study accounting in college and get into the business in a serious way.

Greenwald has always kept his office door open to his family. Since he bought a computer, however, the foot traffic has picked up. His sons use the machine for

homework and games, and sometimes father and son find themselves side by side at the PC grappling with a problem.

Although the daughters of Lipnack and Stamps are a bit young to work with their folks, they weave in and out of their parents' daily lives, popping in to show off a drawing or deliver a cup of tea. Lipnack likes that. "Unlike other working mothers, I know what my children are doing. And," she adds, "I didn't have to go through the heartbreak of leaving a new baby at home to return to work." For Stamps the ability to be around his family all day has been an unanticipated bonus. He says that, like most fathers, "I never thought I'd be able to work and be around the kids."

Second Thoughts

Of course, every situation has its drawbacks. Working at home can be socially and professionally isolating; professional connections are harder to make when you don't congregate with your colleagues at a common place of work. Also, it's hard to break emotionally and psychologically from work and flee to the refuge of home when the two are in the same place. There's also the economic risk. Maintaining an aura of professionalism is a potential problem for the home-based worker. Lipnack quips, "It's hard to get venture capital when you work at home."

But the people who have chosen to work at home play down the problems and risks—or even turn them into advantages. Hall contends that in many professions the

You have to do everything well.

Those who succeed in business are those who consistently demonstrate a high level of skill in a variety of areas. In forecasting, in planning, in implementing, in managing.

GOLDENGATE™ is a business tool that can help you perform your best in each.

A product of Cullinet, the recognized leader in mainframe software, GOLDENGATE is a functionally rich integrated pc package for business professionals. It combines spreadsheet, database, word processing, graphics and telecommunications capabilities. It also provides sophisticated, yet easy to use micro-to-mainframe integration—integration that makes accessing corporate data indistinguishable from accessing data on a diskette.

GOLDENGATE's superior functionality results from its unique architecture. Each function in the program is designed to provide an optimum working environment. And each is linked to the others through core software.

The result is integrated pc software that does each of its jobs exceptionally well, so you can do the same in yours.

For more information about GOLDENGATE, phone Cullinet toll-free, 1-800-551-4555.

Cullinet

We understand business better than any software company in business.

© 1984 Cullinet Software, Inc., Westwood, MA 02090-2198
GOLDENGATE is a trademark of Cullinet Software, Inc.

Practical Advice for Would-Be Pioneers

If you're thinking about setting up a computerized cottage business, first consider whether or not your work can be done at home, either by yourself or with a skeleton crew. Make a fair examination of your conscience: Am I self-motivated? Self-disciplined? Am I capable of giving myself deadlines and meeting them? Am I flexible and good at juggling tasks? Am I willing to take risks?

Finally ask, Do I really want to live this way? The quality of life comes first with the people I talked to. Although they are doing fine financially, there are less risky ways of making money.

Working at home is not for everyone. But if you have the temperament for it, then listen to the advice of the advance guard:

1. When purchasing hardware, choose a reputable dealer. What to buy depends, of course, on how much money you've got and what you're going to use the computer for. Herbert Greenwald's Seequa Chameleon with a dot matrix printer and bundled software cost him around $3500. The Lipnack/Stamps' arsenal of printers and five computers, including an IBM PC, a Vector IV, and a Kaypro (all of which talk to each other), cost more than $25,000.

When buying a computer, anticipate expansion and make sure that the hardware (and software) can grow with you. And make sure you get a surge protector. The home, unlike the conventional office, has lots of high-pull appliances—a clothes dryer, a vacuum cleaner, a well pump, and so forth—that come on and off during the day.

2. Software is the weak link in most home business systems. Seven months after Greenwald bought his computer, the Condor data base software (included in the purchase price) had still not arrived. It took Barth over six months to get her billing program, the *Advocate,* up and running. Hall and Randall found a data base package to love in Alpha Software's *Data Base Manager II,* but not until they'd gone through torture with *dBASE II. dBASE II* is not recommended for the beginner unless you budget the price of a consultant into start-up costs.

Lipnack and Stamps first selected the software best suited to their needs: the *Mist+* package, a text-oriented data base manager with word processing and telecommunicating capabilities. Only then did they buy the hardware. Significantly, they are the only interviewees who have no complaints.

3. Make sure you have a work space in your home that is physically separate from the rest of the house. This is important both for privacy and professionalism while you're working and for

escaping when the workday is done. Being able to shut the door to your office is important.

I was amazed to see Randall and Hall's apartment, where there was virtually no place free of business paraphernalia except the bathroom. How do they survive? A second house in Rhode Island.

4. Don't leave social and psychological breaks from work to chance. Plan activities that take you away from and give you perspective on the work.

Schedule family recreation time and, if you have children, separate time to spend with only your spouse. Lipnack and Stamps make "dates" with each other. Going out for meals and entertainment, traveling, and trading houses with someone who wants to play with a computer for a while were all suggested ploys.

5. Create a strong social network or nurture the one you have. Isolation is a major problem for single individuals working at home.

Lipnack points out that here also you can turn the technology to your advantage: use the computer to plug into networks of like-minded souls–location is no barrier to this new-age method of communication.

6. If you don't have any on-the-job contact–either with a spouse or with someone you've hired –develop alternative methods of professional exchange. It's important to be able to get feedback from and share ideas with colleagues. One way is through professional associations or regular meetings with clients.

mystique surrounding people who use computers offsets the disadvantages of an otherwise "nonprofessional" image. And Greenwald finds that in his profession "patients actually prefer to come to a home."

For 150 years work and home have been competing with each other. Now computers are making it easier to blend the two and increase the satisfactions of both.

The pioneers who are reversing the great migration often experience more than a seemingly idyllic "lifestyle." Many start out with modest goals. But after working with computers and controlling their own lives, their goals expand in unpredicted directions. The Barths would now like to help other small businesses through the process of conversion to computers. Greenwald wants to create software that maps the human psyche. Lipnack and Stamps want to be instrumental in the creation of global networks based on computer technology. Randall and Hall–who believe that "computers extend the mind the way telescopes extend the eye"–do not confine their activities to running the computer exchange. They hope to spread the word about this "appropriate technology" worldwide.

Will these pioneers have any impact on life outside their own cozy, computerized cottages? If Jeffrey Stamps is right, their influence will be greater than their numbers. And their numbers bear watching.

Anita Micossi is a Boston-based writer and sociologist.

Psst. It's

SOFTWARE

Aptec *(for color Prism Printers)*
Rainbow Writer Color Text Formatter $119.
Rainbow Writer Screen Grabber 69.
Ashton-Tate
dBase II 269.
dBase III 369
Upgrade (dBase II to dBase III) 125.
Framework 369.
Friday! 169.
Reference Encyclopedia *(book)* 55.
Best Programs
Personal Finance Programs 65.
PC/Professional Finance Program II 149.
PC/Fixed Asset System 297.
PC/Tax Cut 149.
Bible Research
THE WORD *(KJV Bible - 7 disks)* 145.
Broderbund
Bank Street Writer 59.
Bruce & James
WordVision 39.
Continental
Home Accountant Plus 89.
FCM *(filing, cataloging, & mailing)* 79.
UltraFile *(file,report,graph)* 109.
The Tax Advantage 39.
Digital Research
CP/M-86 39.
Dr. LOGO *(requires 192k & RGB monitor)* 69.
Financier
Financier II 115.
Financier Tax Series 97.
FriendlySoft
FriendlyWriter *(with FriendlySpeller)* 55.
Funk Software
Sideways 45.
Harvard Software
Harvard Project Manager 219.
Hayes
Smartcom II 99.

Please 239.
Get free mailing list template for a limited time - also get a second template of your choice free from Hayes.
Koala
Speed Key see special
Lifetree
Volkswriter Deluxe *(with TextMerge)* 165.
Living Videotext
ThinkTank 109.
Lotus Development
1-2-3 *(version 1A)* call
Symphony call
Micro Education (MECA)
Managing Your Money 129.
Micropro
WordStar & Propak come with quick lesson CAI training disk and tutorial disk

PC Connection Software Special
through November 30, 1984

KOALA TECHNOLOGIES
Speed Key

If you own a Koala Pad you can "upgrade" it to the Speed Key System with this software package — and learn how to take short cuts through the obstacle courses in many business software programs (see Hardware Special for specifications).

- REQUIRES: Koala Pad or KT 2010 Touch Tablet, game port
- INCLUDES: Software, overlays, manual

$55.

Chartstar $209.
Infostar Plus *(w/Starburst)* 299.
WordStar 3.3 219.
Wordstar Propak *(WordStar/MailMerge/CorrectStar/StarIndex)* 279.
Wordstar Propak Plus *(Wordstar/MailMerge/CorrectStar/StarIndex/Mailing List Manager and TeleMerge)* 359.
Microrim
R:base 4000 269.
Extended Report Writer 85.
Clout 119.
Microsoft
Multiplan *(ver 1.2)* 125.
Financial Statement (for Multiplan) 69.
Budget Analysis (for Multiplan) 99.
Cash Plan (for Multiplan) 99.

Microsoft Word *(ver 1.1)* 239.
Microsoft Word with mouse *(ver 1.1)* 289.
Microsoft Mouse with software 139.
Microsoft Serial Mouse with software 139.

Microsoft Project 155.
Microsoft Chart 155.
Microstuf
Crosstalk XVI 99.
Infoscope 149.
Transporter *(includes Crosstalk)* 169.
PCsoftware
PCcrayon II *(new release)* 39.
Executive Picture Show 139.
CREATABASE 47.
Peachtree
PeachPak Series 4 (G/L, A/R, A/P) 189.
Peter Norton
Norton Utilities 49.
Rosesoft
Prokey 3.0 89.
Satellite Software
WordPerfect call
Software Arts
TK!Solver $269.
Software Publishing
PFS/Access 59.
PFS/File 89.
PFS/Graph 89.
PFS/Write 89.
PFS/Report 79.
Softword Systems
MultiMate *(ver 3.22 with spell checker & tutorial)* call
Sorcim
Supercalc 3 199.
Virtual Combinatics
Micro Cookbook 29.
Soups & Salads *(add on disk)* 15.
VisiCorp
VisiCalc IV *(w/StretchCalc)* 149.
VisiFile 99.
VisiSchedule 129.
VisiTrend/Plot 69.
VisiWord Plus *(with VisiSpell)* 109.
Warner Software
The Desk Organizer 149.

TRAINING

ATI
SKILL BUILDER PROGRAMS
Intro To:

Word Processing	Accounting	
Business Software	Data Bases	
		each 32.

How to Use:

Compaq	MS-DOS (2.0)	
CPM-86	PC-DOS (2.1)	
M-Basic	Home Accountant	
IBM-PC	VW Deluxe	
PCjr		*each* 32.

TRAINING POWER PROGRAMS
How to Use:

dBase II	dBase III	Lotus 1-2-3
MS Word	Easywriter II	Multimate
Multiplan	Supercalc 3	Framework
Symphony	Wordstar	TK!Solver

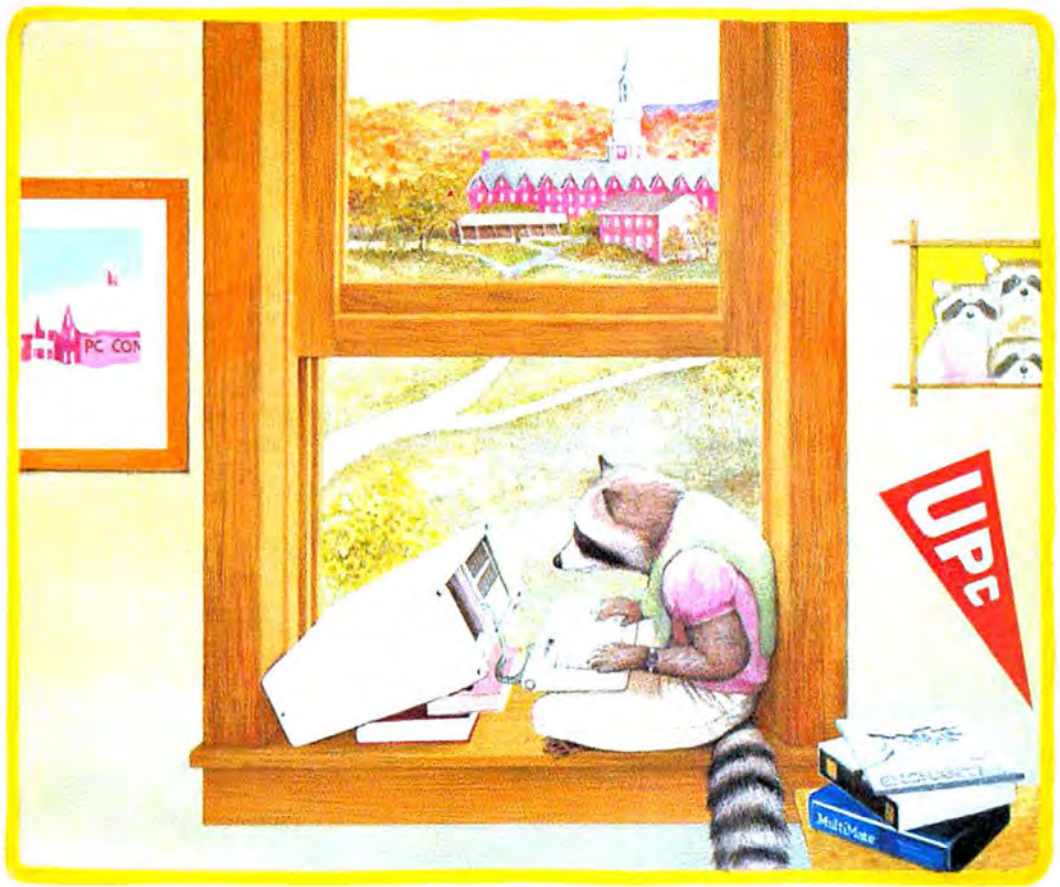
Peachtree *(specify A/R,A/P,G/L, sales invoice, inventory)* *each* 49.
Individual Software
The Instructor 35.
Professor DOS 47.
Tutorial Set *(both items above)* 75.
Professor Pixel 47.
Typing Instructor 39.
Scarborough Systems (was Lightning)
Master Type 39.

EDUCATIONAL

Davidson
Speed Reader II *(high school & college)* 49.
Math Blaster *(grades 1-6)* 35.
Word Attack *(grades 4-12)* 35.

★ DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION. SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS.
© COPYRIGHT MICRO CONNECTION, INC. 1984. ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE. IBM IS A REGISTERED TRADEMARK OF IBM CORP. Jr. CONNECTION AND MICRO CONNECTION ARE TRADEMARKS OF MICRO CONNECTION, INC. PC CONNECTION IS A REGISTERED TRADEMARK.

PC CONNECTION®



PC Preppy.

Our school colors.
Winter's coming. And up here in Marlow, NH (pop. 543), the trees have been showing more colors and patterns than our most dazzling RGB monitors.

IBM-PC users get more serious as winter approaches. Serious about school, work, sports, and even about storing up those gourmet nuts and berries.

We're serious too—about upgrading your IBM-PC.

Block that kick. Boot that disk.
Our PC add-ons and software regularly find their way into the Big 10, Big 8, Big 3, Little 3, Ivy League, Major Leagues, NFL, AFL, not to mention the Fortune 500.

Need to write five papers by Friday? Want to play Zork after that? Do stats for your football team? Wire your parents via modem and tell them to send money? Create fancy spreadsheets to convince them? Connect your fraternity with a Local Area Network? Tap into Top Secret Pentagon...well, we actually can't help you with that last one. But our summa computer consultants can set you up with the hardware and software you'll need for the most popular school and business applications. Ready to ship. At very intelligent prices.

Tie one on.
Let other people wear their old school ties. You can show your PC spirit with our modest contribution to PC preppydom—a PC Connection tie. It features our own sophisticated mascot with a most scholarly grin on his face. Very chic. The ties are free to anyone who places a $500.00 order between now and December 31. (And they look as stunning on men as they do on women.)

Just call 1-800/243-8088 or 1-603/446-3383 anytime Monday through Friday 9:00 to 9:00 and Saturday to 5:30. If you're planning to visit us, call ahead to make sure what you want is in stock. The showroom closes at 8:00 M–F and 5:00 Saturday.

HARVARD PC CONNECTION PRINCETON

The PC Connection tie. Made to the same oh-so superior standards as your basic Ivy League tie. Limit one per customer. Offer not available to commercial accounts.

For the IBM-PC exclusively.

PC CONNECTION®

time to call your

Digital Research
Diagnostic Test (PSAT) ..... $14.
OwlCat SAT *(15 hour)* ..... 63.
OwlCat SAT *(60 hour)* ..... 169.
Knoware
Knoware *(requires graphics board)* ..... 64.
Spinnaker
Educational Games for Young Computer Users. *(All require graphics board).*
Delta Drawing ..... 34.
Snooper Troops I *(ages 10 to adult)* ..... 30.
Snooper Troops II *(ages 10 to adult)* ..... 30.
Most Amazing Thing *(ages 10 & up)* ..... 27.
Face Maker *(ages 3 to 8)* ..... 23.
Kids on Keys *(ages 3 to 9)* ..... 23.
Story Machine *(ages 5 to 9)* ..... 23.
Fraction Fever *(ages 7 to adult)* ..... 23.
Kinder Comp *(ages 3 to 8)* ..... 20.
Rhymes and Riddles *(ages 5 to 9)* ..... 20.
Hey Diddle Diddle *(ages 3 to 10)* ..... 20.
Alphabet Zoo (ages 3 to 8) ..... 20.
Stone *(requires graphics board)*
Great graphics and sound
My Letters,Numbers,Words *(ages 1 to 5)* 29.
Kids Stuff *(ages 3 to 8)* ..... 29.
Across the U.S.A. *(ages 5 & up)* ..... 22.

GAMES

Atarisoft
Centipede ..... 29.
Pac Man ..... 29.
Dig Dug ..... 29.
Defender ..... 29.
Stargate ..... 29.
Robotron ..... 29.
Blue Chip
Millionaire ..... 39.
Tycoon ..... 39.
Baron ..... 39.
FriendlySoft
FriendlyWare/PC Arcade ..... 35.
Funtastic
Snack Attack II *(a favorite)* ..... 27.
Cosmic Crusader *(as good as above)* 27.
Big Top *(climb to new levels)* ..... 29.
Master Miner *(1 or 2 players)* ..... 29.
Hayden Software
Sargon III ..... 35.
Infocom *High quality text games*
Zork I, Zork II, Zork III ..... *each* 27.
Starcross ..... 27.
the Deadline ..... 27.
Suspended ..... 35.
Witness ..... 35.
Planetfall ..... 35.
Enchanter ..... 35.
Infidel ..... 35.
Sorcerer ..... 35.
Seastalker ..... 27.
Microsoft
Flight Simulator *(new version)* ..... 35.
Origin Systems
Ultima III ..... 39.

PC Connection Hardware Special
through November 30, 1984

KOALA TECHNOLOGIES
Speed Key System
- Simplifies the use of Lotus 1-2-3, Wordstar, Dbase II, Multiplan,and others.
- Works like a mouse to move cursor quickly and efficiently, but doesn't monopolize desk space or crowd screen with menus.
- Use or customize preconfigured overlays or create your own to meet individual needs.
- REQUIRES: Game port.
- INCLUDES: KT 2010 Touch Tablet, software, overlays, manual ..... $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 wk for personal & company checks to clear.
- 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% to all orders. For all other items, add $2 per order for UPS surface, $3 per order for UPS 2nd-Day-Air. We particularly recommend 2nd-Day-Air if you live west of the Mississippi or south of Virginia. In most cases it will only cost $1 more and will save you up to four days on delivery time. **Outside Continental US:** We add freight charges to credit card purchases. For prepayment, call 603/446-3383 for information.

1-800/243-8088

PC Connection 310W
6 Mill St., Marlow, NH 03456
603/446-3383

For the IBM-PC *Exclusively.*

Orion
J-Bird *(you'll never sleep)* ..... $29.
PC-Man ..... 25.
Paratrooper ..... 25.
Pits & Stones ..... 29.
PCSoftware *(mono or color board)*
Armchair Quarterback ..... 27.
Chess 2001 ..... 27.
Championship Blackjack ..... 23.
Sir-Tech
Wizardry ..... 42.
Sierra/On-Line
Frogger ..... 27.
Crossfire *(keyboard or joystick)* ..... 23.
Ulysses and the Golden Fleece ..... 27.
Spectrum Holobyte
GATO ..... 27.
Sublogic
Night Mission Pinball ..... 29.

HARDWARE

AST Research *(For IBM-PC or XT)*
All AST Boards come with SuperDrive, SuperSpool, and one year warranty.
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports *(game port optional)* ..... 269.
MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar and serial port *(parallel, game, or second serial port optional)* ..... 269.
MegaPak 128k *(not upgradeable)* ..... call
MegaPak 256k ..... call
I/O Plus II with clock calendar and serial port *(parallel, game, or second serial port optional)* ..... 129.
Parallel Game or second Serial Port *(for any AST board (specify board)* 39
Connectall *connector bracket (PC only)* 19.
AST-5251 ..... 559.
AST-3780 ..... 649.
MonographPlus with clock calendar, serial & parallel ports ..... 429.
Amdek
Video 300G monitor *(green)* ..... 139.
Video 300A monitor *(amber)* ..... 149.
Video 310A monitor *(amber)* ..... 179.
Compucable
Plastic Keyboard & Drive Cover Set ..... 17.
IBM Mono Screen Enhancement ..... 17.
Printer to IBM Cable *(specify printer)* 32.
Smartmodem to IBM Cable ..... 25.
Curtis
STANDS
PC Pedestal *(for IBM Mono or Color)* 39.
PGS or Quadchrome Adapter for above 9.
Low Profile Tilt and Swivel Pedestal ..... 39.
System Stand 21
CABLES
Extension Cables for IBM Mono Display 39.
Keyboard Extension Cable *(3 to 9 feet)* 29.
AC Plug Adapter *(any monitor to your PC)* 8.

PC CONNECTION®

·connection.

SURGE SUPPRESSORS - NEW
Diamond *(similar to EPD Lemon)* ..... $39.
Emerald *(similar to EPD Lime)* ..... 49.
Sapphire *(similar to EPD Peach)* ..... 59.
Ruby *(similar to EPD Orange)* ..... 69.

Electronic Protection Devices
All are rated at 1875 watts, 15 AMP.
The Lemon ..... 39.
The Lime ..... 59.
The Peach ..... 64.
The Orange ..... 94.

Epson
RX-80 with GRAFTRAX-Plus ..... call
RX-80 F/T with GRAFTRAX-Plus ..... call
FX-80 with GRAFTRAX-Plus ..... call
RX-100 with GRAFTRAX-Plus ..... call
FX-100 with GRAFTRAX-Plus ..... call
LQ-1500 *(letter quality dot matrix)* ..... call
Printer to IBM Cable (specify printer) ... 32.

FTG Data
Light Pen (Push Tip) ..... 195.
Demo Disk Set for Light Pen ..... 39.

Hayes
Smartmodem 300 ..... 209.
Smartmodem 1200 ..... 489.
Smartmodem 1200B *(w/Smartcom II)* 409.
Smartcom II ..... 99.
Compucable's Smartmodem-to-IBM Cable ..... 25.

Hercules Computer
Hercules Graphics Card *(parallel port)* 339.
Hercules Color Card *(parallel port)* ... 179.
Graph-X Software ..... 42.

key tronic
Deluxe keyboard (KB 5151) ..... call

Koala
Koala Touch Tablet *with software (connects to game port)* ..... 89.
Speed Key System ..... see special

Kraft
Joystick ..... 39.

Maynard Electronics
Floppy Drive Controller ..... 135.
Internal Hard Disk (10 Meg),WS-1 Controller & ROM for PC mother board ..... 879.
Internal Hard Disk (10 Meg) WS-2 Controller & ROM for PC Mother Board ..... 1079.

Mouse Systems
PC Mouse (w/software & desk pad) ... 149.

NEC
Pinwriter P2(IBM) 80 col ..... 679.
Pinwriter P3(IBM) 132 col ..... 897.
Spinwriter 3550 *(IBM-PC compatible)* 1499.
Spinwriter 2050 *(3550's little brother)* ... 789.

Orchid Technologies
All Orchid Boards come with PCnet Drive (Ram disk), PCnet spool (print spooling), disk caching & partitioning.

Blossom 64k upgradeable to 384k, with clock calendar, serial and parallel ports ..... 239.
PCnet Daughter Board (piggybacks to Blossom) with version 2.4 networking software ..... call
PCnet Blossom 64k Blossom Board with the Daughter Board installed ..... call
Diskless Boot Rom, Cluster Kit, etc. ..... call

Plantronics/Frederick
COLORPLUS *(with Color Magic)* ..... call

Princeton Graphics
HX-12 RGB monitor *(690 x 240)* ..... call
SR-12 RGB monitor *(690 x 480)* ..... call
Scan Doubler Board (for SR-12) ..... call
MAX-12 Amber monochrome monitor .. call

Quadram
New Expanded Quadboard 64k expandable to 384k, with clock calendar, parallel, serial & game port, I/O bracket, and Quadmaster software ..... 269.
Microfazer Printer Buffer (parallel) w/copy MP 64 (64k) *upgradeable to 512k* .... 197.
Quadcolor I ..... 197.
Quadchrome II ..... 469.

SMA (Systems Management)
PC-Documate Keyboard Templates *available for:*

DOS/Basic 1.1	Supercalc 3
DOS/Basic 2.0-2.1	Wordstar
Lotus 1-2-3	Turbo Pascal
Symphony	WordPerfect
Multiplan (IBM)	dBase II
Multiplan (Microsoft)	dBase III
Peachtext 5000	Framework
Easywriter II	Multimate

Volkswriter Deluxe ..... *each* 12.

STB
Graphix Plus II (new version) ..... 349.

TG
Joystick ..... 45.

USI *(monitors for graphic board)*
Pi-2 Monitor (12" green, with cable) ... 119.
Pi-3 Monitor (12" green, with cable) ... 129.

DRIVES

All drives are completely pre-tested. Specify Drive A or Drive B for your PC. Comes with complete step by step installation instructions. Drives are 320k/360k.

Tandon
TM 100-2 (5¼") *full-height drive (DS,DD)* 185.

TEAC
FD-55B(5¼") *half-height drive (DS,DD)* 159.
Free 'y' cable & bracket with each pair.

MEMORY

Memory prices are coming down.
64k Memory Upgrade Set for IBM-PC or XT system board ..... 55.
64k Memory Upgrade Set for any memory board *specify make of board* ..... 55.
Install memory upgrades & run diagnostics *at time of board purchase only* ..... 10.

DISKS

Verbatim *(with 5 year guarantee)*
Datalife Disks SS/DD *plastic box of 10* 23.
Datalife Disks DS/DD *plastic box of 10* 33.
Disk Drive Analyzer ..... 22.
Flip Sort *(holds 75 disks)* ..... 19.

INFORMATION SERVICES

Compuserve
Compuserve Information Service *(includes subscription, manual, 5 hours of connect time, monthly publications)* .... 25.
Executive Information Service ..... 79.
Vidtex Software ..... 59.
Executive Information Service with vidtex 119.

Source Telecomputing
The Source *(subscription & manual)* ... 29.
The Source *with* Sourcelink Software ... 49.

Junior's new look.

Over at Jr. CONNECTION, our consultants are pretty enthusiastic about IBM's relaunch of its not-so-pretty-at-first baby. New keyboard. Expanded memory potential. Admittedly, it's stuff we've been offering from non-IBM sources for months now. But the exciting thing is that IBM's new commitment will translate into a greater variety of hardware and software from third party vendors.

If you own a jr, or are thinking about getting one, our jr. specialists can answer your questions and give you the latest product information. For your PC and XT, keep calling PC CONNECTION. For your PCjr., call Jr. CONNECTION - exclusively for the IBM-PCjr.

1-800/IBM-jr PC

PC CONNECTION®

Circle 136 on reader service card

Compatibles Update

The latest developments in the PC-compatibles marketplace

Laptops are bursting out all over as Data General unveils the DG One, a full-screen "mobile" PC compatible, and Osborne Computer hails its comeback with a familiar portable.

Ken Greenberg

Compatibles Update keeps tabs on the growing market of personal computers that emulate the IBM standard. The column features news on hardware and software as well as insights into the legal and business issues that affect compatibility.

Trends

The Shrinking of a New Machine

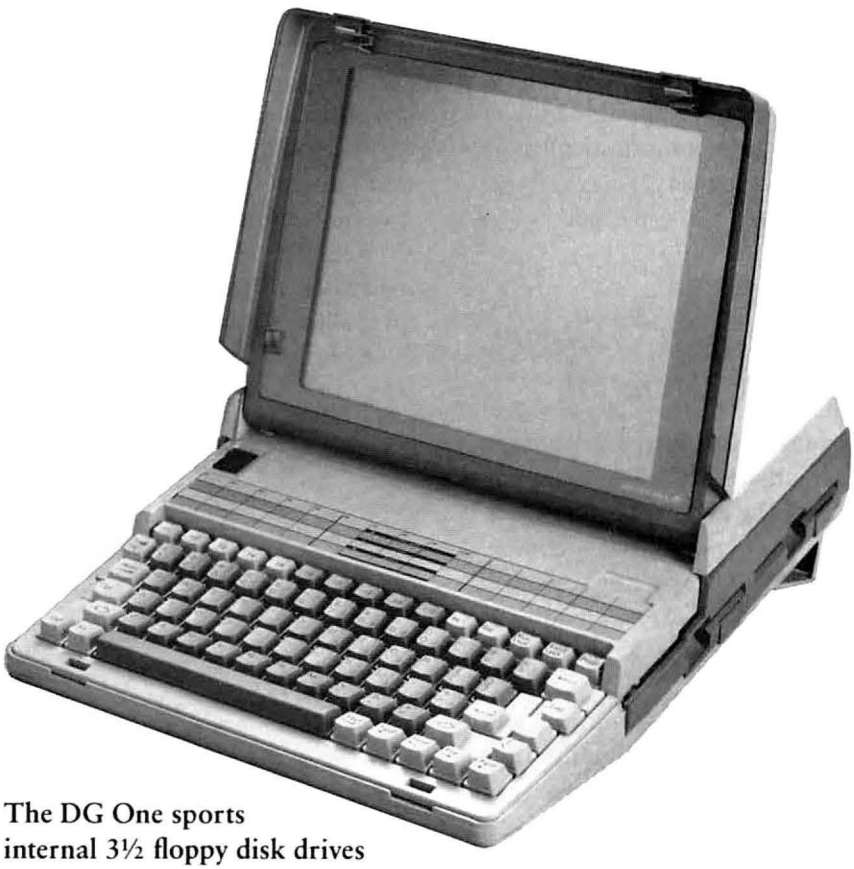
Although some industry analysts suggest that the world doesn't need another laptop computer, Data General (DG) is convinced that it has a winner in the 10-pound Data General One (DG One).

DG has ushered in the machine with the finesse befitting an increasingly cautious marketplace. The DG One offers PC compatibility, but it is not touted as a clone; it is genuinely portable, but its maker prefers to call it mobile.

Like the PC itself, the DG One represents a triumph of both packaging and technology. The packaging in this case is provided by Nippon Data General, a Japanese-based subsidiary. By tapping its Japanese pipeline, DG has released a machine that sports internal disk drives and a 25-line display, which the company says are enough to give it at least a six-month lead in the laptop market. The Japanese connection is critical for DG, because Japan is currently the primary source of 25-line liquid crystal displays (LCDs). A full-size LCD—perhaps the DG One's most salient feature—is akin to the Holy Grail in the laptop world.

DG may be hoping that any resemblance to Hewlett-Packard's 110—a 9-pounder that features a 16-line LCD and 384K of software in ROM but lacks internal disk drives—is to its advantage. With its highly readable, nonglare LCD, bit-mapped graphics, and compartments for two 3½-inch 720K floppy disk drives, the DG One is closer to the Morrow Pivot (or the Osborne 3; see next item), which boasts 5¼-inch disk drives and a 16-line LCD, with room for 25.

The DG One offering is built around the 80C88, a CMOS version of the PC's 8088 microprocessor, and relies on energy-efficient CMOS technology throughout. The DG One's nickel-cadmium batteries can last eight to ten hours on a single charge. What the unit's 3½-inch 720K floppies lack in interchangeability with 5¼-inch-based PC software, they may make up for in availability and storage capacity. The DG One uses the same Sony microfloppies as Apple's Macintosh. An expansion unit housing a 5¼-inch floppy disk drive easily handles the larger floppy disk. Other specifications on the DG One include 128K of RAM expandable to 512K, two serial ports (the machine does not include a parallel printer port), and an optional 300-bps or 1200-bps modem.



The DG One sports internal 3½ floppy disk drives and a full 25-line screen.

DG is marketing the DG One as a "successor product" to its 8086-based Desktop Generation multiuser system. In this case the upstart will have ample opportunity to converse with its predecessor (as well as with other machines in the DG lineup) via the DG One's file transfer capabilities and ROM-based terminal emulation software.

Although the DG One may not be promoted as a PC clone, it behaves suspiciously like one. During a demonstration at *PC World,* the DG One sailed through a battery of tests for PC compatibility. The machine ran *Flight Simulator* in both 3½- and 5¼-inch formats and exhibited surprisingly crisp animation. The unit had no trouble running PC-DOS 1.00 and 2.00, GW BASIC, *WordStar 3.3, dBASE II, Microsoft Word,* and Verbatim's *Disk Drive Analyzer.* DG claims that the DG One will run all of the hits on Softsel's Top 20 off the shelf, with the exception of *1-2-3,* which in order to print must be modified to use the DG One's serial port.

PC compatibility aside, the portable-computer marketplace has been unsteady at best. Among the transportables—the machines that build biceps—the Portable PC has apparently scored something less than a knockout. The Compaq portable continues to outsell IBM's by as much as 4 to 1. Among the truly portable, not much is moving. Convergent Technologies' WorkSlate has been shelved, and Xerox has abandoned its machine. Gavilan has not only delayed its product release but also laid off staff. Kaypro's proposed deal with Mitsui for an MS-DOS laptop appears moribund. Visual slashed prices on its PC-compatible Commuter. Even Tandy has trimmed prices on its popular Radio Shack Model 100. The HP 110 has been well received, but price/performance questions continue to plague the machine; whether vast numbers of consumers will plunk down $3000 for what is usually a second computer is questionable. At press time, DG was considering pricing its machine "somewhat" below the $3000 mark.

The business world's appetite for portable computers may be uncertain, but DG—anything but a skittish company—has presumably seen the handwriting on the analysts' wall. InfoCorp predicts robust sales for full-function portable computers (such as the DG One and the HP 110) during the next few years. According to that market research firm, the installed base of hand-held computers (such as the Radio Shack Model 100) will exceed 2 million by the end of 1984, compared with 408,000 portables and nearly 1 million transportables (such as the Compaq). The "truly portable" variety

will be dominant by 1989, with an estimated 7.8 million units installed, compared with 5 million hand-held and 6.3 million transportable units.

Such a growth path fits DG, a New England version of Apple. The company is spirited, aggressive, and, in the minicomputer business, committed to playing Avis to DEC's Hertz. The company also boasts a cadre of scrappy characters, who are celebrated in Tracy Kidder's Pulitzer Prize-winning book, *The Soul of a New Machine* (Avon, New York, 1982).

For Desktop division marketing vice president Herb Shanzer, purveying portables requires taking a different slant on the market than DG has as a minicomputer vendor. "IBM changed its corporate personality to make the PC succeed," Shanzer opines. "Minicomputer vendors have gone after the PC market without the radical mentality change you need to be successful." DG executives believe that turning out another PC clone is a recipe for being left alone in the marketplace. "We're aiming at those who seek PC functionality and also value mobility," says Shanzer. "We've made no compromises in power to get mobility."

Part of the "radical mentality change" are big ad budgets, splashy TV campaigns, and learning to live with retail sales–a shift that was not easy for DEC. "This is a volume, retail channel product," Shanzer says. He predicts "a spillover in awareness" of DG's entire Desktop Generation line, currently available through only 125 retail outlets. "This is much more involvement in the consumer market than we've ever had," Shanzer says enthusiastically. Welcome to the party.

Born-Again Osborne Turns Compatible

Osborne Computer Corporation is currently drafting required reading for the personal computer industry. That opus, when completed, will bear a title something like "How to Survive Chapter 11 and Create a New Kind of Computer Company."

Emerging from bankruptcy protection less than 11 months after its fall, Osborne is no longer in the proprietary computer business. The company is billing itself as a "generic" computer firm–a trading company that buys and sells products and adds value. In an economy that is often unforgiving, Osborne has won a second chance.

The company has changed virtually everything but its name. During the summer, Osborne left its Hayward, California, home–scene of both boom and bust–for smaller quarters just down the road in Fremont. Stocks of the famed Osborne 1 are dwindling, and most spare parts have been auctioned off. The firm now supports a payroll of about 35, and morale seems high. Osborne has managed to hang on to 38 distributors in 80 countries, and the more than 100,000 Osborne owners continue to receive service. Even the *Portable Companion* magazine has resumed publication after a hiatus of several months.

Osborne's fiscal blueprint consists of a 15-month plan to wipe out indebtedness of somewhere between $9 million and $15 million, down from $40 million in September 1983. Fully 93 percent of the company's 200 voting creditors approved the reorganization plan. Osborne, according to President Ronald Brown, now shops for manufacturers capable of producing its designs "cheaply and well" and then markets those products overseas. At press time, the firm was planning to raise $3.3 million in capital for research and development via a public offering at $1 per share–an offering open only to California residents and foreign nationals.

The Osborne 3, otherwise known as the Morrow Pivot

The big news is that the born-again company's first entry is highly PC compatible. Lack of compatibility, as you may recall, was partially responsible for ushering the firm into bankruptcy court. Osborne learned the hard way a lesson that many compatible makers may have yet to learn: if you're going to sell a PC work-alike, make it interesting.

Enter the Osborne 3, a computer that Ron Brown calls "ultra-portable." It bears an uncanny resemblance to the Morrow Pivot (which isn't surprising because they're essentially the same computer). The machine–a nifty 9-pounder with a CMOS 8086 microprocessor, a 16-line LCD, two ⅓-height 5¼-inch floppy disk drives, and an internal modem–is the handiwork of Vadem Corporation, the Silicon Valley firm that designed the product and licensed it to both Morrow and Osborne. Vadem, in turn, has farmed out production to Selectron, an IBM and Apple subcontractor located in Santa Clara, California.

In a sense, the Osborne 3/Morrow Pivot is a hybrid of the two companies that now share it. Vadem founder Chikok Shing cut his teeth at both Osborne and Morrow as well as at Intel and DEC. Shing helped design both the Osborne 1 and the Osborne Executive.

Although Morrow has exclusive rights to sell the machine in the United States, Osborne will be marketing it overseas, and the twain don't figure to meet. The Osborne 3 (known as the Encore in the United Kingdom) was scheduled to make its debut in Western Europe, South Africa, and Australia this fall, with the Pacific Basin and Africa to follow. Software bundling–an Osborne innovation–is continuing, although programs are being added by distributors, not at the factory. At press time, the Osborne 3 was priced at $2500.

Still, Ron Brown is not prepared to make PC compatibility the cornerstone of Osborne's recovery. Brown, an 11-year veteran of IBM, has little enthusiasm for chasing Big Blue. That could be why there's only a "50 percent" chance that the company will move ahead with a prototype PC compatible called the Osborne PC. Preliminary specifications on the machine, which resembles an Osborne 1 but has an enlarged display, include an 8088 chip, a maximum 512K of RAM, 640 by 200 bit-mapped graphics, a reset button, and the Key Tronic keyboard.

Yesterday's Osborne was a presence in United States retail channels, but necessity and business strategy have made the firm go overseas this time–in some cases getting a jump on the American goliaths. "We're treating countries as vertical markets," Brown explains. Strategy also dictates supporting no more than three products at a time. New areas for Osborne are likely to include micro-to-mainframe communications and educational computing.

Whole Lotta Shakeout Goin' On

Summer's a fine time for vacations, and the summer of 1984 may be remembered for the head start on permanent vacations that it gave some PC-compatibles manufacturers.

The combination of IBM's price cuts and product introductions, AT&T's entry into the PC-compatibles arena, softening demand, and a glut of products spelled gloom even for strong players such as Compaq and Columbia Data Products. And gloom is spelled a number of ways, such as layoffs, fire sales, disappointed stockholders, and postponed plans.

Columbia surprised even itself as an expected $1.5 million quarterly gain became a $3.5 million loss. The company then deferred to later in the year revenue from $10 million in shipments to a major national distributor. The reversal has shaken investors and dealers, some of whom may be on the verge of dropping the Columbia line. In an attempt to right the corporate ship, Columbia laid off 35 percent of its work force at plants in Maryland and Puerto Rico.

TeleVideo Systems has hardly put all its chips in the PC-compatibles basket, and that may be just as well. Third-quarter corporate earnings took a nosedive, largely due to sluggish sales of the company's PC work-alikes. According

to some analysts, TeleVideo's lackluster performance reflects both distribution problems and a tardiness in embracing MS-DOS.

Despite a 20 percent gain in quarterly sales and a generally upbeat response to its Deskpro line of desktop PC compatibles, Compaq has been taking a few hits on Wall Street as well. Second-quarter earnings were flat, owing, the company says, to plant expansion and advertising commitments. Profit on sales of $66 million failed to top $1 million.

Beleaguered Eagle Computer continues its bid for solvency, an effort that may have found help in the person of Sam Goodman, Eagle's new chief financial officer. Goodman reportedly has a knack for turning around companies in dire financial straits (he did it for both Ampex Corporation and a division of W. R. Grace), and Eagle seems to be in that kind of trouble. Citing dismal sales, Tek Aids Industries, a large midwestern distributor, has dropped the entire Eagle line.

Eagle's latest executive office reshuffle witnessed the departure of cofounder Charles Kappenman and his replacement as chairman by company president Ronald Mickwee. Mickwee and his associates are working on a plan to restructure more than $9 million in unsecured debts. The company claims that half its creditors have endorsed the plan, short of the 85 percent needed to make the proposal binding. If the plan doesn't materialize, Eagle could strike an OEM deal with Sperry Corporation, although the computer giant has been leaning toward Corona Data Systems as the replacement for Mitsubishi Corporation, maker of the Sperry PC.

In view of all this hubbub, *The Coming Computer Industry Shakeout: Winners, Losers, and Survivors* (John Wiley & Sons, Inc., New York, 1984) proved appropriate summer reading. Stephen T. McClellan, an industry analyst for Morgan Stanley, has produced a literate and at times incisive book packed with lessons for PC-compatibles makers, owners, and potential buyers.

No business book is complete these days without a gimmick, and, alliterative contrivances aside, McClellan's eight *s*'s in "the new winning formula for computers" do compute: selling, service, software, smallness, specialization, style of management, stock financing, and systems compatibility.

McClellan places heaviest emphasis on the eighth: "The features that now sell a computer product, such as the amount of memory or the speed of the processing unit, will become secondary to whether or not the product can share data and communicate with other equipment. As the computer industry fragments, and new products blitz customers from all directions, systems compatibility, probably IBM compatibility, will be a prerequisite. A machine will not stand alone, out in the cold, unable to tie into other machines." Much of the book serves as validation of IBM's PC strategy and is replete with lessons for and by compatibles manufacturers.

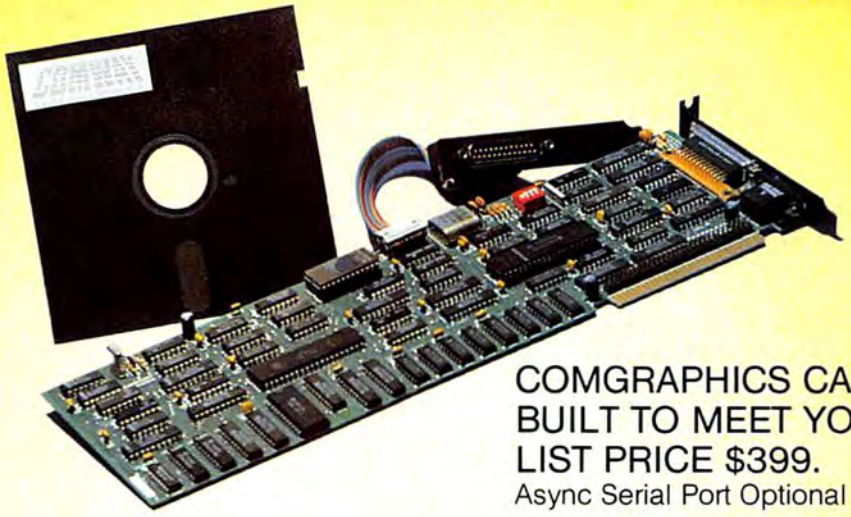
Software

Software to Travel With

Traveling Software has released a pair of business productivity packages for the HP 110, Hewlett-Packard's 9-pound portable. New are the *Traveling Appointment Manager* and the *Traveling Project Manager*. The appointment manager automates schedules and lets you assign priorities to appointments. The project manager provides a system of project tracking, budgeting, and scheduling. Both programs feature windowing environments adapted to the 110's 16-line by 80-column LCD.

Also available for the 110 is a version of *Pertmaster*, Westminster Software's menu-driven critical path analysis package. *Pertmaster* relies on both activity-on-arrow and precedence networking techniques in scheduling as many as 500 activities at once.

COMWAY
THE PC ENHANCER



COMGRAPHICS CARD
BUILT TO MEET YOUR NEEDS !
LIST PRICE $399.
Async Serial Port Optional

ComGraphics. The only card necessary for the average full-function PC system. Provides IBM compatible high-resolution monochrome text and Hercules compatible graphics for Lotus 1-2-3, a printer port, optional "PiggyPlus" memory expansion for Lotus "Symphony" and an optional serial port for modem, mouse and plotter operation. With the best price/performance ratio on the market.

COMGRAPHICS CARD FEATURES

- IBM and Hercules compatible, runs Lotus 1-2-3
- Parallel printer port
- Optional asynchronous Serial Port for modem, mouse or plotter operation
- *Optional Piggy-back memory expansion with up to 448K memory to support "Symphony" plus RAMDISK and Printspooler software, Real Time clock/calendar with battery-powered back-up and game adapter.

*PIGGYPLUS CARD

This card plugs into Comway's ComGraphics or ComTronics card. It has socket to accommodate up to 448K memory. Includes RAMDISK, Printspooler, Real Time clock/calendar with battery powered back-up and game adapter. Ideal for CAD/CAM and "Symphony" users. Also available in stand-alone version.

$229.00

SERIAL PLUS

This includes Asyn Serial chip 8250, cable connector assembly and installation instructions. For ComGraphics or ComTronics Cards.

$45.00

COMPARISON CHART

	COMGRAPHICS CARD	HERCULES GRAPHICS CARD	AST MONOGRAPH PLUS	IBM MONOCHROME ADAPTER
BIT-MAPPED GRAPHICS	●	●	●	
RUNS LOTUS 1-2-3 GRAPHICS	●	●	●	
PIGGY-BACK EXPANSION	◉			
PARALLEL PORT	●	●	●	●
ASYNC SERIAL PORT	◉		◉	
SUGGESTED RETAIL PRICE	$399	$499	$449	$335

● STANDARD ◉ OPTIONAL

* See PiggyPlus card for features

DEALER/DISTRIBUTOR/OEM, ENQUIRES WELCOME.

ALSO AVAILABLE

COMTRONICS CARD

This card will give 4 colors in high resolution or 16 colors in medium resolution. It runs all software written for IBM Color Graphics Adapter and Plantronics Colorplus card. It even has a piggy-back expansion capability with Comway's "PiggyPlus" card. There is also an optional serial port available for modem, mouse or plotter operation.

$388.00

COMCOLOR CARD

This card is compatible with the IBM color graphics adapter. It includes a parallel printer port and an asynchronous Serial Port for modem, mouse or plotter operation.

$299.00

SERVICE: Comway offers service before and after sales. Our normal 12 months warranty against any defect, means we will repair or replace the card within 48 hours. All parts and labour are fully covered under this policy.

FOR ENQUIRIES OR NEAREST DEALER: CALL TOLL-FREE
1-800-387-6010

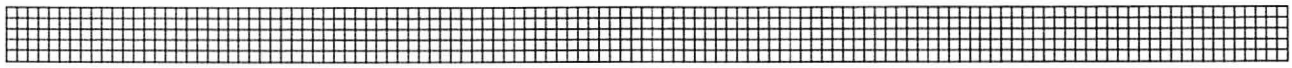
IN CANADA:
(416) 469-5229

See us at
COMDEX™/Fall '84
November 14-18, 1984
Las Vegas Hilton Hotel
Las Vegas, Nevada

COMWAY
ELECTRONICS CORPORATION
THE PC ENHANCER

741 DANFORTH AVE., TORONTO, ONT., CANADA M4J 1L2 TELEX 065-28247 (COMWAY TOR)
U.S. AGENT: EZZAR ROW INC., 308 SOUTH ORCAS STREET, SEATTLE, WA 98108

- IBM IS A REGISTERED TRADEMARK OF IBM CORPORATION
- 1-2-3 SYMPHONY AND LOTUS ARE TRADEMARKS OF LOTUS DEVELOPMENT CORPORATION
- HERCULES IS A TRADEMARK OF HERCULES COMPUTER TECHNOLOGY
- PLANTRONICS COLORPLUS IS A TRADEMARK OF PLANTRONICS ENHANCED GRAPHICS PRODUCTS, INC.



Baker's Dozen for Polo System

Thirteen accounting packages are currently available for Polo Microsystems' Polo System I personal computer. ADS Software has modified its line of accounting programs for the 80188/Z80-based machine. ADS modules include *Payroll, Accounts Receivable, Accounts Payable, Invoicing, General Ledger,* and *Inventory.* ADS also released seven vertical market packages: *Bookkeeping Services, Veterinarians Accounting, Church Financial Accounting, Standard Accounting, Private Membership Clubs, Retail Florists Accounting,* and *General Invoicing and Sales Accounting.* The Polo System I is bundled with *SuperWriter, SuperCalc 3, pfs:file, pfs:report, Finance Manager,* and *Crosstalk.*

Seequa Unveils Hot Utility

In an effort to domesticate some of the traditionally unfriendly traits of MS-DOS, Seequa Computer has released *Seequa Exec,* a shell around MS-DOS that the company claims eliminates the need to master the operating system. *Seequa Exec,* available for the Seequa XT and other PC-compatible hard disk machines, rolls utility and operating system commands into a single package.

Have a Blast With TI . . .

The Communications Research Group has unveiled a version of *BLAST* (blocked asynchronous transmission) software for the TI Professional. *BLAST* offers bidirectional file transfers between dissimilar machines equipped with the *BLAST* package. The program is currently available for some 60 configurations of personal computers, minicomputers, and mainframes.

. . . or Become an Expert

Software developers can use the TI Professional to design expert systems now that Texas Instruments has released the *Personal Consultant* for that machine. Relying on window management techniques and English-language commands, the package permits prototyping and the development of sophisticated commercial applications. Expert systems created with the program can include up to 400 production rules (statements that determine the program's steps).

Cdex Training Programs for DEC, TI

Cdex Corporation has developed training packages for the DEC Rainbow and TI Professional computers. Nine Cdex products are included in DEC's "Digital Classified Courseware" program, among them *Advanced Training for Lotus 1-2-3, Managing Your Business With Multiplan, Making Key Business Decisions With Multiplan,* and *Analyzing Financial Statements.* Cdex has begun shipping the packages and four additional training aids for the TI Professional, including *Training for WordStar* and *Training for dBASE II.*

Open Access for Corona Line

Software Products International has customized its *Open Access* integrated package for the Corona Data Systems line of PC-compatible portable and desktop units. The modified version of the software makes use of the 640- by 325-pixel and 640- by 400-pixel high-resolution graphics modes found on Corona machines. *Open Access* consolidates data management, spreadsheet, word processing, time management, telecommunications, and three-dimensional graphics functions.

Thinking of buying a modem? You owe it to yourself to check out the Qubie' 212A modems.

Inside Outside

Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least $500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

In The Beginning

In September of 1983 we introduced the first 212A modem card for the IBM PC available for under $300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk,™ and Smartcom.™ We picked the best software package we could find based on it's ease of use and features, PC-TALK III. Our modem includes features the old industry standard missed out on. Like being able to fit in one slot in a Portable PC or PC/XT. Or an optional connector to use the modem's serial port when not using the modem. Of course the topper is the $299 price, hundreds less than the competition.

Now Available Outside

Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

Four Hearts

The heart of the Qubie' modems are four digital signal microprocessors. Two handle sending, and two do the receiving. Rather than attempt to filter all but the relevant tones used for modem communications, the microprocessors measure the tones digitally. This allows them to overcome line noise and static better than analog filter based modems

Why Buy From Qubie'

Because you will get a product as good or better than any available, pay less for it, and get factory direct help if you need it. If at any time during the one year warranty period your modem should require service, we will fix it or replace it within 48 hours. Notice also there are no hidden charges in our prices. No extra for freight, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra. If you are like many who say, "Nah, it's too good to be true," just apply the acid test and find out. Then you will be asking yourself, "Why should I pay what these modems used to cost?"

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get anyone selling another modem to give you the same guarantee. Buy both, and return the one you don't like. We know which one you will keep.

IBM is a trademark of International Business Machines Corporation.
Crosstalk is a registered trademark of Microstul Inc.
PC-Talk III is a registered trademark of The Headlands Press Inc.

PC212A/1200 Includes: Modem Card, PC-TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual. **$299**
Optional external serial port connector **$20.**

212E/1200 Includes: Standalone modem with cable (specify male or female), modular phone cable, and instruction manual. **$329.**

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie' 1984

Circle 605 on reader service card

dBASE II for the 2000

Tandy Corporation is offering Ashton-Tate's *dBASE II* for the Tandy 2000, an 80186-based MS-DOS machine. Minimum configuration of the 2000 for the popular data management program is 256K and either a 10MB hard disk or two 720K floppy disks.

Profit Center Ready for Wang, TI

Prentice-Hall's *Profit Center* accounting series is available in versions for the TI Professional and Wang Professional computers. Modules include *General Accounting, Accounts Receivable, Accounts Payable, Business Word Processor, NEAT (Time and Information Manager),* and *Master Menu,* which integrates the modules.

AutoCAD Gains Support

Autodesk, maker of *AutoCAD* computer-aided drafting software, has released versions for the Eagle line of PC compatibles, the DEC Rainbow, and the TI Professional. *AutoCAD* provides precision drawing applications, including schematics, space planning, mechanical drafting, and graphics design.

Communicate With Sanyo

Computer Toolbox has unveiled *Intellicom* for the Sanyo 550/555 series of personal computers. The package permits file transfers and simple terminal emulation. The menu-driven package provides support for 300- and 1200-bps modems and automatic dialing from disk-based phone directories.

Compatibles Update *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* Compatibles Update, PC World, *555 De Haro St., San Francisco, CA 94107.*

Qubie' gives you the three Pluses: Quality, Service, & Low Prices

EXCITING NEW PRICES!
SixPakPlus-64K $254
MegaPlus II-64K $254
SixPakPlus-384K $429
MegaPlus II-256K $359
64K Memory $35

We were tempted to headline this ad with "The 1, 2, and 3 of why you should buy AST from Qubie'." We are as tired of ads with that logo as you are, so we settled on three pluses. Actually, the plus really tells it better. The AST Research plus of quality is the reason they have the number one expansion products for the IBM PC. The Qubie' Plus of service has made us the largest AST dealer. You don't supply the likes of IBM, Exxon, General Motors, and Lockheed, unless you have premier products and service. Top it all off with low, Qubie' prices, and you have the reason tens of thousands of corporations, institutions, and PC owners have come to Qubie' for their expansion needs.

Take Your Choice

We have the range of multi-function boards for IBM PC's and compatibles that gives you the choice of functions right for your needs. The AST Research MegaPlus II™ is the most flexible expansion product available for the PC. It's younger brother, SixPakPlus™ is the standard the competition measures themselves against. I/O Plus II™ is the answer for those who need serial and printer ports and automatic time and date loading, but already have their memory needs satisfied. MonographPlus™ is a multi-function monochrome graphics board. It offers the high resolution of the IBM monochrome board, along with flicker-free 1-2-3™ graphics, clock/calendar, printer port, and optional serial port.

Standard with Mega', SixPac' and I/O is the award winning AST SUPERPAK software. You get SUPERDRIVE™ electronic disk emulation and SUPERSPOOL™ print spooling software.

MegaPlus II™

$229 includes:
- Clock/calendar with battery back-up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- Memory sockets for up to 256K
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	$55	GamePak	$40
2nd async port	$35	MegaPak 256k	$229
Printer port	$35	MegaPak 128k	$199

I/O Plus II™

$149 includes:
- Clock/calendar with battery back-up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- AST SuperPak Software & Q-Quick Menu
- One year Parts & Labor warranty

Options:

Game Port	$35
Printer Port	$35
2nd Async Port	$35

SixPakPlus™

$229 includes:
- Clock/calendar with battery back-up
- Asynchronous communications port, (RS232C serial, COM1 or 2)
- Memory sockets for up to 384k
- Parallel Printer Port (LPT1 or 2)
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	$55
Game Option	$35

MonographPlus™

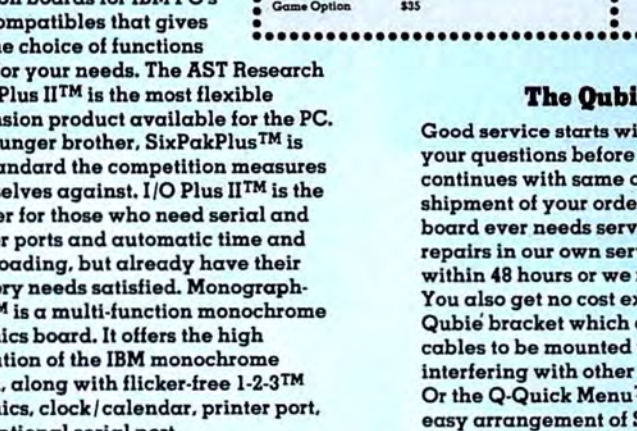
$449 includes:
- IBM PC compatible Monochrome Card
- 720×348 1-2-3™ compatible graphics
- Clock/calendar with battery back-up
- Parallel Printer Port
- AST SuperPak Software & Q-Quick Menu

Options:

Serial port	$35

The Qubie' Plus

Good service starts with answering your questions before you buy. It continues with same or next day shipment of your order. And if your board ever needs service, we perform repairs in our own service department within 48 hours or we replace the board. You also get no cost extras like the Qubie' bracket which allows ribbon cables to be mounted without interfering with other expansion slots. Or the Q-Quick Menu™ which provides easy arrangement of Super Drive's and the size of your SuperSpool printer buffer.



Qubie' Bracket
Free With Any Option

Free **Monitor Stand with purchase of MegaPlus-256K or SixPacPlus-384K. $39 value.**

The Acid Test

Remember, our price is the whole price. No extra charges for shipping, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra. If you are not completely satisfied with any Qubie' product after 30 days, you can return it for a full refund. We will even reimburse you for the postage to return it. If you can get any of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We know which one you'll keep.

IBM is a trademark of International Business Machines Corporation.

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $5.00 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

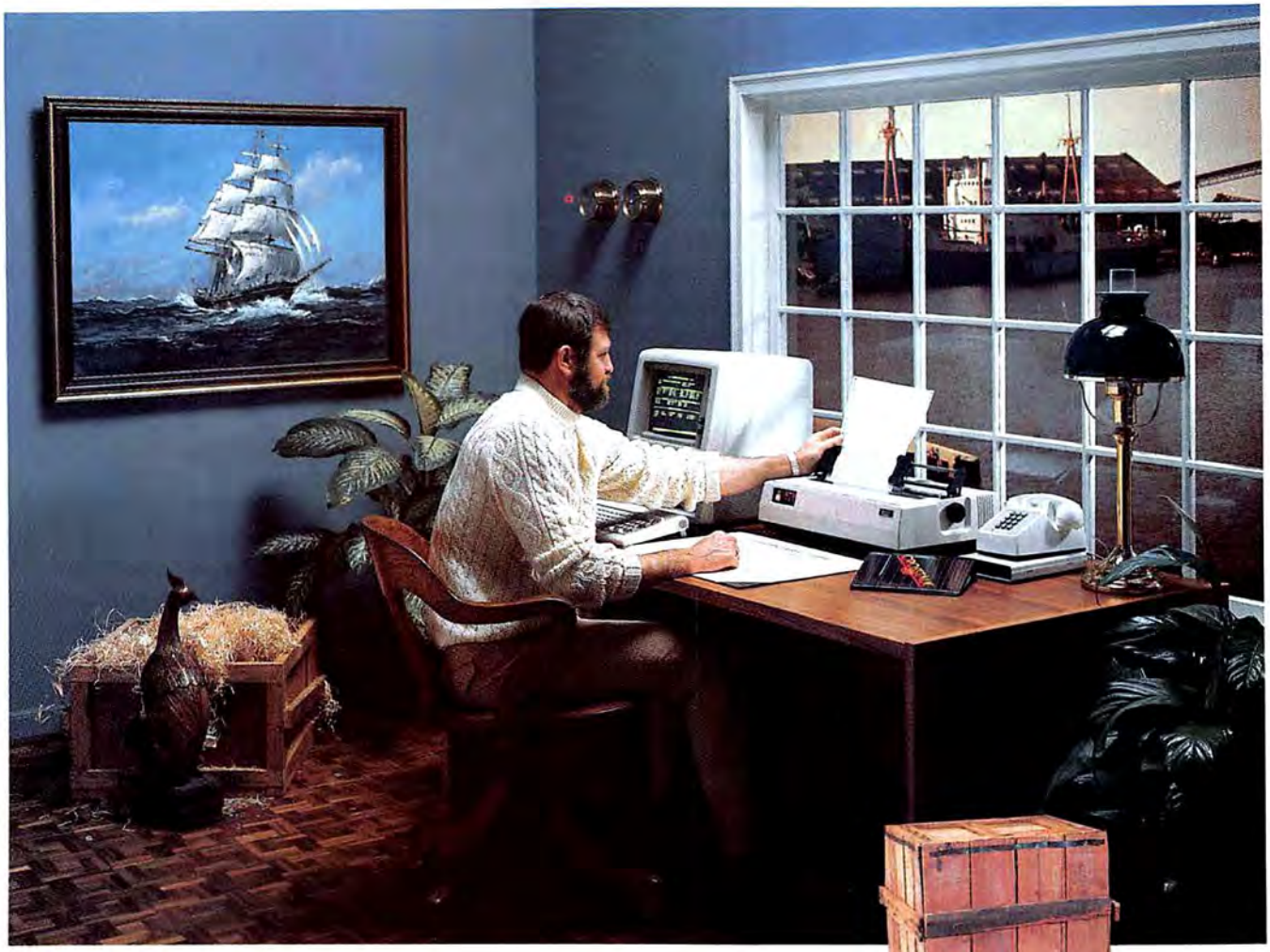
QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie 1984

Circle 605 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.

CROSSTALK™

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

CROSSTALK is a trademark of Microstuf, Inc., CP/M and CP/M-86 are trademarks of Digital Research, Inc., IBM is a trademark of International Business Machines, Inc.

Circle 275 on reader service card

Hard Disk, Soft Shell

The Complete Hard Disk Solutions For Desktop & Portable PC's 10 Megabytes $794, Or 20 Meg $1288.

We have the whole package you need to add a hard disk to your IBM PC or compatible. Our half-height 10 and 20 megabyte drives have the lowest current draw in the industry. Unlike most aftermarket hard disks ours can "boot" direct from the hard disk. No software patches, or drivers to install just a copy of IBM PC DOS 2.0 or 2.1.

1dir fully Easy with the popular *1dir* menu driven "visual shell" software. It replaces complicated DOS commands with menus that allow you to just point at what you want to do. Help files explain DOS commands and give you on-line advice when you need it. *1dir* takes the wonder out of the tree structured subdirectories so useful in organizing a hard disk.

Hard Problems like excessive current draw and heat have until now been unsolved problems with aftermarket hard disks. Most drives draw lots of power. If your PC has many expansion boards in it, power to run a hard disk is probably not available. Hard disks have also been easily damaged by vibration and movement. And of course the problem any non-IBM product must face, compatibility with the IBM PC. We have tackled all these problems and come up with the best solutions available at any price.

Cool & In Control with half-height drives so efficient they *draw the same amount of power as a floppy disk drive.* This means a minimum of heat inside your PC with more power available for expansion boards. The controller uses LSI technology to provide fewer components, drawing less power, and giving significantly im proved performance over the IBM XT.

The Portable Plus is 10 or 20 megabytes to go. In fact, the drives we use have been selected by several computer makers for use in their portable computers. Their plated recording media helps withstand vibration, and allows the drive to be used at any angle.

Total Compatibility is a necessity. Our hard disks have the ability to boot directly from the hard disk. Check around, very few aftermarket systems can. In fact, all you need is a copy of DOS 2.0 or 2.1 and you are ready to go, no software drivers to install, or DEBUG patches to apply.

Why Buy From Us? It's simple really. Better value, and no hassles. You see, the price advertised is the whole price. No extra for freight, credit cards, COD fees, or insurance. Perhaps the best part is if you have a question you deal direct with Qubie'. We have the knowledge and ability to help you quickly. And, *if you do have a hardware problem during the warranty period it is fixed or replaced within 48 hours!*

No Risk. Don't be afraid to save. Our manual is written so even the novice can successfully install his own system. And remember, if for any reason you are not happy within 30 days of purchase you may return it for a full refund, and we'll pay the freight back! Get our competition to make the same offer, and find out which system is best. We know which one you will choose.

System Requirements: Any IBM PC with 64k RAM and PC DOS 2.0 or later. Compatible owners call for application information.

PC10: Includes 10 Megabyte drive, controller, cables, installation instructions, *1dir* software, and 1 year warranty. **$794**

PC20: Same as above with 20 Megabyte drive. **$1288.**

Options: Auxiliary power supply, for those with computers already full of power hungry expansion boards. #PCPWR $88.

Half-height bezel (specify computer), #HHBZL $15.

DEALER AND QUANTITY PURCHASE INQUIRIES INVITED

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $12 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11, United Kingdom

9/62 Blackshaw, Mortdale
2223 N.S.W., Australia

Circle 151 on reader service card

OUR AD #W11

MEMBER DIRECT MARKETING ASSOCIATION

DEALERS WE BUY EXCESS INVENTORIES

MasterCard VISA AMERICAN EXPRESS Card

© 1984 by Conroy-LaPointe, Inc. All Rights Reserved

How to save money and time.

Here's How

By shopping by mail with Conroy-LaPointe you can now afford to go the full 640K RAM memory for your PC or get more software with what you save. A phone order only takes about ten minutes, all from the comfort of your home or office.

Here's Why

1. SAVE an average of 21% to 46%. (Our average profit over 6 years has been less than 4%.)
2. FAST QUALITY SERVICE from our professional and courteous staff and our LARGE INVENTORY will save you time and make shopping easy for you.
3. QUALITY IN-STOCK PRODUCTS means that we only sell products from reliable and reputable manufacturers. Our return policy guarantees that you won't get somebody else's rejects.

PRINTERS AND ACCESSORIES

DOT MATRIX:		LIST PRICE	OUR PRICE
EPSON, LQ1500, 200 & 67 CPS	NEW	$ 1395	Call
Parallel Interface for LQ1500	NEW	$ 100	Call
RX80, 100 cps		$ 399	Call
RX80, F/T		$ 499	Call
FX80, 160 cps		$ 699	Call
FX100, 160 cps		$ 895	Call
Apple II Graphics Dump Program		$ 15	$ 9
*MANNESMANN Spirit, 80 col 80cps		$ 399	$ 299
TALLY, 160L, 80 col. 160cps		$ 798	$ 568
180L, 132col. 160cps		$ 1098	$ 778
OKIDATA, 82A, 80 col., 120 cps, para.		$ 349	$ 319
83A, 132 col., 120 cps, para.		$ 749	$ 599
84, 136 col, 200 cps, para.		$ 1395	$1095
92, 80 col., 160 cps, para.		$ 599	$ 469
93, 136 col., 160 cps, para.		$ 999	$ 695
2350P, Pacemark, 350cps, para		$ 2695	$2095
2410P, Pacemark, 350cps, para.		$ 2995	$2395
Accessories, Plug 'N Play, Tractors, Okigraph			Call
ORANGE MICRO, Grappler+, for Apple		$ 165	$ 119
PRACTICAL, Microbuff In-Line 64K, Para.		$ 349	$ 259
Microbuff In-Line 64K, Ser.		$ 349	$ 259
QUADRAM, Quadjet, Jet Color Printer		$ 895	$ 795
*STAR MIC., Gemini 10"X, 120cps		$ 499	$ 289
Gemini 15"X, 120cps		$ 549	$ 439
TOSHIBA, 1351, 100 cps		$ 1895	$1495
LETTER QUALITY:			
AMDEK, 5040, 40 cps, Para. & Ser.		$ 1675	$1395
*TTX, 1014, 13cps, Para. & Ser., Pin & Fric, 3p.		$ 499	$ 365
1114, same as 1014 with T/F, 2 col. & Prop.		$ 599	$ 439
MACpac, Interface TTX to Apple MAC			Call
*JUKI, 6100, 18cps, Para, 3 pitch		$ 599	$ 459
PRINTER INTERFACES and BUFFERS:			
IBM-PC Parallel Printer Cable		$ 60	$ 35
Apple II I/F & Cable for Epson or Gemini		$ 95	$ 59
QUADRAM, All expandable (w/copy to 512K) (Snap-on to 64K)			
Microfazer, Snap-on & w/Copy		IN STOCK	Call

MODEMS AND ACCESSORIES

	LIST PRICE	OUR PRICE
ANCHOR, Signalman Mark XII	$ 399	$ 269
HAYES, IBM-PC Smartmodem 1200B	$ 599	$ 419
IBM-PC Smartcom II Software	$ 149	$ 109
Micromodem IIe w/Smartcom	$ 329	$ 239
Micromodem 100 (S-100 bus)	$ 399	$ 275
Stack Chronograph (RS-232)	$ 249	$ 189
Stack Smartmodem 300(RS-232)	$ 289	$ 225
Smartmodem 1200 (RS-232)	$ 699	$ 535
IBM-PC to Modem Cable	$ 39	$ 29
KENSINGTON, Modem 1200 NEW	$ 595	$ 385
NOVATION, 103/212 Smart Cat	$ 595	$ 415
ACCESS 1-2-3 (1200B+Crosstalk XVI)	$ 595	$ 399
Apple Cat II 300 BAUD	$ 389	$ 249

MONITORS AND ACCESSORIES

AMDEK, 300, 400, 500, 600, 700	NEW		Call
* 12" Green, #300G		$ 179	$ 119
* 12" Amber, #300A		$ 199	$ 149
* 12" Amber, #310A for IBM-PC		$ 230	$ 159
* 13" Color I+, Composite		$ 399	$ 249
* 13" Color II, RGB, Hi Res. (IBM/Apple)		$ 559	$ 439
* 13", Color IV, RGB, 720Hx400V, (IBM)		$ 795	$ 685
* DVM III, Color II or III to Apple II I/F		$ 179	$ 129
*PRINCETON, RGB Hi Res, HX-12		$ 795	$ 499
* RGB Hi Res, SR-12		$ 799	$ 599
* Amber, MAX-12 (for Mono Board)		$ 249	$ 199
*QUADRAM, Quadchrome 12" RGBColor		$ 695	$ 495
* Quadscreen 17" 968x512		$ 1995	$1595
* Quadchrome II, 14" RGB Color	NEW	$ 650	$ 450
* Amberchrome, 12" Amber	NEW	$ 250	$ 165
ZENITH, 12" Green, ZVM123		$ 200	$ 89
12" Amber, ZVM124		$ 200	$ 149
12" Color, ZVM135		$ 599	$ 499

DISKETTES

★ CONROY-LAPOINTE™ DISKETTES NEW!

We guarantee these top quality products with the Conroy-LaPointe name. 3 YEAR LIMITED WARRANTY.

10 ea, SS/SD, 35 Track (Apple, etc.)		$ 17
100 ea, SS/SD, 35 Track (Apple, etc.)		$ 149
1000 ea, SS/SD, 35 Track (Apple, etc.)		$1245
10 ea, DS/DD, 40 Track (IBM, H/P)		$ 29
100 ea, DS/DD, 40 Track (IBM, H/P)		$ 239
1000 ea, DS/DD, 40 Track (IBM, H/P)		$1995
10 ea, DS/DD, 40 Track (IBM-PC Pre-formatted)	NEW	$ 34
100 ea, DS/DD, 40 Track (IBM-PC Pre-formatted)	NEW	$ 289
1000 ea, DS/DD, 40 Track (IBM-PC Pre-formatted)	NEW	$2495
AMDEK, 3" Diskettes, Pac-10	$ 60	$ 49
CDC, 100 ea SS/DD, 40T (Apple, IBM)	$ 550	$ 195
10 ea SS/DD, 40T (Apple, IBM)	$ 55	$ 21
100 ea DS/DD, 40T (IBM, H/P)	$ 750	$ 295
10 ea DS/DD, 40T (IBM, H/P)	$ 75	$ 32
DYSAN, 10 ea SS/DD (Apple, etc.)	$ 40	$ 27
10 ea DS/DD 48T (IBM, H/P, etc.)	$ 69	$ 35
MAXELL, 10 each, MD1, SS/DD	$ 55	$ 19
10 each, MD2, DS/DD	$ 75	$ 26
VERBATIM, 10 each, MD515-01, SS/DD	$ 49	$ 27
10 each, MD34, DS/DD	$ 84	$ 32

GENERIK™ DISKETTES

100 ea., SS/SD, 35 Track (Apple, Atari)	$ 415	$ 99
1000 ea., SS/SD, 35 Track (Apple, Atari)	$ 4150	$ 850
100 ea., DS/DD, 48TPI (IBM, H/P)	$ 626	$ 119
1000 ea., DS/DD, 48TPI (IBM, H/P)	$ 6260	$ 995

CASH-n-CARRY COMPUTER STORES, INC.

Over-the-counter sales only. Open Monday through Saturday, 10:00 to 6:00.

SAN FRANCISCO — NEW STORE! OPENING 9/84. 520 Washington Street. For information, call (415) 561-9050.

PORTLAND, OREGON—At Park 217, Tigard at intersection of 217 and 99W. **Call 620-5595.**

SEATTLE, WASH.—3540 128th Ave. SE, Bellevue, WA 98006. In Loehmann's Plaza near Factoria Square, SE of Hwy 405 & 90 and at SE 36th & Richards. **Call 641-4736.**

THE WORLD'S LARGEST COMPUTER MAIL ORDER FIRM

CONROY-LA POINTE℠

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO USE IT!

National Order Desk **TOLL FREE (800) 547-1289**

ALL MAIL: Conroy-LaPointe, Inc. 12060 SW Garden Place, Portland, OR 97223 — **CASH-n-CARRY COMPUTER STORES, INC.—SEE BELOW**

SYSTEMS

— Call for Details —

256K IBM® - PC or XT

360K Disk Drives by CDC

90 Day Limited Warranty By Us

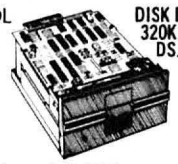
	LIST	OUR
COMPAQ **Portable**, 256K, 2 360K Disk Drives	$2495	CALL
SANYO **555-2**, 256K, 2 320K Disk Drives	$1499	CALL
TeleVideo **PC**, 256K, 2 360K Disk Drives, 8088 Chip	$1499	CALL
ZENITH **Z150**, 256K, 2 320K Disk Drives, MS DOS 2.1, 8088 Chip, 2 S/P	$2799	CALL

DRIVES AND ACCESSORIES

for the IBM-PC or XT

	LIST PRICE	OUR PRICE
ALLOY PC-Backup, 16MB, Cartridge Tape System	$2195	Call
PC-STOR, 41MB/17MB Disk&Backup System	$5995	Call
AMDEK Amdisk V, ½ height, internal, 320/360K	$ 329	$ 249
Amdisk III, 3" Dual Floppies, 500K	$ 499	$ 439

CONTROL DATA



DISK DRIVES 320K/360K DS/DD

Call For Larger Quantity Prices **$185** FULL HEIGHT **$165** HALF HEIGHT

30 Day Limited Warranty by Factory Authorized Distributor

CDC, ½ Hi Dual Drive Installation Kit	$ 30	$ 16
MAYNARD, Floppy Cont. (w/Para.Port)	$ 300	$ 239

QUADRAM Quaddisk Internal Hard Disks w/Controller

6MB Removable	NEW $2295	$1695
6MB Fixed	NEW $1995	$1495
12MB Fixed	NEW $2250	$1650
27MB Fixed	NEW $2895	$2195
72MB Fixed	NEW $6500	$4795

10 MEG (XT) DISK KITS

Convert your PC to 10 meg and to be XT compatible with one of the following INTERNAL HARD DISK SYSTEMS. Kits are quality engineered to work with DOS 2.0/2.1. Completely XT compatible. All you need is your DOS manual. Easy to install. Includes 10 Megabyte Hard Disk, Controller Card and Instructions.

★ ComX Internal 10 meg Hard Disk & I/F — NEW $ 869

Kamerman Labs Megaflight 100, 10 mbyte Hard Disk Kit — NEW $ 869

MAYNARD
10 meg Hard Disk Kit, WS1 Sandstar — $1150
Controller will accept 3 Sandstar modules — $1150

National Order Desk **TOLL FREE (800) 547-1289** OREGON ONLY (800) 451-5151 | Foreign & Portland (503) 620-9877

HOT LINE Information on your order (503) 620-9878 WEEKDAYS ONLY

ORDER DESK HOURS Mon-Fri—6AM to 6PM PST Saturday—10AM to 4PM PST (6AM here is 9AM in New York)

FREE GIFT COUPON

Use of our order forms qualifies you for a free gift with your order. Get on our mailing list now for order forms, and our new newsletter and sales specials announcement. Our customers are already on our list. **OUR AD # W10**

MAIL TO:
12060 SW Garden Place, Portland, OR 97223

NAME _____

ADDRESS _____

CITY _____ STATE ____ ZIP ____

SUPPLY CENTER for IBM-PC or XT

		LIST	OUR
AMDEK	MAI 4-in-1 Multiple Board, Color Graphics & Mono, Para Port.	$ 499	$ 399
AST	ComboPlus Products		Call
	MegaPlus Products		Call
	SixPakPlus, 64K, S/P/CC+S/W	$ 395	$ 265
	SixPakPlus, 256K, S/P/CC+S/W	$ 695	$ 495
	SixPakPlus, 384K, S/P/CC+S/W	$ 895	$ 595
	Game Port for SixPak	$ 50	$ 39
	I/O Plus II, S/P/CC	$ 215	$ 150
	I/O Plus II, S/P/CC/G	$ 265	$ 185
	I/O Plus II, 2S/P/CC/G	$ 315	$ 215
	MonoGraphPlus™ P/CC (for Lotus)	$ 495	$ 375
	PCNet, Starter Kit, PC002		$1095
	PCNet, Circuit Board, PC001		$ 495
*CCS	SuperVision, 132 col., mono. board	$ 799	$ 399
	Graphics Adapter for Supervision	$ 250	$ 99
	Power Pad (Requires Kit)	$ 100	$ 73
Chalkboard	Chalkboard Starter Kit	$ 50	$ 34
*ComX	EconoRAM™ 256K RAM Card w/Fastrak™ RAM disk emulator and spooler software.	$ 495	$ 325
CURTIS	UNI-I, Monitor tilt & swivel base	$ 50	$ 39
	3 to 9 foot keyboard cable	$ 40	$ 30
	Vertical CPU "System Stand"	$ 25	$ 19
	Monochrome Ext. Cable Pair	$ 50	$ 35
HAUPPAGE (HCW)	8087 Chip NEW	$ 175	$ 159
	8087 Math Pak NEW	$ 295	$ 245
	8087 Software Pak NEW	$ 180	$ 129
	8087 Macro Pak NEW	$ 245	$ 195
HERCULES	Color Card w/para.	$ 245	$ 169
	Graphics Card, Mono	$ 499	$ 349
Key Tronic	KB5150, Std. keyboard	$ 209	$ 159
	KB5151, Std. keyboard NEW	$ 255	$ 199
	KB5151 jr. keyboard NEW	$ 255	$ 199
Koala	Koala Pad™ w/PC Design	$ 150	$ 89
	Programmer's Guide	$ 15	$ 14
MAYNARD	Multifunction (6) Card, MFC	$ 89	$ 79
	Memory Card no RAM	$ 199	$ 169
SANDSTAR	Memory Card 256K	$ 495	$ 395
	HardDesk I/F Module (HDM)	$ 499	$ 399
SERIES	HardDesk Cable	$ 30	$ 27
	Para Port Module (PPM)	$ 59	$ 49
	Serial Port Module (SPM)	$ 95	$ 79
	Clock Cal. Module (CCM)	$ 55	$ 48
	Game Adapter Module (GPM)	$ 49	$ 43
	Memory Module "0"K (MMO)	$ 122	$ 99
	Memory Module 256K (MM256)	$ 422	$ 357
★ Maynard, XT 10 meg Hard Disk & I/F WS1		$1395	$1150
MICROSOFT	System Card 256K	$ 625	$ 450
	Mouse	$ 195	$ 129
	PC jr Booster with Mouse NEW	$ 495	$ 329
MOUSE SYSTEMS, PC Mouse w/software		$ 295	$ 195
MAGNUM, PC MasterCard™, 1,536K, Multifunction S/P/G/CC with SofRAM™ software which provides printer spooler, RAM disk & many other functions		$4995	$3950
PLANTRONICS	Color Board & Colormagic, 16 color, w/Para	$ 559	$ 395
	Color Board & Draftsman, 16 color, w/Para	$ 559	$ 395
	PARADISE, MultiDisplay Card NEW	$ 595	$ 435
QUADRAM	★ Quadlink NEWEST VERSION	$ 680	$ 480
	Quadboard, no RAM, expand to 384K	$ 295	$ 215
	Quadboard 64K, expand to 384K, S/P/CC	$ 395	$ 265
	Quadboard 256K, expand to 384K, S/P/CC	$ 675	$ 525
	★ Quadboard, 384K, S/P/CC	$ 795	$ 625
	Quadboard II, no RAM, expand to 256K	$ 295	$ 215
	Quadboard II, 64K, expand to 256K, 2S/CC	$ 395	$ 265
	Quadboard II, 256K, 2S/CC	$ 595	$ 395
	Quad 512 + 64K plus serial port	$ 325	$ 265
	Quad 512 + 256K plus serial port	$ 550	$ 420
	Quad 512 + 512K plus serial port	$ 895	$ 625
	Quadcolor I, board, 16 colors	$ 295	$ 215
	★ Upgrade Quadcolor I to II kit	$ 275	$ 199
	Quadvue, board, Mono/S/P/CC		Call
	★ Quadchrome, 12" RGB Color Monitor	$ 795	$ 495
	Quadchrome II, 14" RGB Color NEW	$ 650	$ 450
	Amberchrome, 12" Amber NEW	$ 250	$ 165
	Quad 3278 NEW	$1195	Call
	Quadnet VI NEW		Call
	Quadnet IX NEW		Call
Tecmar	Graphics Master	$ 695	$ 545
	1st MATE, 64K, S/P/CC	$ 389	$ 275
	1st MATE, 256K, S/P/CC	$ 589	$ 399
	Captain, 64K, S/P/CC	$ 424	$ 324
	Captain, 384K, S/P/CC	$ 795	$ 595
	Wave, 256K (short board)	$ 499	$ 369
	Bosun, S/P/CC (short brd.)	$ 195	$ 145
Titan	AcceleratorPC (8086+ 128K)	$ 995	$ 750
TG PRODUCTS, Joystick		$ 45	$ 30

★ **Memory Chip Kit $45** Call for Larger Quantity Prices
9 Each, 4164, 200 ns
90 Day Warranty by us

★ ComX **EconoRAM™ 256K BOARD**
$325 $295 Two or more.

★ ComX **EconoRAM™ 384K BOARD**
$375
With Fastrak™ RAM Disk Emulator and Spooler Software
Fully Compatible, 1 Year Limited Warranty by ComX
Works on DOS 1.1, 2.0 or 2.1
Prices and availability subject to change. Call.

SOFTWARE for IBM-PC or XT

BUSINESS & TRAINING

	APPLIED SOFT. TECH., Versaform	$ 389	$ 265
	ARKTRONICS, Jane w/Mouse	$ 295	$ 195
	ASHTON-TATE, Friday	$ 295	$ 199
	Framework (avail. July/Aug) NEW	$ 695	$ 399
	dBase III (avail. July/Aug) NEW	$ 695	$ 399
★	dBase II, (req. PC-DOS & 128K)	$ 495	$ 289
	dBase II to III upgrade	$ 200	$ 119
	dBase II User's Guide (Book)	$ 30	$ 20
	Everyman's DB Primer (Book)	$ 15	$ 12
	ATI, Training Programs—Wide line in stock	$ 75	$ 50
★	**BRODERBUND,** Bank Street Writer	$ 80	$ 56
	BPI, Gen'l Acctg, AR, AP or PR, each	$ 595	$ 375
	BUSINESS SOLUTIONS, Jack 2 NEW	$ 495	$ 335
	CDEX, Training for ... (Large Inventory)	$ 70	$ 47
	CHANG LABS, Micro Plan	$ 495	$ 335
★	**CONTINENTAL,** Ultrafile NEW	$ 195	$ 135
	Tax Advantage	$ 70	$ 45
	Home Accountant Plus	$ 150	$ 89
	FCM (Filing, Cataloging, Mailing)	$ 125	$ 79
	Property Management	$ 495	$ 329
	DOW JONES, Market Analyzer	$ 350	$ 225
	Market Manager	$ 300	$ 195
	Market Microscope	$ 349	$ 289
	FOX & GELLER, Quickcode, dGraph, Grafox or Oz, each	$ 295	$ 195
	dUtil (MSDOS or CP/M86, each)	$ 99	$ 65
	HARVARD, Harvard Project Manager NEW	$ 395	$ 265
	HAYDEN, IBM Pie Writer	$ 200	$ 135
	Pie Speller or Sargon III, each	$ 50	$ 34
	HOWARDSOFT, Tax Preparer, 1984—for 1983 year	$ 295	$ 220
	HUMAN EDGE, Management or Sales, ea.	$ 250	$ 169
	IUS, EasyWriter II System	$ 350	$ 259
	EasySpeller II	$ 100	$ 68
	Business System: GL+AR+AP	$1495	$ 995
	GL, AR, AP, OE or INV, each	$ 595	$ 395
★	**INSOFT,** Data Design (easy to use DBMS)	$ 250	$ 95
	GraFORTH (animated 3D graphics)	$ 125	$ 95
	KNOWARE, Knoware (reg. graphics) NEW	$ 95	$ 64
	LIFETREE, Volkswriter 1-2	$ 195	$ 130
	Volkswriter Deluxe	$ 295	$ 195
★	**LOTUS,** 1-2-3	$ 495	$ 309
	Symphony, (avail. July/Aug) NEW	$ 695	$ 465
	1-2-3 to Symphony, (avail July/Aug) NEW	$ 200	$ 145
	QUE, Using 1-2-3 (Book)	$ 15	$ 12
	LIVING VIDEOTEXT, Think tank NEW	$ 195	$ 129
	MICROPRO, WordStar® SPECIAL	$ 495	$ 239
★	WordStar Professional, 4 Pak SPECIAL	$ 695	$ 355
	CorrectStar™ (requires 192K) NEW	$ 195	$ 125
	MailMerge™	$ 250	$ 129
	StarIndex™	$ 195	$ 109
	ProOptions, SS/MM/SI SPECIAL	$ 345	$ 155
	InfoStar™+ SPECIAL	$ 495	$ 259

BUSINESS & TRAINING

★	**MICRORIM,** Rbase, Series 4000	$ 495	$ 299
	Extended Report Writer NEW	$ 150	$ 99
	Rbase Clout NEW	$ 195	$ 129
	MICROSOFT, Chart NEW	$ 125	$ 85
	Project NEW	$ 250	$ 169
	Multiplan	$ 195	$ 129
	Word	$ 375	$ 259
	Word with Mouse	$ 475	$ 325
	MONOGRAM, Dollars & $ense	$ 165	$ 110
	MULTIMATE, Multimate	$ 495	$ 295
	NW ANALYTICAL, Statpak NEW	$ 495	$ 345
	OPEN SYS. GL, AR, AP, PR, INV or PO, each	$ 695	$ 429
★	**OSBORNE/COMX,** (Book & Business, Statistics & Math Programs on DS/DD Disks)		
	Some Common Basic Programs (70 ea.)	$ 100	$ 69
	Practical Basic Programs (40 each)	$ 100	$ 69
	PEACHTREE, Peach Pak (GL, AR, &AP)	$ 395	$ 239
	Peach Text 5000	$ 395	$ 239
★	**PERFECT,** Perfect Writer™	$ 349	$ 219
	Writer & Speller, 2 Pak	$ 399	$ 249
	Perfect Filer™ or Perfect Calc, each	$ 249	$ 149
	Perfect Writer, Speller, Filer, Calc (4)	$ 699	$ 499
	SOFTWARE PUBLISHING, PFS:File	$ 140	$ 89
	PFS:Report	$ 125	$ 79
	PFS:Write	$ 140	$ 89
	PFS:Graph	$ 140	$ 89
	SORCIM, SuperCalc 2	$ 295	$ 195
	SuperCalc 3	$ 395	$ 265
	SSI/SATELLITE, WordPerfect	$ 495	$ 275
	Personal WordPerfect	$ 195	$ 149
	STONEWARE, Advanced D.B. Master	$ 595	$ 395
	SUMMA, Trader's Forecast NEW	$ 250	$ 189
	Trader's Data Manager NEW	$ 200	$ 150
	Trader's Accountant NEW	$ 350	$ 259
	Complete System NEW	$ 700	$ 525
	T/MAKER, T/Maker III	$ 275	$ 169
	THOUGHTWARE, Mgt. Series		33% off list
	VISICORP, VisiCalc 4	$ 250	$ 169
	Full Line In Stock		Call

UTILITY & SYSTEM

1983 CL SOFTWARE AWARD:
"Copy II PC by Central Point Software is still one of the best software buys available. It will copy more copy protected software and faster than any other backup system. Unlike other copiers it makes an exact duplicate of your original and it does 100% verification of copy. Documentation is excellent."

★	**CENTRAL POINT,** Copy II PC. Backup	$ 40	$ 30
★	**COMX,** Fastrak™, RAM/Disk emulator and printer spooler program. Works on any PC/DOS version or RAMCard. Menu Driven	$ 100	$ 59

UTILITY & SYSTEM

	LIST PRICE	OUR PRICE
DIGITAL RESEARCH, Concurrent CP/M-86™ w/windows	$ 350	$ 225
CP/M-86™ (PC/XT)	$ 60	$ 40
CBASIC 86™ (CP/M86)	$ 200	$ 135
CBASIC Compiler (CP/M-86 or PCDOS, ea)	$ 600	$ 365
Pascal/MT+ (CP/M-86)	$ 400	$ 269
Pascal/MT+ (PCDOS)	$ 600	$ 399
PL/1 (PCDOS or CP/M-86, each)	$ 750	$ 499
Speed Prog. Pkg. (CP/M-86)	$ 200	$ 135
DR LOGO-86 (CP/M86)	$ 100	$ 69
FUNK SOFTWARE, Sideways NEW	$ 60	$ 40
HAYES, Smartcom II (Data Com.)	$ 149	$ 109
★ **INSOFT,** GraFORTH (animated 3D graph)	$ 125	$ 95
LIFEBOAT, Lattice C NEW	$ 500	$ 295
MICROSTUF, Crosstalk XVI (Data Com.)	$ 195	$ 129
MICROSOFT, muMath/muSimp	$ 300	$ 199
Business BASIC Comp.	$ 600	$ 399
Pascal Compiler	$ 300	$ 199
C Compiler	$ 500	$ 329
BASIC Compiler	$ 395	$ 259
FORTRAN Compiler	$ 350	$ 229
COBOL Compiler	$ 700	$ 459
NORTON, Utilities 2.0, 14 programs	$ 80	$ 54
ROSESOFT, Prokey	$ 130	$ 87

HOME & EDUCATIONAL

	ATARI, Centipede, PacMan or Donkey, each	$ 35	$ 28
	EPYX/Auto. Sim., Temple of Apshai	$ 40	$ 29
★	**ARMONK,** Executive Suite	$ 40	$ 27
	BLUE CHIP, Millionaire or Tycoon, each	$ 60	$ 39
	BPI SYSTEMS, Personal Accounting	$ 99	$ 63
★	**BRODERBUND,** Apple Panic (Color)	$ 30	$ 19
	Lode Runner or Serpentine, each	$ 35	$ 23
	CBS, Chas. Goren Learn Bridge NEW	$ 80	$ 54
	COMPREHEN., PC Tutor (1.1 or 2.0, ea.)	$ 60	$ 40
	CONTINENTAL, Home Accountant Plus	$ 150	$ 89
	DAVIDSON, The Speed Reader II	$ 75	$ 49
	Word Attack! or Mathblaster, each	$ 50	$ 34
	HAYDEN, Sargon III (chess)	$ 50	$ 34
	INFOCOM, Deadline or Suspended, each	$ 50	$ 33
	Zork I or Zork II or Zork III, each	$ 40	$ 27
★	**INSOFT,** Mystrix, Wordtrix or Quotrix, each	$ 35	$ 25
	MICROSOFT, Flight Simulator II	$ 50	$ 33
	MONOGRAM, Dollars & Sense	$ 165	$ 110
	ORIGIN, Ultima III	$ 60	$ 40
	PBL CORP., Personal Investor	$ 145	$ 99
	SCARBOROUGH, MasterType	$ 50	$ 34
	SPINNAKER, Snooper Troops (1 or 2)	$ 45	$ 35
	Story Machine or Face Maker	$ 35	$ 24
	STRATEGIC, The Warp Factor	$ 40	$ 30
	SUBLOGIC, Night Mission Pinball	$ 40	$ 27

OUR AD # W11

ORDERING INFORMATION AND TERMS: **MAIL TO: 12060 SW Garden Place, Portland, OR 97223** — Include your telephone number, double check your figures for Shipping, Insurance and Handling (SIH). All items usually in stock, **NO C.O.D.** Cashiers checks, money orders, Fortune 1000 checks and government checks—we immediately honor. Personal and other company checks—allow 20 days to clear. Prices reflect 3% cash discount, so ADD 3% to above prices for VISA, MasterCard or American Express. Add **SIH CHARGES:** U.S. Mainland, 3% ($5 minimum) for standard UPS ground; UPS Blue, 6% ($10 minimum); for U.S. Postal APO or FPO, 12% ($15 minimum). Hawaii—UPS Blue. For Alaska or Canada—UPS in some areas only, all others Postal—call or write, or specify Postal. Foreign orders except Canada, 18% ($25 minimum). Monitors by Postal or to foreign countries, 30% ($50 minimum). Orders received with insufficient SIH charges will be refunded. All prices, availability and specifications subject to errors or change without notice, so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices and our assurance that you will get new, unused products—**ALL SALES ARE FINAL.** Call before returning goods for repair or replacement. **ORDER DESK HOURS—6AM to 6PM PST, Monday through Friday, Saturday 10 to 4.** (6AM here is 9AM in New York)

OUR REFERENCES: We have been in computers and electronics since 1958, a computer dealer since 1978 and in computer mail order since 1980. Banks: 1st Interstate Bank, (503) 643-4678. We belong to the Chamber of Commerce (503) 228-9411, and Direct Marketing Association or call Dunn and Bradstreet if you are a subscriber. EconoRAM™, Fastrak™, and Generik™ are trademarks of ComX Corporation. PC MasterCard™ and SofRAM™ are trademarks of Magnum Computer.

Circle 554 on reader service card

Considering Tape For Backup Storage?

. . .Tut, Tut.

There was a time when tape was the way to store backup data from your hard disk. It was fine for archives, but not when you wanted your data live and on-line. Today's business pharaoh can have his data on-line and backups, too—with 5 or 10 megabyte **removable cartridge** hard disk systems from **Micro-Design**.

Single-function tape backup units can't come close to matching the versatility and cost-effectiveness of hard disk cartridges; you get backup capabilities PLUS the benefit of having another full 5 or 10 megabytes of on-line data access.

Use hard disk cartridges the same way you use a floppy disk system. Just switch them out as needed—one cartridge for wordprocessing, another for accounting, and another for backup storage. Add additional cartridges whenever you like.

Fast. Cartridges run as fast, or faster, than fixed hard disk drives. A 5 megabyte backup takes only a few minutes, using Micro-Design's backup utility software. Switching out cartridges takes just a few seconds.

Convenient and Secure. It's easy to lock-up sensitive files—just remove the cartridge and put it somewhere safe. If you share a computer with others, everyone can have their own cartridge. Or, have a home cartridge and a business cartridge for use with your portable computer.

IBM® International Business Machines.

Unlimited Expansion. No more erasing old data to increase space on your hard disk. Fact is, there's no limit to the amount of off-line storage you can add.

Our **DATA Series** 5 and 10 megabyte cartridge hard disks are external drives available in removable only, or paired with 10, 20, or 33 megabyte fixed drives. Our **SQ Series** features 5 megabyte cartridge drives, in matching external cases or ready for internal installation. All are 100% compatible with the IBM-PC, XT, and work-alikes, with no software modifications needed. You can even boot from the hard disk.

Don't let single-function hard disk and tape units send your asp up the Nile. Ask your local computer dealer about Micro-Design's versatile hard disk cartridge units. Or, call us for details on our full product line and ordering information. Dealer inquiries invited.

We've got a complete line of mass storage devices, including floppy drives. Prices start as low as **$1549** for a 20 megabyte fixed hard disk drive. Call for our **FREE** catalog today!

One year warranty. Network compatible. Backup utility software included with 2 drive systems.

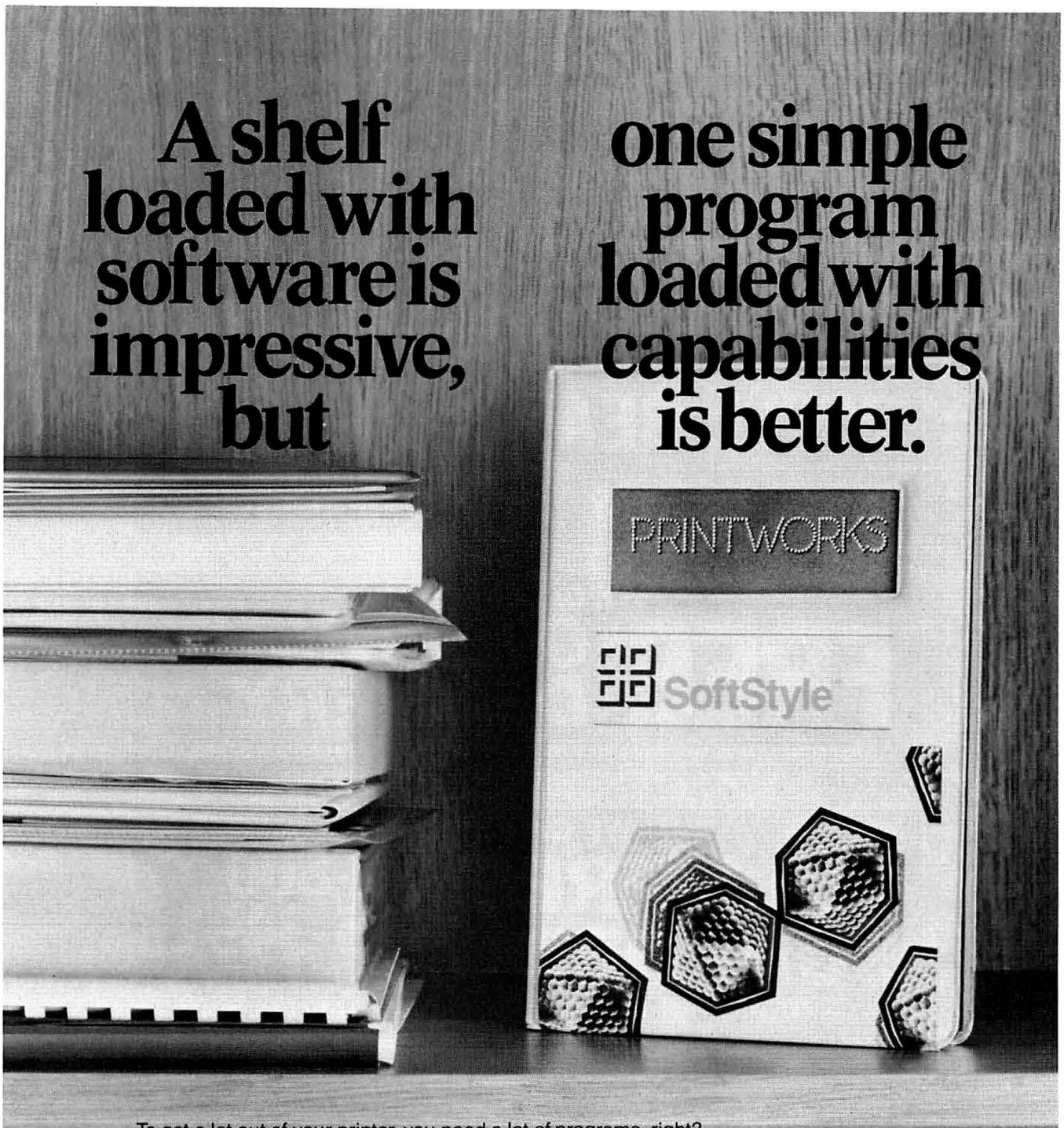
MICRO·DESIGN · MASS·STORAGE·DEVICES

Micro-Design

Making The Most of Your Micro.

Call Toll FREE 1-800-531-5002.
In Texas, call 512-441-7890.
6301 B Manchaca Rd., Austin, TX 78745

Circle 537 on reader service card



To get a lot out of your printer, you need a lot of programs, right?
Wrong.

True, you want the power to change type sizes, create your own characters, and even print sideways. But you don't need a lot of printer utility programs like Sideways, Fancy Font and Facelift.

You don't need to pay for all that, either. One easy-to-use program called Printworks will blow all the others right off your shelf.

Printworks.™ It's loaded.

SoftStyle™

SoftStyle, Inc. • 7192 Kalanianaole Hwy. • Suite 205
Honolulu, Hawaii 96825 • Phone (800) 367-5600

$69.95. SoftStyle products are available at ComputerLand and other fine dealers.
Simple Menu Control • Pivot Printing™ lets you print sideways quickly and easily • Prints full IBM character set including line graphics, math and science symbols • Foreign language characters • Easily set print modes: condensed, emphasized and more • Create new characters or entire fonts • Many fonts included • Supports thousands of popular software packages including Wordstar, dBaseII and Lotus 1-2-3.
Printworks enhances over 30 dot-matrix printers: C.ITOH Prowriter (8510, 1550, 7500 all with the letter "E" included in the model number), CENTRONICS Horizon (H80, H136), EPSON (FX-80/100, RX-80/100, JX-80, LQ-1500, MX-80/100 III with Graftrax Plus), IBM Graphics Printer, INFORUNNER Riteman (Plus, Blue Plus, II, 15), NEC Pinwriter (P2-3, P3-3), OKIDATA (ML 84 Step 2, ML 92 and 93 with or without Plug 'n Play Kit, Pacemark 2350 and 2410), and STAR (Gemini 10X/15X, Radix 10/15, Delta 10/15). For the IBM PC, PC-AT, PC-XT, PCjr., Compaq and many other IBM compatibles. Needs 128K and DOS 1.1 or later.
Sideways is a trademark of Funk Software, Inc. Fancy Font is a trademark of SoftCraft. Facelift is a trademark of Companion Software, Inc.

Circle 816 on reader service card

We're known by the customers we keep!

Here's why...

WE GUARANTEE YOU

WE'LL BEAT ANY PRICE BY $10.00 AND WE LOVE DOING IT!

WE OFFER YOU

FREE* OVERNIGHT DELIVERY

*YOU PAY *ONLY* THE 2% GROUND AND HANDLING CHARGES. WE PAY THE "OVERNIGHT" AIR CHARGES

WE GIVE YOU

TOLL-FREE SUPPORT 1-800 645-3491

516-741-0043(N.Y.S.)

WE OFFER TOLL-FREE TECHNICAL SUPPORT TO ALL OF OUR CLIENTS

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

VISA MasterCard

Continental U.S.

1-800-645-3491

300 GARDEN CITY PLAZA, GARDEN CITY, NEW YORK 11530

New York State 516-741-0043
Canada 416-283-2354

Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

- ☐NO SURCHARGE FOR CREDIT CARDS
- ☐Items shipped in original factory sealed boxes
- ☐Purchase orders accepted from qualified institutions
- ☐All items shipped insured
- ☐PAY NO SALES TAX
- ☐Add 2% for shipping and handling
- ☐Payment: Master Charge, VISA, COD, Money order or check
- ☐NYS residents add sales tax

Circle 95 on reader service card

WE'LL BEAT ANY PRICE BY $10* AND WE LOVE DOING IT!

USE THIS CARD TO SHOP THE MAGAZINE

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS

TEAR and COMPARE

WORD PROCESSING

Wordstar	$215
Wordstar Pro Plus	$349
Wordperfect	$295
Microsoft Word with Mouse	$289
Multimate	$269
Peachtext 5000	$195
Volkswriter Deluxe	$169
Easywriter II/Speller/Mailer	$195
Edix & Wordix	$255
Finalword	$225
Samna Word I, II, III	CALL
XyWrite II Plus	$259
Think Tank	$139
Wordplus (Oasis)	$115

DATA BASE MANAGEMENT

Knowledgeman	$275
TIM IV	$269
R:Base 4000	$295
dBASE III	$369
Quickcode III	$179
Condor III	$325
Data Base Manager II (Alpha)	$195
Infostar Plus	$295
Friday	$169
pfs:file & pfs:report	$165
Dataease	$519
Revelation	$759
Powerbase	$265
Versaform	$245

INTEGRATED/SPREADSHEETS

Jack 2	$299
Smart Software	CALL
Aura	CALL
Open Access	$385
Electric desk	CALL
Framework	$369
Symphony	$429
Lotus 1-2-3	$309
Context MBA	CALL
Supercalc 3	$195
Multiplan	$135
TK!Solver	$269

OVER 400 ADDITIONAL TITLES IN STOCK
ALL SHIPPED IN ORIGINAL FACTORY SEALED BOXES

GRAPHICS

Super Chartman II & IV	$349
BPS Graphics	$289
Fast Graphs	$199
Chartmaster	$279
Signmaster	$195
pfs:graph	$85
Graphwriter Combo Pak	$475
Energraphics	$269
PC Draw	$295

FINANCIAL/SCHEDULERS

Managing Your Money (Tobias)	$159
Financier II	$115
Dollars & Sense	$115
Market Manager (Dow Jones)	$229
Market Analyzer (Dow Jones)	$269
Market Microscope (Dow Jones)	CALL
PCPFP II (Best)	$169

Largest selection of TAX PACKAGES

Microsoft Project	$175
Harvard Project Manager	$319
Project Scheduler (Scitor)	$195

LANGUAGES/UTILITIES

Concurrent CP/M86 with Windows(DR)	$225
Pascal MT+ (DR)	$235
PL/1 (DR)	$479
Display Manager (DR)	$359
Access Manager	$269
Lattice C Compiler (Lifeboat)	$299
CIS Cobol 86 (DR)	$479
Pascal Compiler (MS)	$245
C Compiler (MS)	$325
Basic Compiler (MS)	$245
Cobol Compiler (MS)	$495
Business Basic (MS)	$359
Fortran Compiler (MS)	$245
Prokey 3.0	$69
Norton Utilities	$55
C-Food Smorgasbord	$119
Crosstalk XVI	$105

BOARDS AND MODEMS

Hercules Graphic Boards	CALL
Quadram	CALL
AST Research	CALL
Persyst	CALL
Tecmar	CALL
Plantronics	CALL
Hayes	CALL
Novation	CALL

*Tell us the advertiser and price of any IBM-PC software package advertised in a current issue of any popular computer publication and we'll beat that price by $10. This offer does not apply to packages under $100 or where the price is not lower than Logicsoft's.

Prices subject to change without notice

CLIP AND SAVE FOR YOUR FILE

VISA MasterCard

NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted from qualified institutions.
Add 2% for shipping and handling.
☐COD ☐Check ☐Money Order ☐NYS residents add sales tax

1-800-645-3491

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

300 Garden City Plaza, Garden City, NY 11530

Continental U.S.
1-800-645-3491

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

Looking for an Accounting System?

CALL US...
WE'VE EVALUATED OVER 50 OF THEM

See our ad in *Journal of Accountancy*

INFORMATION UNLIMITED SOFTWARE (IUS)

$295 Per Module

general ledger
accounts payable
accounts receivable
inventory
order entry

payroll $359
financial series
(G/L, A/P, A/R) ... $859

CHAMPION

$399 Per Module

general ledger
accounts payable
accounts receivable
payroll
inventory control

PEACHTREE SERIES 8

$375 Per Module

general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing
job costing

OPEN SYSTEMS

$399 Per Module

general ledger
accounts payable
accounts receivable
payroll
inventory
sales order processing
purchase order processing
job costing

REALWORLD (MBSI)

$575 Per Module

general ledger
accounts payable
accounts receivable
payroll
order entry/inventory

sales analysis $289

STATE OF THE ART

$479 Per Module

general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing

time keeping & billing $679

BPI

$395 Per Module

general ledger
accounts payable
accounts receivable
payroll

inventory $529
job costing ...$529

GREAT PLAINS SOFTWARE

$479 Per Module

general ledger
accounts payable
accounts receivable
payroll
inventory

TCS

$1195

client write up

TEAR AND COMPARE

LOGICSOFT INTRODUCES...

LOGICTRAK DD5

Double sided, Double density, Soft sector floppy diskettes

LOGICTRAK DD5 disks are manufactured to the highest tolerances and are ***certified 100% error free.***

LOGICTRAK DD5 disks carry a full Logicsoft ***lifetime guarantee.*** If any LOGICTRAK DD5 diskette fails to format or exhibits any data retention errors we will ***replace it free of charge.***

CLIP AND SAVE FOR YOUR FILE

LOGICSOFT

We're known by the companies we keep

- ASHTON - TATE
- DIGITAL RESEARCH
- DOW JONES
- INNOVATIVE SOFTWARE
- IUS
- FOX and GELLER
- LIFETREE
- LOTUS
- MICRORIM
- MICROSOFT
- PEACHTREE
- SATELLITE SOFTWARE
- SOFTWARE ARTS
- SOFTWORD SYSTEMS
- SORCIM
- AND OVER 100 OTHER PUBLISHERS

- the Logical Choice!

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

NO SURCHARGE FOR CREDIT CARDS VISA MasterCard

Continental U.S.

1-800-645-3491

300 Garden City Plaza, Garden City, NY 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

Replace this. With this. Instantly!

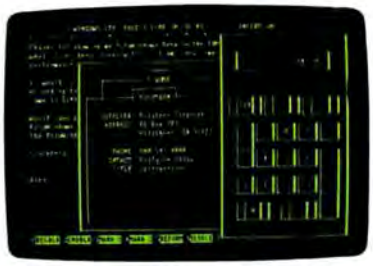
New Standard Equipment For Every IBM Personal Computer In America.

Only $49.95

Shipping $4

PolyWindows was written by Thomas A. Crispin

PolyWindows is a trademark of Polytron Corp. MS-DOS is a trademark of Microsoft Corp. Macintosh is a trademark licensed to Apple Computer, Inc.



Calculator, Filedex over Wordstar

Memo Window Over Spreadsheet

Calendar, Alarm Clock, Appt. Book.

Memo, Game, Color Menu Over Wordstar

POLYTRON

PolyWindows

DESK

Desktop productivity in a single keystroke even while running another program!

Finally, a software package that makes your IBM PC or true compatible as useful as you thought it should be.

PolyWindows Desk™ lets you instantly call up essential desktop tools without having to exit the program you are running or swap disks. Another keystroke takes you back to your program right where you left off.

Your numeric keypad can now become a full-featured calculator or printing calculator.

You can create your own small scale data base and replace your manual Rolodex® with a Filedex system that has an unlimited number of "cards".

To help you manage your day, week, month and long-term projects PolyWindows Desk has a monthly calendar to the year 2000, an alarm clock, and daily appointment book.

And for the memos, letters, and "to do" lists you write everyday you can call up one or more "memo windows" with a built-in full-featured editor.

You can assign functions to specific keys using PolyKey™, a keyboard enhancement program that rivals all the high-priced keyboard utilities. This feature alone justifies the price of PolyWindows Desk.

You can designate the size of each window and, with a color monitor, change the colors of windows and information within the windows. Pull-down menus give you Macintosh™ like speed without a mouse. You can even call up all these tools at once using PolyWindows, the most flexible, friendly windows yet! Plus, PolyWindows lets you include custom functions and is expandable for future utility modules. PolyWindows even includes PolyGames for a quick diversion.

At $49.95, PolyWindows Desk out performs the competition and gives you the office of the future today!

To order with Visa or MasterCard or request a complete information packet call toll-free. (Requires MS-DOS, PC-DOS 2.0, or higher)

1-800-547-4000

(Ask for Dept. No. 305) .

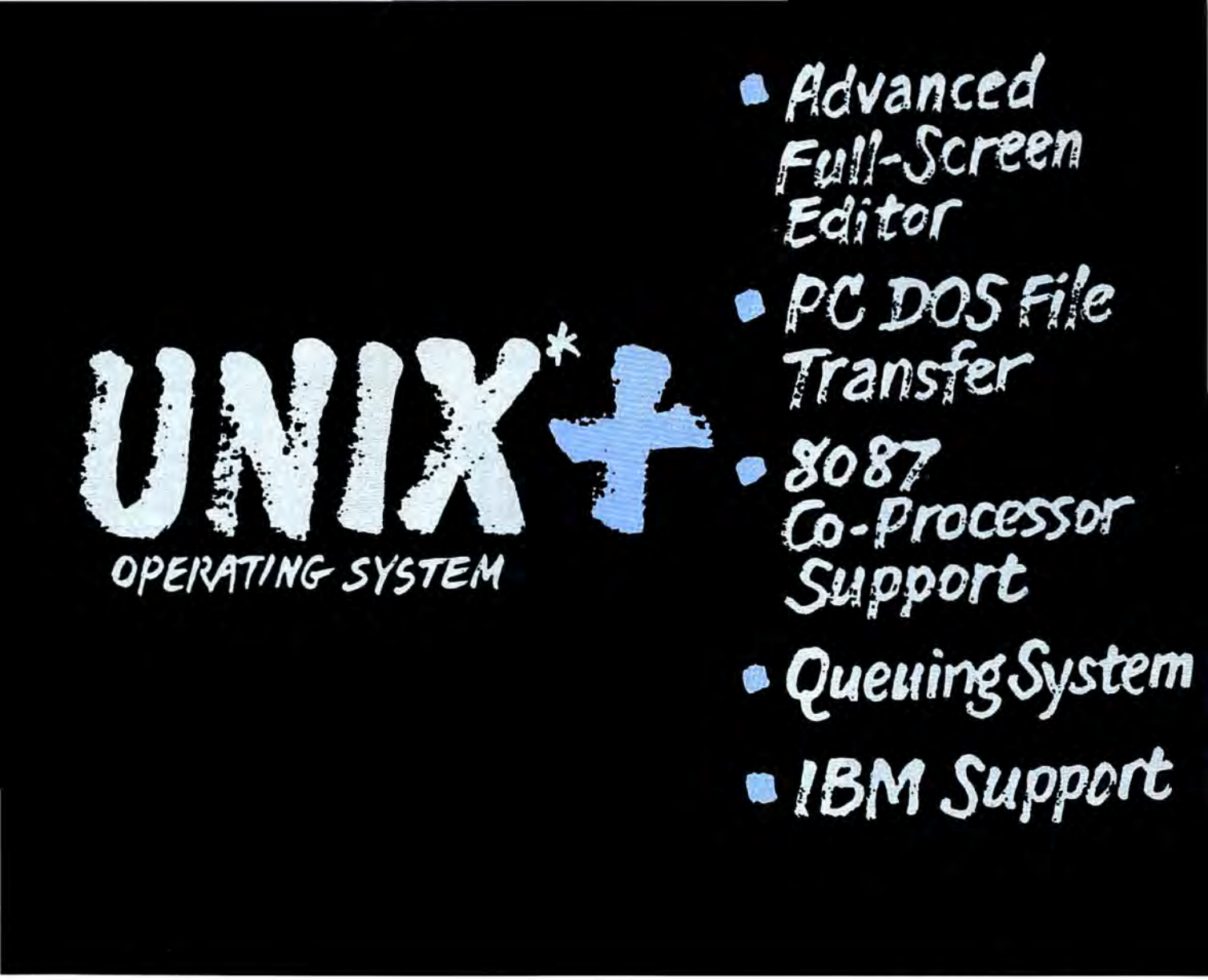
Oregon & Foreign Orders Call 503-684-3000

Send Checks to:

Polytron Corporation, P.O. Box 787

Hillsboro, OR 97123

Dealer/OEM inquiries welcome



Now you can have a complete UNIX System III implementation on most models of the IBM PC.

The IBM Personal Computer Interactive Executive† (PC/IX) offers you tools like the C language, programmer's workbench, communication facilities, a text processing system and much more. It's also a multitasking system that offers you the same facilities found on larger UNIX operating systems.

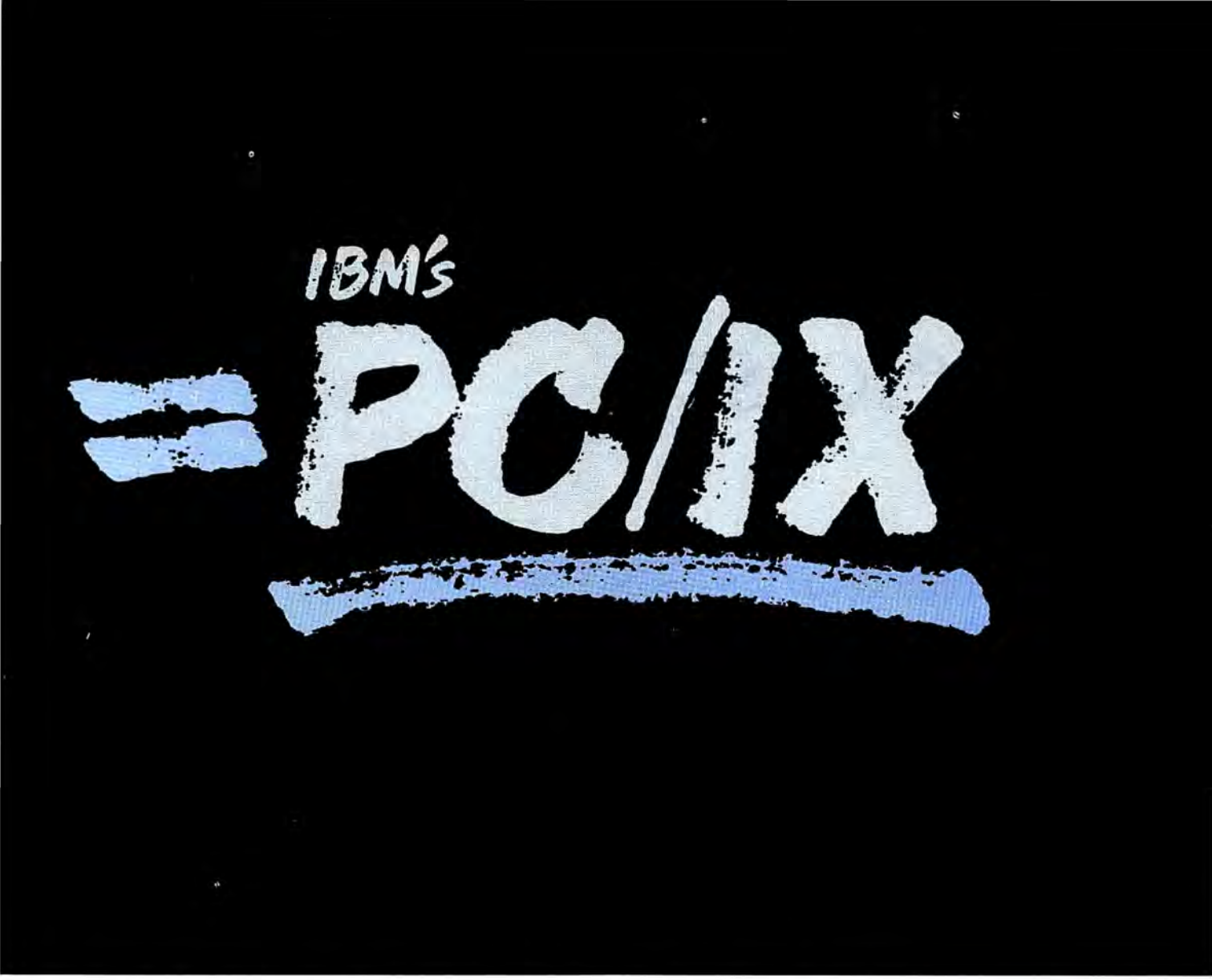
And PC/IX incorporates many significant enhancements. For example, a new full-screen editor helps you program more effectively. It offers such advanced features as windowing, function-key editing, the ability to execute commands from the editor, and automatic file backup. Beginning users of the editor can rely on a variety of "help" screens.

If you've been using PC DOS, you'll be glad to hear that it can co-reside with PC/IX. And that you can transfer files between the two systems.

PC/IX is specifically designed to take full advantage of the architecture of the IBM PC.

It transparently supports the 8087 Math Co-Processor. And PC/IX automates the management of input/output streams through a multipurpose queuing and spooling system.

IBM has other software for PC/IX



available, too, including INfort (a FORTRAN compiler with programming tools) and INmail/INnet/FTP (an electronic mail and file transfer facility)†.

And because PC/IX is from IBM, you get IBM's quality documentation, as well as IBM service and support.

PC/IX requires 256KB of memory on an IBM PC with fixed disk or an IBM PC XT, PC XT/370 or PC AT.

You'll find PC/IX at your nearest IBM Product Center or your Authorized IBM Personal Computer Dealer. To order, or for more information and the latest list of PC/IX application software, call IBM toll free at 1 800 IBM-2468, and ask for the PC Software Department, Ext. 553. Or call your IBM marketing representative.

IBM®

IBM Direct PC/IX
PC Software Dept. 3E/553
1 Culver Road, Dayton, NJ 08810

Please send me more information on PC/IX.

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____

*UNIX is a trademark of AT&T Bell Laboratories. PC/IX is based on UNIX System III, which is licensed to IBM by AT&T Technologies, Inc.
†Developed for IBM by INTERACTIVE Systems Corp.

Circle 781 on reader service card

HP's Desktop in a Briefcase

What weighs 8½ pounds, fits inside a briefcase, but performs like a desktop? Hewlett-Packard's HP 110 Portable runs on batteries while you're on the road and exchanges data with your IBM PC when you get home.

Danny Goodman

Ever since Osborne-size portable computers became available, people have dreamed of owning a powerful computer that was small enough to fit in a briefcase. That dream has gone largely unfulfilled. The Radio Shack Model 100 sparked the imaginations of many mobile computer users, but with only 32K of memory, it can't perform like a desktop computer. A few high-performance briefcase portables have been introduced, but they either lack practical displays (Teleram), are too expensive (GRiD), or were too long chained to the drawing board (Gavilan).

The good news is that a major manufacturer has taken the bold step of producing a briefcase computer that packs a wallop: it replicates the functions of an MS-DOS desktop computer; with the help of a cable and a PC interface board, it can read disks from an IBM PC; and it comes loaded with just about everyone's favorite software. The company is Hewlett-Packard, and the computer is the HP 110, which the manufacturer is calling, simply enough, The Portable. If consumers can swallow the $2995 price tag, it may rank as THE Portable.

The HP 110 fits into the briefcase class of portable computers by virtue of its compact size, 13 by 10 by 2⅞ inches, which is only slightly larger than a three-ring notebook. However, at 8½ pounds the HP 110 seems a bit heavy for extended periods of kneetop computing. I'd rather work with it on a desk. The Portable's neutral, putty-colored plastic case is unblemished by garish logos or other markings, and the computer comes with a black carrying case equipped with a handle and a shoulder strap.

Two spring-lock latches release the HP 110's "lid," which opens to reveal a full keyboard and an 80-column by 16-line liquid crystal display (LCD). (Hewlett-Packard plans to come out with a model that will offer a 24-line display.) The keyboard is typewriter style, with limited, yet adequate, vertical play. Across the top are eight programmable function keys, three dedicated function keys, and four cursor keys, the latter in an inconvenient horizontal row.

The Portable has no power-on switch; you turn it on by pressing any key on the keyboard. A function key on the top row turns off the computer, or you can let the self-timer, which is adjustable from 0 to 30 minutes, turn it off. When you turn it on again, you are returned to wherever you left off.

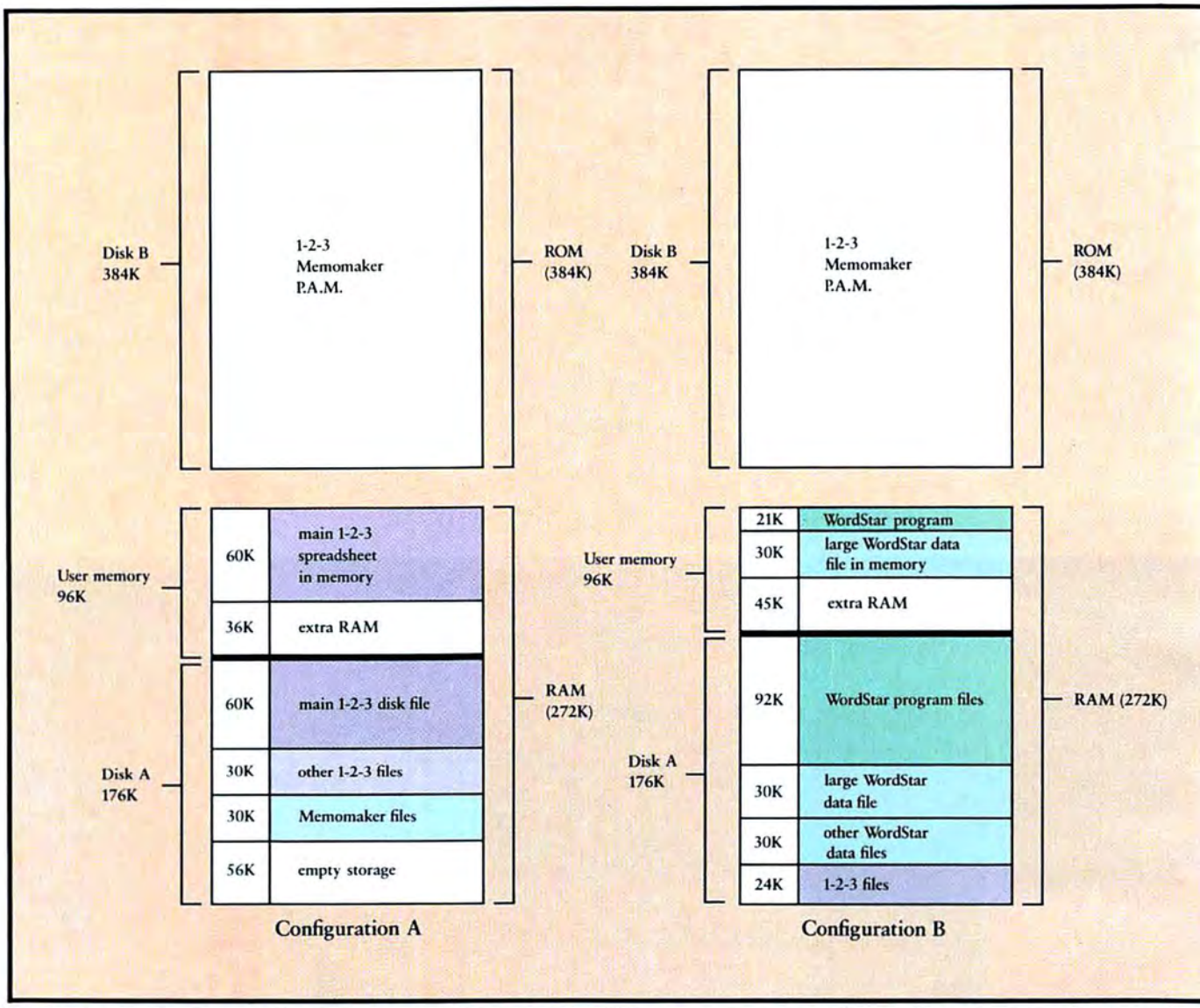
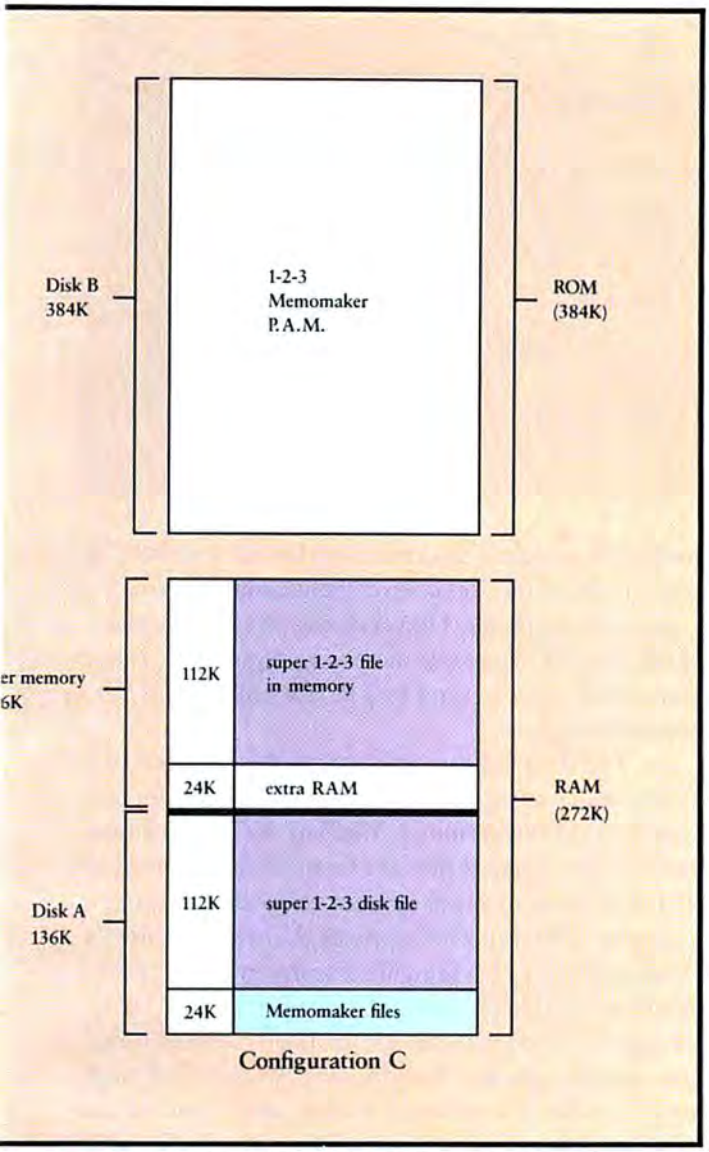


Figure 1: On the System Configuration menu you can divide the HP 110's 272K of RAM into work space memory and disk storage. Although 176K is the most you can devote to disk storage, you can shift more memory to the work space if you need it. Configuration A shows the maximum disk allocation. Configuration B shows what happens when you import WordStar from an external mi-

In graphics mode the 16-line display is capable of 128- by 480-pixel resolution. The contrast of LCD displays in general, however, is poor under typical lighting conditions. The murky display is the HP 110's most serious drawback. The HP 110 has an excellent character-font design, which makes the screen a little more readable, but unless you have arranged your lighting perfectly, you will find yourself squinting. At this time Hewlett-Packard offers no option to connect the computer to a video display.

Sixteen Hours of Computing

Powering The Portable is an intelligent rechargeable battery system. A full charge of its three internal batteries powers 16 continuous hours of computing. According to Hewlett-Packard you can leave the computer off for a full year, and all data stored in its low-power CMOS (complementary metal-oxide semiconductor) memory will be retained.



crofloppy disk drive—the disk can quickly fill up. Configuration C assigns more memory to the work space for working with large 1-2-3 spreadsheets.

If the batteries reach too low a level before you can recharge them, the computer automatically shuts down, preventing them from being completely drained and thus guarding against data loss. A 12-hour charge brings the batteries up to at least 95 percent of their full charge.

The rear panel of the HP 110 contains five small connectors: a telephone jack for the 300-bps internal modem, a 9-pin serial port, the battery charger outlet, and two connectors for the thin cables that link The Portable to its peripherals and to an IBM PC or a Hewlett-Packard HP 150 desktop computer. These last connectors are part of HP's proprietary method of linking peripherals, called the HP Interface Loop, or HP-IL for short. The ability to connect external disk drives, a printer, and a second computer through these wires (they're too thin to be called cables) is amazing to anyone who has wrestled with 25- and 36-pin connectors at the ends of fat, belligerent, snakelike interface cables.

Inside the Portable

Running the show inside the HP 110 is a low-power CMOS version of the Intel 8086 microprocessor. Because it communicates with peripherals in 16-bit chunks, this chip is considered more powerful than the PC's 8088, which processes data in 16-bit chunks within the chip but communicates in 8-bit chunks.

The MS-DOS 2.11 operating system and four major application programs are stored permanently in 384K of CMOS ROM. That section of memory is regarded by the operating system as the equivalent of a disk drive (drive B:). A total of 272K of CMOS memory is assigned to RAM, where you store your data and other programs not contained in ROM. This 272K is divided into two distinct parts: actual working memory and an electronic equivalent of a disk drive (drive A:). The RAM memory-to-disk ratio can be altered on the System Configuration menu.

The computer's active memory is used for holding current documents while the built-in application programs are running. Each time you finish working with a document, it must be stored as a disk file on the electronic disk. Your needs for memory or disk space will change according to the size of the programs you're using and whether those programs are imported from outside or resident in ROM. If you use only the programs in ROM, you can devote the lion's share of RAM to disk space. If you load an external program, you will have to devote more RAM to active memory (see Figure 1).

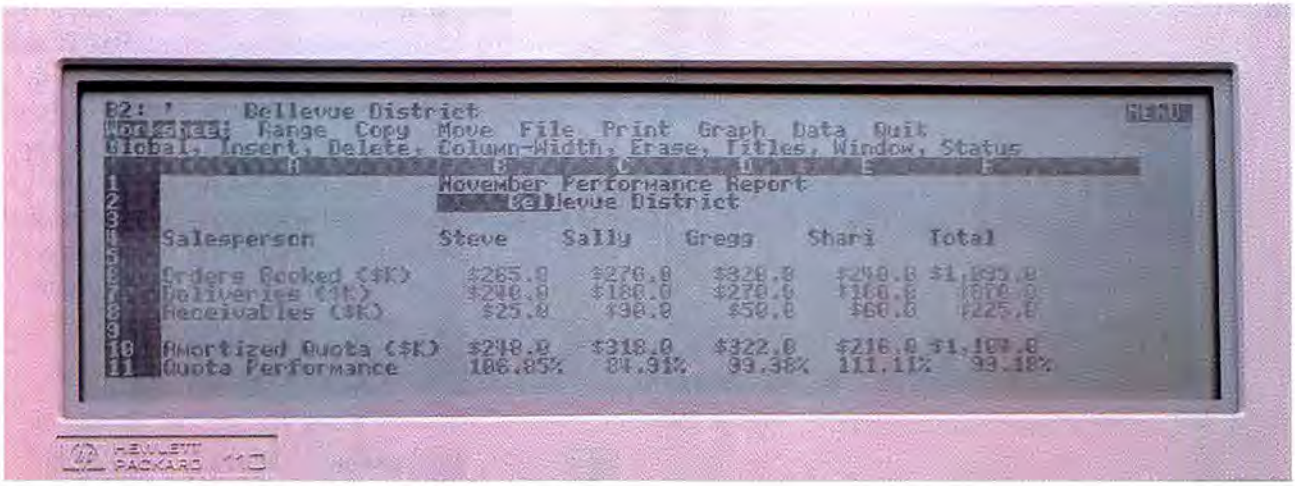


Figure 2: The HP 110 has Lotus Development Corporation's 1-2-3 built into ROM, along with a proprietary word processor and a communications program.

Built-In Software

The main attraction in the HP 110's circus of built-in software is Lotus Development Corporation's popular spreadsheet program *1-2-3*, which is identical to the PC version. The smaller display allows you to see only 8 columns by 11 rows at a time, but unlike the standard PC system, the HP 110 provides instant access to graphic representations of data (see Figure 2).

Depending on the size of a worksheet, *1-2-3* sometimes requires an upward adjustment in the amount of total memory partitioned for RAM. By housing the program in ROM and keeping worksheets stored on an electronic disk, the HP 110 version of *1-2-3* loads those elements much faster than the disk-based PC version.

Two cautions are worth noting. Because the Print Graph portion of *1-2-3* is available only on a 3½-inch disk, you need the companion disk drive to print graphs. Also, the HP 110 has no numeric keypad, making numeric entry more tedious.

The second major program contained in ROM is a simple text editor called Memomaker. Hewlett-Packard apparently believes that executives who use *1-2-3* don't write long, heavily formatted documents. Memomaker lacks basic word processing features like automatic text reformatting, paragraph indentation, on-screen pagination, and search and replace. The awkward straight-line cursor-key layout and the scarcity of cursor-motion controls make maneuvering the cursor a bit difficult. However, the program is adequate for writing simple memos or typing long rough drafts that you can send to a PC for editing and format refinements.

The third built-in program is the Terminal program, which turns the HP 110 into an intelligent telecommunications terminal. You can use it with either the 300-bps internal modem that comes with the HP 110 or with an external modem connected to the serial port. The software supports Ward Christensen's Xmodem error-checking file transfer protocol (called Modem7 in this program). Even when the HP 110 is turned off, Terminal can automatically answer a call and download a file. You can also program Terminal to send a file to a remote computer when you are not present.

Transferring files through the Terminal program takes a little getting used to. You have to fill out an on-screen configuration menu for each file you download or upload. When you go to this menu, you lose any prompts from a host computer that were on the screen. Furthermore, the HP 110 offers no audible verification of dialing, ringing, and connecting. You have to rely on messages displayed on the screen. Unfortunately, the otherwise excellent HP 110 user manual leaves many questions about the Terminal program unanswered and glosses over many of its important aspects.

Figure 3: The HP 110's P.A.M. is the main menu and a link to DOS. P.A.M. also displays the time, date, and current battery level.

The last built-in program is called the Personal Applications Manager, or P.A.M. It acts as a user-friendly link between the user and the HP's built-in disk operating system (MS-DOS, version 2.11). P.A.M. appears whenever you turn on the HP 110, providing you with the current date and time, the battery power remaining, and a menu of applications available on all internal or external disks (see Figure 3).

While the P.A.M. menu is displayed, you can type a DOS command directly or use P.A.M.'s File Manager. The File Manager leads you through DOS commands for operations such as copying, renaming, making subdirectories, formatting external disks, changing the default disk drive, and erasing files. You can also write batch files in P.A.M. and change the P.A.M. menu to reflect other programs you have imported from outside.

If you add the optional external disk drive peripheral, you will be able to use other popular software with The Portable. Hewlett-Packard has released a *Who's Who* of software titles, including *Multiplan, WordStar, Microsoft Word, dBASE II,* and several Microsoft programming languages.

The problem with external software is that unless you stay at home, safely tied to your disk drive, the software takes up too much RAM. If you load *WordStar* into The Portable to take along on a trip, the program occupies about 92K of the maximum 176K of disk space, leaving only about 84K for all your word processing documents, *1-2-3* worksheets, and downloaded communications files. Suddenly The Portable's 272K of RAM is bursting at the seams.

HP Peripherals and the HP-IL

Hewlett-Packard's double-sided 3½-inch disk drive is battery operated and rechargeable. It uses the same Sony microfloppy system as the Apple Macintosh uses, except that it stores data on both sides of the disk. Formatted storage on a single microdisk is a hefty 710K (compared to the PC's 360K double-sided 5¼-inch drives).

Hewlett-Packard's ink jet printer, called the ThinkJet, is also battery powered. It produces fairly clear images with a minimum of noise at a fast 150 characters per second. The best printing results are obtained with HP's continuous-form paper for ink jet printers. When printed on standard computer paper, the images are light and the letters ill formed. The ThinkJet is capable of four print pitches, boldface, underlining, and dot-addressable graphics. None of the fonts could be considered letter quality, but many of them, including the standard pitch used with Memomaker, are more readable than those available with similarly priced dot matrix printers.

Both peripherals connect to the HP 110 through HP-IL, a unique method of daisy chaining peripherals so they make a complete loop. To link all three units, for example, you run one lightweight wire from the

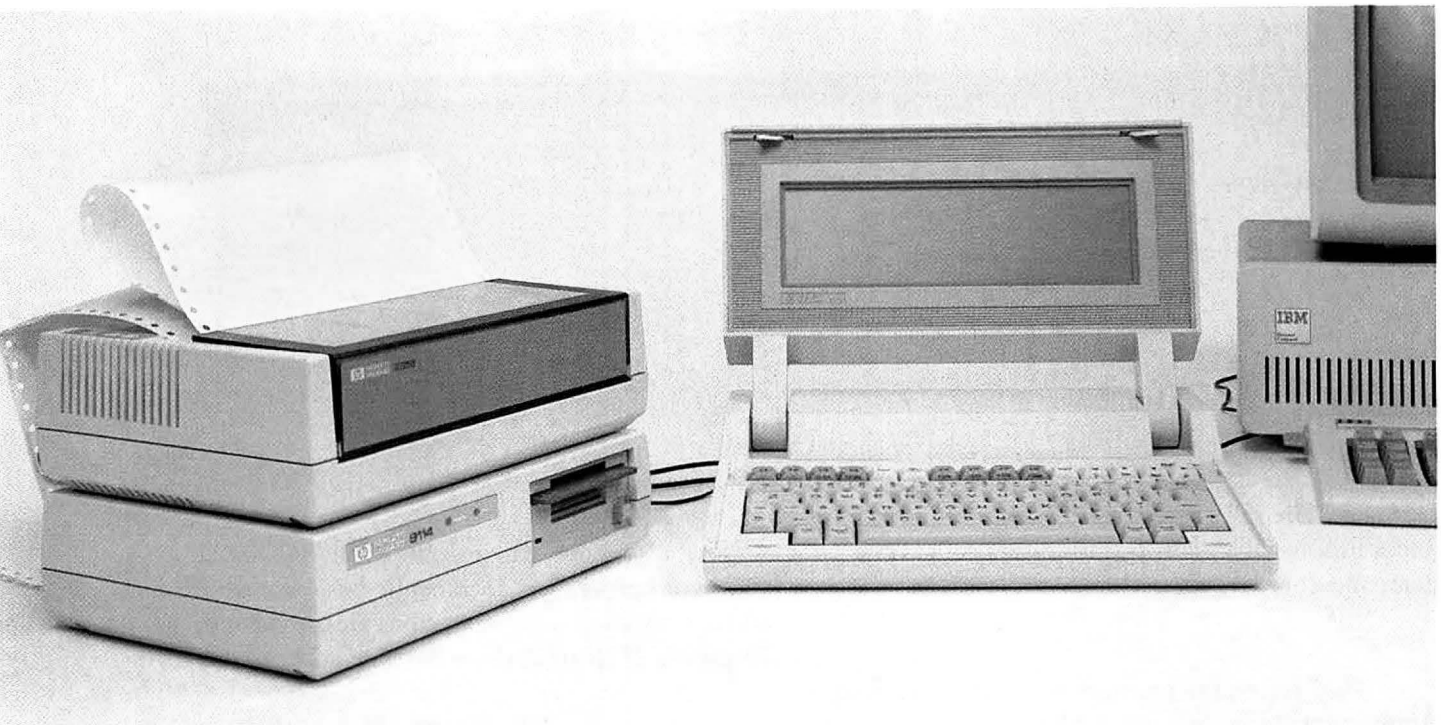


Figure 4: The HP-110's peripherals include the ThinkJet ink jet printer, the 9114A DiskDrive, which can store up to 710K on 3½-inch disks, and cables and interface boards for exchanging data with a PC or an HP 150.

HP 110 to the disk drive, one from the disk drive to the printer, and one from the printer back to the HP 110. To retrieve information from a disk, the computer sends the appropriate signals through the loop. When the signal encounters the disk drive, it starts to read the data from the disk. The data then continues on its way through the loop back to the computer. The pieces of an HP-IL system (including the PC or the HP 150) can be placed in the loop in any order (see Figure 4).

Linking With a PC

A special interface board (different models exist for the PC and the HP 150) provides the proper connectors for the HP-IL cables (the Portable-Desktop Link). I tested the PC version, which comes with a disk that configures the PC to acknowledge the HP-IL signals. Instructions for installing the board are included on the disk.

With the interface board plugged into the PC and the HP-IL loop, the HP 110 accessed each of the disk drives in the PC as if it were its own. With electronic drives A: and B: already inside The Portable, I set up the external HP 3½-inch disk drive as drive C: and the two drives on the PC as D: and E:. I could read a *1-2-3* worksheet from a disk in drive E:, work on it, and save it on the HP's electronic disk. The IBM software for the board also lets the HP 110 use whatever printer is connected to the PC, enabling you to produce letter quality output with Memomaker.

Putting the PC in the controller seat, you can store and retrieve data on HP disks—including the built-in electronic disk. The only difference is that with that arrangement, the order of the disk drive designations shifts down the loop: the PC's internal drives become A: and B:, the HP's internal drives become C: and D:, and the external disk drive becomes drive E:. You can also direct output from the PC to the ThinkJet printer.

PC Compatibility

The HP 110, largely due to its unique display format, is really not a PC-compatible computer. You cannot use the HP-IL linkup to import programs from a PC to the HP 110, for example. But the HP 110 is definitely data compatible with the IBM PC

family. The ability not only to exchange data but to read data disks should be welcomed by executives who use a desktop computer at the office and want to take full computing power home or on the road without carrying a 40-pound computer.

The HP 110 is the ideal portable for those whose work revolves around *1-2-3;* there is ample memory and electronic disk space to hold a reasonable amount of work when on the go. Having a modem built into the portable is a plus. Of course everyone would like to see a disk drive built in and perhaps 512K available RAM, allowing for a 360K electronic disk, but the HP 110 as it currently stands is a powerful, sensible entry into the high-performance briefcase computer category–perhaps the one that will finally send this category on a skyrocket.

Danny Goodman, Contributing Editor to PC World *and* MacWorld, *is the author of* How To Buy an IBM PC *(PC World Books/Simon & Schuster Electronic Publishing),* The Simon & Schuster Guide to the TRS-80 Model 100, *and several other microcomputer books.*

HP 110
Hewlett-Packard
Personal Computer Group
11000 Wolfe Rd.
Cupertino, CA 95014
800/367-4772
List price: HP 110 $2995; 9114A DiskDrive $795; ThinkJet Printer $495; Portable-Desktop Link (IBM PC) $125, (HP 150) $150

KEY-PATCH™ - A full travel mini-keyboard. Plug it in. It automatically locks your IBM keyboard into NUM-LOCK and places all control function keys conveniently at your fingertips without pressing NUM-LOCK.
KEY-PATCH™ plugs into your keyboard in minutes; requires no software. A must for spread-sheets; word processing; etc.

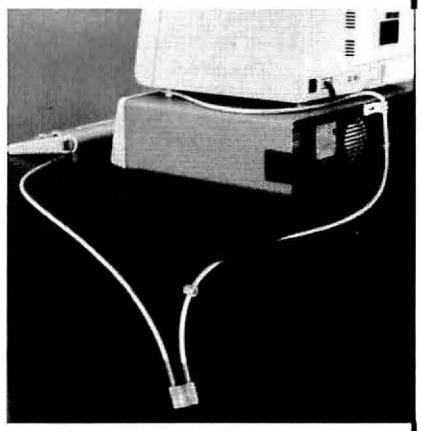
For Immediate Shipment
Genest Technologies, Inc.
1331 E. Edinger Ave.
Santa Ana, Calif. 92705
(714) 547-0880

ONLY $79.95
(Cal. Res Add 6% Sales Tax)
Visa; Master Card; Check; Money Order
™ Patent Pending

Circle 78 on reader service card

Prevent Computer Theft!

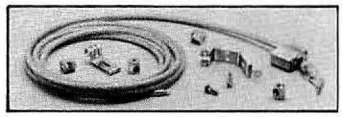
Heavy duty 10' steel cable secures computer, other equipment, up to 6 units



Käblit Systems

Unique Käblit fasteners attach to equipment without drilling, using existing screws. Cable passes through fasteners preventing removal. Cable is then locked. When ordering multiples, specify locks keyed differently or alike. Installs in 10 min. Over 80 college installations.

Käblit works with: •Computers •Printers •Disk Drives •Typewriters •Stereos •Monitors •Lab Equip. •Televisions •Other



$54.95 postage paid. Quantity pricing also avail. for schools, institutions, businesses, etc. Send P.O. Money back if returned in 30 days.

EXCLUSIVE! Proprietary components prevent removal of mounting screws. (Pat. Pend.)

SECURE-IT Inc. 10 Center Square • E. Longmeadow, MA 01028
Phone orders 413-525-7039 **Dealer Inquiries Invited**
See us at COMDEX Fall '84, Booth M1236 and DPMA Anaheim '84, #1217.

Circle 886 on reader service card

Teleservice Telesupport

Micro Flash is Reliable

- In our 4th year of business *(One of the Originals!)*
- Positive buying power within the industry meaning well-stocked inventories and a consistent supply
- A reputation as specialists in the business and corporate marketplaces
- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
  We won't tell you to call the publisher or manufacturer for after-sale support.
  We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it—we'll replace it!

Micro Flash Terms

- MasterCard or VISA—with no credit card surcharge added
- Mail Orders accompanied by certified or cashier's checks
- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- $100.00 minimum order
- Products and prices subject to change without notice
- Corporate Discounts

Micro Flash Shipping

- $6.00 for UPS surface (except for printers and monitors)
- Add $3.00 per item for UPS 2nd Day Air
- All shipments fully insured at no extra charge
- Call for information on foreign orders, US Mail, CODs
- Overnight delivery service available

PRODUCTS FOR IBM PC & COMPATIBLES

HARDWARE & PERIPHERALS	RETAIL PRICE	MICRO FLASH
Alloy PC + Hard Disk/Tape BU	$4295.00	$3600.00
AST Research SixPakPlus 64K	395.00	269.00
AST MonoGraph Plus (Lotus Compatible)	595.00	495.00
64K Ram Chip Sets	100.00	55.00
CDC 9409 DS/DD Disk Drive	525.00	195.00
Davong 10 MB External	2395.00	1795.00
Hauppauge Intel 8087 Chip	175.00	157.00
Hayes Smartmodem 1200	699.00	489.00
Hercules Graphics Card	499.00	369.00
Microsoft® Serial Mouse	195.00	139.00
Plantronics Color Plus (Symphony Compatible)	560.00	389.00
Printers—Epson, Oki, Diablo, NEC, Toshiba, Brother, Others		$CALL$
Princeton Graphics		
Max-12 Amber Monitor	249.00	189.00
HX-12 Hi-res RGB Monitor	695.00	524.00
SR-12 Super Hi-res RGB Monitor w/Scan Doubler	1048.00	843.00
PTI Datashield Power Supply	359.00	329.00
Diskettes—3M, Dysan, Others		$CALL$
SOFTWARE		
Ashton-Tate dBase III	$ 695.00	$ 449.00
FRAMEWORK	695.00	489.00
BPI Systems Accounting* ea.	595.00	398.00
CYMA Shoebox Acctg Pkg	395.00	315.00
Human Edge Sales Edge	250.00	198.00
Microrim Inc. R:base 4000	495.00	315.00
Microsoft® Multiplan™*	195.00	139.00
Multi Tool™ Word	375.00	249.00
Multi-Tool™ Word with Mouse	475.00	298.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	276.00
Business Basic Compiler	600.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	518.00
Sort Facility*	195.00	148.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstuf Crosstalk XVI	195.00	119.00
MultiMate Word Processor	495.00	279.00
Peter Norton Utilities	80.00	55.00
RoseSoft ProKey	129.95	95.00

*Also available in Apple IIc Format

PRODUCTS FOR APPLE MACINTOSH

Davong MacDisk 10 MB	$ 2295.00	$ 1700.00
Haba Systems Habadex	200.00	159.00
Memorex 3½" Diskettes	69.95	49.00
Microsoft® Multiplan™	195.00	148.00
Basic Interpreter	150.00	122.00
Chart™	125.00	99.00
Multi Tool™ Word	195.00	148.00
Odesta Helix	395.00	299.00
PFS File & Report	195.00	149.00

Many other products available at comparable discounts! Quantity pricing available

For product information, price quotes, technical support please call

415/680-1157

inside California

800/457-2433

To order from outside California, call

800/458-2433

Telex # 353199 MFLASH UD

MICRO Flash™

COMPUTER SYSTEMS, INC.

1110 Burnett Avenue, Suites J & K
Concord, CA 94520
Member: Better Business Bureau, Chamber of Co
Listed: Dun & Bradstreet

Circle 108 on reader service card

CAPABILITY

Integrated software for decision support and data processing.

You asked for it, and we've got IT.

The IT series: integrated software that starts with KeepIT, for data base management, and interfaces to other PC-based software and the IT series programs.

The IT series advances the state of the art–to turn your desktop computer into a complete information center. From AskIT, an intelligent interface to KeepIT. To SwapIT, for memory partitioning and instant windowing.

For what you need, try IT. You'll like IT.

KeepIT	StatIT	EditIT
CalcIT	LinkIT	SortIT
ShowIT	PassIT	AskIT
WritIT	MailIT	SwapIT

For IBM, IBM-compatible, and MS-DOS microcomputers.

Circle 81 on reader service card

ITSoftware . . .
ask for IT by name.

For more information, call toll-free (800) 222-0592. In New Jersey, call (609) 799-7500. Or write to us at ITSoftware, P.O. Box 2392, Princeton, New Jersey 08540.

We'll send you our free brochure.

NAME .....

COMPANY .....

TITLE .....

ADDRESS .....

CITY STATE ZIP .....

PHONE .....

PCW1

MARTIN MARIETTA

Martin Marietta Data Systems

WHEN YOU'RE #1 YOU HAVE TO

WORK EVEN HARDER TO STAY THERE

DIAMOND DELIVERS!

FREE SUBSCRIPTION TO "THE SOURCE"
See details below

This Month's Packaged Specials

Wordstar Pro Pack/ Lotus 123	$559	Multimate/Symphony	$709
Wordstar Pro Pack/ Lotus 123/dBase III	$959	AST 6 Pack 384K/ Symphony	$959
Hayes 1200/Crosstalk	$589	Wordstar Pro Pack Plus w/ Telmerge/Mailing List	$369
Wordstar/Mailmerge/ Correctstar/Star Index	$269	Easywriter II/Speller II/ Mailer II	$195

dBase III $call
Volkswriter Dlx $175
Framework $call

Wordstar $199
Lotus 123 $ call
Multimate $289

R:Base 4000 $279
Multiplan $129
Symphony $ call

		LIST	SALE
Alpha Software*	APPLE-IBM CONNECTION	$250	$139
	DATA BASE MANAGER II	$295	$call
	ELECTRIC DESK	$345	$219
Ashton Tate*	dBASE II	$495	$289
	FRIDAY	$295	$159
Condor*	CONDOR 3	$650	$319
Microstuf*	CROSSTALK XVI	$195	$105
Digital Research*	PASCAL MT + 86	$400	$249
	CONCURRENT PC DOS	$350	$call
	CONCURRENT CP/M 86	$350	$229
	C BASIC 86	$200	$135
	PERSONAL BASIC	$150	$109
	CP/M 86	$150	$ 39
	ACCESS MGR	$ 60	$249
	DISPLAY MGR	$400	$329
	DR LOGO	$500	$ 69
	PC DOS LANGUAGES	$ 95	$call
Dow Jones*	MARKET ANALYZER	$350	$239
	MARKET MANAGER	$300	$209
Financier*	FINANCIER II	$195	$119
	TAX SERIES	$150	$109
Fox & Geller*	QUICKCODE	$295	$179
	dGRAPH	$295	$179
	dUTL	$ 99	$ 59
GMS Systems*	POWERBASE	$395	$call
Harvard Software*	HARVARD PROJECT MANAGER	$395	$259
Information Unlimited*	EASYSPELLER II	$100	$ 59
	EASYMAILER	$100	$ 59
	GENERAL LEDGER	$595	$call
	ACCOUNTS PAYABLE	$595	$call
	ACCOUNTS RECEIVABLE	$595	$call
	INVENTORY CONTROL	$595	$call
	PAYROLL	$745	$call
Lifeboat*	LATTICE C COMPILER	$595	$309
	PANEL	$350	$219
	HALO	$200	$125
Micro Data Base*	KNOWLEDGEMAN	$500	$289
Micropro*	MAILMERGE	$250	$129
	CORRECTSTAR	$195	$ 99
	PLANSTAR	$695	$309
	STARBURST	$195	$ 99
	SUPERSORT II	$200	$ 99
	INFOSTAR/STARBURST	$595	$299
	TELMERGE	$145	$ 89
	CHARTSTAR	$395	$209
	PRO OPTION PACK	$345	$179
Microsoft*	MOUSE	$195	$139
	WORD/MAILMERGE	$375	$249
	WORD W/MOUSE	$475	$309
	MULTITOOL FINANCIAL	$100	$ 69
	MULTITOOL BUDGET	$150	$ 99
	PASCAL COMPILER	$300	$209
	FORTRAN	$350	$239
	C COMPILER	$500	$339
	CHART	$250	$169
	PROJECT	$250	$169
Monogram*	DOLLARS & SENSE	$165	$109
Professional Software*	WORD PLUS W/BOSS	$495	$299
Microrim*	CLOUT	$195	$129
	EXTENDED REPORT WRITER	$150	$ 95
Rosesoft*	PROKEY	$129	$ 89
Software Publishing*	PFS REPORT	$125	$ 79
	PFS FILE	$140	$ 89
	PFS GRAPH	$140	$ 89
	PFS WRITE	$140	$ 89
Sorcim*	SUPERCALC 3	$395	$219
	SUPERWRITER	$295	$159
Warner Software*	WARNER DESK ORGANIZER	$195	$169
AST Research*	6 PAK PLUS-64K	$395	$269
	ALL OTHER AST PRODUCTS		$call
Hayes*	SMARTMODEM 1200	$699	$489
	SMARTMODEM 1200B	$599	$419
Quadram*	QUADLINK	$680	$479
	QUADCOLOR I	$295	$209
	QUADCOLOR II	$569	$409
	64K EXPANDABLE BOARD	$395	$269
	QUADBOARD EXP. TO 384K	$395	$259
Hercules*	GRAPHICS CARD	$499	$349
	COLOR CARD	$245	$175
	MEMORY CHIPS (64K)		$ 52

THE SOURCE IS FREE

This on-line information service gives you access to electronic communications, stock reports, business information, news, travel and consumer services. Your subscription worth $49.95 is free from Diamond with every order over $500. Call today as quantities are limited.

TO ORDER CALL TOLL-FREE 1-800-227-0545
Software Specialists For The IBM PC

Diamond Software Supply
484 Lake Park Ave., Suite 123, Oakland, CA 94610

For price quotes, information, or in California call 1-415-893-7676. We credit your order for the call. **Technical Department** (415) 893-7678. International Telex 338139 (attn: 149)

IBM is a trademark of International Business Machines. CPM is a trademark of Digital Research. Apple is a trademark of Apple Computer Inc.

Circle 58 on reader service card

ON APRIL 17, TEN EYEWITNESSES SAW THIS SAMNA DISKETTE MURDER A WANG.

SAMNA Office Automation Software for PC's* outperforms dedicated word processors.

We asked a group of Office Automation professionals to compare SAMNA Office Automation software to the dedicated word processors they've used the most.

The results were shocking. All 10 of the Office Automation people surveyed were convinced that SAMNA far surpassed their stand-alones in terms of pure power, functionality, and user interface. In fact, they felt SAMNA flat out murdered them.

SAMNA offers high-powered features like screen-to-page fidelity, with on-screen display of special formats. Split screen editing. Automatic pagination and footnoting. Automatic search and replacement. Glossary of standard paragraphs. Easy addition, deletion, and movement of text. Electronic fold that lets you "fold" a wide page to compare left and right margins side by side. Zoom that shrinks a whole page until it's entirely displayed on screen. Three levels of Help that guide you through whatever command you're working on. And much, much more.

When the comparison was over, all 10 participants said SAMNA outclassed any word processor they'd ever used. And word processing was only the beginning.

Seamless Integration™ means SAMNA can work with text, math, line drawings, and more...without a break.

SAMNA lets you work with text, then switch to integrated five-function math, free-form line drawing, list management, or spelling checker as you need them. Without a break or interruption. Without going back to a window or changing screens. It gives you an uninterrupted flow of work that's faster, more natural, more productive.

SAMNA also accepts ASCII files directly from other software. So you can use it with Lotus 1-2-3,® dBase II,® even WordStar.®

The better you get, the faster SAMNA gets.

As you become more proficient in using SAMNA, you can go directly from one function to another without going back to a lengthy pull-down menu to select your next keystroke. It's as if SAMNA were thinking along with you, staying one step ahead of what you need to help you work faster.

Introducing SAMNA + : All of this, plus spreadsheet and Word Base Manager.™

Start with the power and productivity of SAMNA's word processing. And the Seamless Integration™ of additional functions for other business applications. Then include a state-of-the-art spreadsheet *and* SAMNA's exclusive Word Base Manager™ and you've got SAMNA + . Complete office automation in one package.

The integrated spreadsheet is interactive, allowing you to change a number in the spreadsheet and have the resulting change automatically made to a number in the accompanying text.

Word Base Manager™ can search through an entire disk in seconds to find every reference to a particular phrase, name, or date. So you no longer have to know the location of data to retrieve it when you need it. Word Base Manager™ also accepts any text format and doesn't require key word definition to create files.

Send $9.95 for a SAMNA software sampler and see the powerful word processing features. Or call 1-800-241-2065 (8AM-8PM EST, Mon.-Fri.) to arrange for a demonstration by the dealer nearest you.

Name _____

Title _____

Business Address _____

City _____ State _____ Zip _____

SAMNA

More powerful. More productive.

SAMNA Corporation, 2700 N.E. Expressway, Atlanta, GA 30345.

*SAMNA is available for IBM PC, XT, IBM-compatible, TI Professional, and DEC Rainbow microcomputers.

The following names are trademarks of the following companies: DEC and Rainbow, of Digital Equipment Corporation; IBM, of International Business Machines Corporation; WordStar, of MicroPro International Corporation; 1-2-3 and Lotus, of Lotus Development Corporation; dBase II, of Ashton-Tate Corporation; TI Professional, of Texas Instruments, Inc.; Wang, of Wang Laboratories

Two Easy Steps to The Most Effective Presentations of Your Career.

1.

Create slide-like graphics on your IBM PC in minutes with PictureIt™ software.

If you can type your name, you can create powerful graphics yourself, in minutes on your personal computer—graphics that cost less than slides but have more impact. PictureIt gives you a whole variety of bar, line, pie and word chart formats that can be combined and modified to provide an unlimited selection. You can change all aspects of a picture—the background, typefaces, colors and shading—or leave them unchanged to save time. When your pictures are complete, you save them on a presentation diskette.

Then leave your computer behind. Just take your presentation diskette to your meeting, place it in VideoShow 150 and you're ready to give a brilliant, professional presentation. Your audience will be dazzled by the slide-like image quality that can't be found on any computer screen.

2.

Make your VideoShow™ presentation anywhere on any color video display.

VideoShow 150 takes your presentation on the road...or down the hall. VideoShow's new MacroVision™ technology gives you unparalleled image quality, 1000 colors in any picture and a million ways to look good.

You reveal your pictures in stages, highlight lines of text, move a pointer on the screen and randomly display any picture using VideoShow's wireless remote.

Since VideoShow model 150 costs about the same as a single slide show,* it pays for itself after just one use.

Say goodbye to expensive slides and dull overheads. Say hello to VideoShow. For more information and the name of the dealer nearest you, call **(800) 443-0100 Ext. 238D.** 24 Hours. 7 Days.

*Suggested retail price of VideoShow is $3499; PictureIt is $595.

VideoShow™
with MacroVision
General Parametrics Corporation, Berkeley, CA.

Circle 877 on reader service card

dBASE III

dBASE III is more than just an update to dBASE II. Ashton-Tate has rewritten and refined this data management best-seller to make it easier for the novice and more powerful for the serious programmer.

David Jenkins

One of the greatest enigmas in the history of software was the enormous success of Ashton-Tate's data base management system (DBMS) *dBASE II*. The program was difficult to learn and plagued with bugs, and it often required the services of a *dBASE II* programmer to set up tailored applications. Yet for years *dBASE II* far outclassed the competition in power and flexibility, and when other data management programs finally appeared that combined power with user-friendliness, many users stayed with the old reliable.

Now, with the introduction of *dBASE III*, you can enjoy all the depth and programmability of *dBASE II* along with the ease of use of the new breed of data management software. The program structure is similar to that of its predecessor, but inconsistencies and bugs have been removed, and the Sort algorithms have been improved so the program performs faster.

For people who already own *dBASE II*, the best part of the new product is the price. Although the program costs $695 off the shelf, for $200 *dBASE II* owners can purchase a dBASE Upgrade Kit—a fancy name for a box in which you return your old *dBASE II* documentation and master disk to Ashton-Tate. The company will send you a complete *dBASE III* package in exchange. Ashton-Tate is not sure whether it will extend the upgrade offer into 1985.

The most significant enhancement of *dBASE III* is the Assistant, a user interface for novices. This extra level of help explains commands and asks questions in plain English. Since the actions required are mainly pointing and selecting, the user needs little knowledge of *dBASE*. Two other important features for the novice are the easily separated mailing labels and considerable on-line assistance in report writing. Retrieving information from a data base has also been simplified.

For the experienced *dBASE* user, many of the constraints of *dBASE II* have been removed. Ten data files can now be open simultaneously, in place of *dBASE II*'s infamous two files. Each data base can have 128 fields, and the Pascal-like capabilities of the memory variables give the user greater control over program structure.

Ashton-Tate has added a host of other major and minor refinements to the operations of *dBASE II*. For example, Find and Locate now operate in the same logical

way. Two new variable types, date and memo, are available, and many new functions have been added, such as average, square root, and logarithm.

dBASE III's text editor is considerably more powerful than that of *dBASE II*, and information retrieval is better. Create Report displays the column headings as they will appear on the report. The List and Display commands use field names as headings on the output. As an example of *dBASE III*'s improved details, the record number now prints out without leading zeros (123 instead of 000123). (See Table 1 for a comparison of *dBASE III* and *dBASE II* features.)

Finally—A Readable Manual

dBASE III comes with three copy-protected disks, a manual, a quick-reference manual, and a short booklet, *dBASE BRIDGE*, written by Adam Green that explains how to convert data and program files from *dBASE II* to *dBASE III*. The first disk is a system disk; the second is a backup of the first; and the third contains two utilities: dconvert.com, which helps convert *dBASE II* files to *dBASE III* files, and dformat.com, the text editor and screen generator. The third disk also contains programs and data for a sample *dBASE III* application.

Unlike the notoriously bad *dBASE II* documentation, the *dBASE III* manual is typeset and readable. The first section is a tutorial that introduces a user to the basic applications of *dBASE III*. It is followed by two reference sections, one on commands and one on functions. The rest of the manual is devoted to appendices, a glossary of terms, and an extensive index. Numerous examples of *dBASE III* instructions appear throughout the manual.

The dBASE Assistant

The user operates most DBMS and file management programs by choosing commands from simple menus. Each step of the task is presented in order, along with simple English prompts. In contrast, *dBASE II* operates much like a computer language. In order to use the program effectively you must first learn the dBASE syntax. For example, to generate a list of the names, addresses, and ages of the people on file who live in California and are over age 20 you must type:

```
Display name,address,age for
state = "ca" .and. age>20
```

dBASE III's Assistant is designed for the user who is not yet familiar with *dBASE* or who does not wish to spend the time needed to learn the commands. The Assistant is an interactive, "hand-holding" device that asks simple questions and displays the available choices to help novices use *dBASE*. *dBASE* commands are created one step at a time as the Assistant translates each intended action into the proper syntax. The actual completed command is shown on the lower part of the screen. The Assistant can be easily turned off and on.

To activate the Assistant, type **assist** at the prompt. After an initial screen appears explaining the cursor controls, you arrive at the main menu, which displays a list of six selections on the top line: Set Up, Modify, Position, Retrieve, Organize, and Utilities (see Figure 1). Press <Enter> to move to the next selection and <Esc> to make a choice. If you hesitate before making a choice, the Assistant assumes you need more help and displays descriptions of the possible choices.

The Set Up option covers such tasks as creating data bases and defining reports and labels. Modify comprises the data entry sections of *dBASE III*, such as Append, Browse, and Edit. Position lets you move around the data base by using the Go To, Find, and Locate commands. Retrieve calls up information.

If you choose Retrieve and then Display, you are in effect issuing a *dBASE* Display command. For instance, on one screen you decide whether to Display only the current record, the NEXT *n* records, all records from the data base, or one specified record. Another

The Assistant is an interactive, "hand-holding" device that asks simple questions and displays the available choices to help novices use dBASE.

Table 1: Comparison of dBASE III and dBASE II

	dBASE III	dBASE II
Type of computer processor	16 bit (8086)	8 bit (8080, Z80) and 16 bit (8086)
Maximum number of records	1 billion	64K
Fields per record	128	32
Maximum data files open	10	2
Maximum index files open (per data file)	7	7
Maximum record size	4000 bytes	1000 bytes
Numeric accuracy	15-16 digits	10 significant figures
Memory variables	256	64
Maximum memory for all memory variables	6000	1000
Data entry verification	Yes	No
Data types	Numeric	Numeric
	Character	Character
	Logical	Logical
	Date	
	Memo	
Ability to correct a command	No	Yes
Copy protection	Yes	No
Minimum disk space required for dBASE programs	261K	70K
RAM required	256K	128K
Language written in	C	Assembler
Help facilities	Ashton-Tate Hotline	Ashton-Tate Hotline
	Improved on-line help	On-line help
	Excellent manual with tutorial	Much criticized manual
	On-line Assistant provides "hand-holding" for novices	Disk tutorial

screen shows all fields from the data base in use, and you select the fields to display by moving the cursor and pressing <Enter> at the appropriate places. In place of the FOR clause, you select a field from the data base, then choose from the logical operators and enter their condition. You might choose the state field, then the = operator, and then type **CA** to produce FOR state = "CA" in the Display command.

The Assistant suffers from some limitations. Certain error messages are not as clear as one would like. For instance, I tried to create a report in the Retrieve section, even though I knew the report had to be created in the Set Up section. The error message I received was, 'There are no files of the type you requested on this drive'. It would be difficult for a novice to know that this meant, 'You can't run your report because you haven't been to Set Up and created it yet'.

Nonetheless, the idea and the implementation of the Assistant are great assets. Novices undoubtedly will be more quickly productive than with *dBASE II*. The Assistant will also enable professional programmers to leave some complex tasks to be programmed by novice users. In *dBASE II* users were simply left to their own resources, with a manual of dubious value. Indeed, it is remarkable that so many people survived to become *dBASE* aficionados.

Converting From dBASE II

To use *dBASE II* programs and data, you must convert them into *dBASE III* formats, even though *dBASE III* uses the same file types. The dconvert.com utility handles most conversions simply and easily.

Data files (.DBF) convert in one step. The user need only know the name of the file. Index files (.NDX) require an extra step: dconvert.com examines the *dBASE II* index file, finds the key expression, and generates a command file that produces the same index in *dBASE III*.

Converting program files can be more complicated. For example, End of File is written EOF() instead of EOF, and Erase is translated into Clear. The record num-

NEW THESYS MEMORY SYSTEM

SLASHES TIME TO RUN APPLICATIONS PROGRAMS

Be More Productive Now for just $59.95

High performance TMS™ 3.0 software is easily installed, operates automatically, requires no user inputs. With TMS you'll be more productive – instantly.

- Works with IBM, AT&T and compatible PCs.
- Reduces disk access time.
- Cuts hard disk to floppy disk backup time **in half.**
- Uses as little as 8K of system memory.
- Uses the same memory to provide an additional print buffer, frees the computer for other tasks.
- Improves performance for database management, spreadsheets, accounting and word processing.
- Requires no user interaction once installed.

Call today for more information.

THESYS
MEMORY PRODUCTS CORPORATION
7345 East Acoma Drive
Scottsdale, Arizona 85260
(602) 991-7356 • TELEX 751933
Dealer Inquiries Invited

Circle 822 on reader service card

ber is no longer written as # but Recno(). Many other minor discrepancies between *dBASE II* and *dBASE III* appear only when the program is run.

One conversion problem stems from the difference in the way *dBASE III* handles memory variables. Only variables created at the dot-prompt level behave like *dBASE II* variables. Therefore, unlike working with *dBASE II*, it is important to keep track of where the variable was created and to know whether it was created at a higher level (by a program that called the current program) or at a lower level (by a program that is called by the current program).

Variables can now be hidden in three ways. As the default, low-level command files release their variables when control passes back to the high-level command file. Variables that were first created at the low level disappear on their return to the high level, and an error message results. (Incidentally, error messages are greatly improved in *dBASE III*. The vague 'syntax error' has given way to messages like 'variable not found' and 'data type mismatch'.) Variables have two other settings. Public means the variable is available to all parts of the program and must be released by the user. Private means that the variable cannot be accessed by low-level routines.

In the short run, the new memory variables are likely to cause a great deal of confusion. In the long run, however, they greatly enhance *dBASE* as a programming language. Parts of programs can now be written to make variables completely independent of other parts of any other program. Portability and reusability will produce outstanding benefits.

dBASE and DOS

dBASE III's interface with DOS has been refined so that *dBASE III*'s terminology is more like DOS's. Dir replaces List Files Like, and Erase replaces Delete File. Type has been added, and Copy now copies all files, not just data base files. A Set Path command lets the user specify a series of DOS subdirectories to be searched. Run now executes any .COM or .EXE program as long as sufficient RAM is available.

New Variable Types

dBASE III provides two new types of variables: dates and memos. The beauty of the date type is its ability to perform date arithmetic. Adding a date and a number produces a new date. For example, to calculate the date one week from the system date, type:

```
? date()
07/25/84
store date()+7 to nextweek
```

The program will respond '08/01/84'.

To find out how many days there are between two dates, you perform a subtraction:

```
? nextweek-date()
7
```

A variable designated as a date occupies 8 bytes. Accompanying the date type are new date functions: DOW() returns the day of

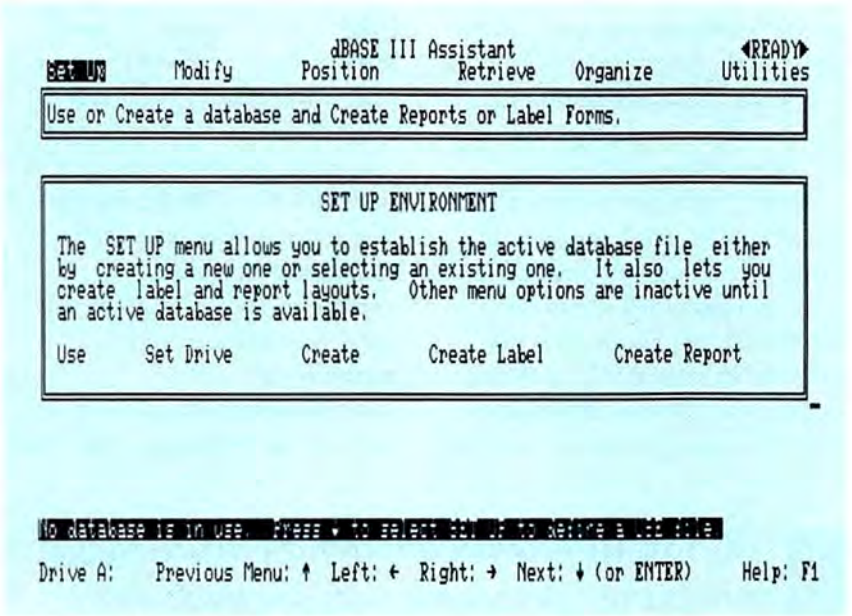


Figure 1: The main menu of dBASE III's Assistant, a user interface for novices. Rather than requiring a knowledge of dBASE commands, the Assistant allows you to program by responding to English prompts.

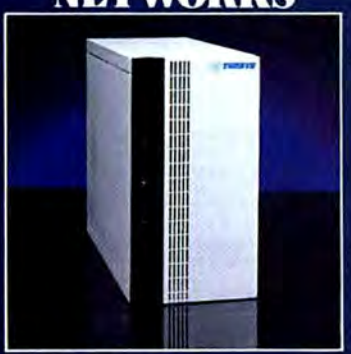
the week as a number from 1 to 7; CDOW() returns the name of the day of the week; Day(), Month(), and Year() return the day of the month, the month, and the year as numbers.

The memo fields in *dBASE III* differ vastly from those found in *dBASE II*. As the name suggests, a memo field allows the user to enter notes and comments that vary for different records. In contrast, the structure of all other *dBASE* variable types–string, number, logical, and date–requires that in every record in the file, you allocate the same amount of space for the field using that variable type.

dBASE III uses 10 bytes for each record of a memo file in the data base file but keeps the actual memos in a .DBT file.

Accessing a memo field is different from entering information into other types of fields. When the memo field is displayed in an Edit or Append screen, only the word 'memo' appears (as if this were a string that contained 'memo'). When the cursor is placed at this field, the user can see the contents of the memo by pressing <Ctrl>-<PgDn>. This clears the screen and brings up the text of the memo, which can be altered as if it were a document being edited with a word processor. <Ctrl>-<PgUp> moves the memo field and returns the previous screen. If you have more than 256K of RAM, you can enter data with an external word pro-

NEW FASTFILE™ MEMORY SYSTEM
GREATLY INCREASES PERFORMANCE OF LOCAL AREA NETWORKS



A Breakthrough In Semiconductor Memory Performance from $1,795

Combine FastFile with a network and reduce disk access time up to 150 times. Used in mass storage applications, it significantly improves productivity.

- Works with IBM, AT&T and compatible PCs.
- Dramatically increases network performance (up to 10 to 40 times that of a Winchester).
- Data transfer rate of one megabyte per second.
- Available memory capacities of 1.5, 3.0, or 5.0 megabytes.
- Patented technology using 256K DRAM chips.
- Priced far below conventional semiconductor mass storage devices.
- Built-in internal uninterruptible power supply.

Call today for more information and say,
THANKS FOR THE MEMORY, THESYS.™

THESYS
MEMORY PRODUCTS CORPORATION
7345 East Acoma Drive
Scottsdale, Arizona 85260
(602) 991-7356 • TELEX 751933
Dealer Inquiries Invited

Circle 822 on reader service card

The best buy you'll ever find!

Nashua™ Diskettes

LIFETIME WARRANTY!

5¼" SSDD
.99¢ ea.
Qty. 50

5¼" DSDD
$1.09 ea.
Qty. 50

(These are poly-bagged diskettes with reinforced hubs, Tyvek sleeves, user identification labels and write-protect tabs.)

SOFT SECTOR ONLY!
Sold in multiples of 50 only.
Prices good while sale quantities last.

INTRODUCTORY SPECIAL!
NASHUA Corporation is a half-billion dollar corporation and a recognized leader in magnetic media. You've used these diskettes before and didn't know it...since Nashua has sold primarily to software duplicators.

SUPER SPECIAL!

Order 50 NASHUA Diskettes on this special offer and you can get an Amaray Media Mate 50 for only $9.99 (shipping included). Normally, a $14.95 retail value, this is one of the best designed disk storage units we've seen. Special slots and ridges for stacking. A great buy.

With 50 NASHUA 5¼" Diskettes **$9.99**

Ordered alone: **$10.95** + $2.00 Shpng.

3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. **$18.00** + $1.50 Shpng.

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value. **$11.95** + $3.00 Shpng.

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes. Beige or grey only.
$1.65 ea. + 20¢ Shpng.

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs.

Epson MX-70/80	**$3.58** ea. + 25 Shpng.
Epson MX-100	**$6.99** ea. + 25 Shpng.
Okidata Micro 83	**$1.48** ea. + 25 Shpng.
Okidata Micro 84	**$3.66** ea. + 25 Shpng.

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes. **Other Items:** Add shipping charges as shown in addition to diskette shipping charges. **Payment:** VISA and MASTERCARD accepted. COD orders only, add $3.00 handling charge. **Taxes:** Illinois residents only, add 8% sales tax.

MINIMUM ORDER: $35.00

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois: 1-312-944-2788)
INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS: 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor NASHUA MAGNETIC MEDIA

Circle 780 on reader service card

cessor. However, you must set the name of the word processor in the CONFIG.DB configuration file and have the word processor on the same disk as *dBASE III*.

Memo fields can be transferred out of *dBASE III*, but not easily. The Copy command does not operate on memo fields, and the *dBASE III* text editor does not produce straight ASCII files that can be read directly. If you use a separate word processor, you may be able to read the .DBT file directly. You can also create a report and then direct the report to a file (another new feature), or you can use the Set Alternate commands to send the memos to a file.

Ashton-Tate has revised the Modify Command command and the text editing features of data entry, to provide *dBASE III* with a highly respectable text editor. The text editor operates at acceptable speeds, has no obvious bugs, and has numerous control functions. The cursor can move either a character or a word at a time, and it can jump to the beginning or end of a line. Once in Modify Command, the program can read in additional files with <Ctrl>-K R; <Ctrl>-K W writes the file into another file.

New Program Controls

A Do command can now accept parameters. This brings *dBASE III* into line with other programming languages such as FORTRAN, COBOL, and Pascal. The calling program writes

Do *filename* **with a,b,c**

and the receiving program, *filename*, commences with

parameter x,y,z

Then whatever values are in *a, b,* and *c* at the beginning of *filename* are taken as the values of *x, y,* and *z*. At the end of *filename*, the values of *x, y,* and *z* are transferred to *a, b,* and *c*.

Unlike *dBASE II*'s DO WHILE loop, *dBASE III*'s doesn't allow macros. For example, you cannot write

```
store "y" to answer
do while continue = &answer
```

The reason, apparently, is that macros would slow down all DO WHILE loops, which are critical in the performance of command files.

dBASE III has one glaring omission. When an error occurs in a command file, there is no way to

dBASE III follows the trend toward bigger programs. Because it uses so much more RAM and disk space than dBASE II, it is less easy to use on a floppy disk system.

pass control back temporarily to the user. There are only two choices: ignore the command or return to the dot prompt. If you return to the dot prompt, the values of any non-public variables are lost. The erring command line cannot be changed, and the user cannot inspect memory, find the current record number, or use the Display Stat command.

My solution to the problem is to produce a companion command file for each .PRG file that makes all variables public. In this way, when I return to the dot prompt, I can examine the variables. When the command file is debugged, I no longer set those variables as public.

Attention to Detail

dBASE III follows the trend toward bigger programs for the PC and the PC XT. Because it uses so much more RAM and disk space than *dBASE II*, it is less easy to use on a floppy disk system. Users whose projects fit tightly on two floppies might well be advised to simply keep using *dBASE II*.

dBASE III is unquestionably superior to *dBASE II*—many people who found *dBASE II* unacceptable will be pleased with the new product. *dBASE III* has moved from 8-bit into 16-bit territory, and by adding the Assistant it now straddles a much wider segment of the consumer market. The program's improvements make it more viable both for newer users who require assistance and for the more expert who were frustrated by the limitations of *dBASE II*.

In performance, certain areas are significantly improved, notably the Sort, Index, and Browse commands. The most remarkable aspect of the change from *dBASE II* to *dBASE III* is the extent to which Ashton-Tate has reexamined, rethought, and refined the details of the program. The company has paid attention to its competition without abandoning the structure and language that made *dBASE II* great.

David Jenkins is the president of Midway Software, a consulting and programming company based in Berkeley, California, that specializes in dBASE II *applications.*

dBASE III
Ashton-Tate
10150 W. Jefferson Blvd.
Culver City, CA 90230
213/204-5570
List price: $695, Upgrade Kit for dBASE II owners $200
Requirements: 256K, two disk drives

NEW FASTCARD™ SUPER MEMORY BOARD
UNLOCKS HIDDEN RAM FOR GREATER MICROCOMPUTER EFFICIENCY.

The secret's in the TMS™ Firmware

FastCard's on-board TMS firmware monitors operations and instantly assigns memory where it's needed most for optimum system performance.

- Contains 384K of RAM, boosts PC memory to 640K and beyond.
- Includes standard 16K bytes of permanent RAM-printer/disk cache.
- Uses new 256 DRAM chips.
- Contains TMS firmware for caching, print buffer and RAM disk utilities – speeds operations.
- Provides custom hardware protection for computer security.
- Works with IBM, AT&T and compatible PCs.
- Cuts hard disk to floppy disk backup time **in half.**
- **400K of on-board memory for $495.00.**

Call today for more information and say,
THANKS FOR THE MEMORY, THESYS.™

THESYS
MEMORY PRODUCTS CORPORATION
7345 East Acoma Drive
Scottsdale, Arizona 85260
(602) 991-7356 • TELEX 751933
Dealer Inquiries Invited

Circle 822 on reader service card

"If one more person asks memory boards,

Multifunction or mass confusion?

We always tell people that the very first enhancement they should buy for their IBM-PC is a multifunction board.

But the tough question is, which one??? Especially now that just about anyone who ever wrapped a wire is coming out with a multifunction board for the PC.

That's why I'm writing this ad. Together we'll cut through the jungles of jargon and topple the towers of tech talk surrounding multifunction boards. And we'll even tell you which one is our personal favorite.

A face only a motherboard could love.

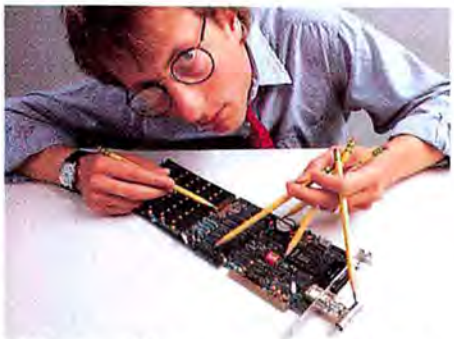
To electronic engineers they may be beautiful. But to most of us, circuit boards (a.k.a. circuit cards, enhancement modules, upgrades, etc.) are strange looking at best and intimidating at worst.

IBM, in its infinite wisdom, gave us *just five slots* to put additional circuit boards into the PC. But the PC can be enhanced in a lot more than five ways. So smart money buys a multifunction board and gets a whole lot of action out of only *one* of those five slots.

A single multifunction board can: 1. increase your computer's memory; 2. set you up to add a printer, mouse, modem, and/or other device; 3. tell your computer the date and the time; and now even, 4. prepare you for networking with other IBM-PC's.

Most multifunction boards come with their own software that puts it on the same wavelength as your motherboard. You'll be able to do things like: 1. input new data while the printer is outputting hard copy; 2. pretend you have additional disk drives; 3. have faster access to frequently used programs or files; and, 4. automatically back-up your data to a hard disk every few seconds.

Those are some of the reasons why multifunction boards are the hottest thing since the push-button phone. But if you want to be able to go to parties and talk about your new "multifunctionboardwith 384KofRAM,parallelport,serialport,clock-calendar,RAMdisk,diskcaching,printspooler, andnetworkinginterface" and actually understand what you're saying, you may have to refer to the very fine print in the glossary. So, whenever you see a term you don't understand, try the glossary.



Up close, multifunction boards look no more complicated than a map of San Francisco.

Glossary

A guide to multifunction board terminology for English-speaking people.

Please excuse the small type. But it was the only way we could squeeze all of these multifunction board basics on two pages. Besides, small type excites some people. So let's get down to business.

Multifunction board. A circuit board that fits into one I/O (input/output) slot and does more than one thing. This ad is about multifunction memory boards—extra RAM, some I/O ports, and other features. There are also multifunction graphics boards. We'll have to save them for another ad.

Memory. The new PC's and the XT have room on the motherboard for 256K. But they can address (a.k.a. find, locate, call up, cope with) 640K. The best multifunction boards have room for an additional 384K. 384K + 256K = 640K. You can add the memory in 64K blocks as needed.

Serial port. a.k.a. "async" or "asynchronous communications port," or "asynchronous adapter." You can hook a mouse, a plotter, a serial printer or any other serial device to this port. A serial device is a gadget that communicates with the computer one bit at a time. Just follow the instructions and the electrons will take care of the rest.

Parallel port. Most printers used with IBM personal computers connect via a parallel port. Parallel devices are gadgets that communicate with the computer eight bits at a time.

Clock calendar. Turn your computer on and it knows what day and time it is. Which is more than you can say for a lot of us when we wake up in the morning.

Game port. Where you plug in your joystick.

Local Area Network (LAN). All of the circuit boards, cables, connectors, and software you need to tie a few IBM's together in one office.

Networking interface. The Orchid BLOSSOM comes with a networking interface. That means that when you slap a PCnet daughterboard on top of it, it knows what hit it and what to do about it.

User-transparent. PCnet is user-transparent. Each user treats the network as if it were his/her own huge computer with a whole lot of disk drives and memory. There are no complex formulas for going from using only your own computer to using the network.

File allocation table locking. Since DOS is single-user, networks need to protect against cross-locking files on public volumes. PCnet does this by insuring that each disk write request sees a fresh copy of the File Allocation Table. This enables two or more users to write at the same time, and eliminates the need to pre-allocate database files.

PCnet TALK. Communicate easily with your fellow networkers. Your message on one half the screen. Their message on the other half.

Disk partitioning. On both BLOSSOM and PCnet software. This program allows you to partition any hard disk into multiple volumes, which you treat like extra disk drives (maximum 16 per PC). In addition you can designate any of these volumes as public or private. Keep your public files public and your private files private.

RAM disk. On BLOSSOM, Quadboard, SixPakPlus, and PCnet software. RAM disk lets you designate part of the available memory as additional disk drives. But these "drives" are electronic. In other words, they're fast.

Disk cache. On BLOSSOM, Quadboard, and PCnet software. Disk caching stores frequently used data in RAM. It is an intelligent RAM disk. When your program looks for a data file it first looks at the cache. If the data isn't there it gets it from the drive, and pulls it through the cache, leaving a duplicate there for future quick access. When you save data, a copy is automatically written to the cache at the server PC which flushes the changes back to the disk every 1 to 60 seconds (you choose). You don't have to wait while your data is being written to the disk. The server PC takes care of it.

Print spooler. On BLOSSOM, Quadboard, SixPakPlus, and PCnet software. A print spooler (a.k.a. printer buffer) lets you dump output to the printer as a background process. First the PC dumps the output to the spooler's RAM buffer at high speed. Then the spooler delivers the output to the printer as fast as the printer can take it. You're already back to work at some new project while the printer's still chugging along.

Which ones work?

PC Connection has sold thousands of multifunction boards. Our two most popular ones have been AST's SixPakPlus™ and the expanded Quadboard™ from Quadram. They both offer a very attractive combination of ingredients: up to 384K of additional RAM, serial port, parallel port, clock calendar, RAM disk, and print spooler. The Quadboard also has a game port, disk caching software, and a "connectall" bracket for arranging your cables neatly. AST offers a game port as an option. We sell both boards for the same price. And our customers have been very pleased with their performance.

The multifunction board breakthrough of the year.

My real inspiration for writing an ad is the new board that just came out from Orchid Technology.

It's called the BLOSSOM,™ and it has all the standard features mentioned above, like up to 384K of RAM, serial port, parallel port, clock calendar, RAM disk, print spooler, and disk caching.

PCnet, PCnet BLOSSOM, and BLOSSOM are trademarks of Orchid Technology. SixPakPlus is a trademark of AST Research, Inc. Quadboard is a trademark of Quadram Corporation. IBM is a registered trademark of IBM Corp. ©Copyright Micro Connection, Inc. 1984. Micro Connection is a trademark of Micro Connection, Inc. PC Connection is a registered trademark.

me about multifunction I'll write an ad."

——DAVID HALL, C.E.O.
PC CONNECTION

Networking lets your PC's share data, peripherals, and their deepest, darkest secrets.

But, unlike *any* other multifunction board, BLOSSOM is designed so that *you can piggy-back a networking board on top of it. Without using an additional expansion slot in the PC.* (In the picture, that's the BLOSSOM Board on the left and Orchid's PCnet™ piggy-back board on the right.)

At last we have one multifunction board that answers all the needs of your typical basic business PC *in just one expansion slot.* And it's actually less expensive than SixPakPlus or the Quadboard. To me that's very impressive.

Networking simplified.

If they gave awards for the computer word-of-the-year, "networking" would be a strong candidate in 1984. It seems that suddenly everyone who owns one PC wants to own two or three or more. And they want those PC's to cooperate—sharing data, printers, disk drives, and even in-house software. Networking saves time. And it saves money.

Orchid Technology has been one of the leaders in networking ever since they developed the very effective, low cost Local Area Network (LAN) called PCnet.

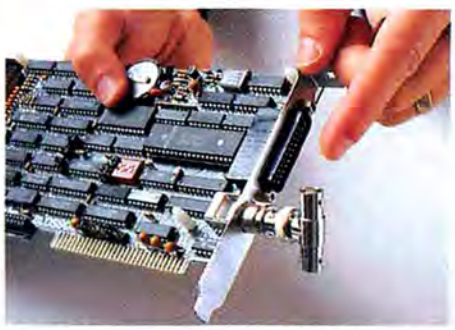
You see other manufacturers selling PCnet as their own product because Orchid licensed it to them. But now you can get Orchid's version along with their most up-to-date version of PCnet software, directly from us. Either alone or, better yet, sitting on top of the Orchid BLOSSOM multifunction board. The picture at the upper right shows how Orchid's new compact PCnet "daughterboard" slips right on top of a set of gold-plated pins on the BLOSSOM board. The coaxial connector for networking is there on the BLOSSOM board, at the right.

Networking complicated.

If you've done some research into networking you know that each system has its own complexities. Orchid's PCnet has a strong reputation for its simplicity and low-cost. PCnet 2.4, the new PCnet software *available only on the Orchid versions,* puts PCnet right up there as far as speed goes.

The key is intelligent use of PCnet 2.4 software—RAM disk, disk caching, partitioning, print spooling, and multi-sector I/O, all of which can work together to keep your data and programs where you want them, for faster access when you want them.

On closer analysis, PCnet turns out to be a very powerful LAN at a very low price. Other features include: PCnet TALK, and



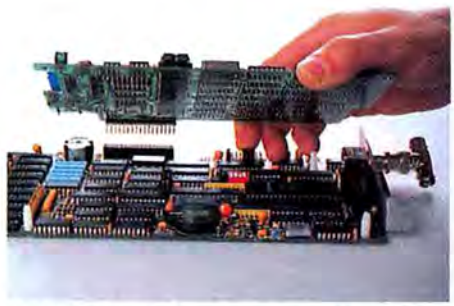
There's your coaxial connector for networking, right on the BLOSSOM board.

true public file sharing via an automatic File Allocation Table (F.A.T.). Best of all, PCnet is so user transparent, and Orchid's new manual is so straightforward, that it can cure your most computer-timid employee of networkphobia. I promise!

(Networkphobia is not in the glossary—but most of those other fancy words are.)

E Pluribus Unum.

Of the many multifunction boards on the market, I'd definitely choose the BLOSSOM. Because, as far as I'm concerned, if there's one thing in the future of most PC's, it's networking.



Orchid's PCnet "daughter board" slips right on top of BLOSSOM.

If networking doesn't interest you, the Orchid BLOSSOM is still a powerful multifunction board. And it looks like there are some other impressive "daughterboards" coming down the Orchid R&D pipeline that you could add on later.

And now that I've written this ad, I'm ready to answer some more questions. About the BLOSSOM, SixPakPlus, Quadboard, other multifunction boards, and/or the other hundreds of hardware and software products PC Connection has for your IBM-PC. Just call.

Products and Prices.

AST	
AST SixPakPlus, 64K	$269
Optional game port	39
Quadram	
Quadram Quadboard, 64K	269
Orchid	
BLOSSOM, 0K	199
BLOSSOM, 64K	239
PCnet daughterboard	call
PCnet BLOSSOM (64K BLOSSOM with daughterboard installed)	call
Cluster kit (25 ft. cable, manual, and PCnet software)	69
note: other cable lengths are available	
Memory	
Additional 64K upgrades for any board	49
We'll install your upgrade(s), put the board in one of our IBM-PC's and run diagnostics for only	10

Prices and specifications are subject to change without notice.

1-800/243-8088

For the IBM-PC exclusively. 292W

PC Connection is a division of Micro Connection, Inc.

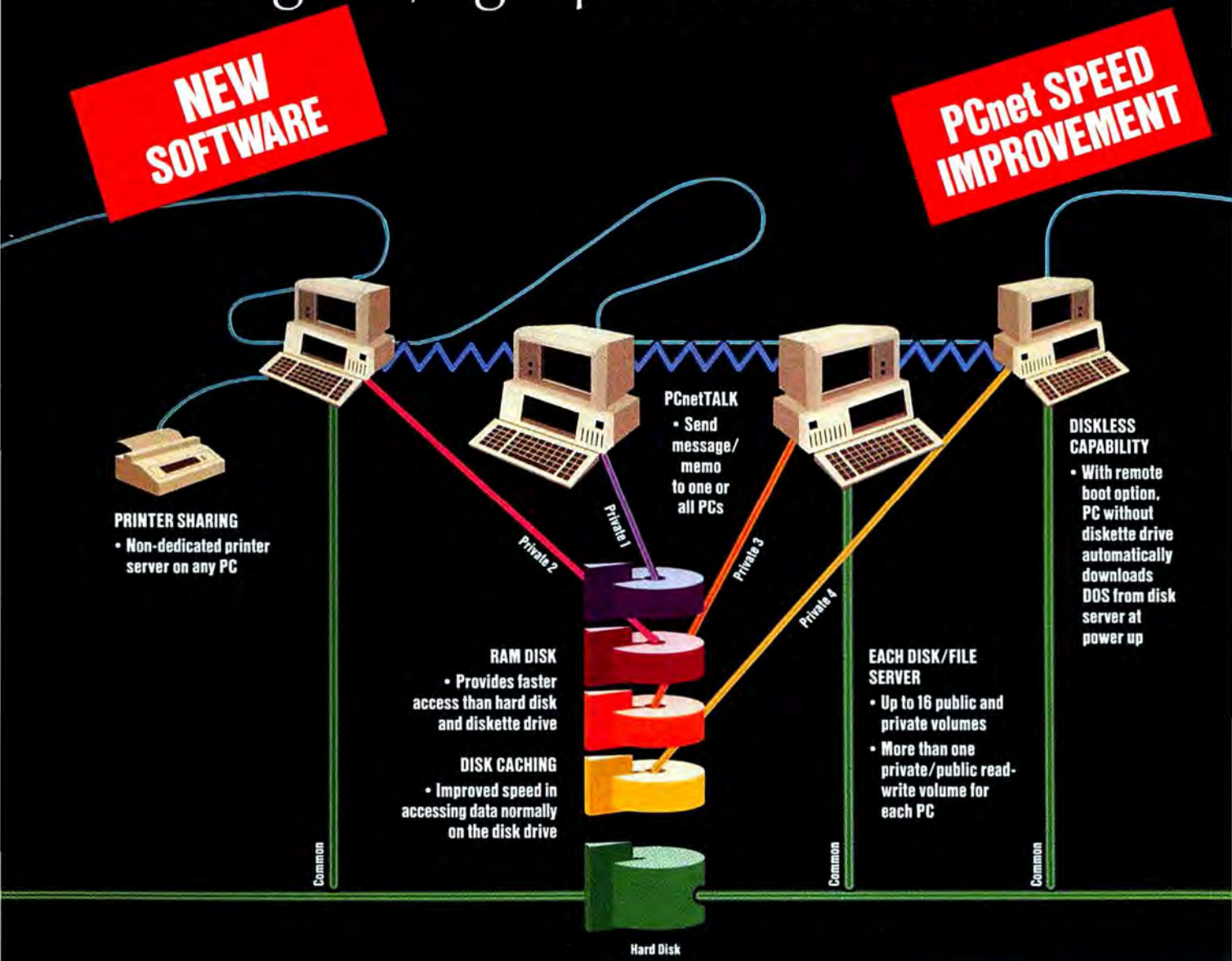
PC CONNECTION®

PC Connection, 6 Mill Street, Marlow, NH 03456, 800/243-8088 or 603/446-3383.

Circle 837 on reader service card

PCnet™ from Orchid Technology

The Most Advanced, Affordable Way to Transform Your Personal Computers into a Fully Integrated, High-Speed Local Area Network.



PCnet is the lowest cost network for IBM™ PCs. Take your choice.

$495 per node when purchased as a stand-alone.
$395 per node when purchased with BLOSSOM (384K RAM, Clock, IO)

Orchid, the creator of PCnet, has made high-performance local area networking affordable to all PC users. Contact your local dealer or Orchid today to unlock the power of your IBM PC and find out more about our full line of products.

PCnet—Stand-alone Network Board
PCnetPlusRam™—PCnet + 256K RAM
PCnetBlossom™—PCnet + 384K RAM + Serial Port + Parallel Port + Clock Calendar
Blossom™—New Generation Multifunction Board
PCturbo™—The Ultimate IBM PC productivity enhancement board

IBM PC is a registered trademark of International Business Machine Corporation.
PCnet, PCnetPlusRam, PCnetBlossom, Blossom and PCturbo are all trademarks of Orchid Technology.

ORCHID
ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539
(415) 490-8586 Telex: 709289

Circle 133 on reader service card

Available for IBM PC

What C did for Programming
Mark Williams has done for C Programming

The C Programming System from Mark Williams

MWC86 gets your C programs running faster and uses less memory space than any other compiler on the market. Then *csd*, Mark Williams' revolutionary C Source Debugger, helps you debug faster. That's The C Programming System from Mark Williams Company.

MWC86

MWC86 is the most highly optimized C compiler available anywhere for the DOS and 8086 environment. The benchmarks prove it! They show MWC86 is unmatched in speed and code density.

MWC86 supports large and small models of compilation, the 8087 math coprocessor and DOS 2.0 pathnames. The compiler features common code elimination, peephole optimization and register variables. It includes the most complete libraries. Unlike its competition, MWC86 supports the full C language including recent extensions such as the Berkeley structure rules, voids, enumerated data types, UNIX* I/O calls and structure assignments.

Quality is why Intel, DEC and Wang chose to distribute MWC86. These industry leaders looked and compared and found Mark Williams to be best.

User Friendly

MWC86 is the easiest to use of all compilers. One command runs all phases from pre-processor to assembler and linker. MWC86 eliminates the need to search for error messages in the back of a manual. All error messages appear on the screen in English.

A recent review of MWC86 in *PC World*, June, 1984, summed it up:

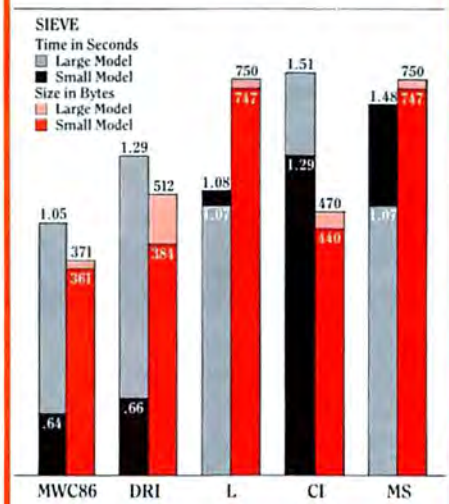
"Of all the compilers reviewed, MWC86 would be my first choice for product development. It compiles quickly, produces superior error messages, and generates quick, compact object code. The library is small and fast and closely follows the industry standard for C libraries."

csd C Source Debugger

Mark Williams was not content to write the best C compiler on the market. To advance the state of the art in software development, Mark Williams wrote *csd*.

csd C Source Debugger serves as a microscope on the program. Any C expression can be entered and evaluated. With *csd* a programmer can set tracepoints on variables and expressions with full history capability and can single step a program to find bugs. The debugger does not affect either code size or execution time. *csd* features online help instructions; the ability to walk through the stack; the debugging of graphics programs without disturbing the program under test; and evaluation, source, program and history windows.

csd eases the most difficult part of development — debugging. Because *csd* debugs in C, not assembler, a programmer no longer has to rely on old-fashioned assembler tools, but can work as if using a C interpreter — in real time.



The C Programming System from Mark Williams now supports the following libraries:

Library	Company
Windows for C	Creative Solutions
Halo	Media Cybernetics
PHACT	PHACT Associates
The Greenleaf Functions	Greenleaf Software
Btrieve	SoftCraft

The C Programming System from Mark Williams

The C Programming System from Mark Williams delivers not only the best C compiler for the 8086 but also the only C source level debugger. That's why it does for C programming what C did for programming. The Mark Williams C Programming System gives the programmer the MWC86 C compiler and the *csd* C Source Debugger for only $495. Order today by calling 1-800-MWC-1700. Major credit cards accepted.

Technical support for The Mark Williams C Programming System is provided free of charge by the team that developed it.

Mark Williams Company
1430 W. Wrightwood Ave.
Chicago, IL 60614

*Unix is a Trademark of Bell Laboratories.

Circle 231 on reader service card

Perfect Compatibility

IBM™ & ACP

HARDWARE SPECIALS

CONTROL DATA
Full Size 320K DS/DD . . . . $ 199*
*"The drive IBM trusted with its logo"

TEAC
Half-Height 320K DS/DD . . . $ 169
"The #1 Rated Half-Height Drive"

64K RAM Chips 200ns Pre-Tested $ 49*

AST SIXPACK w/384K . . . . . $ 539

MAYNARD ELECTRONICS
10MB HARD DISK
(XT Lookalike) . . . . . $ 899

SOFTWARE SPECIALS

LOTUS 1-2-3/WORDSTAR PROPACK . . . . . $ 599

LOTUS 1-2-3/HERCULES GRAPHICS CARD . . . . . $ 669

SYMPHONY/SIXPACK W/384K . . . . . $ 959

MULTIMATE w/80K Word Speller . . . . . $ 269
An advanced word processor with all the features of a dedicated stand alone system.

dBASE III/QUICKCODE III
dUTIL . . . . . $ 629
dB/COMPILER . . . . . $ Call
Neither dBase II nor Run-Time required. 30% less storage, faster execution assembly language interface

EASYWRITER II/SPELLER/MAILER . . . . . $ 195

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

HARDWARE

COMPUTER SYSTEMS

IBM
PC w/256K 2 DS/DD Disk Drives . . . . . $ Call

COMPAQ
w/256K 2 DS/DD Disk Drives . . . . . $ Call

COMMUNICATION PRODUCTS

HAYES
Smartmodem 300 . . . . . $ 209
Smartmodem 1200 . . . . . $ 489
Smartmodem 1200B w/Smartcom II . . $ 419
Smartmodem-to-IBM 6 ft. Cable . . . . . $ 25
Smartcom II . . . . . $ 99

NOVATION
Access 1-2-3 (w/Crosstalk XVI) . . . . . $ 379

TAC
Irma (Emulates 3278 Terminal) . . . . . $ Call
Irma Line (For Remote Emulation) . . . $ Call

FLOPPY & HARD DISK DRIVES

CONTROL DATA
Full Size 320K DS/DD . . . . . $ 199
Half-Height 320K DS/DD w/Bracket . . . $ 169

DAVONG
10 MB to 41 MB Hard Disk Int./Ext. . . . $ Call
(Includes power supply, controller & software)

TALLGRASS
12—70 MB Hard Disk w/Tape Backup . . $ Call

TEAC
Half-Height 320K DS/DD w/Bracket . . . $ 169
Half-Height 640K DS/DD w/Bracket . . . $ 215

MAYNARD ELECTRONICS
10MB Hard Disk WS-1 (XT Lookalike) . . $ 899
10MB Hard Disk WS-2 (XT Lookalike) . . $1049

DISKETTES

SCOTCH 3M
DS/DD Box of 10 . . . . . $ 35

VERBATIM
DS/DD Box of 10 . . . . . $ 35

DISK CONTROLLERS

MAYNARD ELECTRONICS
Standard Disk Controller . . . . . $ 115
with Parallel Port . . . . . $ 165
with Serial Port . . . . . $ 175
Sandstar Modular Disk Controller . . . . $ 209
All Sandstar Modular Options Avail. . . $ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS
Modular Memory Brd. w/64K to 576K . $ 219
Modular Multifunction Board . . . . . $ 95

AST RESEARCH
(All AST boards include SuperDrive, SuperSpool and 1 year warranty)
SixPack Plus w/64K to 384K . . . . . $ 269
MegaPlus II w/64K to 512K . . . . . $ 269
Memory Board II w/64K to 384K . . . . . $ 239
I/O Plus II . . . . . $ 139
MegaPack w/128K or w/256K . . . . . $ Call
Parallel, Serial, Game Options . . . . . $ 35

ORCHID TECHNOLOGY
Blossom w/64K to 384K . . . . . $ 249

TECMAR
Captain w/64K to 384K w/Software . . . $ 269

QUADRAM
Quadboard w/64K to 384K . . . . . $ 279

PRINTERS & PLOTTERS

C. ITOH
Starwriter Letter Quality 40 cps . . . . . $ 999
Printmaster Letter Quality 55 cps . . . . $ Call
Cut Sheet Feeder (Feeds 200 sheets) . . $ 299

EPSON
(All Printers include GRAPHTRAX-Plus)
RX-80 (120 cps, 80 cols) . . . . . $ Call
RX-80 F/T (120 cps, 80 cols) . . . . . $ Call
RX-100 F/T (100 cps, 132 cols) . . . . . $ Call
FX-80 F/T (160 cps, 80 cols) . . . . . $ Call
FX-100 F/T (160 cps, 132 cols) . . . . . $ Call
Epson-IBM Cable . . . . . $ 30

HEWLETT PACKARD
HP—7470A Two Pen Plotter . . . . . $ Call
HP—7475 Six Pen Plotter . . . . . $ Call
HP-IBM Cable (works w/Lotus 1-2-3) . . $ 50

NEC
NEC 3550 Letter Quality 35 cps $1599
NEC 2050 Letter Quality 18 cps . . . . . $ 799
Bi-Directional Tractor . . . . . $ 235
Cut Sheet Feeder (Feeds 200 Sheets) . . $ 299
NEC-IBM Cable . . . . . $ 30

OKIDATA
Microline 83A (120 cps, 132 cols) . Best Price
Microline 92 (160 cps, 80 cols) . . . Best Price
Microline 93 (160 cps, 132 cols) . . Best Price
Microline 84 (200 cps, 132 cols) . . Best Price
Plug n' Play . . . . . Best Price
Okidata-IBM Cable . . . . . $ 30

SILVER-REED
EXP 550 (20 cps, 132 cols) . . . . . $ 595

MONITORS

AMDEK
Video 300 Green Screen . . . . . $ 140

- **No Credit Card Surcharge**
- **Special Corporate Accounts Division**
- **Company P.O. Accepted**
- **Training**
- **Equipment Maintenance**
- **Next Day Shipping**

WE'LL GIVE YOU $10.00!

Simply refer to this reference number with your order and receive $10.00 credit toward your next purchase.*

*Minimum order $100.00. Limit one credit per customer.

REF # PW2

Video 300A Amber Screen ..... $ Call
Video 310A IBM Monochrome in Amber ..... $ 170

PRINCETON GRAPHICS
HX-12 RGB Hi Resolution Color ..... $ 499*
Max-12 IBM Monochrome in Amber .. $ Call
SR-12 Hi Resolution Color ..... $ Call

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card	$ 359
	Color Card	$ 179
PC COMPONENTS	Bi-Graphix I	$ Call
PARADISE SYSTEMS	Multidisplay	$ 339
PC+ PRODUCTS	Colorplus	$ 419
STB	Graphix Plus	$ 389
QUADRAM	Quadcolor I	$ 199
TECMAR	Graphics Master	$ 499

MISCELLANEOUS

Cables (all extension cables) ..... $ Call
8087 Co-processor ..... $ 179

KEY TRONIC
Deluxe Keyboard (KB 5151) ..... $ Call

KOALA—Touch Tablet w/Software .... $ Call
KRAFT—Joystick ..... $ 49
T.G.—Joystick ..... $ 49
MOUSE SYSTEMS—PC Mouse ..... $ Call

SOFTWARE

ALPHA
Database Manager II ..... $ 199

ASHTON TATE
dBase II ..... $ 285
dBase III ..... $ Call
Framework ..... $ Call

ATI
All Software Training Pkgs ..... $ 55

CENTRAL POINT SOFTWARE
Copy II PC ..... $ 35

FOX & GELLER
Quickcode II or III ..... $ 169
dGraph (Requires Graphics Card) .... $ Call
dUtil (Utilities For dBase II or III) ..... $ 25
FUNK—Sideways ..... $ 49
HAYES—Smartcom II ..... $ 99
IMSI—4 Point Graphics (Rated #1) ... $ 89
(Inhance Lotus Graphics)

INDIVIDUAL SOFTWARE
Tutorial Set (IBM PC/XT and DOS) .... $ 79
Typing Instructor ..... $ 39

INFORMATION UNLIMITED SOFTWARE
EasyWriter II System (See Specials) .. $ 195
Accounts Receivable ..... $ 299
Accounts Payable ..... $ 299
General Ledger ..... $ 299
Payroll ..... $ 369

INFOCOM—Zork I, II, III ..... $ 29
All games available ..... $ Call

LATTICE
C-Compiler ..... $ 299
C-Food Smorgasboard ..... $ 110

LIFETREE
Volkswriter Deluxe w/TextMerge ..... $ 169

LIGHTNING SOFTWARE
Master Type (Best Typing Tutor) ..... $ 39

LOTUS DEVELOPMENT
Lotus 1-2-3 (Version 1A) ..... $ Call
Symphony ..... $ Call
Symphony Upgrade ..... $ Call

MICRO DATA BASE SYSTEMS
Knowledgeman w/Kgraph, Kpaint .... $ 299

MICROSOFT
C-Compiler ..... $ 349
Flight Simulator ..... $ 35
Multiplan (New Version) ..... $ 149
Word ..... $ 239
Word w/Mouse ..... $ 299
Mouse w/Software ..... $ 139

MICROPRO
Wordstar w/Tutorial on Disk ..... $ 195
ProPack (Wordstar/MailMerge/CorrectStar/StarIndex) ..... $ 295
ProfessionalPlus (ProPack plus TelMerge Electronic Mail System) Mailing List Management and Business Letters ..... $ 369

MICRORIM
R.base 4000 ..... $ 299
Clout ..... $ 139
Extended Report Writer ..... $ Call

MICROSTUF
Crosstalk XVI (for Hayes Smartmodem) ..... $ 99

MORGAN COMPUTING
Trace 86 (Assembly Language Debug) $ 99
Ted (Program Editor) ..... $ 79
Professional Basic (170K Work Space w/8087 Support) ..... $ 259

MULTIMATE INTERNATIONAL
Multimate (See Specials) ..... $ 269

PETER NORTON
Norton Utilities ..... $ 55

ROSESOFT
Prokey (Newest Version) ..... $ 95

SOFTWARE PRODUCTS
Open Access ..... $ 299

SATELLITE SOFTWARE INTERNATIONAL
Word Perfect (includes Speller) ..... $ 269

SORCIM
Supercalc 3 ..... $ 199

SOFTWARE PUBLISHING
PFS/File ..... $ 89
PFS/Graph ..... $ 89
PFS/Write ..... $ 89
PFS/Report ..... $ 79

TALL TREE SYSTEMS
J-Format 2.0 ..... $ 40

WORDTECH SYSTEMS
dB/Compiler (True dBase II Compiler) ..... $ Call

WANG PUBLICATION
Random House Proof Reader (50K) .. $ 45

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds • We do not charge your card until we ship • **No surcharge added on VISA and Mastercard** • Allow one week for personal and company checks to clear • COD maximum $500 Cash or Certified check on delivery • Please use local phone number for order status inquiries • Prices subject to change without notice • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add $4. **Most orders shipped next day.**

APPLIED COMPUTER PRODUCTS INC.

1633 Republic Rd., Huntingdon Valley, PA 19006
215-934-6990 Telex 756876 UD

1-800-223-3860

When you need competitive prices, prompt service and complete support, call us.

*IBM is a registered trademark of International Business Machines.

Circle 205 on reader service card

The Graphics Gallery

Even novices can create and control presentation-quality business graphics with Microsoft Chart. Choose a graph type from a preprogrammed "gallery" and adapt it to fit your needs.

Steve Lambert

Charts and graphs bring numbers and other abstractions to life. Until recently, only computer users with substantial programming expertise and access to mainframe systems could produce anything but the most rudimentary charts. Now, as desktop computers become more powerful and software more sophisticated, even novice users are creating charts that tell stories vividly.

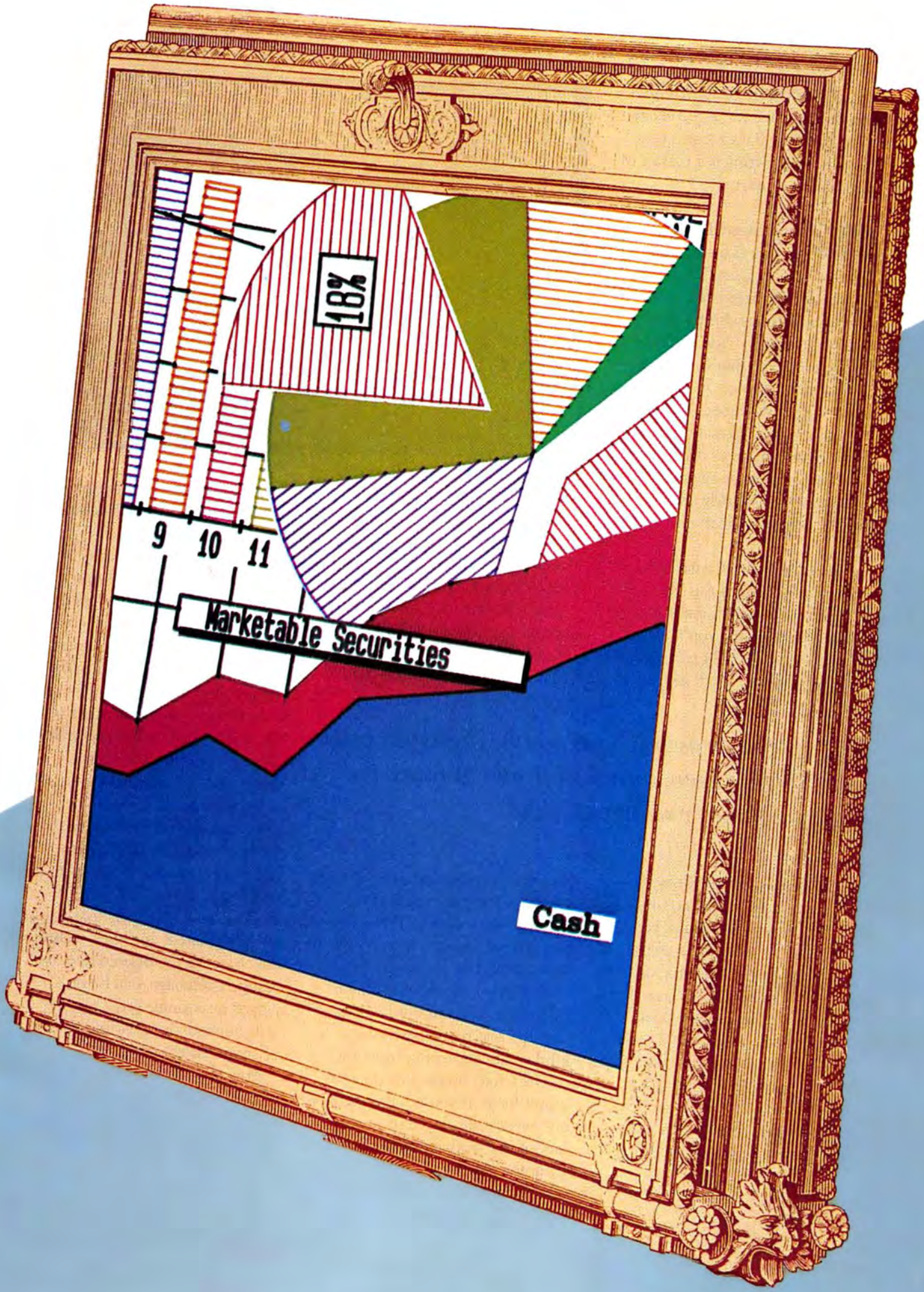
If software industry sales projections are on target, the graphing of America is going to be big business during the next year. In introducing *Chart,* Microsoft is adhering to a pattern established with its spreadsheet and word processing programs: let other software developers break new ground, observe the weak points of their programs, and then create a package that attempts to plug the gaps.

Microsoft Chart is designed to appeal to a broad range of users–from the individual familiar with charting standards and well versed in chart creation to the beginner with a job to do. *Chart* is reasonably easy to learn and use, and it contains features that are both powerful and versatile.

Pictures at an Exhibition

At its best, a charting program should allow you to try out a variety of chart formats on screen before committing one to paper. To achieve such flexibility, the program must be capable of rapidly switching among various types of charts. *Chart* does so by providing 45 preprogrammed charts, distributed among eight groupings–area, bar, column, hi-lo, line, mixed, pie, and scatter–in what Microsoft calls a "gallery" (see Figure 1). These miniature renderings of each major chart style are complete except for the values that you supply. There's no need to create a chart from scratch; you simply start with a sample from the gallery and manipulate it to your specifications.

Once you've selected the style best suited to your data, you can play with the format, that is, the way in which the values are expressed. Under the heading "Formats" are labels, titles, colors, fill patterns, line patterns, markers, grids, and the like. The gallery displays a broad range of formatting possibilities; if you select the pie chart option, for example, you can choose from six variations on that


18%
9
10
11
Marketable Securities
Cash

style. Your choice of format does not change the data; it merely affects how that data is conveyed visually. Formatting is a matter of fine-tuning a chart.

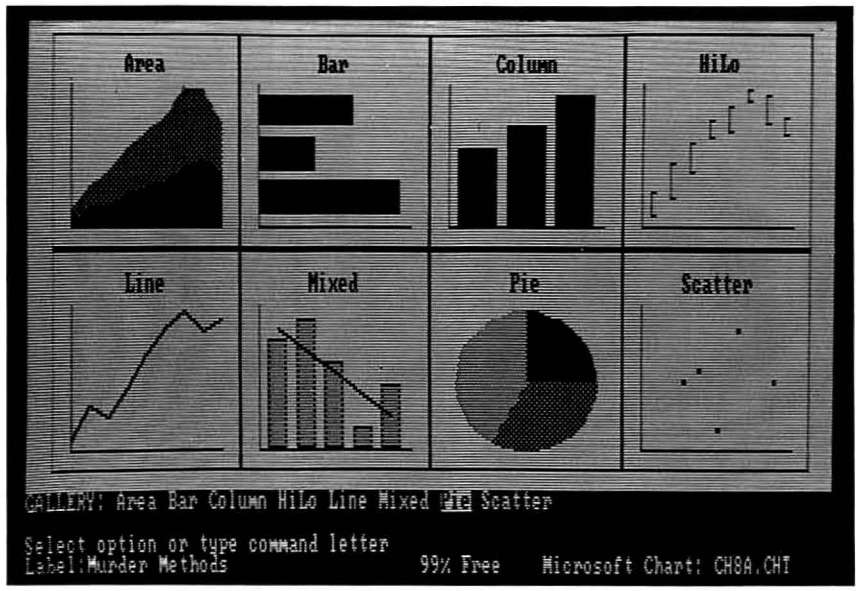


Figure 1: The Chart gallery features eight major chart types.

Getting Started

When you start the program, you're in *Chart*'s List mode—one of three basic modes of operation, along with the Entry and Chart modes. You can move rapidly between modes by pressing the first letter of the mode you want. The three modes include a host of commands that enable you to enter information, display it in chart form, alter or augment the data, and immediately see the effect of your modifications on the chart.

The typical chart-creation routine takes you from the List mode to the Entry mode. Before moving to the Chart mode, you'll usually want to view the gallery. Once in the Chart mode, you'll generally manipulate your creation by invoking various format commands.

As many as 16 charts can be displayed on a single screen, arranged neatly in rows and columns or scattered about.

The Entry mode allows you to type in data. To create a chart, data must be plotted using ordered pairs on a standard *X-Y* axis. Each ordered pair defines one "data point." A data point could consist, for example, of the name of a state and the population of that state, or a year and the consumer price index for that year. When you type in data points on the Entry screen, the program displays your entries in two columns—one for "category," one for "value." *Chart* accepts a maximum of 512 data points per chart.

The entire collection of data points that makes up a set of bars, a line, or the pieces of a pie is called a "data series." From the List screen, you can specify which series should be included or excluded when the chart is drawn. Because it contains all the data series, the List mode performs a kind of housekeeping function.

The Chart mode puts data in graph form. If you've entered data and want it displayed in the format of one of the miniature charts from the gallery, the program will comply in seconds, plotting the information according to your formatting instructions. If you're not satisfied with your initial choice, you can try other styles.

When a chart approximates what you want, you can edit it while you're in the Chart mode. Every aspect of the format—which essentially means every element of the chart—can be modified. You can add text and move it around; add an arrow and stretch it from one point to any other point; add a legend and then change its size, shape, and location; and even add additional charts to the same page. You can take advantage of the last feature by dividing the screen into quadrants (or even smaller sectors), using the List mode to retrieve charts that you've already created, and then scaling the charts to the desired size. As many as 16 charts can be displayed on a single screen, arranged neatly in rows and columns or scattered about.

You can easily add text to any chart; you can even assemble a chart consisting exclusively of text. *Chart* offers a dozen different

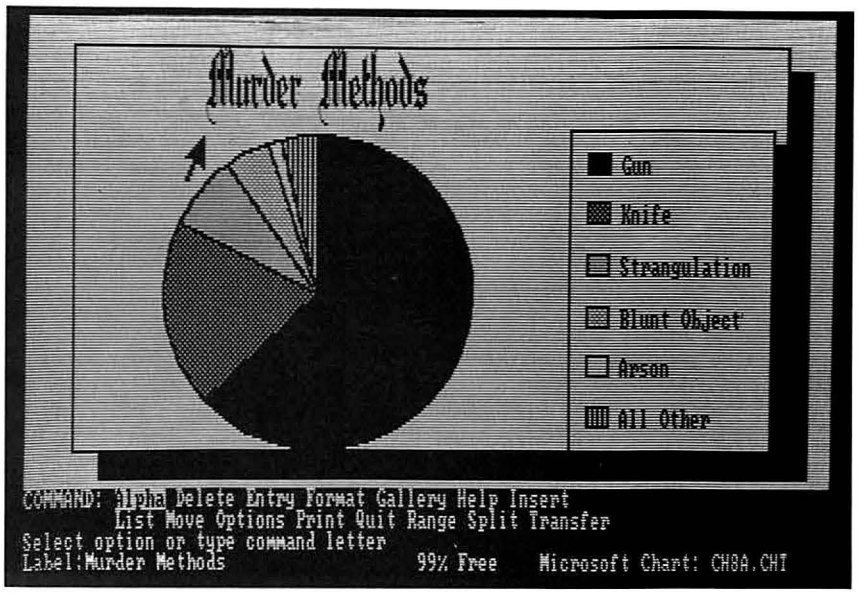


Figure 2: A screen from the Chart mode. While in that mode, you can manipulate any element of a chart.

fonts of varying sizes. Unfortunately, you can't merge *Chart* graphics and a word processing file.

Once you've practiced selecting an element of a chart and then choosing the command to modify it, on-screen chart editing becomes fairly rapid (although this is one area in which a mouse could speed things up even more). If you're currently creating charts by hand or with another program, you'll appreciate this ability to precisely and quickly tailor a chart to your needs.

Dividing the Screen

If you're familiar with *Microsoft Word* or *Multiplan*, you'll probably feel right at home with *Chart*, which partitions the screen in the same manner: into a work area, a command menu, a message line, and a status line. (Figure 2 shows a screen from the Chart mode.) The chart that you're creating or modifying occupies the upper portion of the screen. Near the bottom is the command menu. The message line, located immediately below the command menu, displays prompts for various actions (such as 'enter file name') or error messages (such as 'you cannot apply that command to the selected object').

The status line occupies the bottom line of the screen. While you're in the Chart mode, the status line displays the name of the chart element you're currently working on, such as the caption or the legend. Whatever the mode, the status line indicates the percentage of available RAM, which varies because *Chart* sets aside the portion of RAM needed for data manipulation. This feature serves as a good reminder to save your work periodically.

Automatic Plotting

If you want to plot a recurring or predictable event (such as closing stock prices), *Chart* enables you to specify ahead of time the category part of the beginning data point, the increment of change, and the unit of measure. The program will automatically enter the specified information (for instance, the time element) in the left column; you need only supply data for the right column. For example, suppose you were plotting the closing prices of the Dow-Jones industrial average during a week's time; you would note that the average is measured each weekday, and you might begin on Wednesday, June 20. *Chart* would provide the weekday labels Wednesday, Thursday, Friday, Monday, and Tuesday. This feature can be invoked from the Name command in either the List or the Entry mode.

When the chart looks right, you can save it with the Transfer Save command. This command saves both the formatting information and the data. If you load that chart again, you can load the format alone, just the data, or both. In effect, you can create your own list of standard formats that will display information just as you need it. You can enter new data, load an old format, and choose the Chart mode from the command menu, and *Chart* will plot the new data in the style that you created on a previous occasion. Your list of formats, however, does not constitute a gallery; that is, you can't view your list as an additional series of miniature charts.

Willing to Help

The Help command, which is available from all three modes, leads you through a condensed version of the documentation. The help screens are both constructive and extensive, occupying a 60K file on the program disk. Choosing help in the conventional way–by typing H or highlighting the word 'help' on the command menu and pressing <Enter>–summons the submenu shown in Figure 3. This allows you to wander through the help file a page at a time or jump to the beginning of various major sections, such as those defining every key the program uses and every command you can invoke.

You can also obtain help for a specific command by highlighting that command on the main menu and then pressing <Alt>-H. Relying on help screens and the message line, you can probably learn enough about *Chart* to get by without even cracking the documentation.

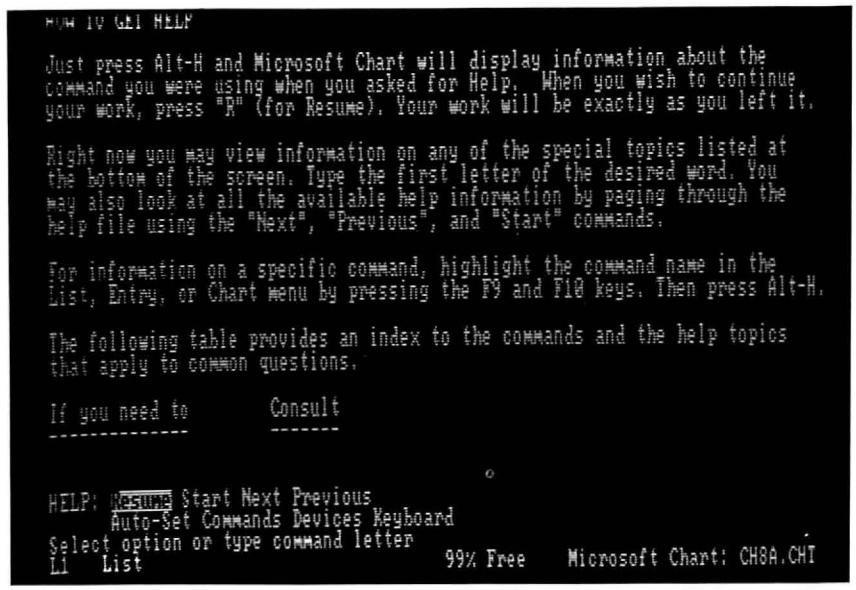


Figure 3: The opening help screen from Chart

The Multiplan Connection

If you use Microsoft's *Multiplan* to keep track of inventory information or any data that requires routine updates, a chart based on that information can be linked to the spreadsheet in which the updates are maintained. Each time you load the chart, *Chart* will open the spreadsheet file and retrieve the updated figures.

Data can also be brought in from other popular programs, among them *dBase II, VisiCalc,* and *1-2-3,* although making connections with these programs is not as easy as making connections with *Multiplan.* For the two Microsoft products, the process is streamlined: *Chart* and *Multiplan* share a common language. *Chart* includes a program that permits quick and simple two-way conversion between other formats. That conversion program, called CONVERTD, allows data to be imported from programs other than *Multiplan* as well, but formatting information is not apt to make the trip intact.

From Screen to Page

Chart makes particularly good use of printers and plotters. The Print Options command permits you to send a chart to any of a number of output devices. Highlighting this option on the command menu displays a list of all installed output devices. Highlighting the name of one of these devices and striking the <Enter> key designates it as the current output device. Changing the output device causes the menu options that pertain to the device to change accordingly.

If you specify an Epson printer, for example, and choose the Format Color command for some element of the chart, the only color listed is black. Changing the output device to an IDS Prism brings the list of available colors to seven, in accordance with that device's capabilities. The Print Options menu also allows you to set such variables as plotter pen speed and line thickness.

Character sizes, shapes, and relationships occasionally differ as you move from the PC's display to an output device. The Option command on *Chart*'s menu allows you to display the chart on the screen as it would appear on a

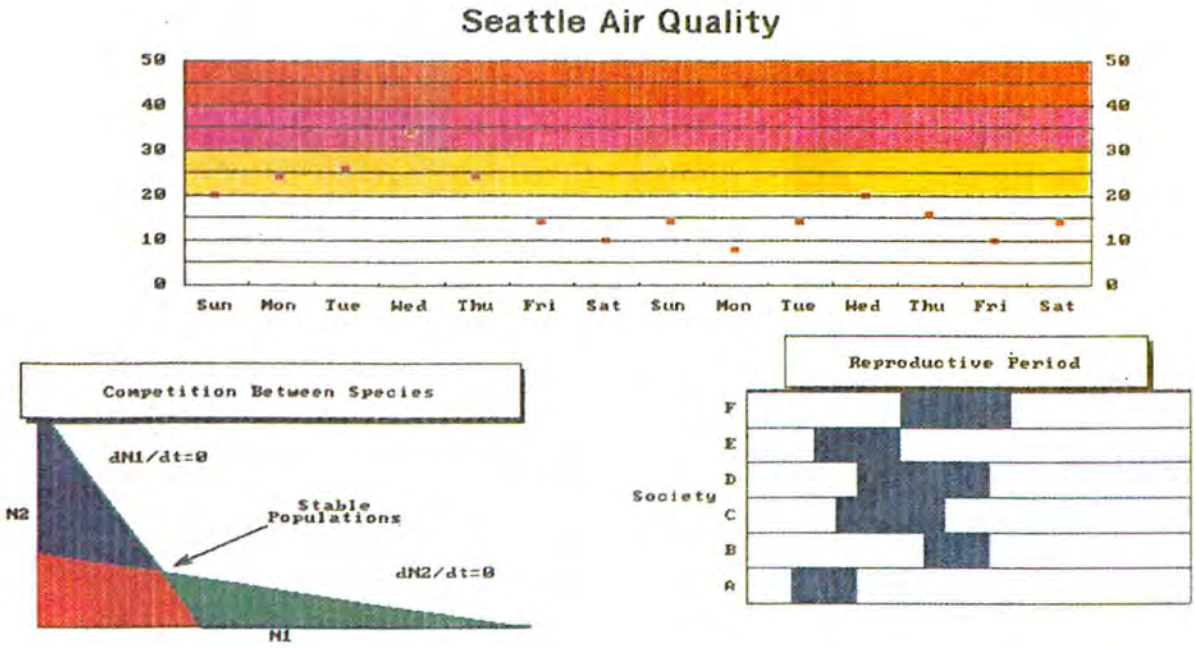


Figure 4: Plotted output from Chart displays the range of colors and fill patterns that the program supports.

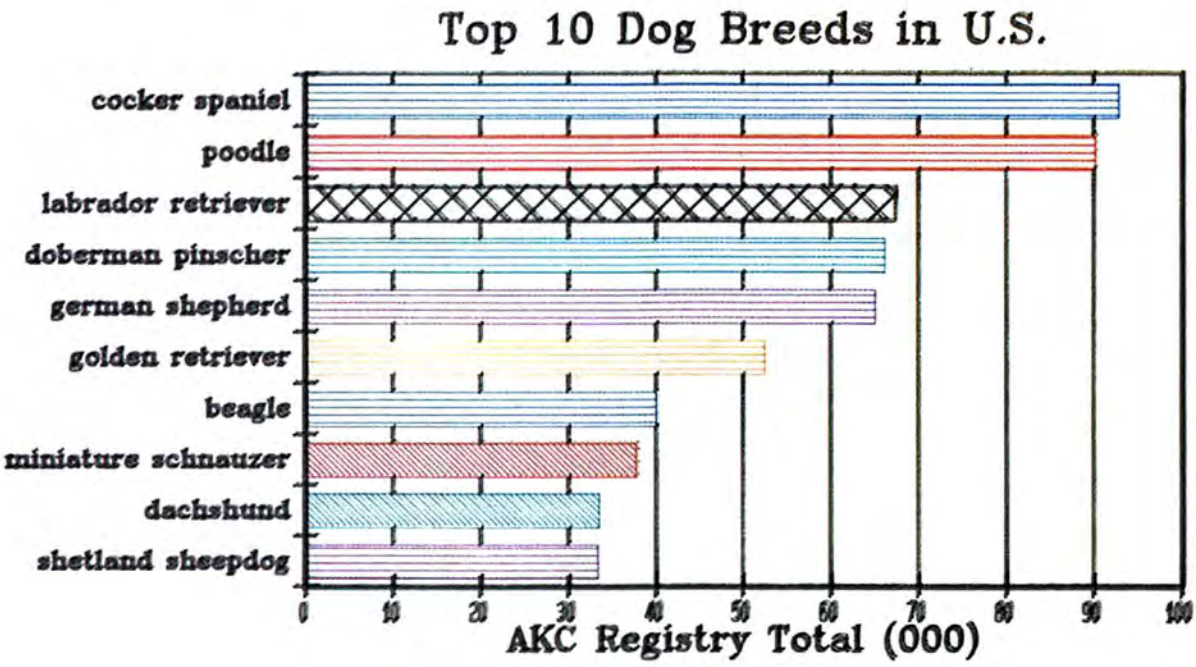


Figure 5: Printed output from Chart

plotter or printer. This permits you to compensate for any differences in display capabilities.

Obviously the quality of the hardware has much to do with the appearance of the final product. The quality of plotted output is shown in Figure 4 and printed output in Figure 5.

What You Get

Three disks are included with *Chart*: one is a copy-protected program disk, the second a backup copy of the first, and the third an unprotected disk containing various fonts that you can load into the program. The program runs on the IBM PC, the XT, and several compatibles. I ran it successfully on a Compaq.

Whatever your computer, you need an IBM Color/Graphics Adapter or a Hercules Graphics Card. The Hercules board enables the program to produce an extremely sharp image on an IBM Monochrome Display.

Documentation Overload

At nearly 500 pages, the documentation on *Chart* is massive. A third of the manual is devoted to an alphabetical listing and explanation of every command. For all its bulk, however, the documentation does not include a sufficient number of examples of sophisticated charting applications.

A short section at the front of the book walks you through the process of adding system and command files to the program disk, explains the PC keyboard, and offers general information about DOS. This is followed by a 75-page tutorial that demonstrates how to load and view a sample chart included on the program disk and leads you through the creation and modification of another chart. If you follow along carefully, it should take about an hour for you to begin creating reasonably sophisticated charts on your own. The tutorial's use of generic key names–such as "word right," "word left," and "newline"–is a bit confusing. It frequently forced me to refer to a keyboard legend before striking the correct key.

The documentation's appendices are somewhat esoteric, but should appeal to the more technically inclined. They feature a complete explanation of Microsoft's SYLK (symbolic link) file format, the company's standard method of storing information. The SYLK format creates readable text files that contain the various attributes of the data you've stored–in this case, charts. Because the format is so accessible, SYLK serves as a convenient point for sharing *Chart* data with other programs.

The appendix also contains information about the CONVERTD program–which is included on the program disk and allows two-way conversion between ASCII, .DIF, *dBase II*, and SYLK files–and a brief section on creating your own fonts and loading them into *Chart*.

Data can be brought in from other popular programs, among them dBase II, VisiCalc, *and* 1-2-3, *although making connections with these programs is not as easy as making connections with* Multiplan.

Weaknesses and Wishes

Much to its credit, Microsoft has incorporated into its program default settings that reflect generally accepted graphics and charting standards. But if you want to depart from a standard or embellish what the company gives you, *Chart* will respond well.

In its incarnation of *Chart* for Apple's Macintosh, Microsoft takes advantage of the Mac's cut-and-paste feature, which permits easy and convenient meshing of charts and word processing files. I'm eagerly awaiting a similar windowing capability for the PC.

Microsoft's promotional material lists certain weaknesses in *Chart* when comparing the program to leading competitors. *BPS Business Graphics*, for example, has more built-in statistical functions than *Chart*'s seven, and supports more than the 30 printers and plotters that work with *Chart*. *Chart* is also unable to perform sequenced presentations or slide shows. I don't consider this a major weakness, however. For my money, you can create a far better sequenced presentation by plot-

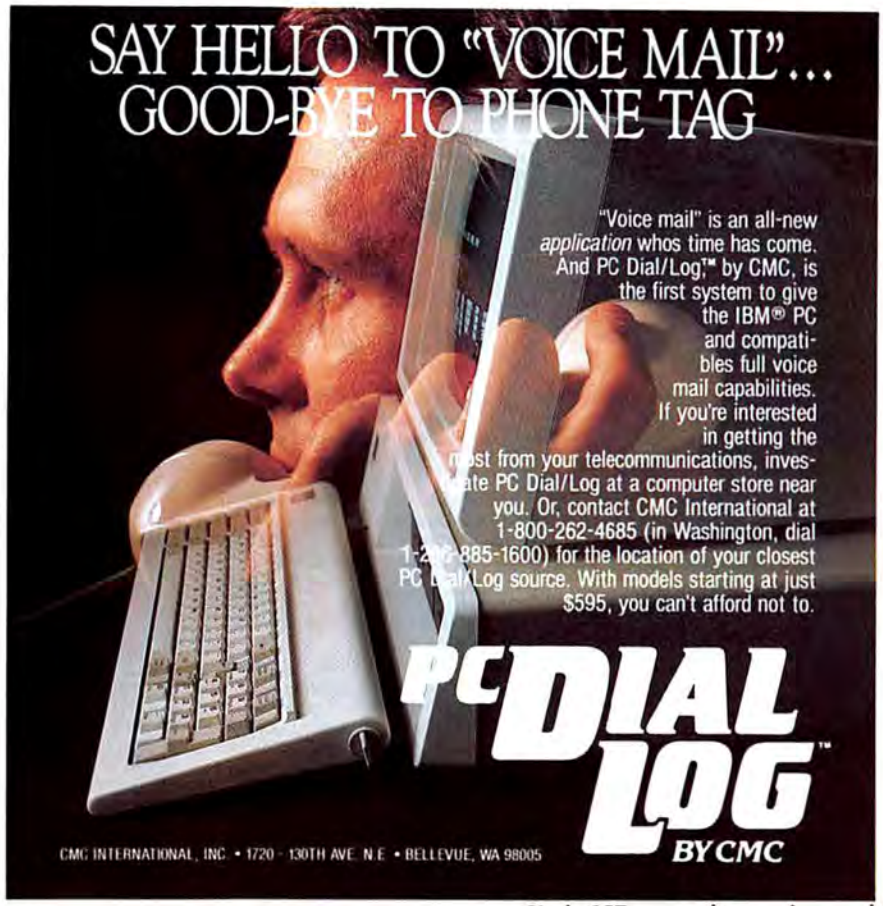
ting the charts on transparency material, then displaying the results with an overhead projector or converting them to slides.

The program would be even better if text could be displayed with more flexibility. Legends along the *Y*-axis can be displayed horizontally or vertically, but the latter means stacking letters vertically. Microsoft's rationale is that you should never have to turn a chart sideways to read it. But *Chart* would be a better program if there were a choice between stacked or rotated vertical legends.

To my wish list for this basically fine program, I'd add a few more things: support for an excellent color graphics board; support for a good slide generation system; a "paint" mode that would allow freehand drawing and pictographs; and support for a mouse to select and move objects. But given its sensible and versatile approach–and its $250 price tag–*Chart* is probably the best available value in a charting program. ●

Steve Lambert is a freelance writer and the author of Presentation Graphics on the IBM PC.

Microsoft Chart
Microsoft Corp.
10700 Northup Way
Bellevue, WA 98004
206/828-8080
List price: $250
Requirements: 128K, one disk drive, DOS 1.10 or later version, color graphics board



Circle 857 on reader service card

IS YOUR HEALTH WORTH $145.00

. . . Don't Take Your Most Precious Asset, Your Health, for Granted . . .

Positive LIFESTYLING™

Helps You Take Charge Of Your World

COMPREHENSIVE
- Covers the key aspects of well being
  - ★ Exercise ★ Nutrition
  - ★ Stress Management
  - ★ Chemical Dependency Control
- Sets goals for eleven factors including weight control
- Tracks an entire family's progress for up to four years

PERSONALIZED
- Provides an interesting & motivating review of your lifestyle
- Gives clear, immediate feedback
- Provides unique, personalized recommendations that guide you towards healthy patterns of living

EFFECTIVE
- Promotes well being by building awareness and self esteem
- Presents data in a clear manner without being simplistic

RELEVANT
- Positive Lifestyling uses concepts developed from extensive research by health experts

EXCITING
- Positive Lifestyling features a full range of exciting graphics and color
- Positive Lifestyling makes improved well being fun, not a chore

EASY TO UNDERSTAND
- Positive Lifestyling can be operated easily by computer novices
- The unique tracking system is stimulating and easy to follow

ACT NOW
- Send $7 for a demo, or $145 for the Positive Lifestyling Program. Add $5 for shipping & handling
- Positive Lifestyling is designed for the IBM PC and compatibles
- Mastercard & Visa welcome
- Contact: Softworld Inc., 9550 Black Mountain Road, Suite G, San Diego, CA 92126, (619) 578-4878

Positive LIFESTYLING™

Circle 710 on reader service card

Business or pleasure, we're your one-stop

HARDWARE

AST RESEARCH

AST 6-PACK PLUS multi-function board. 64K-384K expandable memory, clock calendar, 1 serial and 1 parallel port, includes Super Drive and Super Spool software (optional game port adapter available). 6-Pack Plus 64K **269.95**
For game port option add **34.95**

64K RAM set (consists of 9 pieces) upgrades memory by 64K **49.95**
$10.00 *installation fee (per 64K) with purchase of memory board at time of board purchase only.*

CDC DS/DD disk drive **199.95**

CURTIS

PC-II Pedestal for IBM monochrome display ***New Low Price*** **39.95**
AD-1 Adapter for use of PC-I with Princeton or Quadrome color monitor **7.95**
UNI/1 Universal tilt and swivel base for use with monitor **36.95**
EC-I 3' monochrome extension cable **36.95**
EC-II 3'-9' coiled keyboard extension cable **27.95**
8087 Math coprocessor with diagnostics **174.95**

DCA INC.

Irma Board 3278 Emulation .. **949.95**

IQ TECHNOLOGY

Smart Cable (RS-232C) **79.95**
Eliminates RS-232C cable compatibility problems. Please specify male or female to computer.

KEYTRONICS

New! KB-5151 keyboard **189.95**

MICROSOFT

New! Mouse with software .. **129.95**

MOUSE SYSTEMS

Mouse with pop-up menus. Design your own menus for most programs. Complete software included *(requires RS-232 port)* ..... ***See Box***

PERSYST

Memory expansion card 64K-384K, Parallel and Serial ports, Clock/Calendar and software w/64K **259.95**

QUADRAM QUADBOARD

New! **Expanded Quadboard,** expandable from 64K to 384K, 1 parallel 1 serial and game port I/O bracket and quadmaster software
64K ..... **264.95** 384K **569.95**

STB

RIO PLUS Multi function board 64K-384K exp. memory. 1 serial 1 parallel and game port (game port cable included) clock calendar and PC Accelerator software.
Rio Plus 64K **254.95**

TEAC

Half Height DS/DD Disk Drive **134.95**
CDC DS/DD Disk Drive **199.95**

TECMAR

CAPTAIN multifunction memory board expandable from 64K to 384K.
64K ..... **259.95** 256K **399.95**

HARD DISK DRIVES

ALLOY

Cartridge back-up system for PC/XT & compatibles. 16.5 MB per single cart. *Interface card included* ... **1749.00**

ALLOY PC STOR

New! **PC-STOR** Hard disk drive subsystem w/cartridge tape backup
20 MB (16 FMT) . **Call** 52 MB (41 FMT) . **Call**
40 MB (32 FMT) . **Call** 85 MB (67 FMT) . **Call**

DATAMAC TRUSTOR

10 mega byte external hard disk drive with cabinet and power supply for IBM-PC. Interface card and controller included **999.95**
FIXT Autoboot ROM for Trustor/10 ..... **64.95**

IOMEGA BERNOULLI BOX

10 MB bernoulli box **2295.00**
20 MB (2-10 MB in cabinet) . **2995.00**
10 MB cartridge **69.95**
FIXT Autoboot ROM f/above .. **94.95**

TALLGRASS

Hard drive sub system with backup.
TG-3020 20 MB w/backup .. **2795.00**
DC-600 Data cartridge **34.95**

10 MB Internal Hard Drive for PC w/controller card, Auto boot, Low power **949.00**

DISPLAY CARDS

AST Monograph Plus parallel/serial and clock calendar, Lotus 1-2-3 graphics compatible **399.95**
HERCULES Color Card **179.95**
Graphics Card (Monochrome) **339.95**
New! **PARADISE** Modular Graphics Card **294.95**
64K RAM board expandable to 256K, with clock **209.95**
Parallel port for above **79.95**
PLANTRONICS Color Plus .. **324.95**
STB Graphix Plus II (Color and Monochrome) **349.95**
TSENG Ultrapak Monochrome card, 132 column with Lotus and graphics **469.95**

MODEMS

HAYES

Smartmodem 300 ..... **199.95**
Smartmodem 1200 RS-232 .. **479.95**
Smartmodem 1200B Internal with Smartcom II **419.95**

VEN-TEL

PC Half Modem-Internal 300/1200 modem fits in short slot of XT or PC portable w/Crosstalk XVI **429.95**
1200 Plus-External 300/1200 . **379.95**
(Requires RS-232 Card and Cable)
1200 Baud, Internal
Auto Dial/Answer **259.95**

MONITORS

PRINCETON

HX-12 Hi-res RGB Color **469.95**
MAX-12 Monochrome (to use with Monochrome Card) Amber .. **169.95**

TAXAN

420-12"-super hi-res RGB color **429.95**
122-12"- Amber for PC *(requires monochrome card)* . **144.95**
121-12"-green for PC *(requires monochrome card)* . **154.95**

PRINTERS

BROTHER

HR-15 13 CPS **399.00**
HR-25 23 CPS **649.00**
HR-35 36 CPS **899.00**
Tractor Feed f/HR-15 or HR-25 **124.95**
Single Sheet Feeder for HR-15 or HR-25 ..... **219.95**

DIABLO

630 API letter quality **1499.95**
Tractor Feed **269.00**
Parallel Cable for 630 to PC .. **45.00**
Single Sheet Feeder for 630 . **479.95**

EPSON

RX-100 ... **399.95** RX-80 F/T . **299.95**
FX-80 .... **419.95** FX-100 ... **609.95**
RX-80 .... **249.95** JX-80 Color **599.95**

JUKI

6100 18 CPS Letter Quality .. **429.95**

NEC

3550 letter quality 33 CPS . ***See Box***
2050 letter quality, 18 CPS .. **894.95**
Tractor Feed 3550/2050 ..... **209.95**

OKIDATA

OKI-92 ..... ***Call*** OKI-84 ..... ***Call***
OKI-93 ..... ***Call*** OKI-82 ... **319.95**

OLYMPIA

Compact R/O parallel and serial letter quality **369.95**

PANASONIC

KXP-1090 80 CPS F/T **269.95**
KXP-1091 120 CPS F/T **329.95**

HARDWARE SPECIALS

NEC 3550 Letter quality printer — **$1495.00**

HYPERION 256K portable IBM® compatible
2-320K drives and 7" amber monitor. **Free** Lotus 1-2-3 and an Internal 300 baud modem — **$1895.00**

MOUSE SYSTEM
Mouse with software — **$139.00**

QUADRAM QUADBOARD Model #5256
Memory expansion board w/256K RAM installed, 1 parallel, 1 serial port & Quadmaster Software — **$349.95** LTD. QTY.

ACCOUNTING

OPEN SYSTEM ACCOUNTING
General Ledger, Acct's Receivable, Acct's Payable, Payroll, Inventory, Sales Order Proc., Team Manager — **$419.95** each
BI-286 D (Required to run programs) **$149.95**

IUS Accounts Receivable, Accounts Payable, General Ledger, Order Entry ..... — **$289.95** each
Payroll **$349.95**

OSPREY ACCOUNTING SOFTWARE
Accounts Receivable, Accounts Payable, General, Ledger, Inventory, Sales Invoicing ..... — **$219.95** each

QUME

SPRINT II/55 plus 55 CPS with interface **1599.00**
(Specify IBM PC parallel or standard Centronics parallel).

SILVER REED

EXP-550 16 CPS **449.95**
EXP-770 31 CPS **869.00**
Tractor Feed for EXP-550 ... **124.95**

TEXAS INSTRUMENTS

855 with Tractor Feed **799.95**

TOSHIBA

P1351 Printer **1329.00**
P1340 Printer **779.95**

GENESIS SINGLE SHEET FEEDERS

for Juki 6100 ..... **279.95**
for NEC 3550 ..... **349.95**
for Diablo 630 ..... **349.95**
for Silver Reed 550/770 ..... **209.95**

FLOPPY DISKS

	SS/DD	DS/DD
IBM 5¼" *(10 pk.)*		29.95
MAXELL 5¼" *(12 pk.)*	19.95	29.95
FUJI 5¼" *(10 pk.)*	18.99	24.95
NASHUA 5¼" *(10 pk.)*	17.95	22.95

SOFTWARE

ALPHA

Electric Desk **229.95**
Data Base Manager II **164.95**

ASHTON TATE

Dbase II **289.50**
New! Ashton Tate DBASE III **379.95**
Ashton Tate Framework **379.95**

BEST PROGRAMS

PC Professional Finance II .. **149.95**

BPS

BPS-Business Graphics *(requires color card)* **209.95**

BILLBRIGHT—ROBERTS

Graphics Partner **89.95**
See box for special offer

BUSINESS SOLUTIONS

Jack-2 ..... **269.95**

CBS SOFTWARE

Managing for Success
People Management **59.00**
Personal Development **59.00**
Micro SpeedRead **87.50**
Mastering The SAT **99.50**

COMPUTER EDI TYPE

MagicBind for Wordstar **174.95**
(Req. Diablo, Nec or Qume compatible letter quality printer).

CONCENTRIC DATA SYSTEMS

C.I.P. Concentric Information Processor **249.00**

DOW JONES

Connector **39.95**
Investment Evaluator **99.95**
Market Analyzer *(req. clor card)* .. **239.95**
Market Manager **199.95**
Market Microscope **239.95**
Spread Sheet Link **169.95**

DAYFLO Dayflo (XT/256K) **339.95**

FOX & GELLER *for D Base*

Quick Code* **149.95**
Dutil* **44.50**
D Graph* **149.95**
**For D Base II or III. Please specify*

OZ *(req. 256K & color card)* **219.95**
R Graph (for R Base 4000) **149.00**

FUNK SOFTWARE

Sideways **44.95**

HARVARD SOFTWARE

Harvard project manager **259.95**

HARVARD ASSOC

PC Logo *(req. 128K/color card)* **99.95**

HAYES

"PLEASE" Data Base **229.95**

HERITAGE SOFTWARE

Smartkey II **49.95**

HUMAN EDGE

The Management Edge (128K) **165.00**
The Sales Edge (128K) **165.00**

shopping center for any IBM® PC products.

SOFTWARE SPECIALS

CROSSTALK XVI Communication software	$98.50
PRENTICE HALL Execuvision *(Req. color card)*	$259.95
GRAPHICS PARTNER with purchase of d Base II, d Base III or Framework	$29.95
IN SEARCH by Menlo Park	$279.95
VISICORP VISIWORD PLUS	$104.95

SYSTEMS

MBSI (Real World) ACCOUNTING
General Ledger, Acct's Payable, Acct's Receivable, Inventory Control, Order Entry/Billing, Payroll ..... $399.95 each
Sales Analysis $249.95

STATE OF THE ART ACCOUNTING
General Ledger, Accounts Receivable, Accounts Payable, Inventory, Payroll ..... $409.95 each
Budget and Financial Reporting, Sales Invoicing *(Requires Accounts Receivable)* $379.95 each
Professional Time and Billing $594.95

KNOWARE
Knoware *(requires color card)* 64.50

KRELL SAT 199.95

LIFE TREE
Volkswriter Deluxe 169.95

LIVING VIDEOTEXT
Think Tank *(requires 256K)* .. 134.95

MECA
Andrew Tobias Managing Your Money (128K) 134.95

MICRO DATA BASE SYSTEMS
Knowledge Man 1.6 ..... 249.95

MICRO PRO
INFOSTAR PLUS Version 1.6 .. 274.95
Includes Star Burst
Wordstar Pro Pack 269.95
Wordstar 3.3 ..... 189.95

MICRORIM
R Base 4000 *(requires 256K)* 279.95
Extended Reportwriter 96.50
Clout 119.95

MICROSOFT
Chart 159.95
New! Flight Simulator 34.95
Fortran Compiler MS/DOS ... 229.95
Pascal Compiler 194.95
Macro Assembler 69.95
Multiplan 129.95
Word w/Mouse 279.95

MICROSTUF
Crosstalk XVI ..... *See Box*

MONOGRAM
Dollars & ene 104.95

MULTIMATE
Multimate Version 3.22 ..... 269.95

PBL CORP
Letterform 1000 DOS 2.0 ..... 64.00
Personal Investor 124.00

PETER NORTON
Norton Utilities 49.95

POWER BASE SYSTEMS
Power Base 259.95

PROFESSIONAL SOFTWARE
Word Plus PC with BOSS 279.00

ROSESOFT
Prokey 3.0 ..... 84.00

SIMON & SCHUSTER
Typing Tutor III 32.95

SOFTSTYLE
SET-FX + (f/Epson FX printers) 49.95

SOFTWARE INTERNATIONAL
Open Access *(req. 256K color card)* . 299.95

SOFTREND
Aura (DOS 2.0/256K) 329.95

SOFTWARE PUBLISHING
PFS File ... 89.95 PFS Graph . 89.95
PFS Report 79.95 PFS Write . 89.95

SSI
Word Perfect with Speller 269.95

STATE-OF-THE-ART
The Bookkeeping System 359.95

SOFTWARE ARTS
TK Solver 259.95

SUMMA SOFTWARE
Traders Accountant 299.95
Winning on Wall Street
Traders Data Manager 139.95
Traders Forcaster 169.95

VISICORP VISION
(Reqires XT with 512K)
Calc ..... 229.95 Mouse ... 159.95
Graph .... 149.95 Word 219.95
Application Manager *(required)* 57.95

VISICORP
VisiCalc 4 w/Stretch Calc 149.95
VisiWord Plus 104.95
VisiFile Version 3.0 ..... 99.95

VM COMPUTING
Relay Communication software 99.50

WARNER SOFTWARE
Desk Organizer 169.95

WESTERN UNION EASY LINK
Instant Mail Manager 69.95

- *No surcharge for credit cards.* MasterCard VISA AMERICAN EXPRESS
- *Prompt and efficient service.*
- *Extensive inventory of PC products.*
- *Knowledgable and experienced sales staff.*

We stock an extensive inventory on IBM PC/XT,® Apple,® AT&T,® Kaypro,® Compaq,® Hyperion® and Olivetti® .

Remember Our Name — It's all the Memory You Need.

47st. Computer
Computers and Business Equipment®

A Division of 47st. Photo Inc.

Now at 3 convenient locations

67 W. 47th St. • 115 W. 45th St.
39 Ann Street *Near City Hall and the World Trade Center*

Mail Order Address: 36 East 19th Street
New York, N.Y. 10003

212-260-4410

TOLL-FREE OUT-OF-STATE **800-221-7774**

STORE HOURS:
Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, American Express & personal checks (no delays if approved). Minimum shipping and handling $4.95. Software found to be defective will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the warranty period of manufacturer. Defective items must be sent to 36 East 19th Street, New York, N.Y. 10003, Att: Service Dept. Prices herein are for mail & phone orders only. Store prices may differ. Some items are subject to availability. Due to manufacturers price fluctuations, the prices may change beyond our control. This ad supersedes all previous PC ads.

Keep in touch with the latest items on the market and our up-to-date sale prices by checking our weekly ads in the National editions of the N.Y. Times and Wall Street Journal.

IBM® is a registered trademark of International Business Machines Inc.
PC Magazine Nov. 13-Nov. 27, PC World Dec. 1. Submitted Sept. 13, 1984

Circle 768 on reader service card

Never has an IBM®-compatible printer worked so fast for so few dollars.

With data processing printing at 350 CPS and a price tag of under $2,000, the CI-3500, Model 20 is the fastest IBM PC-compatible printer for the price.

Besides speed, the CI-3500, Model 20 delivers letter quality printing at a swift 87 CPS—more than twice the speed of most daisy wheel printers. And you also get the capability for high resolution graphics, up to 240 X 144 DPI.

The quiet, office friendly CI-3500, Model 20 is as flexible as it is fast and affordable. For instance, a convenient interface cartridge allows you to change your printer's personality simply by changing cartridges.

An operator changeable cartridge compatible with the IBM PC graphics printer is standard. Alternate cartridges compatible with other printers, such as DEC-LA100,® are also available.

A similar font cartridge accommodates multiple font and character sets, so you can avoid costly PROM installations.

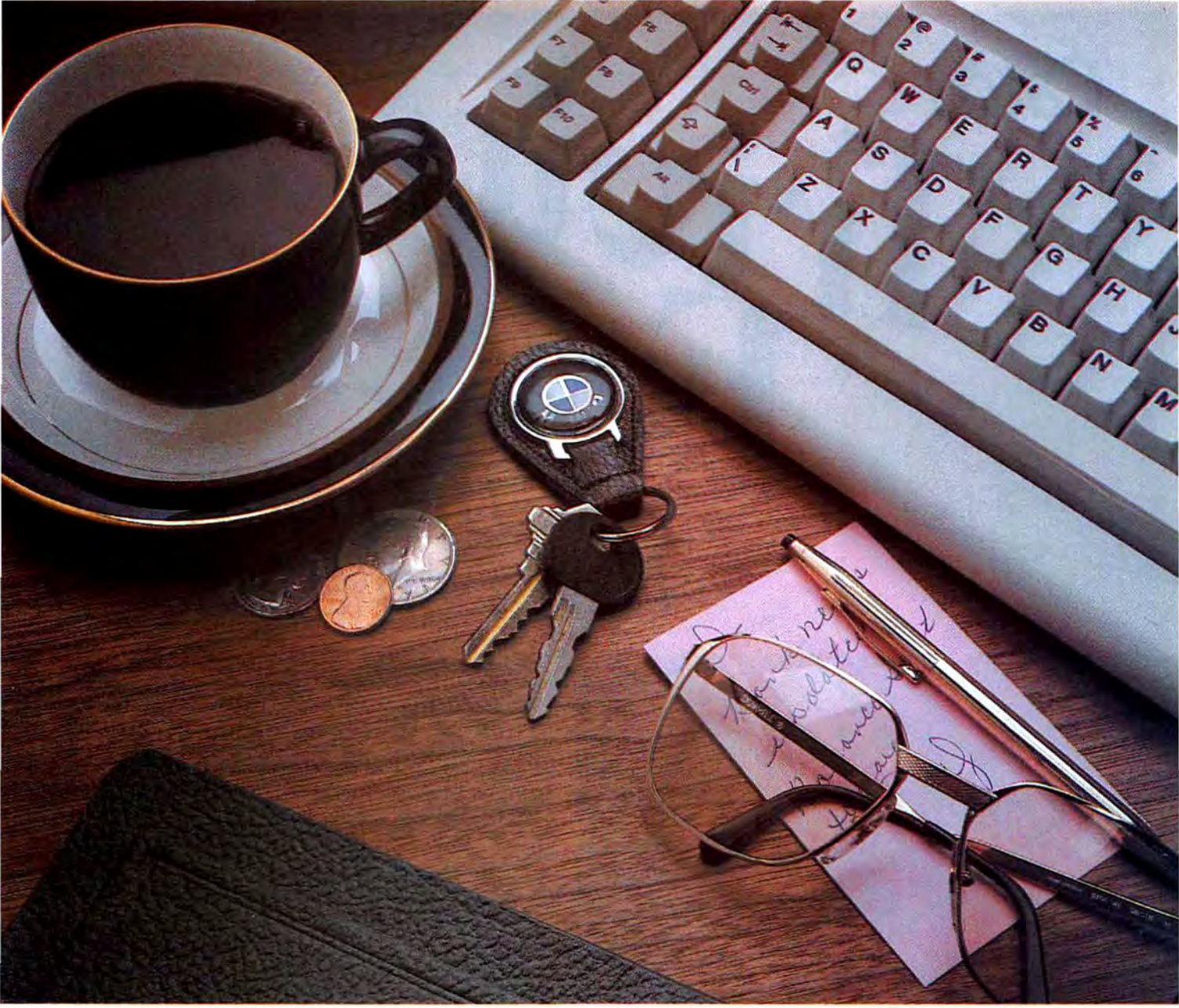
The CI-3500, Model 20 Serial Printer from CIE Terminals. Never has an IBM-compatible printer worked this fast for so little. To find out more, just write or call CIE Terminals, 2505 McCabe Way, Irvine, Ca. 92714-6297. (714) 660-1421. Or call toll-free 1-800-854-5959. In California, call 1-800-432-3687.

CIE TERMINALS
A CITOH ELECTRONICS COMPANY

® DEC-LA100 is a Registered Trademark of Digital Equipment Corp. IBM is a Registered Trademark of International Business Machines, Inc.

© 1984 CIE TERMINALS, INC.

Circle 773 on reader service card



THE ACCOUNTING SYSTEM FOR EXECUTIVE DECISIONS

Fast, accurate information is vital to the executive decision making process. Barron Ross Accounting software, designed for the IBM PC, is a fast, completely integrated accounting system for small-to-medium sized businesses.

We've designed our accounting process specifically to save you time. Data is entered just once, and each software module immediately posts its transactions to the General Ledger.

You can expand your Barron Ross software system from a single IBM PC to as many as twenty-four stations with Execu-Net, the Barron Ross office information network.

Execu-Net compiles information from each work station to quickly create cumulative financial reports. Operators can simultaneously share the same accounting program, spreading the workload among several work stations.

The Barron Ross software line includes:

General Ledger
Accounts Receivable
Accounts Payable
Inventory
Payroll
Sales Order
Purchase Order
Point of Sale
Business Graphics
Communications

Now that we've given you a new dimension in computerized accounting, you can relax with Barron Ross knowing you are keeping pace with today's financial world.

BarronRoss
SOFTWARE DESIGNED for BUSINESS

10933 Trade Center Drive
Rancho Cordova, CA 95670
916/638-0475 800/238-3243

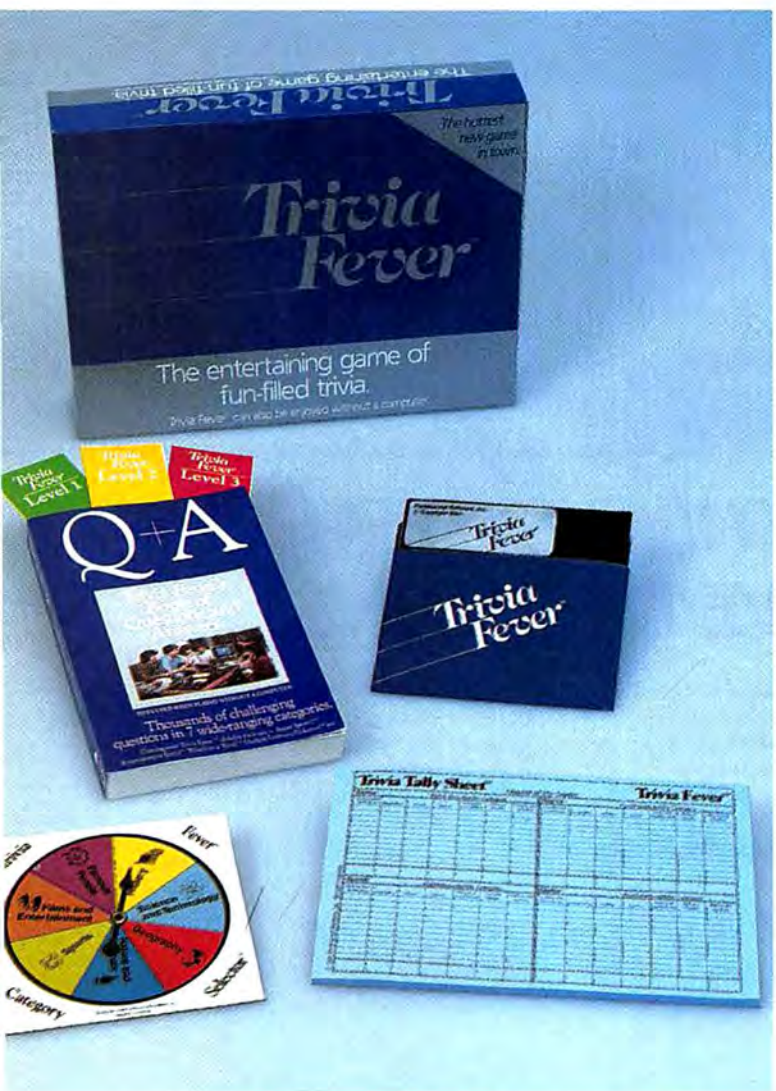
A Computermate Corporation

IBM is a trademark of International Business Machines. Execu-Net is a trademark of Computermate, Inc.

Circle 747 on reader service card

Catch Trivia Fever™

"The Hottest New Game In Town"



At $39.95, Trivia Fever comes complete with Question and Answer Book, Category Selector, and Tally Sheets to be used when played without a computer.

Trivia Fever is absolutely unique — it's the only software entertainment package that can be enjoyed ***with*** or ***without*** a home computer! When played on your home computer, Trivia Fever is a refreshing alternative to all those shoot'em up games. An elected "Master of the Game" uses the computer to randomly select subject categories, handicap players, generate questions and answers, keep score automatically, and more! Instructive by its very nature, Trivia Fever can be enjoyed by up to 8 individuals or teams. And when played without a computer, Trivia Fever has all the best features of the "popular" trivia games plus more — all without the cumbersome board, cards, and little game pieces. You can play in a car, on vacation, anytime, anywhere! And Trivia Fever is by far the best Trivia game available anywhere. Here's why:

Trivia Fever offers thousands of challenging questions in 7 interesting categories, so there's something for everyone. Each category has questions with 3 levels of difficulty, which score comparable points. What's more, Trivia Fever allows players to HANDICAP all those so-called "trivia experts" three different ways, giving everyone a chance to win. And players can easily control the length of play from quick thirty minute games to multi-hour party marathons!

Trivia Fever is unique, entertaining, educational, and most of all FUN. And at $39.95, Trivia Fever is destined to quickly become the best selling software entertainment package of all time. There's even a $5 rebate available to any non-computer users who return the computer diskette.

Trivia Fever can be enjoyed on the Commodore 64, IBM PC & PCjr and compatibles, Apple II series, and others. So don't delay. Catch Trivia Fever at your favorite software retailer today!

For additional information call 617-444-5224, or write to:

PSI P.O. Box 533
Needham, MA 02194

Trivia Fever is a trademark of Professional Software, Inc.

Circle 145 on reader service card

CONFIDENCE

For the New Personal Computer User

The **PC WORLD** starter kit is brought to you by PC WORLD, *The Comprehensive Guide to IBM Personal Computers and Compatibles*, and D-COMP, the leader in value packed confidence building Starter Kits for personal computers.

D-COMP

Contact: D-Comp, Inc., 123 North Broad St.
Lancaster, Ohio 43130, (614) 687-4637

IBM is a registered trade mark of International Business Machines Corp. BASIC SHORTIES and PlaceSavers are trade marks of D-Comp, Inc. PC World is a trade mark of PC World Communications, Inc.

THE SNOOP-PROOF DISK.

Vault Corporation, producer of the advanced Prolok™ and Telelok™ security disk technology, introduces Filelok,™ the inexpensive, effective means of protecting confidential data files from unauthorized access and duplication. Now you can instantly protect all kinds of sensitive information, including word processing, spread sheets and graphics, as easily as saving a file.

Filelok data security disks provide file-by-file security selection, protected back-up copies, optional passwords, and hard disk compatibility. It works with virtually all PC®/MS-DOS® software, including the popular Lotus® 1-2-3,® dBase II® and III,® and WordStar.® All this comes on a U.S.-made 5¼-inch, double side/double density disk of the highest quality. With reinforced hub and lifetime warranty. Certified 100% error-free. The same kind of high performance disks you require every working day with one important difference—they're protected.

Filelok's genius is its simplicity of use coupled with an extremely high level of protection. It looks like an unprotected disk and works like an unprotected disk. Simply tell the computer which file(s) to protect and on which disk drive they're located. Instructions can be as simple as B:FL A:(applications software).

Filelok eliminates the need for expensive add-on hardware. All the technology is on the disk itself. Filelok disks are marked with unique physical "fingerprints." And no two are alike. A precise description of the print is encoded on each disk. Prints and descriptions are compared whenever a protected file is accessed and an *exact* match must occur before any decrypted data is released. Protected back-ups are easily made. However, to read them the original Filelok disk must be present in the system. Unauthorized copies having a different or non-existent fingerprint yield only encrypted—and useless—data.

For the Filelok dealer nearest you, call 1-800-445-0193.
In California, call 1-800-821-8638.
We're adding dealers as quickly as possible but if you can't find one nearby, simply call either of the numbers above. Or write Vault Corporation, 2649 Townsgate Road, Suite 500, Westlake Village, CA 91361. And do it now. Because some people are more nosy than you think.

VAULT
CORPORATION

FILELOK.
DATA SECURITY, RIGHT ON THE DISK.

Copyright © 1984 Vault Corporation. Filelok, Prolok and Telelok are trademarks of Vault Corporation. PC-DOS is a trademark of International Business Machines Corporation. MS-DOS is a trademark of Microsoft Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. dBase II and III are trademarks of Ashton-Tate. WordStar is a trademark of MicroPro International Corporation. Dealer inquiries welcomed.

Circle 278 on reader service card

From the Software Shelf

PC World editors offer first impressions of recent software releases.

To help with Christmas shopping for the family that computes together, we look at recreational software products: computerized versions of chess, cribbage, and twenty questions and an underwater adventure simulation game.

From the Software Shelf samples a small portion of the software flooding the PC market. These reviews, written by the staff of *PC World,* provide a brief glimpse of new word processors, spreadsheets, data base management programs, utilities, tutorials, and other products, including new additions to established software families that might otherwise be overlooked. These impressions are not intended to take the place of full-length reviews of the products but rather to keep you informed of new products that we think will be of interest. *From the Software Shelf* examines programs for ease of use and installation as well as for the strong features or significant weaknesses of these contenders for software fame.

The Right Move

There are skeptics out there, so I've heard, who are aghast at the automation of games that have long served as a crucible for the human mind. These age-old battles of wits, the thinking goes, have been cleansed of the dimension (let's politely call it human conflict) that has made them such potent diversions.

Rubbish. I'm here to tell you that the capacity to be humiliated at chess–a talent I possessed in spades during my playing days–can come as easily at the stacks and registers of a microprocessor as at the hands of a truly skilled (and wretched) friend. I'm thoroughly convinced that *ChessWright,* the callous perpetrator in question, would be a terrible loser. If it ever lost.

ChessWright is polite but unnerving. The problem is the program's built-in clocks–one for each player–which monitor total elapsed time for all moves. This feature hectored me from Game One.

As I plumbed every cranial cavity, sorting and discarding options, the machine methodically ticked off the seconds, then the minutes–a subtle hint that one of us was frightfully slow. *ChessWright* invariably responded with lightning moves–scant hesitation, little apparent indecision, absolutely no trembling. As this pattern repeated itself, I began to find solace in anything less than an instantaneous response to one of my moves. When the machine grappled with a gambit– spending, say, all of 15 seconds before humbling me–calculation time itself became reason for glee. (Better a Pyrrhic victory than none at all.)

If you're a chess buff or merely a bold beginner, *ChessWright* could be the Boris Spassky of your dreams (or nightmares). Like other chess packages, *ChessWright* provides a dynamic way to play the game. Its various bells and whistles manage to add a surprisingly human element to the machine's imperturbable exterior. On top of all that, it likes to win.

ChessWright is both easy to learn and easy to use. You won't need to spend much time deciphering the program; it will serve you well as a learning, or polishing, tool.

Moving pieces is a snap; you can rely on chess notation or the cursor keypad. *ChessWright* notes and plays castling and en passant moves. Although the default skill level is 2, or "average," there are seven degrees of difficulty from which to choose. Should you suddenly feel the old courage reemerging, you can change levels midgame, from blitz/novice (in which the program takes a second or two to move) to master (an hour or two) to postal chess (virtually days). I recommend that you reverse this strategy if you're feeling a sudden tinge of uncertainty amid a shellacking by a lifeless box of printed circuitry and wires.

Whatever your predicament, onscreen assistance is always available. If you're stumped in midgame, you can prevail upon *ChessWright*'s "hint" facility for guidance (although you may need convincing, as I did, that it's not just a devious ploy). Grieving over the loss of your queen to that pawn you neglected to notice? Strike the TakeBack command, and don't tell a soul.

ChessWright's command menu is simple and yields a panoply of features that can't help but improve your game. Games can be saved and restored later for completion or replay. You can display a history of the game on the screen while the game is in progress, or you can print it out later. *ChessWright* will play itself in demonstration mode, or it will sit on the sidelines, enabling two human beings to duke it out while the machine serves as scribe. The program allows you to set up special problems or games and then designate the PC to play either or both sides. Yet another option enables you to replay historic games from a disk-based library of the best of Bobby Fischer, Larry Evans, and others.

If you really like getting riled, you can add sound to the ticking clock, keep tabs on the number of moves, or ring a bell with each move. If your machine sports a graphics board, you can vary the color scheme of the chessboard.

But the board, unfortunately, is *ChessWright*'s single, glaring weakness. Screen definitions of the pieces are abysmal. Pieces of the same color are difficult to distinguish from each other. Even discerning white from black isn't always easy. Images are crude; a shaft of illuminated pixels is all that separates white from black.

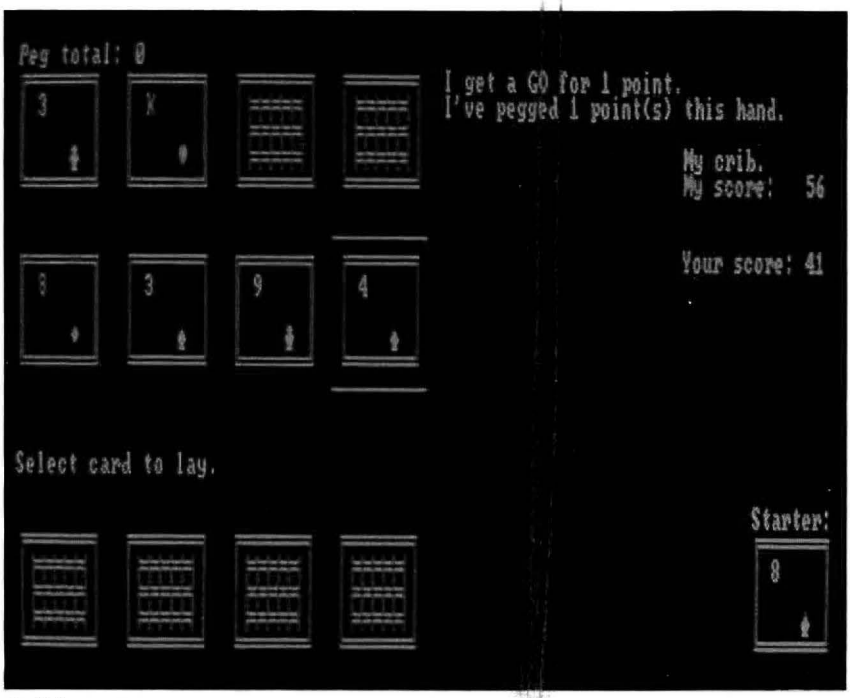
Other than the spartan appearance of the pieces, however, *ChessWright* promises a good tussle, especially if you're rusty. SoftWright Systems, the folks who developed the program, claim that *ChessWright* works two to three times faster on an 8086-based machine. I used a Leading Edge PC equipped with a fairly quick 8-MHz 8088, so I feel slightly redeemed. My advice is to be merciful with yourself: stick to a regular 8088.–KG

ChessWright
SoftWright Systems
P.O. Box 3208
Durham, NC 27705
919/383-4441
List price: $50
Requirements: 64K for DOS 1.10, 128K for DOS 2.00, one disk drive

Cribbage Partner

The introduction of the card game cribbage is credited to the English poet and soldier Sir John Suckling. According to Tailored Data, the manufacturer, Suckling used the basics of an earlier game called noddy to develop "cribbidge" sometime between 1632 and 1639. Since Mr. Hoyle writes about rules and not history, we will have to take Tailored Data's word for the game's beginnings.

My introduction to the game came from two pros, my grandfather and great-grandfather. My grandfather, a canny Scot, developed his playing acumen during cold winter evenings on Prince Edward Island. My great-grandfather left his Missouri home at age 11 and eventually made his way to the California gold fields; he soon discovered he could make more money at a gambling table than at a river sluice. These two men were *card players*, and they elevated cribbage to an art form.



Cribbage Partner keeps track of the scores as you play the game.

Needless to say, with my background I expected a lot from Tailored Data's *Cribbage Partner*, a cribbage game that pits a player against a computer. The game's main menu offers four selections: History, Rules, Strategy, and Cribbage Partner. The Rules section is clear and concise, with well-written explanations. The Strategy section explains which cards to put in the crib, which cards to play, and how to get the most pegging points. The section includes many good tips (some of which echo my grandfather's admonitions to me), takes you through two cribbage hands, and lists five recommended books on the card game.

When you choose the fourth option, Cribbage Partner, the game asks you to select your level of play: Novice, Beginner, Intermediate, or Advanced. Once you make your selection, the game begins. The object of cribbage is to be the first player to peg, or score, 121 points. In place of the traditional wooden cribbage board where points are pegged, the program keeps a running total of the score. The cards in your hand are shown on the screen, but the computer's cards are kept face down until they are played. Like a regular cribbage game, the deck is cut for a starter (card) at the beginning of each hand. You choose which cards to discard into the crib and which to lay down during the play. However, unlike a regular game in which each player counts his or her points during the play, the program calculates every pegging point. *Cribbage Partner* also counts up the points in all hands and cribs. The game's counting ability is efficient and always mathematically correct, but I did miss the old "15-2, 15-4, 15-6 . . . " cant. I beat the computer in our first game, so I won't complain too much.

Cribbage Partner is a well-designed game that can both challenge experts and initiate beginners. Unlike a maze or shoot-'em-up space game, you can't memorize a pattern and score an easy win with *Cribbage Partner*. Cribbage, whether old-fashioned or computerized, depends on the luck of the draw and your playing ability, so each game is different–that's why it's fun. The computer and I are, at present, tied in our matches.

Although *Cribbage Partner* will never give me as good a crib game as my grandfather did, it is a worthy opponent.–KS

Cribbage Partner
Tailored Data, Inc.
4940 Viking Dr. #558
Minneapolis, MN 55435
800/328-5551
List price: $29.95
Requirements: 96K, one disk drive

Seastalker

I had a rough day at the office playing Infocom's new underwater adventure game, *Seastalker*. I ran my submarine into a ship, severely gashed my arm crawling around in the engine compartment, and couldn't find the tool to fix the air supply while my colleagues slowly suffocated around me. Then I was forced to ferret out a traitor and venture forth to battle a mad scientist and his genetic invention, a huge sea monster called a Snark. Nobody said that reviewing software was easy.

A good adventure game draws you in, warps your reality, and makes you believe you are there. Even as I write this article I can taste the stale air from being cooped up in a tiny submarine with my ever-present copilot, Tip. Tip follows you around wherever you go in this game. Sometimes you can order Tip around, but usually he tells you to do it yourself. After a while you get a little tired of Tip.

Seastalker's scenario starts off with dramatic simplicity but gets more complex as you go along: You're an oceanographer working at a research laboratory on Frobton Bay when a message comes in over the videophone from an underwater research station, the Aquadome. A mutant sea monster is attacking, and the dome won't be able to withstand the stress much longer.

You and Tip jump into your trusty submarine, the Scimitar, and try to navigate out of Frobton Bay and make your way to the Aquadome. The plot thickens at the Aquadome when certain traitors rear their ugly electronic heads. Then it's a matter of gathering up the proper tools, clues, and weapons and taking off to kill the Snark.

If you're not well prepared, it can get boring out there on the high seas. Time doesn't pass in this game. Events occur only in response to a certain sequence or number of commands that you type. Depending on what reality you've created for yourself, you could go submarining along forever without finding the Snark. Don't rush off after the Snark until you've spent a good deal of time at the Aquadome picking up clues. Once you're out on the seas you can think about things all you want, but there's not much to do. After a while you get tired of checking the sonar depth and asking Tip questions he refuses to answer. Desperately bored, I took to kissing various tools and electronic instruments. Now I see why sailors begin to lose their minds while living in submarines.

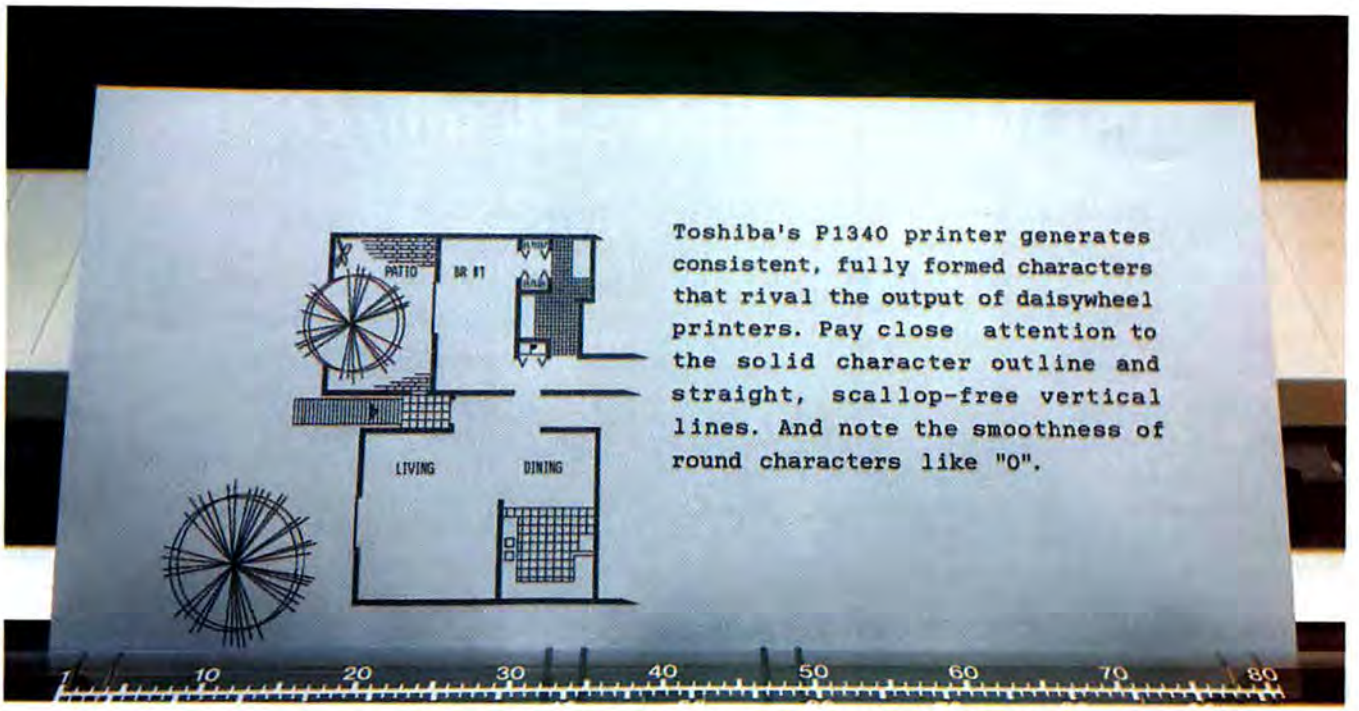
Seastalker is the first in a series of Infocom titles that are designed with the beginner in mind. If you've ever struggled in frustration with adventure games that refuse to accept your input, you will appreciate *Seastalker*'s 800-word vocabulary and the variety of friendly messages that greet syntax errors. Also helpful is the option to save your story to disk at any time so that you don't have to go back to the beginning if you stop in the middle of a game.

Although designed for players age 9 and older, the game is sufficiently complex to challenge an intelligent adult. As with any good interactive game, *Seastalker* can be played many times before you get bored with it. Even if you manage to kill the Snark, you can continue to challenge yourself by improving your score. The score is figured from the ratio of stupid moves (such as kissing a hydrophone) to smart moves (such as solving a puzzle).

Like most of Infocom's interactive fiction games, the narrative, by Jim Lawrence and Stu Galley, is colorful and well written. When you are in the Scimitar, the on-screen type is broken up by a helpful sonar map. Infocom also did a superb job of packaging. *Seastalker* comes with several maps, a logbook, a decal, and even some "infocards" that contain hints you can read by inserting them into a red rubylith decoder.

I won't tell you the exciting conclusion because I never did manage to catch the Snark. I'm still out there kissing my submarine.–EB

Seastalker
Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
617/492-1031
List price: $39.95
Requirements: 48K, one disk drive



Now you can make a great impression for under a grand. The Toshiba P1340 3-in-One printer.

Toshiba has been a pioneer in printer technology and development. Where we have led, others can only follow. Our P1340 printer is an impressive example—the first 3-in-One printer for less than $1,000 that provides high-speed, letter-quality copy, high-resolution graphics and an advanced 24-pin dot matrix print head. And at only $995, the Toshiba P1340 is priced well within your reach.

Perfect impressions. Our unique high-density 24-pin dot matrix print head gives you sharp, clean results from any of the P1340's three resident typefaces. With its 8-mil print wire and overlapping dot pattern, you get letter-quality daisy wheel sharpness and definition—at dot matrix speed.

Impressive speed. You won't have to give up speed for letter-quality results. Because the Toshiba P1340 gives you the best of both. At 54 cps, you get letter-quality copy at better than twice normal letter-quality speed. And even faster draft copy at 144 cps.

An impressive eye for detail. The Toshiba P1340 doesn't just give you high speed, letter-quality type. At 180 x 180 dots per square inch, it also gives you high-resolution graphics that lead the industry.

Impressive versatility. The P1340 is versatile enough to give you your choice of three different resident typefaces. With bold type, underscores, super- and subscripts. And a wide range of condensed printing, line and proportional spacing choices.

And since it features Qume SPRINT 5™ emulation and choice of parallel or serial interface, the Toshiba P1340 3-in-One™ printer can work with an impressive number of word processing programs. And almost every microcomputer, including IBM PC® and Macintosh.™

Impressive price. The Toshiba P1340 printer. It's more than an impressive 3-in-One printer. At only $995, it's also a great buy. For more information call 1-800-457-7777, Operator 32.

SPRINT 5 is a trademark of Qume Corp. IBM PC is a trademark of International Business Machines. Macintosh is a trademark of Apple Computer Inc.

In Touch with Tomorrow

TOSHIBA

TOSHIBA AMERICA, INC., Information Systems Division

Circle 285 on reader service card

The best boards for the IBM PC from the right place...Heath/Zenith

When you buy IBM compatible boards you want performance, not problems or guesswork. So Heath has done the checking and comparing for you. We now sell the finest boards for Heath/Zenith and IBM PC computers. We'll back these products with our 90-day, money back guarantee and we'll back you with instructions on how to install or connect them.

You can buy boards like AST SIX-PAK PLUS.™ 64K memory with room for 384K, serial and parallel ports, printer despooling, clock/calendar with battery back-up, plus a game adapter port for IBM-type joysticks. You get six popular features in one board.

With the DG ANALOG GAME PORT you can plug in analog devices like joysticks and graphic pads. Supports both graphics and joysticks.

The NOVATION ACCESS 1-2-3 MODEM has software selectable 300/1200 baud plus auto-dial and answer. Includes "Crosstalk," the best-selling PC modem software. Crosstalk is an automatic self-contained communications system.

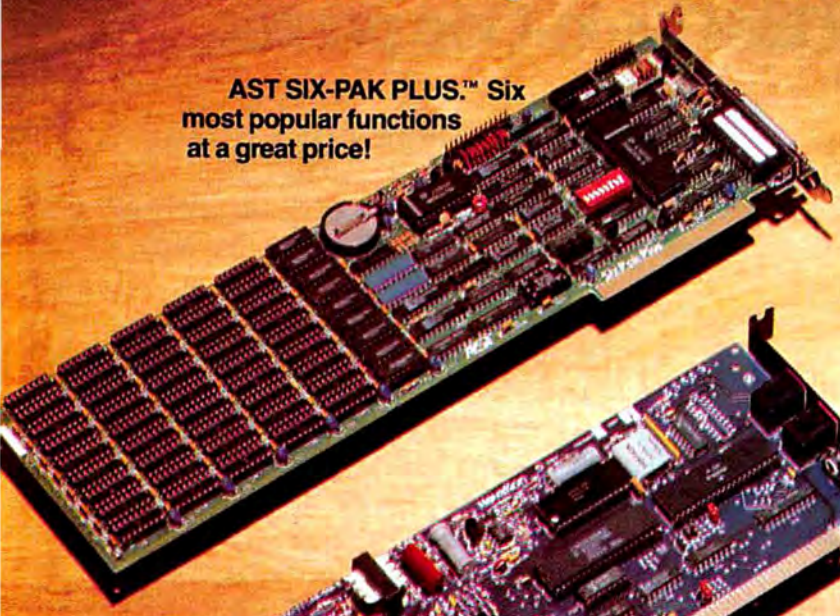
DG MAGIC RAM has four memory banks, individually addressable for 64K or 256K chips.

And those are just the boards! We also stock top names in computer peripherals, software, accessories and computer furniture. All checked for quality performance. So, forget the guesswork. Buy all your computerware at the right price from the one right place. Heath/Zenith.

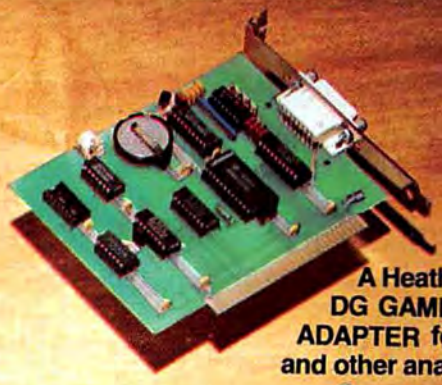
IN-STORE SPECIAL
FREE BOARD INSTALLATION

Buy any of these great boards at a Heathkit Electronic Center* and it will be installed free of charge at the store when you bring in your computer.

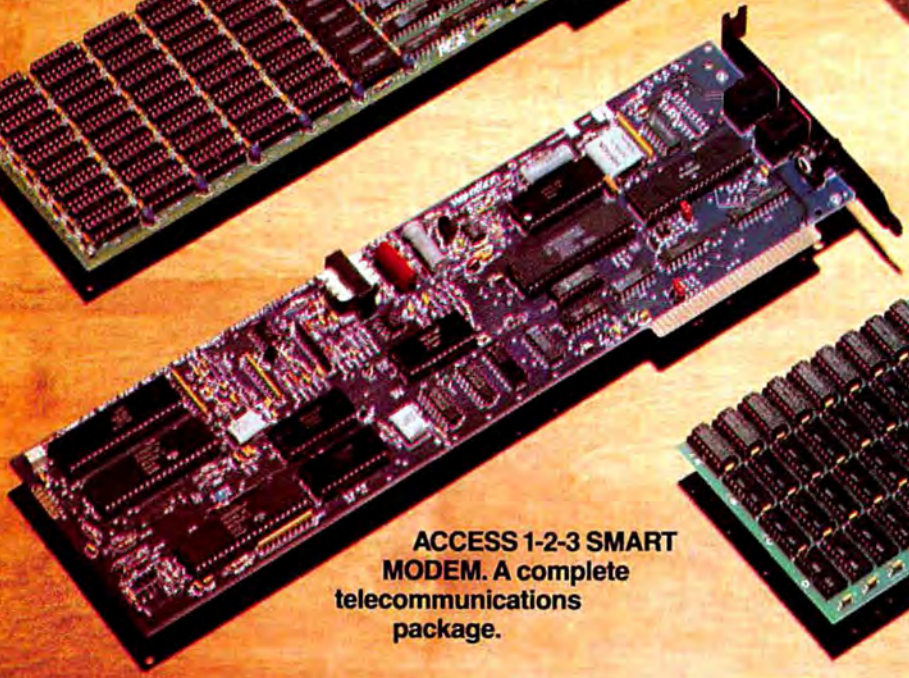
64 stores throughout the U.S. See page at right for locations.



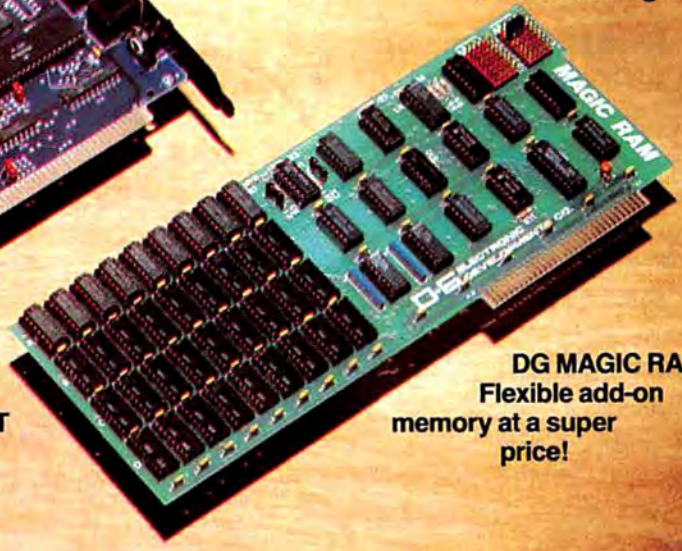
AST SIX-PAK PLUS.™ Six most popular functions at a great price!



A Heath exclusive! DG GAME PORT ADAPTER for joysticks and other analog inputs.



ACCESS 1-2-3 SMART MODEM. A complete telecommunications package.



DG MAGIC RAM. Flexible add-on memory at a super price!

Heath®/Zenith®
Heath Company

See and buy the finest boards and other accessories for your Heath/Zenith or IBM PC.

Find them at these Heathkit Electronic Centers:

- **PHOENIX, AZ** 2727 W. Indian School Rd.
- **TUCSON, AZ** 7109 E. Broadway
- **ANAHEIM, CA** 330 E. Ball Rd.
- **CAMPBELL, CA** 2350 S. Bascom Ave.
- **EL CERRITO, CA** 6000 Potrero Ave.
- **LA MESA, CA** 8363 Center Dr.
- **LOS ANGELES, CA** 2309 S. Flower St.
- **POMONA, CA** 1555 N. Orange Grove Ave.
- **REDWOOD CITY, CA** 2001 Middlefield Rd.
- **SACRAMENTO, CA** 1860 Fulton Ave.
- **WOODLAND HILLS, CA** 22504 Ventura Blvd.
- **DENVER, CO** 5940 W. 38th Ave.
- **AVON, CT** 395 W. Main St., (Rt. 44)
- **JACKSONVILLE, FL** 8262 Arlington Expressway
- **MIAMI, FL** 4705 W. 16th Ave., Hialeah
- **FT. LAUDERDALE, FL** 7173 W. Broward Blvd. Plantation
- **TAMPA, FL** 4019 W. Hillsborough Ave.
- **ATLANTA, GA** 5285 Roswell Rd.
- **PEARL CITY, HI** 98-1254 Kaahumanu St.
- **CHICAGO, IL** 3466 W. Devon Ave.
- **DOWNERS GROVE, IL** 224 Ogden Ave.
- **INDIANAPOLIS, IN** 2112 E. 62nd St.
- **KANSAS CITY, KS/MO** 5960 Lamar Ave., Mission, KS
- **NEW ORLEANS, LA** 1900 Veterans Memorial Hwy.
- **LOUISVILLE, KY** 12401 Shelbyville Rd.
- **BALTIMORE, MD** 1713 E. Joppa Rd.
- **ROCKVILLE, MD** 5542 Nicholson Lane
- **PEABODY, MA** 242 Andover St. (Rt. 114)
- **WELLESLEY, MA** 165 Worcester Ave. (Rt. 9)
- **FARMINGTON HILLS, MI** 29433 Orchard Lake Rd. (At 13 Mile Rd.)
- **EAST DETROIT, MI** 18149 E. Eight Mile Rd.
- **ST. JOSEPH, MI** Lakeshore Dr.
- **MINNEAPOLIS, MN** 101 Shady Oak Rd., Hopkins
- **ST. PAUL, MN** 1645 White Bear Ave.
- **ST. LOUIS, MO** 3794 McKelvey Rd., Bridgeton
- **GREENSBORO, NC** 4620C W. Market St.
- **OMAHA, NE** 9207 Maple St.
- **ASBURY PARK, NJ** 1013 State Hwy. 35, Ocean
- **FAIR LAWN, NJ** 35-07 Broadway, (Rt. 4)
- **BUFFALO, NY** 3476 Sheridan Rd., Amherst
- **JERICHO, LI, NY** 15 Jericho Turnpike
- **ROCHESTER, NY** 937 Jefferson Rd.
- **N. WHITE PLAINS, NY** 7 Reservoir Rd.
- **CINCINNATI, OH** 10133 Springfield Pike Woodlawn
- **CLEVELAND, OH** 28100 Chagrin Blvd.
- **COLUMBUS, OH** 2500 Morse Rd.
- **TOLEDO, OH** 48 S. Byrne Rd.
- **OKLAHOMA CITY, OK** 2727 N.W. Expressway
- **FRAZER, PA** 630 Lancaster Pike (Rt. 30)
- **PHILADELPHIA, PA** 6318 Roosevelt Blvd.
- **PITTSBURGH, PA** 3482 Wm. Penn Hwy.
- **WARWICK, RI** 558 Greenwich Ave.
- **DALLAS, TX** 2715 Ross Ave.
- **FORT WORTH, TX** 6825-A Green Oaks Rd.
- **NORTH HOUSTON, TX** 5050 FM 1960 W. (#126)
- **HOUSTON, TX** 1704 W. Loop N.
- **SAN ANTONIO, TX** 7111 Blanco Rd.
- **SALT LAKE CITY, UT** 58 East 7200 South, Midvale
- **ALEXANDRIA, VA** 6201 Richmond Hwy.
- **VIRGINIA BEACH, VA** 1055 Independence Blvd.
- **SEATTLE, WA** 505 8th Ave. N.
- **TUKWILA, WA** 15439 53rd Ave. S.
- **VANCOUVER, WA** 516 SE Chaklov Dr. (# 1)
- **MILWAUKEE, WI** 5215 W. Fond du Lac

Units of Veritechnology Electronics Corporation.

For more information write:

Heath Company
Benton Harbor, MI 49022

OR CIRCLE READER SERVICE NUMBER

CB-102R1

Circle 73 on reader service card

Question

I remember summertime vacations when seven of us crowded into the family station wagon for a long drive across the country to visit relatives. By the second day, with a child's sense that time and distance are infinite, I was squirming with boredom. At this point we always played the game twenty questions, in which my younger sister would think of an object and I had to read her mind. "Is it bigger than a breadbox?" usually began my brilliant cross-examination, followed by the probing "Is it animal, vegetable, or mineral?"

Alpha Software Corporation has converted this familiar pastime into an educational game for adults and children. The new twist is that *Question* deduces the object of your choice by asking you a series of questions such as "Does this animal have flippers or fins?" and "Do its front teeth grow constantly?" Your job is to know your facts (that's the educational angle, in case you were wondering) and correctly answer yes or no. Assuming the item is in the game's data base, *Question* will usually divine the object after no more than eight questions.

Question's data base has 500 items that fall into three categories: Animals, Cities of the World, and Famous People. The game's outstanding feature is that you can create a data base for any skill level by adding or deleting questions, items, and categories. After the program disk is full, you can switch to a second data disk to store additional items. A special feature lets you review the list of items in the data base.

For the sake of anyone new to computers, Alpha Software has bent over backwards to ensure that there are no problems in playing the game. *Question*'s simple design makes it easy to play without instruction, but the documentation includes a detailed tutorial anyway. Erring on the side of caution, Alpha Software also provides an instructional cassette tape that talks you through the tutorial, a unique approach in games software.

Question's major selling point as an educational game is that it won't get boring because you don't stop learning. The bonus is that *Question* is simple to learn and use. Best of all, if you have a lap-size PC compatible and a copy of the BASICA language, you can bring *Question* along for fun wherever you go.–CW

Alpha Software Corp.
30 B St.
Burlington, MA 01803
800/451-1018, 800/462-2016
Massachusetts, 617/229-2924
List price: $45
Requirements: 64K, one disk drive

Sigma Designs' Trail Guide To High Performance.

The trail to high performance starts with a company which builds added-value and rugged reliability into everything they make: SIGMA DESIGNS' boards are multilayered for superior noise protection, their software is developed for *full* compatibility and thoroughly debugged, interfacing is consciously made easy, and all products are subject to rigorous burn-in and quality control testing.

These are just a few of the added-value procedures that SIGMA DESIGNS routinely provides for its customers to ensure that they not only get on the high performance trail, but stay there as well.

Expansion Cards

Start your climb to the top with our full line of boards to provide added functionality to your PC: 1) RAM only *SDI-384*, which fits into the short PC XT or the PC portable slots; 2) the *SDI-SSC*, which offers a parallel and serial port plus clock, game adapter, *Spool* (a print buffer) and *Softdisk*, a virtual disk in RAM; 3) the *MAXIMIZER*, which provides both RAM and multifunction in one powerful multilayered board; and 4) our *Floppy Controller II* which supports both standard and high density (1.2, 2.6 MB) drives.

Mass Storage Kits

SIGMA DESIGNS' mass storage kits open up the trail to increased power, with several products to choose from: Winchester drives in 10, 20, 33, and 120 MB capacities. For maximum utilization of space in your PC, half height configurations are available in 10, 20, and 32 MB sizes. All hard disk kits include high performance controllers with SIGMA DESIGNS' own ROM BIOS, written for direct boot-up from hard disk, handling data twice as fast as your XT with complete software and DOS compatibility. Other kits, such as our 2.6 MB MegaFloppy, 5 and 10 MB Removable Hard Disk, and 45 and 60 MB Streaming Tape Backup, offer either an alternative to hard disk storage or dependable means for backing up your irreplaceable data. Our proprietary Tape

IBM PC, IBM XT, SUPERCALC, and Lotus 1-2-3 are respective trademarks of IBM, Sorcim, and Lotus.

Utility software allows you to back up a 10 MB disk in 3 minutes in image mode. Other features include: file-by-file, menus, recursive directory, directory creation, multi-tape, and indirect file list.

Stand-Alone Subsystems

For the rugged individualist who wants transportable stand-alone, high performance with the best of both mass storage and reliable data backup, our SWS Series of subsystems let you mix and match all the options available in kit forms. These are compact, self-powered cabinets, capable of housing one full height or any

combination of two half height Winchester, Megafloppy, Streaming Tape, and Removable Cartridge drives.

Expansion Chassis/Subsystem

What if you need both expansion cards and mass storage, but have run out of space in your PC? Take a side trip to our Expansion Chassis. The *EWS* model accommodates up to 9 expansion cards with full DMA support, has room for two full size or four half height drives (or any combination thereof), and packs a heavy duty power supply, to keep all components working at a fast pace. The *MWS* model, with its five expansion slots and space for one full size storage device, benefits from the same good looks and no-nonsense functionality which earned its big brother an enviable reputation for beauty with brawn.

Graphics Cards

Now that you're really marching along, how about adding some color and sophistication to your gear? In addition to our IBM compatible Monochrome and Color Graphics cards, you will find high resolution (640x400), expanded display memory (1024x1024), and a full palette of 16 colors in our *Graphics Dazzler* and *Enhancer* card combination. With the same features but a smaller display memory (640x400), the *Dazzler II* board completes this series of cards, making them perfect for specialized CAD/CAM applications. To run your Lotus 1-2-3, SuperCalc or other popular graphics packages at twice their normal resolution, 16 colors, and without software modification, try the *Color 400* card with our *High Resolution Monitor*. They'll put you on the high trail to graphics you never dreamed of.

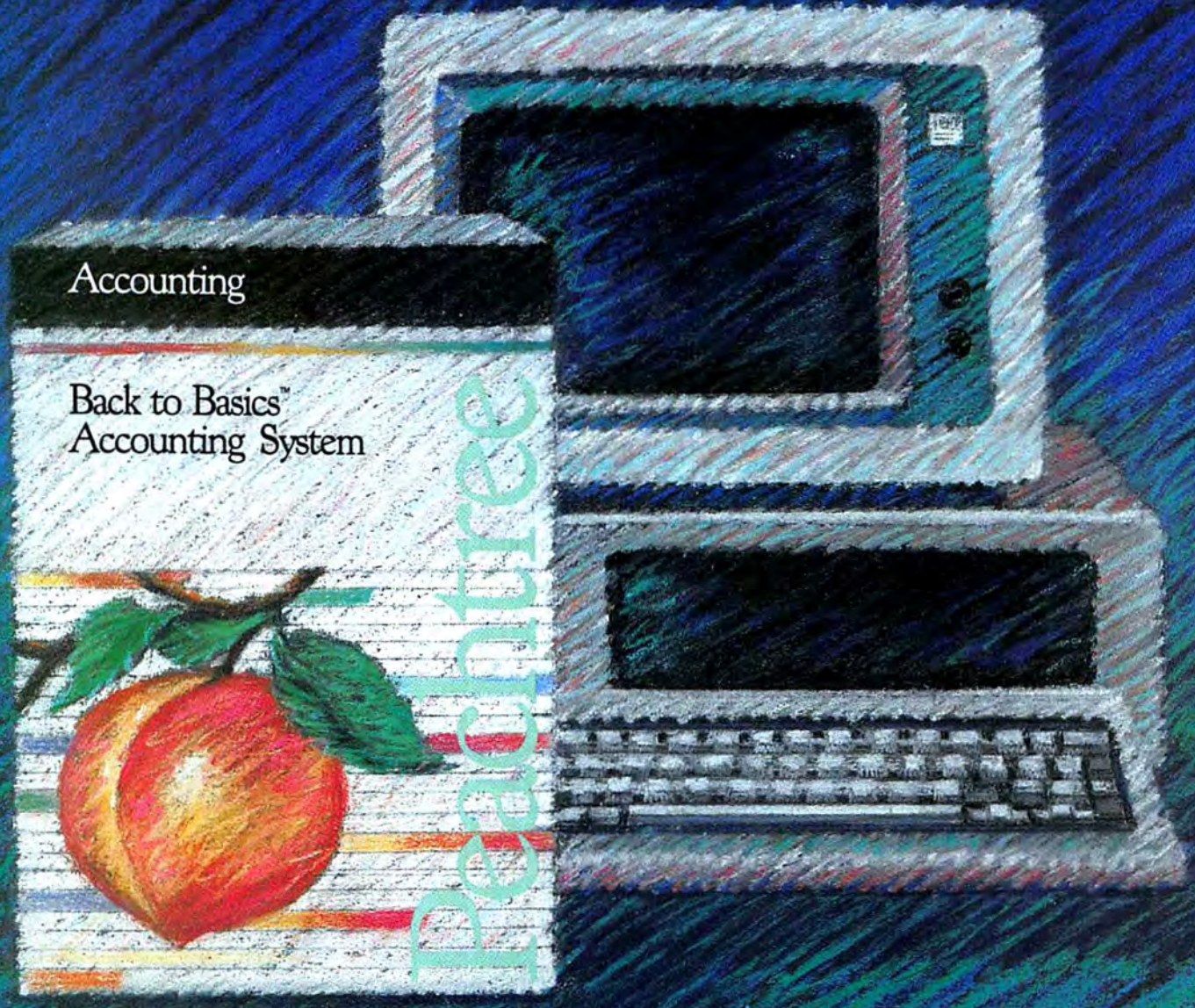
Just Whistle

If you can't find us in one of your local stores, call or write us. We'll be happy to put you in touch with someone close to you. Sigma Designs, 2023 O'Toole Ave., San Jose, CA 95131, (408) 943-9480, Telex: 171240.

SIGMA DESIGNS

Circle 169 on reader service card

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 trademarks of Peachtree Software Incorporated, an MSA Company.

Circle 286 on reader service card

The One-Price Printers.

One low price includes everything... but the paper.

The Brother 2024L dot matrix printer comes standard with advanced features like a bidirectional tractor and parallel interface. And it produces the best print quality you'll find in a matrix printer, using its 24-wire print head to place dots in a dense high resolution pattern.

Switch from word processing to draft speed at the press of a button. The 2024L uses the two most common sets of escape codes to match your word processing, data processing or graphics software. Other front panel switches make operation easy. The 2024L's paper-saving design lets you tear off sheets one inch from the print head. And it's compact, reliable, and quiet. For long life and active use.

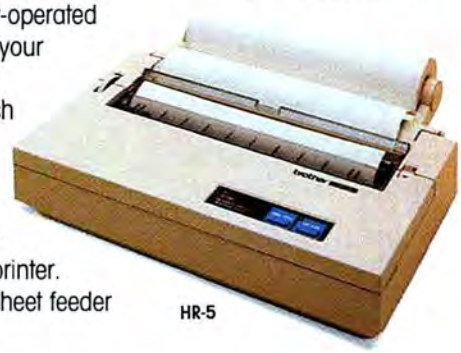
2024L
(under $1500)

SF-50
(optional Sheet Feeder)

For portable printing, the M-1009 is the smallest dot matrix printer in the world today. But don't let its size fool you. Big features like a bidirectional logic seeking 9-pin print head, front panel controls, and parallel interface are standard with the M-1009. It even comes with a tractor feeder and acoustic cover.

M1009
(under $250)

The briefcase Brother HR-5 is a battery-operated thermal printer small enough to fit next to your computer in a standard-sized briefcase. Switch from thermal paper to smooth-finish plain paper using a cartridge ribbon. And the parallel interface is included in its low price.



HR-5

In fact, our only option is the automatic sheet feeder you can add to your 2024L printer. Choose letter size or an adjustable large-sheet feeder for smooth, unattended operation.

Let us tell you more about one-price printing. Call or write today:

Suggested retail prices and specifications subject to change without notice.

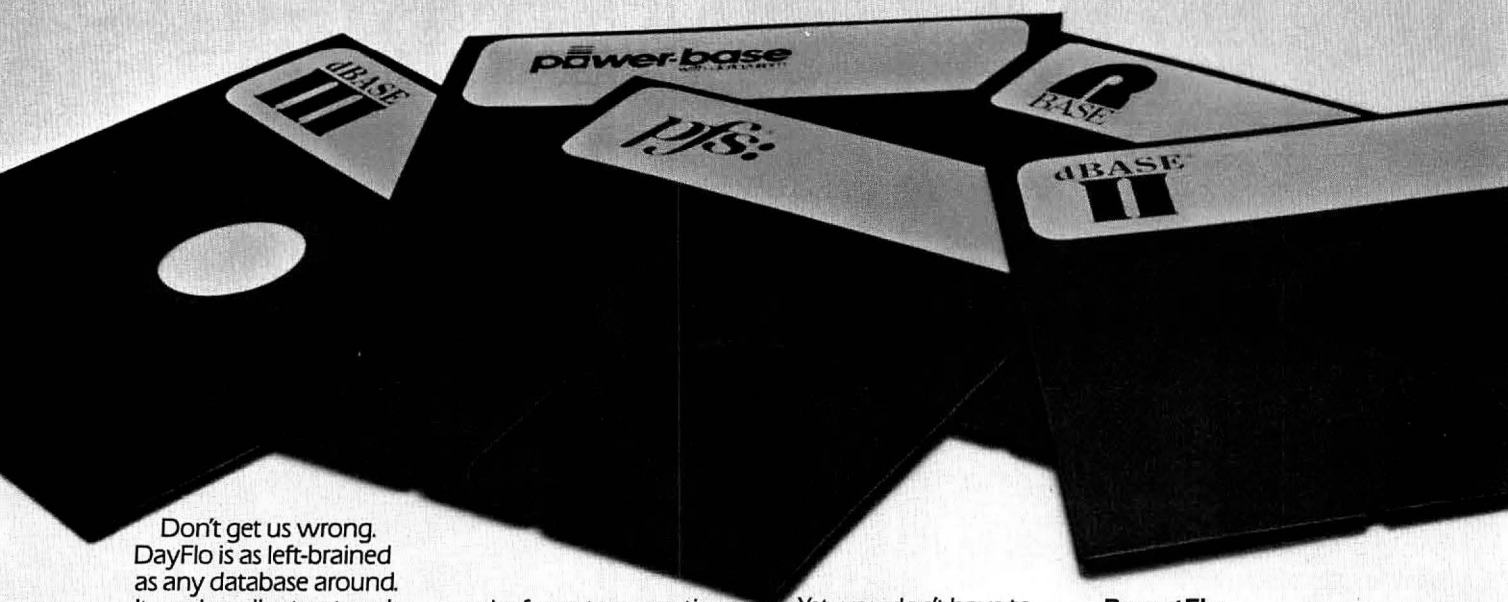
BROTHER INDUSTRIES, LTD.
Nagoya, Japan

brother®

BROTHER INTERNATIONAL CORP.
HEADQUARTERS:
8 Corporate Place, Piscataway, N.J. 08854
(201)-981-0300
WESTERN REGIONAL OFFICES:
20 Goodyear, Irvine, CA 92718
(714) 859-9700

Circle 896 on reader service card

Traditionally, databases have been left-brained.



Don't get us wrong. DayFlo is as left-brained as any database around. It can handle structured information such as customer lists and personnel records. Keywords and field names are used to gain access to records.

Just like traditional databases.

However, solving traditional problems in traditional ways is just one side of DayFlo. It's also flexible enough to handle today's new challenges in exciting new ways.

And that's where strictly left-brained databases get left behind.

The First Free-Form Database.

In the real world, there's always an exception to the rule.

Which wreaks havoc on traditional databases. For example, because of fixed formats, entering a new field such as a Telex number into a single customer record is next to impossible. Unless you're prepared to reprogram and reformat your entire database.

DayFlo, on the other hand, eliminates these tedious operations.

Word-Oriented Database.

Unlike traditional databases, DayFlo has integral word processing. For instance, you can store letters and memos along with customer lists in the same database.

Now you're free to manipulate data at will. Free to enter, retrieve, edit and shuffle information whenever and wherever you please.

Every fact you need, from key client lists to spontaneously entered notes and ideas, is just a few keystrokes away.

Power, Yes. Programming, No.

DayFlo is a powerful package that runs on an IBM PC with hard disk, Compaq Plus, or compatibles.

Yet, you don't have to be a programmer to use it.

So you see, DayFlo is a much greater information management tool than any traditional database. Much more flexibility and power than pfs. Much easier to use than dBASE II.

ReportFlo.

With our ReportFlo package, you can produce presentation-quality documents, reports, letters, memos and so forth from the data stored in DayFlo. This potent report writer also performs calculations.

COMPARING DAYFLO TO TRADITIONAL DATABASES

TRADITIONAL DBMS	THE BENEFITS OF DAYFLO
• Fixed record format. All records must look alike.	• Free-Form record format. No two records need look alike. All record formats are stored in same database.
• No word processing capabilities.	• Integral word processing. Create and store letters, memos, notes, ideas, etc.
• Fixed field length.	• Variable field length. No counting character spaces.
• Adding new fields requires remapping or reformatting of database.	• Instantly add new fields to existing records without reformatting the entire database.
• One value per field.	• Multiple values per field. Information where you want it.
• Retrieves data based on pre-planned criteria only.	• Retrieves information based on content or key words.

WHAT YOU CAN DO WITH DAYFLO

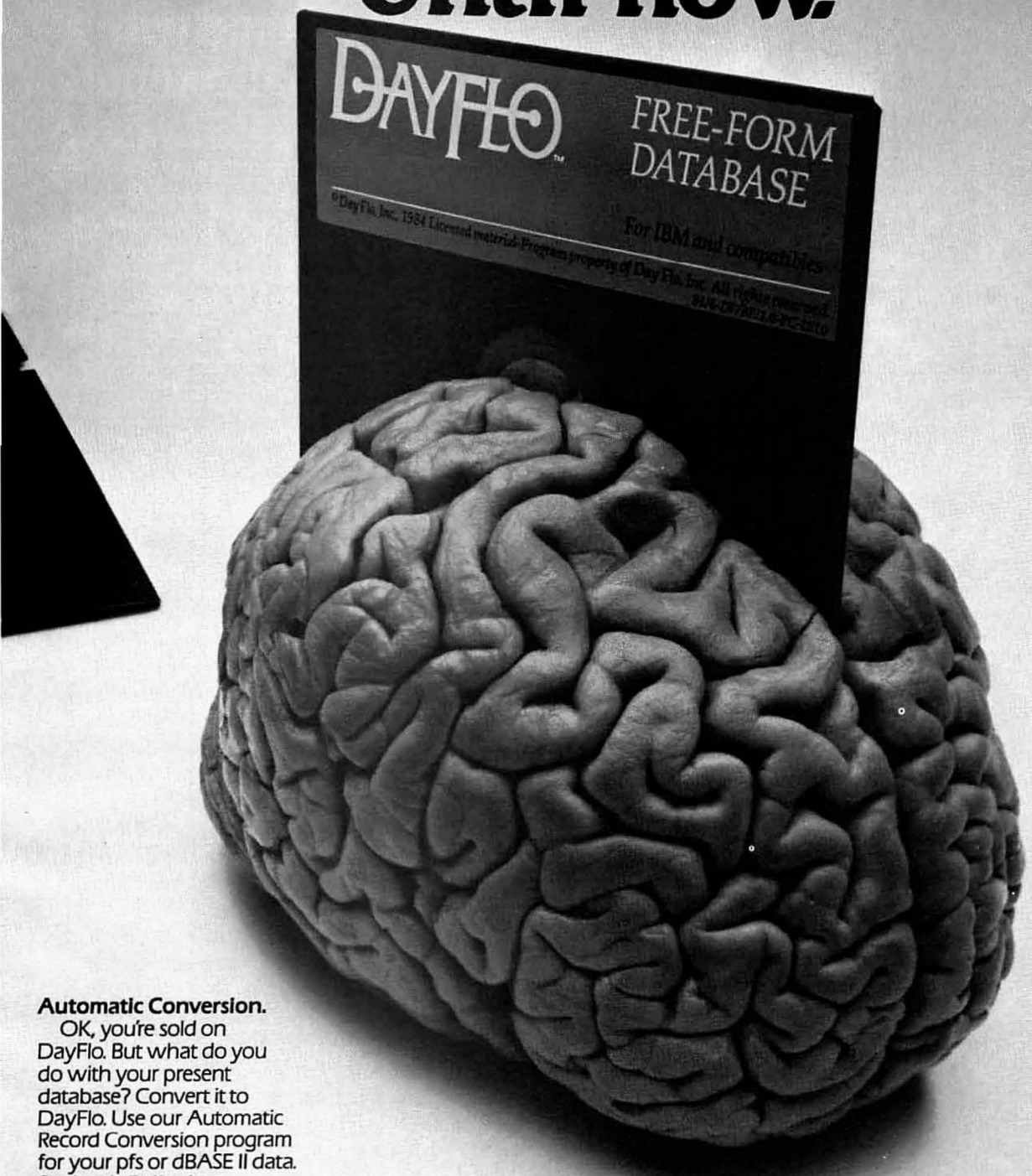
- Client Record Tracking
- Sales Lead Tracking
- Personnel Records
- Letters, Memos, Reports
- Form Letters
- Note Taking
- Purchase Order Tracking
- Project Management
- Field Service Tracking
- And much more

NOW ALSO AVAILABLE FOR IBM PC AT

IBM® is a registered trademark of International Business Machines. Compaq Plus™ is a trademark of Compaq Corp. pfs:® is a registered trademark of Software Publishing Corp. dBASE II® and dBASE III™ are trademarks of Ashton-Tate. R:BASE™ is a trademark of Microrim. Power-base™ is a trademark of Power Base Systems, Inc. Telex® is a registered trademark of The Western Union Telegraph Co.

Circle 211 on reader service card

Until now.



Automatic Conversion.
OK, you're sold on DayFlo. But what do you do with your present database? Convert it to DayFlo. Use our Automatic Record Conversion program for your pfs or dBASE II data.

Seeing Is Believing.
Visit your nearest DayFlo Dealer and see DayFlo in action for yourself. Or, if you prefer, we'll send you a Demo Disk for $10. For details, call 1-800-7DAYFLO. In California, call 1-800-CDAYFLO.

And please ask questions. Anything your brain, either side, can conjure up.

DAYFLO™

The right brain will love it.

DayFlo, Inc., 2500 Michelson Drive, Building 400, Irvine, CA 92715

© 1984 DayFlo, Inc. DayFlo™ and ReportFlo™ are trademarks of DayFlo, Inc.

What if you could get more personal with a personal computer?

Even computer veterans, who have seen and done it all, software-wise, are amazed when they see Framework™ run.

Framework makes your PC truly personal, so it can think and work the way you do.

Framework is the logical step beyond spreadsheet-based, integrated software like 1-2-3.™ Only it's more of a leap than a step. With Framework you can play with ideas, words and numbers as deftly as last generation software let you handle numbers alone.

Framework goes beyond integration. It unites a unique outlining function, word processing, spreadsheet, graphics, data management and telecommunications with a common command structure. It runs other PC DOS compatible programs within itself. Macros are easily written and applied. And it contains a full applications language, Fred,™ which has already made it a hit with third-party developers.

Framework lets you get personal with your personal computer.

For more information call (800) 437-4329, extension 225, or in Colorado (303) 799-4900, extension 225.

ASHTON·TATE®

FRAMEWORK™

Framework. For Thinkers.™

Framework, Framework. For Thinkers., Fred and Ashton-Tate are trademarks of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corp. ©1984 Ashton-Tate. All rights reserved.

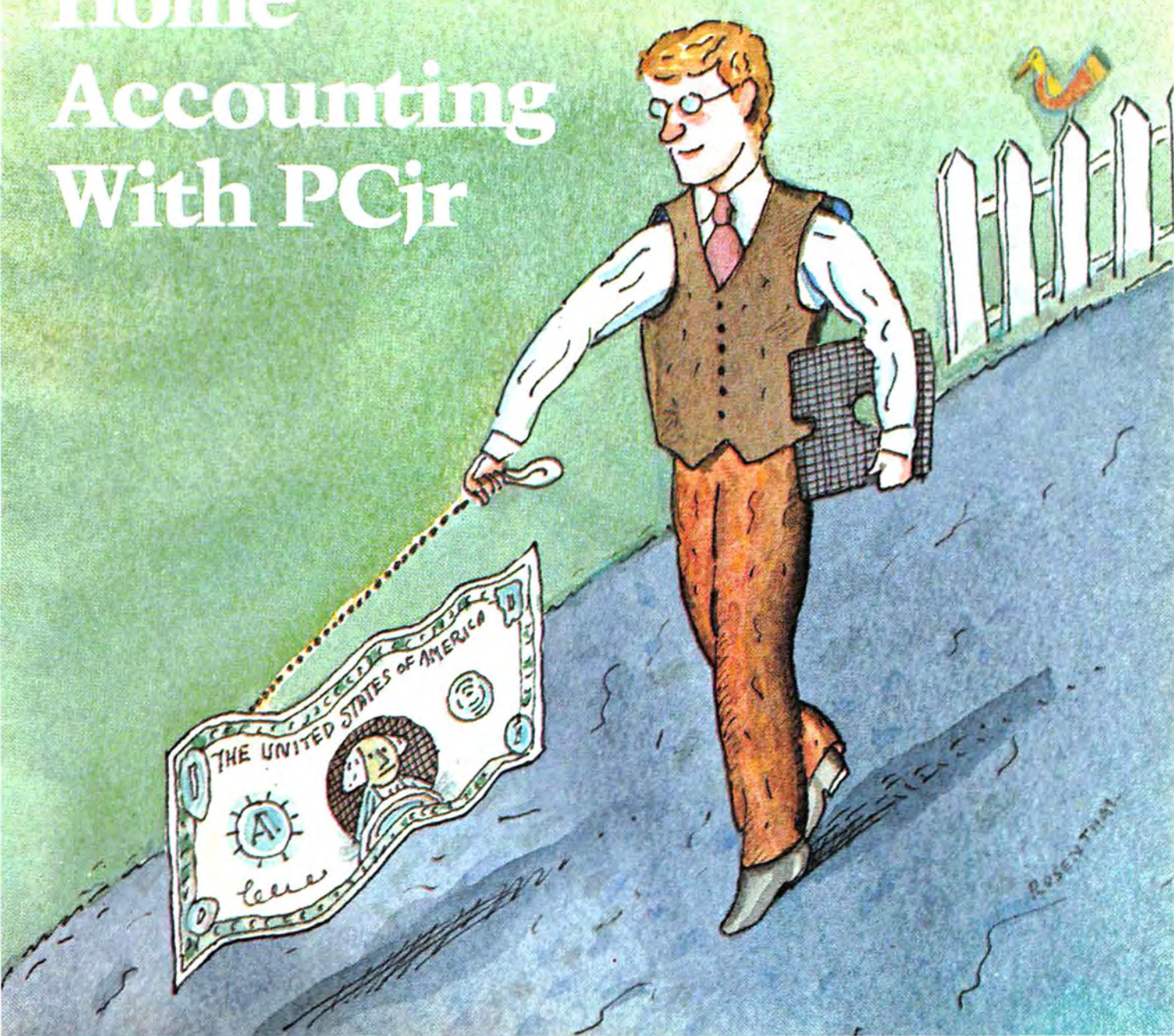
Circle 867 on reader service card

PCjr WORLD

December 1984

The PCjr Magazine

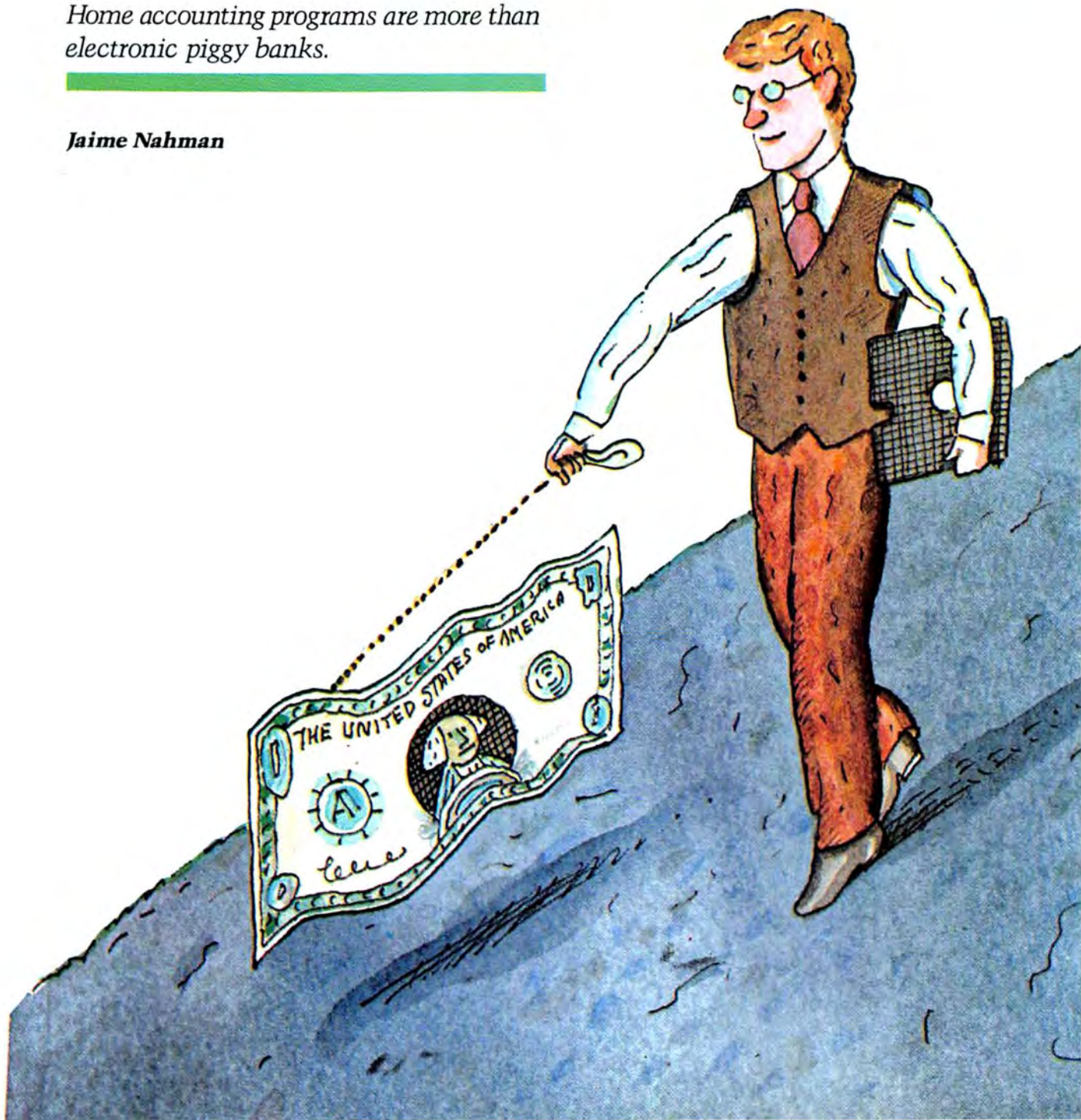
Home Accounting With PCjr



Holding Yourself Accountable

Home accounting programs are more than electronic piggy banks.

Jaime Nahman



Are you considering spending your hard-earned dollars on a home accounting program? In addition to keeping track of your home finances, these programs usually promise to give you insight into your monetary situation and help you to manage your money more effectively.

Home Accountant Plus, Home Accountant jr., and *Dollars and $ense* are among the best-selling home accounting programs. These programs help you set up and monitor your books in much the same way that a bookkeeper keeps track of a small business's general ledger. A business usually requires inventory control and cost management. Your income and expenditures, while not usually as large as a business's accounts receivable and accounts payable, need just as much organization.

What to Look For

When you evaluate a home accounting program, you should examine its capacities and limitations—the number of main accounts, such as assets, liabilities, income, and expenses, that the program allows and the number of distribution accounts, such as mortgage, food, and clothing, that each main account can handle. You should also check to see whether or not the program places a limit on the number of transactions per month or per year.

The ability to flag transactions for tax purposes is also necessary. This feature can, of course, save you from a mad scramble for receipts come tax time, but you can use these flagged records as financial planning tools long before April 15. You can, for example, examine these records on a monthly basis to keep a running total of your tax write-offs or liabilities.

It is imperative that a home accounting program include a split transaction feature so that expenses are distributed to proper budget and tax categories. For example, a monthly check to a mortgage company represents a triple transaction. First, the full amount of the check, which is applied to a principal, is debited against a liability account, the mortgage. At the same time it is credited toward an asset account, the house account, since with each payment you own more of your house. A third part of the check, the portion paying the interest on the loan, is a tax-deductible expense and must be so recorded.

An essential feature of a home financial program is an automatic transaction function that allows you to predefine repetitive transactions. Regular transactions such as mortgage, insurance, and car payments are standard parts of a bill-paying routine. Deposits, such as semimonthly paychecks or trust fund payments, are often the same amount each time. A good financial program permits you to save such transaction information on disk, enabling you to recall the information automatically when it is needed.

Home accounting programs can often print checks for you, but you normally have to order special checks to make use of this feature. In addition, some programs produce reports and statements, such as budget and forecasting reports and net worth statements. Some home accounting programs can also display or print reports and forecasting information in graph form.

Two Popular Programs

Home Accountant Plus, which runs on the IBM PC, and *Home Accountant jr.*, which runs on the PCjr, are from Continental Software. Since the two programs are almost identical, they will be referred to as the *Home Accountant* programs throughout the review. Differences between the two versions will be specified. *Dollars and $ense*, from Monogram (a division of Tronix Publishing), can run on either the IBM PC or the PCjr. The *Home Accountant* programs run under DOS and permit you to make backup copies. *Dollars and $ense*, which runs under the UCSD p-System, is copy-protected, but the package includes a backup program disk.

A major difference between the *Home Accountant* programs and *Dollars and $ense* is their screen designs. Both versions of *Home Accountant* are designed for a 40-column display. Although this design is workable, most people prefer an 80-column display. *Dollars and $ense* offers the choice of a 40- or 80-column display.

The Home Accountant *programs let you view only one transaction at a time;* Dollars and $ense *displays a screenful of transactions.*

All the programs are menu-driven. *Home Accountant Plus* maintains 200 main accounts, or, as the program calls them, budget categories. A total of five checkbooks are tracked. *Home Accountant jr.* maintains 100 main accounts and five checkbooks. Neither version places a limit on the number of distribution accounts or annual transactions for the fiscal or calendar year, but *Home Accountant Plus* handles only 2000 transactions per data disk, and *Home Accountant jr.* handles 1000. *Dollars and $ense* permits a total of 120 main accounts, of which 12 may be defined as checking accounts. The number of distribution accounts is limited only by disk size. *Dollars and $ense* can work with up to 2000 transactions on a single-sided disk and up to 4000 on a double-sided disk.

The programs differ in how they display transactions during data entry. The *Home Accountant* programs let you view only one transaction at a time; *Dollars and $ense* displays a screenful of transactions. Since the *Home Accountant* programs don't offer scrolling or page-back commands, you have to exit and then reenter the data entry function in order to change a prior transaction. *Dollars and $ense* allows you to change any transaction by scrolling forward or backward through the transaction listings during data entry.

Automatic and Split Transactions

Both programs flag transactions for tax purposes and allow unlimited split transactions. Both programs have provisions for automatic transactions, but this feature reveals the major differences between the two programs. The *Home Accountant* programs permit only 5 automatic transactions per month per checkbook, for a total of 25. In contrast, *Dollars and $ense* permits 100 automatic transactions grouped into 25 sets, for a total of 2500.

You can't skip over automatic transactions. When you set up your accounts, you have to plan which automatic checks need to be paid weekly, monthly, and quarterly. You wouldn't, for example, want to put a monthly transaction with weekly payments, because you can't pass over this transaction for three weeks. Since *Dollars and $ense* offers more automatic transactions, it has a slight advantage over the *Home Accountant* programs.

The two most powerful tools in a home accounting program, the automatic and split transaction features, should work together. It doesn't make sense to make your mortgage payment an automatic transaction if you can't credit your expense and asset accounts when the payment is made. The *Home Accountant* programs cannot split automatic transactions. *Dollars and $ense* permits you to split as many automatic transactions as you want.

Check Writing

Both programs print checks, and both include information on where to order special checks. *Dollars and $ense* will print the checks with the payees' addresses; however, the program does not allow you to save address information on disk. You have to type this information each time or add addresses manually to printed checks. The *Home Accountant* programs allow you to create a payee register with up to 50 names and addresses. This information can be saved on disk and recalled whenever it is needed.

Reports	Home Accountant	Dollars and $ense
Budget amounts for all accounts	Yes	Yes
Actual amounts for all accounts	Yes	Yes
Budget vs. actual for all accounts	Yes	Yes
Net worth	Yes	Yes
Net income	Yes	Yes
Account balances	Yes	Yes
Account balances vs. budget	Yes	Yes
Income-expense summary	Yes	Yes
Reports to screen	No	Yes
Reports to printer	Yes	Yes
Graphs		
Actual vs. budget	Yes	Yes
Monthly actual vs. budget	Yes	Yes
Monthly net income	No	Yes
Monthly net worth	No	Yes
Composite accounts	No	Yes
Trend lines	Yes	Yes
Graphs to screen	Yes	Yes
Graphs to printer	Yes	Yes

Table 1: Report and graph capabilities.

	Home Accountant Plus	Home Accountant jr.	Dollars and $ense
Number of main accounts	200	100	120
Number of checkbooks	5	5	12
Number of automatic transactions	25	25	2500

Comparison of the programs' size limitations

Reports, Graphs, and Forecasting Features

The *Home Accountant* programs and *Dollars and $ense* make good use of reports and graphic representations of data, as Table 1 shows.

Dollars and $ense includes a forecasting module that estimates federal taxes based on your financial data. You can create up to five alternative tax situation models and examine them on the screen simultaneously. However, the documentation cautions you not to use the forecasting module to prepare your actual tax returns. *Home Accountant Plus*'s forecasting module helps you compute the future value of an investment and chart various budget models and saving plans. *Home Accountant jr.* has no forecasting module.

The Bottom Line

I prefer *Dollars and $ense* to the *Home Accountant* programs because it allows you to split automatic transactions and view more transactions during data entry, but both programs do a good job of helping you assess and track your financial status. Both the *Home Accountant* programs and *Dollars and $ense* require a commitment of time to set up accounts and then to keep the computer ledger up-to-date. But if a home financial program gives you a better understanding of your economic situation, it will be time well spent.

Jaime Nahman is a registered psychological assistant who is completing his Ph.D.

Home Accountant Plus and Home Accountant jr.
Continental Software
11223 S. Hindry Ave.
Los Angeles, CA 90045
213/417-8031, 213/410-3977
List price: Home Accountant Plus $149.95, Home Accountant jr. $74.95
PC requirements for Home Accountant Plus: 128K, one disk drive (two recommended), DOS 2.00 (color graphics board required for graphics)
PCjr requirements for Home Accountant jr.: 128K, one disk drive, DOS 2.10

Dollars and $ense
Monogram, a division of Tronix Publishing, Inc.
8295 S. La Cienega Blvd.
Inglewood, CA 90301
213/215-0529
List price: $179.95
Requirements: 128K, one disk drive

SPF/PC™

ACTUALLY, there is no comparison. SPF/PC is the best full-screen editor available for the IBM Personal Computer.

It looks and works like IBM's large system SPF editor.

- SPF/PC can use up to 786K of memory as workspace.
- Word processing commands.
- 4-way scrolling.
- Split screen support.
- On-line help facility.
- Can edit up to 240 character records.
- Monochrome or color supported.
- Instantaneous screen display.
- Block Move/Copy/Repeat/Delete/Overlay/Shift/Exclude
- Automatic line numbering supported.
- 40 user-definable Program Function Keys.
- Direct interface to DOS commands for PCDOS 2.0 users.
- Browse sub-system.
- Move/Copy sub-system copies any file format.
- Utilities include: Rename/Delete/Print/Directory list.

AND MUCH MORE . . .

UPLOAD/DOWNLOAD sub-system available to SPF/PC users for $50.00.

$149.95 SPF/PC requires 128K, PCDOS, and 1 disk drive.

THE ODD-COUPLE™

Allows the APPLE and IBM/PC to communicate with each other.

- Connect APPLE to PC, APPLE to APPLE, and PC to PC.
- Transfer any file in either direction.
- CHAT mode allows direct communications through the keyboard.
- An Equipment Profile allows description of your operating environment.
- Communicate Direct or through a Modem at speeds up to 9600 baud (bps).
- Written entirely in machine language for speed and efficiency.

REQUIREMENTS:
APPLE — 48K, 1 disk drive, Serial Interface
IBM — 64K, 1 disk drive, Serial Interface

$79.95

For orders and dealer information write or call Command Technology Corp., 1900 Mountain Blvd., Oakland CA 94611, (415) 339-3530. Mastercard/Visa, Check, or P.O. accepted. Add $5.00 for shipping. Canada $10.00. Foreign $15.00.

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

Circle 380 on reader service card

Discover Solutions With Vision

Dealers are finding Pacific Datanet's Vision™ hard disk sub-systems are today's personal computer users' choice for mass storage sub-systems.

The Vision Series is more than illusionary—read on!

Capacity A variety of sub-systems—10/11Mb, 19/17Mb, 26/21Mb, 40/32Mb, 50/43Mb, 70/62Mb, 105/92Mb, and 140/125Mb.

Software Menu-driven software makes installation simple with the IBM PC, XT, or IBM compatible.

Complete Sub-System Vision Series are complete. Sub-systems include a 5¼" Winchester, our controller, host adapter, heavy duty international power supply, software and cables.

Fast Tape Backup 5¼" ¼" tape streamer backs up at a consistent 5Mb per minute, using standard 90 ips. ¼" tapes.

Error Correction Sub-systems provide 8 bit error correction

Reliability Stringent quality control assures reliable operation

Price Prices start at $2,195 for the hard disk sub-system, and $1,995 for the streaming tape backup

Dealer Inquiries Invited

PACIFIC DATANET, LTD.
4701 Patrick Henry Drive, Bldg. 9
Santa Clara, CA 95054
(408) 980-0693 Telex: 759341

*VISION is a trademark of Pacific Datanet, Ltd
*IBM is a trademark of International Business Machines Corp

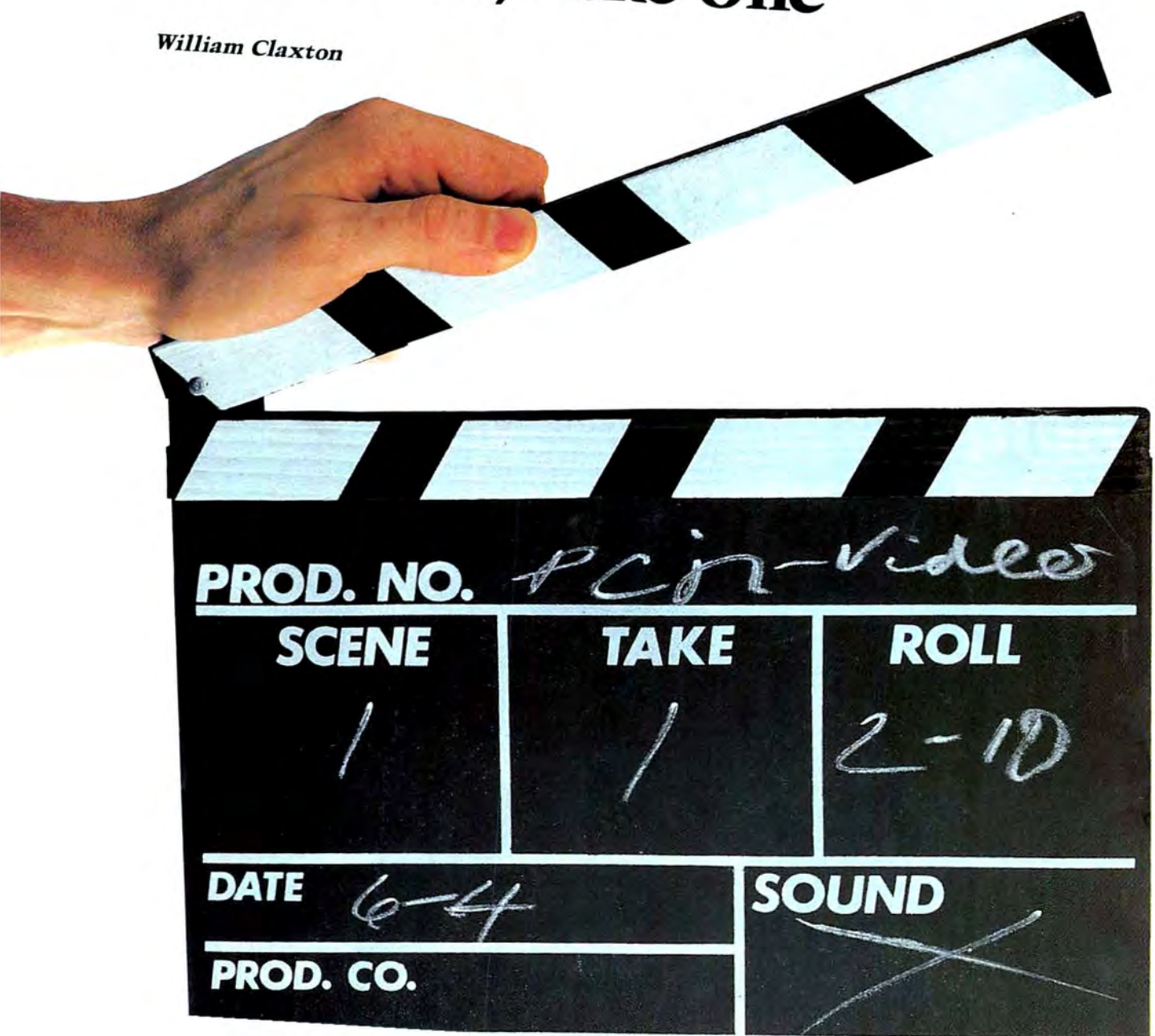
Pacific Datanet

Circle 802 on reader service card

An inside look at the first videotape logging system for the PC and the PCjr

Scene One, Take One

William Claxton



Imagine that your company assigns you to design a sales presentation that will be used in field offices across the country. You want to provide clients with detailed information, but you also want a presentation with visual impact. Since many of your offices are equipped with video tape recorders and computers, you decide to create a presentation that incorporates both machines.

Suppose, for example, that you're a Realtor and your company has produced a 10-minute videotape of prime commercial properties in downtown Houston. As video segments showing each lot or building play on the video tape recorder (VTR), you want the computer to display a full-page description of each property. And you want clients to receive a printout of each property description they are interested in.

A dual presentation of video and computer text is possible with the purchase of a special expansion board for the PC or the PCjr, called a "timecode reader," and a program written in BASIC. Timecode readers are common in video production, but none have been marketed for microcomputers until recently. Michael Short Consulting of Burbank, California, produces timecode reader boards for both the PC and the PCjr. A prototype of their board was used in preparation for this article.

Videotape Logging

Assembling your presentation requires some knowledge of video production techniques. To begin with, you must know how to locate each property on the videotape. The smallest unit of information a VTR can locate is an individual frame. In professional studio productions, videotape is encoded with a reference signal known as "timecode." This signal is read as hours, minutes, seconds, and, most importantly, frames. With timecode, every scene is identified by how far it is from the beginning of the tape, measured in amount of time and number of frames. So your first task is to put timecode on the Houston properties videotape. Production studios (listed in the Yellow Pages under "television program producers") offer timecoding services for $35 to $50 per hour of tape.

Timecode is usually placed on a videotape's second, unused audio track so it cannot be seen or heard by viewers; however, studios often put a copy of the timecode in the picture for visual reference during production work. This enables a video producer to view the tape and create a "tape log," a written record of what happens at given points on a tape. A timecode reader board enables the computer to read and display the timecode from the videotape so you can create your own tape log. While most producers do videotape logging with pencil and paper, you can create a PC- or PCjr-generated log.

Equipment Layout

To make a log of the real estate videotape, you would first link the computer and its monitor to the VTR and the VTR monitor. You need an enhanced version of the PCjr, with a disk drive, 128K of memory, and an 80-column display; a PC requires one disk drive and 128K of memory. The VTR can be any brand of home machine, provided it has stereo audio; since timecode is laid on one audio

A house hunter looks at rental property in Washington, D.C.

DATE:	04/10/84	REEL:	104
TIME:	14:33		
LOGGER:	WMC		

00:01:04:23	Introductory segment. Narrator describes Houston and tells why many corporations are moving to that city. He says we will see photos of some Houston properties.
00:02:32:15	First property, view from Main Street.
00:02:45:06	Second property, downtown highrise.
00:02:55:22	Another angle of the same building. A restaurant and garden court are on the ground level.

Figure 1: Sample video log

track, the VTR must be able to play the narration and music on the second audio track. The two machines should be adjacent to each other so that you can view both monitors simultaneously.

The timecode reader board fits in a PC expansion slot or attaches to the PCjr's I/O expansion bus. A single cable connects the computer to the VTR. The computer end of the cable plugs into the timecode reader board, and the other end of the cable plugs into the audio output of the VTR. I have written a program called Video Basics that is designed specifically for use with Michael Short's timecode reader board and is sold with that board. Inevitably, other hardware and software designers will produce similar video/computer packages. By taking a close look at how this program works, you can get an idea of how powerful the combination of video and computer can be.

Creating a Log

A video log is a written record of video elements and their locations on a tape. Traditionally a log has two columns; one column contains the timecode, and the second column contains a short description of the action or the scene that is displayed on the videotape at that moment. Responding to a keyboard command, Video Basics retrieves the current timecode and places it on the left side of the computer's screen. You would then complete the rest of the "log entry" by typing a short comment, such as "view of ground-level courtyard and restaurant."

If you want to create a log for the real estate videotape, your first step would be to make sure that the VTR and the computer are properly connected. You would then insert the videotape into the VTR and press the Play button on the VTR's console.

While the videotape introduction begins, you would load Video Basics into the computer. The Video Basics main menu has seven selections: Newlog, Textlock, Pagelock, Index, Load, Save, and Quit. You would choose the Newlog option.

Each log must be given a name that is no longer than 8 characters and does not include a suffix. In this case, for example, you could name the file CITYLOTS. The program accepts the file name and, after prompting you for your initials, transforms the computer screen. In the lower left of the PC or PCjr screen is a small window with what looks like an odometer; this is the videotape timecode. As the real estate program plays on the video monitor, the timecode spins along on the computer monitor. When you press the Pause or Stop button on the VTR, the timecode on the PC or PCjr stops; when you press Play, the odometer moves again.

Establishing the Timecode Link

Once you understand what is displayed on the two monitors, you would rewind the tape and play it again from the beginning. When the narrator comes into view on the VTR screen, you would press a function key. This command retrieves the current timecode and places it in the upper left part of the computer screen. Next to the timecode is a comment entry line, an inverse video line where you type the scene description. For the first comment, you would type Introductory segment. Narrator describes Houston and tells why many corporations are moving to the city. He says we will see photos of some Houston properties. When a picture of the first property appears on the video monitor, you would type First property, view from Main Street.

Video Basics retrieves the current timecode and places it on the left side of the computer's screen.

Although you will probably want to keep comments short, comments may be any length; entries longer than 65 characters are formatted line by line on the screen (see Figure 1).

Successive entries become natural. Most of the time, your eyes are fixed on the videotape program. If your typing speed is at least 45 words per minute, you can probably keep pace with the tape. If you cannot, however, you can pause or rewind the tape at any time with the VTR controls because the timecode is always synchronized with the videotape.

When you reach the end of the video program, you would exit the logging section, return to the main menu, and save the entire file to disk. Video Basics automatically adds the suffix *.LOG* to the names of files as they are saved to disk.

Textlock Option

To view the log, you would select the Textlock option from the main menu and specify the CITYLOTS file. The log appears, but the first log entry is located in the center, rather than at the top, of the computer screen. If you look at the numbers in the left column, you see that they are in chronological order. At the bottom of the screen is the familiar, but now static,

As each property appears on the video monitor, the page of description retrieved from the text file appears on the PCjr monitor.

timecode, along with a prompt, 'Please PLAY video program for Textlock'. Then you would rewind and play the videotape. As the VTR replays each video segment, Video Basics moves the associated comment up to the center of the PC's or PCjr's screen as part of a continuous scrolling log.

If your VTR allows you to search for a particular screen in the Play mode, you can move the tape forward and backward, and the program's Textlock option scrolls the text in synchronization with the videotape. Video Basics does this by comparing the current timecode with numbers in the log and placing the entry with a timecode closest to the current timecode in the center of the screen.

Linking Other Files

Once you have a complete log of the real estate tape, you can create a detailed page of description for each property with a word processing program such as *HomeWord*. You would create a text file in standard ASCII format with the same name as your log, but with the suffix *.TXT*, indicating that it is a text file. Video Basics' Index option links CITYLOTS.LOG with the CITYLOTS.TXT file.

Next you would select the program's Pagelock option and play the videotape from the beginning. As each property appears on the video monitor, the page of description retrieved from the text file appears on the PC or PCjr monitor. For each property, the computer screen is cleared, and a new page of text is displayed. You can make the videotape pause, so that clients can read the property descriptions as they view the tape, or you can print out the text file for them after the video presentation.

File Maintenance

Since real estate prices change, you must update files from time to time. By editing the text with a word processing program and reindexing, the property descriptions can be updated as often as needed. There is no need to modify either the videotape or the log. Your final task would be to distribute copies of the video program, along with copies of your most recent disk update of the .LOG and .TXT files, to each suitably equipped real estate office.

Other Applications

Travel agencies are other businesses that might link computers to video recorders. Many travelers would prefer to make a vacation decision after seeing several alternative sites on video and reading relevant details such as hotel availability, local transportation services, and theater and event schedules.

Ten million homes in the United States have video tape recorders, and that number is expected to quadruple by the end of this decade. So there is every reason to see the VTR and the computer as effective partners.

William Claxton is an independent video editor and producer who develops interfacing software for the PC and the PCjr and video editing systems.

Videotape timecode reader board
Michael Short Consulting
125 N. Valley St.
Burbank, CA 91505
213/845-6068
List price: $495, with Video Basics software $700
PC requirements: 128K, one disk drive
PCjr requirements: 128K, one disk drive, 80-column text display

If you are interested in writing your own timecode program for Michael Short's timecode reader board, you can send for a copy of a template. The template captures and displays data as timecode on the PC or PCjr screen and adds and saves short text comments in a temporary index file. Please send a self-addressed, stamped envelope to William Claxton, c/o Editorial Department, PC World, *555 De Haro St., San Francisco, CA 94107.*

the closest thing to perfect is WordPerfect by SSI.

Reference Magazine

When it comes to software, nobody's perfect. But according to many of the experts, one word processing program is as close as you can get. No wonder it's called WordPerfect.

What are all the critics raving about?

Simplicity. Most WordPerfect functions require only one keystroke, a simple press of a finger. So you can concentrate on writing, not programming.

Speed. Because it is document-oriented instead of page-oriented, WordPerfect won't make you wait between pages. No matter how fast you type, WordPerfect won't slow you down.

> WordPerfect isn't flawless word processing software, but it comes very close.
>
> *Digital Review*

Features. From writers to doctors, accountants to lawyers, WordPerfect has built-in special functions to meet a wide variety of specific needs. And at SSI, every day is spent upgrading and improving WordPerfect — reaching for perfection.

> WordPerfect is my favorite because it is easy, simple and powerful. The people
>
> *List Magazine*

Get your hands on the critics' choice, WordPerfect word processing from SSI. It's the closest thing to perfection.

For more information, see your dealer. Or call or write:

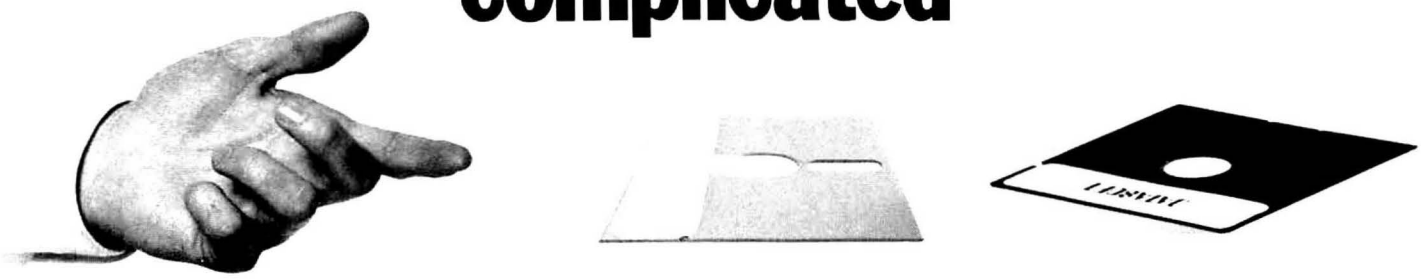
SSI Software
288 West Center Street
Orem, Utah 84057
Information: (801) 224-4000
Order Desk: 1-800-321-4566, Toll-free

SSI Software
Reaching for perfection.

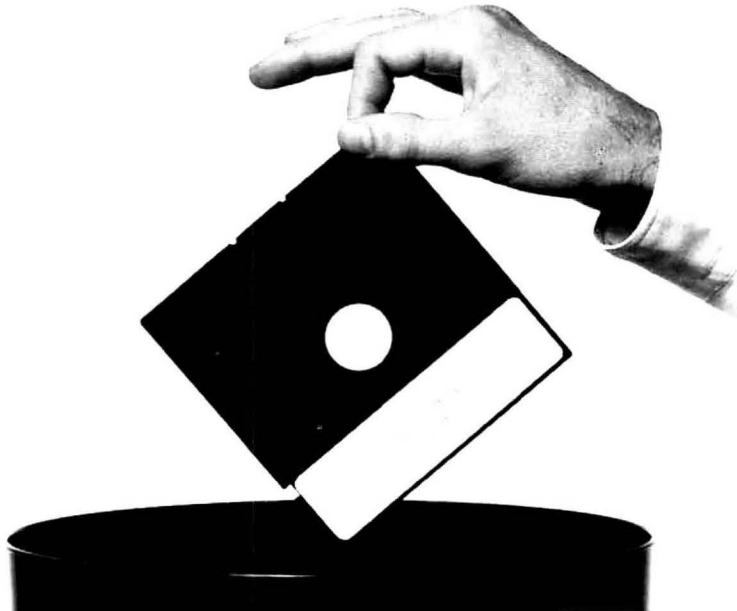
Circle 165 on reader service card

As a rule, database programs are tedious

complicated



& downright boring.



Introducing SSI Data. Because rules were made to be broken.

Until now, most database software has spent more time gathering dust on forgotten shelves than gathering and organizing information in computers. After all, until now databases have mostly been intimidating, overly technical and, worst of all, boring. Dull. Until now.

Now there's SSIData. More than a database, SSIData is a breakthrough because it is easy and fun to use. But don't let the fun fool you. Because SSIData is powerful, too.

With SSIData, storing and retrieving information is a natural, easy process. Large amounts of text are a snap. And the program is fast, with a game-like quickness.

Whether you want to keep track of clients' addresses, store information about the members of a club, or make a bibliography, you don't need to know anything about databases to start using SSIData. The manual is full of simple diagrams and exercises. Plus, the program diskette includes 10 real-life examples so you can immediately make your own applications without learning a programming language. And SSIData works hand-in-hand with WordPerfect, as well as many other word processors.

Get organized with SSIData. It's the database that's breaking all the rules.

For more information, see your dealer. Or call or write:

SSI Software
288 West Center Street
Orem, Utah 84057
Information: (801) 224-4000
Order Desk: 1-800-321-4566, Toll-free

From the makers of WordPerfect

SSI Software
Reaching for perfection.

Circle 868 on reader service card

The Right Commands At Your Fingertips

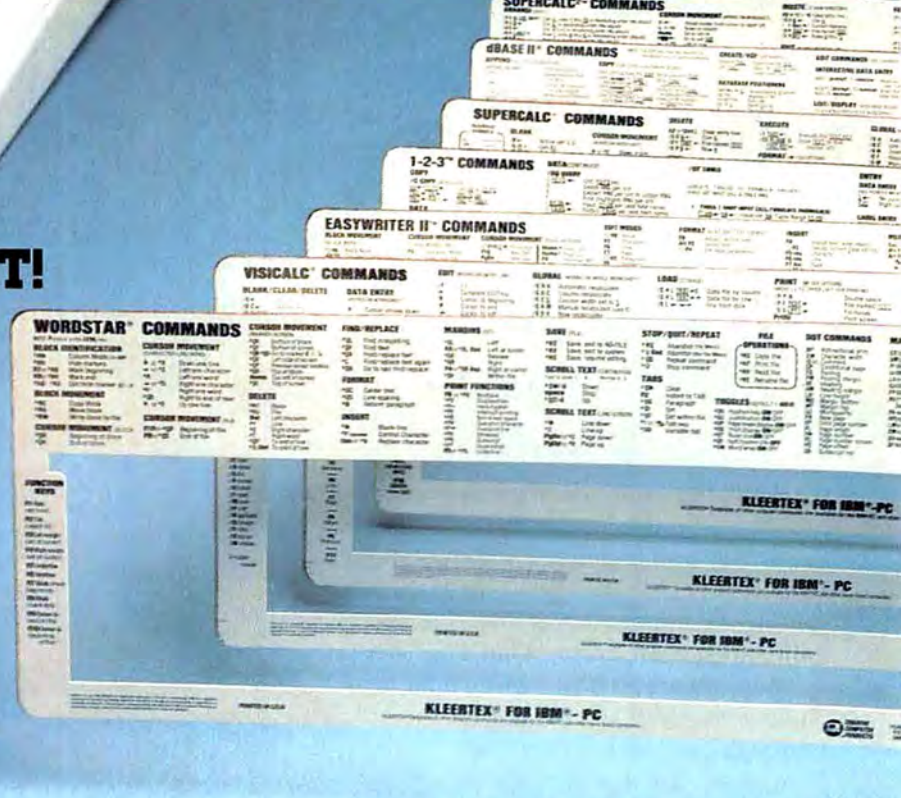
KLEERTEX

... For Your IBM®-PC/XT!

and 20 other name brand computers!

MOST TEMPLATES **$19.95** EACH

(See graph below)



Designed by Training Specialists to help put your program to work, right away!

- Complete commands required to learn and operate your program
- Alphabetized commands to find what you need quickly and easily
- Organized with key-by-key examples for simplicity

This Time-Saving Aid is Ideal for Training, Invaluable for Beginners, and a welcome convenience for the Comprehensive User. Made of sturdy, non-scratchable, non-glare, color-coordinated plastic.

The right commands... ...the right price!

Availability and Price Codes:

- ▲ $ 8.95 Do-It-Yourself Blanks
- ● $19.95 Single Program Templates
- ○ $32.95 Double Program or Extensive Program Templates.

Call About Custom Templates or Quantity Discounts.

All templates, except those for Kaypro and Osborne, are reversible. The reverse side contains additional commands or Do-It-Yourself blank lines.

	WORDSTAR®/MAILMERGE®	dBASE II®	MULTIPLAN®	SUPERCALC®	WORD®	EASYWRITER® II	APPLEWRITER® II	QUICK FILE®	PIE WRITER®	APPLEWRITER® II/QUICK FILE®	APPLE-WORKS	PERFECT WRITER®/PERFECT CALC®	MULTIMATE®	CALCSTAR®	DO-IT-YOURSELF BLANKS	VISICALC® IV	VISICALC®	DOS 2.10	1-2-3®
IBM® STYLE A*	●	○	●	●	●	●			●				●	●	●		▲	●	●	●	○
IBM® STYLE B**	●	○											●	●	●		▲	●	●	●	○
KAYPRO®	●	●											●	●		●	▲				
APPLE® II+	●	○						●			○						▲	●			
APPLE® //e	●	○	●					●	●	●	○	○	●				▲	●			
OSBORNE®	●	●																			

*IBM STYLE A Fits: IBM-PC/XT, COMPAQ, LEADING EDGE.
**IBM STYLE B Fits: COLUMBIA, OLIVETTI, CORONA, TAVA, IVY, PRONTO, SILICON VALLEY MICRO, NORTH STAR DIMENSION, LOGICAL L-XT, IMP and SPERRY-PC.

15 DAY MONEY-BACK GUARANTE

Call Toll Free 1-800-231-5413

California 1-800-523-5441

DEALER INQUIRIES INVITE

CREATIVE COMPUTER PRODUCTS™

P.O. Box 85152 MB13
San Diego, CA 92138
(619) 458-1965

We accept VISA, MC, AMEX or checks.
$1.95 Shipping Fee

WESTERN CANADA:
LD COMPUTERS
12831 HORSESHOE PL.
RICHMOND, B.C. V7A 4X5

EASTERN CANADA:
TRILLIUM COMPUTER RESOURC
423 GRANGEWOOD DR.
WATERLOO, ONTARIO N2K 2H1

Apple/Quickfile-Apple Computer, Inc., IBM-International Business Machines, Osborne-Osborne Computer Corp. Kaypro-Non Linear Systems. Wordstar/Mailmerge-MicroPro Int'l. Visicalc-Visicorp. Supercalc/Supercalc²-Sorcim. Easywriter II-Information Unlimited Software. dBase II-Ashton-Tate. Multiplan-Microsoft. 1-2-3-Lotus Dev. Corp., Perfect Writer/Perfect Filer/Perfect Calc-Perfect Software. Personal Pearl-Pearlsoft. PieWriter-Hayden Software Co. Compaq-Compaq Computer Corp. Multimate-Softword, Co.

©CREATIVE COMPUTER PRODUCTS 1983.

Circle 634 on reader service card

"If you make more than $35,000 a year. . .

Lumen has designed personal financial planning and management software for you. It can help you gain control over what may have been hit-or-miss financial planning. *These days you can't afford hit-or-miss."*

—W. Thomas Porter
Director of Personal Financial Planning Services for the Big-8 Accounting firm of Touche Ross

"When I wrote a best-selling book on personal financial planning and management, I wanted to provide a complete structure men and women like you could use to gain total control over their own financial affairs. Now Lumen has transformed the financial planning and management methods revealed in my book into two easy-to-run software packages for the IBM-PC*."

The Personal Financial Planner

1. **Net Worth Statement:** Calculated for you instantly.
2. **Income and Expenditure Ratios:** Are you within safe limits? Your Planner will tell you.
3. **Investment Analysis and Strategies:** Based on your own financial circumstances.
4. **Tax Planning:** The Planner helps you maximize benefits and minimize tax exposure.
5. **Retirement Planning:** Find out what you should be doing now to make your retirement dreams come true.
6. **Estate Planning:** The most important facet of personal financial planning becomes a breeze.
7. **Education Financing:** You have four children, ages 6, 9, 12, and 15. How much should you be setting aside now for their education?
8. **Insurance Analysis:** Are you overinsured? Underinsured? Do you have the right kind of coverage? The Planner will tell you.
9. **Personal Data:** Up-to-the minute personal financial data at the push of a button.

The Personal Financial Manager

1. **Checking Accounting Management:** Provides instant checkbook balancing—absolutely accurate.
2. **Credit Card Accounts:** No more racking your brains when an incorrect bill comes in.
3. **Assets / Liabilities:** You'll know instantly what you owe and what you own. Changes take only a few seconds.
4. **Budget Tracking:** Are you on budget? Over budget? Under budget? Find out what you need to do to stay on target.
5. **Check Printing:** The Manager can actually write your checks for you. And your balance adjusts automatically.
6. **Double Entry Bookkeeping:** The Manager sets up double entry books for you automatically.
7. **Account Status:** You get a complete series of 170 pre-defined accounts. No time wasted setting up your own.
8. **Tax Reports and Codes:** All your tax records kept in perfect order. You can do your income taxes during halftime of the Rose Bowl.
9. **Transaction Maintenance:** Income from all sources and expenses to all sources are orderly and balanced. Pull a report whenever you want or need one.

Lumen software is exclusively represented by
Prentice-Hall, Inc.
Business and Professional Division
Englewood Cliffs, New Jersey 07632

© 1984 **Prentice-Hall, Inc.**

* IBM-PC is a registered trademark of International Business Machines Corporation.

LUMEN T.M.
Lumen Systems, Inc.
The Brightest Name in Software

Instant $20 Rebate

Ask for our Instant $20 Rebate Certificate at any Authorized Lumen Dealer. It is worth $20 when presented as partial payment for either the Personal Financial Planner or the Personal Financial Manager. For more information, or the name of the Authorized Lumen Dealer nearest you, *call toll free* **800-624-0023** (in NJ call **800-624-0024**). Offer expires October 31, 1984.

Circle 25 on reader service card

IT ALWAYS STACKS UP IN FAVOUR OF SUNOL

Sunol Winchester disk drive replaces up to 2570 floppy disks, increases your speed up to 1000% and costs surprisingly little.

If data management is becoming a problem, you are ready for a Sunol mass storage system.

We're Powerful
Choose from 8, 16, 25, 40, 65, or 92 megabytes per drive and up to four drives per controller. That's a total of 368 megabytes and that's up to 2570 floppy disks or 184,000 typed pages.

We're Fast
You've got more data and almost instantaneous access to that data ... up to 10 times faster than a floppy – 7.5 megabits per second transfer rate.

We're Compatible
You can connect your Sunol to the IBM PC and compatibles, Apple II, III, and Macintosh, TI, Victor 9000, DEC, Epson QX-10, Zenith, and more.

We're Connected
Use your Sunol to network with SUN*NET and SUN*MAC. SUN*NET can handle up to 64 users at a time and with seven different operating systems all on the same Sunol disk. SUN*MAC networks up to 32 Macintoshes on the Applebus and can be networked to SUN*NET. (Sunol's disk is also compatible with Omninet, PC Net, or Ethernet.)

We Have Back-Up
Our optional 21.5 megabyte random access type cartridge gives you the back-up you need. And you can access it as a 21.5 megabyte floppy of on-line disk storage.

We're Clear
Our dynamic display lets you know exactly what the drive is doing every moment.

We're Reliable
Sunol's Error Correction Code gives you the reliability you expect.

COMPARE SUNOL FEATURE FOR FEATURE
Then compare price. There is no better value. There is no better mass storage system.

SUN SYS OL TEMS

IBM PC is a registered trademark of International Business Machines Corporation
P C Net is a trademark of Orchid Technology
Macintosh and Apple are registered trademarks of Apple Computer Inc
Omninet is a trademark of Corvus Systems Inc

P.O. Box 1777•1187 Quarry Lane, Pleasanton, CA 94566•(415) 484-3322 Telex: 703175

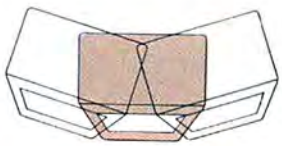
Circle 181 on reader service card

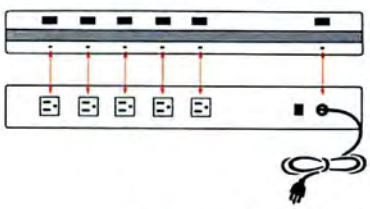
Until now your PC was missing an essential piece. Master Piece.™

Introducing the only accessory your IBM® PC will ever need. The Master Piece is four accessories in one, offering your PC the protection and convenience it's been missing.

SEE EYE TO EYE WITH YOUR IBM PC.

The Master Piece provides a swivel for your monitor. This swivel lets you adjust the viewing angle of your monitor with just the touch of a finger.

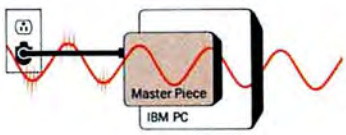




PUTS YOUR ENTIRE SYSTEM AT YOUR FINGERTIPS.

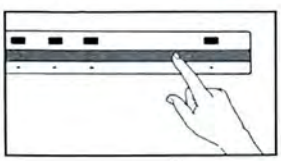
Stop fumbling with cords and scrambling for outlets to plug in your peripherals. Stop lunging to the other side of the room just to turn on your printer. The Master Piece functions as a five outlet power strip to organize all your power needs. Power up with the master switch, then use the individual switches to control your peripherals. Touch the master switch to shut down and the Master Piece makes sure you never accidentally leave your peripherals running overnight.

POWER LINE PROBLEMS ARE NO PROBLEM.



Surges, spikes and line noise are responsible for 70–90% of PC malfunctions. They can wipe out memory in your PC, taking hours of hard work with them. That just costs you time. Even worse, they can zap your delicate chips, sending your PC in for repairs. That costs you money.

The Master Piece stops power line problems dead. You end up with an IBM that's more accurate and more reliable.



EVEN YOU ARE A THREAT TO YOUR IBM PC.

During the course of an active day, you build up static electricity—just as much a threat as surges and spikes. Until now, the only solutions to static were unsightly floor mats or pads that fit under your computer. The Master Piece offers an elegant alternative. Just touch its nameplate before you begin work and all static charges are safely grounded.

Master Piece, the most versatile, most convenient, most useful peripheral ever made for the IBM. In fact, you'll come to think of it as the piece your PC was missing. Special introductory price, $139.95 at most computer stores.

KENSINGTON™ MICROWARE

251 Park Avenue South, New York, NY 10010, (212) 475-5200, Telex: 467383 KML NY.

Trademarks: Master Piece/Kensington Microware. IBM/International Business Machines.

Circle 474 on reader service card

© 1984 Kensington Microware Ltd

WITHIN THE HARD DISK JUNGLE SURVIVAL-OF-THE-FITTEST IS THE ONLY LAW.

Evolution of the Species Results in a Better Product

Within any Hard Disk jungle, evolution will eventually produce a better species.

Take the DISCovery Subsystems, for example. It is one hard disk storage and backup system bred and tested to take the tough everyday rigors of business applications. DISCovery offers higher performance, greater reliability, more flexibility plus a true random access removable Winchester hard disk backup. And it works wonders with just about every PC-compatible micro you could name.

Greater Capacity, Reliability

DISCovery hard disks offer from 5 to 225 Megabytes of storage. Plus more than 40 configurations in between. Enough for your most demanding business application or database requirements.

DISCovery systems all feature our exclusive digital data separator; one which we pioneerd for 5¼" hard disks. With it, you get more precise, accurate performance. In fact, the DISCovery is the first hard disk subsystem to offer a full 2-year Warranty.

Unheard-of Flexibility

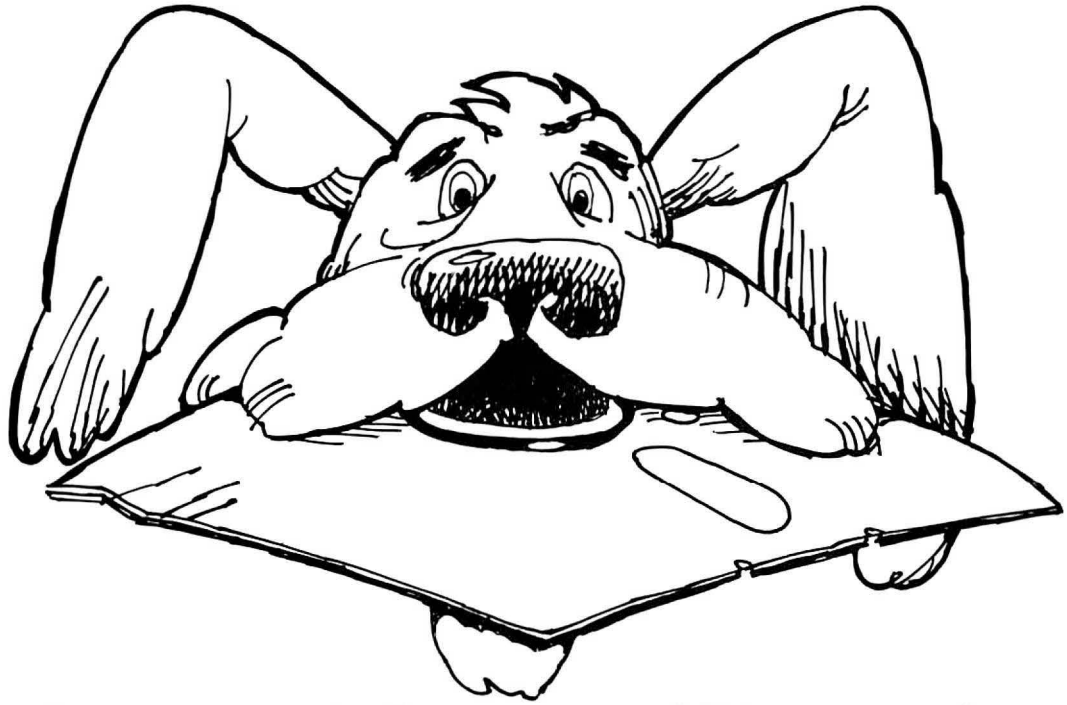
DISCovery will work with dozens of micros and PC-compatibles. Most likely, yours included. Using a DISCovery subsystem with different micros does not mean buying a new hard disk for each kind. With DISCovery, all you do is buy an inexpensive interface card for each one. This gives you excellent flexibility ... especially if your office has a number of different types. DISCovery helps you leverage your investment in existing company micros.

Before you buy a hard disk for your micro, learn more about DISCovery hard disk subsystems. Call Jerry O'Brian at (301) 628-0260, for more information. Do it today.

act

Act Marketing Corp.
104 Lakefront Drive
Hunt Valley, MD 21031

Circle 820 on reader service card



Having problems with retrieval?

You need software insurance.

Diskettes are fragile, and when a protected program is damaged, the results are expensive and inconvenient. If you have a backup diskette, though, you can have your Apple, IBM or compatible computer back on line within seconds... affordably. That's software insurance.

Copy II Plus (Apple][,][Plus, *//e*)

This is the most widely used backup program for the Apple. Rated as "one of the best software buys of the year" by **InCider** magazine, its simple menu puts nearly every disk command at your fingertips. The manual, with more than 70 pages, describes protection schemes, and our **Backup Book™** lists simple instructions for backing up over 300 popular programs. A new version is now available that is easier to use and more powerful than before. Best of all, Copy II Plus is still only **$39.95.**

WildCard 2 (Apple][,][Plus, *//e*)

Designed by us and produced by Eastside Software, WildCard 2 is the easiest-to-use, most reliable card available. Making backups of your total load software can be as easy as pressing the button, inserting a blank disk and hitting the return key twice. WildCard 2 copies 48K, 64K and 128K software, and, unlike other cards, is always ready to go. No preloading software into the card or special, preformatted diskettes are required. Your backups can be run with or without the card in place and can be transferred to hard disks. **$139.95** complete.

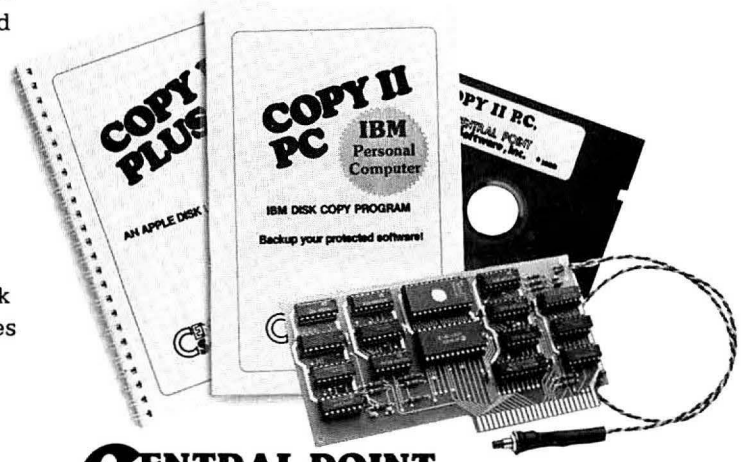
Important Notice: These products are provided for the purpose of enabling you to make archival copies only. Under the Copyright Law, you, as the owner of a computer program, are entitled to make a new copy for archival purposes only, and these products will enable you to do so.

These products are supplied for no other purpose and you are not permitted to utilize them for any use, other than that specified.

Copy II PC (IBM)

This is **THE** disk backup program for the IBM PC and PC/XT that backs up almost anything. Others may make similar claims, but in reality, nothing out performs Copy II PC... at any price. Copy II PC even includes a disk speed check and is another "best buy" at only **$39.95.**

We are the backup professionals. Instead of diluting our efforts in creating a wide variety of programs, we specialize in offering the very best in backup products. So, protect your software investment, **before** your software meets its master.



CENTRAL POINT Software, Inc.

The Backup Professionals

To order, call 503/244-5782, 8:00-5:30 Mon.-Fri., or send your order to: Central Point Software, 9700 SW Capitol Hwy, Suite 100, Portland, OR 97219. **Prepayment is required. Please include $3 for shipping and handling ($8** outside U.S. or Canada). MasterCard VISA **Welcome**

Circle 31 on reader service card

The best values always come from a name you can trust.

SOFTWARE

Alpha Software
ESP $529

Ashton-Tate
IBM/PC Reference Encyclopedia ..... Call

ATI
All Training Prog's . ea $ 49

B&L Multi-job (runs 9 prog's at once) $145

Cdex
All Training Prog's . ea $ 49

Central Point
Copy II PC ..... $ 34

common language systems, inc.
PLAIN ENGLISH $499

CompuView
Vedit CP/M 86 ..... $130
Vedit 130
Systran 99

dBASE II CORNER

Anderson-Bell
Abstat $289

Ashton-Tate
d-Base II ..... Call
d-Base III ..... Call
Framework ..... Call
Friday ..... Call

Better Business Solutions, Inc.
dBase II Writes Checks ..... $ 75

Data Based Solutions
dNAMES ..... $ 95

Fox & Geller
dGraph $169
Quick Code 169
dUtil 58

Global Technologies
dbLINK ..... $ 69

Human Soft
dBase Plus ..... $ 85

Sensible Designs
dProgrammer $199

Software Banc
Advanced d-base II User's Guide ..... $ 27
Report Writing w/ purchase of dBase II ..... $ 10

Software Research Technologies
dFastest ..... $ 75

(All above available on PC-DOS.)

Continental/Arrays, Inc.
Home Accountant + .. $ 95
PC Combo Pak (Tax Advntg/Home Acct't) . $149
Ultrafile 149

Decision Resources
Chart-Master $255

Digital Marketing
Grammatik ..... $ 60
Proofreader 42

Digital Research
Concurrent CP/M 86 .. Call
CP/M-86 ..... Call
Pascal MT+ (PC DOS) Call
C Basic 86 ..... Call
C Language/compiler. Call
DR Graph ..... Call
Personal Basic 86 ..... Call
PL/1-86 ..... Call
Others ..... Call

Dow Jones
Market Analyzer $229
Market Manager 189
Spreadsheet Link 179
Investor's Workshop ... 95
Home Budget 89

Ecosoft, Inc.
Microstat $239

Emerging Technology
Edix (editor) $139
Wordix (formatter) 139
Both 269

Enertronics
Energraphics $259
w/ Plotter Option 299

Fastware
Thor (the thought organizer) $245

Financier, Inc.
Financier II $119
Tax Series 105

Fox & Geller
Grafox $189
R-Graph (for R-base 4000) $175

Harvard Associates
PC Logo $129

Harvard Software
Project Manager $249

Hayes
Smartcom II ..... $ 95
Please ..... Call

Heritage
Smartkey II ..... $ 65

HyperGraphics Corp.
Authoring Graphics $299
Presentation Graphics .. 279
Object Libraries:
Computer Aids ..... $ 49
Maps 49
Borders 49

LOTUS 1-2-3 CORNER

Programs for your LOTUS 1-2-3

Consumer Software, Inc.
"Auditor" (proofing tool) ..... $ 85

Lighthouse Software
Key II (Data Mgmt for 1-2-3) $149

National Training Systems, Inc.
Putting 1-2-3 To Work (8 application templates on diskette) .. Call

Phoenix Consulting Group
3Plus (Fin. Planning, Forecasting) ..... Call

Softsell
Templates, diskettes Call

Strategic Software Systems, Inc.
Bottomline V $195

Trillian Computer
Visuall Plus ..... $ 79
w/ All Shells 119

Whiterock Alternative
The Organizer (quickly access files thru branching tree system) ..... $ 79

Individual Software
Prof. DOS ..... $ 47
Prof. Pixel 47

Innovative Software
T.I.M. IV $275
Fast Graphs 229

Living Videotext
Think Tank (256K) $139

MDBS, Inc.
Knowledge Man $299

Metasoft
Exec. I (WP, Admin., Data Mgmt, Speller) . $395
Telecom 125

Micro Pro
Wordstar $229
Pak (WS, MM, SI, CS) ... 309

Microrim
Report Writer $119
R:Base 279
R:Base Clout 129

Microsoft
MuMath/MuSimp $179
Pascal Comp (DOS) ... 229

Microsoft *(cont'd)*
Project Mgmt 199
C Compiler (DOS) 309
Basic Compiler (DOS) 249
Multiplan MS/DOS 129
Word 229
Word w/ Mouse 299
Others ..... Call

Microstuf
Crosstalk $109

Morgan Computing
Professional Basic $299
Trace 86 99

Mosaic Software
Super Chartman II $299
Chartman IV 199
Both II and IV 350
Integrated 6 369

Multimate Systems Inc.
Multimate (WP) 269

North American
Answer (Database Prog.) $159
Memory Shift 79

Northwest Analytical
Statpak $365

Oasis
The Word Plus $110
Punctuation & Style 99

Open Systems
Acct'g Programs $429
Buy 3 or more @ 419

Opt-Tech Data Processing
Sort (a file containing 4000 records of 128 bytes each can be sorted to produce an address file in 30 seconds) ..... $ 79

PC Innovations
PC RESET (push-button operated direct system reset) ..... $ 42
Remote Control Assembly ..... $ 29

PC Software
PC Crayon ..... $ 36

Peachtree Software
Back to Basics Acct'g System $219
Home Software Library ..... Call
PeachPak 4 (GL, AP, AR) $249
Series 8, ea. mod 389

Peter Norton
Utilities ..... $ 55

PowerBase Systems, Inc.
Power-base w/ DATAZOOM $325

PCjr.
Please call us regarding products for the IBM PCjr.

Prentice Hall
VCN Execuvision $299

Redding Group
Graph Talk $339
Synch (2780/3780) 379

SPI Open Access $379

Satellite Software
Word Perfect w/ Sp ... $255
Others ..... Call

Softcorp, Inc. PRO-JECT 6 (Complete Critical Path Mgmt Syst.) ..... Call

Softcraft
Fancy Fonts $125

Software Arts
TK! Solver $265

Software Publishing
PFS: Report/Access .... $ 79
PFS: File, Graph, Write 89
PFS: Plan 99

Sorcim ..... Call

Star Software
Legal Timekeeping, Billing & Accts $695
Accounting Partner 269

Sorcim ..... Call

Star Software
Legal Timekeeping, Billing & Accts $695
Accounting Partner 229

Warner Software
Desk Organizer (clears desk of 7 bus tasks) .. $219

Woolf Software Systems
Move It (PC to CP/M and PC to PC) ..... $ 79

. . . and many more!

GAMES

Automated Simulation, Armonk, Avalon Hill, Blue Chip, Broderbund, Data Most, Infocom, Spinnaker Software, Sierra/On-Line, Sublogic, Weekly Reader, Xerox ..... Call

BOARDS

DISPLAY CARDS

Amdek
MAI Card $420

Fredericks/Plantronics Colorplus .. $399

Hercules
Graphics Board $339

MA Systems
Peacock
Clr Board..... $249

Paradise/USI
Display Card
(clr/monochrome). $349

Quadram
Quadcolor I..... $199
Quadcolor II..... 389

Tecmar
Graphic Master $479

AST Research
Six Pak Plus 64K (S&P, Clk, exp to 384K)..... $279
MegaPlus 64K, (Cl/Cal, S Port, 512K cap w/ Megapak)..... $279
Extra ports for Megaplus and I/O Plus II (Game, P/S)..... $ 40
Megapak 256K exp... Call
I/O Plus II (Cl/Cal, S Port..... $159

New AST to IBM Mainframe connection now available:
5251 - SNA - BSC - 3780 - PCOX..... Call
Monograph Plus ..... Call

PC NETWORKING

AST Research
PC 002 NET
Starter Kit..... $899

Orchid Technologies
The "Orchid Blossom" (to 384K, Clk, w/ alarm, S&P ports, ram disk & disk caching, upgradeable to PCNet)..... Call

Quadram..... Call

Santa Clara
Starter Kit $1245

X-Comp X Net
(2 bds, 2 users)..... $829
X Net exp bd .. ea 429
Add'l Networking Products..... Call

Maynard Electronics
Floppy Drive Cntrlr.... $169
w/ Par Port..... 219
w/ Ser Port..... 229
Sandstar ..... Call

Orange Micro
Mr. Chips..... Call

Quadram
Quadboard 64K, (exp 384K, Clk/Cal, S&P Ports, Software..... $269
Quadboard 384 (0K) . 239
Microfazer Stack Printer
-P/P 8K..... $139
-S/P 8K (exp 64K only) 149
-S/S 8K (exp 64K only) 149
Quadlink 64K Memory allows Apple SW to run on IBM/PC)..... $469
All Other Products .... Call

COLOR GRAPHICS!

Purchase a SINGLE Board and SAVE SPACE for future expansion!

by

INNOVATION Electronics Corporation

"Innovation CGP"

- Full color graphics capability.
- Single or double-dot character fonts
- Parallel printer port.
- Fully compatible with IBM PC/XT, Portable and look-alikes.
- Compatible with all IBM hardware.
- Compatible with all color graphics software for IBM PC, XT, Portable (including Lotus 1-2-3).
- One year warranty.

ORYX Price..... Call

MONITORS

Amdek
300A Amber $149
Color II +..... 429

NEC
JB1201-12" Green..... $169
JB1260-12" Green..... 119
JC1216 RGB 429

PGS
HX12 RGB Color..... $489
MAX 12..... 189
SR12 (690×480 Res)... 639
Doubler Cd (SR12)..... 175

Quadram
Quadchrome $489

Sanyo
8112 12" HR Green.... $195

Taxan
KG12N-UY 12" Am.... $129
KG12N 12" Gr..... 132
RGB Vision-1 12" Clr.. 319
RGB Vision-3 12" Clr.. 449

USI 1200A
12" HR Am..... $139

MODEMS

Hayes
Smartmodem 300..... $205
Smartmodem 1200 .... Call
Smartmodem 1200B... Call

Microcom, Inc.
Era 42 (1200 int baud) $395

Novation ..... Call

Quadram Quadmodem (Stand alone, full 212A, compatible w/ Quadlink SW..... $529

US Robotics
Auto-Dial 300/1200 ... $459
S-100 Modem..... 349

Ventel
300-1200 baud Modem w/ Crosstalk for portables..... $459

DISK DRIVES

CDC 1800 ..... $199

Corvus HD ..... Call

Datamac
Trustor 10H..... Call

Davong HD..... Call

I-Omega
Bernoulli Box (10 MB removable)... Call

Santa Clara HD ..... Call

Tandon TM-100-2..... $199

Vista
Dynaframe Systems w/ 5-40 MB Primary Disk Drive..... Call

PRINTERS

Dana/Abati
LQ-20P..... $429

Diablo
630 ECS..... Call
630 API..... Call

Mannesman Tally
MT180L..... $799
MT160L..... 569
Spirit..... 299
420L..... Call
440L..... $2399

NEC 3550..... $1625

Okidata 82-93..... Call

Quadram Quadjet... Call

Siemens Ink Jet Printers PT88..... Call

Star Micronics..... Call

Teletex T1014..... $499

...and much more.

DISKETTES

3M 5" DS, DD Box ... $ 35

CDC ..... $ 28

Maxell 5" DS, DD MD2 Box..... $ 32

Spectrum 5¼" DS, DD (Box/10)..... $ 29

Ultramagnetics
5" DS, DD, Box ..... $ 32

Verbatim
5" DS, DD, Box ..... $ 32
(3 Boxes Diskettes Min.)

PLOTTERS

Amdek
DXY-100..... $599
Amplot II..... 899

Enter
P100 Sweet P..... $545
Sweet P Six Shooter... Call

Houston Instruments Call

Panasonic
Digital Plotter
VP6801P.....$1375

MISC.

Alpha-Delta "MACC"
Surge Protector ..... $ 69

American Tourister
Protective cases for computers, printers... Call

Computer Accessories
Power Director (surge/transient protection, EMI/RFI filtration, integrated power cntrl)..... Call

Flip 'n' File 5¼"..... $ 22

Hauppage
8087 Chip $159
Other Products..... Call

Key Tronic
5150..... Call
KB5151 ..... Call
KB5151 Dvorak..... Call

Microsoft Mouse..... $155

Mouse Systems
PC Mouse..... $159

PMC Industries, Inc.
Surge/Power Protectors ..... Call

RH Electronics, Inc.
Guardian Angel (200 watt uninterruptable power source..... Call
Power Angel (800w)... Call

Titan Technologies, Inc.
PC Accelerator (plugs in, programs run 2½ to 4 times faster)..... Call

SGL Homalite
Optech CRT filters..... Call

Street Electronics
Echo speech synth for IBM..... $179

Systems Mgmt. Assoc.
PC Documate (comprehensive ref aids).. Call

TG Joystick..... $ 49

Thunderware
Thunderclock..... $126

Valley Craft
Computer Furniture & Data Stations..... Call

Versa Computing
VersaWriter..... $239

A variety of complete PC compatible systems are available at Oryx. For assistance in determining your needs, use our technical line.* We will be happy to provide full support.

POLICY:

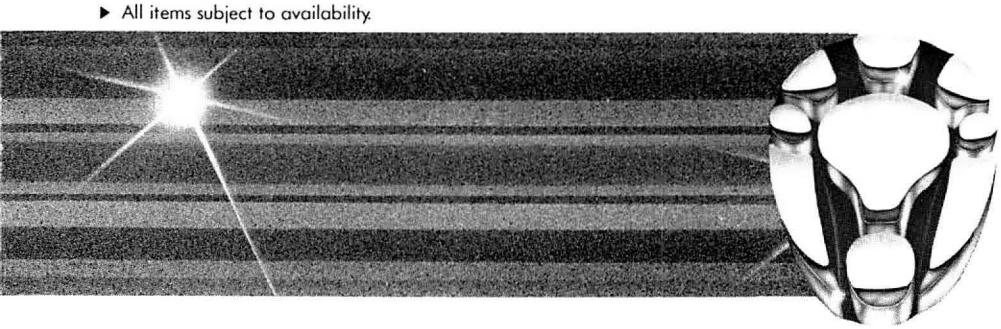
- Wisconsin residents add 5% for sales tax.
- Minimum $4.00 for shipping, handling and insurance for orders to $200.
- For orders over $200, add 2½% for shipping, handling and insurance.
- For cash prepayment of orders $200 or more, add *ONLY* 2% for shipping, handling and insurance.
- Foreign — either add 15% handling & shipping (Int'l money order) or inquire.
- Prices are subject to change without notice.
- All items subject to availability.

WE WELCOME:

- Visa, MasterCharge and American Express. (No charge for credit cards.)
- Corporate, government or educational volume purchases, please ask for special accounts desk for additional discount. (1-715-848-1374)
- COD (Add $2.00 per box/parcel. Cash or certified check required.)
- Checks. (Allow 1-2 weeks for clearing.)

WORKING HOURS:

Monday-Friday 8:30-6:00 • Saturday 10:00-2:00 • Central Time



ORYX SYSTEMS, INC.

CRAFTSMEN OF THE NEW TECHNOLOGY

1 800 826-1589

WITHIN WISCONSIN **1 800 472-3535**

425 First Street • P.O. Box 1961
Wausau, Wisconsin 54401

***For tech. support & order status: 715-848-1374**

Circle 681 on reader service card

And you thought Santa Claus was the only one with the presents this year...

Well ho, ho, ho.

HARDWARE SPECIALS

MONITORS

Amdek
300 - 12" Green composite monochrome..... $135
300A - 12" Amber composite monochrome..... 155
310A - 12" Amber IBM compatible monochrome..... 185

Princeton Graphics Systems
HX 12 - 12" RGB Color..... $485
MAX 12 - 12" Hi Res Amber 185

MULTIFUNCTION/MEMORY EXPANSION BOARDS

AST
Six Pak Plus - Features: Ram memory 64K (exp to 384K), serial & parallel ports, clock/calendar, AST Superpak, utility diskette.
w/ optional game adapter..... $305
w/o game adapter..... 265

PRINTERS

Juki Industries of America, Inc.
6100 - Prints graphics! 2K buffer (exp to 8K), proportional spacing, 11" print line, uses 100-character drop-in daisy-wheel & IBM Selectric II® ribbon. $449

w/ bi-directional tractor *(Special)*..... $565

MODEMS

Anchor
Volksmodem - Features direct connection for RS-232C type interface, Bell 1093 compatible, built-in interface cable and connector, audible carrier detect signal, full/half duplex switch, 0-300 baud. Available for Apple and IBM. ..... $ 65

Hayes Microcomputer
Smartmodem 1200 - Features direct connection to telephone lines, full/half duplex, self-test, compatible w/ Bell 103 and Bell 212A, tone and pulse dialing. $495

MISCELLANEOUS

Electronic Protection Devices
The Lemon / EC-I - Features include: 6 outlets and indicator light. Provides protection from AC power line gliches, spikes, surges and transients. Lemon or Vanilla color. ..... $ 45

The Lime / EC-II - Features are same as Lemon but include 5' power cord and AC on/off switch. Choose Lime or Vanilla color. ..... $ 65

The Orange / EC-III - Features are same as Lime, but also provides EMI-RFI filtering. Orange or Vanilla color. $105

SOFTWARE SPECIALS

Intermatrix
Macphone Telemanagement System -
Telephone, time and management system. (Compatible w/ MacWrite)

Telephone Call Log - Logs outgoing calls
Electronic Calendar
Executive Diary - Records dates/events
Telephone Directory - 200-name cap.
Quick Dialer - auto-dial up to 80 numbers
Memo Pad - Electronic note keeper

For Macintosh. $145

Peachtree
Home Software Library - Multi-faceted program which includes:

Home Accountant - Basic accounting
Home Writer - Word processing
Home Analyst - Spreadsheet
Basic Tutor - Beginning BASIC programming
Compu-Spell - Learning to spell
Compu-Read - Reading speed and comprehension
Prisoner 2 Adventure Game - Logic and reasoning

Documentation provided for various levels so all ages will profit. For IBM, PCjr. $275

Connecticut Software
Printer/Letter Boss - Utility program with full menu-based operation of control functions of Epson printers. Allows advantage of sending complicated control codes with simple keystrokes. Letter Boss prints at full text-mode speed, a two-pass near-letter-quality text. For IBM..... $ 75

Borland
Sidekick - Productivity tool permits, by striking one key, opening windows which include: calculator, notepad, appointment calendar, auto-dialer, ASCII table, and much more. Another keystroke returns to original program. For IBM PC, XT. ..... $ 40

Living Video Text
Think Tank - Designed to organize ideas through outlines which can be arranged in any order by use of a few keystrokes. For IBM..... $115
For Apple & Macintosh..... 85

Alpha Software
Electric Desk - Integrated program w/ word processing, spreadsheet, communications and file management w/ report writing on one disk. For IBM, PCjr. $195

Warner Software
Desk Organizer - Management tool aiding users in tracking information. Managing time and work flow becomes easier. Also included are communication capabilities. For IBM. $195

Multimate
Multimate - Word processing made simple. Includes 80,000 word spelling checker. For IBM. $265

For the TRIVIA buff:

Professional Software - Trivia Fever. For IBM. ..... $ 35

Mirage Concepts - Trivia. For Macintosh. ..... $ 35

Springboard (Counterpoint) - Quizagon. For Apple. ..... $ 35

Dow Jones
Investors' Workshop - Integrated investment portfolio management, charting and communications package. Allows user to go online with Dow Jones News/Retrieval. For Apple II, IIe, IIc. ..... $ 95

Dow Jones
Straightalk - Communications program allowing Mac users to log-on, retrieve and save information. For Macintosh. ..... $ 69

These special hardware and software prices are in effect until December 15, 1984.

For December Special, Circle 756 on reader service card

AT: The PC's Powerful Partner

The PC AT, IBM's new top-of-the-line personal computer, is being marketed as a potent single-user or multiuser system and as the fulcrum of the firm's new local area network. At first blush, the AT appears to be as malleable–and as subject to third-party sculpting–as the PC itself.

Ken Greenberg and Karl Koessel

With unusual candor, IBM president John Akers told *Computerworld* last spring that the company was planning to exploit a host of new technologies and fill new market niches. Akers vowed that in the ensuing five years, IBM would emphasize "personal computers and work stations; communications products; software of all kinds, both system software and application software; and storage products from high to low, both hard and floppy disks."

Last August 14 IBM rolled out the Personal Computer AT (Advanced Technology) and began to make good on John Akers' pledge. In adding the AT and an array of related products to its lineup, IBM has covered a number of bases with a single price-competitive swat. With the AT, IBM is offering enhanced system support (via three new operating systems), filling the gap between the PC XT and the 3270-PC, and tying together a broad spectrum of IBM computer products with a local area network (LAN).

At the same time, IBM is spurring development of multiuser and multitasking applications by pegging them to a machine that features unrivaled speed, storage, and system expandability.

The PC AT is perhaps the most formidable stand-alone personal computer on the market, consolidating existing and forward-looking technologies–and inching into the realm of the so-called supermicro. It's the first personal computer from a major manufacturer to be built around Intel's 16-bit, multitasking, multiuser 80286 microprocessor–although the 80286 remains a chip in search of worthy software (see "80286: Intel's Multitask Master," *PCW*, Vol. 2, No. 12).

Once again IBM has produced a machine that maintains basic compatibility with the rest of the PC line, even though a number of components cannot be used interchangeably with the PC. Big Blue is publicly proclaiming that the AT is an "open architecture" box toward which third-party enhancements can gravitate. As it did with every member of the PC family, IBM has released the AT's Technical Reference manual. And although it's barely out of the starting

The PC AT, IBM's formidable new entrant in the PC marketplace, functions equally well as a stand-alone PC, a multiuser/multitasking machine, and a network file server.

PC WORLD
IBM
IBM
IBM

Table 1: Dueling processors[1]

Task	Time (in minutes and seconds)[2]		
	IBM PC XT (8088)	Compaq Deskpro (8086)	IBM PC AT (80286)
Reformat this article using *WordStar*	1:51	1:32	:59
Load a 267K *1-2-3* worksheet	1:28	:50	:36
Save a 267K *1-2-3* worksheet	:42	:45	:21
Recalculate a 267K *1-2-3* worksheet	:14	:08	:05
Sort a 150K 399-record *dBASE II* file	4:07	3:41	2:17
Find all prime numbers less than 1000[3]			
in Interpreted BASIC	8:56	4:10	3:33
in Compiled BASIC	:11	:06	:06
Run GLOBE, a graphics-intensive BASIC program[4]			
in Interpreted BASIC	4:56	2:18	1:50
in Compiled BASIC	:45	:22	:15

[1] The computers included in this test were selected because each features a different Intel microprocessor. The XT's 8088, the Deskpro's 8086, and the AT's 80286 are all part of the same microprocessor family.

[2] The timing results shown here reflect a test of specific data files and do not represent other files that are the same size. Timings are affected by variations in the way data is structured.

[3] The program used here is taken from PRIMES.BAS, BASIC version, in "Four FORTHs," *PCW*, Vol. 2, No. 5.

[4] The program used here is taken from "A World for Your PC," *PCW*, Vol. 1, No. 1.

gate, the AT is already the impetus for a new generation of expansion boards, disk media, windowing software, and networking products.

Sharing equal billing with the AT's stand-alone capabilities is its powerful penchant for communications. Given the appropriate operating system, the AT will collaborate with other PCs in either a multiuser (shared processor) or networked (shared data and peripherals) setting. The AT is the centerpiece of IBM's new PC Network–an offering that fits into the company's larger scheme to link all of its computer products (see "Local Area Networks," *PCW*, Vol. 2, No. 7).

Features to Mix and Match

The PC AT comes in two basic models, both of which can easily be customized. Model 68, priced at $3995, has 256K of installed RAM and a single half-height 5¼-inch floppy disk drive with 1.2MB of storage, four times the amount of the PC's 360K floppy drive. Model 99 lists for $5795 and features 512K of installed RAM, the 1.2MB floppy disk drive, a combination serial and parallel board, and a full-height 20MB hard disk. (By comparison, $4395 buys a PC XT with 256K of RAM, a 360K floppy disk drive, a serial board, and a 10MB hard disk.)

Both AT models are built around the Intel 6-MHz 16-bit 80286 microprocessor and IBM's new 16-bit input/output bus, performing at a rate two to three times faster than the PC. While the added speed won't make you a more accomplished typist or quicken the pulse of your printer, it will hasten copying files, recalculating worksheets, and sorting data base records (see Table 1). Common to the two versions of the AT are 64K of ROM (including an enhanced BASIC interpreter), the capacity for up to 3MB of user memory, a real-time clock/calendar with battery backup, a socket for the 80287 math coprocessor, a combination floppy disk and hard disk controller board, eight expansion slots, and a 192-watt power supply (including a fan whose speed varies with the temperature, reducing noise).

The AT boasts a revamped 84-key keyboard with modifications that are apt to please critics of the PC's keyboard. The AT's keyboard, however, cannot be used with the PC or any other product in IBM's PC family (see "In a New Key"). One other accoutrement of note is Keylock, a security lock on the front of the system unit designed to control access in network settings. Locking the AT prevents rebooting,

shuts down the keyboard, and prohibits removal of the system unit cover. Keylock is also available for the PC, the XT, and the XT/370.

IBM's confidence in its latest entry extends to service: the company is including a one-year warranty with the product.

The new IBM machine does not include a video board or a monitor. The PC's monochrome and color graphics boards work on the AT, but quite a bit of the existing PC hardware doesn't (see "A Wardrobe Change"). Among the options for the AT are a half-height 5¼-inch 320/360K floppy disk drive, a second internal 20MB hard disk, a Floor Standing Enclosure, and a tilt-and-swivel monitor stand (suitable for IBM's entire PC line). Although it's a slightly different kind of option, DOS 3.00 is the AT's new single-user, single-tasking operating system; it is priced at $65 (see "3.00 and Counting").

Media is the Message

The AT is most modular in the area of disk storage. The new machine is equipped with compartments for three disk drives–either two half-height floppy drives and a full-height 20MB hard disk, or a single half-height floppy drive and two full-height 20MB hard disks. The second hard disk is tucked beneath the 1.2MB floppy drive in the AT's right-hand compartment. Incidentally, a 1.2MB floppy lists for only $225 more than the new half-height 320/360K drive.

In addition to mixed and matched disk drives, the AT offers a choice of floppy disk drive capacities. DOS 3.00, the AT's primary operating system, reads and writes in the traditional 320/360K floppy format, but IBM is selling the AT's 320/360K unit only as a second floppy drive. DOS 3.00 is tailored to the 1.2MB floppy drive–and that means certain limitations as well as added storage space.

If you require data interchange via standard 320/360K disks, you'll need to add the AT's 320/360K floppy drive. The 1.2MB floppy drive can read and write in the 320/360K formats, but what it writes can only be read by the 1.2MB read/write head. That head is narrower–and thus more sensitive–than the read/write head in the PC's 320/360K drive.

Not surprisingly, the AT relies on new disk media capable of handling the higher-density format. IBM's high-capacity disks are designed to be formatted with twice as many tracks in the same 5¼-inch space–80 as opposed to the old 40. The high-capacity format uses 15 sectors per track, in contrast to the 8 used for disks formatted under DOS 1.00 or 1.10 and 9 for those under DOS 2.00 or 2.10. Data stored in the new format can't be accessed under DOS 2.00 or 2.10 without the addition of drivers. A box of ten high-density disks runs about $80, but the new format proves to be a better value per byte of storage than its predecessor.

Playing the Slots

The AT was built to grow. The machine features eight full-length expansion slots, each with a standard 62-pin connector that accepts boards designed for the PC's 8-bit data bus. Six of the eight slots are accompanied by an additional 36-pin connector that makes it possible to transfer data in 16-bit segments and address more than 1MB of memory.

The combination floppy and hard disk controller board fills one 16-bit slot on the Model 68, leaving seven slots free. The combination serial and parallel board takes up an additional 16-bit slot in the Model 99.

Power users can have a field day with the AT's potential for additional RAM. IBM has filled half of the 36 RAM sockets on the Model 68's motherboard

Both AT models are built around Intel's 6-MHz 16-bit 80286 microprocessor, performing at a rate two to three times faster than the PC.

with "memory modules," each consisting of two 64K-by-1-bit RAM chips piggybacked. (Nine regular 64K-by-1-bit RAM chips provide 64K of RAM on a PC; nine of the piggyback chips provide 128K.) The AT motherboard accepts only these unique modules, and only in increments of 18–thus supplying the Model 68's 256K of RAM. The Model 99 features 36 such piggyback modules, which fill the motherboard RAM sockets. To beef up the Model 68's RAM to 512K, you can buy a 256K memory module

In a New Key

Andrew Fluegelman

Figure A: The AT sports a redesigned 84-key keyboard, complete with enlarged <Enter> and <Shift> keys and a segregated cursor keypad.

When the original PC was introduced, it seemed that every review included a mandatory paragraph criticizing the arrangement of the PC's keyboard and comparing it unfavorably with that paradigm of modern industrial design, the IBM Selectric typewriter. Three years later IBM has responded with a reconfigured keyboard for the AT.

The new keyboard incorporates several design changes (see Figure A). The <Backslash/Vertical Bar> key has been moved up to the right of the <Equals/Plus> key. This makes room for a left <Shift> key that, in true Selectric fashion, sits right next to the Z and presents a formidable target for diminutive or arthritic pinkies. Unfortunately, this rearrangement has reduced the size of the <Backspace> key and crowded it into the upper right corner of the keyboard—a full ½ inch farther from the home keys than on the keyboards of the original PC and the Selectric. For those typists who make false starts more often than they type capital letters, this change may not result in a net improvement.

The <Single Quote/Tilde> key has been moved to the <Esc> key's former location, making room for a greatly enlarged <Enter> key. That is a definite improvement. *1-2-3* users who have come to rely on the <Esc> key for its "back out" function will just have to retrain themselves to find it. The <Enter> and <Shift> keys are now labeled with words indicating their functions, although the <Tab> and <Backspace> keys still display only symbols.

The whole right cluster of keys has been regrouped into a more crowded configuration, with several of the keys reduced in size. This cluster is also ½ inch farther to the right of the main section of the keyboard than on the PC. The status of the <CapsLock>, <NumLock>, and <ScrollLock> keys is now indicated by lights above the right cluster. Because the AT's keyboard is bidirectional (in addition to sending characters, it also receives information from the AT), each light reflects the true state of these keys, responding when the state is changed by software or by the user.

The right cluster contains a new key—<SysReq>—which stands for "system request." When this key is pressed, the AT executes a "user interrupt," which is currently defined to have no effect. The interrupt will be used to select from among subsystems when XENIX makes multitasking a reality on the AT. Without redefining the interrupt, however, BASIC applications can be written to respond in a specific manner when <SysReq> is pressed.

The keyboard readjustment has created a new inconvenience. Typing the DOS global specifier *.* now involves either an impossible stretch between the <Period> key and the <Asterisk/PrtSc> key in the upper right corner or a multikey sequence using a shifted 8 key. So there's now another good reason to make use of a macro keyboard enhancer such as *Keynote.*

To accommodate all this, the keyboard enclosure is ¼ inch wider and ½ inch deeper than the PC's. The AT keyboard also sports a generous cord that measures more than 6 feet long unstretched and about 10 feet fully extended. PC owners won't have to decide whether all these changes represent an improvement, however, since the the AT keyboard will not work on the PC or XT.

A Wardrobe Change

Darcy DiNucci

The PC's new brother has outstripped its sibling, and the old hand-me-down wardrobe just won't fit. The PC AT's capacities call for an array of expansion modules and software better suited to its heftier frame.

The more powerful processor and memory capabilities of the new computer have opened up new possibilities for advanced uses of the personal computer, but they have also restricted some hardware and software swapping between the PC and the AT. The AT's memory is accessed in 16-bit segments, which the PC's 8-bit boards can't process. (Interestingly, the AT's 16-bit slots have a different design than the 16-bit slots in AT&T's new PC 6300, indicating that IBM will be contending with a company its own size in the bid for a new hardware standard.)

The list of IBM's PC hardware options that can also be used on the AT is short, and IBM's product announcement specifically states that any hardware not listed is not supported on the AT. The hardware left behind includes:

- 5161 Expansion Unit Model 1, 2, or 3
- 5181 Compact Printer
- 64K Memory Module Kit
- 64/256K Memory Expansion Option
- Prototype Adapter
- Binary Synchronous Communications Adapter
- SDLC Communications Adapter
- Asynchronous Communications Adapter
- 10MB Fixed Disk Drive
- 5¼-inch Single-Sided Disk Drive
- 5¼-inch Disk Drive Adapter
- Printer Adapter
- Fixed Disk Adapter
- 5¼-inch Full-Size Dual-Sided Disk Drive

The following is IBM's list of the PC hardware the AT can use:

- IBM Color Printer Model 1
- IBM 5152 Graphics Printer Model 2
- Printer Cable
- Printer Stand
- IBM 5151 Monochrome Display Model 1
- IBM 5153 Color Display Model 1
- Personal Computer Cluster Adapter
- Monochrome Display and Printer Adapter
- Color/Graphics Monitor Adapter
- Communications Adapter Cable
- Game Control Adapter

To fill the gaps, IBM released a line of memory expansion units, disk drives, and boards. The company also introduced several new options designed to take advantage of the AT's network file server capabilities.

The AT remains compatible with most of the software designed for the PC. DOS 3.00 is close kin to DOS 2.10, and most software that runs under DOS 2.10 should run under DOS 3.00, but other factors that

affect compatibility—such as the dependability of ROM calls—remain largely untested.

Along with its announcement of the AT, IBM published a list of more than 50 of the software products it distributes that are compatible with the new computer—and 11 that are not. Software written entirely with PC-DOS system calls will run flawlessly. Some copy-protected applications and those tied to the PC's 4.77-MHz clock rate will not run on the AT, whose throughput is two to three times greater than the PC's. Several software companies have tested their programs on the AT and have assured buyers of continued compatibility. Lotus Development Corporation, for instance, immediately issued a press release announcing the complete compatibility of *1-2-3* and *Symphony*.

In fashioning a new outfit for a new machine, IBM is looking to the future. The AT's 80286 processor and new operating systems give the machine unprecedented versatility: in stand-alone, single-user applications, in a multiuser/multitasking environment, and as a network server. New software geared to the PC Network will now be at least as important as the PC's single-user software, and new hardware that can capitalize on the AT's multiuser abilities will be a useful adjunct. Following the PC tradition, third-party manufacturers are likely to keep busy fulfilling the promise of the AT's flexibility.

expansion kit for $495. But before you can add the memory expansion board to the Model 68, you'll first need to fill the motherboard's RAM sockets.

Either AT model can accept one 128K memory expansion option once the motherboard is filled with RAM. This brings the machine up to 640K—the maximum addressable RAM in the PC's architecture. (The 8088 addresses 1024K of memory, but the last 384K is reserved for functions other than user RAM [see "How Much Memory Is Enough?" *PCW*, Vol. 2, No. 6].) Part of the appeal of the 80286 is its ability to address up to 16MB of RAM. Accordingly, IBM enables you to increase the 512K AT to 3MB, in five allotments of 512K—at $1125 per expansion board. Theoretically, products from third parties could boost RAM beyond 512K per board, which would enable RAM in the AT to exceed 3MB. All this RAM is open to PC XENIX users, but aside from DOS 3.00's VDISK (RAM disk) utility, DOS 3.00 function calls (upon which application programs rely) cannot recognize more than 1MB of RAM.

None of Big Blue's memory expansion options includes the new (and still scarce) 256K-by-1-bit RAM chips. All the new memory expansion boards for the AT require a 16-bit slot.

Managing Memory

What will you do with all that RAM? Tim Sammons, a consultant who heads Sammons & Associates in Berkeley, California, suggests that the AT's capacity will encourage users to rely on multiple RAM disks. "You'll be able to bring software and data into memory and then do your processing without repeated floppy disk reads. This increase in speed will be helpful in large data management applications," Sammons says. He's convinced that, over time, extra RAM will make software both easier to use and more intelligent. Help files and truly helpful error messages will be readily available and not confined to a disk. Expert systems and artificial intelligence in general, now suffering under the RAM limitations of current machines, may also get a shot in the arm from the AT's prodigious memory.

But perhaps the major assignment in store for the AT's extended RAM is multitasking—the capacity for one machine to execute several jobs simul-

3.00 and Counting

Harry Miller

The introduction of IBM's new PC AT is accompanied by the release of DOS 3.00 and BASIC 3.0, enhanced versions of the PC's most popular operating system and interpretive language. The enhancements are designed primarily to support the AT's hardware (specifically the 20MB hard disk, the 1.2MB floppy disk drive, and the clock/calendar), but they also add a few features to the PC, the Portable, and the XT.

VDISK

Among the most significant of the DOS additions is the VDISK (virtual disk) device driver, which makes it possible to set up a RAM disk emulator. A RAM disk sets aside a portion of the computer's active memory (RAM) to be used as if it were a disk drive. The advantage is that a RAM disk provides much faster file access or transfer than an actual floppy disk drive because the process is electronic rather than mechanical.

VDISK is a very simple RAM disk utility. To use it you include a statement such as **device = vdisk.sys 320** (which establishes a 320K RAM disk) in the CONFIG.SYS file on the disk you use to start the computer. The file VDISK.SYS must also be present on that disk. When DOS is first loaded, it automatically looks for a file called CONFIG.SYS and reconfigures the PC's operating system to include the devices listed in that file. If you don't already have such a file, you can create one from the keyboard. Enter the command **copy con: config.sys**, press <Enter>, and type **device = vdisk.sys** followed by a space and a number specifying the size, in kilobytes, of the RAM disk. Then press <F6> and <Enter>. The next time the PC is started with this disk, it will create a RAM disk called by the next drive designator. For example, if you already have two disks called A: and B:, the RAM disk will be designated C:; if you already have disks called A:, B:, and C:; the RAM disk will be designated D:. On the AT the VDISK utility enables you to utilize memory above the normal 1MB limit.

File Protection

The new DOS command ATTRIB protects the current contents of a disk file by marking the file with a read-only attribute, which lets the file be read into memory but does not allow the file on the disk to be altered in any way. The command might look like 'attrib +r *filename.ext*'. To allow changes to the file (i.e., to disable the read-only attribute), you would issue the ATTRIB command again, this time with a **-r**.

Labels

The new LABEL command enables you to change the volume label of a disk at any time. With DOS 2.00 or 2.10 a volume could be labeled only when a disk was formatted.

International Character Support
DOS 3.00 supports date and time formats as well as keyboard and display character sets for countries other than America. The COUNTRY statement in a CONFIG.SYS file sets the format for display of the date and time. The KEYB*XX* (Load Keyboard) command loads into memory a program that replaces the ROM BIOS keyboard program. DOS 3.00 supplies KEYB*XX* programs for the United Kingdom (KEYBUK), Germany (KEYBGR), France (KEYBFR), Italy (KEYBIT), and Spain (KEYBSP). The command SELECT combines the COUNTRY statement and the KEYB*XX* command. It uses DISKCOPY to make a new disk and creates a CONFIG.SYS file with the appropriate COUNTRY statement and an AUTOEXEC.BAT file with the corresponding KEYB*XX* command.

The command GRAFTABL loads into memory a graphics table of additional character data for the color graphics board, allowing the display of international character sets.

File Sharing
Also included in DOS 3.00 is the command SHARE, which provides support for file sharing and allocates the amount of file space for file-sharing information and for the number of file locks. In the single-user environment for which DOS 3.00 was designed, SHARE is of no use. But this DOS command prefigures DOS 3.10, 3.00's networking successor, which will rely heavily on file-locking and file-sharing capabilities.

BASIC 3.0
The additions to this new version of the ever-popular BASIC language are intended for the advanced programmer. The SHELL statement lets the BASIC programmer execute DOS commands and run DOS programs as "child processes" (programs run from within BASIC). The ENVIRON$ function and the ENVIRON statement are used to inspect and modify parameters in the BASIC environment table (such as PATH, BUFFERS, and FILES). The IOCTL statement and the IOCTL$ function let BASIC send and read control commands to and from installed devices and their drivers. The ERDEV and ERDEV$ read-only variables hold the error code and the device name when a device generates an error.

All the new BASIC statements, functions, and reserved variables are now, of course, reserved words, and programmers, especially novices, should not attempt to use any of them as program variables. Although not documented elsewhere, INTER$ is also included in the list of reserved words.

taneously. In this role, the 80286 truly shines. When multitasking applications are assigned to an XT, for example, there are no hardware circuits to keep tasks separate, and thus applications can write over each other in memory. The 80286 partitions memory, essentially setting up fences between segments of RAM. In this case, good fences do make good neighbors. The XT's 8088 can perform multiple tasks, relying on such window managers as *TopView* and *DesQ*, but RAM is defenseless against overwrites (see "View From the Top").

In addition to its multitasking prowess, the AT has the ability to function in a multiuser environment, enabling several users to share it simultaneously. The machine's supply of serial ports limits it to three users—two at work stations and one at the host.

In order for the 80286 to serve multiple users and perform multiple tasks safely, the AT requires an appropriate operating system. Enter PC XENIX, a version of UNIX System III adapted for IBM by Microsoft (see "IBM's UNIX"). The 80286 is capable of operating in two modes. Under multiuser/mulitasking XENIX, the chip works in the protected (that is, memory-protected) mode. When the AT runs under DOS, the 80286 operates in the compatibility mode—so called because the 80286 works with software for the 8088/8086 family of processors. When you boot the AT, the operating system used determines whether the machine is in the compatibility or the protected mode. (PCIX, a version of UNIX for the 8088, runs on the AT in the compatibility mode.)

The AT as Server

PC XENIX unquestionably makes good use of the 80286, but the AT's multitasking/multiuser operating system won't be available for a few more weeks. Applications written for XENIX may not be plentiful for quite a while, and with the AT initially supporting just three users simultaneously, IBM has only skittishly entered the PC-based multiuser market. Even if third parties load the AT with serial ports (which XENIX and the 80286 can handle easily), IBM has another communications role in mind for its latest machine. Networking is the name of Big Blue's new game.

At the time it introduced the AT, IBM unveiled its PC Network for resource and data sharing. The network places the AT at center stage as a file server capable of simultaneously acting as a work station. But consistent with its emphasis on peer-to-peer (that is, PC-to-PC) communications, the PC Network accepts an XT or another hard disk compatible as server.

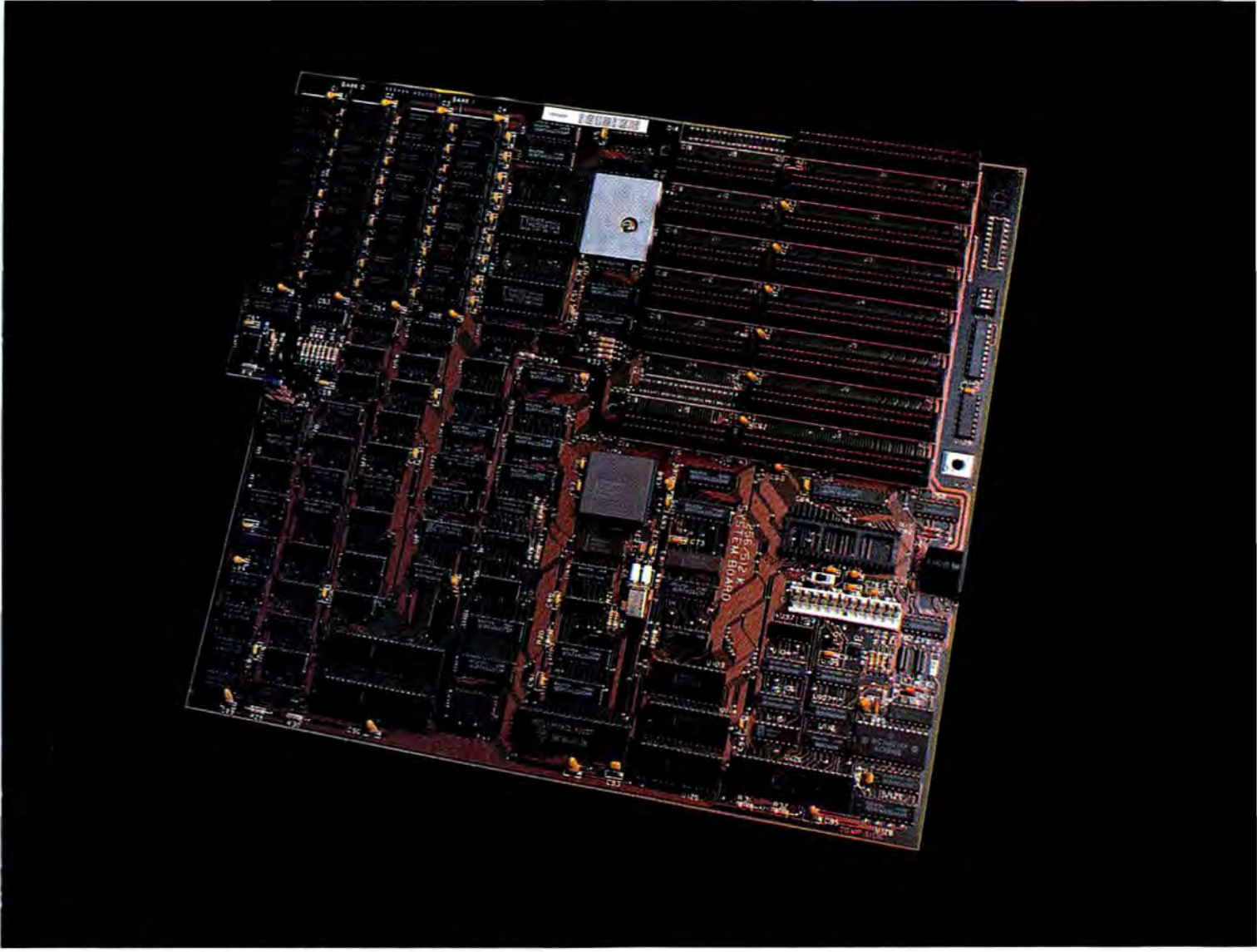
In this way IBM's PC-based LAN enables the company to maintain a "PC philosophy." IBM, after all, is interested in selling and linking PCs, not ASCII work stations. While a true multiuser system shares processing power among users who typically rely on dumb terminals, the PC Network fosters file and hardware sharing among users equipped with processors of their own.

Consultant Tim Sammons puts it this way: "Relying on shared logic systems diverges from IBM's basic strategy. IBM would rather have customers buy minicomputers, not personal computers, for shared logic." Will Zachmann, a market analyst with International Data Corporation of Framingham, Massachusetts, concurs: "Multiuser systems represent a much more limited market [than stand-alone personal computers]. Networking PCs is a perfectly viable alternative—one that individual managers prefer."

Betting on Broadband

Early this year IBM announced that its proprietary network to link PCs, minis, and mainframes would not be released for roughly two years. This ambitious network is based on a token-passing ring arrangement that relies on twisted-pair cabling. (In a token-passing ring configuration, computers are connected in a circle. A single "token," or signal, representing the right to transmit data on the network is passed around to each computer. Twisted-pair wires provide an inexpensive connection among computers and transmit frequencies over a single channel.)

Aware that market interest might burn out while the company fiddled, IBM released its version of a broadband PC-based network developed by Sytek, of Mountain View, California. (A broadband



The AT's motherboard features piggyback RAM chips, eight expansion slots (six with 16-bit bus connectors), and the 80286 microprocessor (the gray square in the center).

LAN links computers with a cable capable of rapidly carrying many signals at once.) IBM claims that the PC Network announced in August can easily be installed in a small business. Tim Sammons agrees, calling the LAN "ready-to-wear."

The PC Network consists of the kind of coaxial cable used for cable television, a $695 network board for each PC, and a $595 Translator Unit for each network. The translator, which converts the incoming signal to a frequency that all network adapters can receive, is connected by cable to as many as eight PCs in a 200-foot radius. Connecting more than eight PCs or extending the radius requires a Base Expander, which is essentially a repeater that boosts the signal.

The PC Network can link as many as 72 PCs within a 1000-foot radius. This is achieved through the use of Base Expanders and Short, Medium, or Long Distance Kits (which include cables and connect up to eight PCs each). IBM claims that with the addition of third-party hardware and installation help, the network supports a maximum of 1000 nodes within a 3-mile radius.

Data is transmitted throughout the network at a rate of 2 megabits per second via the CSMA/CD (carrier sense multiple access with collision detection) protocol. (CSMA/CD is a common, proven networking technique in which a PC sends a packet of data only when the network is quiet. If two PCs send a packet at the same time, each will recognize that the packets have been scrambled, then will alternately

View From the Top

Evelyn Spire and Karl Koessel

TopView, announced at the same time as the PC AT, is an "environment" designed to increase productivity by enabling you to run several programs concurrently and move easily among them to view or transfer information. *TopView* runs under DOS 2.00 and later releases on any member of the PC family with two disk drives. Using *TopView*, you can switch between programs that you already own without having to stop one and start another.

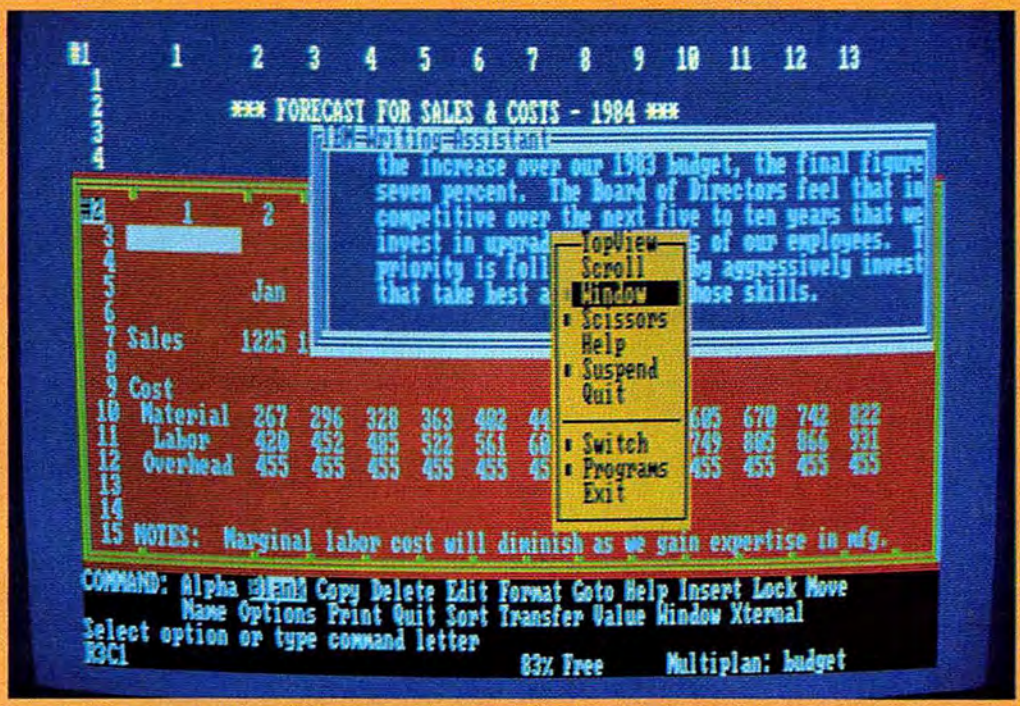
If you don't have an environment such as *TopView*, and you're writing a report that requires figures extracted from a worksheet, you have to save the report in its current form; exit the word processor; find the specific spreadsheet program and data disks; swap spreadsheet for word processing disks; load the spreadsheet and the correct file; find, mark, and copy the figures to a temporary file; exit the spreadsheet; swap disks again; load the word processor and the report; locate the cursor; and read in the figures from the temporary file. The length of this process may seem like a joke. It is. Many a manager has been seen cutting and pasting a portion of a spreadsheet into a report with scissors and tape rather than attempting the electronic method. Integrated programs make extracting figures easier, but you may want to use a word processor that isn't part of the integrated package.

When you're running *TopView* and want to use another application, you load the second program into RAM. All previously loaded applications remain in RAM but reside in the "background." Most of them will continue to run in the background. For example, a data base can sort a large file unattended while you type a letter. Because the size and number of application programs that can be loaded concurrently depend upon the amount of available memory, IBM recommends that *TopView* run on a PC equipped with 512K.

TopView gives each application its own "window." (A window is an area on the screen that a program uses to display its information as it runs.) Windows of separate programs are layered on top of one another. The "foreground" application–the one with which you are currently interacting–is displayed in what is called the topmost window. That window can occupy the entire screen or a portion of it. You can size it, move it, hide it, scroll text within it, or temporarily "zoom" it to occupy the entire screen.

Using a two- or three-button mouse, the cursor keys, or some other pointing device, you select options (such as loading another application, manipulating windows, and cutting and pasting) from *TopView*'s pop-up menus. At any time, one keystroke or click of a mouse button invokes *TopView*'s main menu.

TopView is text oriented, as are most best-selling software packages. *TopView* will run a graphics applica-



TopView is guided by a pop-up menu (the yellow rectangle) that facilitates running–and working on–several programs concurrently. In this example, the PC is running Multiplan and IBM's Writing Assistant.

tion (on a PC outfitted for graphics) or a program that reads directly from, or writes directly to, a text-mode screen. The latter type of application, however, cannot be "windowed," and it is given the entire screen while it runs. When such programs are moved to the background, they remain in RAM but their execution is suspended.

IBM is pitting *TopView* against other window-oriented multitasking environments (such as *Microsoft Windows* and Quarterdeck Office Systems' *DesQ*) vying to become the standard. IBM intends to give *TopView* full support, including the company's biggest software advertising pitch to date and a commitment to improving the program's capabilities and performance. At the present time *TopView* does not run batch files, automatically load applications, support all DOS commands (notably redirection) from within its environment, or manage data interchange beyond the simple cutting and pasting of text.

TopView should be on dealer shelves by spring. The *TopView Programmer's Toolkit* will also be released at that time to assist programmers in developing application programs to work with *TopView*'s features.

IBM's UNIX

Harry Miller

For the PC AT, IBM supports and markets the PC XENIX operating system, which is based on Bell Labs' UNIX System III. XENIX is both multiuser (providing centralized processing and file access for several users on the same machine) and multitasking (allowing several programs to run simultaneously). XENIX also includes the improvements to UNIX that were created at the University of California at Berkeley—the so-called Berkeley enhancements.

Because some of the new DOS 2.00 features, such as tree-structured directories and device drivers, were modeled after UNIX and XENIX features, elements of XENIX will be familiar to DOS users. XENIX can reside on the same hard disk as DOS and is capable of transferring files to and from DOS 2.00, 2.10, and 3.00.

XENIX can address the AT's maximum 3MB of user RAM and takes advantage of the 80286 chip's dynamic memory management and protection capabilities. XENIX supports the IBM Monochrome and Color Displays, but the Color Display can be used only in text mode. Any IBM personal computer can be used as a terminal under XENIX, and the system supports most standard ASCII terminals as well.

XENIX includes three program editors (VI, ED, and SED) and three shell command interfaces: The Bourne shell is a simplified programming language; the Visual shell provides a menu-driven environment resembling the command structure used in *Microsoft Word* and *Multiplan;* and the C-shell has commands and constructs similar to the C programming language.

Currently XENIX on the AT is limited to three concurrent users (two at terminals plus one at the main console), because each user terminal is connected to the AT by a serial port, and IBM provides only two serial ports for the AT. However, more users could be accommodated with the addition of an expansion board, furnished by a third-party manufacturer, that provides extra serial ports. (Indeed, third parties have quickly gotten into the act. Less than a month after the AT's introduction, Computone Systems became the first to augment the AT's multiuser capabilities. The company released a terminal controller board and operating software that enable the AT to accept as many as eight terminals, printers, and communications devices.)

XENIX expands IBM's UNIX strategy—one that already includes PCIX, a single-user, multitasking operating system that runs on the XT, and VM/IX, a multiuser version that runs on IBM mainframes. All three products are enhancements of UNIX System III. Thus far, these systems have been used primarily as product development environments. However, an increasing number of DOS application programs are being written in C for portability. The appearance of such programs for XENIX could make it a popular commercial environment as well.

check network traffic before re-sending.) From PC to PC, the data transfer rate is 200 kilobits per second. By using coaxial cable to transmit a broad band of frequencies, the PC Network can send voice and video as well as data.

A Network on Board

The heart of the network is the board, made by Sytek to IBM's specifications. The board fits into an 8-bit slot in any member of the PC family except the PCjr and the PC Expansion Unit. The adapter includes a pair of Intel coprocessors, the 80188 and the 82586, which operate at the same 6-MHz rate as the 80286.

The 80188, which incorporates the 8088 and support chips into a single unit, works with a 32K ROM module on the board to manage the network (including power-up, protocol processing, error detection, and transmission). The 80188 also governs the 82586, which controls communications with the network via an RF modem on the board. An 8K ROM module, the NETBIOS, serves as the basic input/output system between the network and the host PC. The software on the network board generates a "session-level interface" (that is, menus). The board also includes 16K of RAM, set aside as a buffer. IBM released the board in August in the hope that software developers would write applications directly for the NETBIOS.

Another DOS on the Way

PC XENIX doesn't support the PC Network, but DOS 3.10 does. When it is released in several weeks, DOS 3.10 will replace DOS 3.00 but not DOS 2.10. DOS 3.10, which IBM says will be available as a "trade-up" option for $30, is 3.00 plus support for PC Network hardware and software. DOS 3.10 will work with all members of the IBM PC family (except the PCjr) and will occupy the same amount of memory as DOS 3.00.

DOS 3.00 has file-sharing capabilities (via the SHARE command) but lacks 3.10's network "redirector" facility. According to Dave Crane, a Dallas-based consultant, the redirector intercepts application program calls (such as those for disk or printer services) and redirects them into the network as required. The redirector also fields responses from the network and passes them to the application program.

The PC Network requires LAN software in addition to that etched in ROM. The *PC Network Program*, priced at $75 and scheduled for release around the same time as DOS 3.10, will provide server capabilities for file, print, and message functions.

Crane notes that the *PC Network Program* will use DOS 3.10 to share resources and information among PCs. The majority of applications running under DOS are expected to work with the new server functions. "The software obviously controls the LAN hardware, but unlike a lot of LANs out there, it supports multiple file servers and peer-to-peer communication," Crane says. "Concurrent access to data by multiple users is also supported through sharing functions that still manage to maintain data integrity."

Whither Token Ring?

The PC Network is hardly IBM's last word on LANs. In addition to this peer-to-peer offering, IBM has endorsed the token ring LAN, an industrial broadband coaxial LAN, and the PC Cluster announced last spring. Mindful of these seeming disparities, Big Blue has issued a "statement of direction" affirming its intention to connect all its networks. IBM is especially committed to building a bridge between the local broadband PC Network and the potentially more pervasive token ring plan. "PCs will be able to be attached to both networks," says Bill Osborne, a senior planner for IBM. "There are multiple ways of doing so, and we could do it now—it's not a technological problem."

(Of all of IBM's networking strategies, the PC Cluster remains the most rudimentary. The PC Network permits file sharing using hard disks as servers, but the PC Cluster doesn't. [See "PC to Go . . . ," *PCW*, Vol. 2, No. 5.])

Tim Sammons, who relied on Sytek's LAN in wiring the Democratic National Convention last summer, points out that the IBM/Sytek network fills a

definite need. "It enables incompatible equipment–printers, character readers, and so on–to communicate," Sammons says. "But Sytek is not the answer for everyone–it's primarily for those who have an eclectic mix of equipment already. Sytek doesn't provide top-flight integration, just a good level of performance."

A New Pitch

With the AT batting cleanup, IBM is a formidable player in the network ball game. But the new computer is surely among Big Blue's most complex small machines, and gaining mastery of its standalone and communications characteristics may entail a lengthy learning process.

"For some organizations, this could even be a first computer," says IBM's David Camm. "The network will provide interesting capabilities, but I don't want to categorize the AT's market size or the machine's niche. Let's just say that the facility for expansion is there."

Ken Greenberg is an Assistant Editor at PC World. *Karl Koessel is the magazine's Technical Editor.*

IBM PC AT
IBM
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: Model 68 $3995, Model 99 $5795, 128K memory expansion option $350, 256K memory module kit $495, 512K memory expansion option $1125, 1.2MB disk drive option $650, 20MB hard disk option $1595, 360K disk drive option $425

PC Network Hardware
IBM
List price: network board $695, Translator Unit $595, Base Expander $59, Short Distance Kit $39, Medium Distance Kit $79, Long Distance Kit $89, 25-foot cable $29, 50-foot cable $39, 100-foot cable $59, 200-foot cable $99

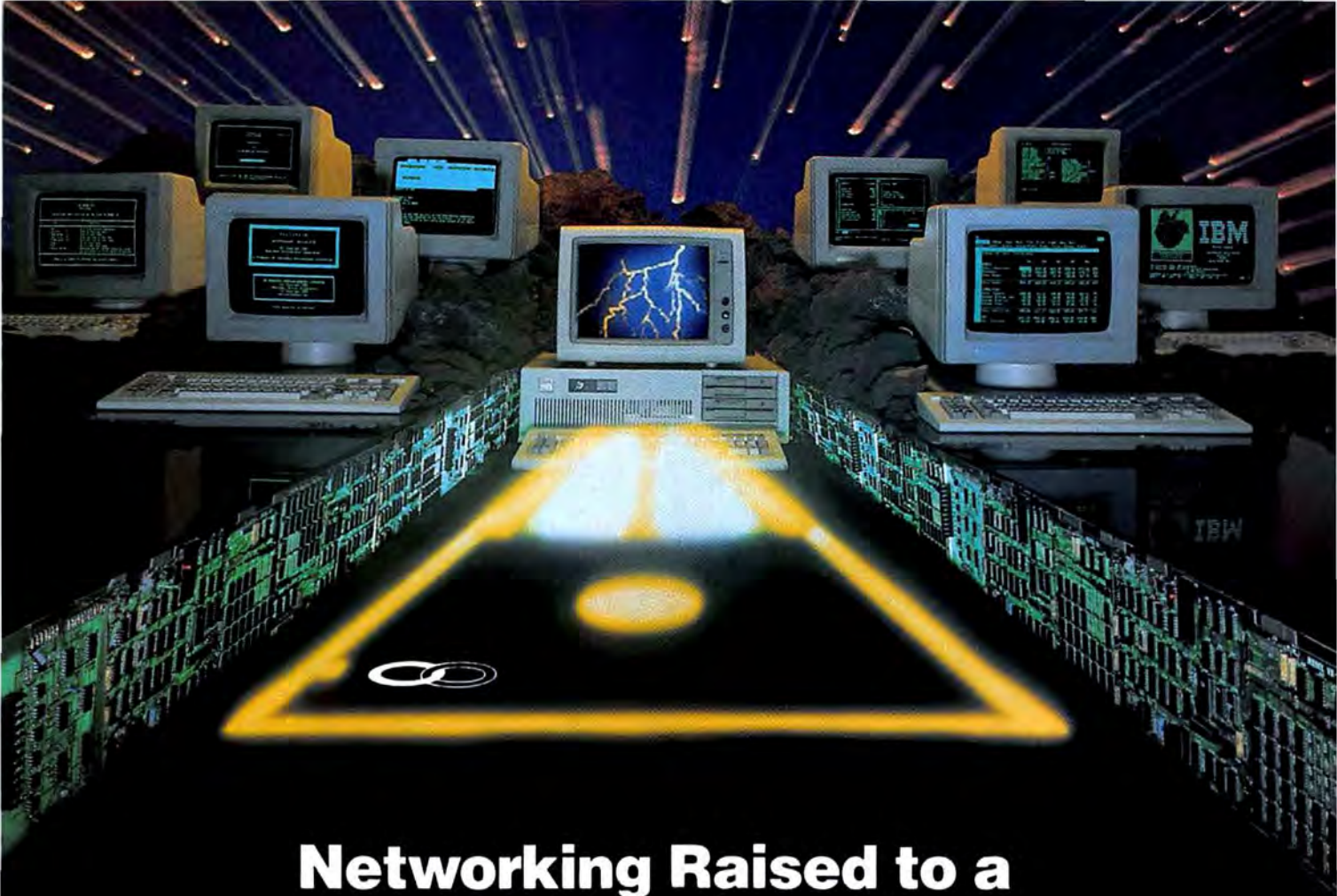
PC Network Program
IBM
List price: $75

TopView
IBM
List price: $149, Programmers Toolkit $395

PC-DOS 3.00
IBM
List price: $65

PC-DOS 3.10
IBM
List price: $65

PC XENIX
IBM
List price: $395, software development system $455, text formatting system $145



Networking Raised to a Greater Power

Advanced Technology. With it, IBM tripled the speed of the PC and increased its memory capacity five-fold. Nowhere is this increase in computing power more important than in networking situations. If the AT's technological advances have prompted you to look into a multi-user network, you owe it to yourself to take a closer look at MultiLink Advanced™ . . . a unique multi-tasking, multi-user networking system that runs programs under PC-DOS 3.0.

Eight Workstations for the Price of an AT. MultiLink Advanced™ represents the next generation in networking systems for IBM microcomputers. The system enables terminals, connected to a single AT, to emulate IBM-PC's having up to 480K of RAM.

This means that instead of spending $3,000 per workstation for a PC with a Kilobuck "Network Interface Board," you can use inexpensive terminals . . . eight of which cost less than an IBM AT. Even if you need only one workstation connected to your AT, you'll realize significant savings.

MultiLink Advanced™ . . . Instant Access to All of Your Resources. Central to most multi-user situations is the ability to coordinate a variety of printers. With what's been described by *PC Tech Journal* as ". . . by far, the best print spooler for the IBM PC," MultiLink Advanced™ gives users the option to print either at their workstations, or at a central location. In addition, programs and files can be shared by multiple users locally or through use of a modem. Just think of it . . . having remote access to an AT with a lightweight terminal modem.

Although designed to take advantage of the AT, MultiLink Advanced™ runs on all versions of PC-DOS, except 1.0, and certain implementations of MS-DOS. A wide range of leading programs are supported which include WordStar, dBASE III, Multimate, and Lotus 1-2-3.

Get the Advanced Story Today. Call The Software Link Today for complete details and the dealer nearest you. MultiLink Advanced™ is immediately available at the suggested retail price of $495 and comes with a money-back guarantee. VISA, MC, AMEX accepted.

MultiLink™ ADVANCED

THE SOFTWARE LINK, INC.

8601 Dunwoody Place, Suite 336 Atlanta, GA 30338 Telex 499614 SWI LNK

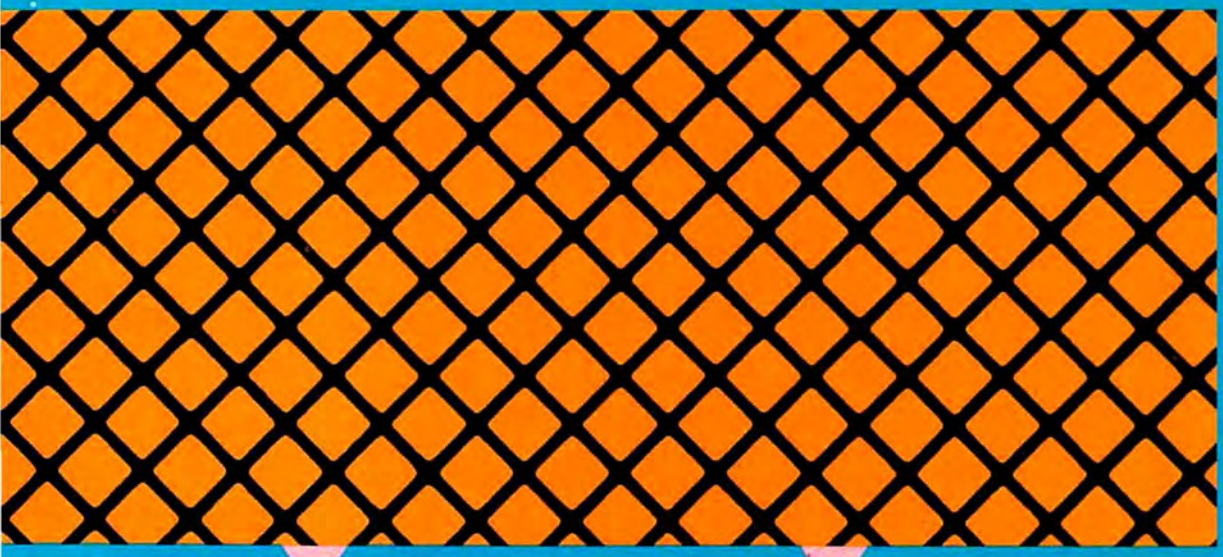
CALL: 404/998-0700

Dealer Inquiries Invited

MultiLink Advanced™ is a trademark of The Software Link, Inc.

IBM, PC, AT, & PC-DOS are trademarks of IBM Corp. MS-DOS, WordStar, dBASE III, Lotus 1-2-3, and Multimate are trademarks of Microsoft Corp., MicroPro, Ashton-Tate, Lotus Development Corp., & Multimate International, respectively.

Circle 526 on reader service card



HELP THEM READ BETWEEN THE LINES.

To make a powerful presentation, you should sit in the back row.

Because when you put yourself in the place of your audience, you see that what's simple to you, isn't to them. To help people follow your thinking, you need strong, clear graphics.

You need Graphwriter. The graphics software that brings you closer to that guy in the back row. Graphwriter puts more easy-to-customize charts at your fingertips than any other graphics package.

It designs, labels, and previews your chart on the screen, automatically. If you like it, plot it. If not, fix it. In seconds.

You don't have to bend over backwards to reach your audience. Reach for the software built to bring them to you. Before your next presentation, get your hands on Graphwriter at ComputerLand, Entre, or your local computer store. Or call 617-890-8778.

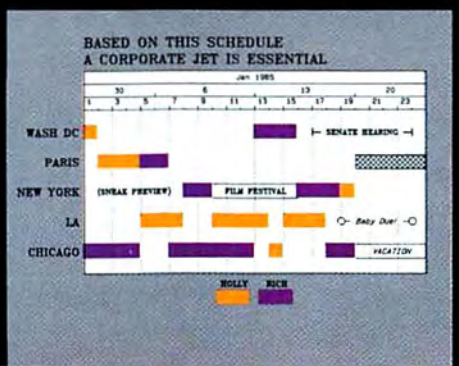
FORMATS
text/word
vertical column
stacked column
clustered column
horizontal bar
stacked bar
clustered bar
pies (1-4)
proportional pies
line
scatter plots
bar-line combination
*Gantt
organization
bubble
table
pie-bar combination
surface line
stacked line
line-table
double stacked bars
range
paired bars
3D horizontal bar

FLEXIBILITY
text justification
variable font sizes
variable font colors
22 font styles
adjustable bar widths
pie rotation/placement
unequal line lengths
8 line types
5 frame options
8 fill patterns
axes labels ($,%,x)
log/semilog scaling
multiple curve fits
floating comments
vertical page plotting
multiple plots per page

EASY-TO-USE
pre-designed formats
chartbook
input forms
1-2-3* DIF* access
Multiplan* file access
on-screen help messages
chart preview
"built-in artist"
batch processing
chart/template storage

OUTPUT OPTIONS
paper
transparency
35mm slides
Polaroid Palette™

COMPUTERS
IBM PC, XT and AT*
DEC Rainbow*
Tandy 2000*
HP 150*
NEC APC*
Burroughs ET2000*
Fortune Systems*



Graphwriter®

THE ART OF PERSUASION.™

Graphic Communications Inc.
Waltham, Massachusetts 02254
617-890-8778

Circle 502 on reader service card

Make Stat Magic

Statistics, reports and plots happen magically with SPSS/PC™—*the* Statistical Package for IBM PC/XTs.*

SPSS/PC is the most comprehensive statistical package for performing simple or complex tasks, regardless of data size. It maintains feature and language compatibility with mainframe SPSS; while optimizing for the PC environment.

Statistics range from simple descriptive to complex multivariate, including Multiple Regression, ANOVA, Factor and Cluster analysis. Loglinear and nonparametric procedures are also included.

Simple facilities allow transfer of files between SPSS/PC and programs like Lotus 1-2-3, dBase II and SAS. A complete Report Writer, Plotting facilities and a Communications program for mainframes round out a fully integrated product.

For more information, contact our Marketing Department without further ado. And see what a little stat magic can do for you.

SPSS Inc., 444 N. Michigan Avenue, Chicago, IL 60611, 312/329-2400.

In Europe: SPSS Benelux B.V., P.O. Box 115, 4200 AC Gorinchem, The Netherlands, Phone: + 31183036711 TWX: 21019.

SPSS inc. PRODUCTIVITY RAISED TO THE HIGHEST POWER™

*SPSS/PC runs on the IBM PC/XT with 320K memory and a hard disk. An 8087 co-processor is recommended. Contact SPSS Inc. for other compatible computers.

IBM PC/XT is a trademark of International Business Machines Corporation. dBase II is a trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corporation. SAS is a trademark of SAS Institute, Inc. SPSS and SPSS/PC are trademarks of SPSS Inc. for its proprietary computer software.

© Copyright 1984, SPSS Inc.

Circle 844 on reader service card

What Business Can Afford To Use Fuzzy Information?

In this age of information processing, perhaps the most important information processing occurs between your eyes and your monitor screen. An unclear on-screen image can visually distort the most accurate information, leaving valuable information lost somewhere between the lines.

You won't take that chance with a monitor from Roland DG. For us, clarity is not just a good feature, it's our most important feature.

We designed the Roland DG monitors as if a sharp image was all that mattered. Then we start adding on the extras—like easy plug-compatibility, non-glare screen and other features. Then we styled them so that they look sharp from any angle—not just the front.

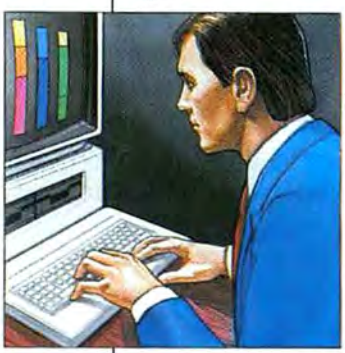
Roland DG makes a broad range of monitors, to suit any personal computer and to please any computer's person. From high resolution RGB and Composite Color monitors to Monochrome Composite or TTL signal (IBM-PC) in either Amber or Green.

If accuracy is important to you, you shouldn't settle for anything less than a Roland DG monitor—the clear choice. Because the most important information processor is you.

Roland monitors are available at fine computer dealers everywhere. Roland Digital Group, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141.

MODEL
CC141

the most important information processing occurs between your monitor and your eyes.



designed to be as beautiful on the outside as on the inside.

there's a Roland DG monitor for every computer's person!

IBM is a trademark of International Business Machines

Roland DG

Circle 727 on reader service card

PC in the Sky

Feeding the PC data from the Landsat satellite results in visually remarkable–and exceptionally useful–images.

Jonathan Littman and Mary Friedland

The scene is a small potato farm in Oregon. To determine optimum irrigation and fertilization techniques, the farmer who tills this land has begun to rely on satellite pictures. These "photos" aren't taken with a camera, and they contain more information than any lens–or eye–could see. The farmer is on the receiving end of a sophisticated microelectronic relay team: the satellite senses Earth's radiation, records it in digital form, and transmits the information to a personal computer equipped with software that processes the data into a photolike image. The results of this procedure, called digital image processing, are no small potatoes.

The potato farmer with the satellite dish by his shed and the PC in his office is probably months, not years, away. But bigger and better crop yields are merely one dividend of digital image processing–a potential PC application that also promises breakthroughs in plastic surgery, industrial design, and innumerable other endeavors. Digital image processing represents a marriage of established computer and space technologies; the looming innovation (like the personal computer itself) may soon make elaborate and expensive techniques accessible and affordable to individuals.

July 9, 1982, was a red-letter day for digital image processing. On that day the National Aeronautics and Space Administration (NASA) sent aloft Landsat (land remote-sensing satellite system), a satellite designed to gather pictorial data on Earth's resources. Landsat incorporates advanced sensing equipment designed to record perceptions of the planet digitally. Completing one orbit of the earth every 99 minutes at a distance of roughly 500 miles, the satellite relays images of the entire globe every 16 days.

Based on NASA's objectives, Landsat is an unqualified technical success. But at a press conference later in 1982, a reporter posed a thorny question: without a mainframe computer equipped with expensive software, what good was the information? IBM's Ralph Bernstein, a senior advisor on the project from IBM's Scientific Center in Palo Alto, California, acknowledged that he had no satisfactory answer. Little work had been done to make digital image processing technology widely available.

Bernstein was intrigued by the prospect of moving the mainframe-based digital imaging system to a microcomputer. En route to the Scientific Center one morning with colleague Joe Meyers, a veteran programmer, Bernstein proposed an experiment. He would define the algorithms to do image processing on the PC if Meyers would do the programming. Meyers agreed, and in two months the team had developed a rudimentary PC-based program capable of processing Landsat's digital images. In February 1983, the pair demonstrated the software, which was written in Advanced BASIC with some assembly language code, at NASA's Goddard Space Flight Center in Greenbelt, Maryland. Within a year, they had refined the program sufficiently to exhibit it at the Landsat Users Symposium in Santa Barbara, California.

Although you can't buy software based on the Bernstein/Meyers collaboration yet (see "Ingredients for Success" for proposed requirements), and IBM remains mum on its product plans, image processing on the PC is no longer confined to theory. Hardware-intensive systems are already available for the IBM PC XT, and it's only a matter of time before this potentially vast resource becomes common in fields as diverse as agriculture, mineral exploration, and medicine. PC-based image processing has even been used to monitor the delicate habitats of endangered species.

What's especially noteworthy about the IBM team's system is that it performs basic image processing with off-the-shelf hardware, so this rich capability may soon be available to the thousands of PC users.

Maintaining an Image

An image-processing application begins with "imaging"—the method by which Landsat collects data. Landsat contains two imaging devices: a multispectral scanner, which checks the intensity levels of various wavelengths of light; and a thematic mapper, which measures the temperature of an object. Each device works like a video camera and has a grid of sensors that measure the electromagnetic radiation that all objects emit or reflect; the grids determine the resolution of the image. Both devices translate the emission levels measured by each component of the grid into digital

Ingredients for Success

Jonathan Littman

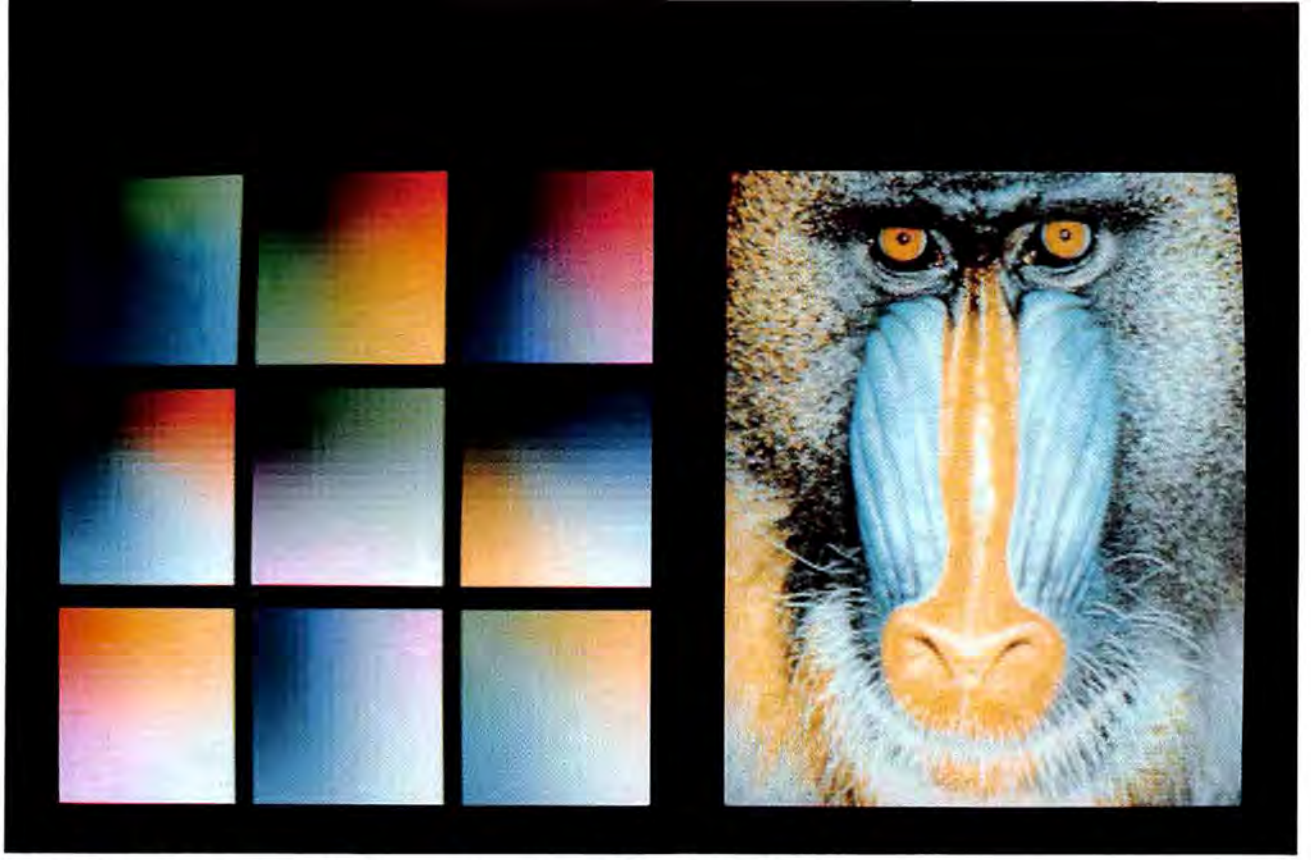
The PC image processing system devised by IBM's Joe Meyers and Ralph Bernstein achieves a high level of sophistication with relatively inexpensive, off-the-shelf hardware. Development costs of the program—for hardware and software, less labor—ran slightly more than $6000. (Keeping costs down is a particularly noteworthy feat in light of the price tag for a typical mainframe image processing system: anywhere from $250,000 to $1 million.)

To confirm his hunch that the PC could handle image processing, Meyers wrote the program in Advanced BASIC and some assembly language code. He did not compile the BASIC programs (which would have abbreviated processing time). Meyers and Bernstein also complied with a self-imposed "limitation"—every scrap of hardware wore the IBM logo. Although excellent imaging systems are being built with other equipment, it's a tribute to Big Blue's versatility that such an advanced system could be constructed entirely in-house.

Hardware	
System unit with 64K, keyboard, double-sided disk drives, and disk drive adapter	$2633
Monochrome display	$345
Graphics printer	$595
Color printer	$680
Two 64K memory module kits	$330
64K/256K memory expansion option	$350
Communications adapter cable	$75
Asynchronous communications adapter	$120
Monochrome display and printer adapter	$335
Color graphics monitor adapter	$244
Printer cable	$55
(Subtotal)	$5762
Software and documentation	
DOS and BASIC language extension	$40
IBM macro assembler	$100
Asynchronous communications support	$60
Personal editor	$100
Technical reference manual	$36
(Subtotal)	$336
Grand total	$6098

Figure A: Meyers and Bernstein's off-the-shelf building blocks

The requirements for the Meyers/Bernstein prototype system are listed in Figure A. Prices have been furnished by IBM; they do not include an estimated retail price for the image processing program itself. Were the collective labors of Meyers and Bernstein packaged as a software product, the program would bear a price tag anywhere from $1000 to $5000, according to sources at IBM.



To produce this photograph of the XT screen, Professor Ronald Lyon ran a demonstration program and generated a digitized image of a mandrill. At the left are color patches, also included in the demonstration program, that show 256 hues and levels of brightness for each color block.

values. From its orbit, the satellite evaluates patches of earth as small as 30 square meters.

These values are eventually telecommunicated to mainframes that store the data on magnetic tape at a ground station. This data is then imported to the PC via a local area network and recorded on 5¼-inch floppy disks. Five 64K images are stored on each double-density disk. (64K is the amount of memory used to store the number of dots, or pixels, that the PC's RGB monitor will display in the 320-by-200 mode.)

The Bernstein/Meyers image-processing software translates the values into colored pixels that form an image on the PC screen. The software produces an image of various colors–ideally one or more colors for each wavelength that Landsat recognizes. The colors can represent such things as a body of water or the vegetation surrounding it.

Sharpening the Picture

Because the PC's medium-resolution color graphics mode displays only four different colors, the original image is often crude. The image must, as Meyers says, be "equalized," so he wrote a program to accomplish that task. The program uses statistics to determine which of the PC's four colors should represent an element of the Landsat image.

The next step in balancing the color display is to clarify the image. This occurs through a method commonly referred to as "classification." Thematic classification is simply the highlighting of any elements, or themes, of interest. Suppose, for example, that a city planner wanted to accentuate the bodies of water in an urban area. The planner might rely on a technique that Meyers calls "boxcar training," which involves placing two sets of parallel lines (the "boxcar") around a portion of an image selected as a prototype. The technique enables the planner to use his or her knowledge about the prototype to obtain more information on the rest of the image.

In this case, an image of a river could be "boxcarred." Meyers's equalization program could then used to determine the mean and standard deviation for the river's image value and to assign the

In this screen shot you're looking at Farmington, New Mexico, through the "eyes" of Landsat and Professor Lyon's XT. Lyon's image-processing program highlights areas of interest, such as the section marked by the horizontal orange band at the top.

river's image a minimum/maximum value. Any pixels falling within that range would then be considered "water." The planner could make the water more prominent by displaying it against a background of a different color or could obtain information by calculating such things as the percentage of the total image made up by water.

The boxcar method has broad applications, according to Meyers. Foresters, for example, often need to identify the amount of brush in a particular locale. A forester can create a boxcar around an area known to contain brush. A new "classified" picture will then show brush that was muted or hidden in the original image. Similarly, farmers need to know if parts of their fields are deficient in water or minerals. By zeroing in on an area acknowledged to be doing poorly, a farmer can discover otherwise undetected problem areas.

The Meyers/Bernstein program can also "filter" an image. The net effect is something like applying Vaseline to a camera lens in order to obtain a gauzy, impressionistic image. By simply striking a key or two, it's possible to smooth the edges where colors meet or to soften the entire picture.

Putting XTs Together

Meyers and Bernstein are pioneers in image processing for the PC, but they're not alone. Geologist Ronald Lyon, a professor of mineral exploration and the director of Stanford University's Remote Sensing Laboratory, isn't restricted to one vendor's hardware, as Meyers and Bernstein are. With fewer constraints, Lyon has been able to take the work of Meyers and Bernstein in exciting new directions.

Stansearch, Lyon's project, uses a PC XT, an XT expansion chassis, and other equipment to emulate a mainframe imaging system—at what Lyon says is 1/15 the cost. Lyon has worked with digital image processing since Landsat was first launched. His Stansearch software, which is written in IBM assembly language and Microsoft's FORTRAN-77, served as the model for the privately written *Remsearch-83* imaging program (see "A Hardware Shopping List"). At $25,000, Lyon's system is more expensive than the Meyers/Bernstein program, but Lyon is convinced that it's still a bargain. "Normally a mainframe imaging system runs $250,000 to $1 million," he says. "We have essentially replaced a huge and expensive system with our own."

Lyon's system achieves high resolution with the aid of three Artist-II color graphics boards. These boards increase screen display to 512 by 408 (nearly a quarter of a million) pixels—almost four times that of the IBM software. Displaying that many pixels requires roughly a megabyte of memory. Using three color boards means that as many as 4096 different colors can be displayed.

The Stanford program was written with the number-crunching 8087 coprocessor in mind; when the extra chip is installed in the XT's motherboard, the additional routines that Lyon's software requires are executed with alacrity.

Because the PC's medium-resolution color graphics mode displays only four different colors, the original image is often crude.

Lyon anticipates revising his system for a 32-bit microprocessor running a version of UNIX, but he's unsure just how soon such a revision will be necessary.

Down to Earth

The IBM and Stanford systems pay more attention to input than to output, at least hard copy output, primarily because the means to print what the PC captures still exceeds the budgets of most users. The price of sophisticated ink-jet printers and plotters, which offer from 16 to 32 colors, will eventually descend from the stratosphere, but Lee D. Miller, a professor at the Nebraska Remote Sensing Center and a leader in the field of microcomputer-based image processing, suggests that display and printing technologies are the least critical aspects of the process. Miller feels that digital image processing will become significantly more accessible to the typical user as soon as the technology offers two additional capabili-

A Hardware Shopping List

Jonathan Littman

For Stanford University professor Ronald Lyon, director of the school's Remote Sensing Laboratory, the chance to create an image processing system was a Christmas dream come true. Under Lyon's tree were virtually all the hardware and software tools needed to develop a PC-based digital imaging product.

Stansearch, Lyon's university-affiliated project, evolved into *Remsearch-83*, an imaging program that Lyon developed outside of Stanford sponsorship. Because Lyon's mission was simply to build the finest program he could, *Remsearch-83* takes advantage of a vast array of hardware. Lyon's shopping list for the package is enumerated here.

- A PC XT system unit (256K RAM, 10MB hard disk, one 360K floppy disk drive, 8087 coprocessor): $5250
- A PC XT expansion chassis with a 10MB hard disk, eight expansion slots, and a 130-watt power supply (increasing the available slots to ten large and six small, and the total power supply to 260 watts): $2500
- A Mitsubishi high-resolution color monitor: 13-inch model $2350; 19-inch model $3950
- Three Control Systems Artist-II color boards (permitting 16 variations of each color): $4800
- An IBM Monochrome Display (for text applications): $345
- A Cipher tape backup unit: M-890 (75 inches per second) $5100; M-891 (120 ips) $6500
- Overland interface board for Cipher tape backup unit: $750

For hardware alone, Lyon's project requires an outlay in the $20,000-to-$30,000 range. Not included are such optional items as plotters, printers, digitizers, and so on. Software isn't much cheaper: *Remsearch-83* source code lists for $15,000; compiled run-time codes for $5000.

For more information contact Remote Sensing Consultants, 860 Tolman Dr., Stanford, CA 94305, 415/494-2004.

ties: the ability to move large amounts of digital information quickly and an improvement in the level of detail that satellites can relay.

The most economical way to transmit data rapidly, Miller says, would involve a TV screen or modified TV transmission. The amount of raw data a typical user might need could easily be accommodated by that existing technology, and data would be available on demand.

Work has already begun on enabling satellites to zero in on much smaller bits of terrain. The process commenced with the "commercialization" of Landsat itself. As part of the space agency's mandate, NASA has put its eye-in-the-sky up for sale. Once Landsat is privately owned, individuals and companies interested in the data it produces will have direct access to regular transmissions. And next year the French will launch a satellite capable of rendering detailed images as small as 10 square meters.

Applications to Spare

Which individuals and companies will use Landsat's images, and from what fields will they come? The pioneers of image processing agree that the initial major applications are certain to involve agriculture, mineral exploration, oceanography, and medicine.

Agriculture. Stanford's Ronald Lyon explains that image processing may become an integral part of the care and cultivation of virtually any crop. "If a plant–say cotton, for example–is dry, an aerial scanner would 'see' it as different from a crop that is properly

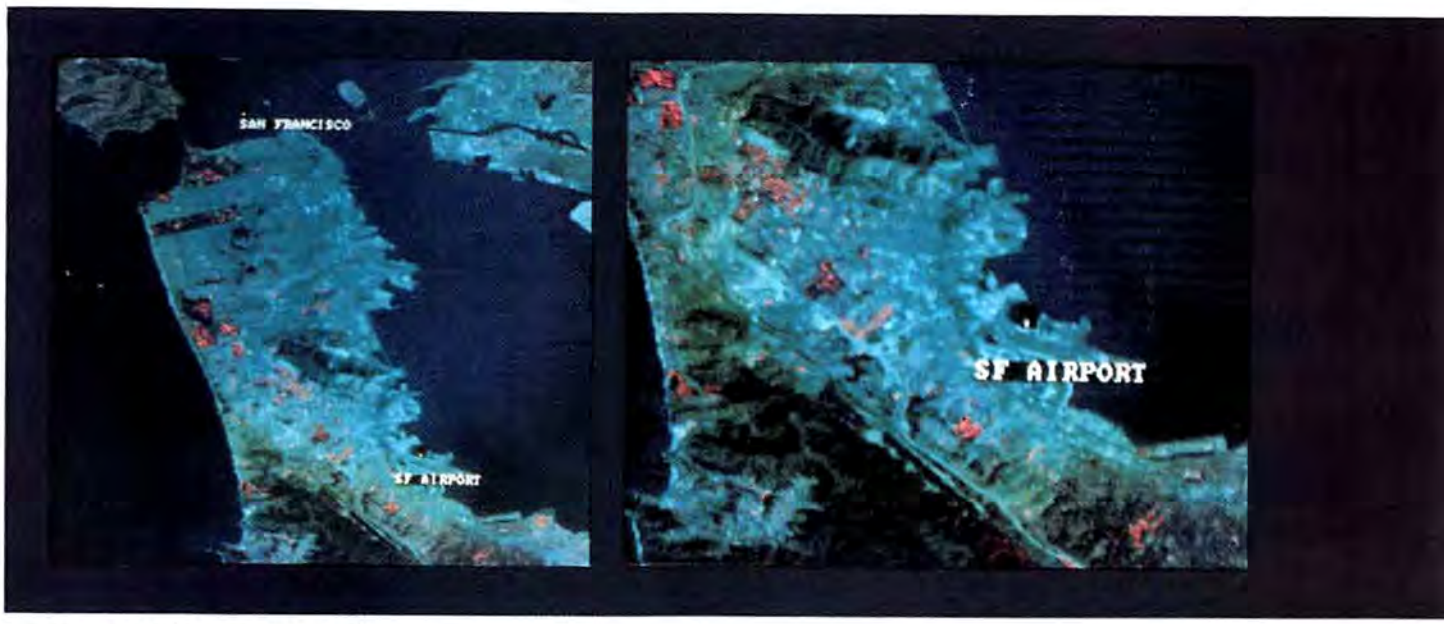


Image processing programs allow you to "zoom in," as these screen shots of the San Francisco peninsula illustrate.

irrigated," says Lyon. "In this way, farmers can identify dry plants and get water to them before yields are affected."

Ideally, according to Lee Miller, image processing systems will monitor crops on a routine basis: "There's no reason why a farmer won't be able to have a small satellite dish. Every week or two, new satellite transmissions will be received, bearing fresh images of the fields below."

Image processing will also serve as an early warning system for possible soil deficiencies. For instance, soil containing copper sulfate (which can endanger crops) gives off a yellow cast in processed images. Lyon is convinced that image processing will help point to relationships that can't be established in any other way. "Examining a digital image of a hill of aspen trees may reveal color abnormalities—one side may be brighter than the other in a way you didn't expect. You may stumble on something in the soil such as a potentially valuable mineral."

Mineral exploration. Lyon considers locating mineral deposits to be the ideal image-processing application. Satellite renderings often reveal geological fissures that may be signs of mineral or oil deposits. Traditionally, mineral exploration has been conducted in areas about which little information exists. In such cases, a preliminary satellite picture can be of enormous help. Lyon notes that digital imaging is already being used to explore several remote regions of China.

Oceanography. The fishing industry will most likely reap big gains from PC-enhanced satellite data about ocean conditions. At the Scripps Institute of Oceanography in San Diego, water temperatures gleaned from a weather satellite are put through the institute's image processor to create a contoured temperature map. This map is then telecommunicated to tuna fishermen, who create simple dot matrix printouts of the contours. Because plankton is often concentrated where warm and cold waters meet, these maps direct tuna boats to pockets of plankton—and to the hungry tuna that feed on it.

Medicine. Curiosity motivated Professor Werner Frei, associate director of the Institute of Physics and Imaging Science at the University of Southern California, to develop an image-processing system for his PC. For the past decade, Frei has conducted research on digital image processing for a variety of groups, including the U.S. Department of Energy.

Frei, whose specialty is medicine, suggests that PC-based image processing may change the way physicians regard X rays. At present, Frei says, physicians and hospitals shuttle large numbers of X rays among themselves. This traffic degrades the quality of the

Arlington Computer Products
312-882-3724

IBM PC $1895
2 360K DRIVES, 256K
CONTROLLER & KEYBOARD

IBM PC $2295
2 360K DRIVES, 256K,
CONTROLLER, KEYBOARD,
MONOCHROME/PRINTER ADAPTER,
AMDEK 310A

PRINTERS

OKIDATA 84P.....$775
92P.....$439
93P.....$649

MONITORS

AMDEK 300G.....$129
300A.....$145
310A.....$155
COLOR 300.....$269
COLOR 600.....$429

GORILLA MONITORS G/A $85/$95

MODEMS

HAYES
SMART MODEM 300 $209
SMART MODEM 1200 $479
SMART MODEM 1200B with software $419

★★★ $PECIAL$ ★★★

TANDON TM100-2 $159
SHUGART SA455* $125
PANASONIC JA551-2* $125
TEAC 55B* $134
TEAC 55F* $169
64K RAM CHIPS (BANK OF NINE) $39
*Free mounting kit with each pair 1/2 ht. drives.

★ NAME BRAND DISKETTES ★
DS/DD 2-PAK $3.40

ACCESSORIES

AST SIX PAK PLUS 64K $265
AST SIX PAK PLUS 384K $449
MA SYSTEMS PC PEACOCK $289

SOFTWARE

HOME RECORD SYSTEM $59
Records your expenses and sorts them for tax purposes. Also gives you an automated bank reconciliation.

Arlington Computer Products
1329 ELGIN LANE
SCHAUMBURG, IL 60194
VISA
312-882-3724
PRICES SUBJECT TO CHANGE

Circle 825 on reader service card

X rays and may even increase the need for additional X rays. According to Frei, hospitals are beginning to store X rays digitally via picture archival and communications systems (PACS). With this tool, a doctor can call up an image from any one of several viewing stations, zoom in on the target area, and even enhance the image–thereby aiding treatment of injury and disease.

Plastic surgery ranks among the more dramatic potential applications of PC-based image processing. Explains Frei: "Work on facial bones can be unpredictable. Only a physician with a great deal of experience can foresee how the skin will stretch and how the reconstructed face will look." Computer simulation via image processing eliminates much of this guesswork. Simulation can be accomplished either by digitizing photographs of a patient or by creating a blueprint for a physical model that encompasses the reconstructed features. Using a model to predict the results of an operation enables the patient to preview his or her new look and even alter the outcome a bit.

Robotics. If helping to rebuild body parts isn't a sufficiently futuristic application, how about fashioning eyes for humanoids? Frei suggests that conferring some sense of sight on robots is a plausible task for image processing. As robots become integral members of the assembly line, the need for these helpers to collect visual information will increase.

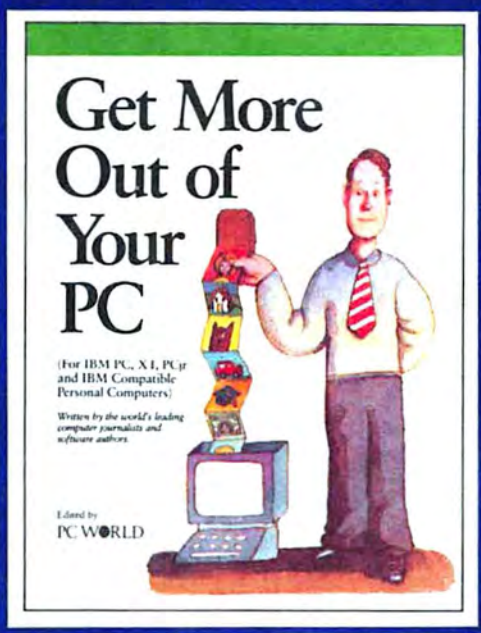
PC-based image processing may enable robots to take digital snapshots of work environments and then analyze that data. Such a capability would effectively permit a robot to spot trouble on the conveyor belt or elsewhere in the immediate workplace. A mainframe-based application to process digital images is already in the works, and Frei thinks the process may be amenable to personal computers as well.

Mainframe to Micro

Nebraska's Lee Miller worked on microprocessor-based image-processing systems years before the advent of the PC. He remembers how large organizations once "looked down on micro-based image processing." In some ways, Miller and his colleagues have had to reinvent the wheel. Noting that micro-based systems are pokey compared to their mainframe cousins, Miller admits to using "wheelbarrows to do what others use trains for."

Like Miller, Frei developed a system that duplicates many of the functions originally performed on a mainframe. PC-based systems are viable, he asserts, because the fact that they have less processing power than mainframes isn't truly significant. "If you can wait a few minutes, the differences between the two systems aren't that great," Frei stresses. "Processing time can be speeded up."

Save $26 and get this book free . . .



. . . when you subscribe to *PC World*!

YES Enter my subscription for the term checked below and rush my FREE copy of *Get More Out of Your PC*. I'll save 58% off the newsstand price and 21% off the regular subscription rate.

☐ 14 issues/$18.95 ☐ 28 issues/$33.50
☐ 42 issues/$47.00

☐ Bill me ☐ Payment enclosed

VISA and MasterCard accepted—call TOLL-FREE: 800/247-5470 (in Iowa 800/532-1272)

Name _____

Company _____

Address _____

City, State, Zip _____

Please allow 6-8 weeks for shipment of your first issue. Outside the U.S., orders must be prepaid in U.S. funds. Outside the U.S. and Canada, add $25/year for surface mail or $110/year for air-mail. **Offer expires June 30, 1985**

PC WORLD

J12D015

YES Enter my subscription for the term checked below and rush my FREE copy of *Get More Out of Your PC*. I'll save 58% off the newsstand price and 21% off the regular subscription rate.

☐ 14 issues/$18.95 ☐ 28 issues/$33.50
☐ 42 issues/$47.00

☐ Bill me ☐ Payment enclosed

VISA and MasterCard accepted—call TOLL-FREE: 800/247-5470 (in Iowa 800/532-1272)

Name _____

Company _____

Address _____

City, State, Zip _____

Please allow 6-8 weeks for shipment of your first issue. Outside the U.S., orders must be prepaid in U.S. funds. Outside the U.S. and Canada, add $25/year for surface mail or $110/year for air-mail. **Offer expires June 30, 1985**

PC WORLD

J12D015

GET MORE OUT OF YOUR PC

SEE OTHER SIDE FOR DETAILS

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 63 BERGENFIELD, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 6700
Bergenfield, New Jersey 07621

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 63 BERGENFIELD, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PC World
Subscription Department
P.O. Box 6700
Bergenfield, New Jersey 07621

While some see the PC's limited display size as an insurmountable obstacle, Miller disagrees. "Those who argue that you can't achieve high-quality image processing without a mainframe aren't addressing the right question. The question is, who can benefit from image processing? In Nebraska, one obvious answer is thousands of independent farmers."

Miller says that PC-based image-processing systems can detect crop losses before those losses become severe. "The farmer may find that the costs of the cure outweigh the increased yield," he notes, "but for a change, there will at least be a choice."

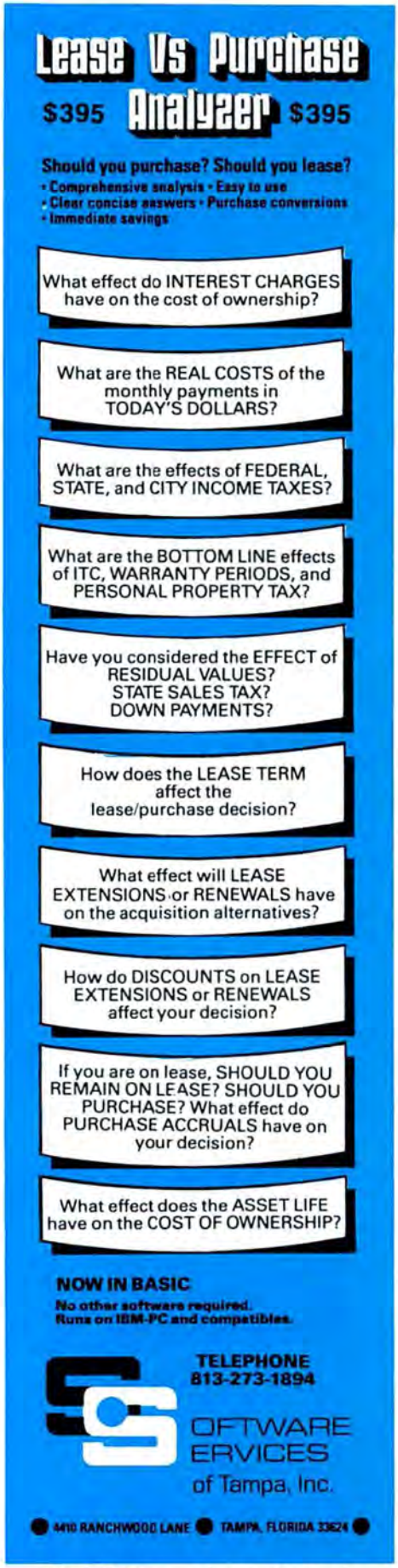
Attractive prices may soon get the ball rolling for an entire genre of image-processing software. Miller feels strongly that micro-based image processing is important, not just because it may prove economical, but because it will give the individual control over his or her data.

Indeed, when it comes to image processing, Miller is a true believer. "What the satellite sees and the PC processes is of little value unless it's put into the hands of the individuals who make decisions," he says. "The American way works best when decisions are made by those closest to a specific situation. And PCs are entering the diffuse process of decision making because they support that individuality." Big Blue may be listening to this approach. Although Miller's work has largely been with Apple computers, his contribution to image processing is so extensive that IBM recently invited him to give a seminar at its Palo Alto Scientific Center.

With technology advancing at a brisk clip, Miller is convinced that it's only a matter of time before the image processor is as common as the car radio. "Why can't an automobile receive imaged satellite maps on a little viewing screen?" he wonders. "Any time you're driving, you'll have a bird's-eye view of the surrounding area. If you're lost, you can figure out where you are. If you're on vacation, you'll be able to see the tremendous scenery just over the hill—and take that magical little detour you otherwise would have missed."

Not a bad prognosis for a so-called "pie-in-the-sky" technology that up to now has been the exclusive domain of government agencies, universities, corporations, and think tanks. ●

Jonathan Littman is a freelance writer working in the San Francisco Bay Area. Mary Friedland writes and edits technical and instructional books in the San Francisco Bay Area.



Circle 740 on reader service card

YOU DON'T HAVE TO REMODEL TO ADD ON.

With some computers, the more you do, the more you have to add on.

A little memory expansion here. A graphics adapter there. Next thing you know, you need an expansion chassis. And a loan from the bank.

Corona builds memory expansion (up to 512K) and high-resolution graphics right into the main board. That saves you money. And expansion slots. Plus, our 128K standard memory and IBM® compatibility let you run thousands of software packages right out of the box. The net result is a PC that grows on you. Painlessly.

The Corona PCs.

It's a matter of simple addition.

In North America, call 1-800-621-6746 for the Authorized Corona Dealer near you. In Holland, call 020-03240-18111. There are over 1,600 dealers worldwide. And their job is to help. Service by Xerox.

corona data systems, inc.

THE CORONA PC

©Corona Data Systems 1984

Circle 48 on reader service card

Choose the publication you need to keep up with your part of the computer world.

We are the world's largest publishers of computer-related newspapers and magazines, serving more than nine-million computer-involved people in more than 25 countries around the world. And we have a publication to suit *your* needs.

Computerworld is THE weekly newspaper for the computer community. Complete, objective coverage of the use of computers and computer technology in large to medium organizations — from mainframes to micros, office automation to communications. More than 500,000 computer user and computer industry executives rely on CW for the news they need. Annual subscription of $44 includes all issues of **Computerworld Office Automation,** and **Computerworld On Communications,** plus five **Computerworld Buyer's Guides*** (*1984 issues include* Communications, Large System Hardware, Large System Software, Microcomputer Hardware, Microcomputer Software.)

InfoWorld is the newsweekly for microcomputer users. **IW's** complete coverage of all the latest news includes up-to-the-minute announcements of new hardware and software products, as well as detailed, independent reviews of the most significant hardware and software products for all major brands of microcomputers. Annual subscription of $31 includes special extra REPORT CARD issues with compiled reviews for easy reference.

PC WORLD is our monthly magazine for users of the IBM PC and compatible computers. Each issue is packed with the information you need to get the most out of your PC, from hardware and software news and reviews to useful applications for your computer. There's no better way to make the most of your investment. Annual subscription is $24.

MICRO MARKETWORLD is our semi-monthly tabazine serving companies whose primary purpose is to sell small computer products. That includes retailers, dealers, distributors, systems houses and other resellers of computers or computer-based products and services. For subscription information please complete and mail the coupon below.

To enter your subscription use the coupon — or take out your charge card and call, toll-free, 800-343-5730 (in Mass., call (617) 879-0700).

To: Circulation Dept., CW Communications/Inc., Box 880, Framingham, MA 01701

☐ Please enter my one-year subscription to the publication(s) I have checked. (If you wish only to get further information on a publication, just circle the name).

☐ Computerworld — $44* ☐ InfoWorld — $31*
☐ PC World — $24* ☐ Micro Marketworld*
☐ My check is enclosed ☐ Charge to my credit card ☐ MC ☐ Visa
☐ Amex Exp. date _____ (MC only)

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐

Name _____
Title _____
Company Name _____
Signature _____ (cardholder's signature)

Address _____
City _____
State _____
Zip _____

Address Shown: ☐Business ☐Home ☐Send foreign rates
☐Check here if you do not wish to receive relevant promotional mail.

CW COMMUNICATIONS/INC.

*US ONLY

LAST NIGHT, 39 MUSICIANS HAD A COMPUSERVE CONFERENCE, SO DID 31 M.D.S, 49 SPORTS FANS AND 640 APPLE POLISHERS, AND NO ONE HAD TO LEAVE HOME.

The Electronic Forum, Cheaper than Long Distance and Much More Rewarding.

Every night on the CompuServe Information Service, professional and social groups discuss a wide range of subjects. From what's new in medical technology to what's nouvelle in continental cuisine.

And every day more computer owners who share a common interest are discovering this exciting new way to exchange ideas and even transfer hard copy data.

And besides electronic forums, they leave messages for each other on our national bulletin board, "talk" informally on our CB simulator, and communicate via CompuServe's electronic mail.

But best of all, in most cases, CompuServe subscribers get all of these state of the art communications options, plus a world of on-line information and entertainment for the cost of a local phone call plus connect time.

To become part of this flexible communications network, all you need is a computer, a modem and CompuServe. CompuServe connects with almost any personal computer, terminal, or communicating word processor.

To buy a Starter Kit, see your nearest computer dealer. To receive our informative brochure or to order direct, call or write:

CompuServe

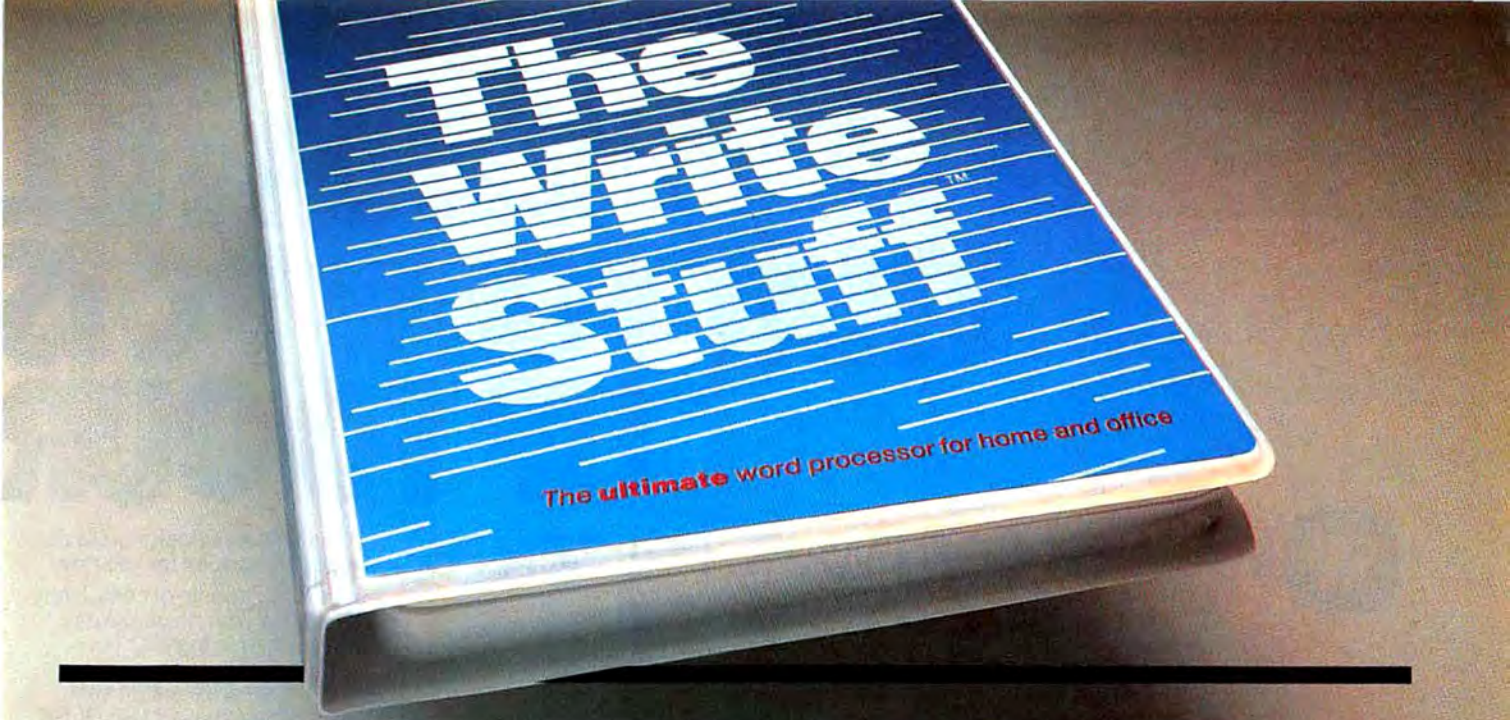
Consumer Information Service, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, OH 43220

800-848-8199

In Ohio call 614-457-0802

An H&R Block Company

Circle 856 on reader service card



HOW TO RIGHT A LOT OF WRONGS FOR $59.95.

Most word processing programs create more problems than they solve. Introducing the first program that rights all those wrongs: THE WRITE STUFF®.

WRONG #1: WORD PROCESSING PROGRAMS ARE EXPENSIVE.

Some people say software has to be expensive to work well. We don't agree.

THE WRITE STUFF is everything those more expensive programs should be. And more: It's affordable. Only $59.95. And it's available for Apple® II +, *IIe*, *IIc* and IBM® PC, XT, and compatible computers.

WRONG #2: GOOD WORD PROCESSING PROGRAMS ARE HARD TO USE.

THE WRITE STUFF was written for Harper & Row by the co-developers of The Bank Street Writer™, the best-selling word processor for children. To say that it's easy to use is an understatement. Twenty minutes is all it takes to master THE WRITE STUFF. Your "help menu" of functions and commands is just a key away. Creative Computing calls it "as simple as using a typewriter...an excellent word processor."

WRONG #3: YOU GET WHAT YOU PAY FOR.

There's virtually no word processing function THE WRITE STUFF can't perform. As well as options you only find in programs costing five times as much: word count, complete cursor control, variable speed scrolling, undo any change in one step, on-screen underline and **boldface**, automatic save, and more.

WRONG #4: GREAT SOFTWARE COMES FROM SOMEONE'S GARAGE.

THE WRITE STUFF is from Harper & Row, one of the world's leading publishers. We've been recognizing great writing for more than 150 years, even before Mark Twain brought us Huck Finn. We think you'll find THE WRITE STUFF right in his league.

© 1984 Harper & Row. 10 E. 53rd St., 20th fl. New York, NY 10022. (212) 207-7492.

Harper&Row.
Software for people.™

$2.00 WILL THAT YOUR PC IS UP TO OUR

WARNER SOFTWARE PRESENTS

THE Desk Organizer™

for the IBM PC

New Macintosh Version COMING SOON! FOR INFORMATION CALL (212) 484-3070.

Your PC was designed to do more than it does for you now.

It's fully capable of completely organizing your business day without interfering with your productivity.

At last, a hardworking software program called THE DESK ORGANIZER helps you and your PC accomplish this and more. How? By giving you one-touch command over 7 vital desk-management functions—while it runs simultaneously with virtually any other IBM software.

For $2.00, you can sample this amazing program by ordering the Demonstration Diskette with our coupon.

The critics are raving:

"THE DESK ORGANIZER is so easy to use that its manual might be considered overkill."

"THE DESK ORGANIZER is a superb software package."

—Infoworld

"It's a gem....There's really nothing quite like this package anywhere else....THE DESK ORGANIZER is a class act."

—PC (Magazine)

THE SECRET IS META

META, our exclusive feature, enables you to use THE DESK ORGANIZER alone or have it lie dormant in your computer's memory while you run Wordstar, Multiplan, Lotus 1-2-3, VisiCalc... BUT the moment you need it to file an idea, write a letter, record

PROVE IT TO YOURSELF IMMEDIATELY!

Go to one of the following dealers:

ARIZONA

Business Management Resources
1000 E. Indian School Rd
Phoenix, AZ 85014
(602) 274-5709

Teaching Tools
3401 N. 35th Ave.
Phoenix, AZ 85017
(602) 272-7973

CALIFORNIA

Academy Software
2222-B West Orange Ave.
Anaheim, CA 92804

Valmont of California
Rte. 1, Box 400
Bakersfield, CA 93308

800 Software
940 Dwight Way, Ste. 14
Berkeley, CA 94710
(415) 644-3611

Microtime Computers
2588-F El Camino Road
Carlsbad, CA 92008

Micromerchant
898 Via Lata St. "H"
Colton, CA 92324

Computerland-Dublin
7190 Regional St.
Dublin, CA 94568
(415) 828-8090

Centaur Software
768 Jamacha
El Cajon, CA

Software Centre
15617-A Ventura Blvd
Encino, CA 91434
(818) 784-2234

Software Center International
15617 Ventura Blvd
Encino, CA 91436
(213) 784-2238

Software Centre
Huntington Beach, CA

TAI Computer Store
5321 University Drive, Ste. D
Irvine, CA 92715

Business Computer Consultant
2049 Century Park East
Los Angeles, CA 90067

Software Center
Pico
Los Angeles, CA

Software Supermarket
11960 Wilshire Blvd
Los Angeles, CA 90025
(213) 207-1494

Personal Support Computer
10431 Santa Monica Blvd
W. Los Angeles, CA 90025
(213) 474-1633

Software Galore
4079 Glencoe Ave
Marina del Rey, CA 90292

Rainbow Computing
9719 Reseda Blvd
Northridge, CA 91324
(818) 349-5560

Quest Computer
175 Forest Ave
Palo Alto, CA 94301
(415) 327-2775

Pasadena Software Centre
548 South Lake St.
Pasadena, CA 91101
(818) 793-4443

Software Central
650 East Colorado Blvd
Pasadena, CA 91101
(818) 793-4101

Microage Computer Store
61 Chilpancigo Parkway
Pleasant Hill, CA 94523

Computerland of Redding
1175 Hilltop Dr.
Redding, CA 96003
(916) 223-4037

Parthenon Computers
17743 Satcoy
Reseda, CA 91335
(818) 344-3563

ACT
9161 Chesapeake Drive
San Diego, CA 92123

Micro Financial
1719 Green St.
San Francisco, CA 94123
(415) 928-6655

Software Center
217 Sansome St.
San Francisco, CA 94104

Alamo Electronics
6940 Santa Teresa Blvd
Ste. 3
San Jose, CA 95119

Computer Biz
4482 Pearl Avenue
San Jose, CA 95136

Software Galleria
2348 Walsh Ave.
Santa Clara, CA 95051

Software Supermarket
15113 Ventura Blvd
Sherman Oaks, CA 91403
(818) 783-3282

Parthenon Computers
17314 Crenshaw Blvd
Torrance, CA 90504
(213) 516-6768

United Economic Services
23879 Madison St.
Torrance, CA 90505

Computer Haven
949 W. Foothill Blvd
Upland, CA 91786

Software Centre
916 N. Mountain Avenue,
Ste. G
Upland, CA 91786

Computer Valley
965 Fairway Drive
Walnut, CA 91789
(714) 594-9748

Info Store
1666 Locust St.
Walnut Creek, CA 94596
(415) 947-0277

One Point
2835 Mitchell Drive
Walnut Creek, CA 94558
(415) 947-0850

Rainbow Computing
21036 Victory Blvd
Woodland Hills, CA 91367
(818) 346-4276

COLORADO

The Software Store
1475 Lawrence St.
Denver, CO 80202
(303) 534-3707

Total Solutions, Inc.
555 S. Howes St., Ste. 105
Ft. Collins, CO 80521
(303) 482-1900

CONNECTICUT

Software City
Rte. 6 Plaza
58-60 Newton St.
Danbury, CT 06810

Queue Soft-Warehouse
636 Kings Highway
Fairfield, CT 06430

Software City
Loehmann's Plaza
185 Boston Post Rd.
Orange, CT 06477

Software City
203 Bedford St.
Stamford, CT 06901

Computer Ease
Bond Industrial Park
33 Village Lane
Wallingford, CT 06492

FLORIDA

Softhouse, Inc.
P.O. Box 141136
Coral Gables, FL 33114-1136

Computer Systems Resource
3222 SW 35th Blvd
Gainesville, FL 32608

GEORGIA

Software Atlanta
Atlanta, GA

Computerland of Augusta
3435 Wrightsboro
Augusta, GA 30909

Computerland of Atlanta
5835 G. Oakbrook Parkway
Norcross, GA 30039
(404) 446-2008

IDAHO

Software Center Northwest
1897 Quincy Dr.
Boise, ID 83706

ILLINOIS

Personal Computer Store
320 W. Ohio St.
Chicago, IL 60610
(312) 280-0002

Polycom Corp. of America
201 E. Erie St., 4th Floor
Chicago, IL 60611
(312) 337-6000

Portland Metro East
7900 N. Nagle
Mortongrove, IL 60053
(312) 966-3669

Illinois Microcomputers
630 E. Ogden Avenue
Naperville, IL 60540
(312) 420-8813

Northbrook Computer
4113 Dundee Rd
Northbrook, IL 60062

Computerland of Oaklawn
10935 S. Cicero Ave
Oaklawn, IL 60453
(312) 422-8080

Compu-Net Services
2 Cross Roads of Commerce
Suite 225
Rolling Meadows, IL 60008
(312) 577-9494

ComputerLand of St. Charles
2075 Prairie
St. Charles, IL 60174
(312) 377-7200

INDIANA

General Micro Computer
2816 Sample St
South Bend, IN 46619

MARYLAND

Entre Computer Center
4856 Bethesda Avenue
Bethesda, MD 20814
(301) 652-8775

CTL
9091 Baltimore Blvd
College Park, MD 20740

MASSACHUSETTS

Corporate Software
235 Bear Hill
Waltham, MA 02154
(617) 890-5350

MICHIGAN

Ekos Computer Center
4215 Miller Rd.
Flint, MI 48507
(313) 732-7930

Computer Mart of Grand Rapids
6441 28th Street S.E.
Grand Rapids, MI 49506

System Directions
14230 N. Lake Rd
Gregory, MI 48137

Programs Unlimited
27621 Southfield Rd
Lathrup Village, MI 48076

Programs Unlimited
44473 Ann Arbor Rd
Plymouth, MI 48170
(313) 455-2983

Software City
Southfield Road
Southfield, MI 48020

The Software Shop
4977 Livernois Rd
Troy, MI 48098

MINNESOTA

Computer Application
1125 Hermon Place
Minneapolis, MN 55403
(612) 338-1777

Kennedy Business Systems
111 Main St.
Winona, MN 55987
(507) 454-6705

MISSOURI

Software Centre
7748 Forsythe Blvd.
Clayton, MO 63105

Atlas Systems
1353 Pennsylvania Ave
St. Louis, MO 63133
(800) 325-0779

NEW JERSEY

Bamberger's Dept. Stores

Software City
Cross County Plaza
2110 Rte. 70 East
Cherryhill, NJ 08003
(609) 424-8155

Wolsten's Project House
99 Washington St.
East Orange, NJ 07017
(201) 678-0008

Lautek Corp.
1 Megan Court
Edison, NJ 08820

Software To Go
2 Executive Dr.
Ft. Lee, NJ 07024

Reel Time
Glenrock, NJ

Software Gallery
Jefferson Ward Plaza
Rte. 70 & 73
Marlton, NJ 08053
(609) 596-1234

Vista Computer Center
76 Highway 34
Pine Valley Plaza
Matawan, NJ 07747

D.A. & D. Sales
Franklin Ave.
Nutley, NJ 07110

Entre Computer Center
312 Rte. 4 East
Paramus, NJ 07652

Computer Library
316 Broad St.
Red Bank, NJ 07701

J. Robert Mullens & Assoc.
8 Damascus Ct.
Sewell, NJ 08080
(609) 589-8975

Computer Communications' Group
1070 Morris Turnpike
Short Hills, NJ 07078

Software City
42 Maple St.
Summit, NJ 07901

Entre Computer
520 5th Ave. West
Westfield, NJ 07090

Software House of NJ
215 Westwood Ave
Westwood, NJ 07675
(201) 664-5100

NEW MEXICO

Mountain Data Systems
8805 Northridge N.E.
Albuquerque, NM 87111

NEW YORK

Computers for Less
297 Commack Rd.
Commack, NY 11725
(516) 499-2496

Computer Dealer
199 Jericho Turnpike
Floral Park, NY 11001

Macy's
Roosevelt Field
Garden City, NY

Logicsoft
Garden City, NY 11803

Measurement Science Corp.
300 Garden City Plaza
Garden City, NY 11530
(516) 741-2122

American Computer
34 West 32nd St.
—10th Floor
New York, NY 10001
(212) 714-0800

DSI Micro, Inc.
770 B way—3rd Floor
New York, NY 10003
(212) 475-3900

47th Street Computer
115 W. 45th St.
New York, NY 10036

J & R Music World
23 Park Row
New York, NY 10038
(212) 625-6111

Jorish & Schwartzman
720 Ft. Washington Avenue
New York, NY 10040

Macy's
34th Street
New York, NY

Microtrek Enterprises, Inc.
60 E. 42nd St.
New York, NY 10165

Software City
665 Lexington Ave.
New York, NY 10022

Software Solutions
90 John St.
New York, NY 10038

Software Shop
300 Main St.
E. Rochester, NY 14445
(716) 385-6620

Computer Solutions
2716 Erie Blvd. E.
Syracuse, NY 13224

Management Services Group
129 Sierra Vista Lane
Valley Cottage, NY 10989

Entre Computer Center
130 Westchester Ave.
White Plains, NY 10601

This is a partial list of the many dealers currently stocking THE DESK ORGANIZER.
If you can't locate a dealer in your area, call (212) 484-3070.

PROVE NOT PERFORMING STANDARDS.

an appointment, check your schedule, do a quick calculation or make a phone call, you simply wake THE DESK ORGANIZER up with a keystroke, complete your task and with another keystroke, return to the other program you were working on.

IT FILES

Notes to yourself, to-do lists, appointments, agendas, correspondence, formulas, telephone lists. Touch "F" for file and enter anything you want to remember. Like a rolling card file, THE DESK ORGANIZER files free form.

IT ORGANIZES

It alphabetizes. It creates as many indexes as you need. It can file under multiple labels, cross-reference entries, scroll through the files and recall data instantly. It can retrieve a telephone number even if you can only remember a person's first name.

IT DIALS

It can take care of all your routine telephone chores, find numbers in reports or correspondence. Dial, redial, get an outside line, call an 800 number, insert a long-distance access code automatically and help you bank by phone.

IT WRITES AND PRINTS

Press "T" for type and write a letter or record the content of an important telephone call. If your need is for a standard business letter, THE DESK ORGANIZER's memory includes 25 commonly used business letters to adapt to your specifications. Just touch a key and THE DESK ORGANIZER prints the letter for you in the type style you choose.

IT CALCULATES

One keystroke and THE DESK ORGANIZER brings a visual calculator to the screen. Alongside it is an electronic paper tape which records your calculations as you go. Also accessible is a more sophisticated formula calculator which runs any formula you create with up to 26 variables, stores and edits them.

IT CHIMES TO REMIND YOU

Even while you're working on other software, THE DESK ORGANIZER can chime to remind you it's time for a meeting or a lunch date. Call up your visual appointment calendar to check or print out today's things due and things to do.

GET ONE-TOUCH CONTROL OF YOUR BUSINESS DAY

To receive the Demonstration Diskette, mail $2.00 with the coupon to Warner Software, Inc., THE DESK ORGANIZER, Dept. R, 666 Fifth Avenue, New York, NY 10103. If the coupon is missing, send your check or money order to the same address.

IBM PC is a trademark of International Business Machines Corporation
Lotus 1-2-3 is a trademark of Lotus Development Corporation
Multiplan is a trademark of Microsoft Corporation
THE DESK ORGANIZER and META are trademarks of Conceptual Instruments Company
VisiCalc is a trademark of Visicorp
Wordstar is a trademark of Micropro International Corporation

Requirements: For the IBM PC • Needs 128K memory • Two disk drives • Or IBM XT

PCW3

PROVE IT TO YOURSELF FOR ONLY $2.00!

You'll be amazed and delighted with the way THE DESK ORGANIZER works in your own IBM PC—alongside other software programs. That's why we want to send you this Demonstration Diskette for just $2.00.

☐ YES, SEND ME THE SAMPLE DISK FOR JUST $2.00*!

Name_____

Company_____

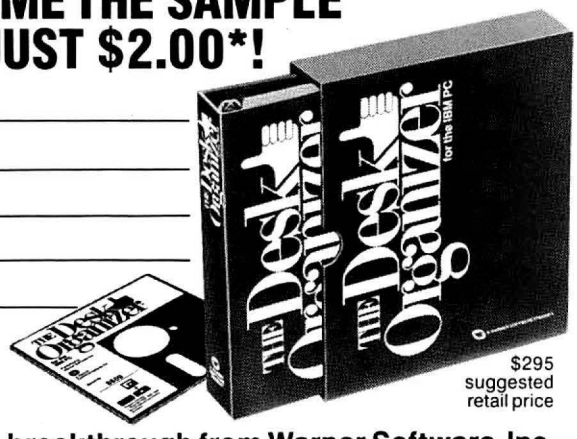
Address_____

City_____

State_____ Zip_____

*Send check or money order.
Do not send cash through the mail.

To: Warner Software, Inc.
THE DESK ORGANIZER
Dept. R 666 Fifth Avenue
New York, NY 10103



$295 suggested retail price

A business software breakthrough from Warner Software, Inc.

Heathkit Electronics Center
7 Reservoir Rd
White Plains, NY 10603
(914) 761-7690

OHIO

Basic Computer Corp.
90 Shawassee
Akron, OH 44313
(216) 864-7709

Ashtabula Office Equipment
5402 Main Ave
Ashtabula, OH 44004

Ascus Micro
11306 Southland
Cincinnati, OH 45240

Ascus Micro
680 Northland Blvd
Cincinnati, OH 45240

Fastback Computer Products
5360 North High St
Columbus, OH 43214

Micro Center
1555 West Lane Ave
Columbus, OH 43221
(614) 481-8041

Dayprom Computer, Inc.
3460 South Dixie Highway
Dayton, OH 45439
(513) 299-8555

Ascus Micro
Forest Park, OH

Strictly Software
1670 Columbus Rd
Granville, OH 43023
(614) 587-2938

Computerland of Cleveland
701 Beta Dr., Unit 30
Mayfield Village, OH 44143
(216) 473-8130

OREGON

Quest Enterprises, Inc.
207 S.E. Oak
Hillsboro, OR 97123

TENNESSEE

Computerland
8807 Kingston Pike
Knoxville, TN 37923

Computermart
800 South Cumberland
Morristown, TN 37814

TEXAS

Computer Basics
229 Dowlen Rd.
Beaumont, TX 77706

Software, Etc.
Corpus Christi, TX

Datar Corp.
12850 Hillcrest
Suite 107
Dallas, TX 75230

Micro D Concepts
Dallas, TX 75214

Software "N" Stuff
P.O. Box 795095
Dallas, TX 75379

The Softsource
9100 North Central Expressway
Suite 189
Dallas, TX 75231

Your Business Software
4311 Oaklawn
Dallas, TX 75219

Entre
Fort Worth, TX

PC Expansion, Inc.
1115 Oakland Blvd.
Ft. Worth, TX 76103

Software Place
6369 Westheimer
Houston, TX 77057

Software Station
Sharpstown
Houston, TX

Software Station
Greenspoint Rd
Houston, TX

Mida Computer Center
Midland, TX 79705

PC Computer Products
25602 I 45
Spring, TX 77386

PC Computer Products
P.O. Box 7666
Woodland, TX 77380
(713) 367-7727

VERMONT

Computer Planning Center
Old Stage Rd
Grafton, VT 05146
(802) 875-3138

WASHINGTON

Egghead Software
14330 N.E. 20th St.
Bellevue, WA 98033

WISCONSIN

Hi Tech Learning Systems
P.O. Box 803
Menomonee Falls, WI 53051
(414) 274-9229

WYOMING

Alpine Computers
321 Thelma Dr.
Casper, WY 82602

Circle 196 on reader service card

Brilliant Deduction

Thinking of claiming your IBM PC as a tax deduction? In the latest revision of the tax code, Uncle Sam has made a difficult task even harder. A former IRS auditor offers pointers.

Ralph Soucie

What the Economic Recovery Tax Act of 1981 gave in greatly enhanced benefits for new investment in business equipment, the Tax Reform Act of 1984 partially takes away. Congress has scaled back tax benefits for certain types of property, including personal computers.

Under the old law, if you could prove that your PC was an "ordinary and necessary" part of conducting an active trade or business or that it was "used in the production, collection or preservation of income," you could claim the same tax benefits enjoyed by Exxon or General Motors. The new law forces you, as a PC owner, to meet a tougher standard before you can reap the full benefits of the 1981 act.

Benefits Galore

What are the "full tax benefits" awaiting you? (See "Can Your PC Survive a Tax Audit?" *PCW*, Vol. 2, No. 6.) In brief, you may still depreciate the business portion of your computer over five years. This may be done by deducting 15 percent of the cost the first year, 22 percent the second, and 21 percent each year over the remaining three years.

In most cases you may claim an investment credit, which is a direct reduction of your income tax equal to 10 percent of the cost of your PC. Taking the 10 percent credit will effectively reduce your depreciation deduction by 5 percent; you can avoid this, however, by claiming a flat 8 percent credit.

If the depreciation and investment credit options seem too complex, you can simply elect to write off your PC investment (up to $5000) in the year you place it in service. This option is called "expensing."

This array of choices–depreciation, investment credit, and expensing–constitutes the "full tax benefits" initially conferred in 1981 (see "Deducting Your PC"). Failing to comply with the new rules means receiving only a watered-down version of these potentially significant tax breaks. (A word of caution: there are myriad exceptions to these general principles, and you may need professional tax advice to help sort it all out.)

One other general modification of the tax code bears directly on personal computer users: the rules for expensing business property have changed. When expensing was first allowed in 1982, it was limited to $5000 per return (or $2500 for a married taxpayer filing separately). The $5000 limit was scheduled to increase to $7500 for 1984 and 1985, then settle at $10,000 in 1986. The new law postpones those increases until 1988 and 1990, respectively, keeping the current limit at $5000. This change pertains to all eligible property, not just to computers.

The 50 Percent Test

Until the latest changes, an IRS audit was tough going if you sought to deduct your computer as an employee business expense. If you purchased your PC after June 18, 1984, taking such a deduction will no longer be just tough—it will be virtually impossible.

That's because a claim for full benefits under the new law requires that your computer be involved more than 50 percent of the time in a "qualified business use." If you do not meet the 50 percent test, you're entitled only to straight-line depreciation stretched out over 12 years. That's not much of a break if you've shelled out several thousand dollars for a system that may be worth only a fraction of its original cost in just a few years.

Keep in mind that the 50 percent test applies to equipment placed in service after June 18, 1984. If you purchased your system before then, you can breathe a little easier. But remember that any device you purchase after that date is subject to the new rules.

The 50 percent test is considerably more stringent than the "ordinary and necessary" and "production, collection or preservation of income" tests that once guided the IRS. In practice, only self-employed PC owners are likely to pass the new test. In better times, almost any "knowledge worker" could claim some connection between computer literacy and work responsibilities. Although the IRS may have disagreed in a given instance, the agency often had difficulty contradicting a taxpayer's position.

A claim for full benefits under the new law requires that your computer be involved more than 50 percent of the time in a 'qualified business use'.

Congress has clarified the matter for IRS auditors. The new law says that using your PC "in connection with the performance of services as an employee" does not count toward meeting the 50 percent test unless your employer requires that you buy a PC as a condition of employment. Generally, a company furnishes a personal computer if the job calls for a machine. Because it's a rare job description that mandates ownership of a personal computer, you're probably wise to scratch "employee use" as the rationale for a tax deduction.

Computer Convenience

You can't elude the 50 percent test by coaxing your boss into signing a letter on company stationery confirming that the personal computer is required for your job. Such an approach will do about as much good as a note from your mother. (Letters do have their place, however: to support a claim for the 12-year straight-line depreciation, you'll need to get written confirmation from your employer delineating "business use.")

The IRS can also fall back on another strict test, depending on the facts of your case, that seeks to determine whether your PC purchase was genuinely "required for the convenience of the employer." Just as compulsory PC ownership is a difficult claim to sustain, it's equally hard to imagine a situation in which an employee's PC purchase would meet this "employer convenience" standard.

The 50 percent test doesn't have many loopholes. The law forbids two owners from getting around the requirement by renting their PCs to each other. Also off-limits to the 50 percent rule are such "production of income" activities as managing investments in stocks, bonds, and real estate. This area of the new law is particularly tricky: investment management, for example, may qualify for either full or reduced benefits, should you legitimately meet the 50 percent test through another business activity.

Fortunately, there are situations in which the 50 percent test does not apply. If your computer is used as an integral part of—and is physically located in—a "regular business establishment," the test isn't applicable. The IRS usually construes "establishment" to mean an office or store that is part of your own business. It could also be a room in your house, if you meet certain "office-in-home" requirements. (But as you may have surmised, those requirements are very strict.)

Deducting Your PC

If you are eligible for full tax benefits according to the rules spelled out in "Brilliant Deduction," you can recover the cost of your PC in a variety of ways. Federal tax rules, which are briefly summarized here, contain numerous arcane exceptions–and some may apply to you. Also, state income tax laws often differ from federal rules. Your best bet is to rely on competent professional advice.

Depreciation

Since 1981 the IRS has relied on a greatly simplified means of figuring depreciation. That method is known as the Accelerated Cost Recovery System (ACRS), and it permits you to depreciate your PC over five years. Your deduction will be 15 percent of the system's cost in the year you placed it in service, 22 percent the next year, and 21 percent in each of the next three years. You can elect to depreciate your system at a lower rate or over a longer period, but it will probably not be advantageous to do so. Depending on how you handle your option for an investment credit, you may have to reduce the cost of the items you are depreciating.

The ACRS rules apply to hardware but usually not to software. Suppose, however, your dealer bundled your PC with *1-2-3* or *WordStar* as part of a special promotion. In that case, you can lump the software with the PC for depreciation purposes.

The IRS maintains that software priced separately is not eligible for ACRS depreciation. Not all tax experts–or tax courts–agree with this interpretation. Some say software should be treated the same as hardware; others say it should be deducted as a current-year expense.

Nevertheless, the IRS says you must amortize the software over its anticipated "useful life." This can be an advantage, since you can convincingly contend that much of the software on the market has a useful life of only two or three years. (Recall the number of *VisiCalc* users who switched to *1-2-3* after using the former only briefly.) But determining a "useful life" is a judgment call, so you cannot presume that the IRS will agree at audit time.

First-Year Write-Off

This is technically known as the Section 179 deduction. In lieu of claiming depreciation and an investment credit, you can deduct the cost of business-related property in the year you place the property in service. For 1984 this deduction was limited to $5000 for a joint or single return.

The limitation applies to your tax return as a whole, not merely to your computer system. For example, if you are married and filing a joint return, and your spouse buys a car for business use and elects to expense $5000 of the cost of the car, you cannot make the same election for an IBM PC you buy in the same year.

To the extent your PC is used for managing investments or for tax planning, it is not used in trade or a business and is therefore not eligible for the first-year write-off.

Minding Your Own Business

Suppose you use your PC a total of 200 hours this year. Of those, 120 hours are devoted to your own programming and consulting business; 20 hours to managing your investments; and 60 hours to other activities such as games and personal correspondence. Because 120 of the 200 hours qualify as business use, you've satisfied the 50 percent test. Now you can add in the 20 hours of investment use and take full tax benefits for the entire 140 hours (70 percent of the total use).

Although the 1984 act does not specifically mention software, it does give the IRS authority to add to the list of specific items covered by the new rules.

Now imagine instead that you've devoted only 90 of those 200 hours to your programming business. Your qualified business use is just 45 percent, and you're forced to use the 12-year straight-line method for depreciation. Once again you add in those same 20 hours of investment use, but because you did not pass the 50 percent test, they count only toward the 12-year straight-line depreciation instead of full tax benefits. In this case, you add those 20 hours to the 90 hours of business use and divide by 200. The resulting 55 percent is that portion of your original PC purchase that is eligible for 12-year straight-line depreciation.

If you must use the 12-year straight-line depreciation method, chances are that the resale value of your PC will be less than its remaining undepreciated cost. If you sell equipment at a loss, you may deduct the loss on the business portion of the item. Because this is a particularly complex area, you should consider seeking professional tax advice when you report this type of transaction.

The new law is unclear about whether or not using your computer to search for a new job within your field qualifies as a business use. Such activity did qualify under the old law. Although job hunting by definition isn't something an employer would require, it seems to me that job seeking is a qualified business use under the 50 percent test. The IRS may view it differently, of course.

Disposable Benefits

The Internal Revenue Code has long required that disposal of depreciable property within a certain period after the property has been placed in service be accompanied by "recaptured" tax benefits. That is, some or all of the tax gains realized by the property must be paid back during the year the taxpayer disposes of the equipment.

The new tax bill does not change the recapture provisions. The provisions do, however, cut more deeply because of the 50 percent business use test. Converting depreciable property from business use to personal use is regarded as a "disposition" for recapture purposes.

Suppose you buy a PC on December 1, 1984, and use it for a total of 50 hours that month—all for a qualified business use. On your 1984 return you elect to expense it, and in January you begin using the computer for personal purposes. You must recapture the portion of the 1984 deduction that corresponds to your personal use for 1985, and the recapture computation must be made on your 1985 tax return. Even without dissecting the computation here, it should be evident that you're in for trouble if your business use drops from 51 percent in 1984 to 49 percent in 1985. Also bear in mind that Congress has formally encouraged the IRS to "strictly enforce" the recapture provisions.

Although the 1984 act does not specifically mention software, it does give the IRS authority to add to the list of specific items covered by the new rules. A definitive IRS interpretation is pending. Until the word is handed down, you may assume that the rules outlined in "Can Your PC Survive a Tax Audit?" (*PCW*, Vol. 2, No. 6) still apply.

Record Time

In addition to limiting tax benefits, the 1984 act imposes much tougher record-keeping requirements than the law it supplants. Effective January 1, 1985, you must keep a record or log itemizing all business uses of your computer. Although the law does not specify a format for this record, the IRS plans to issue

detailed regulations. The mandatory log will probably resemble the one described in "Can Your PC Survive a Tax Audit?"

If you hire a CPA or another paid preparer to complete your tax return, you must sign a statement affirming that you're aware of the record-keeping requirements, that you understand them, and that you have indeed met them. The preparer will almost certainly insist on such a statement in order to avoid a $25 penalty.

The new law also penalizes the taxpayer for not adhering to these documentary requirements. Many taxpayers, of course, don't mind living dangerously. Traditionally, many people have claimed deductions that could not be proven, banking on the long odds of actually being audited. In the unlikely event that an audit occurred, the only "punishment" consisted of paying the additional tax plus interest. That scenario has changed with the new law, and the risk is now a bit higher for computer deductions. If an auditor finds that you failed to maintain the required records, you pay the tax, the interest, and a 5 percent negligence penalty.

No Free Lunch

Before the 1984 Tax Reform Act, self-employment income was the surest way to obtain tax benefits from a personal computer. With the recent changes in the law, self-employment is even more crucial. If you intend to buy a PC, now is the time to begin defining its niche in your business.

What business? you may ask. Although you may not feel comfortable in the role of businessperson, a host of extremely successful entrepreneurs would probably have said the same of themselves at some point. Assuming you have purchased and learned how to use a PC, you already have an excellent tool for starting a business. For extra income and for personal growth—and, of course, for some tangible tax advantages—you ought to give it your best shot. ●

Ralph Soucie, a former IRS auditor, is a CPA with the firm of Kenneth M. Mitchell & Company in Oregon City, Oregon.

The Computer Connection

PRICE BUSTERS!

IBM PC 2 drives 256k 1999
New IBM AT PC .....CALL
Compaq's .....CALL
TI Professionals .....CALL
HP Portable 2099

Many other machines available and in stock

Bernoulli box (10 meg removable)	2295	Tandon TM-100-2	199
AST Board	269	Okidata 93A	729
Ven-Tel Hayes compatible modem	459	TI 855	769
Mitsubushi 360k ½ height drives	149	Epson printers	CALL
		C. Itoh F-10	1049
		Gemeni 10X	279
Microsoft Word/Mouse	289	Multimate	272
Microsoft Mouse	165	dbase II	289
Wordstar	219	dbase III	375
Lotus 123	299	Multiplan	139
Symphony	499	Crosstalk	105
Framework	375	Smartcom II	99

Corporate Accounts — CALL our Mainframe Experts!

1-800-223-8088

IA 1-800-258-8088 **We beat prices!**

Circle 897 on reader service card

FREE SHIPPING

DISKETTES

West Coast "Call" 1(800) 621-6221
Central & East "Call" 1(800) 654-4058
Discounts Starting at 3 Box Quantities

3M	Dysan	maxell	Verbatim
•5¼"•	•5¼"•	3½" CALL	•5¼" Datalife
s-side d-den. 17.95	s-side d-den. 22.95	•5¼"•	s-side d-den. 18.95
d-side d-den. 23.95	d-side d-den. 30.50	s-side d-den. 19.95	d-side d-den. 24.95
s-side quad 27.50	s-side quad 34.50	d-side d-den. 25.95	s-side quad 30.95
d-side quad 33.95	d-side quad 45.50	s-side quad 28.95	d-side quad 39.95
•8"•	•8"•	d-side quad 36.95	•8" Datalife
s-side s-den. 21.50	s-side s-den. 28.50	•8"•	s-side s-den. 24.75
s-side d-den. 26.00	s-side d-den. 30.95	s-side d-den. 31.95	s-side d-den. 26.95
d-side d-den. 31.50	d-side d-den. 34.95	d-side d-den. 34.95	d-side d-den. 31.95

3M	AMARAY MEDIA MATE	Head Cleaners
DC100A...13.95	(3½"...11.95) (5¼"...11.95)	Kits.....5.20
DC300A...18.40	DISK MINDERS	Refills...9.55
DC300XL 20.25	(5¼"...16.75) (8"...21.50)	Analizers 25.00
DC600A..24.45	BULK PACKED DISKS "CALL"	

Diskettes 10/Box

the Diskette Connection™

Dealer Inquiries Welcomed
1(800) 654-4058

OKLAHOMA & NEVADA

"UPS Delivery Only. Add 3.00 on orders under 35.00 or 20 disk.

General DataComm beats Hayes for accuracy.

And we can prove it.

We put our 1200 bps modem to the critical test. We stacked it up against Hayes, one of the "smart" modems.

The Performance

Hundreds of phone calls were carefully monitored, analyzed, and verified by telecommunications engineers. After exhaustive testing, the results were conclusive: when line quality was good, our modem was one and a half times more accurate than Hayes. When line quality was bad, however, our modem was up to ten times more accurate. And when line quality was really bad, their error rate shot up to as much as 100 times ours! The errors ranged from misspelled words to incorrect numbers. The implications for modern business are understandably serious.

The Reliability

Then we went inside and did a component count. The final score: Hayes 252, us 155. This can be viewed two ways: Either Hayes has a 60% better chance of developing part failure, or our modem has a 60% better chance of delivering higher reliability.

Eliminating operator risk is as important to us as eliminating errors. With our modem there's virtually no risk of electrical damage because there are no internal switches to deal with. General DataComm modems automatically select all call parameters.

The Company

The General DataComm intelligent modem is the newest product of a company that has been designing data communication systems for 15 years. A company whose customer list is a "Who's Who" of international business. Most of the Bell operating companies, and other telephone companies in the U.S. and Canada. Major banks. Brokerage firms. And many of the Fortune "500."

We build multiplexers, modems, local area and digital network products, and the most complete networking systems on the market. Now we're applying the technology that won the respect of big business and Bell to the personal computer market. With a line of 300 and 1200 bps modems and our own communications software.

The General DataComm modem. We put it to the critical test. Now it's ready for the ultimate test. Yours. To find the dealer nearest you, contact the Personal Computer Products Dept., (203) 574-1118. General DataComm, Middlebury, CT 06762-1299.

General DataComm

The best connections in the business.

Circle 869 on reader service card

Instant Software Review

Now you can instantly access PC World Software Reviews and Program Listings on-line with Direct-Net

Cooking up a software review has never been easier. With the Direct-Net online database, you can instantly access over 1500 software listings. PC World's own programs can also be accessed online. Direct-Net's own DN-COMM software package allows for instantaneous dial-up along with genuine terminal emulation. Direct-Net's interactive feature allows users to communicate on software problems and remedies. 500 hardware reviews will soon be available.

- Direct-Net is available at an introductory annual membership fee of $50. There is no initial connect 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 towards membership)

Name _____
Address _____
City/State/Zip _____

DIRECT-NET
31220 La Baya Drive, Suite #110
Westlake Village, CA 91362

In an ever changing world...

Maintain the edge!

The clean edge of our continuous letterheads & matching envelopes...

Logicforms has developed a unique method for ordering continuous stationery. We give you the choice of duplicating your existing letterhead or selecting one of our distinctive designs.

With the largest selection of layout/design, typestyles, method of printing, paper and color of ink, you are actually receiving **custom continuous stationery at stock prices.**

To help you make the proper selection, we have designed a **stationery kit** which depicts the various methods of printing and show the assortment of quality papers.

LOGICFORMS OFFERS YOU MORE!

CALL TODAY FOR YOUR FREE CONTINUOUS STATIONERY KIT

1 800 645-3491

NEW YORK STATE 516 741-0043
CANADA 416 283-2354

LOGICFORMS
A MEMBER OF THE LOGIC GROUP

300 GARDEN CITY PLAZA
GARDEN CITY, NEW YORK 11530

Circle 95 on reader service card

©1984 LOGICFORMS, GARDEN CITY, N.Y.

MEMBERS! PC Express Has Changed Its Name To COMPUTERS DIRECT!

Get Dealer Cost Prices for Software & Hardware—Right Over the Phone!

Rent the Hottest Software Titles for 14-25 Days and Save Even More!

Early Bird BONUS Join by Jan. 31, 1985 and receive **$5 OFF** any purchase

Introducing Our ALL-NEW "Living" Cost + 8% FREE Catalog

ACCOUNTING

An innovation in mail-order computer shopping!

Our "Living" Catalog is updated, expanded and sent to you REGULARLY!

Why wait MONTHS for a bulky catalog that is virtually out-of-date before it's even mailed?

BECAUSE 'COMPUTERS DIRECT'/PC Express PAYS LESS, YOU PAY LESS! You pay the actual dealer cost + an 8% administrative fee and shipping when you make all your computer-related purchases **DIRECT** through **'COMPUTERS DIRECT'/PC Express — America's Only "One-Stop" Computer Buying Club!** That's how YOU GET THE BEST PRICES on software and hardware in an industry where prices fluctuate rapidly and middlemen's mark-ups flourish!

TWO SOFTWARE RENTAL SERVICES TO CHOOSE FROM! By enrolling in one or both, you can rent software at 20% of the **'COMPUTERS DIRECT'/PC Express Discounted *COST + 8%*** price! And if you decide to keep the program, 100% of the rental fee applies toward your purchase. **Enjoy the longest rental periods around!**

SPECIAL V.I.P. MEMBERSHIP OPTION! For a few dollars more you're entitled to all the additional money-saving benefits awarded to V.I.P. Members! (See benefit 20.)

If you paid more than the actual dealer *COST + 8%* for any of the products listed below or any of the thousands of products we offer YOU COULD HAVE BOUGHT IT FOR LESS FROM 'COMPUTERS DIRECT'!

HARDWARE

(Please call for shipping and handling charges)

	COST*
ANCHOR MARK XII MODEM	$240.00
AMDEK 310A AMBER MONITOR	145.00
AMDEK 710 COLOR	520.00
AMDEK 300 MONITOR	118.00
AST MONOGRAPH + CPS	350.00
AST SIX PACK 64K C P'S	250.00
AST SIX PACK GAME PORT OPTION	35.00
HAYES SMARTMODEM 1200A	469.00
IOMEGA DUAL 10MEG CARTRIDGE DRIVE	2,510.00
KOALA SPEED KEY TABLET W/SOFTWARE	116.00
MICRON TECH 64K RAM CHIPS	4.95
MICROSOFT PCJR BOOSTER 128K W/MOUSE	321.00
MOUSE SYSTEMS PC MOUSE	190.00
ORCHID PC TURBO 80186 BOARD	767.00

BUSINESS SOFTWARE

(Please add $3.50 shipping and handling for each title)

	COST*
ALPHA ELECTRIC DESK	$207.00
ASHTON TATE dBASE II	262.00
ASHTON TATE dBASE III	380.00
CONTINENTAL HOME ACCOUNTANT	68.00
DIGITAL RESEARCH CONCURRENT PCDOS	295.00
FUNK SOFTWARE SIDEWAYS	36.00
HARVARD SOFTWARE PROJECT MANAGER	237.00
LIVING VIDEOTEXT THINK TANK	100.00
LOTUS LOTUS 1-2-3	279.00
MICROSOFT MULTIPLAN	117.00
MICROSTUFF CROSSTALK XVI	94.00
PETER NORTON NORTON UTILITIES	48.00
ROSESOFT PROKEY	77.97
SOFTWARE PUBLISHING pfs:FILE	72.80
SOFTWARE PUBLISHING pfs:PLAN	72.80
SOFTWARE PUBLISHING pfs:REPORT	65.00
SOFTWARE PUBLISHING pfs:WRITE	72.80
UNITED SOFTWARE ASCII EXPRESS PRO	189.95
WARNER SOFTWARE DESK ORGANIZER	177.00

GAME & EDUCATIONAL SOFTWARE

(Please add $2.00 shipping and handling for each title)

	COST*
ATARISOFT DONKEY KONG	$22.67
BRODERBUND BANK STREET WRITER	47.97
BRODERBUND LODE RUNNER	20.97
CBS MURDER BY THE DOZEN	22.37
CBS DINOSAUR DIG	49.95
HAYDEN SARGON III	29.97
HAYDEN WORD CHALLENGE	23.97
INFOCOM DEADLINE	25.97
MICROSOFT FLIGHT SIMULATOR	29.97
ODESTA CHESS	42.00
ORIGIN SYSTEMS ULTIMA III	35.97
SEGA ZAXXON	28.97
SIRTECH WIZARDRY	35.00
SPINNAKER IN SEARCH OF THE MOST AMAZING THING	20.77
SPINNAKER ALPHABET ZOO	15.57
SUBLOGIC PINBALL	23.50

BRAND-NAME BLANK DISKS

(Please add $1.00 shipping and handling for each ten-pack)

	COST*
BASF DS/DD 5 1/4" TEN PACK	$27.49
DYSAN DS/DD 5 1/4" TEN PACK	30.00
MAXELL DS/DD 5 1/4" TEN PACK	24.00
MAXELL SS/DD 5 1/4" TEN PACK	21.00

And thousands more software and hardware products!

*COMPUTERS DIRECT Members pay the ACTUAL DEALER COST + 8%, plus shipping. All prices reflect a cash discount, credit card orders add 3%. Dealer prices fluctuate rapidly—please call for latest prices.

CALL TOLL FREE

1-800-848-0888

In Illinois call (312) 966-0055

Enrollment Number:

Call today to enroll as a Member and start saving! Charge it to your VISA, MASTERCARD or AMERICAN EXPRESS. Our consultants are waiting to serve you Mon-Fri 9AM to 5PM CST.

COMPUTERS DIRECT

6232 Oakton Street
Morton Grove, Illinois 60053

Formerly PC Express

Copyright © 1984, PC Express Corporation.

Circle 800 on reader service card

For as little as $8 per year, receive these 20 money-saving benefits!

PC EXPRESS

Members! Your overwhelming response to our . . .
- DIRECT Pricing
- DIRECT Delivery
- DIRECT Phone Lines
- DIRECT Response To Your Needs
- Plus Our Vastly Increased Capacity . . .

Prompted us to change our name to COMPUTERS DIRECT

1. **COST + 8% PURCHASING POWER**—You save hundreds, even thousands of dollars by buying at **8% above actual dealer cost!**
2. **OUR "LIVING" *COST + 8%* CATALOG**—You'll REGULARLY receive our listing featuring nearly a thousand of our most popular products—ALL YOURS AT ***COST + 8%***. **We call it our "Living" Catalog because we're constantly updating and expanding it to bring you the newest products and the latest prices!**
3. **INSURED EXPRESS DELIVERY TO YOUR HOME OR OFFICE**—You'll enjoy speedy, fully insured delivery and our ability to bring you special orders quickly!
4. **IN-STOCK ACCESS TO A MULTI-MILLION DOLLAR INVENTORY** — We stock thousands of products to give you the best prices and the fastest delivery!
5. **TRAINED, EXPERIENCED CONSULTANTS**—Our Consultants help you with product selection and any other questions you might have. And we make you this guarantee: ALL PRODUCTS RECOMMENDED BY OUR CONSULTANTS WILL PERFORM AS PROMISED AND WILL BE COMPATIBLE WITH YOUR SYSTEM OR WE WILL TAKE IT BACK FOR A 100% REFUND — NO QUESTIONS ASKED!
6. **OPTIONAL NO-CHARGE SNEAK PREVIEW CLUB**—You'll be invited to audition and rate new programs not yet available to the general public and you'll be able to purchase those you like at discount prices!
7. **OPTIONAL BUSINESS SOFTWARE RENTAL SERVICE**—Save by renting your Business Software at just 20% of the COMPUTERS DIRECT ***COST + 8%*** price BEFORE you buy. You'll have 14 full days (plus three days for return shipping) to see if your rented program best suits your needs. If you decide to keep it, 100% of your rental fee applies toward purchase. Membership in this money-saving club is just $25 per year in addition to the basic membership fee. **See benefit 20 for more rental privileges!**
8. **OPTIONAL GAME & EDUCATIONAL SOFTWARE RENTAL SERVICE**—Enroll in this money-saving service for just $10 in addition to the basic membership fee. The same conditions apply as for our Business Software Rental Service (benefit 7). **See benefit 20 for more rental privileges!**
9. **COMPUTERS DIRECT PASSWORD SAVINGS NEWSLETTER**—The PASSWORD newsletter regularly puts you "on-line" with special, limited quantity merchandise that we were able to purchase at an even greater savings than usual. As a Member, these savings are passed right along to you!
10. **SPECIAL MYSTERY BENEFIT**—This EXTRA MONEY-SAVING BONUS is well worth the membership by itself!
11. **SPECIAL CLUB AND CORPORATE MEMBERSHIP RATES**—Group membership rates allow everyone at one location to purchase their products at
12. **CORPORATE PROGRAM**—Corporate buyers establish open accounts and will be assigned designated account supervisors.
13. **FREE TECHNICAL CONSULTATION**—Our Technical Consultants will be happy to answer all your questions **ABSOLUTELY FREE!**
14. **VOLUME DISCOUNTS**—The more we order, the more we can save you. Inquire about volume discounts for large corporations, clubs and repeat buyers.
15. **MEMBERSHIP DISCOUNTS ON COMPUTER BOOKS AND MAGAZINE SUBSCRIPTIONS**—Save up to 75%
16. **"EXPRESS YOURSELF" SKILL COMPETITION**—Members can win prizes by showing off their best applications of the hottest software. Winning applications will be published in upcoming newsletters and catalogs.
17. **ON-GOING BONUSES FOR RECRUITING NEW MEMBERS** Introduce your friends to us and earn valuable prizes!
18. **MEMBERSHIP SATISFACTION PROMISE**—You must be completely satisfied or receive a 100% money-back refund of your membership fee within 60 days of your Enrollment regardless of whether or not you made any purchases.
19. **PRODUCT SATISFACTION PROMISE**—We will gladly replace or repair any defective hardware and get it to you fast. Any defective software will be promptly replaced.
20. **OPTIONAL V.I.P. MEMBERSHIPS** — For just $40 complete, **V.I.P. Members get a one-year membership in COMPUTERS DIRECT AND BOTH the Business and Game & Educational Software Rental Services PLUS a 25-DAY RENTAL PERIOD** (and three days for return shipping). Also, V.I.P. Members get **FIRST CHOICE ON SPECIALLY SELECTED LIMITED QUANTITY DISCOUNTED MERCHANDISE** featured in the "Password" Newsletter.

Listen To What Our Satisfied Members Say:

"What really stands out is their endless concern ... in making me feel like an individual ... I will recommend [PC Express] *to my friends and colleagues."*
K.P. Gelling • Neuro-Linguistics Institute • Shawnee Mission, KS

"When [COMPUTERS DIRECT] *says they care, they mean it ... I am completely satisfied."*
J. DuMolin • American Beneficial Services • San Francisco, CA

COMPUTERS DIRECT™ MEMBERSHIP APPLICATION

Formerly PC Express

☐ **YES!** Please enroll me as a member in COMPUTERS DIRECT at the low one-year Membership rate of $8. As a Member I will receive my "Living" ***COST + 8%*** catalog and all the other money-saving benefits entitled to Members. Be sure to include my **$5 Early Bird Bonus Gift Certificate** if I join by Jan. 31, 1985!

There is no obligation to purchase. Satisfaction guaranteed.

Check (✓) boxes that apply: (206)

MEMBERSHIP OPTIONS

☐ Business Software Rental Service for $25 add'l per year—members only. 14-Day Rentals.

☐ Games & Educational Software Rental Service, $10 add'l. per year—members only. 14-Day Rentals.

OR SAVE EVEN MORE . .

☐ **One-year V.I.P. MEMBERSHIP** for $40 includes membership in COMPUTERS DIRECT PLUS BOTH Business and Game and Educational Software Rental Services with **extended 25-day rental periods.**

☐ Bill my credit card:
☐ VISA ☐ MasterCard ☐ American Express

Account Number: _____ Expiration Date _____ mo. / year

☐ Check or money order enclosed for $ _____

Name _____ (please print)

Address _____ Apt. No. _____

City _____

State _____ Zip _____

Telephone(____) _____

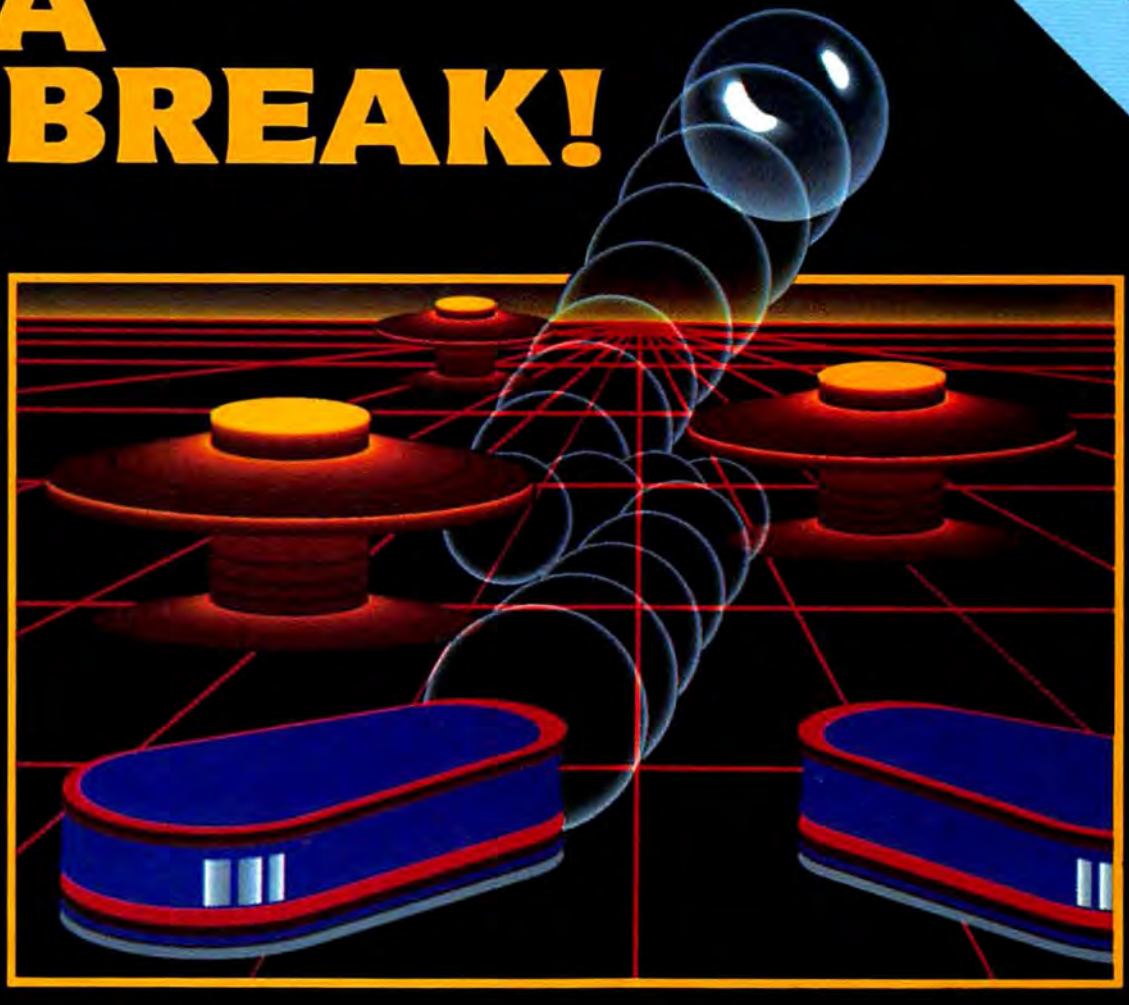
Computers name & model: _____

Signature X _____ (signature required to enroll)

"We're Customer Devoted!"

TAKE A BREAK!

For IBM-PC and IBM-XT



WITH NIGHT MISSION PINBALL

You deserve the best. You've earned it. Now reward yourself with a session of **Night Mission PINBALL**, the most realistic and challenging arcade simulation ever conceived! ■ Stunning graphics and dazzling sound effects put **Night Mission PINBALL** in a class by itself. Game features multi-ball and multi-player capabilities, ten different professionally designed levels of play, and an editor that lets you create *your own* custom modes. ■ So take a break with **Night Mission PINBALL** from SubLOGIC. Winner of *Electronic Games* magazine's 1983 Arcade Award for Best Computer Audio/Visual Effects.

See your dealer . . .

or write or call for more information. For direct orders please add $1.50 for shipping and specify UPS or first class mail delivery. Illinois residents add 5% sales tax. American Express, Diner's Club, MasterCard, and Visa accepted

Order Line: 800/637-4983

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

Circle 308 on reader service card

You're traveling through 140° terrain at 300 rpm.

While some disks lose their way in the torrid zone of drive heat, Maxell guarantees safe passage.

A lifetime warranty. And manufacturing standards that make it almost unnecessary.

Consider this: Every time you take your disk for a little spin, you expose it to drive heat that can sidetrack data. Worse, take it to the point of no return. Maxell's Gold Standard jacket construction defies heat of 140°F. And keeps your information on track.

And Maxell runs clean. A unique process impregnates lubricants throughout the oxide layer. Extending media and head life. How good is Gold?

Maxell's the disk that many drive manufacturers trust to put new equipment through its paces. It's that bug-free.

So you can drive a bargain. But in accelerated tests, Maxell was an industry leader in error-free performance and durability. Proving that if you can't stand the heat you don't stand a chance.

maxell®

IT'S WORTH IT.

Maxell Corporation of America, 60 Oxford Drive, Moonachie, N.J. 07074 201-440-8020

Circle 578 on reader service card

IBM PC AT BACKUP.

BACK UP YOUR IBM® PC AT™ HARD DISK IN 5 MINUTES WITH MOUNTAIN'S $1,595* AT-FILESAFE™ TAPE.

Our new internal AT-FileSafe Tape lets you back up your irreplaceable hard disk files with complete confidence. It's fast. Economical. Easy-to-use. And installs in 10 minutes. It's 100% compatible with IBM's new DOS 3.0. And it comes network-ready to support the 3COM Ether Series, Novell, Orchid PCnet® and NESTAR when available.

Mountain's FileSafe Tape is already the backup standard for thousands of IBM PC and XT™ users worldwide. AT-FileSafe Tape provides the same simple backup/restore user menus or batch (command) flexibility, and error correction (CRC) logic for the IBM AT. Plus it's backed by our six-month warranty.

There's only one practical backup solution for the AT's 20 megabyte hard disk. See Mountain's new AT-FileSafe Tape at Entre, MBI Business Centers, Office Technology Plus (Federal Agencies only), and other leading computer stores today.

For more information, write: Mountain, Inc., 300 El Pueblo Road, Scotts Valley, CA 95066.
Or call (408) 438-6650.
TWX 910-598-4504.

*Suggested Retail Price for FSTI27-AT.
FSTI27-AT with 27 megabytes (formatted)
FSTI60-AT with 60 megabytes (formatted)

See the AT-FileSafe Tape at COMDEX, booth #4160.

Mountain is a registered trademark and FileSafe is a trademark of Mountain, Inc. IBM is a registered trademark; AT and XT are trademarks of International Business Machines Corporation. PCnet is a registered trademark of Orchid Technology.
©1984 Mountain, Inc.

Mountain®
THE PEAK OF PERFORMANCE

1-800-458-0300 (in California, 1-800-821-6066)

In Canada, call Parity Plus Inc. (416) 673-3321.
1495 Bonhill Road, #12, Mississauga, Ontario, Canada L5T 1M2

Circle 120 on reader service card

Formulas for Profit

Cost-volume-profit (CVP) analysis helps manufacturers and other businesses monitor the bottom line and suggests swift action to beef up profit margins. A 1-2-3 template can make CVP a breeze.

Donald Hunt

To a gunfighter of the Old West, reaction time often meant life or death. To a professional baseball player, response time can make the difference between being a hero or a bum. And to today's business executive, quick action can ensure profit instead of loss–success rather than failure.

Business conditions change rapidly and affect virtually every aspect of the bottom line: price increases for materials, labor negotiations, commission schedules,

advertising trends, and pricing strategies. Not only must you stay on top of the changes you know about, you must also attempt to predict tomorrow's changes.

With a PC, a spreadsheet package, and a few key concepts, you can develop a powerful tool to help you fine-tune your reaction time and perhaps even improve your aim.

Eyeing the Bottom Line

For many years financial planners have used cost-volume-profit (CVP) analysis to determine the impact that changes in cost and volume have on their profits. What happens to the bottom line if material costs go up 5 percent and selling price goes down 2 percent? If your company sells multiple products and operates from several locations, analyzing the bottom-line impact of changes in cost or sales volume of a product can be difficult and time-consuming. When fixed overhead is high, a small change in sales volume can mean the difference between profit and loss.

CVP analysis is used to model the profit impact of changes in raw material or service costs, overhead expenses, and sales volume. Once you define and develop the CVP model, you can modify any cost or volume variable to reflect the profit impact of changes. Good or bad news comes quickly.

CVP analysis works with any type of business. It has been used primarily in manufacturing companies, where production or sales fluctuations can significantly affect the profitability of a product line, an individual plant, or the company as a whole. CVP analysis can also be used creatively in distribution, retail, service, and construction businesses.

A distribution company, for example, usually has high fixed costs for warehouse facilities, salaried personnel, and delivery equipment. Since those costs do not vary directly with sales volume, they do not conveniently disappear in a slow sales month. If the distributor relies on smart promotional planning such as discounts, purchasing incentives, and contests, additional volume can be generated in an otherwise slow month. CVP analysis can be used to gauge the profit impact of the increased volume and the increased costs resulting from scheduled promotions. Various combinations of advertising, price cuts, and other volume-boosting techniques can be modeled and compared.

CVP analysis is also an effective budgeting tool. Rather than change the CVP variables to reflect day-to-day activity in the marketplace, you can manipulate variables to test profit-maximizing strategies or operating assumptions prior to formalizing plans and budgets. (For a detailed discussion of the theory behind CVP analysis, see "The Mechanics of CVP.")

You may already have used one facet of CVP analysis called break-even analysis. But since most companies strive to do more than break even, you'll need to take a broader view of CVP analysis as a means of achieving profit objectives. The method can be used by anyone with a pad, a pencil, and a calculator, but it takes time to recalculate the numbers each time variables change. A *1-2-3* spreadsheet equipped with keyboard macros can put CVP analysis to work for you.

The XYZ Story

To try your hand at building a *1-2-3* template for CVP analysis, use the hypothetical XYZ Company. XYZ manufactures sheet metal parts for aircraft, truck, and other large manufacturing companies. Because XYZ doesn't have products of its own, production volume is often difficult to predict. Both volume and profits vary substantially from month to month. Because XYZ has high fixed costs, a low-volume month can have a big impact on cash flow.

XYZ Company could use CVP analysis to help it make better decisions about what contracts to bid on and at what prices. In some months CVP analysis would help maximize profits, while in others it would help minimize losses.

CVP analysis is used to model the profit impact of changes in raw material or service costs, overhead expenses, and sales volume.

The Mechanics of CVP

To develop a CVP model, you must identify all the costs of doing business. If you're a manufacturer, you must deal with raw materials, production labor, and plant overhead. Service businesses have to monitor labor and materials costs. Wholesalers and retailers need to factor in the costs of items bought for resale.
In addition to these product- or service-related costs, businesses incur expenses such as sales administration, office rent, printing, and product liability insurance.

Your next step is to classify each cost as being either fixed or variable. Fixed costs generally do not change directly in relation to sales or production volume. Few costs are totally fixed, but in a practical sense, many are almost fixed. Most general and administrative corporate expenses are fixed costs, at least in the short run. Office rent, for example, is fixed until you move or expand your facilities.

Variable costs change in direct relation to sales or production volume. Labor and raw materials costs should vary according to the number of units produced. Sales commissions expressed as a percentage of sales volume represent another variable cost. As sales or production volume rises or falls, so do variable costs.

Once costs have been classified as either fixed or variable, you can compute a "contribution" amount per unit of sales. Contribution is not necessarily the same as profit; it is the amount remaining when total variable costs are subtracted from total sales. Because variable costs such as sales commissions increase or decrease directly with sales or production volume, the contribution per dollar or unit of sales remains the same. Suppose, for example, that your company buys one style of rain umbrella for $4 apiece (a variable cost) and retails them for $12 apiece. The only other variable cost is the $3 sales commission paid to vendors who sell the umbrellas. To determine your contribution per umbrella, subtract the variable cost (product and commission) from the sales price to end up with a contribution of $5.

For each umbrella sold you will have $5 available to pay for the fixed expenses of running your business. But the $5 is contribution, not profit, because you have some large fixed costs to cover. If these fixed costs total $80,000 per year, divide that figure by 5; the company will break even at a sales volume of 16,000 umbrellas.

But there is more to the umbrella business than breaking even. How about a little profit? The marginal profit per unit after the company reaches break-even volume is equal to the contribution per unit. If the break-even figure is 16,000 umbrellas, and the company sells 20,000 umbrellas in 1984, multi-

ply the difference (4000) by the contribution ($5); the profit should be $20,000.

Any time you try to represent the real world as a model, you encounter problems. In CVP analysis not all costs are strictly fixed or strictly variable, and you may have to make some difficult decisions to classify a cost as being one or the other. You may even want to separate the individual costs into fixed and variable components.

Keep in mind the following observations: All planning depends to a certain degree on your ability to make assumptions about your business. Using CVP analysis involves making some assumptions about cost and volume. The real world is so complex that you may have to simplify things a little to make CVP analysis work for you. If you are careful, your assumptions and simplifications will not greatly affect the value of the information that CVP analysis provides.

The *1-2-3* template described here enables you to enter monthly manufacturing, sales, and overhead cost information easily. The input component of the template contains five sections (see Figure 1).

XYZ's industrial engineer has set normal capacity (line 7) for the plant at 7400 direct labor hours per month. Normal capacity is the production volume that XYZ should achieve in an average sales month. (It is neither the best nor the worst the firm can do.) This capacity assumes no changes in equipment or plant layout. It also assumes a single-shift operation. XYZ can produce in excess of normal capacity in peak months by working the first shift overtime or by bringing in a second shift. The template could easily be changed to reflect increased labor costs. Since virtually no costs are absolutely fixed, it's necessary to have a working concept of fixed costs that falls within a "relevant range" of sales or production volume. That range then becomes this model's normal capacity—the approximate volume at which certain costs are considered fixed. If actual volume changed significantly, these cost estimates would have to be revised.

The average amount paid for all direct labor (line 8) at XYZ is $5.55 per hour. This figure does not include fringe benefits, which are added to variable indirect manufacturing costs.

The fixed indirect manufacturing costs (line 9) include plant supervision, depreciation of building and equipment, and other production costs that do not vary with production volume. These are costs at normal capacity, and they total $55,000 per month.

The variable rate for indirect manufacturing costs (line 10) is computed for manufacturing costs that fluctuate. This rate includes plant electricity, fringe benefits for plant employees, and labor for handling material. It is expressed as a percentage of sales dollars. At XYZ, indirect manufacturing costs equal 8 percent of sales per month.

XYZ's sales expenses (line 12) encompass fixed and variable outlays. Fixed outlays include the sales manager's salary, advertising materials, and sales travel and entertainment. Fixed selling expenses are estimated at $10,000 (line 13). XYZ also hires manufacturers' representatives who pay their own expenses and are compensated by a 3½ percent commission (line 14).

For each product sold or expected to be sold, XYZ enters figures in several columns under the product sales forecast and cost data category (line 16). Sales units include the number of units sold or expected to be sold. Selling price is the average selling price per unit, which reflects sales made to different customers at different price levels. Direct labor (DL) hours/unit conveys the number of direct labor hours per unit calculated by XYZ's industrial engineer, assuming normal efficiency. Material/$ unit is the amount of material in dollars that each product unit requires. Standard prices and a normal scrap allowance are assumed.

```
A3: (T) '================================================================
A4: (T) ' PROJECTION ASSUMPTIONS AND FACTORS
A5: (T) "
A6: (T) ' MANUFACTURING INFORMATION
A7: (T) '  Normal Capacity-Direct Labor Hours
F7: (T) 7400
A8: (T) '  Average Labor Rate Per Direct Labor Hour
F8: (T) 5.55
A9: (T) '  Indirect Manufacturing Costs-Fixed
F9: (T) 55000
A10: (T) '  Indirect Manufacturing Costs-Variable Rate
F10: (T) 0.08
A12: (T) ' SELLING EXPENSE INFORMATION
A13: (T) '  Fixed Expenses
E13: (T) 10000
A14: (T) '  Commission Rate Per Sales Dollar
E14: (T) 0.035
A16: (T) ' PRODUCT SALES FORECAST AND COST DATA
D17: (T) ^Sales
E17: (T) ^Selling
F17: (T) ^DL Hours
G17: (T) ^Materials
D18: (T) ^Units
E18: (T) ^Price
F18: (T) ^Unit
G18: (T) ^$ Unit
A19: (T) '  Product A
D19: (T) 2000
E19: (T) 26
F19: (T) 0.5
G19: (T) 12
A20: (T) '  Product B
D20: (T) 4000
E20: (T) 32
F20: (T) 0.6
G20: (T) 14
A21: (T) '  Product C
D21: (T) 3000
E21: (T) 38
F21: (T) 0.5
G21: (T) 18
A23: (T) ' GENERAL AND ADMINISTRATIVE EXPENSES INFORMATION
A24: (T) '  Fixed Expenses
E24: (T) 40000
A25: (T) '  Variable Rate Per Sales Dollar
E25: (T) 0.04
A27: (T) ' PROJECTION MODIFIER INFORMATION
A28: (T) '  Selling Price Modifier
D28: (T) 1
A29: (T) '  Labor Rate Modifier
D29: (T) 1
A30: (T) '  Material Cost Modifier
D30: (T) 1
A31: (T) '  Fixed IMC Modifier
D31: (T) 1
```

Listing 1: Cell-by-cell breakdown of CVC template

```
A32: (T) '  Variable IMC Modifier
D32: (T) 1
A33: (T) '============================================================
A36: (T) ' COST-VOLUME-PROFIT ANALYSIS
A37: (T) '  Analysis Title:
C37: (T) 'Preliminary Forecast
A38: (T) '  For Month:
C38: (T) 'February 1984
E38: (T) ^Fixed
F38: (T) ^Variable
G38: (T) ^Total
A40: (T) ' Sales
G40: (FO) +D19*E19+D20*E20+D21*E21*D28
A42: (T) 'Manufacturing Costs:
A43: (T) '  Direct Material
F43: (FO) (+D19*G19+D20*G20+D21*G2)*(D30)
G43: (FO) +F43
A44: (T) '  Direct Labor
F44: (FO) (D19*F19+D20*F20+D21*F21)*F8*D29
G44: (FO) +F44
A45: (T) '  Indirect Manufacturing
E45: (FO) +F9*D31
F45: (FO) +G40*F10*D32
G45: (FO) @SUM(E45..F45)
E46: (T) "-------
F46: (T) "-------
G46: (T) "-------
A47: (T) '    Total Manufacturing Costs
E47: (FO) @SUM(E43..E45)
F47: (FO) @SUM(F43..F45)
G47: (FO) @SUM(G43..G45)
A49: (T) ' Selling Expenses
E49: (T) +E13
F49: (FO) +G40*E14
G49: (FO) @SUM(E49..F49)
A50: (T) ' General and Administrative
E50: (T) +E24
F50: (FO) +G40*E25
G50: (FO) @SUM(E50..F50)
E51: (T) "-------
F51: (T) "-------
G51: (T) "-------
A52: (T) '    Total Costs and Expenses
E52: (T) @SUM(E47..E50)
F52: (FO) @SUM(F47..F50)
G52: (FO) @SUM(G47..G50)
G53: (T) "------
A54: (T) ' Profit Before Income Taxes
G54: (FO) +G40-G52
G55: (T) "=======
A56: (T) '    Percent of sales
E56: (F2) +E52/G40
F56: (F2) +F52/G40
G56: (F2) +G54/G40
```

	A	B	C	D	E	F	G
1							
3	==========	==========	==========	==========	==========	==========	==========
4	PROJECTION ASSUMPTIONS AND FACTORS						
5	----------	----------	----------	----------	----------	----------	----------
6	MANUFACTURING INFORMATION						
7	Normal Capacity-Direct Labor Hours					7400	
8	Average Labor Rate Per Direct Labor Hour					5.55	
9	Indirect Manufacturing Costs-Fixed					55000	
10	Indirect Manufacturing Costs-Variable Rate					0.08	
11							
12	SELLING EXPENSE INFORMATION						
13	Fixed Expenses				10000		
14	Commission Rate Per Sales Dollar				0.035		
15							
16	PRODUCT SALES FORECAST AND COST DATA						
17				Sales	Selling	DL Hours/	Materials/
18				Units	Price	Unit	$ Unit
19	Product A			2000	26	0.5	12
20	Product B			4000	32	0.6	14
21	Product C			3000	38	0.5	18
22							
23	GENERAL AND ADMINISTRATIVE EXPENSES INFORMATION						
24	Fixed Expenses				40000		
25	Variable Rate Per Sales Dollar				0.04		
26							
27	PROJECTION MODIFIER INFORMATION						
28	Selling Price Modifier			1			
29	Labor Rate Modifier			1			
30	Material Cost Modifier			1			
31	Fixed IMC Modifier			1			
32	Variable IMC Modifier			1			
33	==========	==========	==========	==========	==========	==========	==========
34							
35							
36	COST-VOLUME-PROFIT ANALYSIS						
37	Analysis Title: Preliminary Forecast						
38	For Month:	February 1984			Fixed	Variable	Total
39							
40	Sales						294000
41							
42	Manufacturing Costs:						
43	Direct Material					134000	134000
44	Direct Labor					27195	27195
45	Indirect Manufacturing				55000	23520	78520
46					-------	-------	-------
47	Total Manufacturing Costs				55000	184715	239715
48							
49	Selling Expenses				10000	10290	20290
50	General and Administrative				40000	11760	51760
51					-------	-------	-------
52	Total Costs and Expenses				105000	206765	311765
53							------
54	Profit Before Income Taxes						-17765
55							=======
56	Percent of Sales				0.36	0.70	-0.06
57							

Figure 1: This template for CVP analysis permits easy entry of monthly sales, manufacturing, and overhead cost data.

General and administrative expenses (line 23) have both fixed and variable cost elements. Fixed general and administrative expenses are those fixed costs not allotted to manufacturing or sales activities. At XYZ, those costs include executive and clerical salaries, office rent and expenses, and insurance. The fixed cost element is $40,000. The only variable general and administrative expenses at XYZ are for part-time clerical workers and temporary office help whose hours per month vary according to sales volume. The variable expense averages 4 percent of sales.

The projection modifier information section (beginning on line 27) shows the impact on profit made by certain percentage changes in various sales, cost, and expense categories. In this section a value of 1 lets you easily manipulate variables without changing a given formula, making data entry a snap. If a factor is less than 1, the normal amount will be reduced. If the factor is greater than 1, the normal amount will be increased. To see the profit impact of an overall 5 percent sales price increase, for example, you would enter 1.05 in the selling price modifier (line 28). Costs that do not have a modifier can be changed directly at their cell locations.

Setting Up a CVP Template

Now that you know the basic structure of XYZ, you can set up the *1-2-3* template and several quick keyboard macros that make the template easy to use.

Start by entering the top portion of the spreadsheet format shown in Figure 1 (Projection Assumptions and Factors). If you have any problems building the template, you can refer to the complete cell-by-cell description of the template as shown in Listing 1. The range of cells from F40 to G54 should be formatted to display only integers with the command */Range Format Fixed* **0 <Enter> F40..G54 <Enter>**. Enter the same numbers shown so you can check your results with the figures shown in the next section of the template, Cost-Volume-Profit Analysis. Later you can build keyboard macros and easily change the variables.

The lower portion of the template displays the results of the CVP calculations. After you have completed this portion of the template, your calculated amounts should match the results shown.

Data Input Macros

Listing 2 shows three input macros for use with the CVP template. Although you don't have to use keyboard macros, they facilitate data entry (see "/X Marks the Macro," *PCW*, Vol. 2, No. 3). Macros automatically move the cell pointer to various input cells and eliminate time-consuming manual keying.

The input macros are named ranges. The sales forecast input macro is named \A; when you press <Alt>-A, the cell pointer automatically moves to the proper cells for entering the sales forecast information. The title input macro (<Alt>-B) moves the cell pointer so you can enter the template title, date, and period covered by the model. You can change the projection modifiers by using the modifier input macro (<Alt>-C).

PC SOFTWARE SALE!

WE'LL MATCH PRICES ON MOST PRODUCTS

LOTUS 1-2-3/ SYMPHONY $309/$425
dBASE II/III $279/$375
WORDSTAR PROF PACK $275
CROSSTALK $99
FRAMEWORK $375
EASYWRITER II SYSTEM $185
PRO KEY $87
HAYES SMARTMODEMS 1200/1200B $489/$409

LOOK AT THESE SPECIAL PRICES!

ATI Training Power	CALL
AST Products	CALL
Crosstalk	$ 99
dBase II/III	$279/$375
EasyWriter II System	$185
Hayes 1200/1200B	$489/$409
IUS Accounting	CALL
Lotus 1-2-3/Symphony	$309/$425
MicroPro Products	CALL
Microsoft Products	CALL
Multimate	$265
Norton Utilities	$ 59
PFS Products	CALL
ProKey	$ 87
Quadram Products	CALL
RBase 4000	$289
SuperCalc 2/3	$149/$199
Volkswriter Deluxe	$175
Wordstar	$209
Wordstar Prof. Package	$275
All Other Products/Diskettes	CALL

To order:
Call TOLL-FREE:
800-227-4780 or 415-845-2651

Or write:
ECONOMY SOFTWARE
2040 Polk Street
San Francisco, CA 94109

ECONOMY SOFTWARE

- ☐ We guarantee our products against manufacturer's defects.
- ☐ Quantity discounts available. We are experienced with Corporate accounts.
- ☐ No surcharge added for charge cards. No charges until products are shipped.
- ☐ Purchase orders accepted.
- ☐ Call for shipping charges.
- ☐ Prices subject to change.

```
Sales Forecast Input Macro   Alt A
         /WGRM{GOTO}A16~
         {GOTO}D19~{?}{RIGHT}{?}{RIGHT}{?}{RIGHT}{?}~
         {GOTO}D20~{?}{RIGHT}{?}{RIGHT}{?}{RIGHT}{?}~
         {GOTO}D21~{?}{RIGHT}{?}{RIGHT}{?}{RIGHT}{?}~
         /WGRA
         {GOTO}A37~

Title Input Macro   Alt B
     {GOTO}A36~{GOTO}C37~{?}{GOTO}H37~{?}{GOTO}C38~{?}{HOME}

Modifier Input Macro  Alt C
     {GOTO}A27~{GOTO}D28~{?}{DOWN}{?}{DOWN}{?}{DOWN}{?}{DOWN}{?}{HOME}
```

Listing 2: Input macros

Template in Action

You can use the CVP template to analyze each month's anticipated production volume. First analyze the anticipated contract sales by product; then enter the volume, cost, and sales price. You can do this on a preliminary basis at least one month in advance to determine how much capacity will be used based on the number of contracts already sold. If the anticipated volume is low, you'll know that a sales push is in order.

As potential new contracts are identified, you can use the template to evaluate various alternative bid prices and estimate an overall profit or loss position. The closer you get to the actual month, the more competitive your pricing will be. If a month looks bad, you can try to generate enough production to cover variable costs and make some contribution to the fixed costs to minimize loss.

You can also use the template to analyze the profit impact of real or anticipated changes in the marketplace. For example, if labor costs increase 5 percent due to a scheduled union contract raise, how much will profits be eroded? By entering a labor rate modifier of 1.05, you can quickly determine the profit impact of the labor increase. If a 3 percent increase in raw material costs was not anticipated during bidding, you can calculate the profit impact of having to absorb the total increase by entering a material cost modifier of 1.03. And if spending $10,000 per month on new equipment would yield a 5 percent labor cost improvement, you can determine whether an increase in profits will result. Simply enter the fixed cost increase and a labor rate modifier of .95 to obtain your answer.

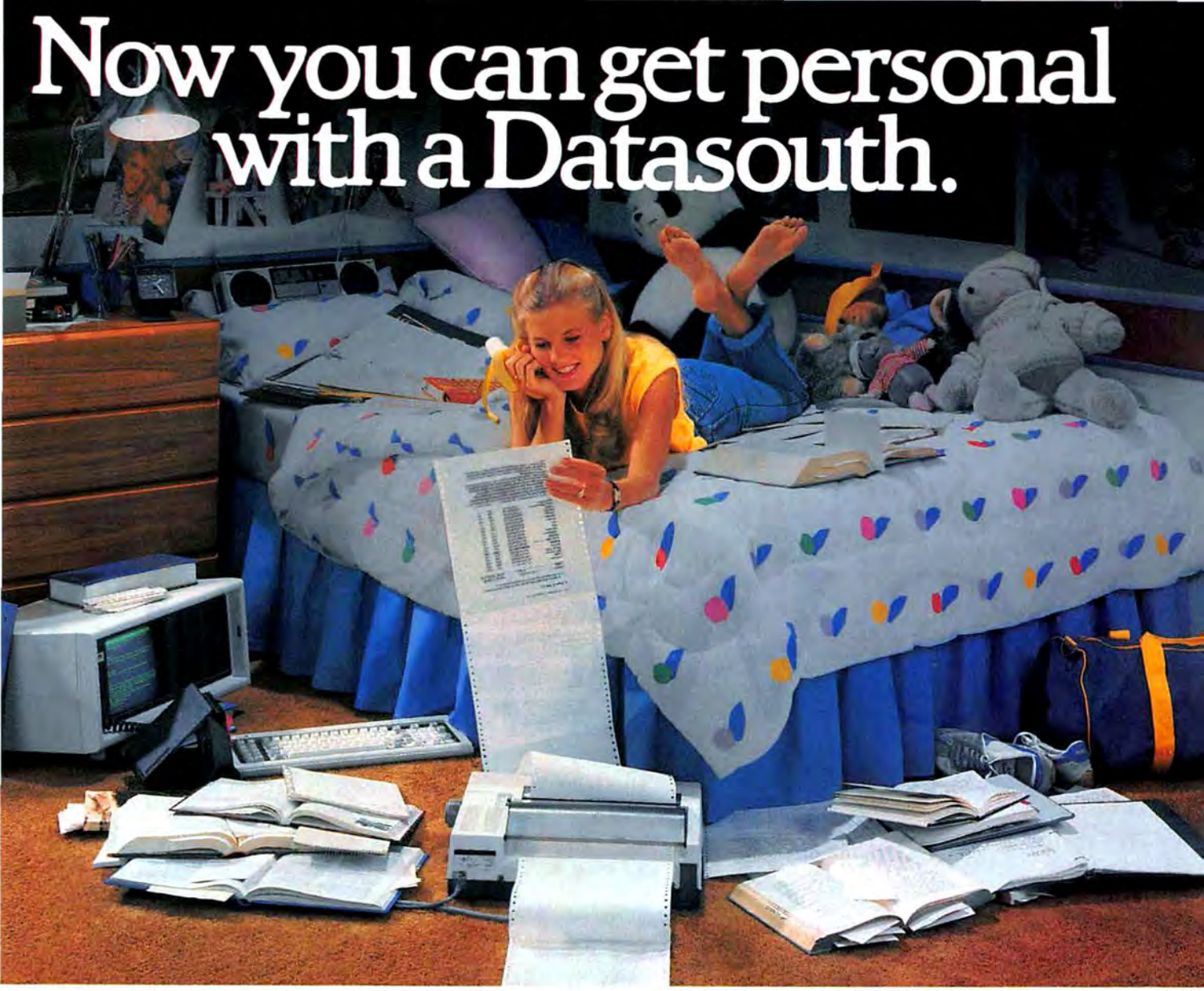
You can use the template to pose a variety of questions. If the company hires an industrial engineer at $2500 per month and cuts labor costs by 5 percent, what is the effect on profit? Does it make sense to accept a contract below the usual margins if the resulting production level exceeds normal capacity? How much of a loss will be sustained in a month of very low volume? (For demonstration purposes, assume a layoff of some plant supervision personnel at a $10,000 savings in fixed costs and a 2 percent increase in variable manufacturing costs.)

Once you have mastered basic CVP concepts, you can easily augment the template. By adding some *1-2-3* data table functions, you can automatically test numerous other "what if" assumptions. Using the *1-2-3* graph functions, you can build an *X-Y* graph of your company's CVP curves. The number of questions that a CVP template can answer is virtually infinite. You'll gain a significant amount of information from a small investment in time.

Donald Hunt is a CPA and a data processing consultant in Atlanta, Georgia.

1-2-3
Lotus Development Corp.
161 First St.
Cambridge, MA 02142
617/492-7171
List price: $495
Requirements: 192K, two disk drives

Now you can get personal with a Datasouth.



Say hello to the Datasouth Personal Printer—an office-quality dot matrix printer that makes itself right at home next to your personal computer.

Technically speaking, the Personal Printer is "Epson compatible." But it's better than the competing Epson because it also does near-letter-quality printing.

Personally speaking, the Personal Printer is "checkbook compatible." So you don't have to sacrifice the money you need to get the printer you want. And it comes in two models—one with a 10-inch and one with a 17-inch carriage.

Make a personal visit to your local computer store, and bring home legendary Datasouth performance for an affordably personal price. The Personal Printer. Only from Datasouth.

personal

datasouth

HIGH PERFORMANCE MATRIX PRINTERS

Find Datasouth Printers At Participating **ComputerLand**® Stores And Other Fine Dealers.

Datasouth Computer Corporation
Box 240947 · Charlotte, NC 28224
704/523-8500 · Telex 6843018 DASOU UW

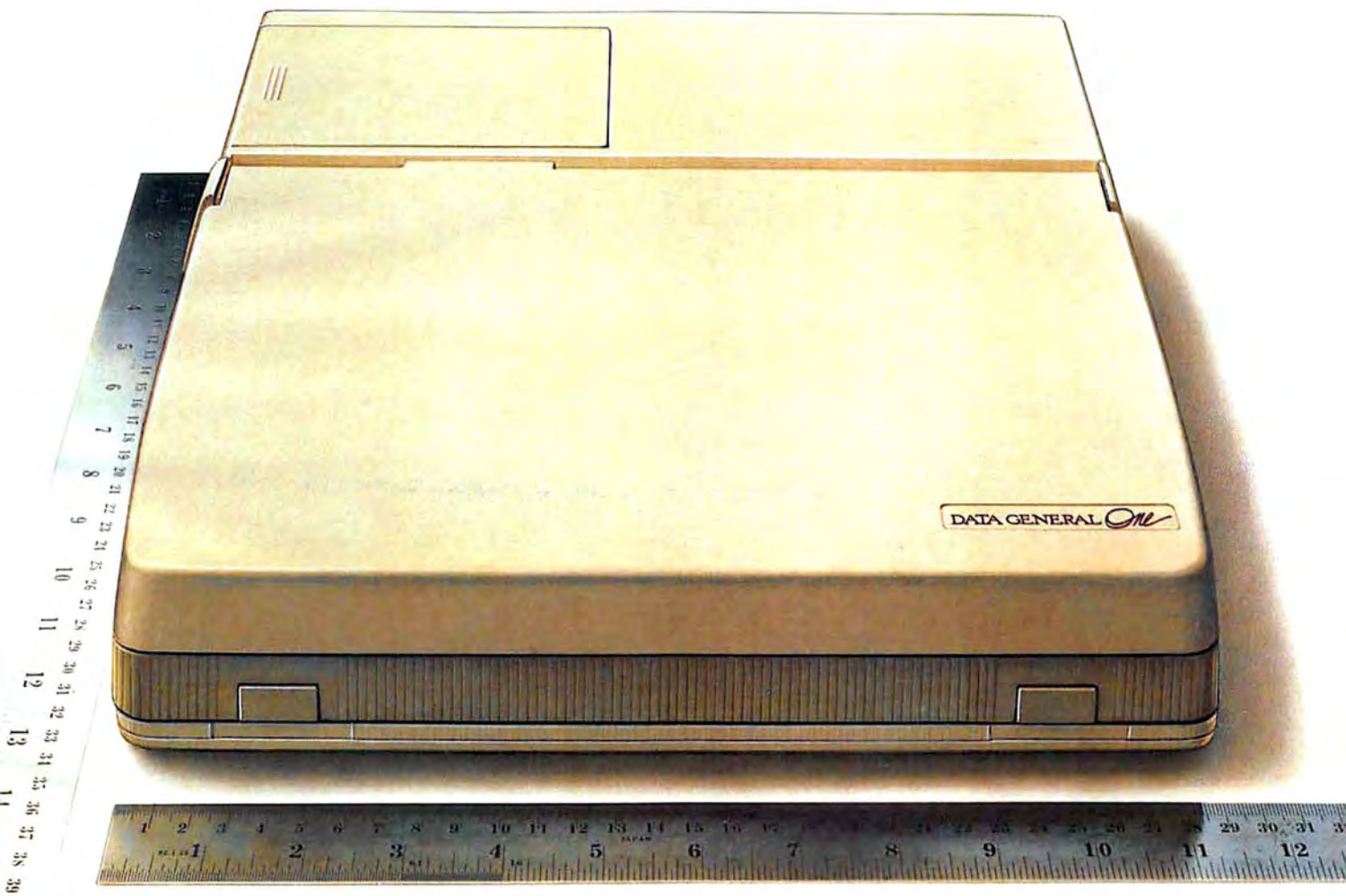
CALL TOLL FREE:
1-800-222-4528

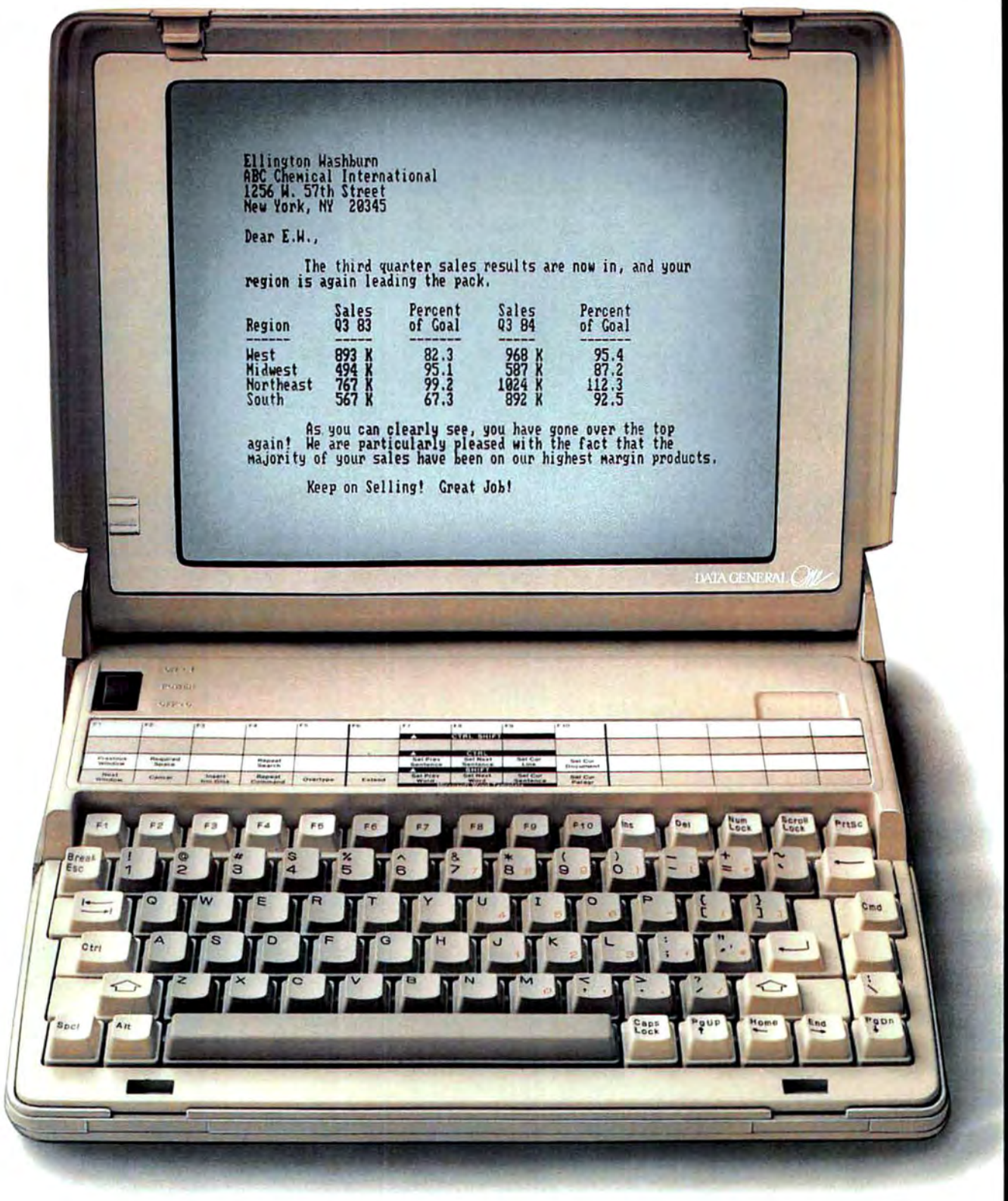
Subscribe to

PC WORLD

- **Save $26 off the newsstand price**
- **Have *PC World* delivered right to your desk**
- **Get a free book to help you get started**

DATA GENERAL INTRODUCES THE STANDARD BY WHICH EVERY OTHER PC WILL BE MEASURED.




Ellington Washburn
ABC Chemical International
1256 W. 57th Street
New York, NY 20345
Dear E.W.,
The third quarter sales results are now in, and your region is again leading the pack.
Region | Sales Q3 83 | Percent of Goal | Sales Q3 84 | Percent of Goal
West | 893 K | 82.3 | 968 K | 95.4
Midwest | 494 K | 95.1 | 587 K | 87.2
Northeast | 767 K | 99.2 | 1024 K | 112.3
South | 567 K | 67.3 | 892 K | 92.5
As you can clearly see, you have gone over the top again! We are particularly pleased with the fact that the majority of your sales have been on our highest margin products.
Keep on Selling! Great Job!
DATA GENERAL

INTRODUCING THE DATA GENERAL/One™ PORTABLE.

Small enough to fit inside your briefcase.

Now, for the first time, you can be freed from the confinement of your desk. And your desk-bound computer.

With the first, full-function business system that lets you do your work anywhere: at the office, at home, or anywhere in between.

IBM-PC compatible so it runs thousands of programs.

The DATA GENERAL/One portable is a computer with the capability of the leading PC: two built-in diskette drives, the same full-size screen, and full-size characters. It even runs the same programs as the leading PC.

All this in a size small enough to fit inside the average briefcase: 11.7 x 13.7 x 2.8 inches, and less than 11 pounds.

Full-size screen lets you get the whole picture.

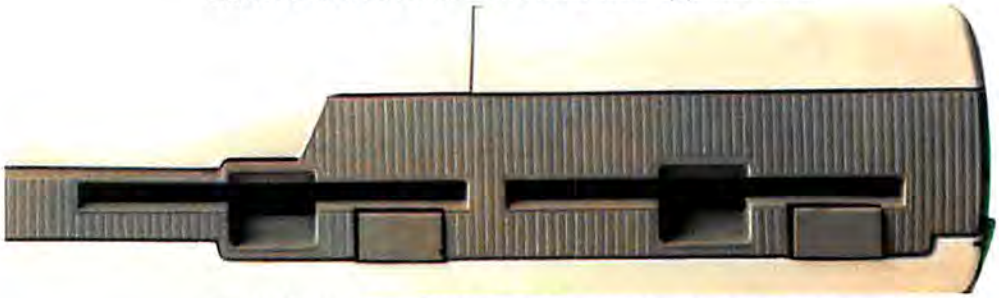
Someday, all PCs will be like this.

It's the only portable computer to give you a full-size 80-column by 25-line screen.

Other portables give you as little as 8 lines.

It's compatible with IBM®-PC software. Which means you can run the thousands of programs available to PC users. Software like 1-2-3™ and Symphony™ from Lotus™, Wordstar®, dBase II®, Multiplan®, as well as the most popular packages from the pfs® series, like pfs: file.

The only portable offering up to two built-in diskette drives for serious business applications.



So you can do such things as word processing, database management, spreadsheet analysis, and business graphics.

The DATA GENERAL/One is the only portable computer that offers up to two built-in diskette drives. Just like the leading PC.

It's the only way to do serious work. No more aggravation swapping diskettes.

And these are state-of-the-art 3.5-inch hardcased microfloppies—with twice the storage capacity at half the size of the 5.25-inch diskettes.

Connects with Data General's CEO office automation system.

Internal memory is expandable up to 512 KB. Storage capacity is 1440 KB—nearly one-and-a-half-million characters of information.

And if you want more information, the optional built-in modem lets you communicate with other computers.

Finally, it's the only portable that can give you the benefits of integrated office automation—by connecting with Data General's CEO® system.

Other options include a portable printer, an 8-hour built-in battery pack, an external 1200-baud modem and an external 5.25-inch diskette drive unit.

The new DATA GENERAL/One portable.

It not only gives you everything the leading PC gives you. It also gives you something the leading PC doesn't give you.

Your freedom.

To find the name of your nearest Data General salesperson or authorized dealer, call 1-800-DATAGEN.

Data General
a Generation ahead.

IBM is a registered trademark of International Business Machines Corporation. 1-2-3, Lotus and Symphony are trademarks of Lotus Development Corp. © 1983. dBase II is a registered trademark of Ashton-Tate. pfs is a registered trademark of Software Publishing. Wordstar is a U.S. registered trademark of Micro Pro Int'l. Multiplan is a U.S. registered trademark of Microsoft Corp. CEO is a registered trademark, and DATA GENERAL/One is a trademark of Data General Corp.

© 1984 Data General Corporation, Westboro, MA.

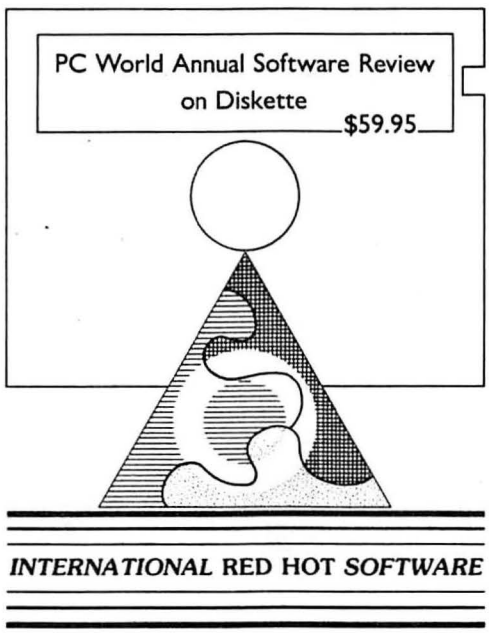
PC World Annual Software Review on Diskette

Only $59.95

International Red Hot Software is now offering the 1983/84 *PC World Annual Software Review on Diskette.* The disk is available for only $59.95 and will operate on IBM and compatible machines. International Red Hot Software's retrieval program will

- ☆ Let you pinpoint a product listing quickly through key attributes, product names, or manufacturers' brand names.
- ☆ Print a product description for off-line use.
- ☆ Produce a letter to request more information or to order a product directly from the manufacturer.

Never before has such an extensive library of software information been available at the touch of a few keys. Be sure to order your *PC World Annual Software Review* on diskette today!



Please send me a copy of the 1983/84 *PC World Annual Software Review* on diskette. Enclosed is a check or money order payable to International Red Hot Software for $59.95 plus $2.00 for postage and handling (California residents must add $3.90 sales tax). Please allow 6-8 weeks for delivery.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

International Red Hot Software, *PC World Annual Software Review,* 1433 Santa Monica Blvd. #158, Santa Monica, CA 90404

Circle 751 on reader service card

"We asked for an encore.

Ronald J. Cook,
Senior Vice President,
E.F. Hutton & Company Inc.
He helped pioneer the investment industry's first direct client communication service.

Lotus gave us a Symphony."

"We've been using 1-2-3™ from Lotus™ almost from the day it was introduced.

"It's the one software program we've tried that meets the analytical needs of almost every department. From Equity Research to Corporate Finance. Right now, we're using 1-2-3 for planning, forecasting, and decision support.

"With the success we're having with 1-2-3, we were naturally excited about new Symphony.™ Symphony's word processing simplifies our preparation of in-house reports and with Symphony's communication capability we can easily access a wide range of information sources.

"We also recommend Symphony to our clients because it's the ideal complement to Huttonline™—our online service that gives clients direct access to their portfolios, stock quotes and critical investment research. All this right on their own PC's.

"With Symphony, our clients can now get this information in really useable terms, and in exactly the format they want: spreadsheet, graphics, database, or words. And like 1-2-3, Symphony comes with everything in one package.

"In a business where timely information is everything, Symphony clearly meets our needs."

To find out which Lotus product is best for you, visit your authorized Lotus dealer.

Lotus
One great idea after another.™

1-2-3, Lotus and Symphony are trademarks of Lotus Development Corporation.
© 1984, Lotus Development Corporation.
Huttonline is a trademark of E.F. Hutton & Company Inc.

"The pace of business today is incredible. What was routine procedure yesterday, can be a bad business habit today. MCI Mail℠ brought us up to speed by allowing us to send letters and documents all over the U.S. *instantly.* All we needed was a communicating terminal, like a personal computer or word processor, to send instant mail to anyone on the MCI system. And for just $1.00* And we can even send mail to people without equipment.

"Hooked on Couriers.
We were addicted to overnight couriers — at $12.50 for each overnight letter! By using MCI Mail for overnight delivery at only $6.00* for a laser printed letter, we've cut our courier bill in *half.*

"The High Speed Trap.
Sometimes overnight wasn't fast enough and we'd spend a fortune on same-day delivery. MCI Mail can deliver letters, sales figures — any text — in four hours for just $25.00* to many major cities.

"Playing Telephone Tag.
You know how it is. You call, they call, you call back, but you never talk. Now, we simply send an MCI message, and it's waiting to be read at the first available moment. We can even get confirmation that it's been read.

"Our Mass Mailings Had No Image.
Computerized mailings all look alike. But with MCI Mail our letters are delivered on high quality bond, with our own letterhead — even *signatures* — and in attention grabbing orange envelopes. We just send the letter and the address list to MCI, and they handle the rest.

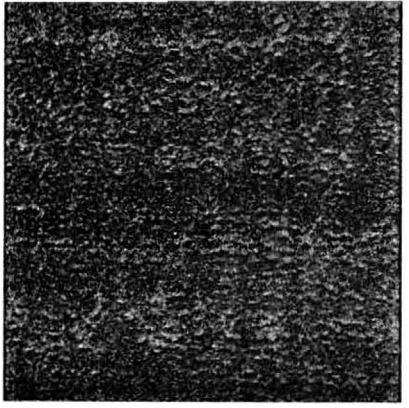
"Wasted Time and Money.
The convenience of MCI Mail not only saves us time, it also saves us megabucks in stationery, postage and labor. And to think, we kicked all these bad habits *instantly* by just calling 800-MCI-2255."

MCI Mail

NOTHING'S FASTER THAN NOW. 800-MCI-2255

In Washington, D.C., call 833-8484, in Hawaii, 545-2000.

Circle 883 on reader service card



Star-Dot-Star

A global exchange of personal computer discoveries

Featured this month: pretty printing with 1-2-3, a pfs:write tip, fast DOS 2.00 key redefinition, utilizing a VCR as an RF modulator, and a better random number generator

Edited by Steven Cook

Worksheet Printer Controls

I once wished for an easy way to put print attributes into *1-2-3* worksheets. The only method I knew for creating boldface print or underlining parts of a worksheet was to repeatedly use the *Range* and *Setup* string commands, but I would not call that easy. Recently I developed a technique that I have been using quite successfully: placing printer codes directly in worksheets.

To do this I first create some files that contain the control codes required by the printer to activate the various print enchancements. Each file contains the characters needed to activate one enhancement, and the files' names all end with the .PRN extension. I keep these .PRN files on my *1-2-3* system disk to allow selection of italic fonts, boldface, underlining, form feeds, and condensed print.

The trick is to read the desired file into a worksheet cell using *1-2-3*'s */File Import Text* command. You will generally see some funny-looking characters on the screen, but you can ignore them; they are the IBM extended character-set representations for the print enhancement codes contained in the cell. If required, additional text can then be added to the cell using *1-2-3*'s edit mode. When *1-2-3* prints the cell, the printer switches to the desired mode until another printer control code is received.

You can use BASIC or the EDLIN program on the DOS disk to create .PRN files with the proper codes for your printer. (You can also use DEBUG, if you know how.) Just make sure that you do not accidentally put a carriage return and linefeed into the files when you create them, or you will have extra lines on your printouts.

Check your printer manual for the proper control codes to activate the various print enhancements and fonts your printer is capable of producing. You may also need codes to turn them off. If you have a keyboard enhancer such as *ProKey,* you can make the process of importing the enhancements into your worksheets completely painless.

Another way I enhance the printing of a *1-2-3* worksheet is by putting the printer control codes used by *WordStar,* my word processing program, into the worksheet, printing the worksheet to disk as a .PRN file, and then using the word processing program to send the .PRN file to the printer. For added power I set the worksheet's left margin at zero and put *WordStar* dot commands in the first column. For example, using a *WordStar* dot command, I can control page breaks, something that is not easy to do using the print facilities of *1-2-3.* Most popular word processing programs can be used to take advantage of these techniques.

Bill Castner
Bethesda, Maryland

Legendary Graphs

Here is an easy way to put floating legends virtually anywhere on a *1-2-3* graph. The trick is to create them as labels for an "invisible" data range—one that will not appear on the screen.

5¼" DOUBLE DENSITY DISKS $1.39 ANY QUANTITY

300-1200 BAUD MODEM FOR IBM $299
AUTO ANSWER
AUTO DIAL WITH
CABLE & SOFTWARE—1 YR. WARRANTY

PANASONIC 1091 PRINTER $349
120 CPS
NEAR LETTER QUALITY
FULL GRAPHICS
1 YR. WARRANTY

CALL FOR FREE CATALOG
BITS & BYTES OF ELECTRONICS
TO ORDER CALL 1-800-241-5119
INFORMATION OR GEORGIA
CALL (404) 442-1516

Circle 134 on reader service card

a Video Enhancer
WITH
Have a color graphics board and a monochrome monitor? Plug it in and turn fuzzy color signals into clear shades of monochrome.
Video Enhancer $79.95
Also: Amber or green monitor for Persyst BoB board $349
Power R
4016 Interlake N.
Seattle, WA 98103
(800) 547-8001
In Washington (206) 547-8000

Circle 827 on reader service card

PC-WRITER T.M.
LETTER QUALITY
Enhancement for Okidata Printers
- Plug-in module easily installs in printer.
- Draft (120 cps) & Letter Quality (30 cps).
- Front panel access to all features.
- Full IBM PC compatibility.
- Eliminates "Plug 'N Play" & "Okigraph".
- Many other features
- *SAVE MONEY... use PC-WRITER with the low cost, high performance Okidata ML82A/83A... move into the world of* LETTER QUALITY printing!

"Plug 'N Play" and "Okigraph" are trademarks of Okidata
SEE: PC WORLD DIRECTORY for more details (this issue).
RAINBOW TECHNOLOGIES, INC.
P.O. Box 7200, Costa Mesa, CA 92628
(714) 241-0565 Telex 386078

Circle 328 on reader service card

•

First set up a data range composed of blank cells. Enter the vertical coordinates of your text in the appropriate cell and leave the other cells blank. Choose a second blank range and enter the desired legend text in the corresponding cell.

For example, if a graph has 12 numbers in its *X* range, and you want to place text over the third number (at vertical coordinate 600), create a range of 12 cells, all blank except for '600' in the third cell. Create another range of 12 blank cells with the text of the legend in the third cell. Assign the two ranges as Data and Data Labels, respectively, and use the */Format Neither* command to suppress the data range so that only the text will appear.

This technique is very flexible because there is no restriction on the length of the text (except for the size of the graph itself), and any number of leading spaces can be used to refine its position.

Everette Gardner, Jr.
Boiling Springs, Pennsylvania

Editor's note: Kent Murray pointed out this technique in last month's Letters. *This contribution from Everette Gardner explains how it is done.*

pfs:write With DOS 2.00

As a user of *pfs:write* I was quite disappointed to see that the manual warned against placing DOS 2.00 on the *pfs:write* system disk. The program works with DOS 2.00; it's just that you can't put DOS 2.00 on the disk to start the program automatically. The people at Software Publishing Corporation told me that the problem is due to insufficient disk space. As purchased, the *pfs:write* disk has 31,583 bytes free, and DOS 2.00 requires about 39,700 bytes.

I reviewed the disk directory and found a file named LOGO.EXE, which does nothing more than display a very nice pfs logo on the screen. By erasing the LOGO.EXE file I was able to create room for DOS 2.00. I also removed the reference to LOGO.EXE from the AUTOEXEC.BAT file so that the *pfs:write* program starts immediately.

Daniel Domzalski
Buffalo Grove, Illinois

Editor's note: It's a good idea to copy the LOGO.EXE program onto another disk before you delete it.

DOS Tips

I've discovered a few things about DOS 2.00 and 2.10 that I would like to pass along to other readers.

First there is a bug in the redirection feature that occurs when you use the append option, as with the command **DIR ≫ DIRLIST**. The problem is that EDLIN places an end-of-file marker (EOF) at the end of its

files, and the redirection feature appends data *after* the EOF mark. Since the TYPE command and some programs cannot read past the EOF, the appended data appears to be missing. You can display the contents of the file by using the COPY command with the /B option (**COPY DIRLIST CON:/B**), but otherwise you might wonder what happened to the data.

Another fact many users apparently do not know is that the EDLIN program on the DOS disk provides a very easy way to put control characters into a file. The trick is to type **<Ctrl>-V** first, then type the capital letter corresponding to the control character you want. For example, **<Ctrl>-V X** puts a *Control X* into the file. This is a great way to create escape sequences that select the various screen control functions provided by the ANSI.SYS device driver [see "Custom Prompts," *.*, *PCW*, Vol. 2, No. 2]. It's discussed in the DOS manual under "Information Common to All EDLIN Commands." To enter the Escape character (ASCII 27), type **<Ctrl>-V** and then a left square bracket ([).

The third tip is that the ECHO command can be used to send escape sequences to ANSI.SYS and, with the redirection feature, to the printer. For example, the command **ECHO ^[@ > PRN** sends Escape-@ to the printer. (The two characters ^[are the characters displayed on the screen when you type **<Ctrl>-V [** in EDLIN.) The only problem with this method is that there is no way to prevent the ECHO command from also sending a carriage return and linefeed after the escape sequence.

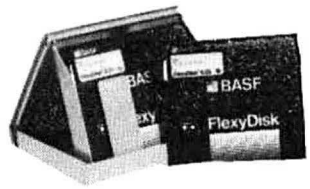
Bob Stephan
Monterey, California

Editor's note: The ECHO command works better than the PROMPT command for invoking the functions of the ANSI.SYS driver because ECHO will send characters to the screen even when an ECHO OFF command is in effect.

Another DOS Secret

AVAILDEV is another undocumented DOS 2.*xx* configuration command that can be placed in a CONFIG.SYS file. The AVAILDEV configuration command specifies whether or not the characters \dev\ must precede the names of devices. When AVAILDEV is set to "true" (or not set at all, since "true" is the default condition), a device can be referenced by just its name–for example, CON:, COM1:, PRN:–or by its name preceded by \dev\ as used in the XENIX operating system. When the configuration is set to "false" by the presence of the line 'AVAILDEV = FALSE' in the CONFIG.SYS file of the system disk, a device can be referenced only by the XENIX-like name.

FANTASTIC LOW PRICES ON
BASF
QUALIMETRIC
DISKETTES!



BASF QUALIMETRIC DISKETTES have a lifetime warranty and are packed in plastic storage cases. TYVEK sleeves, reinforced hubs, user identification labels and write-protect tabs included.

$1.39 ea. 5¼" SSDD Qty. 20
$1.89 ea. 5¼" DSDD Qty. 20

SOFT SECTOR ONLY!
3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. $18.00 + $1.50 Shpng.

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, nipples to keep diskettes from slipping and several other features. We like it.
$10.95 ea. + $2.00 Shpng.

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value.
$11.95 + $3.00 Shpng.

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes. Beige or grey only.
$1.65 ea. + 20¢ Shpng.

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs.

Epson MX-70/80	$3.58 ea. + .25 Shpng.
Epson MX-100	$6.99 ea. + .25 Shpng.
Okidata Micro 83	$1.48 ea. + .25 Shpng.
Okidata Micro 84	$3.66 ea. + .25 Shpng.

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes. **Other Items:** Add shipping charges as shown in addition to diskette shipping charges. **Payment:** VISA and MASTERCARD accepted. COD orders only, add $3.00 handling charge. **Taxes:** Illinois residents only, add 8% sales tax.

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois: 1-312-944-2788)

INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS: 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Reseller Information Processing Media BASF

Circle 780 on reader service card

Own your own computer supply business.

DISK WORLD! will show you how.

You probably know who DISK WORLD! is: our ads are scattered throughout this and every other major computer magazine.

We're one of the largest computer supply marketers in the country.

And we want you!

But, no matter how much we advertise, we still can't reach every computer user...but you can.

We're looking for people who want to run their own part- or full-time computer supply business.

You'll have our help.

You won't be alone.

You'll have the accumulated experience, buying power and merchandising skills of DISK WORLD! working with you. (And, if you don't think that's important, just remember this: eighteen months ago DISK WORLD! didn't exist...and now we're one of the largest distributors in the nation.)

$24.95 gets you started.

We'll send you a complete business plan that tells you everything you need to know.

It'll cost you $24.95 + $3.00 shipping.

But it's risk-free. Read it for fifteen (15) days and if you decide this isn't for you, send it back. We'll refund your money.

If it is for you, you'll know what to do next.

DISK WORLD!
Suite 4806
30 East Huron Street
Chicago, Illinois 60611

YES, I'm interested in the details of the DISK WORLD! independent resellers program. Please send me my manual.

I understand that if I don't like it, I can return it within 15 days for a full refund.

☐ My check or money order for $27.95 is enclosed.

☐ Charge my VISA or MASTERCARD

_____

Exp. ____/____.

Signature:_____

PLEASE PRINT LEGIBLY!

Name:_____

Address: _____

City:_____ State: _____ Zip: _____

Phone: (_____) _____ - _____

Circle 780 on reader service card

•

This setting allows files and directories to have the same names as devices: for example, PRN, CON, and COM1.

Robert Raymond
Provo, Utah

Editor's note: As always, readers are advised to use caution when experimenting with undocumented commands and features. It's best to avoid them if you do not feel qualified to recover from any problems they may create.

Key Reassignments With DEBUG

Readers without the Macro Assembler can enjoy the benefits of Larry Axsom's key redefinition program ["ANSI.SYS Key Reassignment," *.*, *PCW*, Vol. 2, No. 6] by using the DOS 2.*xx* version of DEBUG to assemble the necessary statements.

KEYDEFS shows the screen output as you use this technique to create the file MYKEYS.COM, which redefines keys <F1> through <F10>, <Alt>-1, and <Alt>-0. You can create a file to implement your own set of key definitions by entering the four assembly statements followed by as many lines of characters as are needed for your function key definitions. After the definitions are entered, add the line **DB '$'**, which adds a dollar sign, used by DOS to mark the end of text to be output.

When you have typed this line, press the <Enter> key twice to get the hyphen prompt. Use the Unassemble and Dump commands to verify that you have entered the assembly language statements and key definitions correctly. After the lines have been entered correctly, use the Name command to assign a file name ending with the .COM extension.

Use the command **R CX** to display the contents of register CX and enter the length of the program in response to the colon prompt. The program's length is the offset value that appears on the line below the '$' entry, minus 100 hexadecimal. In KEYDEFS the value is 01D1, so MYKEYS .COM is 00D1 bytes long. The W command writes the newly entered program on the disk with the name you selected earlier, stating the number of bytes being written.

The Quit command returns control to DOS. You can use the Quit command any time you have the hyphen prompt, but everything you have entered will be lost unless you first use the Write command to store it on disk. The Quit command is a good way to stop everything and start over if you have made mistakes. The DOS manual explains more about how to use DEBUG.

Michael J. Grabel
Windsor, Connecticut

Editor's note: This is perhaps the fastest way to implement new key definitions. You may want to create several such .COM files to define various keys as needed.

```
A>DEBUG <Enter>
-A 100 <Enter>
xxxx:0100 MOV  AH,9 <Enter>
xxxx:0102 MOV  DX,109 <Enter>
xxxx:0105 INT  21 <Enter>
xxxx:0107 INT  20 <Enter>
xxxx:0109 DB 1B'[0;59;"DIR "p' <Enter>
xxxx:0117 DB 1B'[0;60;"DIR /W"p' <Enter>
xxxx:0127 DB 1B'[0;61;"*."p' <Enter>
xxxx:0133 DB 1B'[0;62;".* ";13p' <Enter>
xxxx:0143 DB 1B'[0;63;"COPY "p' <Enter>
xxxx:0152 DB 1B'[0;64;"ERASE "p' <Enter>
xxxx:0162 DB 1B'[0;65;"EAZE ";13p' <Enter>
xxxx:0174 DB 1B'[0;66;"BASIC ";13p' <Enter>
xxxx:0187 DB 1B'[0;67;"MORE <"p' <Enter>
xxxx:0197 DB 1B'[0;68;"EDIT "p' <Enter>
xxxx:01A6 DB 1B'[0;120;"MYKEYS ";13p' <Enter>
xxxx:01BB DB 1B'[0;129;"NOKEYS ";13p' <Enter>
xxxx:01D0 DB '$' <Enter>
xxxx:01D1 <Enter>
-U 100 108 <Enter>
xxxx:0100 B409          MOV     AH,09
xxxx:0102 BA0901        MOV     DX,0109
xxxx:0105 CD21          INT     21
xxxx:0107 CD20          INT     20
-D 109 1D0 <Enter>
xxxx:0109  1B 5B 30 3B 35 39 3B                                  .[0;59;
xxxx:0110  22 44 49 52 20 22 70 1B-5B 30 3B 36 30 3B 22 44   "DIR "p.[0;60;"D
xxxx:0120  49 52 20 2F 57 22 70 1B-5B 30 3B 36 31 3B 22 2A   IR /W"p.[0;61;"*
xxxx:0130  2E 22 70 1B 5B 30 3B 36-32 3B 22 2E 2A 20 22 3B   ."p.[0;62;".* ";
xxxx:0140  31 33 70 1B 5B 30 3B 36-33 3B 22 43 4F 50 59 20   13p.[0;63;*"COPY
xxxx:0150  22 70 1B 5B 30 3B 36 34-3B 22 45 52 41 53 45 20   "p.[0;64;"ERASE
xxxx:0160  22 70 1B 5B 30 3B 36 35-3B 22 45 41 5A 45 20 22   "p.[0;65;"EAZE "
xxxx:0170  3B 31 33 70 1B 5B 30 3B-36 36 3B 22 42 41 53 49   ;13p.[0;66;"BASI
xxxx:0180  43 20 22 3B 31 33 70 1B-5B 30 3B 36 37 3B 22 40   C ";13p.[0;67;"M
xxxx:0190  4F 52 45 20 3C 22 70 1B-5B 30 3B 36 38 3B 22 45   ORE <"p.[0;68;"E
xxxx:01A0  44 49 54 20 22 70 1B 5B-30 3B 31 32 30 3B 22 4D   DIT "p.[0;120;"M
xxxx:01B0  59 4B 45 59 53 20 22 3B-31 33 70 1B 5B 30 3B 31   YKEYS ";13p.[0;1
xxxx:01C0  32 39 3B 22 4E 4F 4B 45-59 53 20 22 3B 31 33 70   29;"NOKEYS ";13p
xxxx:01D0  24                                                $
-N MYKEYS.COM <Enter>
-R BX <Enter>
BX 0000
:0 <Enter>
-R CX <Enter>
CX 0000
:D1 <Enter>
-W <Enter>
Writing 00D1 bytes
-Q <Enter>
A>
```

KEYDEFS

SAVE
WITH PACKAGE PRICES
THIS HOLIDAY SEASON!
No Sales Tax Collected
(N.J. Residents Add 6%)

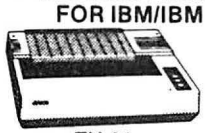
IBM STARTER SYSTEM
INCLUDES:
- IBM Personal Computer
- 1 Disk Drive
- 128K of RAM
- PC DOS
- Zenith Gr. Phosphur Monitor
- Innovation Color/ Parallel Printer Interfc.

SAVE OVER $500
LIST PRICE $2,526
CDA Price $1,995
Only $66.89 per month
Based on $195. down, 36 mo. payments at 20% APR.

TANDY 2000
REMARKABLE
MS-DOS Computer
That Beats IBM-PC!
- 3 TIMES FASTER!
- 4 TIMES MORE STORAGE!
- TWICE THE COLOR RESOLUTION!

— CALL FOR PRICING —
(Now stocking the Tandy 1200XT)

EPSON FX-80 PRINTER PKG.
— DELUXE PRINTER PACKAGE —
FOR IBM/IBM COMPATIBLES



FX-80
160 C P S Dot Matrix 128 different type styles Integral RAM allows creation of up to 256 characters or symbols 2K buffer able to down load user defined characters Uses pin feed roll or single sheet for some of the highest resolution graphics on the market

- Epson FX-80
- Shielded Cable
- DLX Printer Stand
- 2 Extra Printer Ribbons
- Case of Paper (1800 Sheets)
- Printer Dust Cover

LIST PRICE $729
CDA PRICE $499
SAVE OVER $200!

MORE GREAT PRICES!

AMDEK Color 600 RGB Monitor	$ 649	$ 496
Color 700 RGB Monitor	$ 749	$ 569
AST 6 Pack Plus (64K)	$ 395	$ 273
HAYES Smartmodem 1200B	$ 599	$ 419
HERCULES Color Card	$ 245	$ 169
Graphic Card	$ 499	$ 335
INNOVATION Color/Parallel Card	$ 279	$ 199
MICROSOFT System Card 256K	$ 625	$ 426
QUADRAM Exp. Quad Board (64K)	$ 395	$ 299
Quad 512 + (64K)	$ 325	$ 239
QuadBoard (64K)	$ 395	$ 296
QuadBoard II (64K)	$ 395	$ 296
QuadColor I	$ 275	$ 209
RANA 2.5 meg Super Floppy	$1,550	$1,239
10 meg Hard Drive	$1,495	$1,219

Buy Direct By Mail or Phone
ORDERS ONLY: 800-526-5313
Inquiries/Customer Srvc./& in NJ 201-728-8080
MAJOR CREDIT CARDS ACCEPTED!
Place Your Holiday Order Early!
CDA COMPUTER SALES
Our Ad No. 1022-D
15 Marshall Hill Rd., West Milford, N.J.
Circle 842 on reader service card

```
10 INPUT "Number of bits";BITS
20 INPUT "Seeds";A,B
30 MAX=2^BITS-1
40 A=2*A:B=2*B
50 IF A>MAX THEN A=A-MAX
60 IF B>MAX THEN B=B-MAX
70 C=A+B:IF C>MAX THEN C=C-(MAX+1)
80 C=2*C:IF C>MAX THEN C=C-MAX
90 PRINT C
100 A=B:B=C
110 GOTO 70
```

RANDOM.BAS

VCR as RF Modulator

The color graphics adapter on the IBM PC and on the Compaq has a small, round RCA connector for composite video monitors, but it cannot be connected to an ordinary television set without the aid of an RF modulator. If you own a video tape recorder, you can use it in place of an RF modulator. Connect an inexpensive dubbing cable with the computer's composite video output and the VCR "camera" input and flip the switch on the VCR from "tuner" to "camera."

Phil Howitt
Los Angeles, California

Editor's note: You can also use the VCR to record computer output. In my experiments the signals from the color graphics adapter were not strong enough for the recorder, and while the result was very clear, the recording played back in black and white.

Truly Random

I have developed a random number generating algorithm that avoids some of the drawbacks of other methods and appears to be somewhat faster. One of the major faults of random numbers is that they have a finite "string length" (the number of "random" numbers that are produced from a given seed value before the sequence begins to repeat). The technique presented here also has a fixed string length, but it is much larger than that of its predecessors.

Current algorithms use the "congruence" method to produce random numbers, a technique that is highly dependent upon the seed value. Certain seeds will cause congruence algorithms to generate short, nonuniform, or infinitely looped sequences. The technique shown in RANDOM.BAS does not possess this flaw to any great measure, and its string lengths are only slightly dependent on the initial seeds.

Dr. Wilson Talley and I developed the technique based on a concept first suggested by Dr. Nicholas Metropolis of Los Alamos. It involves shifting the bits of a number and adding the two

previous terms to form a new term. Bit shifting ensures that successive terms will have very little correlation with each other. The end of a string is reached when two consecutive numbers are produced that are identical to the first two produced. As expected, the length of the string increases as more bits are used, but the rate of growth is unprecedented. Presently no limit has been found for 16-bit strings after 30 hours of running on an IBM PC.

This random number generator has been tested for average, variance, frequency, runs up and down, cycle breaking, seed dependence, chi-square, D-square, and cycle length up to 12 bits. No preferred pairs or preference for parity or primes has been observed. Serial, gap, maximin, and minimax tests are planned, and interested parties are invited to contact me for those results.

Gary Andrew
Davis, California

Editor's note: Readers can write to Mr. Andrew at 311 E. 7th St. #9, Davis, CA 95616.

*Join the *.* global exchange. We'll pay $25 to $100 for each item published. Send your personal computer discoveries to* Star-Dot-Star, PC World, *555 De Haro St., San Francisco, CA 94107, or electronically to MCI Mail PCWORLD, CompuServe 74055,412, or The Source STE908.* ●

PC WORLD
Special New Subscriber Offer!
See page 64 for details

FINGERTIP CONTROL
of your
EPSON, OKIDATA, or IDS Printer

Adapta-Print© utility program provides:

- Instant popup menu that lets you control the features of your printer from the keyboard.
- Menu is always available at the press of a key and can be accessed while other software is running. Does not require you to exit to DOS to change the printer setup.
- Provides full control of forms layout (tab stops, page size, line spacing, margins), print modes (emphasized, enhanced, correspondence, proportional, underlined, double width, character size), and general printer control (redirect printer to LPT1, LPT2, COM1, COM2, and printer reset).
- Fully restores the display screen to its previous contents when you are finished with the menu. Instantly returns you to the program that you were running.
- Built in print spooler, adjustable size from 0 Kb to 640 Kb.
- Optional control code translator feature makes your printer fully graphics compatible with the IBM printer. Allows you to do graphics screen dumps, and use virtually all software that supports the IBM printer's graphics features.
- Versions also available for NEC, Toshiba, Mannsmann Talley, C. Itoh, Datasouth, and many other popular dot matrix printers.

Adapta-print© only $65.00

Direct Order: 615/966-1399
Operators are on duty until 9:00 P.M. EST

CSi
COMPUTATIONAL SYSTEMS INCORPORATED
ONE ENERGY CENTER, PELLISSIPPI PARKWAY, KNOXVILLE, TN 37922
(615) 966-1399

Wordstar® Wordprocessing and SuperCalc 3™ Integrated Spreadsheet now included Free with all Seequa computers.

SEEQUA SHOWS YOU HOW TO GET AN IBM PC FOR JUST $1595.

BUY A CHAMELEON BY SEEQUA.

The Chameleon by Seequa does everything an IBM PC does. For about $1000 less than an IBM.

The Chameleon lets you run popular IBM software like Lotus® 1-2-3™ and dBase II.® It has a full 83 key keyboard just like an IBM. A disk drive like the IBM. And a bright 80 × 25 character screen just like an IBM.

But it's not just the Chameleon's similarities to the IBM that should interest you. Its advantages should, too. The Chameleon also has an 8 bit microprocessor that lets you run any of the thousands of CP/M-80® programs available. It comes complete with two of the best programs around, Perfect Writer™ and Perfect Calc.™ It's portable. And you can plug it in and start computing the moment you unwrap it.

So if you've been interested in an IBM personal computer, now you know where you can get one for $1595. Wherever they sell Chameleons.

The Chameleon by

SEEQUA COMPUTER CORPORATION

8305 Telegraph Road
Odenton, MD 21113

Chameleon shown with optional second disk drive.

To learn more about Seequa or for the location of the Seequa dealer nearest you, call (800) 638-6066 or (301) 672-3600.

IBM is a registered trademark of International Business Machines Corporation.

Circle 248 on reader service card

FIGHT LUNG DISEASE WITH CHRISTMAS SEALS.

TAKE CARE OF YOUR LUNGS. THEY'RE ONLY HUMAN.

When you give to Christmas Seals, you're not only helping others, you're helping yourself. Because the American Lung Association works to keep everyone's lungs healthy. By fighting against smoking, air pollution, asthma, emphysema, lung cancer. Giving to Christmas Seals is one of the best ways there is to keep your lungs healthy. Have a happy, healthy holiday!

AMERICAN LUNG ASSOCIATION
The Christmas Seal People

WE DID IT.

Now your programs can get to every file they need.

Now you can put your data on any drive.

Up until now, whenever you wanted to use a program, your data files had to be in the same subdirectory as the program. This meant, for example, if you wanted to use a file with WordStar you had to make sure it was in the same directory as WordStar. Which meant you couldn't use subdirectories to organize your files in any sensible way. It also meant you had to do a lot of copying of files back and forth from subdirectory to subdirectory each time you wanted to use them.

What's more, if your programs expected to find a file on a diskette in a particular drive, you had to make sure it was on that drive. You couldn't rearrange files to suit your own situation.

And you couldn't always use a RAM disk the way you might want to, for temporary files, piping, or just to speed up processing with frequently used files.

But we did it. We solved all these problems. Because now there's EasyPath.™ EasyPath lets your programs find the files they need. Automatically. Anywhere. In any subdirectory, on any drive or RAM disk. This means you'll now be able to run any program from any directory. You no longer have to keep multiple copies of any file. You'll be able to use subdirectories to organize your programs and data files in any way that'll make it easy to keep track of them. You'll also be able to keep your programs and your data files on any drive. And you'll be able to use your RAM disk for pipes or any other types of files.

EasyPath comes pre-configured for every major program on the market. Installation is remarkably fast and easy. And, if you want to, you can provide specifications for your own programs and files.

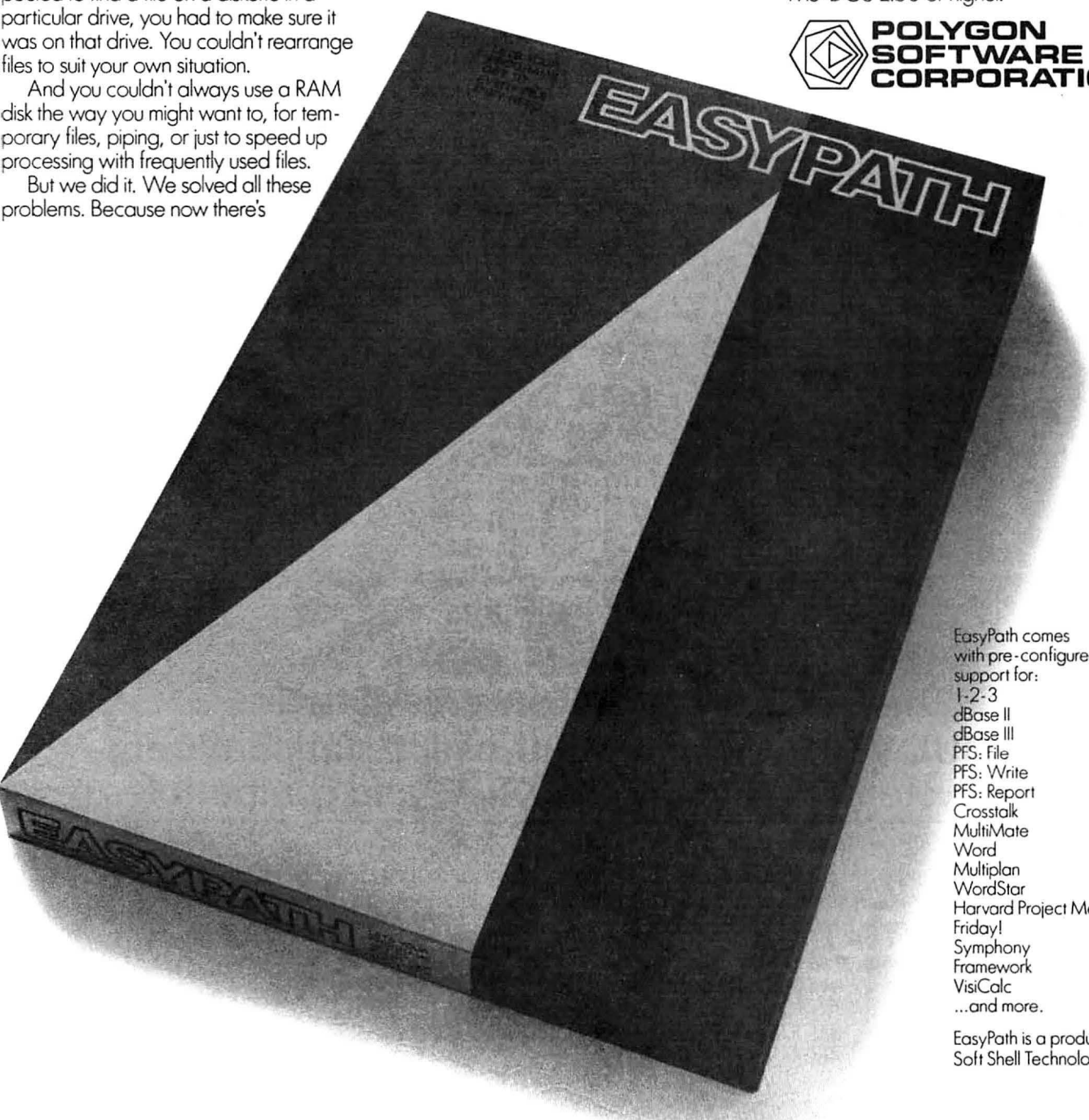
EasyPath comes with a comprehensive user's guide including complete installation and reference documentation. And it's only $100, plus $3.50 shipping and handling. (NY State residents, please add appropriate sales tax.)

EasyPath. You'll wonder how you ever did without it.

EasyPath will VISA MasterCard soon be in stores everywhere. Or to order now, call toll-free 1-800-331-1000. Visa and MasterCard accepted. For more information, write us at 363 Seventh Avenue, Dept. A, New York, NY 10001 or call us at 1-212-563-5487.

EasyPath requires PC-DOS or MS-DOS 2.00 or higher.

POLYGON SOFTWARE CORPORATION



EasyPath comes with pre-configured support for:
1-2-3
dBase II
dBase III
PFS: File
PFS: Write
PFS: Report
Crosstalk
MultiMate
Word
Multiplan
WordStar
Harvard Project Manager
Friday!
Symphony
Framework
VisiCalc
...and more.

EasyPath is a product of Soft Shell Technology.

Circle 848 on reader service card

Four vital software packages

From one source . . . RTCS gives your PC/MS-DOS based systems professional development capabilities with a family of operating software tools. Call RTCS today for detailed information. We'll show you how you can extend the capabilities of your PC for less money than you'd expect.

RTCS/UDI —
UNIVERSAL DEVELOPMENT INTERFACE
Run Intel Series III software on the IBM PC/XT and other MS-DOS computers.
MS-DOS is a trademark of Microsoft

PC/iRMX
Real-Time, Multiuser, Multi-tasking Operating System for IBM PC and others.
iRMX is a trademark of Intel Corporation

INTEL LANGUAGES
Pascal 86/88 Compiler
Fortran 86/88 Compiler
PLM 86/88 Compiler
C 86/88 Compiler
ASM 86/88 Macro Assembler

OTHER UTILITIES
Software Debugger
Hardware Debugger
Target System Development Link

INTEL UTILITIES
Link 86 Linker
Loc 86 Locater

Distributed in: Europe by MICROTECHNOLOGIE ELECTRONICS, Paris
Japan by SYSCON CORP., Tokyo; Israel by MLRN ELECTRONIC LTD., Zahia

See us at BOOTH H7674
COMDEX™/Fall '84
Nov. 14-18, LAS VEGAS HILTON HOTEL

RTCS REAL-TIME COMPUTER SCIENCE CORPORATION
SOFTWARE DEVELOPMENT TOOLS
ADVANCED OPERATING SYSTEMS

P.O. BOX 3000-886, CAMARILLO, CALIFORNIA 93011 • PHONE NO. (805) 987-9781 • TELEX 467897

Circle 163 on reader service card

A FORMULA IV SUCCESS

FORMULA IV is the only Multi-user Relational Database System for the IBM PC, XT, AT and compatibles.

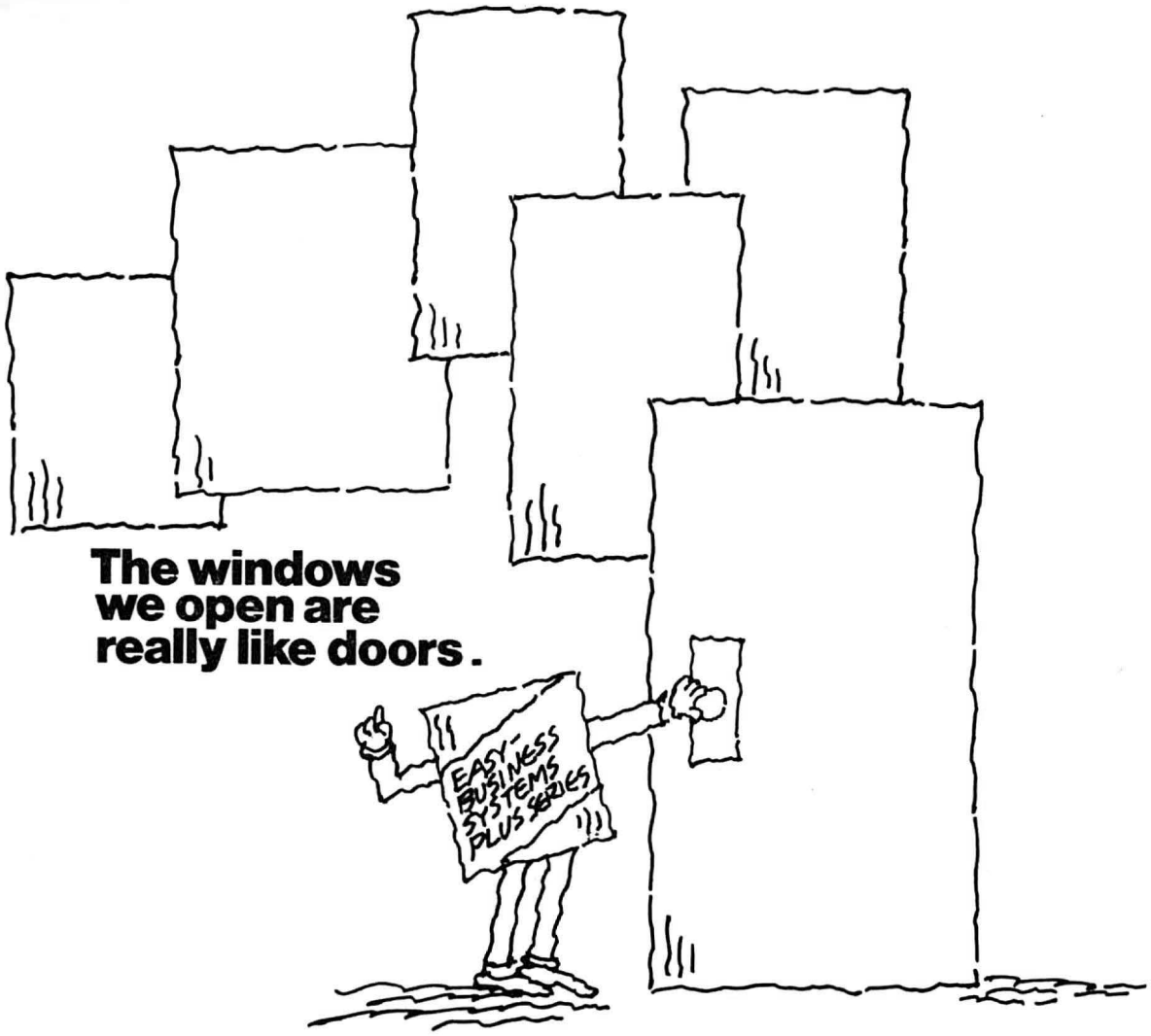
FORMULA IV allows you to create a multi-user environment by adding terminals to your IBM PC—at a fraction of the cost of networks and hardware modification. Advanced record locking capabilities enable users to run several FORMULA IV applications at once while ensuring data integrity. **For more information contact:**

DMA
WE SPEAK YOUR LANGUAGE®

DYNAMIC MICROPROCESSOR ASSOCIATES, INC.
545 FIFTH AVENUE, NY, NY 10017
212-687-7115

See us at
COMDEX™/Fall '84
November 14-18, 1984
Las Vegas Convention Center
Las Vegas, Nevada Booth No. 630

Circle 871 on reader service card



EasyBusiness Systems™ Plus Series

EasyBusiness Systems Plus Series has windows that work harder. Windows you can move more data into and out of easily. They open wide like doors.

EasyPlus™ opens the windows. It's the first window integrator that allows you to work with *all* EasyBusiness Systems accounting functions, plus spreadsheet, word processing and data management programs. You can work with as many Plus Series modules as you need to. All on one screen. All at one time.

EasyBusiness Systems Plus Series includes the following modules: General Ledger, and Financial Reporter, Accounts Receivable, Accounts Payable, Inventory Control and Analysis, Order Entry, and Payroll. EasyPlus allows single-screen integration with EasyWriter™ II System, EasyPlanner™ and EasyFiler.™

Unlike most products you may see, the Plus Series allows you to move words and numbers between accounting and productivity functions. This means you can transfer accounting data directly into letters and reports with a single macro keystroke. You run your whole business more effectively and productively.

Looking through windows can improve your view. Stepping through doors will improve your life. EasyBusiness Systems Plus Series. Doors.

SORCIM/IUS
MICRO SOFTWARE
A Division of Computer Associates International, Inc.

Special offer.
Free demo diskette & rebate.

☐ Please send me a Free Demo Diskette* so I can preview the features and effectiveness of EasyBusiness Systems Plus Series.

I understand I will also receive a $50 certificate with the Demo, good for a rebate from Sorcim/IUS on my purchase of any single Plus Series module listed in this ad.

Name_____

Address_____

City_____

State_____ Zip_____

Mail this coupon to: Sorcim/IUS
P.O. Box 32389, San Jose, Calif. 95152

This coupon expires March 31, 1985.
This offer is void where prohibited by law.
*Diskette is designed for use with IBM-PC® or fully compatible hardware systems. IBM-PC is a registered trademark of International Business Machines Corporation.

1 G

Easy Software working harder.

Sorcim/IUS Products: EasyBusiness Systems™ Plus Series Accounting Products, EasyPlus,™ EasyWriter I™ System, EasyWriter II™ System, SuperWriter® SuperCalc® 3 Rel. 2, and other SuperCalc Software, EasyFiler,™ EasyPlanner™ and EasySales Pro.™

Circle 823 on reader service card

THE RIGHT PRICE

DOT MATRIX PRINTERS

Dynax DM-40/Brother 2024L (160 cps) 1039.88
Epson RX/FX/LQ Series ..... New LOW PRICES

Okidata
Microline 92 (80 col/PC, 160 cps) ..... CALL
Microline 93 (136 col/PC, 160 cps) ..... CALL
Microline 84 (136 col/PC, 200 cps) ..... CALL

NEC
Pinwriter w/tractor (80 col/PC, 180 cps) 699.88
Pinwriter w/tractor (136 col/PC, 180 cps) 959.88

Star Micronics
Delta 10 (80 col/PC, 160 cps) 379.88
Delta 15 (136 col/PC, 160 cps) 529.88
Radix 10 (80 col/PC, 200 cps) 579.88
Radix 15 (136 col/PC, 200 cps) 679.88

LETTER-QUALITY PRINTERS

NEC
2030 (136 col, 20 cps) 739.88
2050 (136 col/PC, 18 cps) 759.88
3530 (136 col, 33 cps) 1379.88
3550 (136 col/PC, 33 cps) 1499.88
7730 (136 col, 55 cps) 1779.88
NEW! 8850 (136 col/PC, 55 cps) 2139.88

Silver Reed
EXP-770 (136 col, 35 cps) 979.88
EXP-550 (136 col, 17 cps) 469.88
EXP-500 (110 col, 12 cps) 389.88
EXP-400 (110 col, 10 cps) 329.88

Star Powertype (110 col, 12 cps) 359.88

MODEMS

Hayes
Smartmodem 1200B (Internal/PC 1200bd) ... $ 459.88
Smartmodem 1200 (Stand-alone, 1200bd) ..... CALL
Smartmodem 300 (Stand-alone, 300bd) ..... CALL

Novation
NEW! SmartCat+ (Internal/PC, 1200bd) ..... $ 349.88
Novation SmartCat+ (Stand-alone, 1200bd) 349.88

Volksmodem (Stand-alone/PC, 300bd) 69.88

MONITORS

Amdek
300G (12" composite, green) ..... $ 144.88
300A (12" composite, amber) 159.88
310A (12" TTL monochrome, amber) 159.88

NEC
JB-1205M (12" composite, amber) 159.88
JB-1201M (12" composite, green) 159.88

Princeton Graphics
HX-12 (12" RGB, 16 colors) 509.88
Max-12 (12" TTL monochrome, amber) 199.88

Roland
DG-121 (12" composite, green/amber) 144.88
DG-122 (12" TTL monochrome, green/amber) 169.88

IBM-PC PERIPHERALS

64K Memory Kits (9/pkg) ..... $ 69.88

Alloy
Tape Backup System ..... CALL
41MB Hard Disk w/Tape Backup ..... CALL
16MB Hard Disk w/Tape Backup ..... CALL

Hercules
Hercules Graphics Card (mono) ..... CALL
Hercules Graphics Card (color) ..... CALL

Keytronics 5151 keyboard ..... CALL
Microsoft Mouse (parallel) 149.88
Mouse Systems PC-Mouse 149.88

Quadram
384K Quadboards (w/64K) 299.88
384K Quadboards (w/384K) 529.88
Quad 512 + Board (w/64K) 239.88
Quad 512 + Board (w/512K) 609.88
Quadram QuadColor-1 ..... 219.88
QuadVue (TTL board) 259.88
Quadram QuadLink 509.88

STB
Graphics Plus II 359.88
Super RIO (w/64K) 289.88
Super RIO Plus (w/64K) 309.88

Tandon TM 100-2 DSDD 189.88
Titan Cygnus Boards ..... CALL

IBM-PC ACCESSORIES

Curtis
Monitor Stand 64.88
System Stand 24.88
Keyboard Extender Cable 39.88
Monitor Extender Cable 39.88

Networks Wire Tree
W/surge protection, RFI, 4 outlets 54.88
W/surge, RFI, 6 outlets, modem filter 74.88

Flip-N-File 50 ..... 29.88
Printer Stand (80 col) 39.88
Printer Stand (132 col) 49.88
Printer/Modem Cables ..... CALL

EXPERT ADVICE

Plus FREE UPS Ground Shipping For Any Order Over $50

WE PIONEERED a "no hidden charges" policy that became the standard for direct mail marketers everywhere: no credit card surchage, no advanced charges to credit cards and FREE shipping, via UPS ground service. And we accept all major credit cards, not just easy ones like MasterCard and Visa.

Plus you'll get expert advice from our sales staff. They're not on commission, so they don't "sell to live"—they do it the other way. Our staff can tell you what to buy, how it works, what to watch out for, and how much it will cost—all without the hard sell approach.

We know there's more to the direct-mail business than low prices. After you look at all the other mail-order ads, talk to the mail-order experts. We can give you expert advice at the right price—we're ***THE BOTTOM LINE***, offering "High Technology at Affordable Prices" since 1981.

Order Desk: ***(800) 343-0726***
Technical Information/Sales: ***(603) 881-9855***

ALLOY • AMDEK • AMT MICRO • ANCHOR AUTOMATION • ALS • C ITOH • COLUMBIA DATA • CURTIS MFG • DIABLO • DYNAX • EASIFEED • EPSON
HAYES MICROCOMPUTER PRODUCTS • HERCULES COMPUTER TECHNOLOGY • INFORUNNER • INTERACTIVE STRUCTURES • JUKI • KENSINGTON MICROWARE
KEYTRONICS • MANNESMAN TALLY • MEMOTECH • MICROSOFT • MILFORD NULL MODEM • MOUSE SYSTEMS • NEC • NOVATION • OKIDATA • ORANGE MICRO
PARADISE SYSTEMS • PERFECT DATA • PRINCETON GRAPHICS • QUADRAM • QUME • QCS • RANA SYSTEMS • ROLAND DG • SATURN/TITAN • STAR MICRONICS
STB SYSTEMS • TANDON • TECMAR • TOSHIBA • US ROBOTICS • VIDEX

AMERICAN EXPRESS

HIGH TECHNOLOGY AT AFFORDABLE PRICES

THE BOTTOM LINE

MasterCard VISA

MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

Circle 208 on reader service card

Experience The Worlds of UNIX* *at*

UniForum™

The International Conference of UNIX Users

January 21-25, 1985 • INFOMART • Dallas, Texas

UniForum '85 is your passport to the fascinating "Worlds of UNIX." You'll examine the growing impact of UNIX in Office Systems, Personal Computers, Technical (Engineering/Programming), and Market Trends at UniForum '85, the largest UNIX event ever held.

More than 200 major vendors, in 850 booths, will display and demonstrate all that's new in UNIX products and applications.

An extensive conference and tutorial program will expand your UNIX database.

This program, organized by /usr/group, will include 15 all-day tutorials on user-specific aspects of UNIX...48 in-depth and informative conference sessions... four nationally-known plenary speakers.

In addition, a number of introductory courses in UNIX will be presented throughout the event.

UniForum '85 will be your total UNIX experience. Whether you're just getting started...or are a seasoned UNIX veteran ...UniForum '85 is *the* UNIX event of the year.

For Complete Information, Call: 1-800-323-5155
(In Illinois, 1-312-299-3131).
Or Mail This Coupon Today!

YES! I need to know more about UniForum '85. Please send complete details.

Name

Title

Company

Address

City

State Zip

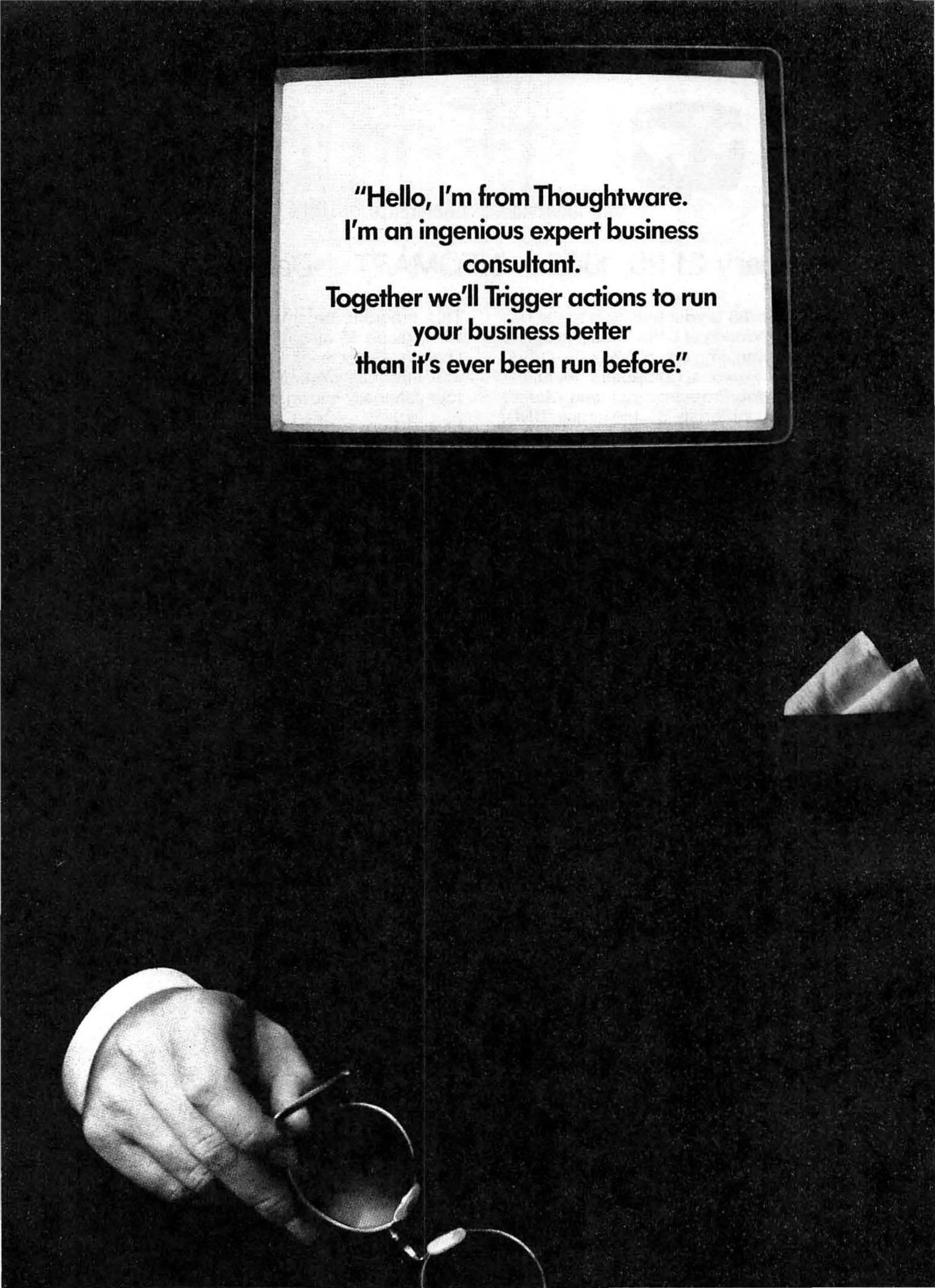
Telephone (Area Code)

Electronic Mail Address (one only): _____

Mail To: UniForum
Suite 205, 2400 E. Devon Ave.
Des Plaines, IL 60018 USA

Sponsored by

*UNIX is a registered trademark of AT&T Bell Laboratories.


"Hello, I'm from Thoughtware.
I'm an ingenious expert business
consultant.
Together we'll Trigger actions to run
your business better
than it's ever been run before."

The Age Of Trigger™ Has Begun.

Trigger Is A New Generation Of Personal Computer Software From Thoughtware.

It Makes You Run Your Business With Greater Insight, Power And Control Than Ever Before.

It Triggers Actions To Make Smarter And More Profitable Business Decisions.

A manager has three overwhelming problems. A lack of time. An information overload. A difficulty in remaining focused on key business objectives and controlling them. Trigger solves these problems in a brilliant and innovative way.

It will transform the way you run your business. Trigger monitors key performance areas. And performance can be measured in volume, dollars, behavior; whatever criteria are important to your business.

And whenever an element being monitored falls outside of its acceptable performance range, Trigger issues an action memo, with probable causes and actions to be taken, requiring the individual responsible to respond. And it makes sure those actions are taken.

The More You Use It, The Smarter You Get.

Trigger becomes an expert system, learning from experience and helping you learn as well. The more you use it the smarter you both get. The more you use it, the more easily and efficiently you can analyze problems, make decisions and create solutions.

It works with your people, monitoring and analyzing their actions, day to day, week to week, month to month. In your absence, Trigger is still present, acting as your surrogate, making sure what needs to be done, gets done.

The more you use it, the more smoothly and beautifully your business will run.

Why It's Easy To Consult With Trigger.

Getting to know Trigger is exciting. Everything is provided to quickly and easily integrate Trigger into your regular business operations. The computer, itself, assists you in every phase of using the program. It explains the business approach on which it is based, and provides all the consultative help that you will need to set up Trigger, and involve and motivate your people.

The Thoughtware Behind Trigger.

Thoughtware pioneered personal computer-based management training. As a member of the Alexander Proudfoot world-wide family of companies, Thoughtware drew on Proudfoot's nearly forty years of management consulting experience in thousands of companies, to develop Trigger.

To meet Trigger, your astounding new Expert Business Consultant, or some of Thoughtware's other Expert Consultants listed below, visit your local software or computer store, or call toll-free 1-800-THT-WARE for the dealer nearest you.

Assessing Personal Management Skills–Evaluating Organizational Effectiveness–Understanding Personal Interaction Styles–Leading Effectively–Motivating To Achieve Results–Defining Goals and Objectives–Improving Employee Performance–Performance Appraisal–Managing Time Effectively–Conducting Successful Meetings–Managing By Exception.

Trigger runs on: IBM® PC, XT, AT and operationally compatible PC's.
Trigger is a Trademark of The Alexander Proudfoot Company.
Thoughtware is a Registered Trademark of Thoughtware, Inc.

Thoughtware®

Expert Consultants In Your Computer.

Circle 720 on reader service card

THE PANASONIC® SR. PARTNER™ NO PERIPHERALS NEEDED

Because they're already built-in. The 80/132-column printer. The 9-inch, high-resolution display. There's even a built-in 360K disk drive. Which all make the Sr. Partner a complete computer as is.

The Sr. Partner is IBM hardware and software compatible so you can run popular business programs immediately. The software bundle currently offered with the Sr. Partner is WordStar. VisiCalc, pfs:Graph, File, Report, MS-DOS 2.11 and GW BASIC.*

And with its 256K internal memory expandable to 512K, the Sr. Partner can run the new integrated software.

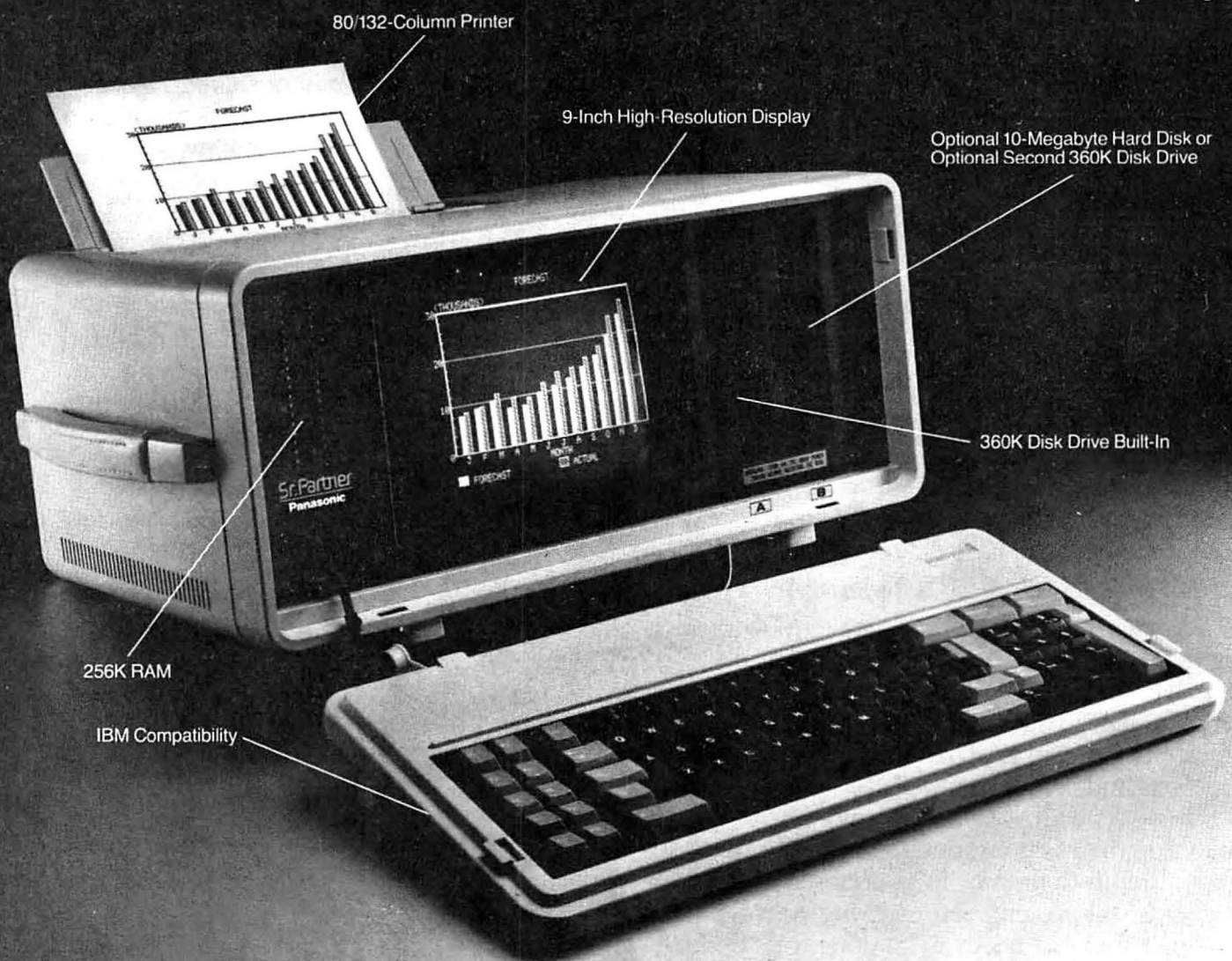
Built-ins also include expansion slots and parallel and serial I/O ports. There's even a built-in RGB monitor port so you can take advantage of the Sr. Partner's color and graphics capability.

If you want 10 megabytes of storage, choose the new hard disk Sr. Partner.

Both the Sr. Partner and the hard disk Sr. Partner come with an exceptional Panasonic warranty.**

For the dealers nearest you, call: 201-392-4261. The Panasonic Sr. Partner. No peripherals needed. It makes the competition look like Jr. Executives.

Panasonic
Industrial Company



*Software bundle offer subject to change or withdrawal at any time without notice. **One-year limited warranty, 6 months on thermal printer head. Carry-in or mail-in service.
Sr. Partner is a trademark of Matsushita Electric Industrial Company Ltd; WordStar is the trademark of MicroPro International Corporation; VisiCalc is the registered trademark of VisiCorp; pfs: Graph, File, Report are the registered trademarks of Software Publishing Corporation; GW BASIC, MS-DOS are the trademarks of Microsoft Corporation.

Circle 694 on reader service card

Just Announced

An array of new PC products

Featured this month: two new compatibles, 2MB of memory on a single board, speech recognition, a portfolio management template, and business graphics and free-form painting programs

Edited by Seth Novogrodsky

In the fast-paced personal computer marketplace, *Just Announced* keeps you informed of the latest developments in IBM PC and compatible technology. Information for this department is provided by manufacturers; these write-ups are not reviews. *Just Announced* does not evaluate or corroborate manufacturers' claims. Many of these descriptions will be followed up by reviews in future issues.

Hardware

Boards

2megaboard
A memory expansion board that provides from 64K to 2MB (2048K) of RAM with full parity checking, 2megaboard accommodates 64K or 256K RAM chips or a combination of the two. Up to eight boards can be installed in an expansion unit for 16MB of memory. 2megaboard comes with MegaCache and MegaSpool software. MegaCache speeds PC performance by creating a "cache" in RAM to store the most recently read data. Unlike a RAM disk, MegaCache automatically updates the disk with any changes to the cache. MegaSpool directs data to the cache and then to a selected output device, such as a printer. An optional multifunction I/O module will be available for the board. List price: without RAM $295, 64K $395.
Datatron, Inc.
2942 Dow Ave.
Tustin, CA 92680
714/544-9970

DASH-16
A data acquisition board for laboratory and industrial applications, DASH-16 transfers data from a measuring device to a PC at speeds of up to 40,000 samples per second, using direct memory access. The board is switch-selectable for 16 single-ended channels or 8 differential analog input channels, and an instrumentation amplifier is provided. DASH-16 also includes two 12-bit multiplying digital/analog converters and utility software for operating all board functions. List price: $895.
MetraByte Corp.
254 Tosca Dr.
Stoughton, MA 02072
617/344-1990

VocaLink Speech Recognition Board (SRB)
The VocaLink SRB allows PC users to operate off-the-shelf software with up to 240 spoken commands. The SRB has two operating modes. Keystroke Simulation, which works with standard PC software, substitutes user-defined spoken commands for keyboard entries. PC mode uses the custom software provided to take advantage of the full range of VocaLink capabilities. The board contains an 80186 microprocessor, Interstate's ASA-16 audio spectrum analysis chip, 128K of RAM, and 32K of EPROM. VocaLink works with the manufacturer's voice synthesizer (PC mode only), standard headset microphone, headset microphone with earphone, and desktop microphone. List price: $1650.
Interstate Voice Products
1849 W. Sequoia Ave.
Orange, CA 92668
714/937-9010

Vutek-CPS

A multifunction display board for the PC, Vutek-CPS features color graphics, a parallel port, and a serial port. The board is compatible with *1-2-3* and Microsoft's *Word* and *Flight Simulator.* Vutek-CPS provides composite video output, direct RGB output, and output for an RF modulator used with a television set. The parallel port can be configured as LPT1, LPT2, or LPT3, and the serial port can be configured as COM1 or COM2. List price: $449.95.

Vutek Systems, Inc.
Marketing Dept.
P.O. Box 23032
San Diego, CA 92123
619/789-8360

Computers

APC (Advanced Personal Computer) III

Priced at less than $2000, the APC III is advertised as having faster processing and higher-resolution graphics than the IBM PC, but it lacks the ability to run programs that make direct calls to the hardware. The APC is promoted as a UNIX development tool that works with the 8086 chip, a speedier chip than the PC's 8088. Although the APC can operate nearly 100 PC-DOS programs, most PC software requires modification to run on this computer. The basic machine includes 128K RAM (upgradable to 640K), MS-DOS 2.11, one 5¼-inch floppy disk drive, an NEC 7220 graphics processor and dedicated graphics memory, a detachable keyboard with 12 function keys and separate cursor keys, and a 12-inch monochrome monitor. A 10MB hard disk is required to run UNIX System III. A color monitor, a second floppy disk drive, a 20MB hard disk, and a memory management board for UNIX applications are optional. List price: $1995, with 10MB hard disk $3995.

NEC Information Systems
1414 Massachusetts Ave.
Boxborough, MA 01719
617/264-8000

Otrona 2001

The 19-pound Otrona 2001 is billed as a "convertible" personal computer, rather than a "luggable" or a "desktop." By replacing

Otrona 2001, Otrona Advanced Systems

the unit's 80-column, 7-inch flat screen with an optional 12-inch monochrome or a 13-inch RGB display, you can switch the 2001 from mobile to stationary mode. When configured as a portable, the 2001 displays amber characters that are crisp but roughly half the size of the PC's. The manufacturer promises compatibility in six major areas: operating system, media, ROM, architecture, display, and keyboard.

The 2001 comes with an 8088 microprocessor, an 8087 socket, 128K RAM expandable to 640K, a single 5¼-inch floppy disk drive, a 7-inch monitor, a detachable keyboard that departs slightly from the PC's, one serial port, and two parallel ports. Options include MS-DOS 2.00, GW BASIC, a second floppy disk drive, an internal 10MB hard disk, a Z80B coprocessor and CP/M, two additional serial ports, an expansion chassis with three slots, an internal 1200/300-bps modem, and a battery pack. The 2001 accepts either AC or DC power. List price: $2495.

Otrona Advanced Systems Corp.
4725 Walnut St.
Boulder, CO 80301
800/525-7550, 303/444-8100

Monitors

DT-H103

A high-resolution, high-contrast, 16-color RGB monitor, the 10-inch DT-H103 features 640 horizontal by 480 vertical pixels and displays up to 25 lines of 80 characters each. A swivel stand is included. List price: $753.

Panasonic Industrial Co.
1 Panasonic Way
Secaucus, NJ 07094
201/348-7183, 201/392-4322

DT-H103 Color Monitor, Panasonic

Printers

Amdek 5055
A 55-character-per-second, letter quality daisy wheel printer with a 2K buffer, the Amdek 5055 prints

Amdek 5055 Printer, Amdek

in both directions with adjustable character spacing of 10, 12, or 15 characters per inch. The printer uses a double daisy wheel that accommodates up to 125 characters, handles paper up to 16 inches wide, uses a cassette-type ribbon, and comes with both serial and parallel ports. List price: $1995.
Amdek Corp.
2201 Lively Blvd.
Elk Grove Village, IL 60007
312/595-6890

for peace of mind
...instead of pieces

Why ship and worry!
Ship it complete
Ship it safely
Ship it in a PCase.

Military "Spec" quality shipping cases for computer systems on the move.

- All Aluminum construction
- Splinter proof-fungus proof
- Weather resistant-puncture resistant
- Durable Epoxy/Acrylic finish
- Full interior cushioning
- Meets requirements of Air Transport Assoc. test #300
- Welded-on, dual carry handles
- Lockable latches
- Exterior shipping document carrier
- Rolling caster base option available

PCASE™, inc.
60 Orville Drive
Bohemia, N.Y. 11716
800 231-CASE — 516 567-5800

Circle 312 on reader service card

IF POWER FAILS, DATASAVER® TAKES OVER!

PROTECTION – saves data during power failures.
– saves hardware from overvoltage transients.
PORTABILITY – allows mobile or extended holdup time using auxiliary 12 volt battery.
FEATURES – internal battery provides 5 min. + operating time – AC line conditioning
– audible and visual alarms, interrupt signal – compact, desktop styling
– no installation required.

200 WATT—$495 / 90 WATT—$350
IBM PC/XT PCjr.

Instant power order line
805-541-4161

CUESTA SYSTEMS, INC.
3440 Roberto Court, San Luis Obispo, California 93401

INSTANT AC POWER

Circle 50 on reader service card

ARMAGEDDON™

DATELINE: 1988

THE WORLD HAS BEEN DIVIDED BY 2-6 MILITARY POWERS . . . YOU MUST CHALLENGE 1-5 OTHER PLAYERS FOR CONTROL OF THE WORLD WITHOUT CAUSING ARMAGEDDON {NUCLEAR HOLOCUAST}™

DEMANDS:
• Strategic Decisions
• Politics • Cunning

Requires IBM PC or PCjr.
128K RAM, One Disk Drive,
Color Graphics Adaptor

Dealer Inquiries Invited

VISA, MASTERCARD ONLY
CALL 1-800-521-7702

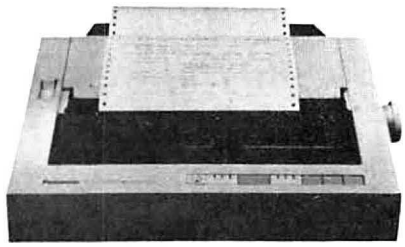
In Michigan 1-313-565-8954
or send money order of
$29.95 plus $3.00 postage
and handling to:

SOCIAL SOFTWARE, INC.
P.O. Box 7207, Dearborn, MI 48121
MICH. RESIDENTS ADD 4% SALES TAX

WARNING: THIS GAME MAY BE HAZARDOUS TO FRIENDSHIPS

Circle 870 on reader service card

KX-P 1092
A bidirectional, logic-seeking dot matrix printer, KX-P 1092 prints up to 180 characters per second in



Model KX-P 1092 Printer, Panasonic

both pica and elite, with modes for graphics, draft, or near letter quality output. The printer has both tractor and friction feeds and accommodates paper from 4 to 10 inches wide. A parallel port is standard; a serial port is optional. List price: $599.
Panasonic Industrial Co.
1 Panasonic Way
Secaucus, NJ 07094
201/348-7183, 201/392-4322

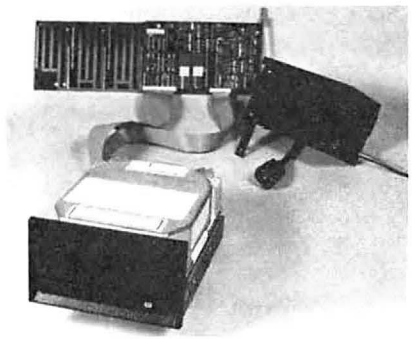
Storage Devices

Super XT
The Super XT is a cartridge disk subsystem with two 5MB 5¼-inch drives that provide unlimited off-line storage. The product includes

Super XT, Datrex

an adapter board, a power supply, a cable, and a device driver for DOS 2.00 or 2.10. List price: $1995.
Datrex, Inc.
3536 W. Osborn Rd.
Phoenix, AZ 85019
602/272-9491

Apollo 30MB Hard Disk Drive
An internally mounted hard disk drive system with 30MB of storage, the Apollo Drive requires no special software drivers and comes with the manufacturer's SandStar Hard Disk Controller Card. Features include read/write heads that protect information automatically when the power is turned off; complete shock-mounting; low-



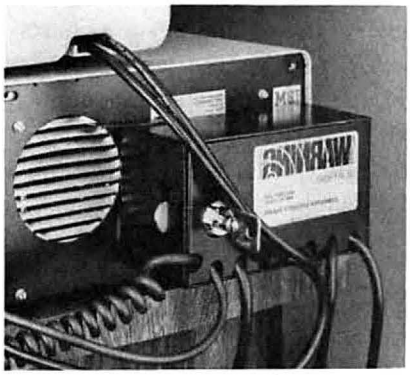
Apollo Hard Disk, Maynard Electronics

noise operation; and a power supply that clips onto the back of the PC. List price: with multifunction controller board $2995, with floppy and hard disk controller board $3195, with RAM controller board $3195.
Maynard Electronics
400 E. Semoran Blvd. #207
Casselberry, FL 32707
305/331-6402

DataSystem
DataSystem is a combination hard disk and tape backup system for the PC and the XT, available in 10MB, 21MB, 32MB, and 40MB capacities, with a built-in 24MB tape backup. Features include compressed or full-volume backup, file-by-file or full-volume restore, and automatic flaw mapping for media interchangeability. Password protection is available with Davong's *Multi-OS* software. List price: $3295 to $4995.
Davong Systems, Inc.
217 Humboldt Ct.
Sunnyvale, CA 94086
408/734-4900

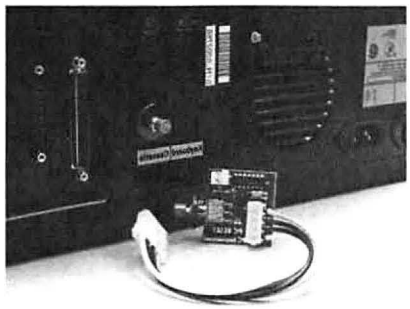
Miscellaneous

Computer Security Alarm
Designed to prevent the theft of a PC or an XT, this alarm attaches to the back of the computer. When triggered, its sensitive motion-detection circuit sets off a piercing dual-tone siren. The alarm also protects the monitor, the keyboard, the printer, and an external hard disk by locking their cables into the motion-detection system. The unit comes with metallic warning labels and two seven-pin tumbler keys for relocating the device. List price: $99.
MicroComputer Accessories, Inc.
5721 Buckingham Pkwy.
Culver City, CA 90230
213/641-1800



Computer Security Alarm, MicroComputer Accessories

PC Reset
A logic board that eliminates the need to use the power switch as a reset button when the keyboard is locked out, PC Reset also can save time by bypassing the RAM check when the PC is turned on. The board does not require a system slot; it mounts through the rear panel of the PC and plugs into existing cables. An optional remote control unit with a push-button switch can be placed near the keyboard. List price: PC version $44.95, PC XT version $49.95, remote control unit $29.95.
PC Innovations, Inc.
P.O. Box 4374
Cherry Hill, NJ 08034
609/784-1133



PC Reset, PC Innovations

DANGER: LOOSE PICO NUTS

It's catching. You, too, will go nuts over briefcase-size computers.

These lap-sized "picocomputers" are the indispensible new tool you'll need to get ahead.

But which pico should you buy?

Read *PICO—The Briefcase Computer Report*, and you'll learn which pico is best for you: your word processing, your spread sheets, your data bases. The best pico for your successful business management.

You need a picocomputer right now. Read *PICO*, and you'll learn which pico is your best investment.

PICO
The Briefcase Computer Report

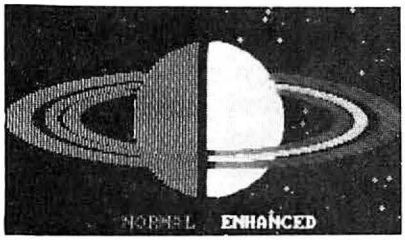
To subscribe:
Call 1-800-227-1053
Or mail in this completed form to:
PICO
150 South Main St.
Woodridge NJ 07075

☐Enter my subscription to *PICO—The Briefcase Computer Report*, 12 monthly issues for $19.97.
☐Send me a *PICO* Product Evaluation Kit so I can help evaluate pico products.
☐Check enclosed ☐Bill me
☐MC ☐VISA ☐AE 74D131

Exp. date_____
Card no._____
Name_____
Address_____
City_____
State_____ ZIP_____

Circle 797 on reader service card

Model 100-2124-00 Video Enhancer
An external device that connects a PC or compatible to any standard high-resolution monochrome monitor (except the IBM Monochrome Display), the Video Enhancer eliminates grainy texture and highlights text for programs designed to display color graphics. It converts the RGB color signal to 16 shades of gray, amber, or green,



Model 100-2124-00 Video Enhancer, Power-R

depending on the color of the monitor. The device also amplifies the video signal for increased maximum brightness or for parallel operation of up to six monitors. The Video Enhancer works with the IBM Color/Graphics Adapter, the Amdek MAI, the Plantronics ColorPlus, the Tecmar Graphics Master, and other RGB video boards. List price: $79.95.
Power-R Inc.
4016 Interlake N
Seattle, WA 98103
206/547-8000

System Software

Utilities

Lemma Shell
A DOS command processor that lets you reuse and edit commands without retyping them, *Lemma Shell* also provides features from other command processors, particularly the C shell for UNIX. These include a command history for reusing any of the last 24 commands, a directory history for moving between directories without retyping path names, command line editing, global file-name character expansion, command completion from an initial string, and function-key redefinition. *Lemma Shell* has enhanced some DOS commands and added others, including commands for time and date, idling, and counting characters, words, and lines in a file. List price: $55. Requirements: 192K, one disk drive.
Lemma Systems, Inc.
1508 Calle del Ranchero NE
Albuquerque, NM 87106
505/268-7220

Diskette Filing System
Designed to keep track of files on multiple disks, the *Diskette Filing System (DFS)* lets the user inventory a disk by inserting it into a drive and pressing a key. Files listed in the inventory can be searched by file name, file name extension, disk label, or global file names. The program supplies the disk label, file name, and date of file creation. *DFS* also prints labels for disks or disk jackets, listing files in alphabetical order. List price: $20. Requirements: 128K, two disk drives.
Zeit-Geist Systems
414 S. Elm St.
Saginaw, MI 48602
517/791-3036

Application Software

Communications

PC102
A terminal-emulation program with file transfer capabilities, *PC102* provides full keyboard and screen emulation of DEC VT-102, VT-101, VT-100, and VT-52 terminals. Each VT terminal key equivalent can be generated with a single keystroke, and key-top charts are included in the package. *PC102* also offers printer support and a status line. List price: $139. Requirements: 64K (96K for DOS 2.00 and 2.10), one disk drive.
General Micro Systems
7525 Mitchell Rd. #101
Minneapolis, MN 55344
612/937-9194

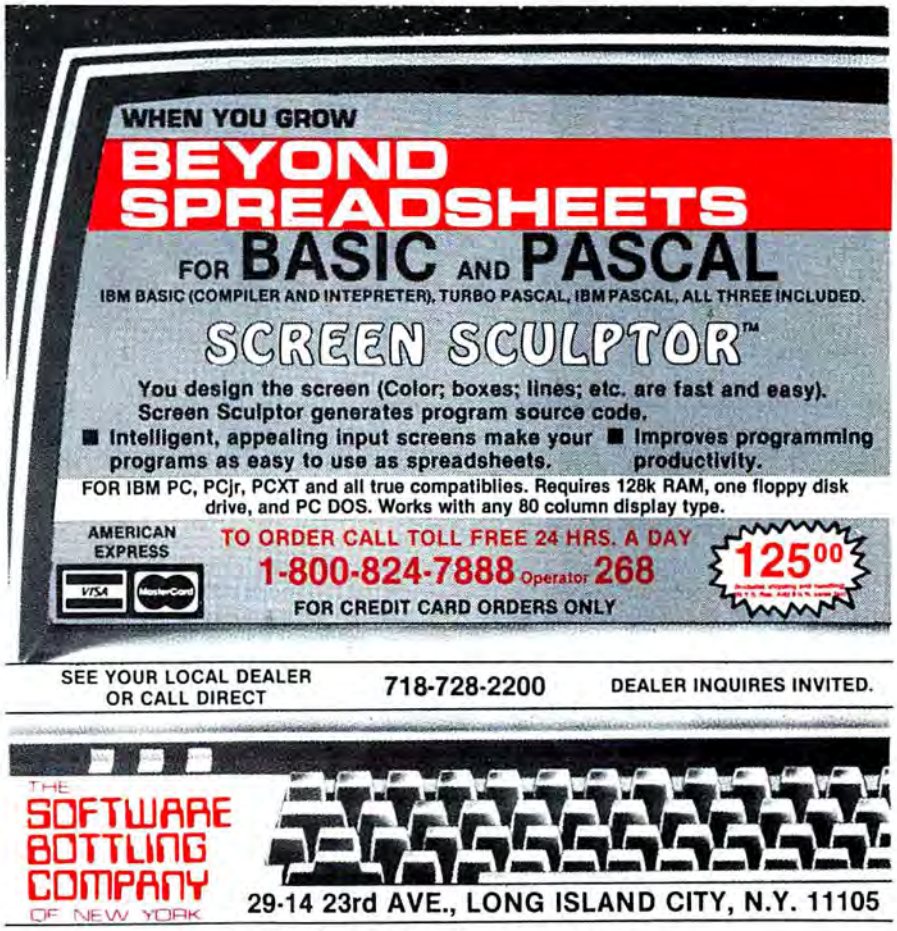
Conexus

Conexus is an integrated electronic mail, computer teleconferencing, and bulletin board system. It allows users with manager access to institute new bulletin boards that can search for items by keyword. The package includes a member directory, outline explanations, and menus for both new and experienced users. List price: $624. Requirements: 256K, hard disk, Hayes-compatible modem.
New Era Technologies, Inc.
2025 Eye Street NW #924
Washington, DC 20006
800/368-5787, 202/887-5440

Educational

Gradebook

A grade analysis and recording program for teachers, *Gradebook* handles an unlimited number of homework sets and minor tests and up to three major tests for 75 students per class in any number of classes. Final course grades are based on grade weighting factors assigned to homework, minor tests, and major tests. *Gradebook* provides individual performance summaries and printouts of class grades and student rank lists. Student rolls are alphabetized and accommodate adds and drops. List price: $49.50. Requirements: 64K, one disk drive.
Wren Software Inc.
P.O. Box 1138
Castle Rock, CO 80104



Circle 862 on reader service card

Circle 493 on reader service card

RETURNABLE SOFTWARE FOR THE IBM-PC®

(AND AT 20% TO 50% OFF MANUFACTURERS' LIST)

Eliminate the risk of buying software that doesn't meet your needs.

With Computer Inventory Control, you 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 20% 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 15% of the manufacturer's list price.

	LIST	DISCOUNT PRICE	RESTOCK FEE
WORD PROCESSING			
MicroSoft WORD	$375	**$239**	$ 56
MicroSoft WORD w/mouse	$475	**$299**	$ 71
Word Plus speller for MicroSoft	$150	**$109**	$ 23
MultiMate	$495	**$269**	$ 74
Volkswriter Deluxe	$285	**$179**	$ 43
* Word Perfect	$495	**$259**	$ 74
WordStar	$495	**$225**	$ 74
* WordStar Propak	$695	**$329**	$104
DATABASE			
Knowledgeman	$500	**$299**	$ 75
Kgraph	$225	**$149**	$ 34
Kpaint	$100	**$ 69**	$ 15
R:BASE 4000	$495	**$279**	$ 74
R:BASE Clout	$195	**$129**	$ 29
R:BASE Extended Report Writer	$150	**$ 99**	$ 23
dBASE II	$495	**$299**	$ 74
* dGRAPH	$295	**$149**	$ 44
* Quickcode	$295	**$149**	$ 44
dBASE III	$700	**$389**	$105
dBASE III Upgrade	$200	**$149**	
Quickcode III	$295	**$159**	$ 44
PROJECT MANAGEMENT			
Harvard Proj. Mgr.	$395	**$229**	$ 59
MicroSoft Project	$250	**$179**	$ 38
UTILITIES			
Crosstalk XVI	$195	**$109**	$ 29
Norton Utilities	$ 80	**$ 49**	$ 12
PROKEY 3.0 (NEW)	$130	**$ 85**	$ 19
Inside IBM-PC (Norton)	$ 80	**$ 65**	$ 12
INTEGRATED/SPREADSHEETS			
FRAMEWORK	$700	**$399**	$105
Lotus 1-2-3	$495	**$309**	$ 74
Open Access	$595	**$299**	$ 89
Symphony	$700	**$469**	$105
* VisiCalc	$ 99	**$ 59**	$ 15
COMPILERS			
BASIC (MicroSoft)	$395	**$259**	$ 59
C Compiler (MicroSoft)	$500	**$319**	$ 75
FORTRAN (MicroSoft)	$350	**$239**	$ 52
* FORTRAN (SuperSoft)	$495	**$199**	$ 74
Macro Assembler	$100	**$ 69**	$ 15
Pascal (MicroSoft)	$350	**$229**	$ 53
BUSINESS ACCOUNTING			
BPI Systems	$595	**$429**	$ 89
IUS Business Accounting	$595	**$395**	$ 89
Open Systems	$695	**$559**	$104
Peachtree Business	$595	**$439**	$ 89
Real World/MBSI	$695	**$575**	$104
OTHER SOFTWARE			
* Desk Organizer	$295	**$179**	$ 44
Electric Desk	$345	**$239**	$ 52
* Home Accountant Plus	$150	**$ 79**	$ 22
* Statpac (Walonick)	$400	**$259**	$ 60
Think-Tank	$195	**$139**	$ 29
HARDWARE			
AST 6 Pack-OK	$340	**$229**	
AST Megaplus-OK	$340	**$229**	
Hayes 1200	$699	**$489**	
Hayes 1200B	$599	**$399**	
PC LOCK II	$349	**$299**	

PLUS HUNDREDS OF OTHER DISCOUNTED ITEMS
SAME DAY SHIPMENT FOR ORDERS RECEIVED BY 1 PM

*Limited Quantity Above prices represent a 2% CASH discount
Copyright and licensing requirements of the software package manufacturers must be observed.

To place your order call TOLL FREE (800)647-1200 (outside PA)
For more information and our FREE catalog call (412)687-2000

COMPUTER INVENTORY CONTROL, INC.™

MasterCard VISA

159 Techview Terrace • Pittsburgh, PA 15213 • (412) 687-2000

Financial

Master Forecaster
Intended primarily for investors, *Master Forecaster* uses statistical techniques to predict daily, weekly, monthly, or yearly figures for stocks, commodities, bonds, and other financial instruments. For example, the program can forecast tomorrow's stock market highs, lows, and closing prices; next week's money supply and grain export figures; or next month's consumer price index. List price: $139. Requirements: 48K, two disk drives, printer.
Microvest
P.O. Box 272
Macomb, IL 61455
309/837-4512

Rory Tycoon Portfolio Manager
A financial planning template for *1-2-3*, this program evaluates the relative performance of various investments. It calculates the present and future value of each investment, profit or loss, net worth, rates of return, yields to maturity, margin requirements, weighted averages, and portfolio distributions. *Rory Tycoon* also tracks investments in stocks, options, bonds (including zero-coupon instruments), cash accounts, certificates of deposit, precious metals, mutual funds, commodity futures, IRAs, and employee profit-sharing plans. List price: $19.95. Require-

ments: 192K (256K for DOS 2.00 and *1-2-3*, version 1A), two double-sided floppy disk drives or one double-sided floppy and one hard disk drive, *1-2-3*.
Coherent Software Systems
311 W. 21st St.
Houston, TX 77008
713/869-0465

Graphics

ChartStar
A business presentation graphics program, *ChartStar* produces a variety of charts, including text (with nine choices of fonts), line (linear or logarithmic), pie (four types including three-dimensional), bar (six types including stacked, side-by-side, and three-dimensional), organizational, scatter, curve-fitting (linear, logarithmic, exponential, and power functions), and Gantt (up to five time scales). *ChartStar* reads data from *InfoStar, 1-2-3, Multiplan,* and other programs. List price: $395. Requirements: 192K, two disk drives.
MicroPro International Corp.
33 San Pablo Ave.
San Rafael, CA 94903
415/499-1200

PC Paintbrush
A mouse-driven, free-form painting program with 14 tools, five pull-down menus, and 30 backgrounds, *PC Paintbrush* provides the PC and the PCjr with capabilities similar to those offered by the *MacPaint* program for the Macintosh computer. In addition to a variety of colors and patterns, six fonts can be manipulated in seven styles and seven sizes from 9 to 72 points. *PC Paintbrush* supports seven graphics boards and 17 printers and plotters. List price: $150. Requirements: 192K (256K for PCjr), one disk drive, DOS 2.00 or 2.10, mouse (Summagraphics, Mouse Systems, or Microsoft) or joystick, color graphics board (e.g., Amdek, IBM, PCjr, Quadram, Scion, or Tecmar).
IMSI (International Microcomputer Software, Inc.)
633 Fifth Ave.
San Rafael, CA 94901
415/454-7101

Integrated Applications

IOAS-2
An integrated office automation system for the PC, the XT, and the PCjr, *IOAS-2* consists of three modules that can be purchased together or separately. The *Exec-I* module has seven applications: appointments, stock security, mailing lists, checks, personal finances, personal inventory, and memos. *Word-X* is a word processor with a full-screen editor. *SS* is a spreadsheet that lets you specify column widths, colors, and display formats. List price: $149, each module $59. Requirements: 128K, one disk drive.
Micro Architect Inc.
6 Great Pine Ave.
Burlington, MA 01803
617/273-5658

Job and Industry Specific

FitScrip
As a physical fitness testing, exercise, prescription, and membership management system for fitness centers and health clubs, *FitScrip* processes test data and produces individual status reports. A management utility tailors testing and exercise prescriptions to specific requirements of each health facility. List price: $2495. Requirements: 128K, one floppy disk drive, one hard disk (5MB minimum), printer (160 cps recommended), monochrome monitor.
HealthTech Corp.
7005 St. Anne's Ave.
Lanham, MD 20706
301/459-0776

Creative Edge **$799**

10 MB HARD DISK
- includes 10 MB drive, controller, cables & installation instructions
- one year warranty

SIGMA

10 MB HARD DISK $895

EXPANSION CHASIS . . . $695
- includes chasis, power supply, 9-slot backplane, 2 interface boards & cable

MEGA FLOPPY $749
- 2.6 MB capacity per disk (8 times capacity of standard DS drives)
- includes floppy controller card, disk drive, 2 diskettes, cables & software
- 500 KHZ data transfer rate

STREAMING TAPE BACKUP
- 45 Megabyte capacity
- fast 5 MB per minute data transfer rate
- software allows backup of entire disk or individual files/directories
- includes controller, drive, cables, interface to PC & software.

. . . $1195

DYSAN 5¼ INCH FLOPPY DISKS 104/2D - DS/DD
- 10 disks w/library case **$37**
- 20 or more disks **$35**

IBM COMPATIBLE

Multifunction Board w/64K **$249**
Monochrome Card **$199**
Color Adapter **$189**
Floppy Controller **$159**
TAXAN, AMDEK, PGS Monitors . . **$CALL**
OKIDATA, CITOH Printers . . . . . **$CALL**
HAYES 1200 Smartmodem **$469**
HAYES 1200B w/Smartcom II **$419**

Write or Call For Our Free Product List

Creative Microsales
171 Mayhew Way, Suite 211
Pleasant Hill, CA 94523
(415) 945-1201

OUTSIDE CALIFORNIA
CALL TOLL FREE

800-321-3324

Circle 110 on reader service card

NameManager
Sales and marketing personnel can use this mailing list program to build and update simplified customer and prospect lists. *NameManager* prints names, addresses, phone numbers, and comments in a variety of formats on paper or mailing labels; it stores information on hard or floppy disks. List price: $49.95. Requirements: 96K, one disk drive, 80-column monitor, printer recommended.
Oracle, Inc.
Box 550
Chelsea, MI 48118
313/572-9379, 313/475-3600

Personal Management

Electronic Calendar
Designed for use until the year 2000, *Electronic Calendar* displays and prints a monthly calendar, highlights important dates, and accommodates up to ten daily messages, such as reminders of meetings, bill payments, important anniversaries, and birthdays. The program can also determine the day of the week for future events. List price: $29.95. Requirements: 64K, one disk drive, monochrome display.
Home Software Systems
P.O. Box 381557
Germantown, TN 38183-1557

Master Control
A diet and exercise program that runs on the PC and the PCjr, *Master Control* provides a comprehensive approach to weight management for the serious dieter. Dieters can monitor calorie intake and expenditure, using a data base containing caloric values for more than 3000 foods, including name brands and junk food, plus information on more than 100 exercises. The program provides graphics reports on weight-loss progress. A 95-page manual has information on nutrition and guidelines for developing a personal diet and fitness program. List price: $69.95. Requirements: 128K, one disk drive, 80-column monitor.
Healthware
Physicians Plaza
2300 Round Rock Ave. #209
Round Rock, TX 78664
512/863-6910

Bank à la Modem

With a Menu of HomeBanking Services...

Bank of America is one of the first to bring an appealing menu of services to your personal computer. With HomeBanking service and a Bank of America checking account, you can check your daily balance, review your checking statement records, transfer funds, even send and receive messages.

You can also make on-line payments—**prescheduled up to 30 days in advance**—to more than **800** department stores, utilities, insurance companies, and other financial institutions.

You'll handle many of your routine banking transactions conveniently in your home or office—6 a.m. to midnight, every day. And best of all, Bank of America's advanced technology handles all the necessary interface, so HomeBanking service is compatible with **any** personal computer or terminal with communications capability.

You can bank à la modem with all these services for only **$8.00*** a month!

An Appetizing Rebate Offer

Sign up now for HomeBanking service and we'll give you an appetizer that makes it almost irresistible! You'll have a choice of rebates on **any or all** of the following:

- **$50 off** *Apple® Modem 1200***
- **$30 off** *Apple Modem 300***
- **$30 off** *Dollars & Sense™ and Forecast™ for Apple personal computers*
- **$30 off** *Dollars & Sense with Forecast for IBM and IBM-compatible personal computers*
- **$20 off** *PFS:® ACCESS for selected MS-DOS and the Apple IIc and IIe personal computers*
- **$20 off** *PFS:® WRITE for selected MS-DOS and the Apple IIc and IIe personal computers.*

Circle 861 on reader service card

Call 1-800-652-1111

Complete and return the coupon and you can be on-line with HomeBanking service. Or simply call **toll-free 1-800-652-1111** from 8 a.m. to 5 p.m. (Pacific Time), Monday through Friday, for an on-line demonstration.

To take advantage of this special rebate offer from HomeBanking service, sign up before **December 31, 1984**...and join the thousands who bank à la modem.

*Regular checking account charges still apply.
Note: Special restrictions apply to Cash Maximizer™ accounts.

**Apple modems must be purchased from an authorized Apple dealer.
Apple is a registered trademark of Apple Computer, Inc.
Dollars & Sense and Forecast are trademarks of Monogram.
PFS: is a registered trademark of Software Publishing Corporation.

Bank of America NT & SA • Member FDIC

Mail this coupon to:
Bank of America
HomeBanking Service Center
P.O. Box 306
Half Moon Bay, CA 94019
1-800-652-1111

HomeBanking
A VERSATEL® SERVICE FROM BANK OF AMERICA

YES! I'd like to bank à la modem with HomeBanking service and receive my rebate package.

☐ I am already a Bank of America checking account customer. Please begin my HomeBanking service immediately.

Signature _____

Checking Account Number _____

VERSATEL® Customer Number _____
(last nine digits on your card)

☐ I am not yet a Bank of America checking account customer. Please send me all the information I need to open an account and sign up for HomeBanking service.

Name _____

Address _____

City _____ State _____ Zip _____

Phone ( ) _____ Best time to call _____

Act now! You must sign up for HomeBanking service before **December 31, 1984** to qualify for the rebate offer. (**Note:** One rebate package per customer. To qualify for rebates you must receive the rebate package **prior** to purchase(s). Proof of purchase by **March 15, 1985** will be required.)

Bank of America

TALK to your computer

It's as Simple as Saying "On" and "Off"

Plug in the new MICRO•EAR™ Voice Command System, and experience the incredible thrill of *talking with your personal computer.* Become virtually keyboard-independent, because your computer will now understand and obey your vocal commands.

Just Think of the Applications

Speak a single word or phrase and you: invoke functions . . . load and run programs . . . enter data . . . perform practically *any* keyboard operation.

You Select the Vocabulary — and Change It at Will

Input up to 256 words or short phrases *you* select, define, and train to your voice. MICRO•EAR achieves *95-98% recognition accuracy* . . . and retains its training even when turned off!

FREE Voice-Activated Software

You get demonstration software for the IBM™ PC and Apple™ II computers • voice-activated programs for a typewriter, a calculator, and voice-command video games • high quality microphone • plus communications software for the IBM PC and compatibles.

Software for the IBM PC includes EAR-DOS™, for concurrent voice/keyboard input capability while running applications software.

And because it plugs into a standard RS-232 interface port, you can use MICRO•EAR with just about *any* personal computer. MICRO•EAR Voice Command System — suggested price $579.00.

Act Now —

Call or write today for more information.

arctec systems

9104 Red Branch Rd. • Columbia, MD 21045 • (301) 730-1237

Micro•Ear and EAR-DOS are trademarks of Arctec Systems, Inc. Apple is the trademark of Apple Computer, Inc. IBM is the trademark of International Business Machines Corporation.

Circle 841 on reader service card

CopyWrite backs up IBM PC Software.

We have not found anything yet we can't copy. Copy-protected software is copied readily. **CopyWrite** needs no complicated parameters.

Requirements: IBM Personal Computer or XT, or Columbia, or Corona.
64k bytes of memory.
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 $12 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.

CopyWrite is available at a price of $50 US funds from:

Quaid Software Limited
45 Charles Street East, Sixth Floor
Toronto, Ontario, Canada M4Y 1S2
Telephone (416) 961-8243

Word Processing

T³ Scientific Word Processing System

T³ provides unlimited file size, up to 25 levels of superscipts and subscripts, chemical and complex mathematical formulas, headers, footers, and footnotes. Up to eight user-defined fonts of 128 characters each, including chemistry, math, Greek, and Cyrillic, can be incorporated into a single document. All fonts can be displayed on the screen. The program offers a font editor, boldface, underlining, and strikeout of any character. Standard word processing features include Move, Copy, Delete, and Center. The program supports a number of dot matrix printers. List price: $495. Requirements: 512K, two double-sided disk drives, color graphics board.
TRIAD Computing, Inc.
1190-B Foster Rd.
Las Cruces, NM 88001
800/874-2383

Just Announced uses information provided by manufacturers. Send a description and a photograph of your new product along with complete system requirements (such as memory, disk drives, display, and software) to Just Announced, PC World, *555 De Haro St., San Francisco, CA 94107.*

COMMUNICATIONS SOFTWARE THAT INTEGRATES WITH ANY PROGRAM.

SOFTERM IS ALSO AVAILABLE IN VERSIONS FOR APPLE II® AND TANDY 2000 PERSONAL COMPUTERS.

TERMINAL EMULATIONS

TTY Compatible	HP 2622A
ADDS Regent 20	Honeywell VIP7205
ADDS Regent 25	Honeywell VIP7801
ADDS Regent 40	Honeywell VIP7803
ADDS Regent 60	IBM 3101 Model 10
ADDS Viewpoint	IBM 3101 Model 20
Data General D200	Lear Siegler ADM-3A
Datapoint 3601	Lear Siegler ADM-5
DEC VT52	TeleVideo 910
DEC VT102	TeleVideo 925
Hazeltine 1400/1410	TeleVideo 950
Hazeltine 1500	User Defined
Hazeltine 1520	

Here's the first software that lets you integrate communications with all your favorite programs. Now you can add concurrent communications to programs like Lotus 1-2-3,™ dBase III,™ WordStar,® or any other IBM PC compatible software. Softerm PC™ can function two ways—as a stand-alone program or as an extension to your PC-DOS operating system to let you access Softerm's capabilities while using other programs.

Simple to use.

Softerm PC lets you interrupt any program simply by pressing one key. You can then use disk utilities, print a file, dial a host computer, use terminal mode, or initiate a file transfer. Then you can continue working in the original program while the other tasks are performed concurrently. You can even receive electronic mail while you work.

Hooks your PC to any mainframe.

Softerm PC lets you access information services, bulletin boards, electronic mail systems, and even your company's computer. It has all the features you need, including keyboard macros, built-in phone book for automatic dialing, and simultaneous capture to print or disk. Softerm's extensive file transfer capabilities include automatic execution using command files, support for popular protocols like XMODEM, and our own Softrans™ protocol which includes an adaptable source program for your host computer.

Do it all together. In real time.

Softerm PC supports concurrent operation of up to 4 communications ports and 3 printer ports through background processing queues. Now you can operate your system to its full potential by simultaneously using your available ports for printing or communications functions. Real-time scheduling eliminates unnecessary pauses and gives maximum throughput for smooth, efficient operation.

Complete emulation of 24 terminals.

Softerm PC is not limited to basic TTY terminal emulation. It includes *exact* emulations of 24 popular terminals and provides all keyboard and display functions. Also, both conversational and block modes are supported. If Softerm PC is not completely compatible with your application, return it for a full refund.

The best communications software on the market.

Right now you can buy the best communications software on the market for only $295. And that's a real bargain when you consider all the things Softerm PC will do. Plus, you get an unconditional 30-day money-back guarantee. So ask your dealer for a demonstration today.

SOFTRONICS

3639 NEW GETWELL ROAD, SUITE 10
MEMPHIS, TENNESSEE 38118, (901) 683-6850

Circle 792 on reader service card

C Is The Language.
Lifeboat Is The Source.

Lifeboat.™
The Leading Source And Authority For Serious Software.
1-800-847-7078.

In NY State: 212-860-0300

Serious Software For The C Programmer From Lifeboat.™

Lattice® C Compiler: *The serious software developer's first choice.*

Selected for use by IBM,® Texas Instruments, Wang,® MicroPro,® Ashton-Tate,™ IUS/Sorcim,® Microsoft® and Lotus™ to name a few of the many. Why? Lattice C is clearly the finest 16 bit C compiler available today.

—Renowned for speed and code quality.
—Fully compatible with the C standards set forth by Kernighan and Ritchie.
—Four memory model options offer you unsurpassed control and versatility.
—Superior quality documentation.
—Now includes automatic sensing and use of the 8087 chip.
—Widest selection of supporting add-on packages.

Halo™: *A graphics development package rapidly emerging as the industry standard.*

—140 graphics commands including plot, line, arc, box circle and ellipse primitives, bar and pie charts; pattern fill and dithering commands.
—New: multiple viewports and "stroke text" for angling, scaling and filling text.

C Food Smorgasbord™: *This beautifully written collection of C functions is a valuable time saver.*

—Library includes a binary coded decimal arithmetic package, level 0 I/O functions, a terminal independence package, IBM PC ROM BIOS access functions and much more.

Pmate™: *The premier editor for the programming professional.*

Pmate is a full screen editor with its own powerful macro command language:

—Perform on screen row and column arithmetic, alphabetize lists, translate code from one language to another, call up other macros.
—Customize Pmate almost any way you like.
—Contains 10 auxiliary buffers for storage of macros, text, subroutines.
—An "undo" feature allows the programmer to retrieve whole series of deleted items.

Additional C Tools Available From *Lifeboat:*

Panel™: Screen formatter and data entry aid.
Lattice Windows™: Windowing utility; create "Virtual Screens."
Plink-86™: The popular linker; includes extensive overlay capabilities.
Pfix86™: Dynamic debugging utility.
Pfix86 Plus™: Symbolic debugger with capacity to debug overlays.
Btrieve™: Database record access/retrieval library.
Phact: Multikeyed ISAM C-Function library.
Fabs: Fast access B-tree database function library.
Autosort: Fast sort/merge utility.
ES/P: 'C' program entry with automatic syntax checking and formatting.
Greenleaf Functions™: Library of over 200 popular C functions.
And much more.

YES! Please rush me the latest FREE Lifeboat™ catalog of C products.

*Company Name*_____ *Business Phone*_____

*Name*_____ *Title*_____

*Address*_____

*City*_____ *State*_____ *Zip*_____

Please check the category where Lifeboat can best help you:

☐ *Software development* ☐ *Corporate* ☐ *Education*
☐ *Dealer/distributor* ☐ *Government* ☐ *Other*_____

Call Direct: 1-800-847-7078 (In NY State: 212-860-0300)
Return coupon to: Lifeboat Associates™
1651 Third Avenue, New York, NY 10128. WD/10

© 1984 INTERSOFT CORPORATION

Circle 92 on reader service card

TOLL FREE ORDERS ONLY! **800-631-0962**

(INSIDE CALIFORNIA) **800-521-6162**

Customer Service HOTLINE (408) 559-6556

GUARANTEED the LOWEST!

OUR PRICE GUARANTEE – It's Simple! We'll beat any ad in this magazine – same terms – call TOLL FREE for details!

DCC DISCOUNT COMPUTER CENTERS

OUR CUSTOMER SATISFACTION GUARANTEE: If for any reason your DCC purchase fails to meet manufacturers specifications within 30 days of purchase, please return it to us for a full refund or exchange of your choice! Sorry, software excluded due to copyright laws.

EPSON all models! RX/FX and LQ1500 — PRINTER SALE!!! — all models 82/83 92/93!! **OKIDATA**

IBM PC $1449 1 drive 64K with 2 drives 256K **$1795** — 256K, 10 mg. hard disk 1-360Kb drive only **$3695** **IBM XT**

WORDSTAR PRO PACK
- Wordstar
- Correct Star
- Star Index
- Mail Merge

only **$249**

COMPUTERS

IBM PC & XT... See special above!!!
COLUMBIA w/$3000 retail software!
VP Portable – 256K ..... ridiculously
1600-1 2 drives ..... low!!!
1600-4 Hard Disk ..... please call!!
VISUAL COMMUTER New 16 lb. IBM Compatible 256K, 2 drives ..... $Call

MONITORS

IBM MONOCHROME 259
COLOR 589
AMDEK 300G 129
300A 145
310A 165
GORILLA Composite monochrome . Sale!
Green or Amber 85
TAXAN 12" Green 114
12" Amber 117
420 RGB 439
PRINCETON HX-12 467
SR-12 649
MAX-12 184
ZENITH 122 – 12" G 93
12" A 93
124 MONO – IBM 169
133 RGB 446
135 RGB/COMP 475

MODEMS

HAYES 300 199
1200 468
1200B IBM INTERNAL 398
MICROMODEM II E 229
ANCHOR MARK XII 259

PRINTERS

*****DOT MATRIX*****
EPSON RX 80 100 cps 289
RX 80 F/T 100 cps 319
RX 100 100 cps, 132 col. 522
FX 80 160 cps ..... best price
FX 100 160 cps, 132 col. ..... in
LQ 1500 200 cps NEW! ..... magazine
OKIDATA 82A/83/84 ..... Save
92P ..... All
93P ..... Models
2410 ..... Drastically Reduced!!
GEMINI 10-X 258
15-X 369
C-ITOH PROWRITER 324
*****DAISY WHEEL*****
PRIMAGE I 55 cps, SER/PARR 1395
w/Cut Sheet Feeder 1695
BROTHER DAISY WHEEL
HR-15 359
HR-25 598
HR-35 (36 cps) 969
JUKI 6100 419
DTC 380 Z 949
DIABLO 620 829
36 1276
630 1689
TTX 1014 SER/PAR/TRACTOR 360
DYNAX DX-15 359
SILVER REED 550P 560
NEC 3550 1645
QUME 559

DRIVES

IBM 360 KB 219
TANDON 100-2 360KB 185
PANASONIC ½ HI-360 KB 149
TEAC ½ HI-260 KB 159
SHUGART ½ HI-360 KB 149
EVEREX 10 MG H.D. W/CONTRL 798
ATARI INDUS GT 349

IBM SOFTWARE

*****SPREADSHEETS*****
FRAMEWORK Monthly Special 399
MANAGING YOUR MONEY 138
SUPERCALC 3 228
MULTIPLAN 138
IBM WORDPROCESSORS
WORDSTAR PRO PACK 249
PFS WRITE 84
MULTIMATE 249
WORD W/MOUSE 269
VOLKSWRITER DELUXE 159
PEACHTREE SOFTWARE all ..... $Call
IBM DATA BASE
dBASE II 284
dBASE III 399
PFS FILE 84
CONDOR III 249
R-BASE 4000 279
FRIDAY 179
IBM MISC
CROSSTALK 104
COPY II PC 29
MASTERTYPE 37
PROKEY 3.0 79
HARVARD PROJECT MGR 245
SIDEWAYS 45
NORTON UTILITIES 55
PFS REPORT 79
DOW JONES ANALYST 219
SET FX + ... 47
IBM GAMES
FLIGHT SIMULATOR 34
PINBALL 39
THINKTANK 129
FROGGER 28
ULTIMA III 35
ZORK 35
GATO SUB SIMULATOR 35

IBM – BOARDS

HERCULES GRAPHICS 315
HERCULES COLOR New! 199
AST SIX PAK W/64K 249
MEGAPLUS 259
STB GRAPHIX PLUS 322
EVEREX GRAPHIC EDGE ..... Low!!
H.D. CONTROLLER 299
MAJIC CARD ..... Low!!
QUADRAM QUADBOARD W/64K 269
QUADBOARD I 199
QUADLINK 449
IBM MONOCHROME 249
COLOR GRAPHICS 219
PLANTRONICS COLOR PLUS 358
MA SYSTEMS PC PEACOCK GRAPHICS 235
TECMAR GRAPHICS MASTER 475

IBM ACCESSORIES

64K RAM CHIPS 200ns 45
150ns 45
IBM KEYBOARDS 179
KEYTRONICS 5151 NEW! 199
5150 189
MICRO-SOFT MOUSE ..... low!!!
MOUSE SYSTEM-MOUSE 139
KOALA PAD 85
KRAFT JOYSTICKS 45

APPLE – BOARDS

ORANGE MICRO GRAPPLER 113
BUFFERED 168
MICROMAX GRAPHMAX 99
VIEWMAX 80 139
VIEWMAX 80E W/64K 189
MICROSOFT 16 RAM CARD 75
SOFTCARD 239
SOFTCARD PREMIUM PAK 475

ACCESSORIES

PRINTER RIBBONS all makes ..... Low!!!
64K RAM chips SALE 45
VERBATIM SS/DD diskettes 21
DS/DD diskettes 28
DYSAN SS/DD diskettes 26
DS/DD diskettes 34
DISK MINDER-PLEXI (75) 29
DISK MINDER W/KEY (100) 34
SURGE PROTECTOR Compugard 69
PTI POWER BACK-UP 200 w 329
300 w 549
FINGERPRINTS – EPSON all models 48
PRINTER DUST COVER all models 10
MONI-BASE Monitor Stands 22
COMPUTER PAPER all makes ..... Low!!!
PRINTER STANDS Plexiglass 29/39
COMPILERS ..... $Call

ATARI/C-64

ACCESSORIES low, low ..... CALL!!
C-64 CARDCO +G 79
ATARI MP1150 94
APE FACE 69
PRINTER INTERFACES all ..... $Call

QUADRAM 384K **QUADBOARD** w/64K RAM **$249**

AST $229 SIX PAK PLUS w/64K RAM **$249**

FRAMEWORK ASHTON·TATE It's Here! **$399**

EVEREX GRAPHICS EDGE MONO AND COLOR ON A MONO MONITOR.

SHUGART ½ Hi-Drives $149 **IBM™ $219** 360Kb drvs.

DCC DISCOUNT COMPUTER CENTERS

an established mail order/retail distribution network

BUYER FRIENDLY TERMS! • **DELIVERY** We ship immediately! Most orders delivered within 5 days! Add 3% (5% min) for UPS shipping, handling, insurance. Calif. residents add 6.5% sales tax. 2nd day UPS available at extra charge. • **PAYMENT** Visa, M/C, cashiers checks, money orders, personal checks accepted. (Allow 10 business days for personal/company checks to clear). **WE NEVER CHARGE EXTRA FOR CREDIT CARDS!** C.O.D.'s welcome (20% p/p deposit) with cash, certified check or money order. • **WARRANTY** All items shipped are new, include **FACTORY WARRANTY** and are **GUARANTEED TO WORK. DCC** is an **AUTHORIZED DEALER** and **SERVICE CENTER** for most major brands. • **RETURNS Must** be accompanied by **RMA** number (supplied by DEALER) and may be subject to a 20% restocking fee. Prices and availability subject to change without notice. All items limited to stock on hand. • **MAIL ORDER PRICES NOT VALID AT RETAIL OUTLETS DUE TO REGIONAL PRICING RESTRICTIONS.** Minimum order $50.

FREE – VISA/MC!

1707 S. BASCOM AVE • SAN JOSE, CA 95008 • (408) 559-6555
1243 W. EL CAMINO • SUNNYVALE, CA 94081 • (415) 965-4494
1341 FULTON AVE • SACRAMENTO, CA 95825 • (916) 971-3503

VISIT OUR DISCOUNT SHOWROOMS!

Circle 880 on reader service

ALL THE BEST PRICES

MODEMS

ANCHOR

Volksmodem	$59.99
Mark XII	$269.00

HAYES

300	$199.00
1200B	$419.00
1200	$489.00

NOVATION

J-Cat	$99.99
Smart Cat Plus	$339.00

MONITORS

AMDEK

300 Green	$129.00
300 Amber	$149.00
310 Amber IBM-Plug	$169.00
Color 300/Audio	$269.00
Color 500 Composite/BRGB/VCR	$389.00
Color 600 Hi-Res (640x240)	$439.00
Color 700 Hi-Res (720x240)	$499.00
Color 710 Long Phosphor	$599.00

BMC

1201	$88.99
9191 Color Plus	$249.00

NEC

JB 1201 Green	$149.00
JB 1205 Amber	$159.00
JC 1215 Color	$269.00
JC 1216 RGB	$429.00

PRINCETON GRAPHICS

Max-12 Mono	$199.00
HX-12 RGB	$489.00
SR-12 RGB	$659.00

QUADRAM

8400 RGB	$489.00

ZENITH

ZVM 122 Amber	$99.99
ZVM 123 Green	$89.99
ZVM 124 IBM Amber	$149.00
ZVM 131 Color	$309.00
ZVM 133 RGB	$429.00
ZVM 135 RGB/Composite	$469.00

PRINTERS

DIABLO

36	$1399.00
620	$949.00
630	$1549.00
630-ECS	$2099.00

EPSON

RX80, RX80FT, RX100	CALL
FX80, FX100	CALL
LQ 1500	CALL
JX 80 Color	CALL

IDS

Prism 80/132	CALL

NEC

2050-IBM	$749.00
3550-IBM	$1449.00
8850-IBM	$799.00

OKIDATA

82, 83, 84	CALL
92, 93, 2350, 2410	CALL

OLYMPIA

Compact 2 Letter Quality	$469.00
Compact RO	$499.00
ESW 3000	$1399.00
Needlepoint Dot Matrix	$329.00

CALL FOR YOUR FAVORITE PC/COMPATIBLE

SOFTWARE

ASHTON-TATE

Framework	$399.00
dBASE II	$299.00
dBASE II upgrade	$149.00
dBase III	$399.00
Friday!	$179.00

ALPHA SOFTWARE

Electronic Desk	$229.00

ELECTRONIC ARTS

Get Organized	$139.00

LOTUS

1-2-3	$319.00
Symphony	$499.00

MICROPRO

WordStar ProPack	$369.00
WordStar ProPack Plus	$419.00
WordStar	$219.00
MailMerge	$159.00
InfoStar Plus	$399.00
CalcStar	$179.00

MICROSOFT

Multi Plan	$139.00
Multi Tool Word w/Mouse	$299.00

PEACHTREE SOFTWARE

Peachtext 5000	$209.00
Peachpack (GL/AP/AR)	$219.00

PFS

File	$89.99
Report	$79.99
Graph	$89.99
Write	$89.99
Proof	$89.99
Access	$89.99
Plan	$89.99

VISICORP

VisiCalc 4	$159.00

MICROMIM

R:Base 4000	$279.00

PROFESSIONAL SOFTWARE

PC Plus/The Boss	$269.00

FUNK SOFTWARE

Sideways	$39.99

CENTRAL POINT

PC Copy II	$29.99

DISKETTES

maxell

MD-1	$19.99
MD-2	$26.99

Dennison

Elephant SS/SD EM-1	$15.99
Elephant SS/DD EM-2	$17.99
Elephant DS/DD EM-5	$26.99
Elephant EMSP-5 DS/DD	$34.99

VERBATIM

SS/DD	$21.99
DS/DD	$29.99

CARDS & ACCESSORIES

AST RESEARCH

MEGA PLUS II	as low as $299.00
I/O-PLUS II	as low as $139.00
SIXPAKPLUS	as low as $249.00

MAIN FRAME

AST-5251	$699.00
AST-SNA	$699.00
AST-BSC	$699.00
AST-3870	$749.00

MONOGRAPH PLUS

Video Board	CALL

IDEAssociates

IEDAboard MPR-64	as low as $219.00
IDEAmax ZPR-64 CSP	as low as $279.00
IDEAmax ZPR-OK CSPG	as low as $229.00
IDEAcomm CPR-3278	$799.00

IDEAdisk

5MB to 45MB Hard-drives with removable Cart. backup as low as $1399

PARADISE

Multi-Display Card	$339.00
Modular Graphics Card	$319.00

QUADRAM

Quadlink 64K	$479.00
Quadboard II	as low as $309.00
New Expanded Quadboard	as low as $279.00
Quad 512 Plus	as low as $259.00
Quad I/O	$199.00

QUADCOLOR

Quadcolor I	$239.00
Quadcolor II (640 x 200)	$449.00
Upgrade I-II	$299.00

QUADDISK

6, 12, 20, 27, 72 Meg starting at $1799

CHRONOGRAPH

Clock/Calendar	$89.99

PARALLEL BOARD

Printer Interface w/8' Cable	$89.99

QUADJET

QJ9000 Ink Jet Printer	$749.00

MICROFAZER

Call for Configurations...P/P, P/S, S/S, S/P Starting at $189.00

EFAZER

Epson Internal Buffers

8K	$69.99
64K	$149.00

KEYTRONICS

5150 Keyboard	CALL
5151 Keyboard	CALL

MEMORY CHIPS

4164 Ram Chips (set of 9)	$44.99

COMPUTER MAIL ORDER

west
VISA
800-648-3311
In NV call (702)688-5654
Order Status Number: 588-5654
P.O.Box 6689, **Dept. 140**
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call (416) 828-0866
Telex: 06-218960
2505 Dunwin Drive, Unit 3B, **Dept. 140**
Mississauga, Ontario, Canada L5L1T1

east
MasterCard
800-233-8950
In PA call (717)327-9575
Order Status Number: 327-9576
Customer Service Number: 327-1450
477 E. 3rd St., **Dept. 140,** Williamsport, PA 17701

No risk, no deposit on C.O.D. orders and no waiting period for certified checks or money orders. Add 3% (minimum $5) shipping and handling on all orders. Larger shipments may require additional charges. NV and PA residents add sales tax. All items subject to availability and price change. Call today for our catalog.

Circle 420 on reader service card

COMPUTER DISCOUNT PRODUCTS

HUGE Inventories • IBM Specialists

★ ASK ABOUT OUR FAIR PRICE POLICY – *IT'S GUARANTEED!* ★

ADVENTURE & GAMES

BRODERBUND Apple Panic	21.99	MICROLAB Miner 20-49er	27.99
Loderunner	24.99	SIR-TECH Wizardry	44.99
Serpentine	26.99	SUBLOGIC Night Mission Pinball	32.99
SIERRA Crossfire	26.99	**MICROSOFT**	
Frogger	21.99	**Flight Simulator II**	**39.99**

INFOCOM™ TEXT ADVENTURE GAMES

CP/M Versions: $CALL

Cutthroats *NEW*	27.99	Sorcerer	31.99
Deadline	34.99	Starcross, Suspended	ea34.99
Enchanter	27.99	Witness	27.99
Infidel	31.99	Zork I	27.99
Planetfall, Seastalker	ea27.99	Zork II-III	ea31.99

UTILITIES & ENHANCEMENTS

ALPHA Typefaces	79.99
CENTRAL POINT Copy II PC	25.99
NORTON Utilities	55.99
PC Crayon	49.99
SIDEWAYS	44.99

KOALA SPEED KEY
Touch Pad Enhancement 79.99

DISKETTES & STORAGE

Flip 'n File w/Locktray Holds 25		17.99
Flip 'n File w/Locktray Holds 50		27.99
Library Case		1.99
Media Mate 5¼" Holds 50		12.99
Media Mate 3½" Holds 50		11.99
Printer Stand-Large		29.99
Printer Stand-Small		24.99
	10	100
Dysan 5¼" SS/DD	31.99	299.99
Dysan 5¼" DS/DD	38.99	369.99
Maxell 5¼" SS/DD	27.99	259.99
Maxell 5¼" DS/DD	37.99	359.99
Memorex 3½" SS/DD	41.99	399.99
Memorex 5¼" SS/DD	19.99	189.99
Memorex 5¼" DS/DD	26.99	259.99

HARDWARE

AST I/O Plus	*$CALL*
Mega Plus II	289.99
Six Pack Plus	279.99
MODEMS: Hayes 300 Baud	219.99
Hayes 1200 Smartmodem	495.99
Hayes 1200B Modem	439.99
Novation 103 Smart Cat	169.99
Novation 103/212 Auto Cat	399.99
NOVATION Access 1-2-3	439.99
Expansion Module	29.99
ORANGE MICRO Chipmunk	359.99
Mr. Chips-4 Functions	116.99
PLANTRONICS Color Plus	375.99
TITAN 64K Board	499.99

MicroPro

Chartstar *NEW*	319.99
Infostar	259.99
Spellstar	139.99
TelMerge *NEW*	119.99
Wordstar	259.99
Wordstar Pro	369.99
Pro Options Pack	181.99

SPECIAL THIS MONTH

TAXAN

MONITOR

420 RGB **449.99**

Super High Resolution
Compact Design • Sharp Image

QUADRAM

Quad 512+ 64K	229.99
Quadboard I or II No K	219.99
Quadboard I or II 64K	269.99
Quadcolor I	205.99
Quadcolor I Upgrade	209.99

MICROFAZER
All Configurations 149.99

APPLE PRODUCTS

COMPLETE PRODUCT LINES
AVAILABLE FOR APPLE!
Call For Pricing

BEAGLE Utilities Galore!	*$CALL*
BRODERBUND Print Shop	39.99
DLM Educate. Home & School	*$CALL*
DAN PAYMAR Low. Case 2 Rev 7	19.99
Lower Case 1 Rev 1-6	25.99
KENSINGTON System Saver	64.99
MOCKINGBOARD	109.99
NOVATION Applecat II 300Bd.	249.99
ORANGE MICRO Grappler +	114.99
TAXAN 12" Monitor Amb 20mhz	139.99
TITAN Accelerator IIe	449.99
VIDEX Pre-Boots (Assorted)	*$CALL*

ACCESSORIES & PERIPHERALS

OTHER PRINTERS & MONITORS
– *$CALL* –

KENSINGTON PC Saver	29.99
KOALA Touch Pad	95.99
KRAFT Joystick	44.99
Paddles	31.99
MONITORS: Amdek 310A	179.99
Princeton HX-12	475.99
Princeton Max-12	189.99
Quadram Quadchrome RGB	529.99
Taxan 12" Amber #122	169.99
Taxan 12" Green #121	159.99
PRINTERS: Epson FX80	499.99
Epson RX80	329.99
Oki 92P w/Plug 'n Play	459.99
RIBBONS: FX, MX, RX80	4.99
FX, MX, RX100	7.99
TG Joystick	39.99
Paddles	27.99
TEAC ½ Height Drive	179.99

APPLICATION SOFTWARE

FOR THE HOME

BRODERBUND Bank Street Writer	59.99
CONTINENTAL Home Accountant	84.99
Tax Advantage	49.99
MICRO COOKBOOK	31.99
MONOGRAM Dollars & $ense	119.99

FOR THE BUSINESS

ASHTON TATE dBASE III	474.99
Encyclopedia	59.99
Frame Work	474.99
Friday	184.99
CONTINENTAL Ultrafile	119.99
CROSSTALK	139.99
LIFETREE Volkswriter Deluxe	219.99
MICROSOFT Multiplan	165.99
Word	239.99
Word with Mouse	315.99
MULTIMATE	379.99
PFS File, Graph, Write	99.99
PFS Report	89.99

EDUCATIONAL

LEARNING COMPANY *NEW*	
Addition Magician	26.99
Magic Spell/Word Spinner	ea27.99
Reader Rabbit/Moptown	ea31.99
PEACHTREE Algebra I	34.99
SCARBOROUGH Mastertype	34.99
SPINNAKER Alphabet Zoo	21.99
Hey Diddle/Kindercomp	ea21.99
Delta Drawing	32.99
Facemaker/Fraction Fever	ea23.99
Most Amazing Thing	26.99
Snooper Troops I-II	ea29.99
Story Machine	23.99

KOALA
Muppet Learning Keys 59.99

MAIL AND PHONE ORDERS
Inquiries Welcome!
(408) 985-0400
MAIL, PHONE, WILL-CALL
SERVICE FROM 6AM (PST)

COMPUTER DISCOUNT PRODUCTS – SINCE 1977
860 So. Winchester Bl., San Jose, CA 95128
– CALL (408) 985-0400 –
Retail Showrooms In California
San Jose • San Mateo • San Francisco

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- International Orders Welcome
- Min. UPS Chg. $4 + Ins.
- Min. US Postal Chg. $10
- P.O's Welcome – $CALL

VISA AMERICAN EXPRESS MasterCard

Circle 754 on reader service card

Compuclassics

SOFTWARE

ALPHA SOFTWARE
ELECTRIC DESK $199
DATA BASE MANAGER II 175

ASHTON TATE
D BASE II 289
D BASE III 375
FRAMEWORK 360
FRIDAY 169

BORLAND
SIDEKICK 35
TURBO PASCAL 35

CONTINENTAL SOFTWARE
HOME ACCOUNTANT PLUS 82
PROPERTY MANAGEMENT 295

DIGITAL RESEARCH
C BASIC COMPILER 360
PASCAL MT + ... 360
C 209

FOX & GELLER
QUICKCODE III 165
OZ 269

LEADING EDGE SOFTWARE
WORDPROCESSOR 85
WORDPROCESSOR/MERGEPRINT 109
NUTSHELL 109

LIFETREE
DELUXE VOLKSWRITER 169

LIVING VIDEOTEXT
THINK TANK (IBM) 129
THINK TANK (MAC) 78

LOTUS DEVELOPMENT CO.
1-2-3 (Version 1A) 309
SYMPHONY 435
1-2-3 UPDATE TO SYMPHONY 145

MICRO DATA BASE SYSTEMS
KNOWLEDGEMAN 285
K. GRAPH 130
K. PAINT 59

MICROPRO
INFOSTAR+ 279
WORDSTAR 199
WORDSTAR PRO-PAC 299
MAILMERGE 129
CORRECTSTAR 129
PLANSTAR 289

MICRORIM
R BASE 4000 289
CLOUT 129
EXTENDED REPORT WRITER 89

MULTIMATE INT.
MULTIMATE 279

MICROSOFT
MULTIPLAN 125
WORD 239
WORD AND MOUSE 299
BASIC COMPILER 249
PASCAL COMPILER 249
FORTRAN COMPILER 229
BASIC INTERPRETER 249

MICROSTUF
CROSSTALK 105
INFOSCOPE 125

SATELLITE SOFTWARE INTL.
WORD PERFECT $279
PERSONAL WORD PERFECT 99

SORCIM
SUPERCALC II 159
SUPERCALC III 229

SOFTWARE PUBLISHING
PFS REPORT 69
PFS FILE (IBM) 85
PFS FILE (APPLE) 69
PFS GRAPH (IBM) 85
PFS GRAPH (APPLE) 69
PFS WRITE (IBM) 85
PFS WRITE (APPLE) 69
PFS ACCESS 60

WOOLF SOFTWARE
MOVE-IT 85

HARDWARE

AST RESEARCH
MEGAPLUS 64K 259
SIX PAC PLUS 64K 259

BIZCOMP
INTELLIMODEM 325
EXTERNAL MODEM 369

HAYES
SMARTMODEM 300 205
SMARTMODEM 1200B (with SMARTCOM II) 419
SMARTMODEM 1200 485

HERCULES GRAPHICS CARD 335

C. ITOH
PROWRITER 8510 339
PROWRITER 1550 629
STARWRITER 40CPS 1100

INTERMATRIX
MACPHONE 155

OKIDATA
MICROLINE 82A 329
MICROLINE 92 449
MICROLINE 93 695

INCREDIBLE PRICES WITH PROFESSIONAL SUPPORT!

- Corporate Accounts Welcome
- We Accept VISA & MasterCharge
- No Credit Charge Surcharge
- Free Technical Support

HOURS
Order Desk & Technical Support Open
8 a.m. to 6 p.m. Monday thru Friday
10 a.m. to 2 p.m. Saturday

SHIPPING
$4 per item UPS surface ($8 for Blue Label printers $25

TO ORDER CALL
1-800-328-4473 or (818) 705-1895 (CA.)
6934 CANBY STREET (SUITE 104) RESEDA, CA 91335

TERMS
ALL prices subject to change. We honor Cashiers Check/MO/Bank transfers immediately. Allow time for company & personal checks to clear. California residents add sales tax.

Circle 90 on reader service card

THANKS A LOT!!

OUR 12th MONTH IN BUSINESS AND WE OWE IT ALL TO YOU.

This Thanksgiving we'll be saying a prayer of gratitude for all our wonderful customers.

INTEGRATED SOFTWARE

AS02	Alpha-Electric Desk	199
AT05	Ashton-Tate-Framework	449
LD01	Lotus-1-2-3 (1A)	319
LD02-3	Symphony; Upgrade	454/135
MD01	MDBS-Knowledgeman	299
SI01	Software Prod.-Open Access	359
SR43	Sorcim-Supercalc 3	219
TM01-2	T/Maker III; Integrated	165/315
VC04	Visicorp-Visicalc IV	155

EDUCATIONAL/AMUSEMENT

CXxx	CDEX Training-any module (ea.)	47
HA90	Sargon III	34
IF01-3	Infocom-Zork I;II;III; (ea.)	26
IF04-5	—Starcross; Seastalk (ea.)	26
IF06-7	—Deadline; Witness (ea.)	33
IF08-9	—Planetfall; Infidel (ea.)	33
IF10	—Enchanter	33
IF11-12	—Sorceror; Suspended (ea.)	33
MS90	Microsoft-Flight Simulator	33

DATA BASE/FILE MANAGEMENT

AL01	Alpha-Data Base Manager II	175
AT01	Ashton-Tate-dBase II	299
AT02	—dBase III	399
AT04	—Friday!	175
FG02	Fox & Geller-dUtil	54
FG03	—Quickcode	158
MR01	Microrim-R:Base 4000	269
MR02-4	—Ext. Report; Clout	93/119
ST01	Stoneware-DB Master Adv	390
VC03	Visicorp-Visifile	96

ACCOUNTING/FINANCIAL

BP07	BPI-Personal Accounting	64
BP01-3,5	—GL; AP; AR; PR (ea.)	394
CP81	Computronics-Versa Ledger II	129
CP82-6	—AP; AR; Invent.: PR (ea.)	86
FN01	Financier II	114
RW01-3	Real World-GL; AP; AR (ea.)	449
RW04,6	—Ord. Ent; PR (ea.)	449
SP02	Systems Plus-The Landlord	399

LANGUAGES/UTILITIES

DR03	Digital Res.-PL/1-86	438
DR06	—Display Manager	329
DR08	—Dr. Logo	75
MF01	Microstuf-Crosstalk XVI	103
PR05	Perfect Link	102
PN01	Peter Norton Utilities	55
SU01	Super Soft-C Compiler (8086)	349
SU02,3	—Fortran; Ratfor	295/75
SU05	—Basic Compiler	220

GRAPHICS

DR07	Digital Res.-Dr. Graph	209
FG01	Fox & Geller-dGraph	158
FG04,5	—Grafox; R:Graph (ea.)	163

DISKETTES

CD01	Control Data-5" SS/DD	22
CD02	—DS/DD 48T 10/bx	33
FJ01	Fuji-5" MD1-SS/DD	22
FJ02	—MD2-DS/DS 48T 10/bx	29

800-621-5199 In Illinois Call 800-972-5855

Or Write: **RAMWARE SOFTWARE PRODUCTS,** Dept. A4A
49 Carmer Avenue, Belleville, NJ 07109

Send name, address, telephone #, quantity and description of items you want, and payment as described, next. NJ residents add 6% sales tax. Domestic orders add $3.50 shipping and handling (if order is > $500, forget the S&H). Foreign order: add 10% S&H, minimum $10. Payment may be made by check, money order, MasterCard and Visa. No COD's, please. Card will not be charged until order is shipped. There is no surcharge for credit card orders. Allow two weeks for personal check to clear. For MC/Visa orders, send card number, expiration date, bank name and signature. Prices and items subject to change.

RSP™ "THE TOUGHWARE PEOPLE"™

Circle 586 on reader service card

Meet The Controllers.

Control Power, Peripherals, Spikes, and Glitches.

Power Control™ protects computer circuitry and data stored in memory against the damage voltage spikes can cause.

Puts on/off control of your computer, terminal, printer, and more at your fingertips in a slim panel unit sized to fit *underneath* your computer terminal.

Contains a master switch (to turn your computer, terminal, printer, a modem or a lamp on or off at the same time) and three additional switches to turn peripherals on or off in any order.

Eliminates reaching over, behind and around devices to turn them on or off.

Master switch turns computer and all peripherals on or off at same time.

Less than 2" high.

16" width, 10" depth allows placement under terminal for fingertip control.

Additional switches give individual control over peripherals.

Organizes power wires. 4 cords in- 1 cord out.

©Relax Technology. *The company that works so you can relax and get down to business.*

Relax Technology.
To order, phone: 415/471-6112 or mail to:
3101 Whipple Rd., #25, Union City, CA 94587
**Calif. Residents add applicable sales tax.*
Prices include shipping.

☐ Power Control 1: $69.95*
☐ Power Control 2: $89.95*
10 amp circuit breaker. RFI noise filtering. IEC power connector.
☐ Power Control 3: $129.95*
Cross suppression between all 4 outlets. Illuminated switches. 3-stage RFI filter.

☐ Check for $ _____ enclosed.
☐ VISA ☐ MasterCard
Card # _____
Exp. Date _____ Bank # _____
Name _____
Address _____
City _____ St. _____ Zip _____
Signature _____

Circle 157 on reader service card

62 REASONS TO CALL PC Warehouse

404/432-5555 404/432-5555

FLOPPY DISK DRIVES
(*IBM PC compatible)

TANDOM TM100-2 (DS/DD)	**$205.00**
1/2 HEIGHT (DS/DD)	**$189.00**
64k RAM CHIP SETS	**$49.00**

MONITORS

Amdek 310A	**$175.00**
Amdek 300A	**145.00**
Amdek 300G	**135.00**
Hitachi 12" (green)	**89.00**
Taxan RGB Vision III	**435.00**
Quadram Quadchrome	**479.00**
PGS HX12	**479.00**

HARD DISK DRIVES

PEGASUS (External 10MB)	**$1,229.00**
PEGASUS (Internal 10MB)	**1,049.00**

PRINTERS

OKIDATA 82	**$349.00**	GEMINI 10X	**$285.00**
OKIDATA 83	**599.00**	GEMINI 15X	**389.00**
OKIDATA 84	**959.00**	EPSON RX80	**CALL!**
OKIDATA 92	**459.00**	EPSON FX80	**CALL!**
OKIDATA 93	**Best Price**	EPSON FX100	**CALL!**

EPSON MX100	**CALL!**
MANNESMANN TALLY SPIRIT 80	**289.00**
QUME PRINTERS	**CALL!**
DYNAX DX-15	**449.00**
DYNAX HR-25	**735.00**
DIABLO 620	**925.00**
DIABLO 630	**CALL!**
SILVER REED 500	**509.00**
SILVER REED 550	**549.00**
C. ITOH	**Best Price**

MONITOR INTERFACE CARDS

PLANTRONICS COLOR +	**$389.00**
PC PEACOCK	**299.00**
USI MULTI-DISPLAY	**Best Price**
HERCULES HI-RES GRAPHICS	**359.00**
QUADRAM QUADCOLOR I	**249.00**
PARADISE MULTI-DISPLAY	**CALL!**

MULTI-FUNCTION BOARDS

AST 6 PAK PLUS (with 64k)	**$279.00**
AST GAMEPORT	**35.00**
QUADRAM QUADBOARD	**279.00**
TECMAR CAPTAIN	**Best Price**

64K RAM UPGRADE . . $49.00

MODEMS

HAYES SmartModem 1200	**$489.00**
HAYES SmartModem 1200B	**449.00**
HAYES SmartModem 300	**209.00**
NOVATION Modems	**CALL!**
SIGNALMAN Mark I	**99.00**
SIGNALMAN Mark VII	**129.00**
ANCHOR Volksmodem	**79.00**
RIXON (2400 BPS)	**Best Price**

SOFTWARE

LOTUS 1-2-3	**$329.00**
dBase II	**389.00**
WORDSTAR	**259.00**
HAYES Smartcom II	**89.00**
CROSSTALK	**108.00**
MULTIMATE	**CALL!**
PEACHTREE PEACHPAK 4	**239.00**
PEACHTREE PEACHPAK 5000	**CALL!**
IUS (GL, AR, AP)-per module	**299.00**

MISCELLANEOUS

KEYTRONICS KEYBOARD	**CALL!**
MICROFAZER	**139.00**
MICROSOFT MOUSE	**145.00**

Please call for current prices.

Dealer inquiries welcome.

Circle 737 on reader service card

P.O. Box 723994 / Atlanta, Georgia 30339

MASTERCHARGE
VISA
ACCEPTED

CALL TODAY . . .

404/432-5555

PC Warehouse

"THIS SHOW DREW MORE QUALIFIED BUSINESS PROFESSIONALS THAN I HAD EVER HOPED FOR!"

Kim Hercules, Compaq Computer

"WE PAID FOR OUR BOOTH BY NOON OF THE FIRST DAY."

Ray Rogers, International Computerized Linguistics, Inc.

"THERE JUST WASN'T A SINGLE THING WRONG WITH THIS SHOW."

Mack Pendleton, Digital Equipment Corp.

"WE WERE VERY IMPRESSED WITH THE QUALITY OF BOOTH VISITORS."

Ben Weber, 3M Company

"THE TRAFFIC AND QUALITY OF ATTENDEES MAKES THIS ONE OF THE BEST SHOWS I'VE EVER SEEN."

George McMurtry, Corona Data Systems, Inc.

"WE'RE HAVING A FIELD DAY!"

Sam Harrod, Aero/High Technology, Inc.

The word around Houston, Texas is that last year's PC World Exposition was a smash. Over 15,000 business professionals walked through Astro Hall to see, learn, use and choose the latest PC technologies and equipment.

The 1985 PC World Expo in Houston is gearing up to attract even bigger numbers of high-quality attendees than last year—professionals who are now ready to buy more stand-alone PC's, multi-user systems, software, peripherals and accessories than ever before.

The reason we're telling you this now is so that you can start making plans to be in this year's PC World Expo at Astro Hall, January 16-18. Space reservations are coming in fast, so if you want to be assured a spot in what exhibitors and attendees all over the country are calling "the best-organized and most professionally run PC show in America," call us today.

The PC World Exposition. It's the one computer show run for professionals by professionals.

For attendee or exhibitor information contact PC World Exposition, Mitch Hall Assoc., PO Box 860, Westwood, Massachusetts 02090. Or call 617-329-7466/8091.

PC WORLD EXPOSITION®

HOUSTON

Hard Disk Drive with Winchester Method of Recording
Hard Disk Drive with Whitney Recording Method
Hard Disk Drive with R.L.L. (Run Length Limited Coding)

Outstanding Quality Products • Latest Technology • Satisfaction Guaranteed
7 Days Trial • The Best Hard Disk Drive Subsystems in the World
Complete and Ready to Run • Full Year Warranty

10 MB 5¼"	$ 1,200.00
* 16 MB 5¼"	$ 2,100.00
* 25 MB 5¼"	$ 2,400.00
30 MB 5¼"	$ 2,200.00
* 40 MB 5¼"	$ 3,500.00
* 65 MB 5¼"	$ 4,000.00
* 92 MB 5¼"	$ 4,900.00
*184 MB 5¼"	$ 8,500.00
*368 MB 5¼"	$17,000.00
MX-4 Multiple User Kits	$ 400.00
PTR Server Automatic Despools	$ 1,100.00
Letter Quality Printer I/O Device 45CPS	$ 700.00
Teac Drive	$ 150.00
Memory Chip #4164-150	$ 5.50

Compatible with the following computers:
Access Matrix (Actrix)/IBM & IBM Compatibles/Apple II, II+, IIe, III, III+ & Apple Compatible/Altos/Atari 800/Texas Instrument/Osborne/DEC/EPSON QX-10/S-100/NEC PC 8000/Kaypro/North Star/TRS 80 I, II, III/Zenith Z89, 90, 100/Xerox 820/Toshiba T300/Sanyo 550 & 555/Commodore VIC-20 & C-64/etc.

*Kits for multiple users available for these models.
*Up to 64 users. Can run up to 7 languages on 1 drive.
24 hours delivery anywhere in U.S.A. (option)
Tape back up available • Removable hard disk available

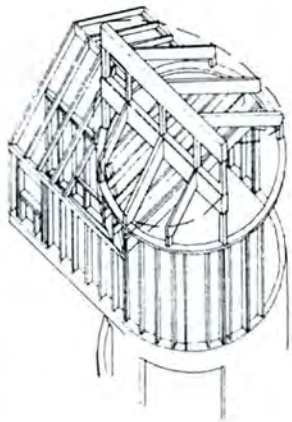
FREE SHIPPING AND DELIVERY ANYWHERE IN U.S.A.

MANDINGO COMPUTERS & CAMERAS
6500 OLD BRANCH AVE.
CAMP SPRINGS, MD 20748
(301) 449-3180 (301) 449-3181 (301) 449-3182

Circle 762 on reader service card

MicroCAD™

MicroCAD ™, the first 3-Dimensional modeling system for your microcomputer is **still** the the only system to offer you 3-D space to work in. The others say they have 3-D but only give you "extruded" 2-D. We (and the CAD industry) call that 2-1/2-D!



Our system is a completely integrated **2-D and 3-D** package offering you capabilities unequaled by any other microcomputer-based system, including 999 layers, true perspective, plan and elevation view and the automatic calculation of section properties. Rotate, edit, append, rubber-band, scale, change perspective or isometric with ease.

MicroCAD™**'s modular** system allows you to customize for your specific application or add features as you need them. With our **free update policy** your system grows as we do.

MicroCAD™ $500 **Modules** additional

IMAGIMEDIA TECHNOLOGIES
7650 Geary Boulevard
San Francisco, CA 94121
415/387-0263

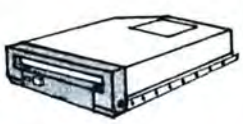
Circle 39 on reader service card

NEED MASS STORAGE?

'Creative Edge'
10 MB HARD DISK
$799

The Creative Edge 10MB Hard Disk System features a power efficient ½-height winchester drive & controller. Boot DOS 2.0 directly from your hard disk! Includes drive, controller, cables, installation manual & one year warranty.

'Creative Advantage'
5 MB REMOVABLE HARD DISK



The 5 MB Hard Disk System features plated removable media, ½-height design, low power dissapation and unlimited storage capability. Includes drive, cartridge, controller, installation manual and a one year warranty.

$995

SIGMA Designs

10MB Hard Disk Kit	**$ 895**
Expansion Chassis	**$ 695**
Maximizer w/64Kb	**$ 249**
2.6Mb MegaFloppy	**$ 749**
45 Mb Streaming Tape Backup	**$1195**
HAYES 1200 Smartmodem	**$ 469**

Creative Microsales (800) 321-3324 (415) 945-1201
171 Mayhew Way, Suite 211, Pleasant Hill, California 94523

Circle 110 on reader service card

Hooleon COMPANY

Our complete line says it all: Touchdown™ Keytop Expanders fit over existing keys on IBM PC and most PC lookalikes. Adhesive provided insures easy removal without damage to keyboard. Touchdown™ Key Overlays re-assign, clarify or blank-out PC keytop commands; durable, non-glare surface looks and feels like original keytops.

P. O. Box 201, Dept. PCW, Cornville, AZ 86325

DEALER INQUIRIES INVITED—Add these unique items to your software line and reap immediate profits. Write us today or phone 602-634-7517 for complete details.

KEYTOP EXPANDERS ☐ Blk. ☐ Grey

Qty.	Price*
____IBM PC, PC/XT, PC Port (12 keys)	$21.95
____IBM 5291 Display Station (13 keys)	21.95
____Compaq, Columbia (10 keys)	$21.95
____Corona, Eagle Spirit, Qubie, Keytronic (10 keys)	21.95

KEY OVERLAYS

____5250/5251 (48 keytops/fronts)	$21.95
____5520 (95 keytops)	28.95
____Display Write 2 (36 keytops)	21.95
____Dvorak (43 keytops)	26.95
____Wordstar (29 keytops)	26.95
____Control Key English (5 keytops)	6.95
____Blank Overlays (99 keytops)	21.95
____Do-it-yourself Kit (154 pieces)	29.95
____MultiMate	29.95
____Visicalc	24.95
____EasyWriter II	29.95
____Lotus 1-2-3	29.95

*All prices include postage TOTAL $_____
Arizona residents add 5% tax _____
TOTAL ENCLOSED $_____

☐ Check ☐ Money Order
☐ Visa ☐ MasterCard Exp. Date_____
Card #_____
Visa or MC orders phone 602-634-7517

Custom Overlays, Other Software Kits. Write for information.

Company Name_____
Attention_____
Address_____
City_____ State_____ Zip_____

Circle 206 on reader service card

DUST COVER PROTECTION WITH
ANTI-STATIC, LINT FREE NYLON PACK CLOTH

IBM PC™ Keyboard		14.00
IBM PC	Monitor	16.00
IBM PC	Drive	16.00
IBM PC	Mon./Dr. Comb. (1 pc.)	28.00
IBM Graphics Printer		16.00
Apple IIe Comb.		28.00
Apple Printer Image Writer		16.00
Apple Disk II™	9.00	2 stacked 14.00

Silver Gray with Black Trim
CHECK/VISA/MC
Plus $2 Ship. & Hand. – R.I. Res. Add 6% Sales Tax

© 1984
ComputerAid
P.O. BOX 293, BARRINGTON, R.I. 02806
FOR QUANTITY DISCOUNTS (401) 245-0532

Circle 146 on reader service card

EMULATE *HP* TERMINAL 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** is the powerful, easy to use terminal emulation program that provides the features you need!

- HP2624, HP2648 and DEC VT52 modes
- HP2624 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
- General purpose file transfer between PC and host

Price: $200. Visa and MasterCard welcome.

Inner Loop
Inner Loop Software
5456 McConnell, Ste 120
Los Angeles, CA 90066
(213) 822-2800

Circle 624 on reader service card

Buy and sell stocks with your personal computer.

For more information, call today!
Toll-free
1-800-343-8722
FIDELITY
INVESTORS EXPRESS
FIDELITY BROKERAGE SERVICES, INC.
Member NYSE SIPC

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)

DYNAMIC RAM			
256K	256Kx1	150 ns	$27.97
256K	256Kx1	200 ns	25.97
64K	64Kx1	150 ns	4.44
64K	64Kx1	200 ns	4.27
16K	16Kx1	200 ns	1.21
EPROM			
27256	32Kx8	300 ns	$49.97
27128	16Kx8	300 ns	17.50
27C64	8Kx8	200 ns	22.50
2764	8Kx8	250 ns	6.50
2732	4Kx8	250 ns	6.37
2716	2Kx8	450 ns	3.50
STATIC RAM			
6264LP	8Kx8	150 ns	$31.25
6116P	2Kx8	120 ns	6.97

QUANTITY ONE PRICES SHOWN

Open 6½ days. We can ship via Fed-Ex on Sat

MasterCard VISA or UPS CASH COD
Factory New, Prime Parts μP∞
MICROPROCESSORS UNLIMITED
24,000 South Peoria Ave.
BEGGS, OK 74421 **(918) 267-4961**
Prices shown above are for October 1, 1984
Please call for current prices & volume discount. Prices subject to change. Please expect higher prices on some parts due to world wide shortages. Shipping and insurance extra. Cash discount prices shown. Small orders received by 5 PM CST can usually be delivered to you by the next morning, via Federal Express Standard Air @ $5.99!

Circle 103 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-102
Santa Barbara, CA 93121
(800) 524-5678 Toll Free
(805) 564-2424 In California

4-5-6 WORLD™
Your definitive Lotus enhancement source

Circle 854 on reader service card

SAVE MONEY
Public Domain
&
(User Supported)
PC SOFTWARE

#1 PC-Write (word processor)
#2 PC-File III (data base manager)
#3 PC-Calc (spreadsheet)
#4 PC-Dial (modem communications)
#5 Bus & Finance (46 business & financial programs)
#6 Games (flight, adventure, startrek, packman, & many more)

$8.00 Each

Try our Six-Pac
all the above double sided $34.95
(Please specify, double or single sided format)
(all orders add $2.00, shipping & handling)
The above programs were tested on the IBM PC, will run on some compatibles
Be certain of compatability before ordering!

Soft/Plus Research
P.O. Box 590
Boonville, CA 95415
(707) 895-3521

MasterCard VISA

Circle 850 on reader service card

Scroll & Recall™

Screen and Keyboard Enhancement for the IBM - PC, XT and Compatibles

Allows you to conveniently scroll back through data that has gone off the top of your display screen

Allows you to easily recall and edit your previously entered DOS commands and data lines

Very easy to use, fully documented. Compatible with all versions of DOS, monochrome & graphic displays

$69 - Visa, M/C, Check, COD. POs. Phone orders accepted

Make Your Work Easier!

To Order or to Receive Additional Information, Write or Call
Opt-Tech Data Processing
P.O. Box 2167 • Humble, Texas 77347
(713) 454-7428
Dealer Inquiries Welcome

Circle 894 on reader service card

OPT-TECH SORT™

SORT/MERGE program for IBM-PC & XT

Now also sorts dBASE II files!

- Written in assembly language for **high performance**
  Example: 4,000 records of 128 bytes sorted to give key & pointer file in 30 seconds. **COMPARE!**
- Sort ascending or descending on up to nine fields
- Ten input files may be sorted or merged at one time
- Handles variable and fixed length records
- Supports all common data types
- Filesize limited only by your disk space
- Dynamically allocates memory and work files
- 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, includes on-line help feature
- Full documentation – sized like your PC manuals
- **$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 2167 Humble, Texas 77347
(713) 454-7428
Requires DOS 64K and One Disk Drive

Circle 894 on reader service card

Electronic Mail on a Micro!

– And a Public, Private or Pay BBS as well! Our system offers so many features that it is impossible to mention most of them in an ad this small.

PROMINENT FEATURES INCLUDE:
- Multi levels of access to a user
- High security of system and files
- Unattended message transfer to compatible system
- Fully maintainable from remote location
- Most features user configurable, allowing you to personalize your system
- Supports Hayes type of modem

Available for I.B.M. PC, Columbia or Corona with ROM 1.55 (Dos 2.0 or better required)
Also available for TRS-80 Model 3 & 4 (Newdos 80 Ver 2 required)

I.B.M. and compatible	$ 249.95
TRS-80	199.95
Mail Label Module	59.95
Terminal (for I.B.M.)	79.95

Note: Prices quoted are payable in Canadian Funds. Save even more – mention where you saw this ad when you place an order, and we deduct $ 10.00 from your bill.

TRY OUR BBS BY CALLING OUR DATA LINE
(604) 946-0995
For further information, contact

TVG Systems
P.O. Box 94488
Richmond, B.C., Canada V6Y 2A8
(604) 946-7910

Circle 863 on reader service card

BANNER

Print Banners and Signs on your IBM PC or compatible with the BANNER program. Prints 3-inch or 6-inch high characters. Requires 64K, disk, and parallel printer. Call or send for free brochure and sample banner. **$39.95** (VISA/MC/COD accepted).

CALL FREE 24 HOURS/DAY:
800-824-7888 (operator 989)
(In Alaska or Hawaii call 800-824-7919)

SAM WILSON & ASSOCIATES
P.O. Box 37085 Houston, TX 77237
(713) 785-7830

Circle 506 on reader service card

C UTILITY LIBRARY

The **C UTILITY LIBRARY** is a set of **200+** functions designed specifically for the PC software developer. Use of the Library will speed up your development efforts and improve the quality of your work.

- **BEST SCREEN HANDLING AVAILABLE**
- **WINDOW MANAGEMENT, COLOR GRAPHICS**
- **DOS 2 DIRECTORIES, COMMUNICATIONS**
- **KEYBOARD, PRINTER, TIME/DATE**
- **EXECUTE PROGRAMS, BATCH FILES**
- **STRINGS, BIOS, AND MUCH MORE**
- **ALL SOURCE INCLUDED—NO ROYALTIES**

Available for Microsoft/Lattice $149, Computer Innovations $149, Mark Williams $149, DeSmet $99. Add $3 shipping. N.J. residents add 6% sales tax. Visa, MC, checks—10 days to clear.

Order direct or through your dealer. Dealer/Distributor inquiries welcome.

ESSENTIAL SOFTWARE, INC.
P.O. Box 1003
Maplewood, N.J. 07040
(914) 762-6605

Circle 853 on reader service card

IBM PC COMPATIBLES

64K SUPER PC	$825.00
IBM Look-A-Like Metal Case	$89.00
Keyboard w/conventional shift keys	$145.00
Funpad (Joystick & Graphic Pad)	$89.95
135W IBM Compatible Power Supply	$185.00
PC/XT Motherboard (bare)	$60.00
PC/XT M.B. assembled & tested w/BIOS	$425.00
Disk Controller w/Cable	$150.00
Color Graphic Card	$195.00
Multifunction w/game port (OK!)	$195.00
Parallel Printer Card	$75.00
Teac FD55B ½Ht DS/DD Disk Drive	$165.00
Ramex ½Ht DS/DD (w/full size panel)	$135.00
1200 baud Modem Card w/software	$280.00
10MB ½Ht Hard Disk w/controller	$850.00
5¼" Diskette Box (holds 75 disks)	$14.95
Joystick w/fine tuning & auto center	$19.95
64K D-RAM 200 nS (set of 9)	$40.00

Send $1.00 for our detailed catalog. Credit towards 1st order. NO C.O.D. please!

BETTER PRODUCTS, INC.
765 S. State College Blvd., Ste-E
Fullerton, CA 92631
(714) 526-7923

IBM PC is a trademark of IBM CORPORATION

Circle 784 on reader service card

GOOD-BYE Basic Line Numbers!

Introducing
PREBASE-V2.3
A Symbolic Macro Preprocessor for
Basic

Functions
- Macros with parameter passing
- Include file capabilities
- Symbolic line references
- Line number control

Advantages
- Symbols replace line numbers
- Build libraries of macro functions
- Use your word processor to create **PREBASE** source file
- Self documenting and MORE!

Requires IBM-PC, DISK, AND 128K RAM
(Includes PREBASE Preprocessor on Disk, Manual, and Example Programs)

Send check or money order for $49.95 to:
PREBASE PACKAGE
P.O. BOX 71
ALPHA, OHIO 45301
(Shipping and handling included)

RSG RICKARD SOFTWARE GROUP

Circle 726 on reader service card

FREE PC BOOK

** GET ONE BOOK FREE FROM THIS AD WITH EVERY $ 20.00 PURCHASE **

Circle 824 on reader service card

HARD DISK BOOT + DATA SECURITY

FiXT ends boot hassles, stops data thieves—

DATAMAC, DAVONG, GREAT LAKES, IOMEGA, XEBEC, ZOBEX, others.

No-Slot Installation for IBM PC, COMPAQ, COLUMBIA
$70 - $95 + tax/shpg

GOLDEN BOW SYSTEMS
Box 3039
San Diego
CA 92103
619/298-9349

Circle 851 on reader service card

STATPLAN II

$99
Statistical Software for IBM PC Computers

- 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, auto-correlation, 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

CONSTRUCTION CONTRACTORS Get a New Handle on Your Business.

The Software Shop Construction System for the IBM Personal Computer AT.™

- Comprehensive construction accounting
- Fully integrated functions
- Easy to learn, easy to use
- Committed local dealer support
- 97.9% rate of user satisfaction

Call **800-554-9865** for the dealer nearest you

Software Shop — Authorized IBM Personal Computer Value Added Dealer

SYSTEMS — A CGA Computer Company

™Trademark of International Business Machines Corporation

Circle 849 on reader service card

Maxell Floppy Disks

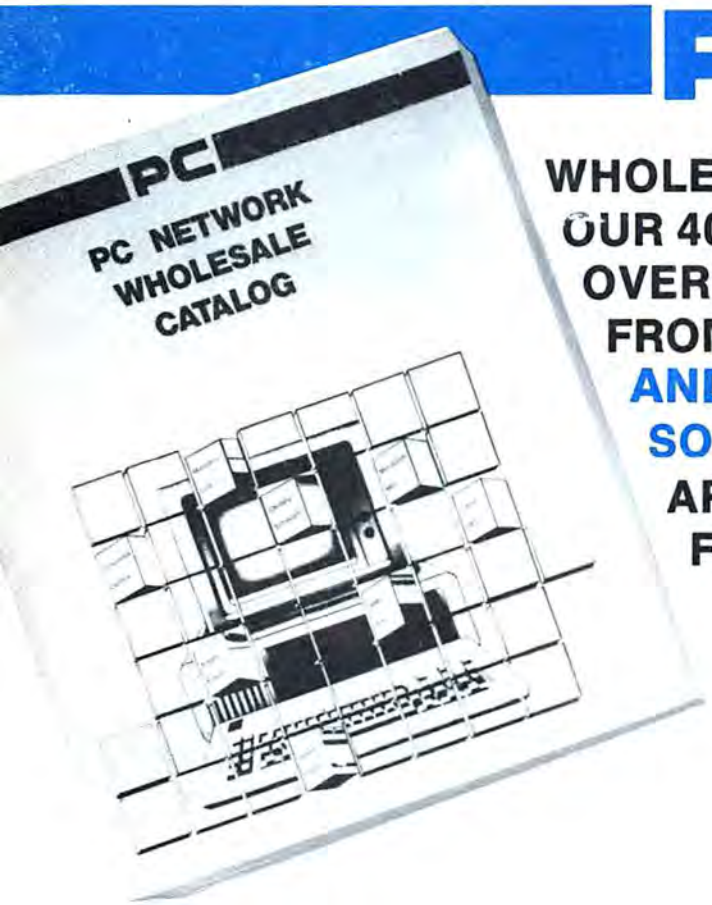
The Mini-Disks with maximum quality.

Dealer inquiries invited. C.O.D's accepted.
Call FREE (800) 235-4137

PACIFIC EXCHANGES
100 Foothill Blvd., San Luis
San Luis Obispo, CA 93401
In Cal. call (800) 592-5935 or
(805)543-1037

Circle 576 on reader service card

PC NETWORK



WHOLESALE + 8% PRICING
OUR 400 PAGE CATALOG
OVER 20000 PRODUCTS
FROM 600 MANUFACTURERS
AND 14 TO 28 DAY SOFTWARE RENTALS
ARE JUST THE BEGINNING
FOR NETWORK MEMBERS ONLY . . .

For as little as $8 per year you can join the thousands of value wise buyers who have saved more than $18,000,000 on 45,000 orders over the last few months and received these 15 unique benefits:

- Wholesale + 8% Pricing
- Our 400 Page Catalog—Over 20000 Products
- In-stock Delivery On Popular Products
- Experienced Sales Consultants
- Add-on Quantity Discounts
- Free Technical Support
- 14-28 Day Business Software Rentals (optional)
- 14-28 Day Game Software Rentals (optional)
- Special Savings Newsletters "The Printout"
- Discount Book Library—Over 1000 Titles
- Membership Referral Bonus
- Corporate Accounts
- Software Publishing Assistance
- Membership Refund Guarantee
- 10 Day Hardware Return Policy

PC NETWORK Members come back to buy

PC NETWORK Members join America's Number 1 Computer Buying Service because they recognize a great value. So it makes sense that sometimes our value-wise customers may check another source before making their purchases. And it makes sense that they come back to PC NETWORK to buy—at just 8% over the wholesale price plus shipping.

We know of no "discount" house, computer store, retail shop, direct mail outlet or imitator that can beat our consistently low prices or match our tremendous selection of products!

We Invite You To Compare

Shop around. Then add up the transportation costs and time spent on the phone or traveling from store to store. Or remember frustration you may have experienced asking an untrained order-taker or sales clerk about compatibility, language requirements, memory capacity, price comparsions . . .

Or call us first. Our trained personnel will gladly answer all your questions and quote you the best prices on the largest selection of computer software and hardware in the nation! And when you buy, it's all delivered right to your doorstep from our multimillion dollar inventory—quickly!

Our Members depend upon the high quality of PC NETWORK's Software Rental Libraries and its 14-28 day evaluation period!

Many Members have taken advantage of the savings and convenience our Software Rental Libraries have to offer. They know we have the latest versions of all the most important software titles, and that their orders will be shipped promptly! *Furthermore, our 14-28 day rental period is the longest in the industry.* Maybe that's why so many folks have switched to the PC NETWORK for their software needs.

The nation's largest corporations depend on PC NETWORK

Our corporate roster includes some of the nation's largest financial, industrial and professional concerns. 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 and ask about our Major Corporation Membership Program, and feel free to inquire which companies have already joined!

CALL 1-800-621-S-A-V-E
In Illinois call (312) 280-0002

Your Membership Validation Number: W2C1

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!

Copyright ©1984, PC NETWORK INC.

Circle 460 on reader service card

PC NETWORK

Buy Hardware And Software at Wholesale + 8% And Get 14-28 Day Software Rentals† . . .

Below is a sampling of the over 20,000 products available from the NETWORK at our everyday low prices!

GAMES & EDUCATIONAL SOFTWARE

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Avant-Garde *Air Traffic Controller*	$18.50*
Bluebush *Chess (Your Toughest Opponent)*	34.00*
Broderbund *Lode Runner*	19.75*
CBS *Goren-Bridge Made Easy*	48.00*
CBS *Mastering the SAT*	81.00*
Epyx *Temple of Apshai*	21.97*
Infocom *Zork I or Witness*	21.50*
Infocom *Deadline or Suspended*	27.00*
Microsoft *Flight Simulator*	27.00*
Orion *Bird (QBert Look Alike)*	22.00*
Scarborough *Mastertype*	27.00*
Screenplay *Asylum (works with mono card too)*	15.50*
Sierra On-Line *Frogger*	21.00*
Sierra On-Line *Crossfire*	18.00*
SubLogic *Night Mission Pinball*	24.00*
Spinnaker *Alphabet Zoo*	17.00*
Spinnaker *Delta Drawing*	29.00*
Spinnaker *FaceMaker*	20.00*
Spinnaker *Hey Diddle Diddle*	17.00*
Spinnaker *KinderComp*	17.00*
Spinnaker *Rhymes & Riddles*	17.00*
Spinnaker *Story Machine*	20.00*
Spinnaker *Most Amazing Thing*	23.00*
Virtual Combinatics *Micro Cookbook*	21.00*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

ATI *How to use MultiMate*	$42.00*
ATI *How to use Microsoft Word*	42.00*
ATI *How to use Lotus 1-2-3*	42.00*
► **Ashton-Tate** *DBASE III*	347.50*
► **Ashton-Tate** *Framework*	347.50*
Ashton-Tate *Friday!*	158.00*
Central Point *Copy II PC*	23.00*
Conceptual Instruments *Desk Organizer*	177.00*
Cosmos *Revelation (Requires 8087)*	575.00*
Digital Research *CP/M-86*	33.00*
Digital Research *DR Logo*	57.00*
Digital Research *PL/I Compiler*	399.00*
Digital Research *Concurrent CP/M—Windows*	90.00*
Funk Software *Sideways*	36.00*
Harvard *Harvard Project Manager*	215.00*
► **Hayes** *Smartcom II—New UTIOO Emulator*	68.00*
Human Edge *The Management Edge*	145.00*
Human Edge *The Sales Edge*	145.00*
► **Lotus Development** *Lotus 1-2-3*	270.00*
Lotus Development *Symphony*	CALL
MicroRim *RBase 4000*	230.00*
Microsoft *C Compiler*	275.00*
Microsoft *Word with Mouse—Latest Version*	255.00*
Microsoft *Multiplan*	105.00*
Monogram *Dollars & Sense*	89.90*
► **Multimate** *Multimate (Latest Version)*	240.00*
Oasis *The Word Plus*	90.00*
Open Systems *P/O Sales A/R INV G/L A/P Team Mgr*	370.00*ea
RDS *Informix*	510.00*
Real World *G/L A/P A/R P/R or OE/INV*	387.50*ea
Rosesoft *Prokey Version 3*	74.00*
Ryan McFarland *RM COBOL (Dev. System)*	570.00*
Samna *Samna III Word Processor*	325.00*
Satellite Software *WordPerfect*	210.00*
Softcraft *Fancy Fonts*	125.00*
Softstyle *SET-FX*	35.00*
Software Publishing *PFS: File*	72.00*
Software Publishing *PFS: Report*	64.00*
Software Publishing *PFS: Write*	72.00*
Software Publishing *PFS: Graph*	72.00*
TCS *Client Ledger*	730.00*
Verbatim *Disk Drive Analyzer*	25.00*

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh Base System*	1,580.00* *(34.12)*
Apple *Apple //c*	860.00* *(18.58)*
Apple *Apple //e*	CALL
Columbia *Desktop & Portable Systems*	CALL
Compaq *All Models*	CALL
Eagle *Desktop PC and Spirit Portables*	CALL
► **IBM PC Starter System 1 DSDD/ FDC/Color CD/Par Port/Monitor/64K**	1,642.00* *(35.47)*
► **IBM PC Base System 2 DSDD/FDC/256K**	1,625.15* *(35.10)*
► **IBM PC Professional Hard Disk (XT) (1 DSDD/FDC/10 MB Hard Disk/256K)**	2250.15* *(48.60)*
IBM PC/AT All Configs	CALL
Sanyo *MBC 550 "Lowest Cost Compatible"*	640.00* *(13.82)*
Tava *PC Complete IBM Compatible (64K/Color or Mono Card/2 drives)*	1,450.00* *(31.32)*
Texas Instruments *Professional*	CALL

DISK DRIVES & CONTROLLERS

► **Cogito** *1/2 Ht Low Power 10MB Winchester W/IBM Controller*	735.00* *(15.83)*
IBM *Floppy Disk Controller*	75.00* *(2.50)*
► **Maynard** *WS-1 10MB Internal Hard Disk with Sandstar Multi Function Card*	770.00* *(16.15)*
► **Maynard** *WS-2 same as WS-1 but with Sandstar Floppy Controller (uses 1 slot)*	930.00* *(20.30)*
Maynard *Floppy Controller/Serial Port*	145.00* *(2.50)*
► **Panasonic Half Height DSDD Drive Pair**	225.00* *(5.40)*
Qume *Half Height DSDD Drive Pair (Same as used on IBM Portable)*	350.00* *(7.00)*
► **Tandon** *TM100-1 Full Height DSDD Drive*	153.00* *(3.15)*
► **Tandon** *10MB Internal Winchester w/IBM Controller*	685.00* *(14.85)*
► **Tallgrass** *20MB External Hard Disk with Tape Backup*	2,150.00* *(46.44)*

MEMORY CHIPS

All chips guaranteed for life

► **64K Memory Upgrade Kits (9 Chips)**	35.55* *(1.00)*
► **64K Dynamic Ram Chips (Each)**	3.95* *(1.00)*
256K Dynamic Ram Chips (Each)	33.00* *(1.00)*

MODEMS

Anchor *Mark XII LOWEST PRICE 1200BPS HAYES COMPATIBLE EXTERNAL MODEM!*	230.00* *(5.00)*
Hayes *Smartmodem 300*	180.00* *(3.60)*
Hayes *Smartmodem 1200B with new Smartcom II VT100 Emulator*	366.90* *(8.50)*
Rixon *R212A Stand Alone 1200BPS*	335.00* *(8.50)*
U.S. Robotics *Password (Compact 1200BPS External)*	290.00* *(6.50)*

MONITORS

Amdek *Video 300G Composite Green*	110.00* *(3.00)*
Amdek *Video 300A Composite Amber*	120.00* *(3.00)*
Amdek *Video 310A IBM Type Amber*	130.00* *(3.00)*
Amdek *Color 300 (NEW!) Composite*	215.00* *(4.64)*
Amdek *Color 500 (NEW!) Composite/RGB/VCR*	320.00* *(6.91)*
Amdek *Color 600 (NEW!) High Res RGB*	395.00* *(8.53)*
Amdek *Color 700 (NEW!) Ultra High Res*	455.00* *(9.83)*
Amdek *Color 710 (NEW!) 700 w/Non-Glare/Long Phosphor*	485.00* *(10.48)*
Princeton *HX-12 RGB Monitor*	CALL
Princeton *MAX-12 IBM Mono*	CALL
Princeton *SR-12 Ultra High Res RGB*	CALL
► **Quadram** *Quadchrome II NEW! 640x200 RGB w/14" Screen/ Black Phosher Mask/IBM Case*	370.00* *(8.21)*
Taxan *420 Super High Res RGB Monitor*	380.00* *(8.21)*
Taxan *440 Highest Res RGB (720x400) Currently Available Works With Persyst Bob Card*	525.00* *(11.34)*
Zenith *ZVM-123 Green High Res (Consumer Reports Rated Best Buy!)*	76.00* *(2.50)*

MULTIFUNCTION CARDS

Apparat *256K Memory Board with OK*	67.00* *(2.50)*
Apparat *Combo II w/ser/par/game/ clock/stwr*	123.00* *(2.50)*
► **AST Six-Pack Plus with OK**	197.00* *(2.50)*
AST *MegaPlus II with OK*	205.00* *(2.50)*
AST *I/O Plus II*	105.00* *(2.50)*
► **ORCHID BLOSSOM W/64K** *Multifunction with networking at an unbelievable price. Up to 384K/ Ser/Par/Clock/Software/Net Slot*	205.00* *(2.50)*
► **Quadram** *Improved Quadboard w/OK*	199.00* *(2.50)*
Tecmar *Captain Multifunction Card O/K*	195.00* *(2.50)*

PRINTERS

Amdek *5025 (NEW!) 25CPS LQ w/2K Buffer*	525.00* *(10.48)*
C. Itoh F10/40 *Starwriter 40 CPS LQ*	875.00* *(18.90)*
C. Itoh *Prowriter 8510 AP*	285.00* *(6.16)*
Epson *RX-80*	267.90* *(6.00)*
Epson *FX-80*	415.00* *(9.25)*
Epson *FX-100*	600.00* *(14.35)*
Epson *LQ1500*	CALL
Epson *IBM-to-EPSON Parallel Cable*	21.00* *(1.00)*
NEC *2030 20CPS LQ Parallel*	625.00* *(16.53)*
NEC *2050 20CPS Letter Quality Printer*	875.00* *(14.58)*
NEC *3530 33CPS LQ Parallel*	1,185.00* *(31.54)*
NEC *3550 33CPS Letter Quality Printer*	1,315.00* *(24.40)*
NEC *8850 55CPS LQ New Model IBM Version*	1,710.00* *(36.94)*
Okidata *ML84P 200CPS 132 Col*	720.00* *(16.00)*
Okidata *ML92P 160CPS 80 Col Printer*	395.00* *(8.55)*
Okidata *ML93P 160CPS Wide Platen*	590.00* *(15.00)*
Okidata *2410P Pacemark 350CPS*	1,850.00* *(60.00)*
Okidata *IBM-to-Okidata Parallel Cable*	20.75* *(1.00)*
Qume *Sprint 11/45 45CPS Letter Quality*	1,155.00* *(24.00)*
Qume *Sprint 11/90 90CPS Letter Quality New! Fastest Daisywheel Out!*	CALL
Qume *IBM Cable and Interface (required)*	72.00* *(1.00)*
► **Star Micronics** *Gemini 10X 120 CPS w/Tractor Epson Graphics Compatible*	225.00* *(4.86)*
► **Star Micronics** *Gemini 15X 10X Features w/132 Col*	325.00* *(7.02)*
► **Star Micronics** *Powertype 18 CPS LQ Diablo Code Compatable*	300.00* *(6.48)*
Texas Instruments *855 DP/LQ w/Tractor*	718.00* *(15.50)*
Toshiba *P-1340 80 Col Version of P-1351*	696.00* *(15.03)*
Toshiba *P-1351 160/100 CPS Draft/LQ LQ Printer*	1,200.00* *(25.92)*

VIDEO CARDS

► **Amdek** *MAI Card*	310.00* *(2.50)*
Eagle *Monochrome Display Card*	160.00* *(2.50)*
► **Hercules** *Monochrome Graphics Card*	298.00* *(2.50)*
► **Paradise** *New Modular Multidisplay Card*	CALL
Persyst *Bob Card Ultra High Res Color Card with Mono Quality Text in Color*	365.00* *(2.50)*
Quadram *Quadcolor I Color Card*	170.00* *(2.50)*
Quadram *Quadvue Mono Card w/Ser/Par/Clock*	210.00* *(2.50)*
STB *Graphix Plus II NEW! (simultaneous Mono Graphics & Color)*	295.00* *(2.50)*

ACCESSORIES AND SUPPLIES

► **Brand Name DSDD Diskettes** *Guaranteed for Life! Not Generic*	16.00* *(1.00)*
Curtiss *PC Pedestal II*	36.00* *2.50)*
► **Keytronic** *KB5151 Deluxe IBM Keyboard*	170.00* *(4.00)*
Source-Tek *Replacement 100W IBM-PC Power Supply lets old PC's Drive Internal Hard Disk & More*	215.00* *(4.64)*
WP Printer Paper *2500 Sheets Microfine Perfs (invisible when torn)*	17.00* *(10.00)*

*PC NETWORK Members pay just 8% above the wholesale price, plus shipping. All prices reflect a 3% cash discount. Minimum shipping 2.50 per order.

†*RENT BEFORE YOU BUY—Members are eligible to join PC NETWORK's Business and Game Software Rental Libraries for a much smaller fee than other software rental services. And PC NETWORK's rental charges are far less—just 20% of the Members WHOLESALE PRICE.*

Hardware prices highlighted by ► reflect recent major price reductions

CALL TOLL FREE **1-800-621-S-A-V-E** (orders and memberships only)

In Illinois call (312) 280-0002 validation code W2C1

COMPLETE IBM™ PC SYSTEMS

IBM PC STARTER SYSTEM

IBM PC w/64K (256K capacity) **$1,642.00*** *(35.47)*

Floppy Drive Controller
1 Double Sided Double Density 320/360 Disk Drive
Hercules Color Card w/Parallel Port
Zenith ZVM-123 Display Monitor

CALL FOR LATEST IBM ANNOUNCEMENTS

The NETWORK has the perfect starter system for you! The combination of a double sided drive, color card and printer part allows you to run most any program and grow without need for replacing any component you buy now.

IBM PC BASE SYSTEM

IBM PC w/256K **$1,625.15*** *(35.10)*

Floppy Drive Controller
2 Double Sided Double Density 320/360K Disk Drives

The Base System is your lowest cost starting point for configuring the exact system of your choice. Combine it with any of the monitors, video cards, multifunction cards and accessories listed in this ad, and prove the Network can't be beat as your system source.

IBM PC PROFESSIONAL HARD DISK SYSTEM (XT)

IBM PC w/256K **$2,200.15*** *(48.60)*

Floppy Drive Controller
1 Double Sided Double Density 320/360K Disk Drive
w/Tandon 10MB Hard Disk Subsystem:
Automatic Hard Disk Boot Feature

CUSTOM CONFIGURATIONS WELCOME

This system increases productivity in any business or professional situation. The 10Mb hard disk eliminates cumbersome floppy disk changes, simplifies operations and dramatically speeds program execution time. The NETWORK's buying power provides you with better than XT performance at a price lower than you'd expect to pay for a standard PC.

*PC Network Members pay just 8% above this wholesale price plus shipping. These prices have been prepared in September, 1984 and may have been changed with new product announcements. Call for latest prices.

LATEST REDUCTIONS!

64K MEMORY EXPANSION KITS ..... **$ 35.55***
Set of 9 chips *Guaranteed for Life.*

LOTUS 1-2-3 ..... **$270.00***
New Best Price!

AST SIX-PACK PLUS with OK **197.00***

TANDON 10MB INTERNAL HARD DISK **685.00***
Low Power Automatic Boot

STAR MICRONICS GEMINI 10X **225.00***
120 CPS Epson IBM Graphics Compatible w/Tractor

TANDON TM100-2 DRIVES **153.00***

TALLGRASS TG3020 ..... **2150.00***
20 MB Hard Disk w/25 MB Tape Backup

ORCHID BLOSSOM/64K installed **205.00***
New Price! Full Six-Pack Features with networking capability!

PANASONIC/SHUGART ..... per pair **225.00***
1/2 Height Disk Drives with Mounting Kit

AMDEK MONITORS
V300G Composite Green **110.00***
V300A Composite Amber **120.00***
V310A IBM Amber **130.00***

HERCULES MONOCHROME CARD **298.00***

HAYES 1200B with New Smartcom II **366.90***

C. ITOH STARWRITER F10/40 ..... **875.00***
40 CPS-Letter Quality Printer

BRAND NAME DISKETTES **16.00***
DS/DD Box of 10 *Guaranteed for Life Not Generic*

*NETWORK members pay just 8% above these wholesale prices plus shipping.

PC NETWORK

America's Number 1 Computer Buying Service Brings You These 15 Exclusive, Money-Saving Benefits . . .

Join PC NETWORK for as low as $8 for one year (or $15 for two years) and receive all these exclusive, money-saving benefits:

1 COST + 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 400 PAGE WHOLESALE CATALOG—Members receive our 400 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.

3 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. ***EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.***

4 10 DAY RETURN POLICY—If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.

5 MEMBERSHIP SATISFACTION GUARANTEE—If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—OR IS INCOMPATIBLE WITH YOUR SYSTEM—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

7 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!**

†**8 OPTIONAL BUSINESS RENTAL LIBRARY**—All members can join our BUSINESS RENTAL LIBRARY ***featuring over 1000 available titles*** for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNTED 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 28 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†**9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY**—The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS—THE PRINTOUT—The NETWORK seeks every opportunity to save money for its members. We buy excess dealer inventories, and store bankruptcy closeouts regularly. We then turn around and make this merchandise (only top quality name brand products) available to our members at fantastic savings via THE PRINTOUT, our newsletter and savings bulletins.

11 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left)*. The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 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!!**

CALL TOLL FREE

1-800-621-S-A-V-E

In Illinois call (312) 280-0002

Your Membership Validation Number: W2C1

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.

PC NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

The Nation's Largest Corporations Depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial, industrial and professional concerns *including some of the most important names in the computer industry:*

AT&T	*Harvard University*
Barclays Bank	***Hewlett Packard***
Bell & Howell	*Hughes Aircraft*
Citibank	***IBM***
Columbia University	***ITT***
Data General	*Kodak*
Farm Bureau Insurance	***Multimate***
Frontier Airlines	*Standard Oil of Ohio*
General Mills	*University of Chicago*
Gillette	*Veteran's Administration*

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.

PC Network's Try-Before-You Buy Software Evaluation Service is the Ideal Way to Avoid Costly Errors in All Your Software Purchases!

SPECIAL V.I.P. MEMBERSHIP

A limited number of PC NETWORK V.I.P. Memberships are available at just $15 for one year or $25 for two years.

V.I.P. Members receive additional benefits:

1. FIRST PICK ON "BELOW WHOLESALE" SPECIALS—V.I.P. Members are given preference in the purchase of any "below wholesale" merchandise specials as featured in the "PRINTOUT" where only limited quantities are available. Whether it be 75¢ diskettes or $3 chips, V.I.P. Members often earn back the membership cost difference the first time they exercise this option.

2. V.I.P. SAVINGS ON SOFTWARE RENTAL LIBRARIES—All V.I.P. Members are eligible to join our Business AND Game Software Rental Libraries for just $30 per year in addition to the basic V.I.P. membership fee. All the same conditions apply to the V.I.P. Libraries as the Basic Membership Libraries.

3. EXTENDED V.I.P. RENTAL PRIVILEGES—V.I.P. Members can enjoy their rented merchandise longer . . . **a full 21 days instead of the twelve days allowed with our Basic Membership.**

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 $480 ($160 per issue). We offer a six-time insertion, 15 percent discount contract for a total of $816 ($136 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

Computer Covers

PC Covers & More . . .
Protect your PC & XT investment with our sturdy, clear antistatic vinyl dust covers. 2 piece set. (One covers monitor/system unit, one covers keyboard.) Only $15.95. $1 s/h. Visa/MC/chk. Printer & other covers avail. Call/write to order. Free catalog of unique & useful accessories. *SGW Enterprises, Inc., 722-J Genevieve St. Dept. W, Solana Beach, CA 92075, 619/755-8324*

Computer Cozies?
Beautiful, hand-made, quilted dustcovers. A classy alternative to vinyl. Vinyl can damage machines by retaining heat. These covers are anti-static & machine washable. Offered in six colors: grey, chocolate, cream, wine, navy, & rust. Perfect Christmas gift. Prices from $20. Send for brochure. *Covers A Lot, P.O. Box 369, La Honda, CA 94020, 415/747-0352*

Supplies

Keytops/Key Overlays
Touchdown™ full size keytops enlarge major control keys on IBM & most compatibles. State model & color: black or IBM grey, $21.95. Touchdown™ key overlays available for 5251, 5520, DisplayWrite2, *WordStar* & most popular software, plus do-it-yourself kits. $6.95 -$29.95. U.S. orders postpaid. *Hooleon Company, Dept. WD, P.O. Box 201, Cornville, AZ 86325, 602/634-7517*

• Computer PAPER •
Letter Quality, Letter Size, 20 lb. weight, Continuous Forms with CLEAN BREAK PERFORATION, 540 sheets, First Quality GUARANTEED. Only $7.95, tax included. Add $2 shipping & handling. Continental USA only. Make check payable to: *DVR Distributing, 20993 Foothill Blvd. #724, Hayward, CA 94541, 415/886-6171*

Surge Suppressors

Quality Protection
Protect your computer from high voltage spikes with PROTECT-ALL™ surge suppressors. Two models: each has 6 outlets, monitor light, ivory case & 2 year warranty. Approx. 3.5" X 5". Components UL listed. PRO-1, wall mounted, $39.95; PRO-2, on/off switch, 6' cord, $59.95. Add $2 handling. OH Res. add 5.5% tax. Visa/MC/Chk. *Paxton Products Inc., 1101 Paxton Rd. #5, Cincinnati, OH 45208, 513/321-0400*

Agents, Software

Attention Programmers
Our established literary agency is seeking to represent talented software authors. We open doors for our clients at the leading software publishers & negotiate the best possible deals. For further information on the benefits of representation, please contact: *The Robert Jacob Agency, 1642 Eveningside Dr. #110, 1000 Oaks, CA 91362, 805/492-3597*

Business Opportunities

Medical/Dental Franchises
Software development company needs to establish dealers. Open item accounts receivable systems will print patient statements, all third party insurance claims, patient & clinical recall, day sheets, financial & statistical reporting for the medical office. Installed & supporting over 75 medical offices nationwide. *MTA Medical Systems, 4825 Heffield Circle, Syracuse, NY 13215, 315/488-1518*

Market Research/Survey
Entrepreneurs needed to establish local branches of research/survey dept. related to computer/engineering products. Full/part time. Regular amazing second income filling R & S questionnaires for domestic/international corporations. Limited offering. Send $2 or stamps for package. *KBW & Associates, P.O. Box 1304, Cerritos, CA 90701, 213/926-8983 eve. TLX 4940708*

Distributors Wanted
University Park Press, an innovative medical publisher established in 1969, is seeking distributors to sell its successful, high profit IBM PC & XT microsoftware for critical care medicine to the lucrative hospital markets. Call: *Vince Spittal, University Park Press, 800/638-7511*

Communications

Tel-A-Switch
An external add-on device that turns on/off PC/XT via the phone. Simply connect Tel-A-Switch to PC/XT's power cable & Smartmodem. Also allows PC/XT to turn itself off. A special remote program allows Tel-A-Switch to turn PC/XT into an unattended host. Run under PC-DOS 1.10, 2.00. Price from $175. *Texas Technology Company, P.O. Box 740694, Dallas, TX 75374, 214/783-9218, TLX: 6501125324*

Computer Products

LF Computer Products
Computers: IBM Compatibles. Peachtree Software: GL, AR, AP, InvCtl. $389 each. Back to Basics set Accounting for IBM PC, $225; complete lines of software at bargain price. New LF 5¼" High Quality Disks 100% error free, SSDD $1.75, DSDD $2.25; 3½" disk & full computer supplies, printers, drives, boards, modems, etc. *LF Computer Products, 8660-D Miramar Rd. #265, San Diego, CA 92126, 619/566-6823*

Computer Repair

DEC & PC/XT Repair

We repair DEC & IBM PC/XT computers, peripherals & disk drives. We offer a 5-day or emergency 1-day service along with a 120-day warranty & extremely low prices. We have been repairing computers for over 7 years. The next time you need repair try us! *Electronic Service Specialist, N92 W14612 Anthony Dr., Menomonee Falls, WI 53051, 414/255-4634*

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*

Computers & Parts

IBM PC/Tava

We offer the parts & peripherals you need to expand or build your PC at the sharpest price. Tava CPU $995. Teac drive $119. AST six pak $210. 64K RAM set $39. 10MG HD $399. 64/256K RAM card $129. Amdek 310A $139. RGB color (720 x 480) $429. Color card $160. Diskettes $1.20. Dealer inquiries welcome. *Integrated Relational Systems, P.O. Box 3283, Gaithersburg, MD 20878, 301/840-9530*

Consultants

California

IBM PC Consulting

We specialize in business applications of the IBM PC. We provide software consulting, custom programming, on-site training & support. We work with people who have little or no computer experience. Let us help you with *Wordstar, 1-2-3, dBASE II*, or any other business program for the IBM PC. *Centurion Systems Corp., 4333 Price St. #203, Los Angeles, CA 90027, 213/665-4677*

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)*

dBASE Consultants

We're the experts!

- We write custom software
- Specialists in order entry, accounting, mailing list mgmt.
- Write for a catalog of *dBASE* utilities

Call or Write: *David Jenkins, Midway Software Inc., 1609 Bancroft Way, Berkeley, CA 94703, 415/644-2369*

Advance to Vance

Finding the perfect computer fit for your business can be time-consuming & costly! As data processing professionals specialized in IBM PC business systems integration, we understand these concerns. We offer user-needs analysis, hardware & software selection, training, custom programming w/dBASE III & Lotus *Symphony*, networking, telecommunications, etc. *Vance Info Systems, 2818 Clay St., San Francisco, CA 94115, 415/922-6539*

Disk Copy Service

Superior Disk Copying

Allenbach created the industry, & we've since been imitated—but never duplicated. Copies supplied on OEM quality Allenbach LIFETIME GUARANTEE diskettes, now avail. in a variety of colors! Virtually all formats & systems. Copy protection, serialization, downloading & packaging avail. Rapid delivery on 100 to 1,000,000 copies. *Allenbach Industries, Inc., 2101 Las Palmas Dr., Carlsbad, CA 92008, 800/854-1515, (CA) 619/438-2258 collect*

3½" • 5¼" • 8"

SOFTWARE DUPLICATION on Premium Diskettes. Full service duplication house, including copy protection, private labeling & custom packaging. YOUR NEEDS ARE UNIQUE. Our service is responsive, expert & cost effective. A decade of servicing small & major customers. *Computer Media Products, 5482 Complex St., San Diego, CA 92123, 619/565-7802*

Western Transdata, Inc.

Why risk duplicating your important programs on your computer, when *our* equipment is designed solely to duplicate disks & verify their perfection 100%? Over 600 formats including Commodore 64. Plus serialization, copy protection, labeling, packaging, shrink-wrapping and *fast*, personalized service. *Western Transdata, Inc., 1701 E. Edinger Ave. A-7, Santa Ana, CA 92705, 714/547-3383 (collect)*

9 Track Tape to Disks

Conversion from ASCII or EBCDIC 1600 BPI magnetic tape to PC-DOS 5¼" diskettes. New high speed automated process verifies transfer. Quality guaranteed. Only SIX CENTS per thousand characters. $95 minimum. Other conversions also available. *Austin Scientific Inc., 1259 El Camino #260, Menlo Park, CA 94025, 415/323-6338*

Duplication/Packaging

Specialists in product introductions & peak period needs. Duplication of 3.5, 5.25 and 8 disks. ProLock protection, package assembly of binders (30,000/day) & color disks. Professional attention to QC & inspection. Rapid turnaround. We can help you with 10 to 10,000,000 copies. *Hoffman Computer Products, 1720 Flower Ave., Duarte, CA 91010, 818/303-1571*

We'd Fire Our Mother

You made it right! We duplicate it right! We use SPECTRUM® diskettes made by us to exceed ANSI specs. We're so tough on quality control, we'd fire our own mother if she didn't do it right. We duplicate, serialize & copy protect all diskettes. Anything less than success is not quite good enough. *Memory Media Products, 17032 Murphy Ave., Irvine, CA 92714, 714/863-1101*

Disk Drive Diagnostic

Interchange Diagnostic

Assure interchangeability between drives. In a minute you can be sure to read & write with confidence. R.I.D., a precision recorded disk, checks: drive speed; W/R; alignment; backlash/histeresis; clamping & erase cross-talk to the exact spec. mfgr. established standards. Recover data with integrity. For users & service. Qty. 1-9, $34.95. *Unitrace Incorporated, 3350 Scott Blvd. #20, Santa Clara, CA 95054-3106, 408/727-7573*

Diskettes

Wabash/Super Sale!

SD/SD–#M11A–$15.90/box/10
SS/DD–#M13A–$17.90/box/10
DS/DD–#M14A–$23.90/box/10
96TPI– OMNI–$ CALL
Head Cleaning Kits–$12.95
Printer Paper–$CALL
Add $2 s/h on all orders under

$40. MC/Visa/MO/COD ($1.85), check. MA res. add 5%. *Magnetics, Inc., P.O. Box 98, 153 Main St., South Grafton, MA 01560, 800/334-DISK (-3475), 617/839-4404 (MA)*

Documentation

Technical Writing

Let our experienced staff of technical writers design or upgrade your present user documentation. We write manuals that can be understood by the most casual user. Documentation–from job aids to detailed manuals for:

- Custom systems
- Commercial software packages
- Hardware installation

Call or write for our brochure for more details. *Techwriters, P.O. Box 1954, New York, NY 10185, 718/748-2822*

Hardware

Add-On Boards

AST/Maynard/Quadram

AST MegaPlus(64K) $269, Six-Pak(64K) $269. I/OPlus $129. MonoGraphPlus $389. AST-3780 $659. PCnet-starter $809. MAYNARD Disk Controller $114. Sandstar Series $Call. QUADRAM Quadboard (64K) $269. Quadcolor I $199. HERCULES card $349. Set of nine 64K chips $45. HAYES modems $Call. *VLM Computer Electronics, 10 Park Place, Morristown, NJ 07960, 201/267-3268*

No Slot Memory Upgrade

Let us install up to 256K RAM on your EXISTING SYSTEM BOARD using NO SLOTS. We improve your IBM PC so it can address the 64K RAM chips. 256K, $335 (expandable & warranteed). DO-IT-YOURSELF KITS, PC-KPC, $69.95. With assembled no slot PC Board, $99.95. 64K-RAMS ($5.85 ea). *Add-MEM, 22151 Redwood Rd., Castro Valley, CA 94546, 415/886-5443*

256K Expandable Mem

64K-256K User Expandable (Socketed) Parity Memory, Precision Delay, Line Timing, Switch Selectable Start Address on 64K Boundaries anywhere in 1M Address Space, Hold-Down Bracket & Card Guide. 1 year warranty. Fully tested memory board, $98. RAM 64K increments, $49 ea. (9 64K chips, 200ns). Call for latest prices. *Ontrax, Inc., P.O. Box 368, Oakhurst, NJ 07755, 201/244-2302*

IEEE-488 Interface

Complete implementation of the IEEE-488 std. On-board firmware supports all data/command transfers & many special features. Our customers include HP, TEK, IBM, & major OEMs worldwide. Uses standard cables. Comprehensive documentation. See *Byte* 2/84, p. 334. $395. *Capital Equipment Corp., 10 Evergreen Ave., Burlington, MA 01803, 617/273-1818*

Voice I/O for IBM PC

Talk back to your PC! Expansion board takes voice input, stores on disk, gives high fidelity playback. Low data storage rate (1K to 2K per sec.). Runs under PC-DOS. We provide device drivers & demo software. DIALOG/1 with voice I/O for $295. DIALOG/2 with phone interface, $495. DIALOG/3 with 300B modem, $595. Send for data sheets. *Dialogic Corp., 164 McKinley Ave., East Hanover, NJ 07936, 800/221-0393, 201/386-0202*

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., 6802 NW 20th Ave., Fort Lauderdale, FL 33309, 305/975-9515*

Graphics and Memory

High performance, low cost, color graphics adapter runs B & W, 16-color RGB output, light pen interface, composite video, characters for games, scientific notation, etc. $185. For memory, 128K for $228, 256K for $314, 384K for $408. 90-day warranty, 15-day return. Call for others. *H.M. Technologies, 4221 Ringwood Ave., San Jose, CA 95131, 800/225-5468, 408/946-9036*

Automated Data Entry

Bar Code

Read & generate bar code on one short card that talks directly to the PC bus. Two ports, on at all times, are transparent to all applications software. Commercial s/steel wand plugs into port 1 which autodiscriminates 7 codes. Port 2 allows RS232/422/CL input. Keyboard command prints BC from firmware directly through LPTI. Model BCS100. $495. Model BCS100. *Aedex Corporation, 181 W. Orangethorpe Ave., Ste. C, Placentia, CA 92670, 714/528-4700*

BIOS

Fixed Disk BIOS/Boot

FiXT boots from DATAMAC, DAVONG, XEBEC, PERCOM, GREAT LAKES, ZOBEX, others. Adds XT-like BIOS for your disk to IBM PC & COMPAQ. Plug-in installation. DOS 2.00/2.10 req. Specify controller model with order. $70 + $3 shpg. + tax. (Optional volume support at additional cost.) *Golden Bow Systems, Box 3039, San Diego, CA 92103, 619/298-9349*

Disk Drives

Disk Drives for PC

Qume 142A(½ Ht):	$199
Teac FD55B(½ Ht):	$169
TM100-2,DS,40T:	$199
TM101-4,DS,80T:	$295
CDC 9409 DS,40T:	$219

MAYNARD complete Internal 10M Winchester Hard Drive System: WS1: $899, WS2: $1079. *VLM Computer Electronics, 10 Park Place, Morristown, NJ 07960, 201/267-3268*

1.2M PC-At Disk Drives

Replace your PC disk controller & full-height disk drive with our JDISKETTE controller plus our 1.2M & 360K half-height drives for $499. Only $375 without 360K drive, $549 with two 1.2M drives. Put 800K on ordinary diskettes. 1.2M diskettes are $59 per box (10). Mounting brackets & JFORMAT included. Jdiskette also plugs into our JRAM-2 multifunction board. *Tall Tree Systems, 1032 Elwell Court #124, Palo Alto, CA 94303, 415/964-1980*

Graphics Systems

Angel Workstation

High resolution color graphics workstation, 640 × 480, 16 colors from a palette of 4,096. Business presentation, CAD and 3-D software available. Create graphics interactively with mice and digitizers & display images using monitors, computer cameras, video projectors, frame grabbers, printers & plotters. *Media Cybernetics Inc., 7042 Carroll Ave., Takoma Park, MD 20912, 301/270-0240, 301/270-6066*

Multigraph Board

Monochrome & color display adapter compatible with IBM PC. Monochrome graphics (*1-2-3* compatible) with 720h x 350v resolution. Expandable options include "Soft Scroll" smooth scrolling, 132-column display, high resolution color graphics in 16 colors, & more. Price base configuration, $499. *Profit Systems, Inc., 30150 Telegraph Rd., Birmingham, MI 48010, 313/647-5010*

Monitors

Finest .31mm Pitch RGB

Monitor in price range, PX-IV is better than Princeton Graphic Systems HX-12, larger 13" screen & sharper colors with tilt swivel base, green text mode, & cable. List $699. Also, CGA color graphics board (runs Flt. Sim & Lotus *1-2-3*). CGA List $244. Our price PX-IV @ $499. CGA @ $175. PX-IV w/CGA $649. *M. Systems Inc., 27 Station Square, Bergenfield, NJ 07621, 201/387-1109*

Printer Enhancements

PC-WRITER™
Easy to install plug-in module for Okidata ML82A/83A printers. Superior 30 cps LETTER QUALITY print, front panel access to all features, *full* IBM PC compatibility, dot addressable graphics, HEX dump, HELP mode, plus many more! Obsoletes "Plug 'N Play". See your dealer NOW! PC-WRITER makes your ML82A/83A printer TOP QUALITY! *Rainbow Technologies, Inc., P.O. Box 7200, Costa Mesa, CA 92628, 714/241-0565, Telex 386078*

Printers

NEC Spinwriter Catalog
FREE CATALOG! Features the IBM PC compatibles 3550, 2050 and new NLQ PINWRITER. The Ziyad cutsheet feeder for all Spinwriters at $495. Catalog also illustrates all character sets (with alternate sets) available for the Spinwriter & identifies interchangeable Thimbles. Write or call: *WPPS Inc., One Industrial Way, Eatontown, NJ 07724, 201/389-1600*

Storage Devices

Tape Backup System
IBM compatible PCTAPE stores 17.7M per ¼" cartridge in file oriented streaming & start/stop modes w/DMA & menu-driven/batch software. The system is versatile, fast & easy to use w/full MS-DOS 2.00+ support. Ability to append only changed files keeps backups to a minimum. $1595 complete. *Advanced Peripheral Technology, Inc., Sales Dept. P, 9051-L Red Branch Rd., Columbia, MD 21045, 301/992-1952*

Switches

Reboot Button
This simple kit goes behind any IBM PC computer. It is a great way to reboot if your program goes haywire. A touch of the button & you're back in business. Aren't you tired of doing it the hard way? Kit fits IBM PC or XT. Hurry, send $29.80 (add 6% in MN). *Reset Corp., P.O. Box 14809, Minneapolis, MN 55414, 612/489-5892*

Printer/Modem Switch
Fast, easy, automatic way to share a printer or modem with many PCs. No software required. RS232/centronics. Scans for request, locks in, releases when done. LEDs show status. Channels-price: 2-$200, 4-$250, 6-$300, 8-$350. Manual switches for IBM PC. PC board construction enclosed in aluminum box. Centronics 1:2, $99 (wow!); 1:4, $179. Also RS232. *Rose Electronics, P.O. Box 742571, Dept. W, Houston, TX 77274, 713/240-ROSE*

Wanted

Please Help!
Non-profit refugee relief fund desperately needs your old computer, printer, etc. Your gift is fully tax deductible. Please contact: *Brent Danninger, 1010 Corporation Way #201, Palo Alto, CA 94303, 415/969-7682, days*

Insurance

Safeware
If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media & purchased software. As little as $35 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 to 8 Mon. thru Sat. *Safeware, The Insurance Agency Inc., 2929 North High St., Columbus, OH 43202, 800/848-3469 (Nat), 614/262-0559 (OH)*

Leasing

PC•XT•COMPAQ Rental
Don't tie up cash! Attractive rates & flexible terms. Quick delivery anywhere in the U.S. All configurations available. A portion of your payment can apply to purchase. Lease terms of 1 month & up. Customized leases available to fit special budget requirements. Call or write for no-obligation quote. *Use 'r Computers Inc., 12800 Industrial Park Blvd., Minneapolis, MN 55441, 612/559-7096*

Mailing Lists

IBM PC Mailing Lists
100,000 IBM PC owners mailing list available now! We are the largest dealer of microcomputer owners' names, with over 600,000 total ... many different brands. Plus 4519 stores, 2,600 computer clubs, educational lists, micro publications, & much more. Write or call for free catalog. *Irv Brechner, Targeted Marketing Inc., Box 5125, Ridgewood, NJ 07451, 201/445-7196*

Reusable Labels?
Names, addresses & industry codes of 1,000 LARGEST U.S. COMPANIES on diskette. USE OVER AND OVER. Ideal for test markets, press releases, rollouts, surveys, job searches, etc. FREE SORT & LABEL PROGRAM. Compatible with *Mailmerge, dBASE*, & others. $45 postpaid. MC/Visa/MO/Chk. *Competitive Press, Inc., 2206 Pickwick Place, Dept. PW-1, Fullerton, CA 92633, 714/525-3684*

Online Services

SEXTEX
High Society Magazine announces the nation's first erotic online service. Features include: Nationwide multiuser "chatting", e-mail, personals, conferencing, shopping, Dear Gloria Leonard, sigs, games, travel, reviews & more. Very discrete. $65 fee/$11 hr. Send major card or call for brochure. *CVC Online, 801 Second Ave., New York, NY 10017, 212/582-2006*

Publications

dBASE II in English I
New Book Sensation. Simple—Logical—Easy to understand. Perhaps the finest computer book ever written. Will teach any novice to program in *dBASE II*. 242 pages full of great examples. Written by a father and son team who have decoded *dBASE*. Order your copy today. Dealer inquiry invited. Send $29.95 or MC/Visa to: *English I Computer Tutorials, 1617 N. Troy St., Dept. B, Chicago, IL 60647, 312/489-1588*

WordStar in English I
Simple memory codes help you master *WordStar* and *MailMerge* in a few hours. A great reference with 184 pages full of practical examples. Saves time and money for anyone writing letters, charts, envelopes, mailing labels, or form letters. Block moves and IBM special keys fully explained. Order your copy today. Send $12.95 or MC/VISA to: *English I Computer Tutorials, 1617 N. Troy St., Dept. B, Chicago, IL 60647, 312/489-1588*

Retailers

California

Edge-PC: IBM-Like

PC-88 CPU card	$349
Color/Graphic card	$189
Disk adapter with cable	$120
Monochrome Card	$189
Keyboard	$149
System Enclosure	$119
65W Power Supply w/fan	$139
Disk Drive 1/2H/DS/DD	$169

Edge Micro Systems, Inc., 2350 Walsh Ave., Santa Clara, CA 95051, 408/980-9866. Telex 3719075

Security Systems

HDW/SW Solutions

• PC-LOK™
Prevents theft of PC, or boards & locks power switch to protect hard disk data. Black anodized alum. no drilling or special tools. $99.
• DATA-LOK™
Keeps unauthorized users from your confidential info. Encryption protects one or groups of files, Dir. Mgmt. Fast, easy to use. MS-DOS $99. *Qualtec Data Products Inc., 1400 Coleman Ave., #D23, Santa Clara, CA 95050, 408/496-6184*

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*

Practicing Accountants

Ten of the top 12 CPA firms use AMI Software for Professionals. DATAWRITE™ Client Write-up allows custom reports, packs mainframe power into your micro. Expand your practice with Fixed Asset Management, Post Facto Payroll, Practice Management & The TAX MACHINE.™ Nationwide training/support. *Accountants Microsystems, Inc., 3633 136th Place SE, Bellevue, WA 98006, 800/426-8201, 206/643-2050*

Interactive Business Sys.

Integrated software package includes A/R with Order Entry/Commissions & Point-Of-Sale, A/P, Inventory Control/Bill of Material & P.O., auto calculating payroll & G/L with Fixed Assets. 53 detailed reports, audit trails & automatic posting from all modules. Floppy or hard drive. Free brochure. Demo & Manual, $25. *PEP Engineering, 390-N Oak Ave., Calrsbad, CA 92008, 619/434-6023*

Hate Bookkeeping?

Single entry checkbook acctg. system in "C". Emphasis is on simple, fast, data entry w/error trapping. Audit trail is built into normal use. Allows 999 account codes w/budgets, 99 departments, 99 charge cards, bank reconciliations. Options to print checks, flexible, sorting & reporting . Demo $5. Complete program, $95. MC/Visa. MICRO-ONE-WRITE, *William A. Permar, CPA, 1125 Sunnyhills Rd., Dept. W, Oakland, CA 94610, 800/443-0100, ext. 644*

Construction System

Offers fully integrated Job Cost, GL, AP, PY & AR accounting for the XT. Getting Started book, audio-cassette, HELP, online slideshow, & sample company tutorials for the first-time user. Complete manuals to help set up your books on each application. Options: estimating & Lotus interface. *Software Shop Systems, 960 Holmdel Rd., Holmdel, NJ 07773, 800/554-9865*

CPA Review

IBM PC takes the work out of preparing for the exam. AICPA questions with referenced solutions are random generated by exam weights. Study single, multiple or all categories with or without solutions. Scores, creates results table & updates data base for future study. Sold by section. *Micro Mash, P.O. Box 6512, Huntsville, TX 77340, 409/295-1597*

Adventures

Want Some A.S.S.?

Exciting, Fun & New! American Sterling Software (A.S.S.) is proud to present VENTURE III! Easy to use! Ideal for everyone! Explore the uncharted inner depths of this long-forgotten series of crusty caverns. Collect the treasures, battle the enemies & emerge victorious! If you dare . . . $39.95. *American Sterling Software, 1280 C Newell Ave. #187, Walnut Creek, CA 94596, 415/946-1777, ext. 201*

Agricultural

Feed Blending Programs

MIXIT-2 ($595) finds least-cost rations for all animals. Hundreds of ingredients & 57 user-chosen nutrients. MIXIT-3 ($995) runs multiple rations. Each ration is stored on disk and summarized in a one-page output. PRICE-IT ($395) is a feed pricing and inventory program. Demo disks available. *Agricultural Software Consultants, 1706 Santa Fe, Dept. P, Kingsville, TX 78363, 512/595-1937. Telex 757375*

Assemblers

Cross-Assemblers

Use your desktop computer as a development system with Avocet assemblers—the industry standard since 1980. Available for CP/M-80, CP/M-86, & PC-DOS/MS-DOS host systems, in most popular disk formats. Target chip families: 6805, 6809, 1802/05, 8048, 8051, 6502, 6800, NEC7500, F8, Z8, COP400, 8085, Z80. $200 to $500. *Avocet Systems, Inc., 804-W South State St., Dover, DE 19901, 800/448-8500, 302/734-0151*

Simulate & Assemble

IBM PC will assemble, program & simulate microcomputer code for 8048, 8051, Z8, 7000, 8085, etc. Execute & debug HEX files w/unique windowed simulator. Watch your code run. EPROM Programmers avail. –Assemblers $195 –Progs. 8749/8751/27XX $245 –Simulator/debugger $395 *Cybernetics Micro Systems, P.O. Box 3000, San Gregorio, CA 94074, 415/726-3000*

Cross Assemblers

Operating on IBM PC & PC compatibles under MS-DOS, CP/M, relocatable 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

Backup Restore

Backup data base or other files from a Winchester to a floppy under Concurrent CP/M and/or CP/M-86.
• Automatic volume mgt.
• Selective file backup/restore
• Data base backup/restore
• Compression reduces space required to store data
Requires IBM PC/XT or clone w/128K RAM, 1 dd & Winchester disk. To order use MC/Visa, or send $99 to: *Award Software, Inc., 236 North Santa Cruz Ave., Los Gatos, CA 95030, 408/395-2773*

Fast XT Backup

DATACARE™ lets your XT fly! Backs up a full 10M hard disk to diskettes in 22 minutes–any type/number of files. Better verification. No more data loss. Optimum use of your time & equipment. Nothing to learn: works just like your DOS Backup. 30-day unconditional guarantee. $129. Visa/MC. *Ellicott Software, Inc., 3777 Plum Hill Court, Ellicott City, MD 21043, 301/465-2690*

Business Applications

Myte Myke™ Business Pkg

Commercial Grade—Integrated
• BUSINESS ACCT: o/e, p/o, a/r, s/a, inventory, a/p, g/l
• MFG CTRL: std cost bom, oper rtg, where used, fcst-sched, mrp, mpp, prod order proc, sfc
• PROTIME: time & analysis, installation + ongoing support avail. CP/M, PC-DOS, MS-DOS, UNIX, others. *MDS Associates, P.O. Box 108 Orchard Park, NY 14127, 716/662-6621*

Linear Programming
MINI-MAX ($395) is saving a copper refiner in Ashland, IL, $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, 1706 Santa Fe, Dept. P, Kingsville, TX 78363, 512/595-1937. Telex 757375*

LP88-Linear Programming
Solves problems with 255 constraints & 2255 variables. Fully menu-driven, spreadsheet-style display, double-precision accuracy, Revised Simplex method start/restart options, primal & dual solutions, sensitivity analysis, report generator, storage of problems & bases, user's guide & examples. $88. *Eastern Software Products, P.O. Box 15328, Alexandria, VA 22309, 703/360-6942*

Save $ On Phone Costs
Increase office efficiency with PHONECHEK The Telephone Manager for the IBM PC, XT & PCjr. Generates summary & detail reports necessary to allocate phone costs to departments, extensions, or to clients for bill back purposes. Discourages phone abuse. Helps determine need for WATS or SPRINT. $279. PHONECHEK, THE TELEPHONE MANAGER, *XIOX Corp., 1720 S. Amphlett Blvd. #120, San Mateo, CA 94402, 415/571-7911*

Solve Problems in English
MASCOPE solves Linear & Integer Programming problems in everyday English. No difficult jargon or syntax. Its just like writing on a sheet of paper. Everything is menu-driven. Helpful prompts & tutoring are provided at each step. Problems are entered, saved & recalled w/o using other software/editors. Demo disk with manual is available. *Management Analytic Support, Inc., Route 4, Box 4127, La Plata, MD 20646, 202/293-1624*

Do Surveys with Your PC
Assessment Survey Kit (A.S.K.). Customer satisfaction surveys, market research, employee surveys, opinion polls, ratings. Create questionnaires, process data quickly & easily, study sub-populations, print statistical reports. IBM PC, 128K, 1 drive. $395 + $4 shipping. Full-feature preview $25. *Shamrock Press, Division of Karl Albrecht & Associates, 1277 Garnet Ave., P.O. Box 90699, San Diego, CA 92109*

Business/Home

¢heapware™
TAX RECORD: Create & update ledger entries on disk for any calendar year in 32 different types and 8 classes. Program can display & print entire ledger or print ledger entries for any month, type or class. Video display is in 40 column width. RAM disk recommended. $22.50 postpaid. *Robert L. Nicolai, 4038 N. 9th St., St. Louis, MO 63147, 314/621-7618*

Menu-Driven Lotus
Checkbook & shoebox acctng. Home or business. Menu entry tracks expenses & income. Your codes or IRS sched. A or C. Prints monthly summary by acctng. codes & totals. $35 ea. Business or home mailer. Prints form letters & labels, $25. IBM PC covers, set of 3, $21. Combo chkbook/mailer, $45. COD ok/$2 ship. Specify format: IBM/COMPAQ. Menu-driven programs to specs. Visa/MC. *Audi Electric, P.O. Box 7445, Fremont, CA 94537, 800/321-4130 (NAT), 800/621-5293 (CA)*

Public Domain Software
Our Users Group library can help you get more from your PC or PCjr! Choose from these software packages:
- SAMPLER DISK–One get-acquainted disk, $10.
- *WordStar* SPECIAL–Help for *WordStar* users, $10.
- PC SIX-PAC–Six disks containing a wide variety of useful software, $49.

Send in your order today (please include $2 s/h). Catalog included. *Central California Users Group, P.O. Box 8140, Santa Cruz, CA 95061*

Calculator

The Disk Calculator
A premium desk-top calculator. Features: 18 digit results; decimal selector; constant; running totals; subtotals, item numbering; date stamping; printing comments; recalling results; accumulating a series of results; chained calculations; power; percentages; future & present values; User's Guide. $29. *RJL Systems, 106 New Haven Ave., Milford, CT 06460, 203/878-0376*

PC-Calculator™ Plus
Combine the simplicity of a calculator with the flexibility of a spreadsheet to solve financial, statistical & scientific problems with ease. Save/Recall/Edit/Print & Recalculate all entered functions. Provides over 40 functions with tutor & HELP facility. $49.95 + $2.50 ship. NY + 7%. Chk/MC/Visa. *Alternative Decision Software, Inc., 11 Robinwood Court, Lancaster, NY 14086, 716/683-4603*

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"™
Our 4th yr. Now Avail. for PCs. Organize your collectibles (Dolls, Antiques, HHG's, Hummels, Trains, you name it) all on one disk. Disk holds 2000 items. Unlimited capability by copying master (it's allowed). Sorts Alph/Numeric with Cost/Cur Val at touch of a key. For PC/XT (128K-DOS 2.00/2.10). Free brochure, or $65. *The Third Rail, P.O. Box 143, O'Fallon, IL 62269, 618/632-7424*

Collections Unlimited
Finally, a single program enabling all types of collections-Coin/Stamp/General–to be recorded & maintained with the same easy to use, menu-driven program. File, correct, print, sort, calculate total value, generate "Want List" & many other features. For IBM PC & jr. $34.95–$2 s/h. PA res. add 6%. *Able Software, P.O. Box 422, Kulpsville, PA 19443, 215/368-2518*

Compilers

C Compiler Debugger
- Full C Compiler per K&R
  - Inline 8087 or Assembler Floating Point
  - Full 1M Addressing for Code or Data
- MS-DOS 1.10/2.00 Library Support
  - Incl. Exec, Wait, Alloc & Free
  - Environment Avail. to Main
- c-window™ C Source Code Debugger
- Fast 8088/8086 Assembler

Combined pkg. $199. *c-systems, P.O Box 3253, Fullerton, CA 92634, 714/637-5362*

Wizard C Compiler
Full UNIX system 3 compatibility with up to 1 megabyte of code & data, fast compilation & compact code. Best diagnostics available anywhere. Floating point math library. Includes all library source. In-line assembly. PC/MS-DOS 2.00 & 2.10. Assembly and Microsoft object file output. $450. *Wizard Systems Software, 11 Willow Ct., Arlington, MA 02174, 617/641-2379*

F77L–FORTRAN
A complete implementation of the FORTRAN 77 Standard for the IBM PC. Mainframe performance: LOGICAL*1, INTEGER*2, REAL*8, COMPLEX*16. Features: Recursion, INCLUDE, OPTION, CHAIN statements & more. Subroutines: TIME, DATE PROMPT, etc. Commons & subprograms may be 64K. Re-

quires 256K, 8087. List $477. For Brochure: *Lahey Computer Systems, Inc., 904 Silver Spur Rd. #417, Rolling Hills Estates, CA 90274, 213/541-1200*

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, 409/733-2919*

Culinary Arts

"Compu-Chef"

A complete Culinary Guide for the IBM PC. Create a personal Recipe Library, Directory of Foods, perform Food Cost & Portion Comparisons. COMPUCHEF has over 90 Continental Recipes, Culinary terms, a Calorie guide, Herbs & Spices, & more. Home & restaurant use. Req. 128K, DOS, double-sided disk drive. Special intro., $30. Distributors invited. *DeAmicis Software Development, 4193 Galbar St., Oceanside, CA 92056, 619/758-4766*

Data Entry

Radar-II

RADAR-II is a powerful key-to-disk program that will do everything a 3741 or 5280 will do & more. Features: auto-duping, two-pass verification, accumulators for batch total checks, cross foot checks, check digit tests, data typing of fields, field tagging, operator stats., etc. Throughput permits 40,000 characters per hr. $995. *Southern Computer Systems, Inc., 2304 12th Ave. N, Birmingham, AL 35234, 205/933-1659, Telex: 755714*

Data Management

Instant Recall

Store 10K records, 30 fields. Each record has a history. When a client calls, you have instant recall on what you talked about last. The number of histories & length of each is only limited by disk space. Each contact is automatically dated. Reports, sorting, etc. Perfect for doctors, lawyers, sales people. $245. *Intelligent Systems Inc., 490 Hickorynut Ave., Oldsmar, FL 33557, 813/785-0378*

GOLDATAbase

GOLDATAbase is an easy-to-use DBMS for the IBM PC/XT. Data bases & reports are painted on the screen. Selection is by English-like commands. Procedures & a W/P interface are included. A BASIC Programmers Interface is available. With it, programs are written in BASIC that access GOLDATAbase. *Goldata Computer Services, Inc., 2 Bryn Mawr Ave., Bryn Mawr, PA 19010, 215/525-1036*

APL Data Base Utilities

DOSFILE APL data base utilities directly access DOS random files (including *dBASE II*. User can create custom APL-file based system & easily integrate own functions into DOSFILE. GP gives random storage of functions & variables. Requires STSC APL, $99—DOSFILE, $30—GP, + $5 s/h. CA res. add 6.5%. *Enigma Research, John Uchida, 4534 Vista del Monte #104, Sherman Oaks, CA 91403, 818/990-8631*

PC-FILE III™

A "top ten" winner (*SOFTALK* magazine survey). Version 2.00 (a major enhancement) includes full-screen data entry, a "browse" mode, global update & delete. Extremely fast & easy to use. Exchange data with *1-2-3*, *WORD*, *WordStar*, etc. Printed manual included. $49 check/MC/Visa. *ButtonWare, P.O. Box 5786, Bellevue, WA 98006, 206/746-4296*

Data Security

N-CODE™ Data Security

Fast, ultra-secure data encryption system. N-CODE protects your files from unauthorized access or change. Encrypt/decrypt a single file, entire disk. Select or change coding key when you want. Unique password & coding system supplied. 30-day money back guarantee. Uses DOS 1.10 or 2.00. $199 each. Demo disk, $10. For orders/free brochure call anytime. Visa/MC/chk. *K + L Software, White Flint Mall, P.O. Box 2303, Kensington, MD 20895-2303, 301/564-8669*

CYPHERTEX

Protect your data files & programs. These fast & easy to use encryption programs will protect any type file, can be used for file transfer, electronic mail, multiuser environment, etc. Money back if you can decrypt sample file. MS-DOS or PC-DOS, 64K, 1 disk, $89. *Binary Corporation, 4091 126 Dr. N., Royal Palm Beach, FL 33411, 305/798-3100*

Data Padlock

DATA PADLOCK is a software implementation of the Natl. Bur. of Std. DES. Written in Assembler, offers max speed w/no increase in file size. Several command line options complement encryption: Verify, Hide, Destroy ... 8 char. password provides key for encryption. Protect sensitive data/text/program files from unauthorized access. Works w/all DOS versions. $150. Visa/MC. Object code avail. *Glenco Engineering, 3920 Ridge Ave., Arlington Hts., IL 60004, 312/392-2492*

Protect Your Data!

VAULT keeps the right information out of the wrong hands. In plain English, each user picks coding keys to turn data into random garbage. Confidential files, reports, software, etc. can be stored, mailed or telecommunicated & remain safe until needed again. VAULT informs of any attempted tampering. List $285. Demo disk & manual available. For brochure call/write: *Management Analytic Support, Inc., Route 4, Box 4127, La Plata, MD 20646, 202/293-1624*

Dictionary

¢heapware™

WORD LIST: Almost 27,000 words from 3 to 15 letters consisting of all but proper nouns, hyphenated words & words w/embedded foreign characters. Words are stored in random format supplied on a DSDD diskette. A utility to add, delete or change an entry as well as a display function are included. $19.95. MO res. add 5⅝% tax. *Robert L. Nicolai, 4038 N. 9th St., St. Louis, MO 63147, 314/621-7618*

Disk Conversion

Converts CP/M to DOS

CROSSDATA converts any data/text file format from:

CP/M to MS/PC-DOS
CP/M to CP/M
MS/PC-DOS to CP/M

CROSSDATA reads/writes on IBM PC or clone using MS/DOS 2.00. CROSSDATA is a self-contained program. Ready to run, comes with 25 formats plus, you can add your own formats. To order this proven package, use MC/Visa or send $99 to: *Award Software, Inc., 236 North Santa Cruz Ave., Los Gatos, CA 95030, 408/395-2773*

micro/VERSAL™

Package to read, write, and format 20 plus CP/M formats plus DUMP utility, file append, user definable formats & sector by sector retrieval—$79. COED™ full screen editor has MACRO commands, definable keys, multiple files, more! $34. Runs on IBM PC or Z-100 (PC-DOS/Z-DOS). Check/MC/Visa. Call/Write. *Advanced Software Technologies, 417 Broad St., Bloomfield, NJ 07003, 201/783-7298*

Documentation Processor

The Explain System
Now your manuals can be on line! With Explain, on line manuals can be:
- connected to your software program
- accessed directly from your program screen at the touch of a key
- written using CSI's template screens to guide you
- updated quickly & easily, &
- printed in whole or in part

Communication Sciences, Inc., 100 N. 7th St. #518, Minneapolis, MN 55403, 612/332-7559

Edit

KEDIT
KEDIT is an XEDIT-like full screen editor for the PC. Split-screen editing of multiple files, targets, ARBCHAR, SCHANGE, GETFILE, SORT, wordwrap, prefix commands, block operations, key redefinition. Requires 80 column display, 192K. $125 + $3 shipping. Demo version $10. *Mansfield Software Group, Box 532, Storrs, CT 06268, 203/429-8402*

Super Screen Editor
(SSE) is a full featured screen editor including file encryption, split-screens, 4 way scrolling, macros, copy/move/delete blocks of data, opt. line numbering, file backup, search/replace/undo, print utility, help screens: $99. Shipping, $5. *Binary Corp., 4091 126 Dr. N, Royal Palm Beach, FL 33411, 305/798-3100*

Educational

PC/Pilot
Language for education and training. By MicroPi, the source of PILOT on the other major personal computers. Meets Common PILOT standard. Extensions for color, graphics, user fonts, windows, files and video disk/tape control. Includes EZ editor. Lic: $100 single, $550 multiple. *Washington Computer Services, 3028 Silvern Lane, Bellingham, WA 98226, 206/734-8248*

Hebrew/English/Greek
Type any language combination on your PC, Compatible, or jr. Highest quality letters—80 column. Works right to left and/or left to right (with or without vowels). Insert/delete, word-wrap, etc. Requires: 128K, DOS, graphics, Okidata, IBM, Epson, C. Itoh printer. Price, $149.95 ($15 for Demo). To order/for info call: *Gamma Productions, 817 10th St., Santa Monica, CA 90403, 800/227-1617, 800/772-3545 (CA), ext 129.*

TYPIST—Teach, Test
Modern typing tutor for PCjr, PC and XT. The TYPIST teaches rapid, accurate typing by the touch method. Computer analysis shows overall and individual key performance. Beginner, intermediate, advanced. Individual or class use. User-prepared drills. Many options. $40 plus $3 shipping. *Choice Software, P.O. Box 726, Dept. J1, Centerville, UT 84014, 801/292-7424*

Mr. Math
Four programs tutor basic math skills in arithmetic, money & fractions. Each program features 4 different games, optional step-by-step tutoring, annotated step-by-step solutions. All answers worked out directly on screen–no paper or pencil needed! 1dd, 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*

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, $699. Demo disk, $15. *Raster Technology, Inc., P.O. Box 3477, Longwood, FL 32779, 305/862-2859*

Lucinda's ABCs
Tired of children's programs that can't be modified? Then try these programs in BASIC *source code.* Does not need graphics card. The 52 "cross-stitch like" screens overcome computer phobia. *Lucinda's Christmas Fun* is now available. IBM-PC or PCjr, 1 disk drive. Specify Color/Graphics or B/W. $27.95. *Feller Associates, 550 CR PPA Rt.3, Ishpeming, MI 49849, 906/486-6024*

Hebrew Bible for the PC
Compu-Bible, an important & innovative study aid for schools, univ., libraries, congregations & at-home use. Complete Bible, Prophets & Scriptures in Hebrew. Convert screen, printer & keybd. to print in Hebrew & English. Complex string, word & phrase freq. analysis done in minutes! Also avail., Hebrew/English word processor-ability to enter Hebrew & English in same text. *Mikrah Computer Research Systems, 40 Jackson St., Freehold, NJ 07728, 201/780-1540*

Engineering

Structural Design
Quick, versatile, interactive structural programs—beams, columns & frames of any material efficiently analyzed & designed. Extremely friendly input/output with COLOR graphics options. Specify PC configuration and send $25 for demonstration disk to: *c^2b^2 - software design, 763 27th Ave., San Francisco, CA 94121, 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, Multiple Phased Life Cycle Costing, & more avail. for CP/M, CP/M-86, & 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.: 409/775-1782, By Modem: 409/775-0760*

smARTWORK™
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 pen-and-ink plotter. $895. Write or call for a brochure. *WINTEK Corp., 1801 South St., Lafayette, IN 47904-2993, 317/742-8428*

CONVFACT
Unit conversion system data base provides a quick, reliable & flexible tool for US-SI-METRIC & nonstandardized units conversion. The program includes 23 built-in unit tables, calculator, scientific notation, user-defined precision, menus & help screens. DOS or CP/M. $35. *Conan Systems, Inc., 10333 Northwest Frwy. #516, Houston, TX 77092, 713/681-4037*

Fluid System Design
Easy to use integrated package for complex networks with valves, pumps, controls, pipe loadings, ... IMPULSE2: Transient design using the MOC. BALANCE2: Steady state design. BUILDER2: System builder: interactive, English equip. names, libraries of data, ... + plotting & 8087 NDP support. $2775. Contact: *IMPULSE Engineering, Benjamin R. Strong, Jr., P.O. Box 3540, San Francisco, CA 94119-3540, 415/788-4611*

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)*

Files

File Honey
No more memorizing subdirectory names, waiting for "Dir" or "Tree" commands, or fumbling to identify files. This directory-scanning aid uses windows for rapid access to your subdirectory tree, allows scrolling of sorted file directories, and much more. For PC/XT with 128K & DOS 2.00. Price, $42.50. Demo, $15. *Joe Phillips Co., 9071 Metcalf #145-A, Shawnee Mission, KS 66212*

Financial

Planning Templates
Sophisticated templates for most electronic spreadsheet programs. Written by CPA/Tax Attorney team. ESTATECALC™, PENSIONCALC™, FIVE-YEAR TAX PLANNER™, INCORPCALC™, INSURANCECALC™, BUSINESS VALUATION™, & PERSONAL BALANCE SHEET & CASH FLOW™. Others available. *Innovative Professional Software, Inc., 730 West Hampden Ave. #307, Englewood, CO 80110, 303/762-1954*

Creative Amortization
Highly flexible/user friendly. Actual 360, 365/366 or 30/360 yr basis. Allows specific period changes, pmts of: p & i/prin only/p + i/int only, APR & grad. equity mort. calc., predetermined ending balloon pmt & MORE! Avble for IBM PC, XT or compatible. 30 day $ back satis. guar. $265 + $10 ($10 demo). *Wilson and Associates, Inc., P.O. Box 941, Paris, TN 38242, 901/642-3130*

Portfolio Management
ASSET TWO provides full professional & institutional investment management. More than 50 standard stock & bond reports for more timely, cost effective investment decisions. Includes comprehensive documentation & 24-hour "Hot Line" support. $495. *Compass Software, Inc., 335 Norwood Rd., Downingtown, PA 19335, 215/269-6412*

Food Management

OMNI Food Management
Food Service Professionals: COMPLETE SYSTEM includes: National Telecommunications, Mfg. Promotion access, Direct Order Processing, Inventory, Sales & Waste Control, Menu Explosion, Time Entry, Tip Reporting, optional Scheduling, Financial Costing Reports (Food & Labor). Includes a complete IBM SYSTEM–FREE! *OMNI Food Management Services Corp., 3400 Oakcliff Rd. #8B, Atlanta, GA 30340, 404/451-3049*

Gambling

Play the Horses
A scientifically derived system for handicapping thoroughbred races. Many factors analyzed, ten found to be vital in picking winners. See *Popular Computing*, Feb. 1984 for review. Simple to use. Obtain "Daily Racing Form" & answer ten questions on each horse. Computer will print out odds. $29.95. *3G Company Inc., Rt. 3, Box 28A, Gaston, OR 97119, 503/662-4492*

Games

Blackjack Analysis
Tell the computer exactly how you play. Splits, double, ins., stick. Then let it play 20,000 hands an hr. for you. Automatically varies bet depending on card counting technique you use. Allows interactive play w/ help key. Uses 1-6 decks, really shuffles. 1-2 players. After play is completed, one page report is produced w/game stats. $65. *Intelligent Systems Inc., 490 Hickorynut Ave., Oldsmar, FL 33557, 813/785-0378*

Sfinks PC Chess Game
The number 1, USCF rated 1793, chess game for the TRS-80 is now available for your IBM PC. Featuring problem mode, opening book, takeback, game save, clock, printer, hints, superior color/monochrome graphics, Sfinks PC is unsurpassed! 64K disk, only $49.95 + $2 s/h. MC/Visa. FL add 5% tax. *William Fink, 1105 N. Main St., Ste. 24-B, Gainesville, FL 32601, 904/377-4847*

World Class Blackjack
Realistic simulation of 21 with detailed graphics. Has all Blackjack options. Tracks game & gives analysis of your play. Can also count cards. It's educational & can save money in real situations. It's fun too. Hard disk comp. Uses color or mono monitor. DOS 1.10 or 2.00. Requires 128K of RAM. $18.95. *Bits & Pieces Software Co., 1803 Mission St. #402, Santa Cruz, CA 95060*

¢heapware™
Compute exact odds for any poker and & play DRAW POKER on your PC, XT or PCjr. Play for points to beat your highest scores. Play against the dealer for most wins, play up to 6 others for fun or money. Requires color adapter, RGB monitor, & 128K. DOS 1.10 $17.75, DOS 2.xx $22.25. MO residents add 5⅛% sales tax. *Robert Nicolai, 4038 N. 9th St., St. Louis, MO 63147, 314/621-7618*

Hearts
3 computer players, 1 human. Computer: no random factor involved in cards played, plays cards within 2 seconds, shoots moon, defends against moon shots, tries to give queen to low man, does not cheat. No graphics. No color. Simple sound effects. 40 character lines. BASIC. Not protected. 96K. Disk. $20. *Andrew Lavis, 1443 Wake Forest #6, Davis, CA 95616, 916/756-5825*

Science Fiction Trivia
TRIVEAX–Over 3,000 questions, 2 full disks. Encyclopedia Intergalactica, Galactic Survey (12 categories; Aliens to Lovers to Starships). Try to Beat the Dragon. Hundreds of books & authors. 1-4 players, Options Menu. IBM PC & clones, SS or DS disks. $39.95. Visa/MC/chk. *Tessera, Route 6, Box 338K6, Columbia, SC 29210. Orders only, 800/334-0854, ext. 506*

Games/Educational

Gramarcy—Word Game
If you like anagrams & play this game in your daily paper, you'll love Gramarcy. Program displays all words of 4-11 letters in any word, or will give a word, let you find all words in it then score the # of correct words. Game totals saved to show improvement. Utility incl. to modify word list. Req. 128K & DS drive. DOS 2.X, $29.95. DOS 1.10, $33.95. *Robert Nicolai, 4038 N. 9th St., St. Louis, MO 63147, 314/621-7618*

Gas Stations

Station Master
Complete integrated bookkeeping system for gas stations. Quick, easy data entry automatically creates daily accounting. Reports shift check out, TBA, profit & margins. Has full inventory control, accounts receivable, payroll, P/L statement, & many other features. Great vertical marketing opportunity for dealers. *Small Business Computer Systems, Inc., 313 Llewellyn Rd., Ambler, PA 19002, 215/542-9639*

Genealogy

Family Reunion II
For IBM PC, XT, PCjr or compatibles. Keeps track of living relatives as well as geneological data. Produces pedigree charts, group sheets, descendant charts, address labels, birthday lists, text data, & much more! Price $129.95. Requires 128K & PC DOS 1.10, 2.00 or 2.10. Supports monochrome or color. Any printer. Visa/MC/Amex/COD. Add $3.50 S&H. *Personal Software Co., 1580 East Dawn Dr., Salt Lake City, UT 84121, 801/943-6908*

Graphics

Grafmatic: Fortran/Pascal
4 packs in 1! Other sources have text/graphics; pixels/lines/paints but GRAFMATIC follows thru w/2D interactive, 2D plots (contour too!), 3D plots & solid models (hidden line removal for realism). 100 pg. manual makes it easy! Specify compiler: MS (3.10 or 3.20) FORTRAN/Pascal. IBM 2.00. $135. Call for a personal response. *Microcompatibles, 11443 Oak Leaf Dr., Silver Spring, MD 20901, 301/593-0683*

PC-Title/PC-Projector
See *PC* mag's (Dec., pg. 619) review of this useful tool for creating full color professional text for slides, screen displays & fliers. Add complete graphics with PCcrayon. PC/PCjr/XT & compatibles. PC-Title/PC-Projector, $49.95. PCcrayon, $59.95. Order all 3 for $89.95. Visa/MC. *PC Resources, Inc., 620 Hobart Terrace, Santa Clara, CA 95051, 408/243-4169*

Halo
The most powerful library of graphics subroutines under MS-DOS. Extensive functions include point, line, pie, 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., 7042 Carroll Ave., Takoma Park, MD 20912, 301/270-0240, 301/270-6066*

Fortran/Pascal Pen Plots
PLOTMATIC: Complete support for H-P, IBM, and HI pen plotters. All primitives available as subroutine/procedure calls PLUS total 2D plotting support package. Interfaces with GRAFMATIC. Specify compiler (version number) and plotter. $135. Plotmatic from Microcompatibles. *Microcompatibles, Dept. W, 11443 Oak Leaf Dr., Silver Spring, MD 20901, 301/593-0683*

FlexiTek 4010-Alike
Emulation of Tek 4010 for accessing mainframe graphics. Versions included for PC & Z-100. Fast drawing; menu setup. Capture pictures to disk, copy to matrix printer (FlexiPrint, incl. free), or HP plotter. MASM source code incl. Manual gets you started quickly. Send biz SASE for info. $129.95. *VariousWare, P.O. Box 21070, El Cajon, CA 92021, 619/448-7126*

FlexiPrint
Need graphics dump which does what YOU want? Pre-installed for OKI, Epson, C-ITOH, NEC, Imagewriter, etc. for ease of use. For odd printers, you get source code (MASM), set most printer parameters by changing EQUates, enables handling quirks. Dump from screen, or anywhere! SASE for info. $34.95. *VariousWare, P.O. Box 21070, El Cajon, CA 92021, 619/448-7126*

CAD Software
It's brilliant, fun to use, cost effective, & increases productivity! Over 100 packages on the market. Want to know more about CAD software? When you call or write us, you will receive expert advice, excellent prices, & most important... Professional Support! *Brighter Images, 936 Dewing Ave., Lafayette, CA 94549, 415/283-3340*

Executive Picture Show
For IBM PC & COMPAQ: the complete presentation graphics package. Easily the most powerful & distinctive package of its kind; with its ability to create presentations using literally hundreds of animated drawings, graphs, etc. Ideal for slides, displays, hard copies. Retail, $245. *PCsoftware, 9120 Gramercy Dr. #416, San Diego, CA 92123, 619/571-0981*

SignART
Whether it's a PARCEL POST label for your Xmas mail, a SPECIAL MEETING notice, a SALE sign or a WELCOME banner, print it with style in one of 4 fonts. Character sizes from ½ inch to 6 inches. Special effects & formatting options. Graphics Editor for drawing logos & other special symbols. $49.50. Requires: 128K, Color/Graphics Adapter. *TechArt Associates, P.O. Box 370, Berkeley, CA 94701, 415/525-0870*

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*

Healthcare

OMNI DCI
Hospital, Healthcare, Physician, Dietitian & Other Medical: COMPLETE NUTRITION MANAGEMENT. Analysis of 25 Nutrients + Cholesterol & RDA. 10,000 data base; user add-on. 23 Lab Tests, Inventory Control, Forecast, Recipe-scaling/conversion, soft/hard version w/Telecommunications. INCLUDES IBM SYSTEM–FREE! *OMNI Dietary Consultants, Inc., 3400 Oakcliff Rd. #8B, Atlanta, GA 30340, 404/451-3283*

Home Use

Teli/Solar
A tool to aid homeowners in making intelligent decisions about energy-related home improvements & investments. It can be used to determine hot water usage & cost, home heat loss, solar collector sizing, investment payback, & areas to concentrate on to reduce energy usage. $50. 128K, color adapter. *Tesseract Enterprises Ltd., P.O. Box 25966, Colorado Springs, CO 80936, 303/594-6199*

Diskette Cookbook Series
ATTENTION GOURMET COOKS! VANILLA is redefining the meaning of software publishing. We publish the most comprehensive library of diskette cookbooks available. Search, scale & print recipes from the thousands available in the Series' cookbooks. Powerful, yet simple; no user manual needed. Software, $40; cookbooks, $12-16 each. Send for free catalog. *Vanilla Software, 3345 Lakeshore Ave., Dept. W, Oakland, CA 94610*

Shop Cheap–Eat Smart
- COUPON-O-MIZER. Save more money with your discount coupons and rebates. 64K
- DIET ANALYZER. Perfect for weight control, menu planning & special diets. 128K

$49.95 ea + $2.50 s/h. Req's 1 diskette, 80 col display, ptr. Immediate shipment–2 week $ back trial. AmEx/MC/Visa. *Natural Software Limited, 7 Lake St. #7E, White Plains, NY 10603, 800/626-2511, 914/761-9329 (NY)*

Insurance

The Agency Manager™
Designed by insurance professionals for independent insurance agents, this integrated system performs customer & company accounting, General Ledger, Client/policy data base, over 100 marketing reports & sales tools, ACORD's, IVANS, single or multiuser, IBM XT, CP/M. *Applied Systems, P.O. Box 400, Monee, IL 60449, 312/534-5575*

Integrated

FREE 30-day Trial
Top-quality, fast & easiest to use. Data base manager, spreadsheet & word processor—all 3 for $99 ($600 list) or $50 each. 128K PC/XT/jr. 140-page manual. Enhanced TCS AR, GL, PR & AP—all 4 for $499 or $199 each. Program changes avail. Opt. inventory & report writer. Ultimate mail program. Add $10 for handling. *Micro Architect Inc., 6 Great Pine Ave., Burlington, MA 01803, 617/273-5658*

Inventory Control

Mr. QuarterMaster
Features: receipts & issues updating; inventory, reorder & usage reports; screen display of stock item(s); price quotes, purchase orders & invoices; reorder points adjusted automatically & file maintenance to add, change & delete stock items. List Price: $120. Manual alone: $20. Free brochure. *RJL Systems, 106 New Haven Ave., Milford, CT 06460, 203/878-0376*

Inventory/Sales

Periodic Inventory/Sales
For retailer, wholesaler, restaurant, parts. PERIODIC Acctg. MTD (avg. cost, FIFO/SI). Mainframe techniques. Menu & Fkey driven. Index files, no dept/item limit. U set fiscal period, year, passwds. utility. Keep purchase hist. Update, inquire/print current & prior years/periods data. 9 Reports: PTD, YTD, VendorPO. Write free info. U.S. $495. *Pidata Computer Systems, 4312 Ontario St., Dept. W, Vancouver, B.C. V5V 3G9 Canada, 604/876-3145*

Languages

FORTH-32
Use up to one megabyte of memory for programming and data! Complete Development System includes a Symbolic Debugger, Structured Decompiler, Full 8088 Assembler, Editors, Graphics. Our 480 page manual is the best! $195. Fully compatible software and 8087 Floating Point Extensions. $95. Call today. *Quest Research, Inc., 303 Williams Ave., Huntsville, AL 35801, 800/558-8088, 205/533-9405*

C86 C Compiler
Our C compiler keeps the best company. Customers who use our C86 C compiler read like a who's who of the software industry. We would like you to join them in using our fast, reliable, UNIX & MS-DOS compatible C compiler. $395. • Full K & R implementation • Fully supported • MS LINK • LIBRARY SOURCE • Call for further info & reference list. *Computer Innovations, Inc., 980 Shrewsbury Ave. #327DR, Tinton Falls, NJ 07724, 800/922-0169, 201/542-5920*

muLISP-83
An integrated environment for AI software development. Includes a high performance, pseudo-code LISP compiler; a resident, screen-oriented editor & debugging system; interactive LISP programming lessons; & a detailed reference manual. $250. Also available, the muMATH Symbolic Math System, $300. *The Soft Warehouse, P.O. Box 11174, Honolulu, HI 96828*

Pascal: Examples Plus
Jato Inc. now offers a diskette for the PC with over 300K bytes of useful info about IBM Pascal. More than 65 sample programs. Save time & effort, we have found the problems & documented the solutions. Send $30 for diskette (CA add 6%) or $3 (refund with order) for complete description to: *Jato Inc., 24861 Alicia Parkway #272, Laguna Hills, CA 92653*

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. $399. *Satori Software, 5507 Woodlawn N., Seattle, WA 98103, 206/633-1469*

LawSearch for Westlaw
Certified & recommended by West Publishing to access their WESTLAW legal data base using an IBM PC or compatible. Easy to learn & use: Log on automatically w/one keystroke. Screen highlighting for key words & on-screen editing of inquiries. $350. *Direct.aid, Inc., P.O. Box 4420, Boulder, CO 80306, 303/442-8080*

LawLibrary
Build your own legal opinions & precedents data base. Written by a lawyer, menu-driven & very friendly. Comprehensive manual. Minimize work duplication & the unwitting giving of contradictory legal advice. Search by Statute name, by Statute name & Section #, & by Keyword. Screen or printer reports. Installation & Keyword-list utilities. $250 U.S. *ZYVAK Corporation, P.O. Box 2516, Station D, Ottawa, Ontario K1P 5W6 Canada, 613/523-4210*

Life Insurance

Client Mgmt. System
Data base manager for Home Office to distribute enabling agents to quickly & easily create client files. Flexible formats provide many storage & reporting options. Word processing link supports personalized correspondence. Easy information access increases productivity, improves service. Menu-driven for easy use. IBM XT, PC & WANG PC-DOS. *Informatics General Corp., Sigma Software Division, 248 Columbia Turnpike, Florham Park, NJ 07932, 201/966-1633*

Mailing Lists

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*

Manufacturing

Twin Oaks mrp2
- Bills/Material
- Inv Control
- Purchasing
- MRP & CRP
- Master Sched'g
- Phys Inventory
- Std Costing
- 22 Modules
- 128K PC or XT
- DOS 1.10, 2.00
- Hard/Soft Disk
- Online-Real Time
- Multi user
- Acctg Interface

Twin Oaks Inc., Box 136, Cottage Grove, MN 55016, 612/458-1604

MCBA Software System
Adapted for the IBM PC using MS-DOS. Inventory Management, Bill of Materials, Order Processing, Purchasing, Job Costing, MRP, Labor Performance, Shop Floor Control, Standard Product. Costing & Routing, Accounting. Install. & support available. In use at over 11,000 installations! *MDM Systems, Inc., 24525 Southfield Rd. #205, Southfield, MI 48075, 313/557-1254*

Manufacturing Inventory
Designed with the small to medium sized manufacturing firm in mind, MISys is big enough to handle your needs, yet costs only $995. Integrated Inventory Control, Bills of Material, Purchase Orders. For IBM PC/XT & compatibles. Multiuser versions also available. Dealer inquiries invited. *Microcomputer Specialists, Inc., 18 Lyman St., Westboro, MA 01581, 800/833-1500, 617/366-1200*

Mathematics

Optimization
Optisolve solves nonlinear systems of equations & maximizes or minimizes nonlinear functions with nonlinear constraints. It can find all solutions, including complex ones. No programming language is required; the user simply inputs the problem directly in terms of symbolic equations & inequalities. $195. *Optisoft, 1445 Crone Ave., Anaheim, CA 92802*

Medical

Threshold
Medical office management. Features automatic insurance claim preparation, teleprocessing to Blue Shield and Medicare, unattended statement processing, total security, statistical reports, inquiry management reports & on-line help. FREE REMOTE DEMONSTRATIONS AVAILABLE. List $5,500. *Physicians Practice Management, Inc., 1810 S. Lynhurst Dr., Ste. Q, Indianapolis, IN 46241, (Nat) 800/428-3515, (IN) 800/792-3525*

Dental Management
Multiple Practitioners, Procedure Codes & Insurance Co. Billing. Provides family billing, search by Name or Acct. #, Aged Walk-out & Monthly Stmts., Dun Notices, Recall Notices, Mail Lists, Daily Journals, Aged Trial Balance, Income & Procedure analysis & reports. Hard disk is desirable. Visa/MC. $595. *dATAMAR Systems, 5055-A N. Harbor Dr., San Diego, CA 92106, 619/223-3344*

PC*CLAIM
Physicians' office insurance claim filing with printed insurance forms & paperless claims processing. Overnight electronic claims submission. Speeds Blue Shield, Medicare, private insurance settlement. 23 programs, 3 diskettes, user manual, DOS/128K/modem/2 floppies or hard disk $89.95. $-back guarantee. *Physicians Practice Management, Inc. 1810 S. Lynhurst, Suite Q, Indianapolis, IN 46241, 317/246-0357, 800/792-3525 (IN), 800/428-3515 (Nat.)*

Menu System

MenuMaster
Create custom menus for IBM PC & XT applications quickly & easily. You love PC-DOS, but do your users? MenuMaster supports complex job streams, run-time prompts, real-time clock display, hard disk, color, graphics & more. Menu system req. IBM PC, 64K, 1 disk. Menu editor (creates & modifies menus) req. 192K. Full system, $175. Demo disk & documentation, $25.00. MC/Visa. *DecisionWare, P.O. Box 505, Moorestown, NJ 08057, 609/778-0799*

Music

TuneSmith/PC™
Make GOOD Music on any IBM PC! It's easy with this amazing Music Development System—There's an ON-LINE TUTOR to guide you, + Help Screen. Simulated CHORDS allow you to create complex music. Special Full-Screen Music EDITOR; 8 sample TUNES to educate & entertain! Req. 96K, 1 Drive, 80 col. display. Send $49.95 (plus $5 ship.). Visa/MC. *Blackhawk Data Corp., 307 N. Michigan Ave. Dept. 3A, Chicago, IL 60601, 800/328-5727 ext. 132, 800/742-5785 ext. 132 (MN)*

Nutrition

Diet and Health
Our software puts you in control of your nutrition in ways impossible before. Now everything is at your fingertips to make it easy to follow diets, control weight, or simply live better. Includes data base of 15 nutrients & 800 foods + 100 pg. user & nutrition guide. PC/MS-DOS, AP/DOS, CP/M. Send for free information. *Nutritional Data Resources, P.O. Box 540, Willoughby, OH 44094, 216/951-6593*

Office Systems

Mail on a Local Net
Mailnet turns any local PC network into an office communications system. Scan your mailbox, Read & Answer, Write & Send messages to any person or list. English commands & options are exercized with a few keystrokes. Mailnet fits the way you like to work. PC/MS-DOS. Base Price $595, Demo $8. *hi concepts, 13263 Ventura Blvd. #8, Studio City, CA 91604, 818/905-6434*

Oil and Gas

Analyzer II
Economics analyzer for existing & proposed oil & gas properties. Projects financial performance for 15 years. Decline curve & reserve analysis. Ability to analyze "what if" cases every 11 seconds, evaluates investment terms & conditions. Vivid graphic displays of trends & comparisons. Dealer inquiries invited. *ITV Company, 4801 Spring Valley, A-109, Dallas, TX 75244, 214/387-1000*

Pricing

The PriceBook
A multi-purpose system that can be used to generate invoices, purchase orders, quotations or any other business application that requires price extensions & totals calculated. Ideal for sales & insurance agents, estimators, subcontractors, buyers, billing personnel, et al. Price $99.95. Manual alone, $15. *RJL Systems, 106 New Haven Ave., Milford, CT 06460, 203/878-0376*

Public Domain

Public Domain "Freeware"
Hundreds of games, utilities, & business programs aren't copyrighted, so are in the public domain. Copy them yourself & save! RENTALS: IBM PC SIG—100 Vols., $99.50. IBM PC BLUE—45 Vols., $49.95. Rental is for 7 days after receipt, 3 days grace for return. Credit cards accepted. 50 5" flippy disks $100. *National Public Domain Library, 1062A Taylor St., Vista, CA 92083, 619/727-1015, 24 Hour Order. 619/941-0925, Customer Service.*

IBM PD disks $9.95 ea!
Send $9.95 for SS-DD Intro Disk: 2 challenging games, 1 artwork, 1 song, 2 banner makers, 5 utilities, 1 superb disk librarian. $4.95 for SS-DD Catalog Disk of 53 disks w/1,054 programs. BONUS FOR DS-DD DRIVES: $9.95 DS-DD disk has Programs AND Catalog! Specify SS or DS. *The El Dorado Group, P.O. Box 5626-I, Sherman Oaks, CA 91423*

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. $525. *Realty Software Co., 1926 S. Pacific Coast Hwy. #229 Redondo Beach, CA 90277, 213/372-9419*

Property Management
Software for owners of apartments, mini-storage, single family, condos, marinas, shopping centers and office complexes. Provides instant cash flow analysis, prints cash flow report, records expenditures on each unit, prints summary of operations report and accumulates cost for tax purposes. Visa/MC. *Tomar Productions, P.O. Box 740871, Dallas, TX 75374, 214/750-1212*

Management & Analysis
"Real Property Management" $395, for apts., offices ... Records & projects income/expenses/budget 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*

Investors/Syndicators
Let your computer calculate the right price. A complete analysis: cash flow, taxes, projections, & syndication feasibility. All values easily changed for risk analysis or structuring an offer. A powerful tool for making sound investments. $250. Manual & demo disk, $35. IBM PC & CP/M computers. *DRF, Inc., 3333-F Soquel Dr., Soquel, CA 95073, 408/475-4456*

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*

Resort Property Mgmt.
Menu-driven for ease of use. Designed for properties that rent on a Daily, Weekly, Monthly basis. Automatic Searching & Booking of available units. Check-in Check-out listings. Monthly/Yearly owner statements. Check printing, Mailing labels, Automatic History recording. $895 Plus COBOL Runtime. *Contemporary Computer Services Inc., P.O. Box 3086, Atlantic Beach, NC 28512-3086, 919/247-3130*

PMSplus
Property Management System & General Ledger for IBM & compatible computers. Reports include: Current Occupancy, Late Rent, Payment Journal, Vacancies, Deposits, Cash Receipts & Disbursements, G/L Trial Balance & P & L Statement. User friendly & support for $250. Demo disk & manual $25(refundable). *Comtronic Systems, 31620 121st Ave. SE, Auburn, WA 98002, 206/735-2916*

Religion

Bible Studies Part 1
A series of studies proving how mankind is being deceived by following man's doctrines & not God's. Other subjects: coming of Christ, where are the dead? Pre-existence of Christ & many more. These studies will open your eyes & help you know what God expects from us. Write or call for info. $34.95. *Ray's Electronics, Box 254, 632 E. 4th St., Nescopeck, PA 18635, 717/759-3894*

Scientific

muMATH-83™
Infinite precision rational arithmetic plus automatic formula manipulation. Includes exact integration, differentiation, limits, matrices, vector calcus, infinite series Laplace transforms & the solution of algebraic or differential equations: $300. Also muLISP: $250. *The Soft Warehouse, P.O. Box 11174, Honolulu, HI 96828*

Literature Filing System
SearchLit Version 2.00 stores & searches bibliographic data for your literature collection. Retrieval based on title, author, source, abstract or key word index. Absolutely no programming required. Will merge downloaded data. Sorted output. Source code & file structure provided. DOS 1.10, 2.00. $249.50. Send $10 for demo disk. *MediSoft, 1595 Soquel Dr. /350, Santa Cruz, CA 95065, 408/476-7106*

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 2167, Humble, TX 77347, 713/454-7428*

Spreadsheet

Format *1-2-3*
- Loads ANY data into Lotus!
- *1-2-3* & *Symphony* Utility!
- SAVES data entry time!
- EASY mainframe interface!
- Comprehensive User Guide
- On-line Help System
- FAST-FRIENDLY-FLEXIBLE
- Runs on PC, XT & lookalike
- DOS 2.00 with 64K, 1 Drive
- $105, Chk/MC/Visa

Reliable Software, Box 849, Marina, CA 93933, 800/235-6646, ext. 581 (Nat), 800/235-6647, ext. 581 (CA)

The Fix for Lotus
THE FIX runs *1-2-3* on XTs & compatible hard disk systems without the need for the Lotus "System" disk in the floppy drive. Loads Lotus quicker, frees the floppy drive to use other disks such as DOS. Saves wear on your Lotus "System" disk; $39.95. Lotus *1-2-3* is a trademark of Lotus Development Corp. *Blue Heron Publishing Company, 8350 Lincoln Ave., Skokie, IL 60077, 312/676-1080*

Stamp Collectors

Stamp Collectors
The Philatelic Management System is superior software for every level of collector. Covers every aspect of collection management. Inventory Module now available & upgradable to complete system. IBM PC, Apple //e and ///. Complete system $295, Inventory Module $159. Demo package $15, credited to final purchase. *SoftStyle, Inc., 7192 Kalanianaole Hwy. #205, Honolulu, HI 96825, 800/367-5600*

Statistics

Statistician's Mace 2.00
A full-featured program. Calculates descriptive stats, multiple regression, correlations, several ANOVAs, nonparametric tests, data transformations & much more. Reads data from keyboard or disks created by word-processors or data base programs. Requires IBM PC/XT, 128K PC/MS-DOS, 1 disk. $295. Evaluation version, $30. Buy direct or from dealers. *MAtrix Calculating Engine (MACE), Inc. 2313 Center Ave., Madison, WI 53704, 608/241-4566*

BMDPC
BMDPC Statistical Software is a comprehensive package of programs that provide researchers with numerous statistical methods, ranging from simple data display & description to advanced statistical techniques. BMDPC programs are designed for ease of use & to handle all steps in an analysis. *BMDP Statistical Software, 1964 Westwood Blvd. #202, Los Angeles, CA 90025, 213/475-5700*

ELF-The Statistical Pkg
Reads & writes *VisiCalc, SuperCalc, Multiplan, dBASE II*, etc. Does Factor Analysis, Principal Components, Discriminant Analysis, Stepwise Regression, ANOVA (1 & 2 way), Correlations, Probabilities, t-Test, Crosstabs, Frequencies, transformations, permanent data base, & more. MC/Visa. *The Winchendon Group, Inc., P.O. Box 10339 #200, Alexandria, VA 22310, 703/960-2587*

M-STAT™
A menu-driven system for Tables, Descriptive, Regression, Factor, ANOVAS, Discriminant, Non Parametric, Transformations, & much more. Up to 255 variables, number of cases limited only by disk. For PC-DOS & MS-DOS, 256K, supports 8087. Includes 172 page manual, 17 sample data sets, $795. Demo $10. *M-STAT, P.O. Box 17075, Milwaukee, WI 53217, 414/351-2771*

1,2,3 FORECAST!
Menu-driven template for Lotus *1-2-3*, forecasts time series data in existing *1-2-3* files. Professional results even with little Lotus or forecasting experience. Linear & non-linear trends, regression, smoothing, decomposition, seasonal adjustments, more. Easy-to-read 50 page manual includes tutorial & documentation. $75 chk/MO ppd. USA, more info: *1,2,3 FORECAST!, P.O. Box 12582, Salem, OR 97309*

Systems

Multiuser PC-DOS
MultiLink turns PC-DOS into an efficient multi-user multitasking 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 Link, Inc., 8601 Dunwoody Place #336, Atlanta, GA 30338, 404/998-0700*

Tax

A Tax Planning Template
Diskette used with *1-2-3* or *Symphony*. User can toggle between 1983 & 1984 law; includes both year's tax tables. Computes state income tax. 256K req. Flexible, menu-driven. Follows IRS forms by line. Includes 1040 schedules: A,B,C,D,E,G,W,SE; forms 2106,2441,3468,6251, & ACRS deprec. Send $75. Jan. 1985 update, $10. MC/Visa. *1040PLAN, William A. Permar, CPA, 1125 Sunnyhills Rd., Dept. W, Oakland, CA 94610, 800/443-0100, ext. 644*

Tax Preparation
1984 Federal tax program follows IRS forms and includes form 1040, sch. A-G, R, RP, SE and W, and forms 2106, 2119, 2441, 3468, 3903, 4562, 4797, 4835, 4952, 4972, 5695, and 6251. Available for the IBM PC, PCjr, TI Pro. and DEC Rainbow with MS-DOS. Req. 128K. Price: $99; updates $29. Check/MC/Visa. *Dunphy Systems Inc., 2215 Deewood Dr., Columbus, OH 43229, 614/891-2131*

Tax Surgeon I & II
Tax preparer & planner. Full screen display of forms make data entry/editing easy. Print IRS approved forms. Surgeon I ($49.95) has A,D,G,RRP,W, 2106,2119,2440,2441,3903. II for $89.95 adds 20 forms. 128K DOS 2.00 or PCjr. '84 update is ½ price. Professional version is $895. Visa/MC/COD. *TAXbyte Inc., 3803 28th St. Dept. JR, Moline, IL 61265, 309/764-7245*

TurboTax™
Full feature Federal tax prep & planning software. 33 forms plus multiples. FAST! Calculates complete return under 3 secs. WINDOWS! Exceeds IRS print specs. Operates like a spreadsheet. Full depreciation support. Much more. (CA/AZ module avail. Dec.). FREE update in Jan. Req. 192K. $65. Visa/MC. (CA res. 6 ½% tax). *ChipSoft, Inc., 5674 Honors Dr., San Diego, CA 92122, 619/453-8722*

Templates

1-2-3/Symphony Templates
Make Instant Use of Your Lotus Spreadsheet
Practical Applications
1. 1984 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

PC950
PC950 transforms an IBM compatible PC into a Televideo 950™ for accessing other computers via serial interface or modem. PC950 also lets you transmit & receive text files to disc or printer. $150. Dealer inquires welcome. *Contel Corp., 416 W. Fifth Ave., Naperville, IL 60540, 312/355-8188*

Flexible Communications
Multi-Terminal Emulator: Ideal for those with broad or highly specific communications needs. Preconfigured emulations for VT52/100, ADM3A, IBM 3101 models 10 & 20, Televideo 912/950, Hazeltine, & more. Or customize your own emulation using the program's built-in communications "language". Virtually unlimited asynchronous capability. $195. *Direct.aid, Inc., P.O. Box 4420, Boulder, CO 80306, 303/442-8080*

Tools

Pascal and C TOOLS
TOOLS includes full string use, screen handling, graphics, and a general BIOS gate. TOOLS 2 supports all DOS 2.00 functions, including program chaining. VIEW MANAGER screens are painted and then stored in a screen data base. Source code is provided. TOOLS $125, TOOLS 2 $100, VIEW MANAGER $275. Visa/MC. *Blaise Computing Inc., 2034 Blake St., Berkeley, CA 94704, 415/540-5441*

FORTRAN Library
REAL programmers use FORTRAN but need the same facilities as IBM BASIC gives. Low Level Library provides FORTRAN callable routines including Peek/Poke, Fast screen access, DOS/BIOS function calls, date/time in many formats, DOS commands & more. Requires MS or IBM FORTRAN. $99 + $5 shipping. *Tessella Software Ltd., Foremark House, Faringdon Road, Abingdon, OX14 1BD, England, 235-31800*

Moviecode BASIC monitor
Very fast DUAL window visual animation for BASIC or BASICA programs. User program runs in window 1; animated program list, monitored variables & execution control data in 2. Features: variable change, breakpoint, skip, single-key control, fast mode, animation speeds from 5 to 5,000 stm./min. $99. S/h included. *Impulse Systems Limited, c/o PC World Directory Dept., Box A, 555 De Haro, San Francisco, CA 94107*

Training

ATI Training Software
American Training International (ATI), a leader in computer based training programs carries a complete line of software designed to get you up & running on your computer & applications software in no time. Training pkgs. for *1-2-3, Multiplan, WordStar*, & popular hardware such as IBM & Macintosh. See display ad this issue. *ATI, 12638 Beatrice St., Los Angeles, CA 90066, 213/823-1129*

InfoStar Tutorials
Two interactive tutorials on DataStar & ReportStar. All principle procedures are explained including the use of key fields, resorting data files, & using logical expressions. Each tutorial includes a two-disk training program & 50 pg. handbook with exercises & sample applications. $59.95 each. *Witech Corp., 763 Vallejo Way, Sacramento, CA 95818, 916/441-7772*

Transportation

TSA88-Transportation
Solves problems with 256 origins & 256 destinations. Fully menu-driven, spreadsheet style display, Transportation Simplex Algorithm start/restart options, primal & dual solutions, sensitivity analyses, report generator, storage of problems & solutions, user's guide & examples. $88. *Eastern Software Products, P.O. Box 15328, Alexandria, VA 22309, 703/360-6942*

Utilities

Peeks 'n Pokes for the PC
A customer told us "Peeks 'n Pokes is the best bargain in *PC World*." We think you'll agree! Discover how to access and modify the status of the PC. Perform DOS and BIOS function calls from BASIC or Pascal. Learn how to find more Peeks 'n Pokes and much more. Disk (58 programs) and manual $30 + $2.50 shipping. MC/Visa. *Data Base Decisions, 14 Bonnie Lane, Atlanta, GA 30328, 404/256-3860*

The Inside Track
Another bargain! Give your programs speed and control. Read files as fast as DOS, display data faster, load programs faster, control memory use, run any program from your program, copy-protect your disks

and much more. Fold-out memory map too! Disk (61 programs) and manual $45 + $2.50 shipping. MC/Visa. *Data Base Decisions, 14 Bonnie Lane, Atlanta, GA 30328, 404/256-3860*

Disk Mechanic

The ULTIMATE Floppy Disk Backup & Repair Utility. Can back up ALL software protected disks written on the IBM PC. Works manually or automatically. Files or sectors can be restored, searched, examined & changed. Checks disk drive speed. Requires IBM PC, DOS 1.10(128K)/ 2.00(192K), + 64K if only 1 floppy drive. $73 Ppd. USA. For info/MC/Visa: *MLI Microsystems, P.O. Box 825, Dept. PCWD, Framingham, MA 01701, 617/926-2055*

Pascal/Fortran/C Util.

Written in assembly language, Pascal/FORTRAN/C Utilities control screen, keyboard, graphics, music, lightpen, mouse, joystick, printer, RS-232, & I/O ports. Line/circle/ellipse/pie drawing, clipping, windowing & animation. Terminal emulator, random number, BIOS/DOS calls. 150 page manual, demos. Specify compiler. $119. Chk/Visa/MC. *Software Labs, 1221 Matisse St., Sunnyvale, CA 94087, 408/730-8108*

DOSshell

A complete menu & directory system for organizing a hard disk. Superior to other organizers because it is written with DOS files & batch files so that the user is always in DOS. DOSshell may be altered to match any users needs. Utilities included. Disk & manual, $70. *Handcrafted Software, P.O. Box 902, Santa Barbara, CA 93102, 805/967-7837*

Screen I/O Utility

SCRIO creates complex displays, menus & input screens under PC-DOS 2.00 using Lattice C (Lifeboat Assoc.). Separates the screen I/O parameters from the compiled program. Recompilation is not necessary to make changes. Immediate type checking, input limit checking & more. List, $250. Includes shipping & COD. *Delta-Pro Management Consultants Inc., 350 Sagamore Pkwy. #6, P.O. Box 2638, W. Lafayette, IN 47906, 317/463-1936*

Deluxe File Manager

At last! Display disk directories sorted ANY WAY you want. List hidden/system files. Perform file operations (type, delete, etc.) using SINGLE KEY commands after selecting file with cursor. Great timesaver! Many features put you in control of your files. Executable from BASIC. $39.95. Free brochure. *World Class Software, Box 2146, Toledo, OH 43603, 419/698-8086*

RamDisk II

RamDisk II is a 180K RAMDISK & comes with a PRINT SPOOLER. Runs on IBM PC compatible systems, & WORKS EXACTLY LIKE ANOTHER DRIVE. Instantaneous loading of programs. NO hardware, NO commands, 100% software! Self-initializes at bootup. Searches ALL boards for memory. ONLY $59.95 for the ramdisk & our print spooler. *Rensin Communications, P.O. Box 414, College Park, MD 20740, 202/728-7955*

Attn: Fixed Disk Users!

Organize your fixed disk more effectively with FloatFiles! Easily access & use application programs & data files from any directory. No more confusing batch files or path commands. Find files with forgotten directory location. On line help eases use of both FloatFiles & DOS. Visa/MC accepted. $64.95. *K D Ware, Dept. 10, P.O. Box 712, DeKalb, IL 60115, 815/756-6286*

Padlock/Padlock II Disks

PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS commands. $99. PADLOCK II disks come preformatted with fingerprint & serialization. PADLOCK II disks offer superior protection. Ask about our fast data encryption product. All work w/hard disk, EXE/COM files & all DOS versions. MC/Visa. *Glenco Engineering, 3920 Ridge Ave., Arlington Hts., IL 60004, 312/392-2492*

DOS Data Path Command

Now Lotus *1-2-3*, *dBASE II*, *WordStar*, others can access data files no matter where they are located! Works with hard disks & floppies. A stay-resident function allowing you to organize your disk any way you like. Includes screen-oriented maintenance utility & 60-page man. DOS 2.00+. $25. Qty. discounts. *Personal Business Solutions Inc., P.O. Box 757, Frederick, MD 21701, 301/865-3376*

Print Package $39.95

LAYOUT–Print sideways. Split pages for brochures, booklets. Select char. style & size (to 35/inch)!
SETUP–Set printer features (Italics, compressed, etc.).
EDITCHAR–Create/Modify char. sets interactively. 20 sets incl.
Menus, online help! IBM/Epson printer, DOS, 128K. Chk/MO, PA + 6%.
Digital Concepts, P.O. Box 8345, 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*

MATIS, Screen Manager

70 Assembler subroutines used as BASIC commands, PROCEDURES in C & PASCAL, & CALLS in Assembler. Features: window management, screen design, control of video attributes, screen loading from & saving to disk printer utility, demo program. 170-page manual. $150 + $2.50 shipping. (CA add 6.5%) Visa/MC. *Softway, Inc., 500 Sutter St. #221, San Francisco, CA 94102, 415/397-4666*

¢heapware™

BASIC CREF–Will format & print source code & all literal variables in it w/line number cross reference. If program fails to work as documented, you may get a refund of the purchase price. Hard copy $9.95; disk version $14.95, w/compiled code $19.95. Compiled code scans any program in under 3 minutes. (MO res. + 6% tax). *Robert L. Nicolai, 4038 N. 9th St., St. Louis, MO 63147, 314/621-7618*

Word Processing

Pelada-Science-Foreign

TEXT ENGINEER and LINGUIST are word processors with special symbols & character fonts. You can design characters, even whole alphabets. Italics, European characters, super/subscripts, math, chemistry & more. Text is displayed EXACTLY as printed. Instant, simple editing operations. $150 to $400. *Pelada Informatica Inc., 562 Johnson St., Kingston, Ontario K7L 2A1 Canada, 613/549-1747, Source STP892*

PC-Write™

Features: wordwrap, search/replace, justify, underline, boldface, headers/footers, etc. 9 help screens, quick ref card, 100 page manual. Split screen edits two files. Software & manual on disk, $10; registration w/ support, source, commissions $75. Visa/MC. Shareware: copy and share with others. *Quicksoft, 219 First N. #224F, Seattle, WA 98109, 206/282-0452*

MY WORD!™ Just $25!

Get a WS-like word processor for the IBM PC/XT/jr or compatibles (even Tandy 2000). Sort, mail merge, quick print; use 256 char.! Word wrap, 100+ operations, won't lose text, ASCII files. Manual with index included. Source code: just $25 more! 96K, 1 drive, DOS 1.10-2.10. 30-day money back guarantee. *T.N.T. Software, Inc., 34069 Hainesville Rd., Round Lake, IL 60073, 312/223-0832*

forMath™

- formats articles, books, theses in science/engg.
- on dotmatrix, daisywheel, laser printers, typesetters, CRTs
- automatically sizes & places matrices, ratios, integrals, equations, footnotes
- numbers chapters, equations, references
- multiple fonts/sizes, symbols, macros, indexes, tabs, hyphenation

$400. *Shantha Software, Inc., 50 West 97th St. Room 11N, New York, NY 10025, 212/222-SNIP*

Tape/Conv.

Conversion Services

Mag tape to disk conversion. Any 9 track 1600 BPI MAGNETIC TAPE converted to: 8":

CP/M	IBM 3740
DISPLAY WR.	CPT 8000
IBM SYS/??	IBM PC

5¼":

APPLE II	ZENITH
MORROW	TELEVIDEO
KAYPRO	ALTOS
XEROX	SUPERBRAIN
TRS80	NORTHSTAR
	Many Others

Disk to disk & disk to tape conversion also avail. *Pivar Computing Services, Inc., 47 W. Dundee Rd., Wheeling, IL 60090, 312/459-6010*

Tutorials

Novice Tutorials

Quick guides for the novice. QUICKDOS–extensive examples of common DOS commands. Clear, easy. Only a few advanced commands. BATCHES. The what, why & how of batch files. Complete examples. VERY BASIC ... a 20 minute tutorial, using only 15 commands, teaches how to write & run a menu-driven program. With listing. $9.95 for all 3 pamphlets. Chk/MO. Dealer discounts. *Glenn Abelson/Sales, P.O. Box 1031, Rockville Ctr., NY 11571, 516/766-7782*

Typesetting

High-Speed Typesetting

Your computer is now your own personal typesetting terminal! You control all typesetting parameters. Our automated Compugraphic equipment offers high speed & top quality. Excellent for: • Newsletters • Directories • Catalogs • Documentation • Books Friendly, personal service. Send your file direct to our BBS, or via MCI or Compuserve. Call our BBS for more details, or write for free brochure. CIS–70130,161–MCI Mail 218-5055. *Cimarron Graphics, P.O. Box 12593W, Dallas, TX 75225, BBS–214/691-5092*

JL Network

Telecommunicate your manuals, catalogs, high tech pubs. to a specialist. Save time, save money. Fully paginated, camera-ready output. Call today. Ask about our "Instant Proof" service! Visa/MC. *JL Network, 373 Main St., Salem, NH 03079, 800/637-0707*

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 $480 ($160 per issue). We offer a six-time insertion, 15 percent discount contract for a total of $816 ($136 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.*

Advertiser Product Index

Reader Service Number

Computers

- — AT&T Information Systems, 45,46-47
- 15 Articulate Computers,Inc., 36
- — COMPAQ Computer Corporation, 17
- 48 Corona Data Systems, 266
- — Data General Corp., 280A
- 830 IBM, 21,22-23,32A
- 834 NCR, 94-95
- 694 Panasonic Industrial Corporation, 318
- 248 Seequa Computer Corporation, 308
- 75 Zenith Data Systems, 111

Hardware

Boards

- 18 AST Research Inc., IFC,1
- 900 Comway Electronics Corp., 137
- 857 CMC International, 187
- 699 Everex, 66
- 73 Heath Company, 200-201
- 153 IDEAssociates, 26-27
- 133 Orchid Technology, 176
- — Paradise Systems, 112
- 827 Power R, 302
- 141 Profit Systems, 16
- 151 Qubie' Distributing, 141
- 190 Tecmar Inc., 8-9,114,IBC
- 822 Thesys Memory Products, 170,171,173
- 261 Univation, 113
- 193 Ven-Tel Inc, 116

Storage Devices

- 820 ACT Marketing, 228
- 17 Ampex, 88-89
- 243 Emulex/Persyst, 112B-112C
- 153 IDEAssociates, 26-27
- 537 Micro Design, 146

Reader Service Number

- 120 Mountain Computer, Inc., 285
- 802 Pacific Datanet, 215
- 151 Qubie' Distributing, 143
- 169 Sigma Designs, 202-203
- 181 Sunol Systems, 226
- 188 Tallgrass Technologies Corp., 49
- 261 Univation, 113

Monitors

- 296 Princeton Graphic Systems, 24
- 149 Quadram Corporation, 53
- 75 Zenith Data Systems, 111

Printers, Plotters, and Typewriter Interfaces

- 896 Brother International, 205
- 773 CIE Terminals, 190
- 777 C. Itoh Digital Products, Inc., 76
- 95 Logicsoft, 281
- 864 Microbits Peripheral Products, Inc., 74
- 328 Rainbow Technologies, 302
- 727 Roland Corporation, 255
- — Texas Instruments, 34
- 285 Toshiba America, Inc., 199

Communications

- 857 CMC International, 187
- 869 General Datacomm, 278-279
- 151 Qubie' Distributing, 139
- 405 US Robotics, 71

Miscellaneous

- 841 Arctec Systems Inc., 330
- 50 Cuesta Systems, Inc., 321
- — Curtis Manufacturing Company, 93
- 78 Genest Technologies, 159
- 851 Golden Bow Systems, 343
- 153 IDEAssociates, 26-27
- 864 Microbits Peripheral Products, Inc., 74
- 103 Microprocessors Unlimited, 342
- 827 Power R, 302
- 157 Relax Technologies, 338
- 886 Secure It, 159

Systems Software

Operating Systems

Utilities

- 760 Borland International, 38-39
- 31 Central Point Software, 229
- — Computational Systems, Inc., 307
- 853 Essential Software, 343
- 781 IBM/Direct, 150-151
- — Microsoft Corporation, 75

Reader Service Number

- 894 Opt-Tech Data, 342
- 133 Orchid Technology, 176
- 848 Polygon Software, 310-311
- — Quaid Software Limited, 330
- 726 Rickard Software Group, 343
- 160 Rickerdata, 92
- 162 RoseSoft (Prosoftware), 81
- 163 RTCS Corporation, 312
- 816 SoftStyle, Inc., 147
- 862 Software Bottling Co. of N.Y., 325
- 526 Software Link, Inc., 251
- 278 Vault Corporation, 194

Languages

- 92 Lifeboat Associates, 112H,332-333
- 231 Mark Williams Company, 177
- 100 MBP Software Systems Technology, 365
- — Microsoft Corporation, 115

Applications Software

General Business

- 20 Creative Software, 110
- 493 Ecosoft, 307
- 532 The Future's Group, 343
- 859 Human Edge Software, 364
- 830 IBM, 18,21,22-23,32A
- — Microsoft Corporation, 35
- — POLYTRON Corporation, 149
- 281 SAMNA Corporation, 164-165
- — Scitor Corporation, 90
- 850 Soft/Plus, 342
- 816 Softstyle, 147
- 526 Software Link, Inc., 251
- 844 SPSS, 254
- 819 TLB, Inc., 83
- 863 TVG Systems, 342

Financial & Spreadsheets

- 747 Barron-Ross, 191
- — Fidelity Investments, 342
- 891 H & E Computronics, Inc., 33
- 97 H & E Computronics, 87
- 292 Micro-Tax, 28
- 321 Pacific Data Systems, 376
- 286 Peachtree Software, 204
- 740 Software Services of Tampa, 265

Job and Industry Specific

- 849 Software Shop Systems, 343

Data Management

- 658 Concentric Data Systems, 50-51
- 211 Dayflo Incorporated, 206-207
- 871 Dynamic Microprocessors Assoc., 312
- 474 Kensington Microware, 227
- — MicroRIM, 14-15
- 868 SSI, 222-223
- — Software Publishing, 82

Reader Service Number

Word Processing/Text Editing

- 91 Leading Edge Products, Inc., 65
- 657 Meca, 5
- — Microsoft Corporation, 6-7
- 533 Office Solutions, 91
- 281 SAMNA Corporation, 164-165
- 165 SSI, 221
- 704 Zylab Corporation, 67

Communications

- 49 Corvus Systems,Inc., 52
- 624 Inner Loop Software, 342
- 751 International RED HOT SOFTWARE, 297
- 883 MCI, 300
- 275 Microstuf, 142
- 133 Orchid Technology, 176
- 792 Softronics, Inc., 331
- 526 Software Link, Inc., 251

Graphics

- 596 Autodesk, 72-73
- 39 Computer Aided Design, 341
- 342 Decision Resources, 112A
- 877 General Parametics, 166
- 502 Graphic Communications, Inc., 252-253
- 77 Hercules Computer Technology, 13,117
- 332 MICROGRAFX, 31
- 241 Polaroid, 84-85

Integrated Systems

- 6 Alpha Software, 10
- 867 Ashton-Tate, 208
- — Bellsoft, Inc., BC
- 884 Cullinet Software, 121,123,125
- 840 Electroinic Arts, 54-55
- — Lotus Development Corporation, 298-299
- 81 Martin Marietta/ ITSoftware, 161
- 281 SAMNA Corporation, 164-165
- 823 Sorcim/IUS, 313
- 196 Warner Software, Inc., 270-271

Educational, Personal, Entertainment & Misc. Software

Educational

- 710 Business Tectonics, 187
- 830 IBM, 18,21,22-23,32A
- 145 Professional Software, Inc., 192
- 720 Thoughtware, 316-317

PC WORLD BACK ISSUES!

PC World is much more than a magazine; it's an incredible reference library for getting the very most out of your IBM PC or compatible. Now you can complete that valuable reference set by ordering back issues of *PC World*.

Within the U.S. and Canada, the cost is $5 per copy for monthly issues and $7 per copy for the special *Hardware Review* and *Software Review* issues. This price includes second-class postage. Please allow 4 to 6 weeks for delivery. For first-class delivery, please add $3 per copy ordered. Outside the U.S. and Canada, the price (including first-class postage) is $11 per copy for monthly issues and $15 for special review issues. We regret we are unable to bill you or accept credit card orders for back issues.

To order: Check the issues you want below and enclose a check (in U.S. funds) with this form. Mail to: *PC World* Back Issues, 555 De Haro Street, San Francisco, CA 94107.

Name_____

Company_____

Address_____

City/State/Zip_____

- ☐ Vol. 1 No. 1 PC Compatibility
- ☐ Vol. 1 No. 2 PC Portability
- ☐ Vol. 1 No. 3 MS DOS 2.00, PC XT
- ☐ Vol. 1 No. 4 Disk Emulation
- ☐ Vol. 1 No. 5 Communications Programs
- ☐ Vol. 1 No. 6 Hard Disks
- ☐ Vol. 1 No. 7 Computer/Aided Design
- ☐ Vol. 1 No. 8 Modems
- ☐ Vol. 1 No. 9 ($7) Annual Software Review
- ☐ Vol. 1 No. 10 Ink Jet Printers
- ☐ Vol. 2 No. 1 Artificial Intelligence
- ☐ Vol. 2 No. 2 PCjr Home Computing
- ☐ Vol. 2 No. 3 Customizing Spreadsheets
- ☐ Vol. 2 No. 4 PC Compatibles
- ☐ Vol. 2 No. 5 PC Portability
- ☐ Vol. 2 No. 6 Electronic Mail
- ☐ Vol. 2 No. 7 Data Management
- ☐ Vol. 2 No. 8 ($7) Annual Hardware Review
- ☐ Vol. 2 No. 9 Business Graphics
- ☐ Vol. 2 No. 10 Project Management

Reader Service Number

Personal

— Bellsoft, Inc., BC
710 Business Tectonics, 187
— Microsoft Corporation, 37
25 Prentice Hall/Lumen Systems, Inc., 225
589 Spectrum Holobyte, 32

Entertainment

840 Electronic Arts, 48,86
830 IBM, 21,22-23,32A
— Microsoft Corporation, 37
866 Owl Software, 124
145 Professional Software, Inc., 192
870 Social Software, 322
589 Spectrum Holobyte, Inc., 32
308 subLOGIC Corporation, 283

Miscellaneous

145 Professional Software, Inc., 192
506 Sam Wilson and Associates (Banner), 343
816 Softstyle, 147

General

Accessories

146 Computeraid, 342
634 Creative Computer Products, 224
206 HOOLEON Co., 341
578 Maxell, 284
312 PC Case, Inc., 321

Services

861 Bank of America, 329
856 Compuserve, 268
— Direct Net, 280
— Uniform, 315

Books, Catalogs, and Periodicals

— D-Comp, Inc., 193
824 ElComp Publishing, 343
— Harper & Row, 120,269
797 Wayne Green Enterprises, 323

Events

885 PC World Exposition,(CW Communications), 267

Mail Order

825 Arlington Computer Products, 264
205 Applied Computer Products, Inc., 178-179
— Beck Manufacturing, 122
784 Better Products, 343
134 Bits & Bytes of Electronics, 302
208 Bottom Line,The, 314
865 Bulldog Computer Products, 372
842 CDA Computer Sales, 306
879 Command Technical Corporation, 214

Reader Service Number

90 Compuclassics, 337
897 Computer Connections, 277
— Computer Inventory Control, 326
420 Computer Mail Order, 335
554 Conroy La Pointe/Computer Exchange, 144-145
110 Creative Microsales, Inc., 341
58 Diamond Software, 162-163
880 Discount Computer Center, 334
780 Disk World!, 80,172,303,304
— Diskette Connection, 277
— Economy Software, 293
214 (Eight Hundred) 800 Software, 371
768 47th Street Photo, 188-189
854 456 World, 342
95 Logicsoft, Inc., 148
762 Mandingo Computers & Cameras, 341
— Micro Exchange, Inc., 140,368
108 Micro Flash Computer Systems, Inc., 160
112 Micro Mart, 374-375
116 Microshop, 373
552 Micro Storehouse, 370
681 Oryx Systems, 230-232
756 Oryx Systems, 233
576 Pacific Exchanges, 343
201 PC Connection, 108-109
136 PC Connection, 128-131
837 PC Connection, 174-175
800 PC Express, 282
— PC Link, 369
460 PC Network, 344
737 PC Warehouse, 339
274 Progressive Micro Distributors, 366-367
586 Ramware Software Products, 338

Advertisers Index

Reader Service Number	
820	ACT Marketing, 228
6	Alpha Software, 10
17	Ampex, 88-89
205	Applied Computer Products, 178-179
841	Arctec Systems, Inc., 330
825	Arlington Computer Products, 264
15	Articulate Computer, Inc., 36
867	Ashton-Tate, 208
18	AST Research Inc., IFC,1
—	AT&T Information Systems, 45,46-47
596	Autodesk, 72-73
861	Bank of America, 329
747	Barron-Ross, 191
—	Beck Manufacturing, 122
—	Bellsoft, Inc., BC
784	Better Products, 343
134	Bits & Bytes of Electronics 302
760	Borland International, 38-39
208	(The) Bottom Line, 314
896	Brother International Corp., 205
865	Bulldog Computer Products, 372
710	Business Tectonics, 187
777	C. Itoh Digital Products, Inc., 76
842	CDA Computer Sales, 306
31	Central Point Software, Inc., 229
773	CIE Terminals, 190
857	CMC International, 187
879	Command Technology Corporation, 214
—	COMPAQ Computer Corporation, 17
90	Compuclassics, 337
856	Compuserve, 268
—	Computational Systems, Inc., 307
146	Computeraid, 342
39	Computer Aided Design, 341
897	Computer Connection, 277
754	Computer Discount Products, 336
—	Computer Inventory Control Inc., 326
420	Computer Mail Order, 335
900	Comway Electronics Corp., 137
658	Concentric Data Systems, 50-51
554	Conroy La Pointe/Computer Exchange, 144-145
48	Corona Data Systems, 266
49	Corvus Systems, Inc., 52
634	Creative Computer Products, 224
110	Creative Microsales, Inc., 341
20	Creative Software, 110
50	Cuesta Systems, Inc., 321
884	Cullinet Software, 121,123,125
—	Curtis Manufacturing, 93
—	D-Comp, Inc., 193
—	Data General Corp., 280A
211	Dayflo Incorporated, 206-207
342	Decision Resources, 112A
58	Diamond Software, 162-163
—	Direct Net, 280
880	Discount Computer Center, 334
780	Disk World!, 80,172,303,304
—	Diskette Connection, 277
871	Dynamic Microprocessors Assoc., 312
—	Economy Software, 293
493	Ecosoft, Inc., 325
214	(Eight Hundred) 800 Software, 371
824	ElComp Publishing, Inc., 343
840	Electronic Arts, 48,54-55,86
243	Emulex Persyst, 112B-112C
853	Essential Software, 343
699	Everex, 66
—	Fidelity Investments, 342
768	47th Street Photo, 188-189
854	456 World, 342
532	Future's Group, The, 343
869	General Datacomm, 278-279
877	General Parametics, 166
78	Genest Technologies, 159
851	Golden Bow Systems, 343
502	Graphic Communications Inc., 252-253
—	Harper & Row, 120, 269
73	Heath Company, 200-201
891	H & E Computronics, 33
97	H & E Computronics, 87
77	Hercules Computer Technology, 13,117
206	HOOLEON Co., 341
859	Human Edge Software, 364
830	IBM, 18,21,22-23,32A
781	IBM/Direct, 150-151
153	IDEAssociates, 26-27
624	Inner Loop Software, 342
751	International RED HOT SOFTWARE, 297
474	Kensington Microware, 227
91	Leading Edge Products, Inc., 65
92	Lifeboat Associates, 206-207,112H,332-333
95	Logicsoft, 148,281
—	Lotus Development Corporation, 298-299
762	Mandingo Computers & Cameras, 341
231	Mark Williams Company, 177
81	Martin Marietta/ ITSoftware, 161
578	Maxell, 284
100	MBP Software Systems Technology, 365
883	MCI, 300
657	Meca, 5
864	Microbits Peripheral Products, Inc., 74
537	Micro Design, 146
—	Micro Exchange, The 140,368
108	MicroFlash Computer Systems, Inc., 160
332	MICROGRAFX, Inc., 31
112	Micro Mart, 374-375
103	Microprocessors Unlimited, 342
—	MicroRim, 14-15
116	Microshop, 373
—	Microsoft Corporation, 6-7, 35,37,75,115
275	Microstuf, Inc., 142
552	Micro Storehouse, 370
292	Micro-Tax, 28
120	Mountain Computer, Inc., 285
834	NCR, 94-95
533	Office Solutions, 91
894	Opt-Tech Data, 342
133	Orchid Technology, 176
681	Oryx Systems, 230-232
756	Oryx Systems, 233
866	Owl Software Corporation, 124
802	Pacific Datanet, 215
321	Pacific Data Systems, 376
576	Pacific Exchanges, 343
694	Panasonic Industrial Co., 318
—	Paradise Systems, 112
312	PC Case (Metricase), 321
201	PC Connection, 108-109
136	PC Connection, 128-131
837	PC Connection, 174-175
800	PC Express, 282
—	PC Link Corp., 369
460	PC Network, 344
737	PC Warehouse, Inc., 339
	PC World Exposition, 340
286	Peachtree Software Inc., 204
241	Polaroid, 84-85
848	Polygon Software, 310-311
—	POLYTRON Corporation, 149
827	Power R, 302
25	Prentice-Hall/Lumen Systems, Inc., 225
296	Princeton Graphic Systems, 24
145	Professional Software, Inc., 192
141	Profit Systems, 16
274	Progressive Micro Distributors, 366-367
149	Quadram Corporation, 53
—	Quaid Software Limited, 330
151	Qubie' Distrubiting, 139,141,143
328	Rainbow Technologies, Inc. 302
586	Ramware Software Products, 338
157	Relax Technologies, 338
726	Rickard Software Group, 343
160	Rickerdata, 92
727	Roland Corp., 255
162	RoseSoft, 81
163	RTCS Corporation, 312
506	Sam Wilson & Associates/ Banner, 343
281	SAMNA Corporation, 164-165
165	SSI, 221
868	SSI, 222-223
—	Scitor Corporation, 90
886	Secure It, 159
248	Seequa Computer Corp., 308
169	Sigma Designs, Inc., 202-203
870	Social Software, 322
850	Soft/Plus, 342
792	Softronics Inc., 331
816	SoftStyle, 147
862	Software Bottling Co. of N.Y., 325
526	Software Link, Inc., 251
—	Software Publishing, 82
740	Software Services of Tampa, Inc., 265
849	Software Shop Systems, 343
823	Sorcim/IUS, 313
589	Spectrum Holobyte, Inc., 32
844	SPSS, 254
308	subLOGIC Corporation, 283
181	Sunol Systems, 226
188	Tallgrass Technologies Corp., 49
819	TLB, Inc., 83
190	Tecmar Inc., 8-9,114,IBC
—	Texas Instruments, 34
822	Thesys Memory Products, 170,171,173
720	Thoughtware Corporation, 316-317
285	Toshiba America, Inc., 199
863	TVG Systems, 342
—	Uniforum, 315
261	Univation, 113
405	US Robotics, 71
278	Vault Corporation, 194
193	Ven-Tel, Inc., 116
196	Warner Software, Inc., 270-271
797	Wayne Green Enterprises, 323
75	Zenith Data Systems, 111
704	ZyLab Corporation, 67

Read Any Good Minds Lately?

With the Mind Prober™ you can. It's an ingenious new software program from the Human Edge™ that lets you read people like a book. And discover things about them that most people wouldn't dream of telling you.

All you do is answer a series of questions and agree or disagree with a list of adjectives describing a specific person. In just a few minutes your personal computer can show you their strengths, weaknesses, sexual interests, and more.

The Mind Prober delivers a personality profile on your subject that's so accurate, it's frightening. You'll know what makes them tick. And that's a tremendous advantage in figuring out how to get what you want from someone. Anyone. In a business situation, or a personal situation.

Pick up the Mind Prober today. And get a piece of someone's mind.

The Mind Prober is available at fine retail and computer stores everywhere. In the United States call 1-800-624-5227 (in California 1-800-824-7325) for more information. Mind Prober is another practical expert systems program from the Human Edge™ Software Corporation.

Software That Lets You Read People Like A Book.

Mind Prober™

IBM • Apple • Macintosh • Commodore

Circle 859 on reader service card

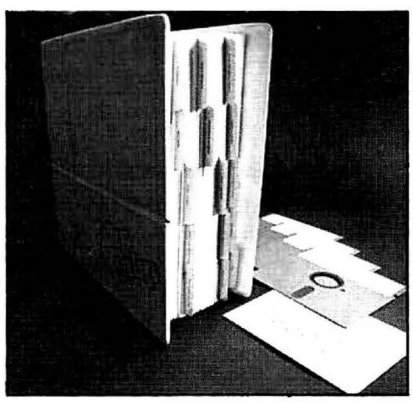
For your IBM/PC

mbp COBOL: 4 times faster, and now with SORT & CHAIN.

$750.

mbp COBOL can be summed up in one word: fast.

Because it generates native machine language object code, the mbp COBOL Compiler executes IBM/PC* programs *at least* 4 times faster (see chart). Fast also describes our **new SORT**, which can sort four-thousand 128-byte records in less than 30 seconds. A callable subroutine or stand-alone, 9 SORT control fields can be specified. And our **new CHAIN** is both fast and secure, conveniently transferring control from one program to another, passing 255 parameters. Plus, **new extensions** to ACCEPT & DISPLAY verbs give better, faster interactive programming.



GIBSON MIX Benchmark Results
Calculated S-Profile
(Representative COBOL statement mix)
Execution time ratio

mbp COBOL	Level II** COBOL	R-M*** COBOL	Microsoft**** COBOL
1.00	4.08	5.98	6.18

128K system with hard disk required. *IBM/PC is an IBM TM; **Level II is a Micro Focus TM; ***A Ryan-McFarland TM; ****A Microsoft TM.

The complete COBOL.

An Interactive Symbolic Debug Package included standard; Multi-Keyed ISAM Structure; listing options allow source & object code, map & cross-reference checking; GSA Certification to ANSI '74 Level II; mbp has it all.

It's no surprise companies like Bechtel, Chase, Citicorp, Connecticut Mutual, and Sikorsky choose mbp COBOL; make it your choice, too. mbp is available at Vanpak Software Centers, or direct; just send the coupon, or call for complete information–today.

mbp COBOL: 4 times faster.

mbp Software & Systems Technology, Inc.
7700 Edgewater Drive, Suite 360, Oakland, CA 94621
Phone 415/632-1555

Please send complete mbp COBOL information to:

NAME _____

COMPANY _____

ADDRESS _____

CITY/STATE/ZIP _____

PHONE _____

Circle 100 on reader service card

HOW TO MAKE YOUR

Christmas is coming and everyone is hurrying to take advantage of end of the year bargains. As the malls fill to overload capacities and traffic jams are as common as mistletoe, your local computer store will become even more of a zoo. Why not have a cool Christmas and shop with the experts at PROGRESSIVE. Choose from literally hundreds of the newest and finest product

The AT will appeal to buyers who need maximum performance.

AT

Call to ask our AT specialists how to buy better value while avoiding hidden pitfalls.

Printers:

★ ★ ★ **NEW EPSON PRICES!!!** ★ ★ ★

EPSON FX-80 (160cps, 10")	$425
EPSON FX-100 (160cps, 15")	$625
EPSON RX-80 (100cps, 10")	$245
EPSON RX-80F T (100cps, 10" w platten)	$295
EPSON RX-100 (100cps, 15")	$425
EPSON LQ-1500 (LQ dot matrix w parallel interface)	$1295
OKIDATA ML92 (160cps, 10")	$439
OKIDATA ML93 (160cps, 15")	$659
OKIDATA ML84 (200cps, 15")	$795
OKIDATA PACEMARK 2410 (350cps, 15")	$1995
GEMINI 10X (120cps, 10", PC ROM)	$275
GEMINI 15X (120cps, 15", PC ROM)	$395
DELTA, RADIX, by Star Micronics	CALL
DATAPRODUCTS 8010 (180cps, dot matrix, 10")	CALL
DATAPRODUCTS 8020 (180cps, dot matrix, 15")	CALL
DATAPRODUCTS 8050 (200cps, dot matrix, 15", color)	$1395
DATAPRODUCTS 8070 (400cps, LQ dot matrix, 15")	$1695
TOSHIBA P1340 (Best LQ dot matrix, 10")	$775
TOSHIBA P1351 (Best LQ dot matrix, 15")	$1395
TI-855 (LQ dot matrix w replaceable font cartridge)	$775
DIABLO 630API (40cps LQ)	$1595
DIABLO 630ECS (192 chars on wheel)	$1995
NEC 2050 (Durable, low cost LQ)	$865
NEC 3550 (33cps LQ, industry standard)	$1595
NEC 7730 (55cps LQ)	$1995
NEC 8850 (Fast LQ from the people who set the standard)	CALL
BC C ITOH A10 New Letter Quality	CALL
C ITOH STARWRITER (40cps LQ)	$1025
C.ITOH PRINTMASTER (55cps LQ)	$1395
QUME LETTER PRO 20 (New, nice)	CALL
QUME SPRINT 1140 Plus (40cps LQ)	CALL
QUME SPRINT 1155 Plus (55cps LQ)	CALL
BROTHER HR-15 (13cps LQ, 10")	$395
BROTHER HR-25 (23cps LQ, 15")	$675
BROTHER HR-35 (32cps LQ, 15")	$895
COMREX, DYNAX PRINTERS	CALL

CALL FOR ADD-ON TRACTORS & CUT SHEET FEEDERS

Ask for an application to join our Preferred Account Charge Club.

Multifunction Boards:

EXPANDED QUADBOARD (64-384K,S,P,C C,bracket) $269/459

AST 6-PAK (64-384K,S,P,C C,opt G)	$269/459
AST MEGAPLUS (64-512K*,S,C C,opt S,P,G,K)	from $269
AST I O PLUS (S,C C,opt S,P,G)	from $139
ORCHID BLOSSOM (64-384K S,P,C C, **opt PC Net**)	from $249
TECMAR CAPTAIN (64-384K,S,P,C C)	from $259
BABY BLUE II (64-256K,Z80B,2S,P,C C)	from $429
PERSYST Time Spectrum (64-384K,S,P,C C, 2 yr wrty)	$279
PROFIT RAM ELITE & PLUS (64-512K w Tascmaster)	CALL
MAYNARD SANDSTAR MODULAR BOARDS	CALL

Modems:

HAYES 300 baud external	$209
HAYES 1200 (300 or 1200 baud ext)	$469
HAYES 1200B (300 or 1200 baud internal w SMARTCOM II)	$399
POPULAR HAYES COMPATIBLE BRANDS	CALL
SIGNALMAN MARK 12 (1200 baud at 300 price)	$269
VENTEL HALF CARD w CROSSTALK	BEST PRICE

Display Cards:

EVEREX GRAPHIC EDGE (Simult. color & mono. & more)	$399
TSENG UltraPAK (132 mono,S,P,C C,opt RAM,FDC,color)	$439
PARADISE MODULAR GRAPHICS CARD (Color graphics in mono with modular port options!)	from $339
PERSYST BoB (finally clear text on a color monitor)	CALL
STB GRAPHIX PLUS II (Mono, color, par)	$369
PROFIT MULTIGRAPH (Mono, color, opt par)	$369
TECMAR GRAPHICS MASTER (640x400 · mono)	$489
QUADCOLOR I (Upgrades to hi res w Quadcolor II)	$199
HERCULES COLOR CARD (New from old faithful)	$189
AST MonoGraphPlus (LOTUS mono, serial, parallel, clock)	$399
PLANTRONICS Color · (Hi res w color magic or draftsman)	$379

Hard Disk Drives:

SYSGEN 10MB HARD DISK (w streamer tape back-up)	$2395
SYSGEN 20MB HARD DISK (w streamer tape back-up)	$2895
SYSGEN IMAGE 4 minute XT tape back up	$795
SYSGEN QUICK FILE 20MB tape back-up	CALL
BERNOULLI TECHNOLOGY Single or dual remov. 10MB	CALL

CALL FOR TECMAR, DAVONG, AND TALLGRASS PRICES

NEW IBM PRICES!!

IBM PC w/256K, 2 360K drives, controller, Monochrome/ Printer adapter, Amdek 310A **$2195**

IBM PC w/256K, 2 360K drives, controller, Color/ Graphics adapter, HX-12 color monitor **$2495**

IBM PC w/256K, 2 ½ ht. 360K drives, controller, 10MB hard disk w/autoboot **$2795**

(These systems are brand new, fully tested and burned in, fully warranteed for 90 days **AND ARE ALWAYS IN STOCK!**)

TANDON TM 100-2

IBM's 1st choice now only **$179**

HALF HEIGHTS

Direct drive with 1 year warranty . . . **$149**

Mounting kit & "Y" jack FREE with purchase of two MITSUBISHI, TEAC, SHUGART, CDC in stock . . . . . CALL

XT-LIKE HARD DISKS

We specialize in new technology, state of the art internal hard disks for upgrading your PC's storage capabilities. With features like integral streamer tape back-up, auto-boot and auto-park to choose from, our experts can recommend the best choice for your particular application. **CALL FOR THE LATEST AND GREATEST BUYS AND CHOOSE FROM NAMES LIKE PEACHTREE PERIPHERALS, MAYNARD, EVEREX AND MITSUBISHI.**

64K RAM MEMORY UPGRADES

$39.00 NINE CHIPS

CALL FOR QUANTITIES

CHRISTMAS MERRIER.

lines available, and at prices that would put a smile on Santa's face. A call is all it takes to have your sleighful of PC goodies delivered to your door, quicker than Donner and Blitzen. Let the experts at PROGRESSIVE take the rush out of Christmas. **CALL US NOW AT 1-800-446-7995 and we'll show you why we're called PROGRESSIVE.**

PROGRESSIVE will custom engineer a networking configuration for your office needs.

NETWORKS FOR YOUR IBM PC

Details below

Here's what you get:
- **Engineered Layout.**
- **Custom Parts List.**
- **Price Comparisons.**
- **Service Options.**

Monitors:

AMDEK COLOR 710(No glare, no flicker ultra hi res)	$579
AMDEK COLOR 700 (New ultra hi res RGB)	$495
AMDEK COLOR 600 (New hi res RGB w audio)	$429
AMDEK COLOR 500, 400, 300 (New hi res RGB)	CALL
AMDEK 300 A and G (Amber or green)	$149/$139
AMDEK 310A (Amber, dark non-glare tube)	$169
PGS SR-12 (690x480 non-interlaced, req. scan doubler)	$599
PGS HX-12 (690x480 interlaced)	$479
PGS MAX-12 (720x350 mono)	$189
WYSE 50, 75, 100 TERMINALS (Programmable function keys)	CALL
TAXAN, NEC, ZENITH MONITORS	CALL

Miscellaneous:

ORCHID PC TURBO (80186 coprocessor-runs at 8MHz)	CALL
INTEL 8087 High speed math co-processor	$169
KEYTRONIC 5151 KEYBOARD (Separate cursor keys)	$199
MOUSE SYSTEMS (Optical mouse, runs LOTUS)	$139
MICROSOFT SERIAL OR BUS MOUSE (w software)	$139
SOBAR SURGE PROTECTORS (4 & 8 plug)	$49/$69
POWER BACK-UP (200 & 425 watts)	$269/$499
MICROFAZER (8-128K print buffer)	from $139
BRET SALTER'S new debug board w software	CALL

Verbatim Diskettes:

SS DD Box	$24-Case	$199
DS DD Box	$29-Case	$249

Software:

LOTUS SYMPHONY	BEST PRICE-CALL
FRAMEWORK (New from ASHTON-TATE)	$395
MULTIMATE (Emulates WANG dedicated WP)	$279
SAMNA WORD III ("Ultra-WANG")	$295
WORDSTAR PRO-PAK (WS CS MM SI Tutor)	$279
MICROSOFT WORD w/MOUSE (4th generation WP)	$289
VOLKSWRITER DELUXE w Textmerge	$179
BANK STREET WRITER	$59
EASYWRITER II SYSTEM (-writer,-speller,-mailer)	CALL
SUPERCALC 3 (Better graphs than LOTUS)	BEST PRICE
PFS Write, File and Graph each $99, Report	$79
OPEN ACCESS (Proven Integrated Package)	CALL
dBASE II & III (From Ashton-Tate)	$299/375
KNOWLEDGEMAN (New version)	$299
RBASE 4000 & 6000 (Use w CLOUT, REPORT WRITER)	CALL
POWER BASE (Relational, hierarchical)	$279
CIP (By Concentric Data Systems)	CALL
DAYFLO (Enhance with REPORTFLO)	CALL
OZ (from Fox & Geller)	CALL
NUTSHELL by Leading Edge	CALL
LIFEBOAT LATTICE C-COMPILER (w 8087 support)	$289
LIFEBOAT LATTICE C-FOOD SMORGASBORG	CALL
MICROSOFT C,BASIC,FORTRAN,PASCAL,COBOL	CALL
BORLAND TURBO PASCAL & TOOLBOX	CALL
DIGITAL RESEARCH (All products)	CALL
DOW JONES (All products)	CALL

IUS A/R, A/P, G/L	$299
OPEN SYSTEMS ACCOUNTING MODULES	BEST PRICE
STATE OF THE ART (G/L,A/R,A/P,INV,PR)	BEST PRICE
BPI GENERAL ACCOUNTING AND MODULES	CALL
DOLLARS AND SENSE by Monogram	$119
MANAGING YOUR MONEY by Tobias/Meca	$129
HARVARD PROJECT MANAGER	BEST PRICE
TAX PREPARATION PACKAGES	CALL FOR THE BEST
DECISION RESOURCES CHART MASTER	$259
BPS BUSINESS GRAPHICS	$259
Z-SOFT PC PAINTBRUSH w/FRIEZE GRAPHICS	$99
PROKEY VERSION 3.0 by Rosesoft	$95
SET-FX for your EPSON by Softstyle	$45
NORTON UTILITIES by Peter Norton	$59
COPY II PC by Central Point	$35
COPYWRITE by Quaid (Copies all IBM software)	$45
COMPUSERVE STARTER KIT	$35
SIDEWAYS by Funk Software	$49
CROSSTALK XVI by Microsoft	$109
HAYES SMART COM II	$95
TRACE 86 by Morgan (Assembly language debug)	CALL
FLIGHT SIMULATOR	$39

Call for our daily OVERSTOCK SPECIALS!

NETWORKING APPLICATIONS ENGINEERING

We'd like to design a network application for your business using the PC. For a fee of $35 (refundable w/order) our networking applications department will custom sketch a layout designed for your hardware and software requirements. Send us your description of the PC configurations and the software applications to be considered. We will prepare and supply you with your own custom networking layout specific to your needs, complete with diagram, parts recommendations, our bottom line price (with price comparisons), and service options.

☑ PRICE

Quantity purchases allow us the best prices anywhere. The prices you see in our ads were prepared far in advance, due to magazine production requirements. We will always try to have the lowest possible prices. If you have any questions call our **TOLL-FREE NUMBER.**

☑ STOCK

We stock huge quantities of the finest and most popular products for your PC. Because we're on-line we can supply stock information accurately and ship immediately from our enormous inventory. There's no need to call around, because if we don't have it, you probably don't want it.

☑ SERVICE

Simply the best. We pride ourselves on our unparalleled technical service and troubleshooting. In the unlikely event a problem should arise, our tech staff is trained to get to the bottom of things and help you get on-line ASAP. We have incredibly fast turn-around if repair is necessary.

☑ SUPPORT

We know and we care. We won't lead you into anything we know won't work. Our staff is trained to ask questions like "What is your application?" and won't avoid a lower cost alternative to push what's in stock. We'll gladly send you product information instead of pushing the close of a sale to an unsure buyer. Again, **WE CARE.**

Circle 274 on reader service card

PROGRESSIVE MICRO DISTRIBUTORS

"IBM PC System Enhancement Is Our Business ... Personal Service Is Our Commitment."

FOR ORDERS ONLY

1-800-446-7995

for further information and technical support

1-404-446-7995

HOURS: 9AM to 9PM EST
(Sat/Sun-12PM to 5PM EST)

7000 Peachtree Industrial Blvd.
Norcross, Georgia 30071

All prices are subject to change without notice.
IBM is a registered trademark of International Business Machines.

NO SURCHARGE FOR MC/VISA
MOST ORDERS SHIPPED NEXT DAY

GUARANTEED LOWEST IBM PRICES

What's the catch?

Yes, there is a catch. The guaranteed lowest prices in America on hardware and software for your IBM computer are now available only to members of The Micro Exchange℠. But, the good news is it costs only $25 to join, and you can earn that back *plus much more!*

Computerized Bidding

The Micro Exchange℠ is linked by computer with a nationwide network of suppliers who are eager to bid on your order. Through bidding, we're able to purchase products for you at prices which are guaranteed to be the lowest in America. Simply call the toll-free number, available to members only, with the makes and model numbers of the items you wish to purchase. We'll handle the transaction and arrange for the delivery of your merchandise right to your doorstep. All done quickly and efficiently so we keep you as a satisfied member of The Micro Exchange℠.

OUR INCREDIBLE GUARANTEE

If you find that any item you purchased through The Micro Exchange℠ was available at the time of your purchase at a lower nationally advertised price, send us appropriate proof of the lower price, including sales tax, shipping, and other charges, within 21 days of your purchase, and we will refund the purchase price and the merchandise is yours!

Call toll-free today to join...

THE MICRO EXCHANGE℠
A Service of MicroVision, Inc.

Also serving the Apple community.

1-800-34M-ICRO
(In Florida Call: 1-800-35M-ICRO)

Earn More Than You Spend

You'll want to tell all your friends and associates about the guaranteed savings at The Micro Exchange℠. And for every new member you refer, we'll thank you by paying you $10 cash! Not only will you easily cover the cost of your membership, but you can even earn hundreds of dollars more through this unlimited offer.

Hardware, Software, You Name It.

We'll furnish you with virtually everything you need for your IBM system, including products from these leading manufacturers:

• Amdek • Ashton-Tate • AST • BPI • CDC • Digital Research • Dow Jones • Epson • Hayes • IBM • IUS • Lotus • MicroPro • Microsoft • Multi-Mate • NEC • Peachtree • Quadram • Tandon • Teac • Tecmar • Visicorp

Yes, I want to be guaranteed that I'm purchasing my hardware and software at the absolute lowest prices in America.

Charge my ☐ Visa ☐ Master Card ☐ Check or Money Order enclosed

Credit Card No. _____ Expiration Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Telephone (_____) _____

Signature _____

MicroVision, Inc.
2915 Independent Square
Jacksonville, Florida 32202
904-634-1020

PC LINK

INDEPENDENT STORE IN NYC DEDICATED TO IBM® PC SOFTWARE AND PERIPHERALS ONLY

BY APPOINTMENT WE DEMONSTRATE MOST OF THE PRODUCTS WE SELL.

STORE HOURS: 9:00 A.M.–5:30 P.M. E.S.T. MON.–FRI.
Saturdays 10 A.M.–4 P.M.
Terms, conditions and prices differ in our store.

PC LINK, CORP. 29 WEST 38TH ST. 2ND FL., NEW YORK, NY 10018

SPECIALS OF THE MONTH EFFECTIVE DEC. 1st through 31st

NORTON COMPUTING
Norton Utilities $49.00
HAYES
Smart Modem 1200 ..... $469.00

TOSHIBA
P1351 Printer 1249.00
HERCULES
Color Card $169.00

DYSAN DISKETTES
DS/DD ..... $29.00 SS/DD $19.00
KRAFT
Joysticks $32.00

BUSINESS SOFTWARE

ALPHA SOFTWARE
DATA BASE MANAGER II $205.00
TYPE FACES 89.00
ELECTRIC DESK 249.00

ASHTON–TATE
dBASE III ..... CALL
FRAME WORK ..... CALL

BORLAND INT.
SIDEKICK 39.00
TURBO PASCAL 39.00

CONTINENTAL
HOME ACCOUNTANT PLUS 89.00
TAX ADVANTAGE 45.00
PROPERTY MANAGEMENT 319.00

ENERTRONICS
ENERGRAPHICS ..... CALL

FOX & GELLER
QUICKCODE III 179.00
OZ ..... CALL

HARVARD SOFTWARE
HARVARD PROJECT MANAGER ..... CALL

HAYES
SMARTCOM II 95.00

I U S
ACCOUNTING PACKAGES 4.0 ..... CALL
EASYWRITER II PLUS ..... CALL

LOTUS DEVELOPMENT CORP.
LOTUS 1-2-3. (No Mail Or Phone Orders) CALL
SYMPHONY (No Mail Or Phone Orders) CALL

MICRO DATA BASE
KNOWLEDGE MAN ..... CALL

MICRO PRO
INFOSTAR 269.00
WORDSTAR PROFESSIONAL 290.00

MICRORIM
R BASE 4000 ..... 309.00
EXTENDED REPORT WRITER 99.00
CLOUT (RE8.256K) 129.00

MICROSOFT
MULTIPLAN 139.00
PROJECT 179.00
WORD 235.00
COMPILERS ..... CALL

MICROSTUFF
CROSSTALK 105.00
TRANSPORTER 169.00

MONOGRAM
PROFESSIONAL BASIC 269.00

NORTH AMERICAN BUSINESS
MEMORY SHIFT 69.00

NORTON COMPUTER
NORTON UTILITIES ..... SEE SPECIAL

PC SOFTWARE
CREATABASE 65.00

PALSOFTWARE
ARTPAK 79.00

PEARL SOFT
PERSONAL PEARL ..... CALL

REMS SOFTWARE
REAL ESTATE INVESTOR II 225.00

ROSE SOFT
PROKEY 3.0 ..... 89.00

STSC
APL*PLUS ..... CALL

SATELLITE SOFTWARE
WORD PERFECT 269.00

SAWHNEY SOFTWARE
TAX MODE ..... CALL
PLAN MODE ..... CALL

SOFTWARE GROUP
ENABLE ..... CALL

SOFTWARE PUBLISHERS
PFS SERIES ..... CALL

SOFTWARE SYSTEMS INC.
MULTIMATE 299.00

WARNER SOFTWARE
THE DESK ORGANIZER ..... CALL

DISK DRIVES

IOMEGA BERNOULLI BOX 20MB 2900.00
QUME T142 ..... CALL
SYSGEN ..... CALL
TANDON TM 100-2 ..... 175.00

MULTIFUNCTION BOARDS

64 RAM CHIPS 45.00
AST CARDS ..... CALL
QUADBOARD CARD oK 209.00
PC MOUSE ..... CALL
ORCHID BLOSSOM BOARD 199.00
PLANTRONICS COLOR PLUS CARD ... CALL
HERCULES ..... CALL
HELIX BUBBLE MEMORY ..... CALL

ENTERTAINMENT & EDUCATION

ACROSS THE USA 25.00
ATI TRAINING PACKAGES ..... ea. 55.00
ATTACK ON ALTAIR 29.00
BIG TOP 27.00
CONQUEST 29.00
COSMIC CRUSADERS 27.00
DEADLINE 37.00
DIGGER 29.00
THE EXTERMINATOR 29.00
FLIGHT SIMULATOR–NEW VERSION .. 35.00
FRIENDLY ARCADE 29.95
FRIENDLY PC INTRO SET 29.95
FROGGER 25.00
HI RES #4 ..... 27.00
KID STUFF 32.00
MASTER MINER 27.00
MILLIONAIRE 49.00
MOON BUGS 29.00
MY LETTERS, NUMBERS & WORDS ... 32.00
PC CRAYON 39.00
INTRO TO OPERATING SYSTEM 49.00
PLANET FALL 39.00
SERPENTINE 25.00
*SNACK ATTACK 27.00
SPINNAKER SERIES ..... CALL
SUSPENDED 39.00
WITNESS 39.00
WIZARDRY 39.00
ZORK I, II, III ..... ea. 27.00
ZURAN DEFENDER 25.00

ACCESSORIES

CURTIS PRODUCTS
DISPLAY PEDESTAL 35.00
MONO CABLE 38.00
KEYBOARD CABLE 30.00
SYSTEM STAND 17.00
COLOR CABLE 45.00
SURGE PROTECTORS ..... CALL
KRAFT JOYSTICK ..... SEE SPECIAL
HAYES MACH III JOYSTICKS 45.00
KEYBOARD DRAWER 75.00

MONITORS

AMDEK 310A $175.00
PRINCETON GRAPHIC HX-12 ..... 479.00
SR-12 ..... CALL
MAX-12 ..... 179.00
ZENITH RGB MONITOR 479.00

MODEMS

HAYES SMART MODEM $205.00
HAYES SMART MODEM 1200 .... SEE SPECIAL
HAYES SMART MODEM 1200B 419.00
RACAL VEDIT MAXWELL MODEM 1200 CALL

DISKETTES

	SS/DD	DS/DD
CATALINA TECHNOLOK		28.00
DYSAN		SEE SPECIAL
MAXELL	23.00	33.00
VERBATIM	22.00	31.00
WABASH		25.00
VERBATIM HEAD/CLEANING KIT		10.50

PRINTERS

DIABLO 630 ..... $1699.00
DIABLO 630 TRACTOR FEED 249.00
DYNAX DX-15 ..... 389.00
BROTHER 25/35 ..... CALL
OKIDATA 92P / 93P / 84P ..... CALL
TOSHIBA P1351 ..... SEE SPECIAL
EPSON FX SERIES ..... CALL
NEC 3550 ..... 1425.00
PRINTER CABLE/PARALLEL 25.00

CORPORATE ACCOUNTS POLICY

We honor purchase orders from major corporations listed on stock exchanges, governmental agencies and universities.

PLEASE ADD 10% to the listed prices for purchases with purchase orders.

OUR TERMS ARE NET 10 DAYS.

It is our policy not to advertise names of corporations who purchase from us.

CALL TOLL FREE 800-221-0343

All prices listed in this ad are effective Dec. 1-31, 1984. All Brands are Registered Trademarks. IBM is a Registered Trademark of IBM Corp.

IN NEW YORK CALL 1-212-730-8036

TERMS AND CONDITIONS

We reserve the right to repair, replace or return to manufacturer for repair, all goods acknowledged faulty or damaged on receipt by customer. ***Customer must call for Return Authorization Number before returning any goods.*** Prompt attention will be given to all damaged and faulty returned goods. Any goods returned for credit are subject to 10% restocking charge, plus shipping charge. No returns for credit on any software. Customer must deal with the manufacturer directly if the customer finds any false claims made by the manufacturer. All goods are shipped U.P.S. only. Add 2% of price, or minimum of $3.00 for shipping. Shipping charges on Printers & Accessories vary. We do not ship C.O.D. Please allow one to two weeks for personal or corporate checks to clear. To expedite shipping send money order, certified cashier's check, or charge to your **VISA, MasterCard, WE DO NOT Add a Service Charge For Credit Card Usage.** Prices subject to change without notice. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.

micro STOREHOUSE

333 Peters Street, S.W./Atlanta, Georgia 30313/404/522-0000

HARDWARE

COMMUNICATIONS
WE CARRY IRMA BOARDS AND A VARIETY OF NETWORKING ALTERNATIVES. CALL FOR INFORMATION.

DISK DRIVES
AMDEK IBM COMPATIBLE ½ HEIGHT...
GREAT LAKES 10MEG, 23MEG, & 40MEG.
IOMEGA BERNOULLI BOX.
TANDON TM 100-2.

MODEMS
HAYES 300, 1200, 1200B.

MONITORS
AMDEK MOST MODELS.
COMREX 5400A & 5400G.
PGS HX-12.
QUADRAM QUADCHROME.
NOTE: THE PRINCETON HX-12 AND QUADRAM QUADCHROME ARE IDENTICAL.
ZENITH ZVM 133.

MONITOR ADAPTERS
AMDEK MAI BOARD.
HERCULES COLOR & MONOCHROME.
QUADRAM QUADCOLOR I &II.
TECMAR GRAPHICS MASTER.

MULTIFUNCTION BOARDS
QUADRAM MOST MODELS.
PARADISE.
TECMAR CAPTAIN.

PRINTERS
BROTHER HR-15 & HR-25.
CANON COLOR INK JET.
COMREX CR II & CR III.
NOTE: BROTHER AND COMREX PRINTERS ARE VIRTUALLY IDENTICAL.
DIABLO 630 API & 630 ECS...
EPSON ALL MODELS.
NEC 3550.
OKIDATA 92, 93, & 84.
NOTE: WE CARRY TRACTOR FEEDERS AND CUT SHEET FEEDERS FOR MOST OF THE PRINTERS WE SELL.

MISCELLANEOUS ACCESSORIES
EPD LEMON, LIME, ORANGE, & PEACH..
KAOLA PADS.
KRAFT JOYSTICKS & GAME PADDLES...
MICROSOFT MOUSE.
NETWORX POWER & MODEM PROTECTORS.
QUADRAM MICROFAZERS.

BUSINESS SOFTWARE

ARMOUR SYSTEMS EXCALIBUR.
BPI GENERAL ACCOUNTING.
DOW JONES SOFTWARE.
HARVARD PROJECT MANAGER.
IUS BUSINESS SERIES.
MICROSOFT PROJECT.
PRACTICAL ACCOUNTANT.
SAM'S FINANCIAL PLANNING.
THINK TANK.
XQ SOFTWARE.

COMMUNICATIONS
CROSSTALK XVI.
HAYES SMARTCOM II.

DATA BASES
EASY FILER.
INFOSCOPE.
INFOSTAR PLUS.
KNOWLEDGEMAN.
PFS FILE & REPORT.
POWERBASE.
RBASE 4000, CLOUT, PROGRAM INTERFACE, & EXTENDED REPORT WRITER.

INTEGRATED PACKAGES
DAYFLO.
IUS EASY PRO.
OPEN ACCESS.
VISION.

GRAPHICS
BPS BUSINESS GRAPHICS.
CHARTSTAR.
CHARTMASTER.
GRAPHWRITER.
PC-DRAW.
PFS GRAPH.
SIGNMASTER.
SNAPSHOT.

PROGRAMMING
LATTICE C & UTILITIES.
MICROSOFT COMPILERS.
MORGAN PROFESSIONAL BASIC.
SCREEN MANAGER FOR C AND PASCAL.
VEDIT TEXT EDITOR.

SPREADSHEETS
MULTIPLAN.
MULTI-TOOL BUDGET.
MULTI-TOOL FINANCIAL STATEMENT.
SUPERCALC 3.
VISICALC.

TRAINING
ATI MOST PACKAGES.
CBS MASTERING THE COLLEGE BOARDS.
CBS MASTERING THE SAT.
MASTERTYPE.
PC TUTOR.

UTILITIES
MULTILINK.
NORTON UTILITIES.
PEEKS & POKES.
PROKEY.
SET-FX+.
SIDEWAYS.
THE INSIDE TRACK.
WATCHDOG.

WORD PROCESSING
EASY WRITER II SYSTEM MICROSOFT WORD W/ OR W/O MOUSE.
MULTIMATE.
PFS WRITE.
VISIWORD PLUS.
VOLKSWRITER DELUXE.
WORDPERFECT.
WORDSTAR.

Micro Storehouse has built an enviable reputation in the past year. We promised the best hardware, software, peripherals, accessories and supplies quickly at the most competitive prices and that's exactly what we've delivered to the IBM PC and compatible market.

In keeping with our policy, we now announce a revolutionary innovation:
DAILY PRICE UP-DATES!
To overcome the months of lead time required for advertising, we have decided to eliminate prices from our ads so that **you will be able to order from us at the lowest possible price on the day you call.**

Call Micro Storehouse toll free and get today's lowest price TODAY!

We will continue to accept Visa, MasterCard and American Express at no extra charge to you.

Shipping costs are unchanged: the exact cost of shipping plus $2.00 for handling and processing.

LARGE QUANTITY, CORPORATE ORDERS NEED SPECIAL ATTENTION. Ask for a Corporate Account Representative if you're ordering multiples of any product. Your volume orders will be followed throughout the shipping and billing process to assure your corporation's total satisfaction.

Annoucing

Daily Price Up-Dates!

Call

1-800-554-7661

and order at today's lowest possible price. Any product shown here (and many we can't advertise) will be available at the most competitive price possible.

Circle 552 on reader service card

LOOK WHO BUYS SOFTWARE FROM US!

IBM • XEROX • NCR
CHEVRON • GTE • SPERRY
JFK SPACE CENTER • ARAMCO
AT&T • BENDIX • PRICE WATERHOUSE
HEWLETT PACKARD • GENERAL ELECTRIC
GENERAL DYNAMICS • TRW • KAISER CEMENT

If you order software from us, you're in good company. You see, some of our best customers are America's biggest corporations.

Maybe they're attracted by our low, low prices (big companies are price-conscious too!).

Or maybe when you're an "IBM", you're looking for something extra. Like the personal service, giant inventory, and in-depth technical support you'll find at 800-SOFTWARE.

You see, when you call us, we'll take care of you like our business depends on it. Because it does. Which means when you place an order, you can be sure we'll fill it promptly. And that our unique Order Tracking System™ is keeping tabs on your order every step of the way.

Most important, we'll be there if you need us after your software arrives. We'll make sure that you'll receive the finest technical support and customer service in the industry. And that's a promise. If you purchase in large quantities, you'll be delighted by the service our National Accounts Program provides.

Next time you're looking for low price and great service, do what IBM, General Electric, and a lot of other big companies do. Pick up the phone and give us a call.

We'll show you why some hard-headed companies buy their software from us.

CHECK OUT ALL OUR INCREDIBLE BUSINESS SOFTWARE PRICES:

Lotus 1-2-3 $319	dBase II/III $309/$399	Framework $399	WordStar Pro Pack $299
Lotus Symphony $449	Crosstalk $105	SuperCalc 3 $219	Hayes Modems 1200/1200B $499/$425

AMDEK™	
Monitors	CALL
ASHTON-TATE™	
dBase II/III	$309/$399
Framework	$399
Friday!	$219
AST™ PRODUCTS	CALL
ATI™ & CDEX™ TRAINING	CALL
DIGITAL RESEARCH™	CALL
FOX & GELLER	CALL
HAYES™	
Smartmodems 1200/1200B	$499/$425
All Other Products	CALL
HERCULES™	
Graphic Card	$375
IMSI™	
4-Point Graphics	$129
PC Paintbrush	$149
LIFETREE™	
Volkswriter Deluxe	$179
LOTUS™	
1-2-3	$319
Symphony	$449
MAXELL™ DISKETTES	CALL
MEMOREX™ DISKETTES	CALL
MICROPRO®	
WordStar	$209
WordStar Prof Package	$299
InfoStar	CALL
ChartStar	$239
TelMerge	$ 99
All Other Products	CALL
MICRORIM™	
RBase 4000	$309
MICROSOFT®	
Multiplan	$149
Word w/Mouse	$359
Fortran	$269
All Other Products	CALL
MICROSTUF™	
Crosstalk	$105
MULTIMATE™	$299
NORTON UTILITIES™	$ 59
QUADRAM™	CALL
ROSESOFT™	
Pro Key	$ 99
SOFTWARE PUBLISHERS™ (PFS)	CALL
SORCIM/IUS™	
SuperCalc 2/3	$159/$219
EasyWriter II System	$195
IUS Easy Business Accounting	$299/mod.
All Other Products	CALL
WESTERN UNION EASY LINK®	FREE

WE ALSO CARRY HUNDREDS OF OTHER PRODUCTS!

WRITE:
800-SOFTWARE, INC.
940 Dwight Way, Suite 14
Berkeley, CA 94710

Copyright 800 Software 1984
Macrosoft is a registered trademark

800-SOFTWARE

- ☐ Dealer inquiries welcome.
- ☐ Quantity discounts available through our National Accounts Program.
- ☐ Purchase orders accepted. Please call in advance.
- ☐ Call for shipping charges. Overnight delivery available.
- ☐ We do not add surcharge for credit card purchases.
- ☐ Prices may change. Above prices are for IBM-PC and compatibles.
- ☐ International orders welcome: TELEX #751743800-SOFTWARE UD
- ☐ Compuserve Key Word "GO-E.H."
- ☐ Member of Direct Marketing Association and Better Business Bureau.

TO ORDER CALL TOLL FREE:
800-227-4587 or 415-644-3611

Circle 214 on reader service card

BYTE BACK!

YOU DON'T *HAVE* TO PAY HIGH PRICES!

COMPUTERS

IBM PC with one drive – 64 K	$1695
IBM PC with two drives – 256 K	$1895
IBM PC with two drives – 256 K monochrome monitor & monochrome card	$2195

PERIPHERALS

AST SIXPACK PLUS Up to 385 K on a board. RS-232 port. parallel port. clock & Super Drive/Spooler software.	$279
KOALAPAD	$117
FREDERICKS PLANTRONICS	$379
TAC IRMA BOARD	$1025
GRAPHICS MASTER TECKMAR	$599
MA SYSTEMS-PC PEACOCK	$289
HERCULES GRAPHICS CARD	$349
QUAD BOARD	$279
QUAD COLOR	$219
QUADLINK	$497
PARADISE	$389
MICROBUFFER II	$229

MONITORS

TAXAN 12" GREEN	$129
TAXAN AMBER	$139
TAXAN 210 Composite/RGB	$339
TAXAN 420 IBM Look-Alike (Hi Res RGB/Composite	
TAXAN RGBvision III	$479
TAXAN RGBvision I	$319
AMDEK 300 G	$135
AMDEK 300 A	$149
AMDEK 310 A	$179
AMDEK COLOR I	$289
AMDEK COLOR II	$399
GORILLA 12" GREEN	$89
GORILLA AMBER	$99
PRINCETON HX-12 Hi-Res RGB Color	$479

DISKS

MAXELL DS/DD	$31.50
VERBATIM DS-DD	$31.50

DISK DRIVES

TANDON TM 100-2	$169
SHUGART SA-455 (or equivalent) DS/DD 360 KB ½ Height	$139
Floppy (set of 2)	$275
TEAC 55B	$139
CDC	$195

PRINTERS

OKIDATA ML 82 A	$349
OKIDATA ML 83 A	$599
OKIDATA ML 84 P	$849
OKIDATA ML 84 S	$899
OKIDATA ML 92 P	$449
OKIDATA ML 92 S	$449
OKIDATA ML 93 P	$695
EPSON RX 80T	$285
EPSON RX 80FT	$399
EPSON FX 80	$499
EPSON FX 100	$699
EPSON MX 100	$569
STAR GEMINI 10X 120 CPS	$279
STAR GEMINI 15	$399
TOSHIBA 1351	$1351
RITEMAN A-1 120 CPS. 3" High. 80 Column "Epson Like" printer	$349
SILVER-REED 500	$409
SILVER-REED 550	$495
DIABLO 630	$1595
Tractor for 630	$140
C. ITOH 8510-BCD 80 Column. 120 CPS. Friction & Tractor Feed	$415
C. ITOH STARWRITER 40 CPS Letter Quality Printer Uses Diablo code. wheels & ribbons. 10 or 12 pitch. Proportional spacing.	$1039

CHIPS

64 K RAM CHIPS set of 9	$45

MODEMS

HAYES SMART MODEM 300	$209
HAYES SMART MODEM 1200	$469
HAYES SMART MODEM 1200 B for IBM	$399
NOVATION SMART-CAT 103	$209
NOVATION SMART-CAT 103/212	$459
NOVATION APPLE-CAT II	$299
ANCHOR VOLKSMODEM 300 Band. Original-Answer Mode with Subscription to the Source	$79
ANCHOR MARK VII 300 Band. Auto Answer. Auto Dial. Direct Connect wiht RS 232. Includes Cable and power supply.	$139
ANCHOR MAKR XII 1200 Band Modem	$299

SOFTWARE

MICROPRO WORDSTAR PRO PAK	$279
LOTUS 123	$335
ASHTON-TATE dBASE II	$369
ASHTON-TATE dBASE III	$489
MICROSOFT MULTIPLAN	$179
MICROSOFT MULTIMATE	$299
MICROSOFT R BASE 4000	$369
MICROSOFT PEACHTEXT 5000	$229
MICROSOFT HAYES SMARTCOM II	$79
MICROSOFT CROSSTALK XVI	$109
COMPUSERVE Starter Kit	$32

SHIPPING

Add 3% Shipping & Insurance.
We Ship UPS.
We Accept VISA, MasterCard and American Express.
Add 3% For Charge Card Orders.
Georgia Residents Add 4% Sales Tax.

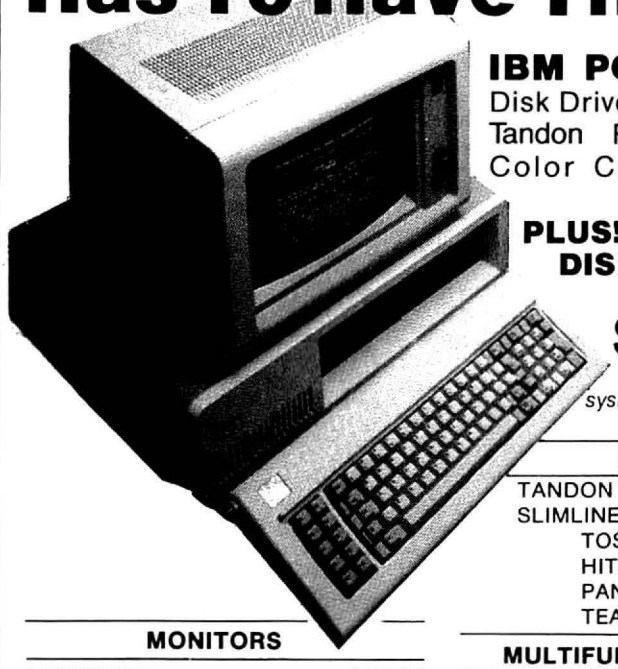
Bulldog Computer Products

TOLL FREE 1-800-438-6039—GEORGIA RESIDENTS 1-404-860-7364

3837-A Washington Road
Martinez, Georgia 30907

Circle 865 on reader service card

SOMEBODY
Has To Have The Lowest Prices!



IBM PC, 256k, 320k Disk Drive, (Toshiba Half or Tandon Full-High), Persyst Color Card, Amdek 300 Monitor, Dos 2.1

PLUS!-A 10MB HARD DISK SUB SYSTEM

All For Only:

$2699.00

(We configure and test the system for you at no extra cost)

MONITORS

AMDEK 300	$135.00
AMDEK 300A	$149.00
AMDEK 310A	$165.00
AMDEK COLOR I	BEST PRICE
AMDEK COLOR II	BEST PRICE
PGS HX-12	$475.00
PGS MAX-12	$195.00
PGS SR-12	$625.00
IBM MONOCHROME DISPLAY	$260.00
IBM COLOR DISPLAY	$590.00
QUADCHROME C. DISPLAY	$590.00

PRINTERS

EPSON FX 80	$489.00
EPSON FX 100	$689.00
EPSON RX 80	$295.00
EPSON RX 80 FT	$349.00
OKIDATA 82A	$299.00
OKIDATA 83A	$569.00
OKIDATA 92P	$399.00
OKIDATA 93P	$649.00
OKIDATA 84P	$799.00
OKIDATA 2410P	$1999.00
OKIDATA 2350P	$1849.00
TOSHIBA P1351	$1399.00
TOSHIBA 1340	$825.00
NEC SPINWRITER 3550	$1650.00
NEC SPINWRITER 7730	$1750.00
NEC PINWRITER 80 COL.	$720.00
NEC PINWRITER 136 COL.	$960.00
QUAD INK JET PRINT	$799.00
CITOH 40 CPS	BEST PRICE
CITOH 55 CPS	BEST PRICE
GEMINI 10X	$290.00
GEMINI 15X	$390.00
BROTHER HR-25	$719.00
BROTHER HR-35	$925.00
SILVER REED 500P	$465.00
SILVER REED 550P	$570.00
SILVER REED 770P	$995.00

ACCESSORIES ON NEC & OKIDATA PRINTERS AVAILABLE.

DRIVES

TANDON TM-100-2	$199.00
SLIMLINE DRIVES:	
TOSHIBA	$165.00
HITACHI	$165.00
PANASONIC	$165.00
TEAC 55B	$165.00

MULTIFUNCTION BOARDS

AST I/O+1 SER & 1 PAR	$179.00
AST SIX PACK 64K, 1 SER, 1 PAR	$269.00
AST MEGA+64K, 1 SER	$269.00
AST COMBO	$269.00
QUADBOARD 64K (EXPANDABLE TO 256K)	$269.00
QUADBOARD 64K, 1s, 1p, GAME PORT (EXPANDABLE TO 384K)	$299.00
IBM COLOR GRAPHIC ADAPTER	$225.00
IBM MONO/PRINTER ADAPTER	$230.00
PERSYST COLOR ADAPTER	$199.00
PERSYST MONO/PRINTER ADAPTER	$215.00
HERCULES GRAPHIC	$349.00
PLANTRONICS COLOR PLUS	BEST PRICE
PARADISE MULTIFUNCTION CARD	BEST PRICE
ORCHID BLOSSOM	BEST PRICE
64K RAM UPGRADE KIT	$50.00
PEACOCK COLOR CARD W/PP	$215.00
STB RIO PLUS 64K	BEST PRICE
STB SUPER RIO 64K	BEST PRICE
STB PIGGYBACK FOR SUPER RIO	BEST PRICE
STB GRAPHIX PLUS II	$375.00

MODEMS

HAYES SMART MODEM 1200	$469.00
HAYES SMART MODEM 300	$209.00
HAYES 1200B PLUG IN MODEM CARD	$429.00
QUBIE PC 212A/1200 INTERNAL	$275.00
QUBIE 212E/1200 EXTERNAL	$299.00

HARD DISKS

10MB HARD DISK SUB SYSTEM INCLUDES:
SOFTWARE, CONTROLLER, CABLES, ETC.

INTERNAL	$850.00
EXTERNAL	$1025.00

TALLGRASS TECHNOLOGY

12MB W/TAPE BACKUP	$2750.00
20MB W/TAPE BACKUP	$3199.00
35MB W/TAPE BACKUP	$4350.00
INTERFACE IBM	$125.00
POWER BACK-UP SYSTEM	$479.00

GENERAL

MAXELL DISKETTES MD2	$35.00/box
CONTROL DATA DISKETTES	$30.00/box
MICROSOFT MOUSE	$130.00
MOUSE W/WORD	$339.00
KEYTRONIC KEYBOARD KB5151	$199.00
PARALLEL CABLES	BEST PRICE
IBM PC DOS 2.1	BEST PRICE

We also carry
CORONA, APPLE IIe, APPLE IIc, MACINTOSH, TECMAR

Many other products available, Please call for Low, Low Prices!

Microshop
COMPUTER PRODUCTS

(714) 838-7530

2640 Walnut Avenue, Unit K, Tustin, California 92680

Prices & availability subject to change without notice - IBM is a registered trademark of IBM Corp.

Circle 116 on reader service card

HOW TO SHOP AT MICRO MART BY PHONE.

For when you can't stop by your local Micro Mart store.
ORDERS ONLY

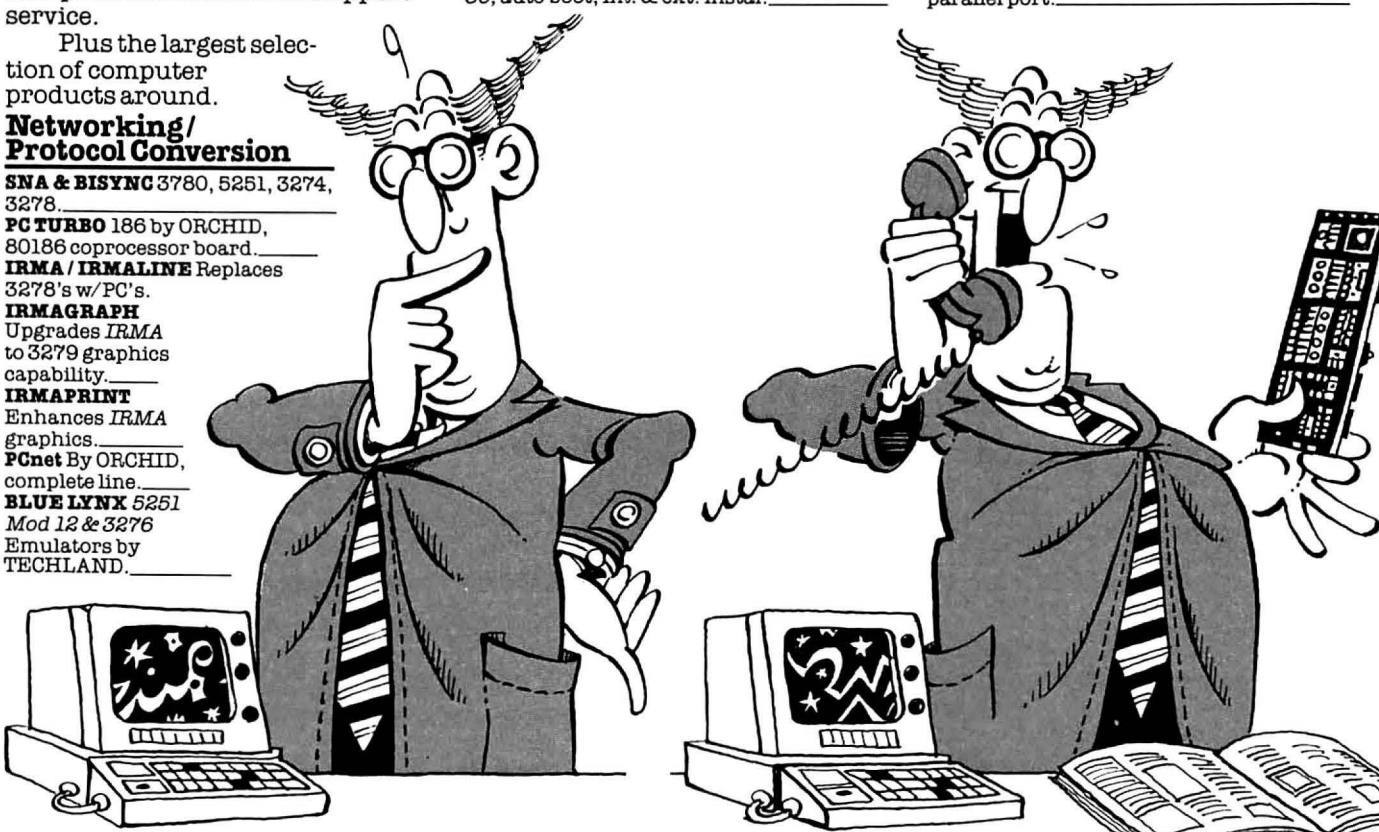
1-800-241-8149

New Micro Mart stores are opening all over the Southeast. But if we haven't yet opened a store near you, don't give up. Call us on the phone. It's the next best thing to the personal, professional service you'll find in every one of our stores. Expert advice, your best price and immediate support service.

Plus the largest selection of computer products around.

Networking/ Protocol Conversion

SNA & BISYNC 3780, 5251, 3274, 3278.
PC TURBO 186 by ORCHID, 80186 coprocessor board.
IRMA / IRMALINE Replaces 3278's w/PC's.
IRMAGRAPH Upgrades *IRMA* to 3279 graphics capability.
IRMAPRINT Enhances *IRMA* graphics.
PCnet By ORCHID, complete line.
BLUE LYNX *5251 Mod 12 & 3276* Emulators by TECHLAND.



Printers & Plotters

Micro Mart has thousands in stock.

AMDEK *AMPLOT II*, 6 pen plotter, supports Lotus.
HOUSTON INSTRUMENTS Plotters and digitizers.

Dot Matrix

SMITH CORONA *D-300*, by TEC, 140 cps.
EPSON *FX80 & 100*, 160cps.
EPSON *RX80 & 100*, 100 cps.
EPSON *LQ 1500*, a letter quality dot matrix.
OKIDATA *92 & 93*, opt. IBM PROMS
OKIDATA *ML84*, 200 cps, opt. IBM PROMS.
OKIDATA *Pacemark 2410*, 350 cps.
TOSHIBA *P-1351 & 1340.*
DATAPRODUCTS *PRISM 8050 Color*, 132 col., 200 cps.
STAR MICRONICS Complete line of *Gemini*, *Delta* and *Radix*.
TEXAS INSTRUMENTS *855.*
NEC *Pinwriters, P2 & P3*, 180 cps.

Letter Quality

NEC *Spinwriters 2050, 3550* & the new *8850.*
DIABLO *620, 630 & 630 ECS.*
C-ITOH *Starwriter*, 40 cps; *Printmaster*, 55 cps.

Micro Mart has a full range of Form Handling options and Peripheral Devices.

Floppy Disk Drives

TANDON *TM 100-2*, DD/DS, 360K.
1/2 HEIGHT DISK DRIVES From SHUGART, PANASONIC, TEAC. We have the south's largest supply of top names.

Hard Discs

We carry all major name brands so if you don't see it—ask for it.
PEACHTREE PERIPHERALS *The P-10, 20 & 50*, auto boot, int. & ext. instal.
SYSGEN *10 & 20*Meg w/streamer tape.
SYSGEN *Image*, streamer tape back-up for your IBM XT.
BERNOULLI TECHNOLOGY Hard Disc Subsystems.

Multifunction Boards

We sell more of these than anyone else, so we've become experts on boards of all types.
SIX PAK 64-384K, multifunc.
MEGAPLUS 64-512K, max. 8 func.
ULTRA PAK 64-384K, mono & color graphics, multifunc.
I/O PLUS Ser., Clk., Splr., Ramdisk, opt. 2nd Ser., Par., & Game.
QUADRAM *QUADBOARD*, New Version, 64-384K, multifunc.
TECMAR *CAPTAIN*, 64-384K, multifunc.
TALLTREE *J-RAM II*, 0-512K, multi-func., w/J-RAM Software.
MICROLOG *BABY BLUE II*, 64-256K, Z80 coproc., extra software.
ORCHID *PC Blossom*, 64-384K multifunction with optional *PCnet* Piggy-Back.
MAYNARD *Sandstar*, mod. Floppy & Hard Disc Controllers.

Chips

We've stock-piled the best. Call us for quantity prices.
INTEL 8087 High speed math coprocessor.
64K RAMCHIPS For the IBM-PC compatibles and their boards.

Graphic Cards

PERSYST *BoB board.*
STB *Graphics Plus II*, color & mono, w/par. port & software.
HERCULES Mono & color graphics cards support Lotus on IBM.
PLANTRONICS *ColorPlus +* , HiRes color bd. par. port w/software.
TECMAR *Graphics Master*, HiRes color & mono supports Lotus.
QUADRAM *QUADCOLOR I & II*, color cards.
PARADISE SYSTEM *Multi-display* or *Modular Graphics Cards*, color & mono, parallel port.

Software

Accounting

SORCIM / IUS A/P, A/R, G/L, inventory, order entry, payroll.
PEACHTREE A/P, A/R, G/L, payroll, job cost, inventory, order entry.

Spreadsheets & Integrated Packages

ASHTON-TATE *Framework.*
LOTUS *Symphony and Lotus.*
MICROSOFT *MultiPlan*, comes with choice

Atlanta, New Orleans, Charlotte, Louisville, Nashville, Raleigh,

of templates.
MDBS *Knowledge Man.*
SORCIM *SuperCalc 3, Version 2.0,* new enhancement pkg.
SPI *Open Access.*

Enhancements & Utilities

FOX & GELLER Complete line of enhancements for *dBase II, III & Rbase 4000.*
NORTON Utilities.
ROSESOFT *ProKey 3.0.*
CENTRAL POINT SOFTWARE *Copy II PC.*
ATI *Training,* critic's choice software tutorials.
SOFTSTYLE *Set FX,* Epson font control package.
SIDEWAYS Inverts printout.
BORLAND *Sidekick.*

Compilers & Language Tools

LATTICE *C*-Compilers.
MICROSOFT Complete line.
DIGITAL RESEARCH Complete line.
BORLAND *Turbo Pascal, Turbo Toolbox* and more.

Graphics & CAD

Zsoft *PC Paint Brush,* mouse driven graphics w/screen dump util.
DECISION RESOURCES *ChartMaster/ Sign-Master* graphics pkgs.
AUTODESK *AutoCAD.*
ENERTRONICS *Energraphics,* low cost graphics & CAD package.
MICROPRO *ChartStar.*

Communications

MICROSTUF *CROSSTALK XVI.*
HAYES *SMARTCOM II.*
VM *Relay.*

Word Processors

MULTIMATE With spelling checker and tutorial.
SAMNA *III,* New Flagship wd. processor.
MICROSOFT *Word;* w/or without mouse.
LIFETREE *VOLKSWRITER DELUXE.*
MICROPRO *WordStar Professional* series with Tutor, CorrectStar, MailMerge & Star Index.
SSI *WordPerfect.*
PEACHTREE *PeachText 5000,* Personal Productivity Series.

Office & Project Planning

HARVARD *Harvard Project Manager.*
IUS *Easy SalesPro.*
MICROSOFT *Project.*

Data Base Managers

MICRORIM *4000* or *6000,* Report Writer & Clout options.
GMS SYSTEMS *Power-base.*
ASHTON-TATE *dBase II & III.*
MICROSTUF *Infoscope.*

Modems

HAYES *Smartmodem 300, 1200, & 1200B.*
NOVATION Complete line of int. & ext.
RIXON 1200-4800 BAUD sync. & async. models.
ANCHOR AUTOMATION *Signalman Mark XII.*
VEN-TEL 1200 BAUD Half Card for the IBM portable & XT.

Miscellaneous Hardware & Accessories

DYSAN DS/DD. Quantity savings.
MICRO MART DS/DD, a 7 year warranty.
KEYTRONICS *5150 & 5151* keyboards.
LQ SHEET FEEDERS Cut sheet feeders for the NEC 3550 & C-ITOH printers.
MOUSE SYSTEMS *PC Mouse,* optical w/software.
MICROSOFT *Mouse;* Bus or serial mech. mouse with mouse menu software.
CURTIS Monitor pedestal, keyboard extension cable, monitor extension cable.
QUADRAM *MICROFAZER,* print buffer: 8-128K.
TRIPPELITE Back up power supply 200-1000 Watts, and *ISOBAR* surge protectors with 4 & 8 plug.

Monitors & CRT's

PGS *MAX 12,* amber, monochrome, 720h x 350v.
PGS *SR-12,* 690h x 480v, w/dual scan cd.
PGS *HX-12,* 690 Dot RGB.
QUADRAM *QUADCHROME,* 690 Dot RGB.
AMDEK *COLOR I, IIA & IVT,* RGB's.
AMDEK *COLOR 300, 500, 600, 700, 710,* new complete line of HiRes RGB's.
AMDEK *300A/300G,* composite monitors.
AMDEK *310A,* amber monochrome w/3 yr. warranty.
WYSE Terminals, 100, 75, 50, entire line in stock.

We'd really like you to come by our stores, but if you can't, call us direct. When you need the right product at the right price, remember the service and support our local store experts and national distribution center can give you.

Ask for expert advice and your best price.

For information or the store location nearest you, call

(404) 449-8089

©Copyright Micro Mart 1984.

Technology
Corporate Campus
3159 Campus Drive
Norcross, Georgia 30071

America's PC Specialist.

MICRO MART™

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

Miami, Ft. Lauderdale, Tampa, Orlando, Tyson's Corner, Rockville.

Circle 112 on reader service card

INTRODUCING A FINANCIAL PROGRAM THAT'S NOT FOR YOU.

Introducing MoneyTrack. A financial program designed especially for your best clients. Clients with multiple sources of income. Clients with small businesses. Property. Stocks. And bonds. And clients with problems. Problems managing all their investments. And keeping track of them.

That's why they come to you. Seeking your expertise and guidance. And eventually asking the same question: "What's the best way to organize my financial records?"

Now you can give them the same answer. MoneyTrack. Because the MoneyTrack software program from Pacific Data Systems will organize your clients' financial affairs in ways they never before thought were possible. And in ways no other financial program has been able to do before. One major reviewer called the MoneyTrack program "among the best." Another labeled it a "masterwork."

WHAT MONEYTRACK DOES FOR YOUR CLIENTS.

Using simple layman's vocabulary and easy-to-follow formats, MoneyTrack lets your clients know where their money is at all times. It charts up to 99 funds, 99 different businesses, 900 ledger accounts and 900 ledgers for securities, payees, and rental units. MoneyTrack also prints checks, reconciles bank statements, and produces files that can be read by almost all popular spreadsheet programs.

WHAT MONEYTRACK DOES FOR YOU.

MoneyTrack produces a variety of clear, concise and highly accurate reports for your clients. Reports that make your work, as a financial advisor or CPA, easier. And far more productive.

Time spent with your client is now time spent on tax strategy and financial planning instead of bookkeeping.

HOW MUCH DOES IT COST?

MoneyTrack will only cost your clients $295.00. And even though it was created for non-accountants, you'll find it handy even for your own finances or small business applications. MoneyTrack operates on the IBM PC, XT and most major compatibles.

MoneyTrack. For your clients' money or for your money, it's the best personal financial program available today.

MONEYTRACK™

For information and free eight-page brochure, call Pacific Data Systems, Inc. at 800-343-9194 outside of California, 800-421-4706 in California, and 559-8713 in the 213 area code.

Circle 321 on reader service card

Now make your PC paint.

Make it draw. Shade. Color. Erase. Create perfect circles. Ellipses. Rectangles. With the touch of a button. Print on screen and off in a variety of type fonts. Gothic. Roman. Old English. Script. Print in light. Medium. Bold. Italicize. Underline. Outline. Kern. Make it print in a wide range of point sizes. Make it cut. Make it paste. Make it all happen in one package. With Tecmar's Graphics Master™ Board and PC Paintbrush*Software.

Make a trip to your dealer for a demonstration. Or, make a call to Tecmar for the dealer nearest you. (216) 349-0600.

Tecmar

THE POWER BEHIND THE PC

*Registered trademark of the ZSoft Corp.

Circle 190 on reader service card

Introducing Pop-Ups™

6 desk tool programs only a keystroke away.

Imagine: one keystroke puts a calculator, a notepad, or a host of other tools into windows on your screen! Even in the middle of Wordstar™, 1-2-3™ or other programs, you can have instant access to . . .

Pop-Up Calculator One keystroke instantly displays a full-function calculator on your screen! Enter your figures on the numeric keypad and watch them appear on the tape display. It will move the total into your program for you! $39.95, including Pop-Up AlarmClock.

Pop-Up Notepad Now, the touch of a key pops up a notepad window for jotting down your thoughts or reviewing your notes. You may even use it as a handy address and phone directory! Print out your ideas or copy them to a file for later reference! $39.95, including Pop-Up AlarmClock.

Pop-Up Calendar You're developing a production schedule on your PC and you find yourself squinting at the wall across the room to see the calendar. No longer! Strike a key and up pops a calendar that windows 3 months at a time. And there's room for 30 messages on your calendar to highlight special dates! $19.95, including Pop-Up AlarmClock.

Pop-Up TeleComm With a modem, your computer can now autodial a number, retrieve information, and insert it into an application program at the touch of a key! You have instant access to Dow Jones™, data bases, or even the computer across the room! $79.95, including Pop-Up AlarmClock.

Pop-Up PopDOS From the middle of an application, just hit a key to pop up a menu of commonly-used DOS functions. Delete a file, check disk space, look at a directory, and more . . . all without exiting your program! $39.95, including Pop-Up AlarmClock.

Pop-Up Alarm Clock It's a clock and more! Set messages in advance that will "pop up" on your screen to remind you of appointments. Pop-Up Alarm Clock has a stopwatch, optional hourly chimes, a "snooze alarm" and it will even run programs for you when you're not there! Go ahead — lose yourself in your work. Your PC will keep track of time *for* you! ~~$19.95.~~ **FREE** *with the purchase of any Pop-Up, or see coupon.*

Work more efficiently — with Pop-Ups from Bellsoft. Available at computer stores nationwide. Or call **1-800-862-6262.**

BELLSOFT

Pop-Ups are designed for use on the IBM PC, XT, PCjr and compatibles operating under MS-DOS or PC-DOS.

Pop-Up and Pop-Ups are trademarks of Bellsoft, Inc. Wordstar is a trademark of MicroPro Corp. 1-2-3 is a trademark of Lotus Development Co. Dow Jones is a trademark of Dow Jones & Co., Inc. IBM is a registered trademark of International Business Machines.

FREE Pop-Up™ Alarm Clock!

Included with the purchase of any Pop-Up or send us this coupon

To show you these remarkable tools on your PC, we'll send you your own free Pop-Up AlarmClock on an IBM PC diskette! Send this completed coupon, along with $5 for postage and handling to Bellsoft. Or, call 1-800-862-6262 for VISA, MC, or AMEX orders.

Name

Address

City, State, Zip

Bellsoft, Inc., 2820 Northup Way
Bellevue, WA 98004
(206) 828-7282

Cash value 1/20¢